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MEJ

IN THE UNITED STATES DISTRICT COURT

FOR THE NORTHERN DISTRICT OF CALIFORNIA

DENNIS FERNANDEZ,

Plaintiff,

v.

MICROSOFT CORPORATION.

Defendant.

Case No. CV 11 4974

COMPLAINT FOR PATENT INFRINGEMENT

JURY TRIAL DEMANDED

Plaintiff, Dennis Fernandez, complains of Defendant Microsoft Corporation and alleges as follows:

NATURE OF THE SUIT

1. This is a claim for patent infringement arising under the patent laws of the United States, Title 35 of the United States Code.

PARTIES

2. Dennis Fernandez is a resident of Atherton, California, located in San Mateo County, California.

3. The patents-in-suit are U.S. Patent No. 7,221,387 entitled "Digital Television With Subscriber Conference Overlay," which issued on May 22, 2007 (the "'387 patent," Exhibit A) and U.S. Patent No. 7,355,621 entitled "Digital Television With Subscriber Conference Overlay," which issued on April 8, 2008 (the "'621 patent," Exhibit B), U.S. Patent No. 6,339,842 entitled "Digital Television With Subscriber Conference Overlay," which issued on January 15, 2002 (the "'842 patent," Exhibit C), and U.S. Patent No. 8,032,915 entitled "Digital Television with Subscriber Conference Overlay," which issued on October 4, 2011 (the "'915 patent," Exhibit D). The '387, '621, '842, and '915 patents generally cover devices and methods for on-line conferencing in gaming devices.

4. Dennis Fernandez owns and has all right, title and interest in the '387, '621, '842, and '915 patents, including all claims for damages by reason of past, present or future infringement, with the right to sue for and collect damages for the same and, therefore, has standing to sue for infringement of the '387, '621, '842, and '915 patents.

5. Microsoft Corporation ("Microsoft") is a Washington Corporation with its headquarters located in Redmond, WA. Microsoft designs, develops, offers for sale and sells nationwide, including substantial sales in this judicial district, products that are covered by claims 17, 48, and 51 of the '387 Patent, claims 6 and 8 of the '842 patent, claim 35 of the '621 patent, and claim 11 of the '915 patent including Microsoft Xbox and Xbox Live.

JURISDICTION AND VENUE

6. This Court has exclusive jurisdiction over the subject matter of this action under 28

U.S.C. § 1338(a).

7. Venue is proper in this district under 28 U.S.C. §§ 1391 and 1400(b) because Microsoft transacts business in this district and have committed acts of infringement in this judicial district.

PATENT INFRINGEMENT

8. Microsoft has made, used, sold, offered for sale, and/or imported products with on-line conferencing capabilities, including but not limited to the Xbox and Xbox Live products. These acts by Microsoft have directly infringed at least claims 17, 48, and 51 of the '387 patent, claims 6 and 8 of the '842 patent, claim 35 of the '621 patent, and claim 11 of the '915 patent within the meaning of 35 U.S.C §271(a).

9. Microsoft has also committed and unless ceased upon filing of this Complaint, will continue to commit acts that constitute, with its knowledge of the '387, '621, '842 and '915 patents, knowing and intentional inducement of infringement of at least claims 17, 48, and 51 of the '387 patent, claims 6 and 8 of the '842 patent, claim 35 of the '621 patent, and claim 11 of the '915 patent by others within the meaning of 35 U.S.C. §271(b) through, among other things, its acts of providing on-line conferencing capabilities through at least its Xbox and Xbox Live products, and demonstrating and instructing users of Xbox and Xbox Live how to install and utilize the Xbox and Xbox Live product through, for example, on-line instructions available through its web site, http://support.Xbox.com, or through other user guides or manuals. Microsoft has committed, and will continue to commit, these acts with knowledge of the '387, '621, '842, and '915 patents and with knowledge of infringement of these patents through the use of Microsoft's Xbox and Xbox Live product by Microsoft and other users.

10. Microsoft has had this knowledge since August 31, 2006 when it was notified of its infringement of the '842 patent, July 23, 2007, when it was notified of its infringement of the '387 patent, and June 3, 2011, when it was again notified of its infringement of the '842 and '387 patents, as well as the '621 patent. Microsoft has had knowledge of the '915 patent since the filing of this Complaint.

11. Users of Xbox and Xbox Live, in turn, who have used such products directly infringe

at least claims 17, 48, and 51 of the '387 Patent, claims 6 and 8 of the '842 patent, claim 35 of the '621 patent, and claim 11 of the '915 patent within the meaning of 35 U.S.C. §271(a) through the use and operation of the Xbox and Xbox Live products.

10. The Defendant's direct infringement and/or inducement to infringe has injured Dennis Fernandez, and Dennis Fernandez is entitled to recover damages adequate to compensate him for such infringement, but in no event less than a reasonable royalty.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff, Dennis Fernandez, respectfully requests this Court enter judgment against defendants and against their subsidiaries, successors, parents, affiliates, officers, directors, agents, servants, employees, and all persons in active concert or participation with them, granting the following relief:

A. The entry of final judgment in favor of Dennis Fernandez;

B. An award of damages adequate to compensate Dennis Fernandez for the infringement which has occurred, together with prejudgment interest from the date infringement began, but in no event less than a reasonable royalty as permitted by 35 U.S.C. § 284; and

C. Such other further relief as this Court or a jury may deem proper.

JURY DEMAND

Dennis Fernandez demands a trial by jury on all issues presented in this Complaint.

Dated: October 7, 2011

Respectfully submitted,

By: _____

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Attorneys for Dennis Fernandez

Exhibit A

US007221387B2

(12) **United States Patent**
Fernandez et al.

(10) **Patent No.: US 7,221,387 B2**
(45) **Date of Patent: *May 22, 2007**

(54) **DIGITAL TELEVISION WITH SUBSCRIBER CONFERENCE OVERLAY**

(75) Inventors: **Dennis S. Fernandez**, 1175 Osborn Ave., Atherton, CA (US) 94027; **Irene Y. Hu**, Belmont, CA (US)

(73) Assignee: **Dennis S. Fernandez**, Atherton, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **10/444,261**

(22) Filed: **May 22, 2003**

(65) **Prior Publication Data**

US 2003/0193559 A1 Oct. 16, 2003

Related U.S. Application Data

(60) Continuation of application No. 10/026,095, filed on Dec. 21, 2001, now Pat. No. 6,590,602, which is a division of application No. 09/095,390, filed on Jun. 10, 1998, now Pat. No. 6,339,842.

(51) **Int. Cl.**
H04N 7/14 (2006.01)

(52) **U.S. Cl.** **348/14.08**; 348/14.09; 725/62; 725/64

(58) **Field of Classification Search** .. 348/14.01–14.09, 348/14.11, 14.12, 14.13; 455/550.1, 556.1, 455/556.2, 557, 558; 725/62, 63, 64; 434/350, 434/356, 362
See application file for complete search history.

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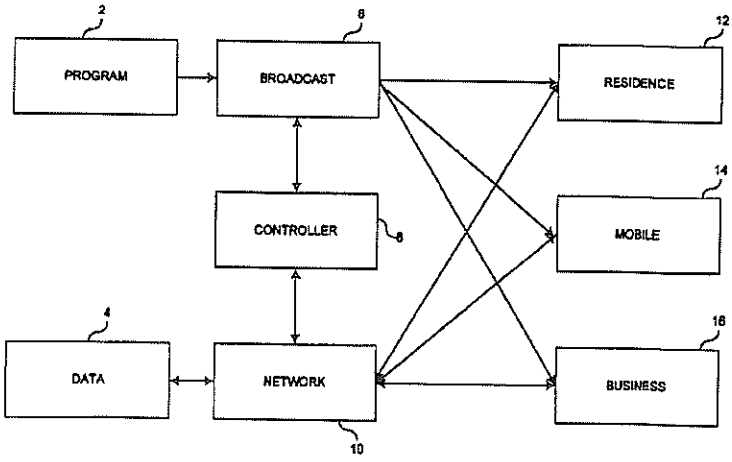
Primary Examiner—Melur Ramakrishnaiah
(74) *Attorney, Agent, or Firm*—Fernandez & Associates, LLP

(57) **ABSTRACT**

Digital television system overlays subscriber two-way communication during broadcast program delivery to create virtual audience community. Individual or group billing and advertisement is personalized per DTV receiver program viewing and/or conferencing activity. Subscriber receiver includes camera and other media I/O device for multi-way video conferencing. Participants may be added or removed dynamically during programming or conferencing.

78 Claims, 5 Drawing Sheets



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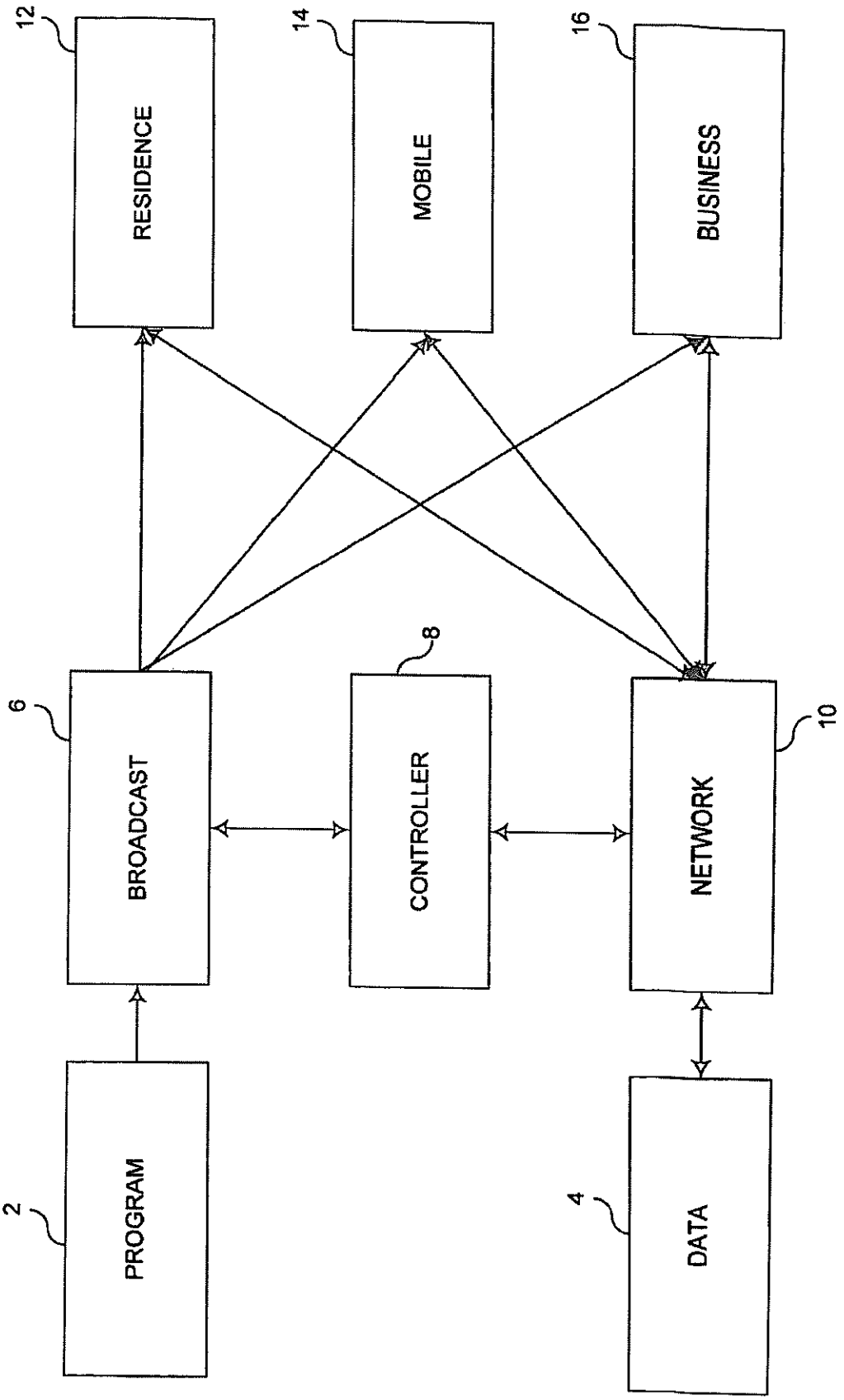
12
RESIDENCE
14
MOBILE
16
BUSINESS
6
BROADCAST
8
CONTROLLER
10
NETWORK
2
PROGRAM
4
DATA

FIG. 1

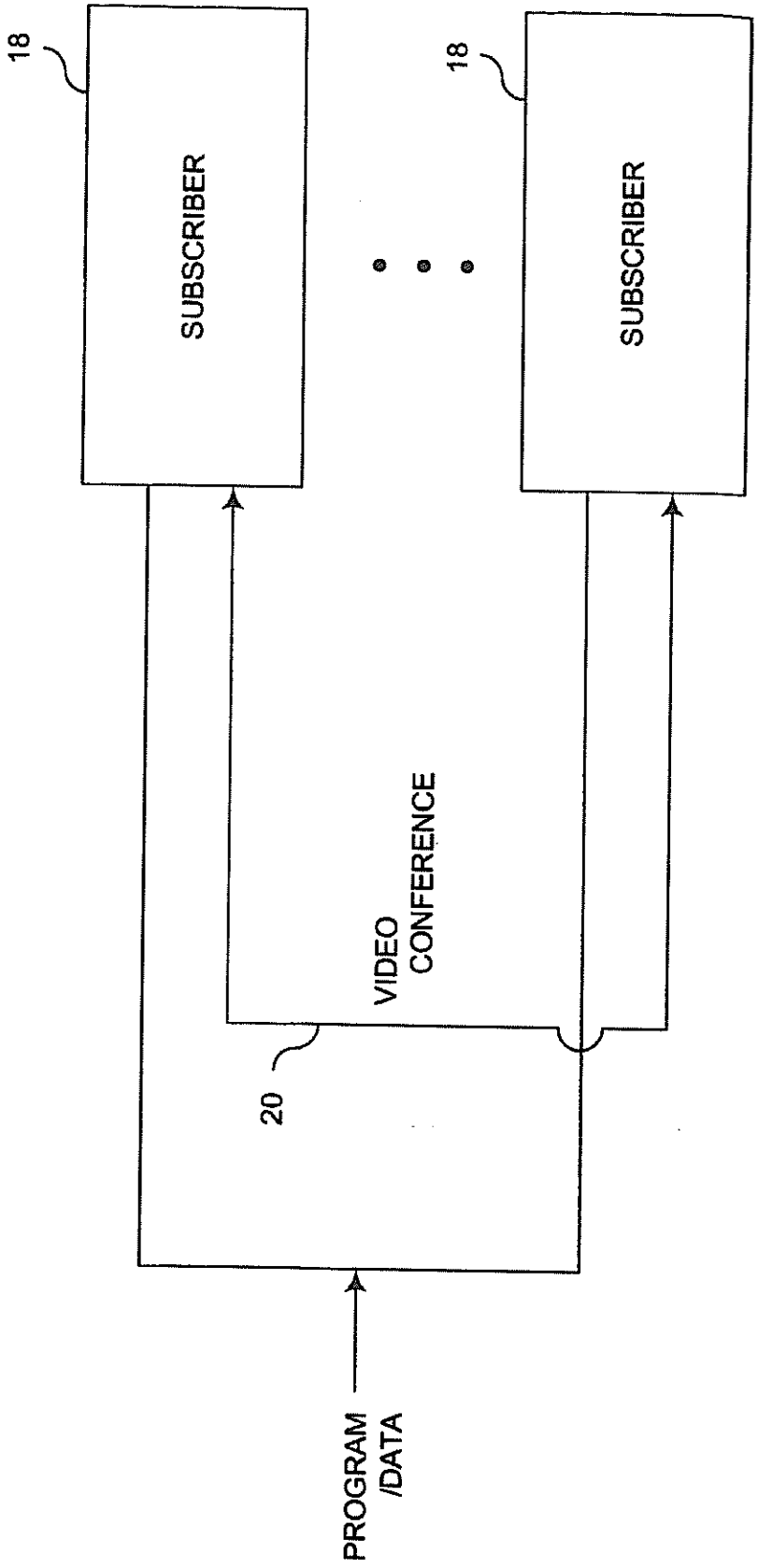
18
SUBSCRIBER
18
SUBSCRIBER
VIDEO CONFERENCE
20
PROGRAM /DATA

FIG. 2

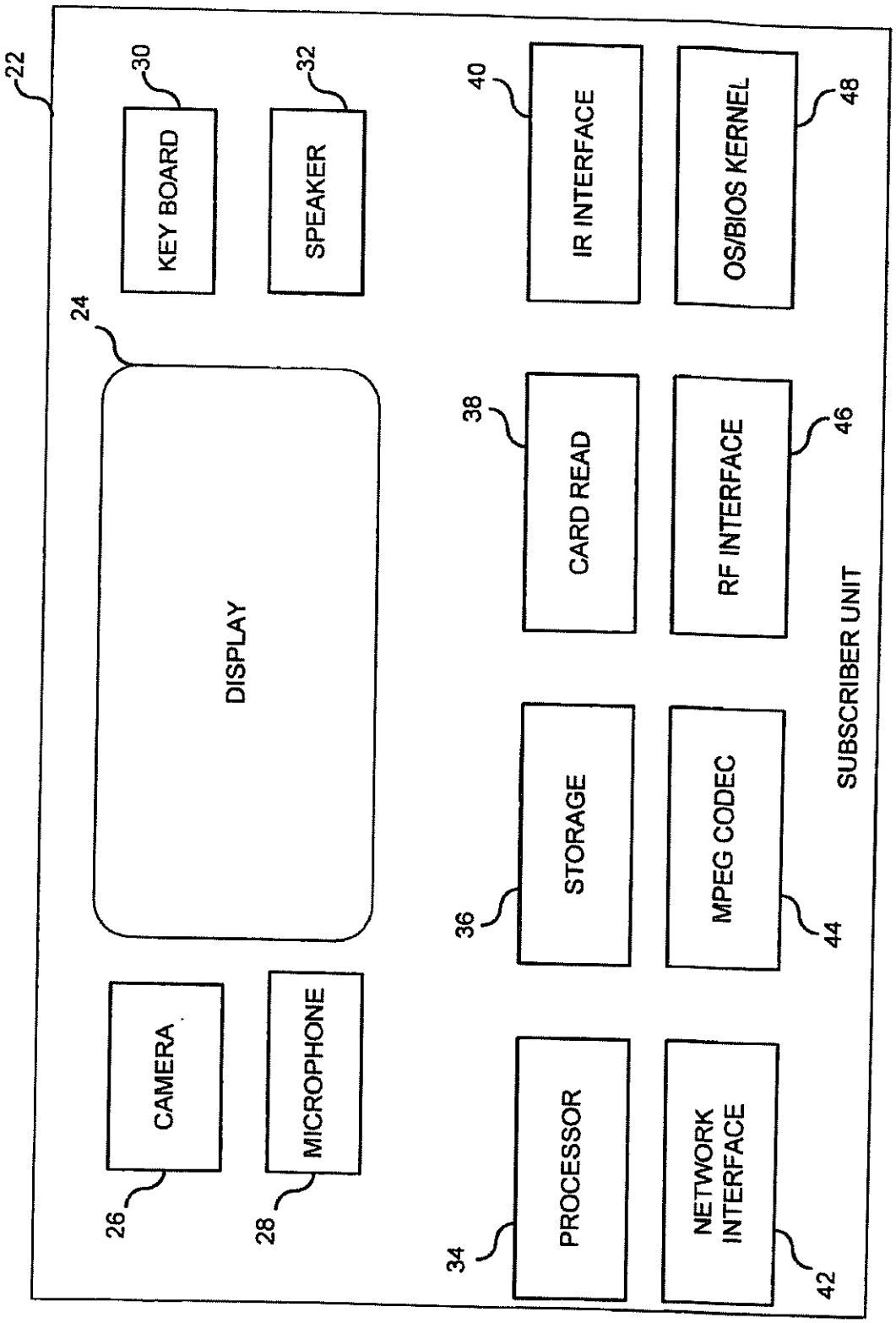
22
SUBSCRIBER UNIT
KEY BOARD
30
SPEAKER
32
IR INTERFACE
40
OS/BIOS KERNEL
48
24
DISPLAY
CARD READ
38
RF INTERFACE
46
STORAGE
36
MPEG CODEC
44
CAMERA
26
MICROPHONE
28
PROCESSOR
34
NETWORK INTERFACE
42

FIG. 3

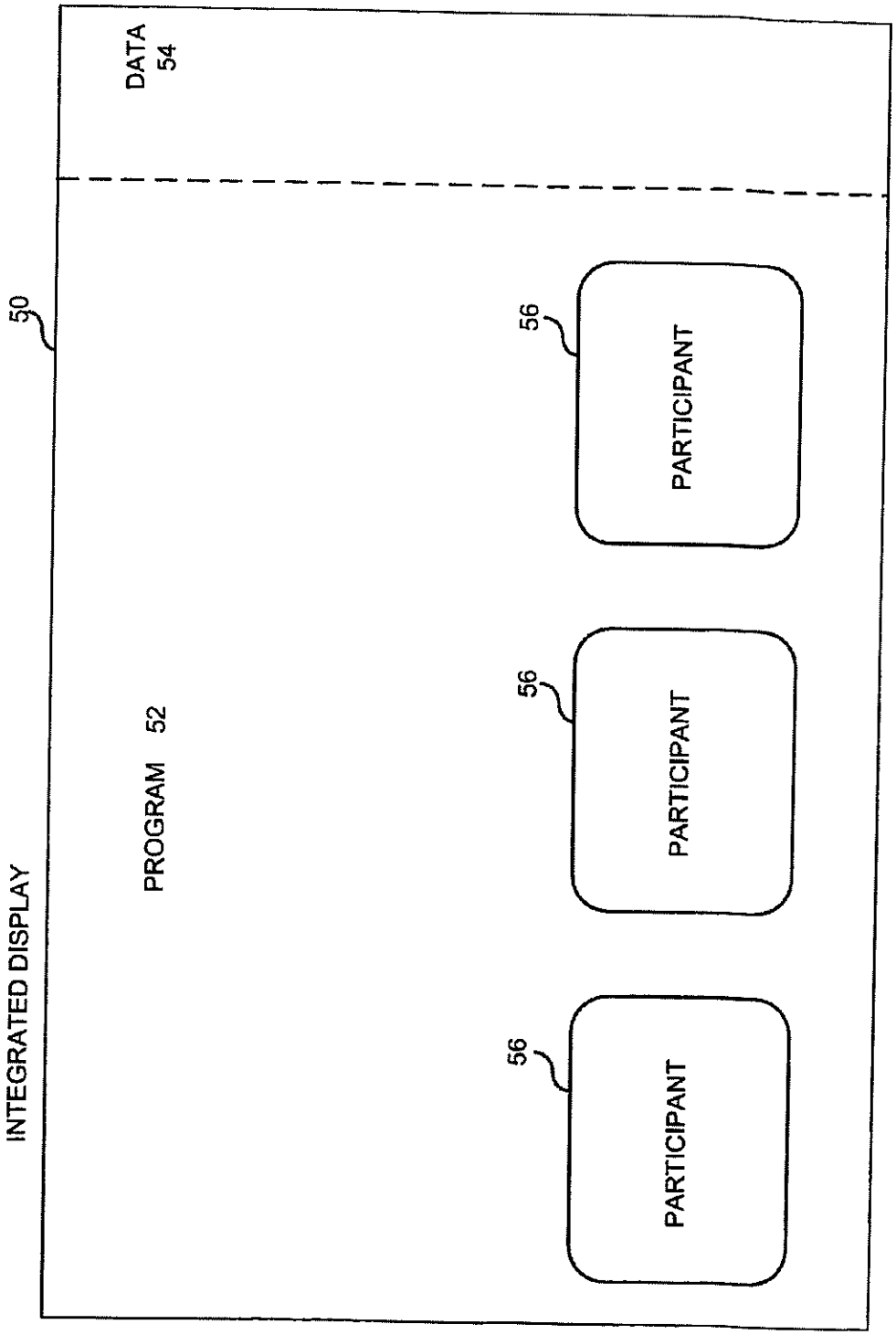
50
INTEGRATED DISPLAY
PROGRAM 52
DATA 54
56
PARTICIPANT
56
PARTICIPANT
56
PARTICIPANT

FIG. 4

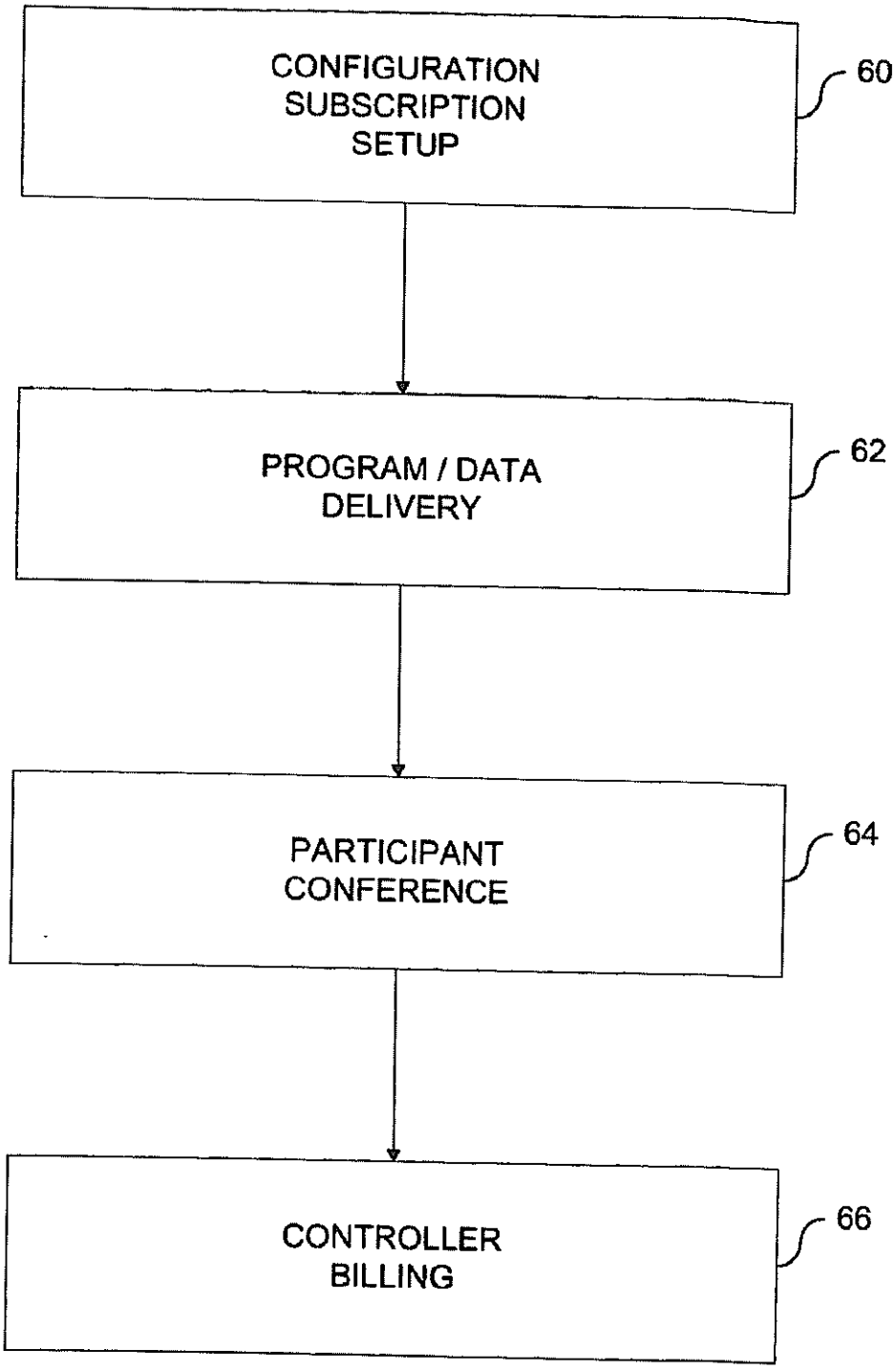
CONFIGURATION SUBSCRIPTION SETUP
60
PROGRAM / DATA DELIVERY
62
PARTICIPANT CONFERENCE
64
CONTROLLER BILLING
66

FIG. 5

DIGITAL TELEVISION WITH SUBSCRIBER CONFERENCE OVERLAY

RELATED U.S. APPLICATION DATA

This application is a continuation of U.S. patent application Ser. No. 10/026,095 filed on Dec. 21, 2001 now U.S. Pat. No. 6,590,602; which is a divisional of U.S. patent application Ser. No. 09/095,390 filed on Jun. 10, 1998, and issued on Jan. 15, 2002 as U.S. Pat. No. 6,339,842 B1, all entitled "DIGITAL TELEVISION WITH SUBSCRIBER CONFERENCE OVERLAY" by FERNANDEZ, et al.

FIELD OF INVENTION

The invention relates to digital television systems, particularly to subscriber video conferencing with conventional programming.

BACKGROUND OF INVENTION

Digital television (DTV) attributes have been standardized by industry (e.g., Advanced Television Systems Committee (ATSC) and government (U.S. Federal Communications Commission (FCC)). Such DTV standards, which provide enhanced multimedia quality, as well as interactive data services, are hereby incorporated by reference. Generally, however, DTV specifications contemplate program delivery to various receiver units, but not necessarily communication between receiver units. Accordingly, there may be need for conferencing between units receiving digital system programming.

SUMMARY OF INVENTION

The invention resides in digital television system configured for subscriber conference overlay during program delivery. Billing and advertisement may be personalized according to actual program viewing and/or conferencing activity by DTV receiver. Receiver unit includes media input/output device for multi-user conferencing. Subscribers may be added or removed during programming.

BRIEF DESCRIPTION OF DRAWINGS

FIG. **1** is block diagram of integrated digital television program and data delivery system for enabling present invention.

FIG. **2** is simplified diagram of novel overlay of subscriber conferencing over program and/or data delivery.

FIG. **3** is representative digital TV subscriber unit used according to present invention.

FIG. **4** is sample digital TV display according to present invention.

FIG. **5** is flow chart of operational steps of present invention.

DETAILED DESCRIPTION

FIG. **1** is block diagram of integrated digital television program and data delivery system, including one or more residential **12**, mobile **14** and business **16** subscriber, receiver and/or digital television (DTV) units coupled over broadcast **6** and/or network **10** channels respectively to program **2** and/or data **4** sources. Controller **8**, which is one or more processor, server, computer or other functionally equivalent controller functionality coupled to broadcast **6** and/or network **10** channel, may affect network **10** and broadcast **6** functionality as described herein.

Program source **2** comprises one or more source for broadcasting one or more video and/or data programs, or other functionally equivalent information signal stream, according to conventional digital and/or analog program broadcasting, accessible or addressable publicly or privately over various broadcast **6** equipment, medium, or other functionally equivalent channels, such as cable, optical fiber, microwave, wireless radio frequency (RF) transmission, direct broadcast satellite (DBS), multichannel multipoint distribution system (MMDS), local multipoint distribution service (LMDS), etc. For example, program **2** may comprise live sports or entertainment performance event, such as professional football game, broadcast over restricted pay-per-view television channels.

Data source **4** comprises one or more source for providing two-way or interactive access to one or more database, file, directory, or other functionally equivalent data repository site or signal source, accessible or addressable publicly or privately over conventional network **10**, such as local or wide area network, world-wide web Internet/intranet, or combination thereof, including, for example, network switch, router, bridge, gateway, hub, or other wired and/or wireless networking connection equipment for enabling ISDN, SONET, ATM, frame relay, gigabit Ethernet, TCP/IP, virtual private networks, xDSL, or other similar functionality. Additionally, data **4** may comprise text, graphics, video, or other digital or media information, such as current news update, photographic images, video or audio clips, sports statistics or analysis, stock quotes or financial data, weather forecast report, research data, commercial transaction details, product pricing, etc.

In accordance with important aspect of present invention, digital television system includes multiple receivers coupled selectively or programmably to program **2** and/or data **4** source over broadcast **6** and/or network **10** communications infrastructure, wherein conferencing or communication among DTV subscribers **18** occurs during program and/or data delivery. Consequently, controller **8** may send or transmit service bill indication to participating DTV units per actual program view or conference usage. As used herein, term "conference" or "conferencing" is interpreted broadly and understood to mean any communication between multiple parties.

Additionally, controller may facilitate electronic narrowcast delivery of personalized or customized commercial and/or non-commercial message to select DTV units. Controller **8** and/or subscribers **18** may employ one or more intelligent agents or functionally equivalent software constructs to search, obtain, or transact certain information or activity across network **10**. Controller **8** or subscriber unit **18** processor may selectively restrict or censor pre-defined program or data classes or titles, for example, to content screening criteria and/or procedure provided for so-called V-chip specifications. Preferably, each DTV receiver includes searchable and/or identifiable address and various multimedia input/output device capability for enabling video conferencing. Moreover, DTV units may be added or removed during conference period.

Accordingly, FIG. **2** shows overlay of subscriber conferencing **20** over program and/or data delivery to subscribers **18**. In this networked configuration, controller **8** effectively serves as broadband system headend processor for generating, forwarding, modifying, storing, accessing or otherwise controlling program/data delivery to subscribers **18**, while

generating, forwarding, modifying, storing, accessing or otherwise controlling video conferencing signal transmission between subscribers **18**.

Preferably, such program/data signal generated, transmitted or otherwise processed to receiver units comply with established DTV standards, such as ATSC or other generally accepted industry DTV information or signal format and/or protocol interface, and video conferencing signal generated, transmitted or otherwise processed between receiver units comply with established video conferencing standards, such as H.323, H.324, H.320, T.120 or other generally accepted industry video/data conferencing information or signal format and/or protocol interface, such currently published or online-accessible standards being hereby incorporated by reference.

FIG. **3** shows digital television subscriber unit **22**, which may be implemented as one or more DTV receivers **12**, **14**, or **16** of FIG. **1**. Preferably, DTV unit **22**, which functions in compliance with Advanced Television Systems Committee (ATSC) standard for DTV equipment and system operation, substantially includes display panel or screen with video frame buffer **24**, digital video-conferencing camera or image sensor **26**, microphone **28**, keyboard and/or mouse **30**, speaker(s) **32**, processor or controller **34**, digital memory or recordable video disk storage **36**, peripheral card reader **38**, remote control infrared interface **40**, network interface or modem **42** (e.g., for coupling to network channel **10**), digital compressed video encoder/decoder (i.e., according to Moving Pictures Experts Group (MPEG) industry standards)), radio frequency (RF), broadband or wireless communications interface **46** (e.g., for coupling to broadcast channel **6**), and operating system, BIOS, browser, or other associated kernel software **48** for generally enabling system and controller **34** operation and network communications.

It is contemplated that ATSC-compliant DTV unit **22** may be embodied as well in personal or network computer, workstation, set-top television device, or functionally equivalent processing and associated network equipment, as configured to operate as specified herein according to present invention.

Moreover, controllers **8**, **34** execute one or more computer programs for performing functions as described herein, preferably according to embedded or real-time software syntax, such as JAVA and/or Windows CE, which currently published or on-line specifications are hereby incorporated by reference.

When DTV unit **22** operates according to present invention, sample display **24** screen output may be as represented in FIG. **4**. In particular, display **24** may integrate, combine, mix, or otherwise include program **52** and/or data **54**, effectively through video frame buffer, with video conferencing windows from current (i.e., self) and/or other DTV participants **56** coupled thereto, preferably during program/data delivery. For example, each screen element **52**, **54**, **56** may be shown as picture within or adjacent to another picture element. In this overlaid manner, each DTV unit in select set displays common program and/or data stream, as well as conference video and audio signal output as generated from video camera and microphone from other participant DTV units.

Preferably, such program and/or video signals are compressed and encoded according to industry standard such as MPEG format. Display **50** may also show whiteboard-type screen commonly among participants **56** for jointly communicating text, graphics, or other observable or audible

program or data, such as for workgroup or class collaboration to review or discuss draft documents, faxes, or other forms or files.

FIG. **5** shows operational flow chart, including steps for system configuration and subscription set-up **60**, program and/or data delivery **62**, participant conference **64**, and controller billing **66**. Preferably, controller **8**, serves as central processor to coordinate DTV unit set-up, user smartcard account authorization or identity authentication program/data and/or conference scheduling, programming, viewing, output formatting, conference access and communication, billing, advertising, and other associated activity, particularly for managing access to program **2**, data **4**, as well as DTV video conferencing signals **20**. To reduce latency, controller **8** may transmit static image instead of live video.

For example, controller **8** may authorize or cause certain DTV units to be added or removed dynamically from one or more video conferencing active set or selected logical group, as well as restrict select DTV unit(s) from viewing certain program and/or data. Moreover, controller **8** monitors one or more actual program/data viewing and/or conferencing usage for appropriate billing. Furthermore, controller **8** may direct personalized or targeted commercial, incentive, or advertising messages to certain recognized demographic interest group, DTV subscribers or participant video conferencing parties.

Preferably, controller **8** directs such messages dynamically or adaptively according to current subscriber or participant information activity or needs, as well as product availability, market pricing, or other commercial attribute. Additionally, controller **8** may take corrective action or functional adjustment to redirect, restrict, control, or otherwise manage network, program/data, or other system resources, upon detecting actual or possible performance bottlenecks or other equipment or connection fault causing undesirable impact on such information delivery.

In one embodiment of present invention, DTV system is configured for luxury-suite type or other effectively exclusive membership multi-user conferenced viewing of live sports event, such that professional football, basketball, baseball, hockey, soccer, or other competitive individual, team, or tournament telecast is provided as program **2** through broadcast channel **6**, including preferably statistical or background data **4** about player, team, or other related game aspect. In particular, controller **8** provides proper access by authorized DTV subscribers **18** to such sports program and/or data. Additionally, controller **8** coordinates or monitors video conferencing activity occurring directly or indirectly between DTV units watching common program/data stream.

Hence, for example, initially, during configuration subscription setup phase **60**, system or headend controller **8** begins to identify system configuration, network address, program order and account status of any subscriber units coupled thereto over broadcast **6** and/or network **10** channels. Commercial transaction may occur to define DTV receiver unit user subscriptions, particularly for authenticating, billing, scheduling, notifying, requesting or otherwise providing desired access to any upcoming or current program **2** or database **4**. As appropriate, controller **8** may conduct remote diagnostics over such channels to various units **12**, **14**, **16** to ensure proper functioning for signal delivery.

Next, program and/or data delivery may commence according to controller **8** programmable selection to enable digital transmission for electronic signal delivery **62** of

certain program **2** and/or data **4** for presentation in integrated display **50** of selected or addressed DTV subscriber units **18**. Then, thereafter, prior, or simultaneously, select participants **56** are enabled for video conferencing **20**, particularly by allowing such participants to be monitored by activated video camera **26** and/or microphone **28**, for transmission of monitored static image or live motion video compressed encoded digital signal for presentation in display screen **50**. Upon completion of program/data delivery and conferencing activity, controller **8** may send proper billing indications to participant DTV units. Controller **8** may appropriately add or delete subscriber **18** in active database.

Therefore, in this combined DTV program/data viewing and select viewer conferencing scheme, important objective of emulating luxury-suite or otherwise more collaborative, intimate or personal conditions among associated audience members located at different locations is achieved effectively.

Optionally, while receiving program/data, conferenced subscriber may also send or receive electronic text message to other subscribers or other mail account addressable through network **10**, or run various application programs locally or in distributed client-server networked manner, preferably in common with other conferenced DTV units, such as for multi-user simulation or gaming application.

To improve system program/data broadcast or video conferencing performance, for example, when restricted effectively by channel bandwidth or traffic congestion, controllers **8**, **34** may reduce or eliminate actual transmission of full content video signal, and preferably transmit information subset, such as static image, text and/or voice.

Foregoing described embodiments of invention are provided as illustration and description. It is not intended to limit invention to precise form described. Other variations and embodiments are possible in light of above teaching, and it is thus intended that scope of invention not be limited by detailed description, but rather by claims as follow.

We claim:

1. Wireless mobile subscriber unit for real-time collaborative communication comprising:

an embedded processor; a user media interface; and a mobile communication interface;

wherein the user media interface comprises a microphone and a digital video or image camera for sending respectively a first audio signal and a first image signal, and a speaker and a display for receiving respectively a second audio signal and a second image signal; the first and second audio and image signals being transmitted or received via wireless radio-frequency communication through the mobile communication interface; the embedded processor enabling two-way image or audio communication for conferencing between multiple subscriber units through the user media interface while simultaneously, prior or after accessing a one-way broadcast or transmission of a common program or data stream through the mobile communication interface, wherein a controller centrally manages combined one- and two-way services of conferencing coupled with broadcast or transmission by authorizing or restricting access to the program or data stream by one or more subscriber units during, after or prior the conference, thereby enabling collaborative access by a virtual audience to integrated conferencing and broadcast or transmission services, wherein the controller functionally overlays: (a) the common program or data stream that is wirelessly accessed by a plurality of the subscriber units, with (b) the conference authorized directly between privately-restricted conferencing subscriber units.

2. The subscriber unit of claim 1 wherein:

the user media interface displays a text message from a conferencing subscriber unit.

3. The subscriber unit of claim 1 wherein:

the broadcast or transmission comprises a sports program provided by a direct broadcast satellite.

4. The subscriber unit of claim 1 wherein:

the broadcast or transmission comprises an interactive program for multi-user gaming.

5. The subscriber unit of claim 1 wherein:

the broadcast or transmission comprises an agent program for multi-user scheduling.

6. The subscriber unit of claim 1 further comprising:

authorization means for reading a smartcard to enable multiple subscriber unit conferencing.

7. The subscriber unit of claim 1 wherein:

the broadcast or transmission comprises an advertisement or narrowcast message directable selectively to one or more subscriber unit belonging to a target group.

8. The subscriber unit of claim 1 wherein:

the broadcast or transmission comprises a bill for a particular subscriber unit according to a monitored usage by the particular subscriber unit.

9. The subscriber unit of claim 1 wherein:

the broadcast or transmission comprises a whiteboard or graphical screen application for collaboration by a plurality of subscriber units belonging to a workgroup.

10. The subscriber unit of claim 1 wherein:

the display comprises means for displaying adjacently a plurality of video or program images.

11. The subscriber unit of claim 1 wherein:

the common program or data stream comprises a sports game, statistics or analysis, whereby a virtual game or simulation program may be run locally by the subscriber unit user in common with another subscriber unit.

12. The subscriber unit of claim 1 wherein:

a user media capability or address, program or data content, or actual or possible channel bandwidth congestion or network connection fault is identified, thereby enabling restricted, redirected, or reduced transmission effectively to improve or transcode such conferencing or broadcast or transmission.

13. The subscriber unit of claim 1 wherein:

an intelligent software agent is used to run a network search, thereby enabling selection of the common program or data stream for scheduled viewing, storage or delivery to one or more subscriber units.

14. The subscriber unit of claim 1 wherein:

a personalized or targeted commercial or advertisement is directed to one or more subscriber units for customized screen display or incentive messaging dynamically or adaptively according to such subscriber unit action or commercial attribute, thereby enabling the embedded processor to integrate, combine or mix graphically such commercial or advertisement with or within the common program or data stream.

15. The subscriber unit of claim 1 wherein:

the embedded processor enables authorization or authentication of such conference or access via subscriber unit memory card, thereby enabling authorization or authentication for internet, cable, satellite, optical fiber, microwave, MMDS, LMDS, wireless or other delivery source of the common program or data stream.

16. The subscriber unit of claim 1 wherein:
the conference and broadcast are enabled to be accessed by a non-mobile subscriber unit comprising a residential or business set-top device, digital television, or personal computer.

17. Wireless communication method between multiple mobile subscriber units for real-time collaboration comprising the steps of:
enabling a conference between a plurality of mobile subscriber units, at least one subscriber unit transmitting or receiving an audio or video signal to or from another subscriber unit via wireless communication; and
broadcasting or transmitting to at least one conferencing subscriber unit a common program or data stream via wireless communication, simultaneously during, prior or after the conference, wherein a central controller coordinates integrated services for conferencing and broadcasting or transmission by authorizing or restricting access to the program or data stream by one or more subscriber units during, prior or after the conference, thereby providing centrally-coordinated network collaboration via such integrated services, wherein the controller functionally overlays: (a) the common program or data stream that is wirelessly accessed by a plurality of the subscriber units, with (b) the conference authorized directly between privately-restricted conferencing subscriber units.

18. The communication method of claim 17 wherein:
a text message from a first subscriber unit is displayed by a second subscriber unit.

19. The communication method of claim 17 wherein:
the broadcast or transmission comprises a sports program provided by a direct broadcast satellite.

20. The communication method of claim 17 wherein:
the broadcast or transmission comprises an interactive program for multi-user gaming.

21. The communication method of claim 17 wherein:
the broadcast or transmission comprises an agent program for multi-user scheduling.

22. The communication method of claim 17 wherein:
the conference and broadcast or transmission are enabled by a smartcard.

23. The communication method of claim 17 wherein:
the broadcasting or transmitting step comprises sending an advertisement or narrowcast message directable selectively by controller means to one or more subscriber unit belonging to a target group.

24. The communication method of claim 17 wherein:
the broadcasting or transmitting step comprises sending a bill for a particular subscriber unit according to a monitored usage by the particular subscriber unit.

25. The communication method of claim 17 wherein:
the broadcasting or transmitting step comprises sending a whiteboard or graphical screen application for collaboration by a plurality of subscriber units belonging to a workgroup.

26. The communication method of claim 17 wherein:
at least one conferencing subscriber unit comprises means for displaying adjacently a plurality of video or program images.

27. The communication method of claim 17 wherein:
the common program or data stream comprises a sports game, statistics or analysis, whereby a virtual game or simulation program may be run locally by the conferencing subscriber unit in common with another conferencing subscriber unit.

28. The communication method of claim 17 wherein:
a user media capability or address, program or data content, or actual or possible channel bandwidth congestion or network connection fault is identified, thereby enabling restricted, redirected, or reduced transmission effectively to improve or transcode such conferencing or broadcast or transmission.

29. The communication method of claim 17 wherein:
an intelligent software agent runs a network search, thereby enabling selection of the common program or data stream for scheduled viewing, storage or delivery to one or more subscriber units.

30. The communication method of claim 17 wherein:
a personalized or targeted commercial or advertisement is directed to one or more subscriber units for customized screen display or incentive messaging dynamically or adaptively according to such subscriber unit action or commercial attribute, thereby enabling integration, combination or mixture graphically of such commercial or advertisement with or within the common program or data stream.

31. The communication method of claim 17 wherein:
such conference or access is authorized or authenticated via subscriber unit memory card, thereby enabling authorization or authentication for internet, cable, satellite, optical fiber, microwave, MMDS, LMDS, wireless or other delivery source of the common program or data stream.

32. The communication method of claim 17 wherein:
the conference and broadcast enabled to be accessed by a non-mobile subscriber unit comprising a residential or business set-top device, digital television, or personal computer.

33. Wireless communication controller for providing real-time conferencing between multiple mobile subscriber units comprising:
a digital repository; and controller means for accessing data in the digital repository;
wherein the digital repository stores a first representation of a conference between a plurality of mobile subscriber units, at least one subscriber unit transmitting or receiving an audio or video signal to or from another subscriber unit via wireless communication, and a second representation of a broadcast or transmission to at least one conferencing subscriber unit of a common program or data stream via wireless communication, simultaneously during, prior or after the conference, wherein said controller means controls both conference and broadcast or transmission services by authorizing or restricting access to the program or data stream by one or more subscriber units commonly or selectively during, after or prior the conference, thereby delivering integrated conferencing and broadcast or transmission services for virtual audience community, wherein the controller means functionally overlays: (a) the common program or data stream that is wirelessly accessed by a plurality of the subscriber units, with (b) the conference authorized directly between privately-restricted conferencing subscriber units.

34. The communication controller of claim 33 wherein:
the broadcast or transmission comprises a sports program provided by a direct broadcast satellite.

35. The communication controller of claim 33 wherein:
the broadcast or transmission comprises an interactive program for multi-user gaming.

36. The communication controller of claim 33 wherein:
the broadcast or transmission comprises an agent program for multi-user scheduling.

37. The communication controller of claim 33 wherein:
the conference and broadcast or transmission are enabled by a smartcard.

38. The communication controller of claim 33 wherein:
the broadcast or transmission comprises an advertisement or narrowcast message directable selectively by controller means to one or more subscriber unit belonging to a target group.

39. The communication controller of claim 33 wherein:
the broadcast or transmission comprises a bill for a particular subscriber unit according to a monitored usage by the particular subscriber unit.

40. The communication controller of claim 33 wherein:
the broadcast or transmission comprises a whiteboard or graphical screen application for collaboration by a plurality of subscriber units belonging to a workgroup.

41. The communication controller of claim 33 wherein:
at least one subscriber unit comprises means for displaying adjacently a plurality of video or program images.

42. The communication controller of claim 33 wherein:
the common program or data stream comprises a sports game, statistics or analysis, whereby a virtual game or simulation program may be run locally by the conferencing subscriber unit in common with another conferencing subscriber unit.

43. The communication controller of claim 33 wherein:
the controller means identifies a user media capability or address, program or data content, or actual or possible channel bandwidth congestion or network connection fault, thereby enabling restricted, redirected, or reduced transmission effectively to improve or transcode such conferencing or broadcast or transmission.

44. The communication controller of claim 33 wherein:
the controller means or one or more subscriber units enables an intelligent software agent to run a network search, thereby enabling selection of the common program or data stream for scheduled viewing, storage or delivery to one or more subscriber units.

45. The communication controller of claim 33 wherein:
the controller means directs a personalized or targeted commercial or advertisement to one or more subscriber units for customized screen display or incentive messaging dynamically or adaptively according to such subscriber unit action or commercial attribute, thereby enabling integration, combination or mixture graphically of such commercial or advertisement with or within the common program or data stream.

46. The communication controller of claim 33 wherein:
such conference or access is authorized or authenticated via subscriber unit memory card, thereby enabling authorization or authentication for internet, cable, satellite, optical fiber, microwave, MMDS, LMDS, wireless or other delivery source of the common program or data stream.

47. The communication controller of claim 33 wherein:
the conference and broadcast are enabled to be accessed by a non-mobile subscriber unit comprising a residential or business set-top device, digital television, or personal computer.

48. Subscriber unit for real-time collaborative network gaming comprising:

a processor; and a network interface;

wherein the processor runs a multi-user game application locally or across a network via the network interface in common with an other subscriber unit effectively running the same multi-user game application, whereby the other subscriber is coupled via the network interface to enable audio or video conferencing or messaging between coupled subscriber units effectively playing the same multi-user game application during such conferencing or messaging, the network interface being coupled to a gaming community network controller for centrally controlling access in common or selectively by one or more subscriber units to both the conferencing or messaging and the multi-user game application, wherein the controller functionally overlays: (a) the game application that is accessed by a plurality of subscriber units, with (b) the conference or messaging authorized directly between privately-restricted conferencing or messaging subscriber units.

49. The subscriber unit of claim 48 wherein:

the processor runs a software program or an intelligent agent for searching or transacting via the network, thereby enabling network delivery of or access to one or more multi-user game application.

50. The subscriber unit of claim 48 further comprising:

a user interface for displaying at least one screen element representing a subscriber playing the same multi-user game application while conferencing or messaging.

51. Communication controller for providing real-time gaming and conferencing between multiple subscriber units comprising:

means for coupling to a first subscriber unit playing a multi-user game application; and

means for coupling to a second subscriber unit playing effectively the same multi-user game application;

whereby an audio or video conference or message is enabled between the first and second subscriber units while, after or before playing effectively the same multi-user game application, such that the communication controller functions effectively as a system headend controller in an integrated broadband services network for multi-user gaming and conferencing or messaging, thereby enabling centralized network control of subscriber access in common or selectively by one or more subscriber units to both conferencing or messaging and multi-user game application services, wherein the control functionally overlays: (a) the game application that is accessed by both subscriber units, with (b) the conference or messaging authorized directly between privately-restricted conferencing or messaging subscriber units.

52. The communication controller of claim 51 further comprising:

means for controlling or restricting access to the conference or message by an additional subscriber unit playing effectively the same multi-user game application.

53. The communication controller of claim 51 further comprising:

means for sending a narrowcast message or commercial advertisement to the first or second subscriber unit adaptively or dynamically in response to such subscriber unit gaming, conferencing or messaging action, thereby enabling network transaction or billing according to actual gaming or conferencing usage by such subscriber unit.

54. Communication method between multiple subscriber units for real-time collaborative gaming comprising the steps of:

running a multi-user game application effectively in common by a plurality of subscriber units locally or across a network; and

conferencing or messaging between the subscriber units via the network while running the multi-user game application;

wherein a system headend controller for multi-user gaming and conferencing or messaging centrally controls access by one or more subscriber units to conferencing or messaging while, before or after such one or more subscriber units runs the multi-user game application, wherein the controller functionally overlays: (a) the game application that is accessed by the plurality of subscriber units, with (b) the conference or messaging authorized directly between privately-restricted conferencing or messaging subscriber units.

55. The communication method of claim **54** wherein:

the multi-user game application comprises a simulated sports game, whereby a screen element representing at least one subscriber unit playing the multi-user game application is displayed during the conference or message.

56. The communication method of claim **54** wherein:

one or more subscriber unit receives a personalized message or bill for actual usage of or participation in such game application, conference or messaging.

57. Multi-user game application comprising:

a simulator or gaming program for access by a plurality of users via a network; and means for conferencing textually, audibly or visually between the users, thereby enabling a virtual community among on-line players;

wherein a broadband system processor for integrated multi-user gaming and conferencing centrally controls access by one or more users to conferencing while, before or after one or more user may access the simulator or gaming program, wherein the processor functionally overlays: (a) the simulator or gaming program that is accessed by the plurality of users, with (b) the conference authorized directly between privately-restricted conferencing users.

58. The application of claim **57** wherein:

one or more of the users is billable or receives an advertisement according to a controller for controlling user access to the program.

59. Integrated television gaming and conferencing console comprising:

means for conferencing a first user with another integrated television gaming and conferencing user for video, audio or text messaging or chat before, while or after a television or gaming program broadcast or data application is accessed commonly by both users from memory or via a network data interface or broadcast program channel, whereby such conference and common access are integrated functionally for management or coordination by a centralized television/gaming access and user-conference controller coupled to both users for delivering or enabling a combined broadband television gaming and conferencing service, wherein the controller functionally overlays: (a) the television or gaming program broadcast or data application that is accessed by both users, with (b) the conference authorized directly between privately-restricted conferencing users.

60. Console of claim **59** wherein:

the program broadcast or data application comprises a video game or simulation program run locally by both users, whereby the centralized controller bills one or more user for combined gaming and conferencing service.

61. Console of claim **59** wherein:

the controller or console programmably identifies a user media capability or address, program or data content, or actual or possible channel bandwidth congestion or network connection fault according to a program for restricting, redirecting, or reducing transmission of the conference or access.

62. Console of claim **59** wherein:

the controller or console runs software for searching for the program broadcast or data application for delivery to or access by a virtual audience of users authorized for such delivery or access in common.

63. Console of claim **59** wherein:

the controller directs a targeted or narrowcast commercial, advertisement or message to one or more user for customized or personalized screen display or incentive messaging dynamically or adaptively according to user action or commercial attribute, wherein the commercial, advertisement or message is integrated, combined or mixed with or within the program broadcast or data application.

64. Console of claim **59** wherein:

the controller authorizes the combined service by authenticating a set-top device coupled via internet, cable, satellite, optical fiber, microwave, MMDS, LMDS, or wireless channel.

65. Internet protocol television transaction method comprising step of:

transacting with a system controller by a first internet protocol television subscriber unit conferencing with a second internet protocol television subscriber unit before, while or after a program broadcast or data application for multi-user gaming is accessed in common by the first and second subscriber units from memory or via a network data interface or broadcast program channel, whereby such conference and access are integrated functionally for transaction management by the system controller centrally coupled to both subscriber units to authorize combined conferencing and gaming service for multiple gaming and conferencing subscriber units, wherein the controller functionally overlays: (a) the program broadcast or data application for multi-user gaming that is accessed by both subscriber units, with (b) the conference authorized directly between privately-restricted conferencing subscriber units.

66. Method of claim **65** wherein:

the controller determines a subscriber unit capability or address, program or data content, or actual or possible channel bandwidth congestion or network connection fault, thereby enabling restricted, redirected, or reduced transmission effectively to improve such conference or access.

67. Method of claim **65** wherein:

the controller or first subscriber unit runs software for searching or selecting the common program broadcast or data application to enable combined conferencing and multi-user gaming.

68. Method of claim **65** wherein:

a personalized or targeted advertisement is provided to the first subscriber unit for customized messaging or incentive dynamically or adaptively according to subscriber unit action or user commercial attribute, such advertisement being integrated, combined or mixed with or within the program broadcast or data application.

69. In a networked device, a programmable broadband service software comprising:

firmware or computer code for authorizing a conference between a first broadband subscriber unit and a second

broadband subscriber unit before, while or after a multi-player game program broadcast or data application is accessed from memory or via a network data interface or broadcast program channel by at least one subscriber unit, whereby both the conferencing and accessing are authorized by an integrated broadband service provider centrally coupled to such subscriber units, wherein the service provider functionally overlays: (a) the multi-player game program broadcast or data application that is accessed by both subscriber units, with (b) the conference authorized directly between privately-restricted conferencing subscriber units.

70. Software of claim **69** wherein:

the program broadcast or data application is selectable programmably according to a software search, whereby a message adapted to such search is integrated, combined or mixed with or within the common program broadcast or data application.

71. Mobile television and gaming signal processor comprising:

a processor for conferencing a first mobile gaming user with a second gaming user before, while or after a television or gaming program broadcast or application is accessed from memory or via a network data interface or broadcast program channel by at least one gaming user, whereby such conference and access are integrated functionally for combined authorization centrally by a network controller coupled to both gaming users, wherein the controller functionally overlays: (a) the television or gaming program broadcast or application that is accessed by both gaming users, with (b) the conference directly between authorized privately-restricted conferencing gaming users; and

a digital codec for processing an access or conference signal.

72. Signal processor of claim **71** wherein:

the codec processes a message personalized for the first mobile gaming user, such message being integrated, combined or mixed with or within the access signal.

73. Wireless gaming and conference signal processing method comprising the steps of:

conferencing wirelessly a gaming subscriber with another subscriber before, while or after a multi-user game program broadcast or application is accessed from memory or via a network data interface or broadcast program channel, both wireless conference and multi-user game access being authorized centrally by a controller for providing combined conference and game access to both subscribers, wherein the controller functionally overlays: (a) the multi-user game program broadcast or application that is accessed by both subscribers, with (b) the conference directly between privately-restricted authorized conferencing subscribers; and

processing an access or conference signal using a codec.

74. Wireless broadband network apparatus comprising:

a broadband system controller for enabling access by at least one wireless subscriber to a digital television or multi-user gaming broadcast program or network data signal; and

means for conferencing between the accessing subscribers during, before or after such access, the controller centrally coupled for authorizing access by such subscribers in common to digital television or multi-user gaming service integrated functionally with conferencing by at least one subscriber accessing the digital television or multi-user game program or signal, wherein the controller functionally overlays: (a) the digital television or multi-user gaming broadcast program or network data signal that is accessed by a plurality of the subscribers, with (b) the conference authorized directly between privately-restricted conferencing subscribers.

75. In an interactive system comprising a data management system for authorizing subscriber service, a database comprising:

a database representing one or more subscriber account authorized to access a program or data for online broadband service, and conduct a conference between authorized subscribers while, after or before such subscribers access the program or data;

wherein a controller centrally authorizes the access to both the program or data and the conference, wherein the controller functionally overlays: (a) the program or data for online broadband service that is accessed by a plurality of subscribers, with (b) the conference authorized directly between privately-restricted conferencing subscribers.

76. Database of claim **75** wherein:

the program or data comprises one or more multi-user gaming or digital television program or signal, whereby a plurality of authorized subscribers access in common the multi-user gaming or digital television program or signal, while, after or before the conference is conducted between the plurality of subscribers.

77. In an interactive network device for accessing a gaming program or data signal and conferencing with another interactive network device while, before or after accessing the same program or data signal, a method for integrating broadband service comprising steps of:

outputting by a first network device interactively a gaming program or data signal; and

integrating in such output at least one participant accessing the gaming program or data signal,

wherein a controller coupled centrally to each conferencing network device authorizes access by a plurality of participants to the gaming program or data signal while, before or after the authorized participants conduct a conference with each other, wherein the controller functionally overlays: (a) the gaming program or data signal that is accessed by the plurality of participants with (b) the conference authorized directly between privately-restricted conferencing participants.

78. A set-top gaming device for coupling to a media output comprising:

a set-top processor, and a network interface;

wherein the set-top processor enables a conference by a subscriber with another subscriber during, before or after access by both subscribers to a multi-subscriber gaming program; the media output generating an integration of one or more conferencing subscriber and the accessed gaming program, wherein a controller couples to the network interface for authorizing centrally the access and conference as a combined subscription service for on-line gaming community, wherein the controller functionally overlays: (a) the multi-subscriber gaming program that is accessed by a plurality of subscribers, with (b) the conference authorized directly between privately-restricted conferencing subscribers.

* * * * *

EXHIBIT B

US007355621B1

(12) **United States Patent**
Fernandez et al.

(10) **Patent No.: US 7,355,621 B1**
(45) **Date of Patent: Apr. 8, 2008**

(54) **DIGITAL TELEVISION WITH SUBSCRIBER CONFERENCE OVERLAY**

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H04N 7/14 (2006.01)

(52) **U.S. Cl.** **348/14.08**; 348/14.09; 348/14.01

(58) **Field of Classification Search** .. 348/14.01–14.09, 348/14.1, 14.11, 14.12, 14.13, 14.14; 370/260, 370/261; 709/204; 725/133, 141, 183
See application file for complete search history.

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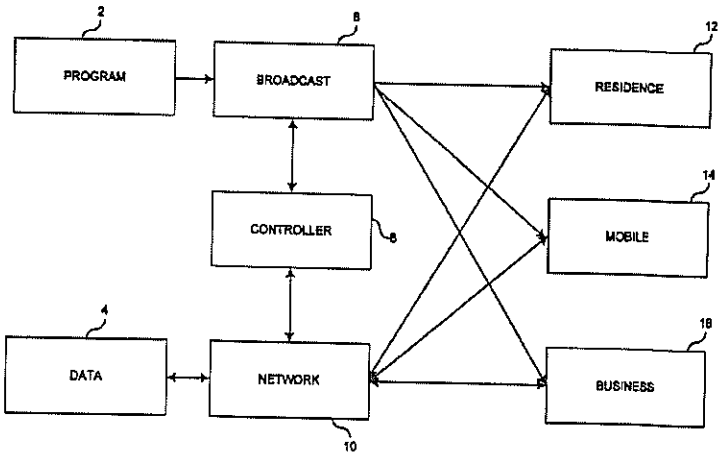
(57) **ABSTRACT**

Digital television system overlays subscriber two-way communication during broadcast program delivery to create virtual audience community. Individual or group billing and advertisement is personalized per DTV receiver program viewing and/or conferencing activity. Subscriber receiver includes camera and other media I/O device for multi-way video conferencing. Participants may be added or removed dynamically during programming or conferencing.

58 Claims, 5 Drawing Sheets



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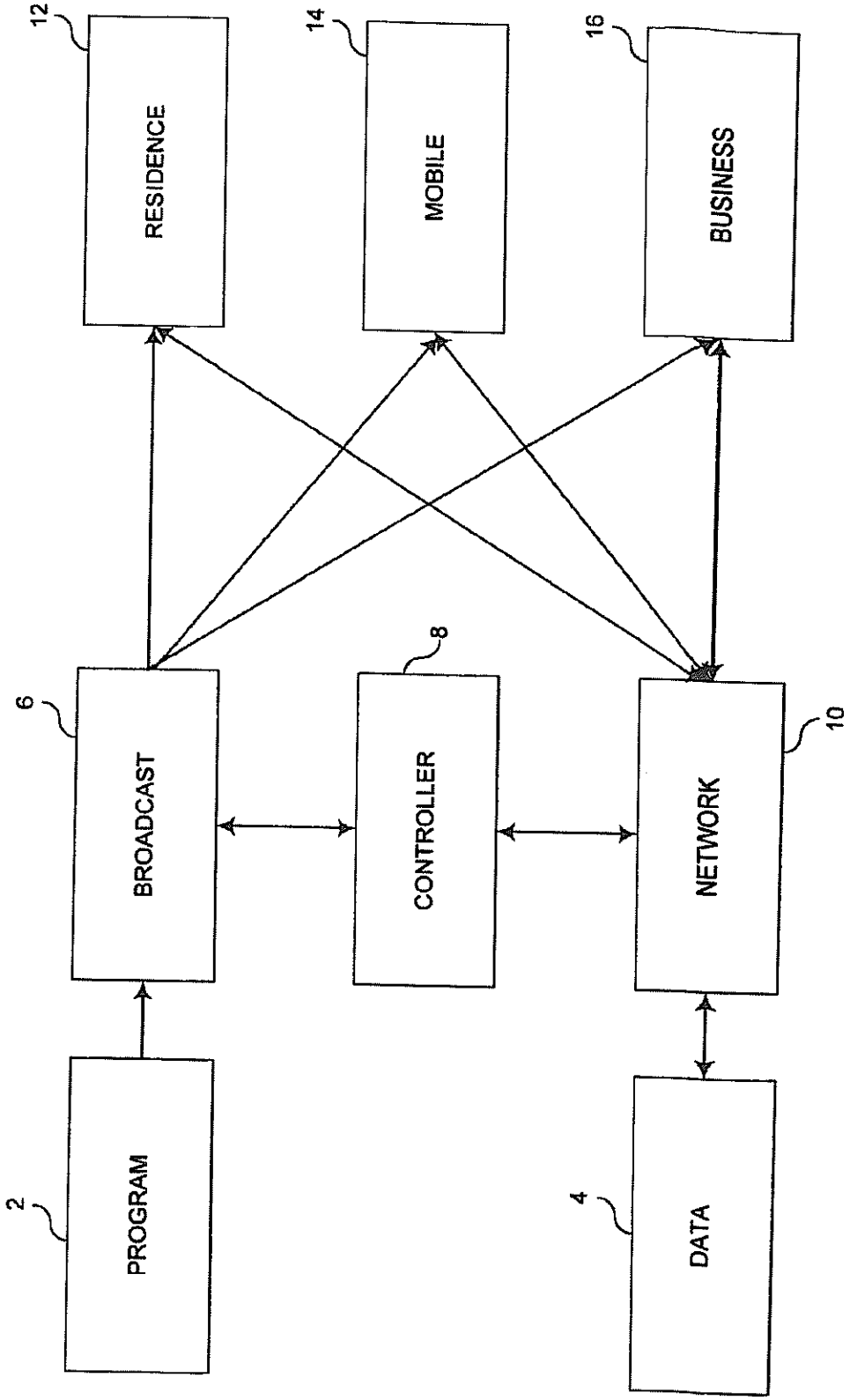
12
RESIDENCE
14
MOBILE
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BUSINESS
6
BROADCAST
8
CONTROLLER
10
NETWORK
2
PROGRAM
4
DATA

FIG. 1

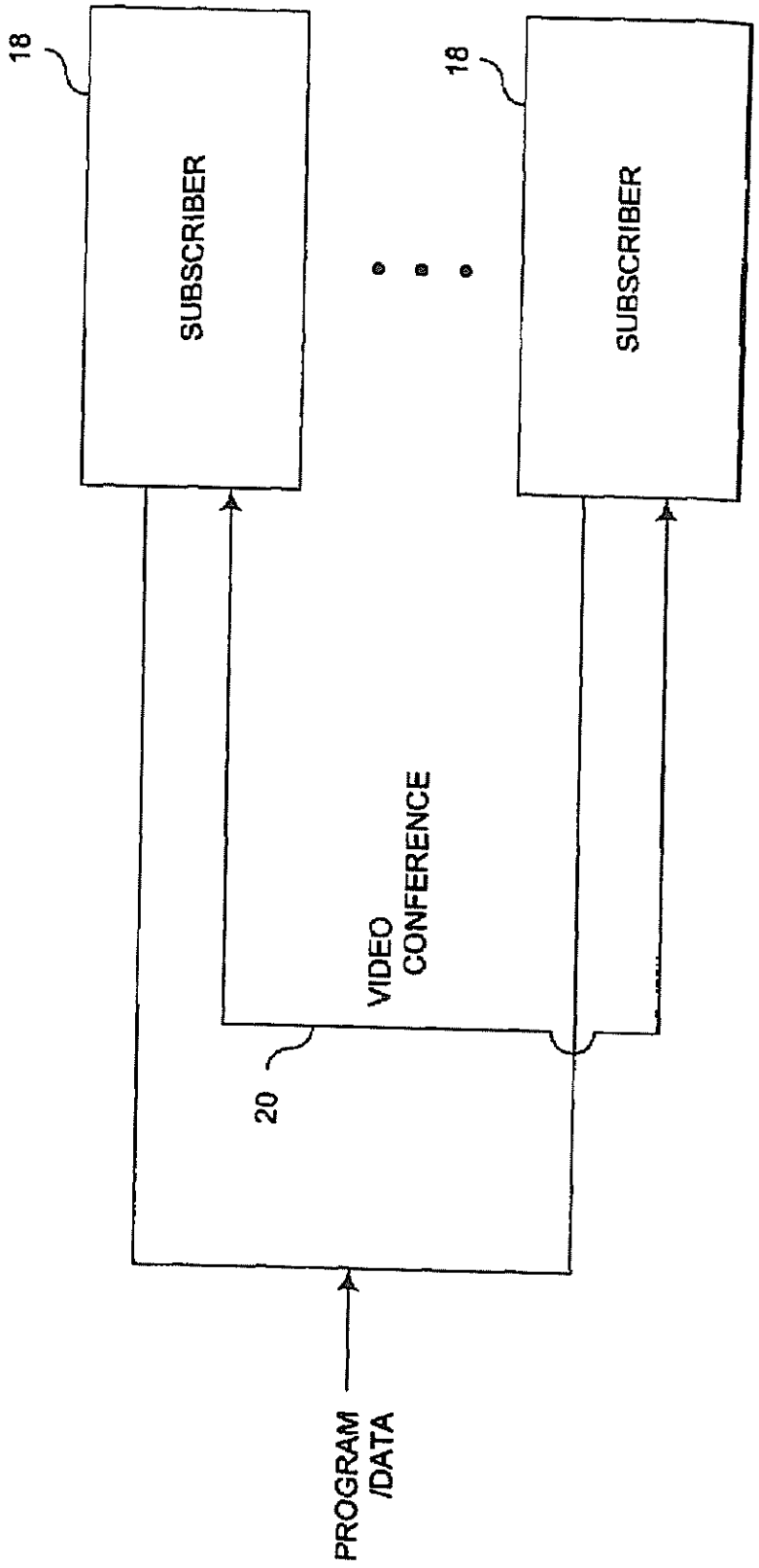
18
SUBSCRIBER
18
SUBSCRIBER
VIDEO CONFERENCE
20
PROGRAM /DATA

FIG. 2

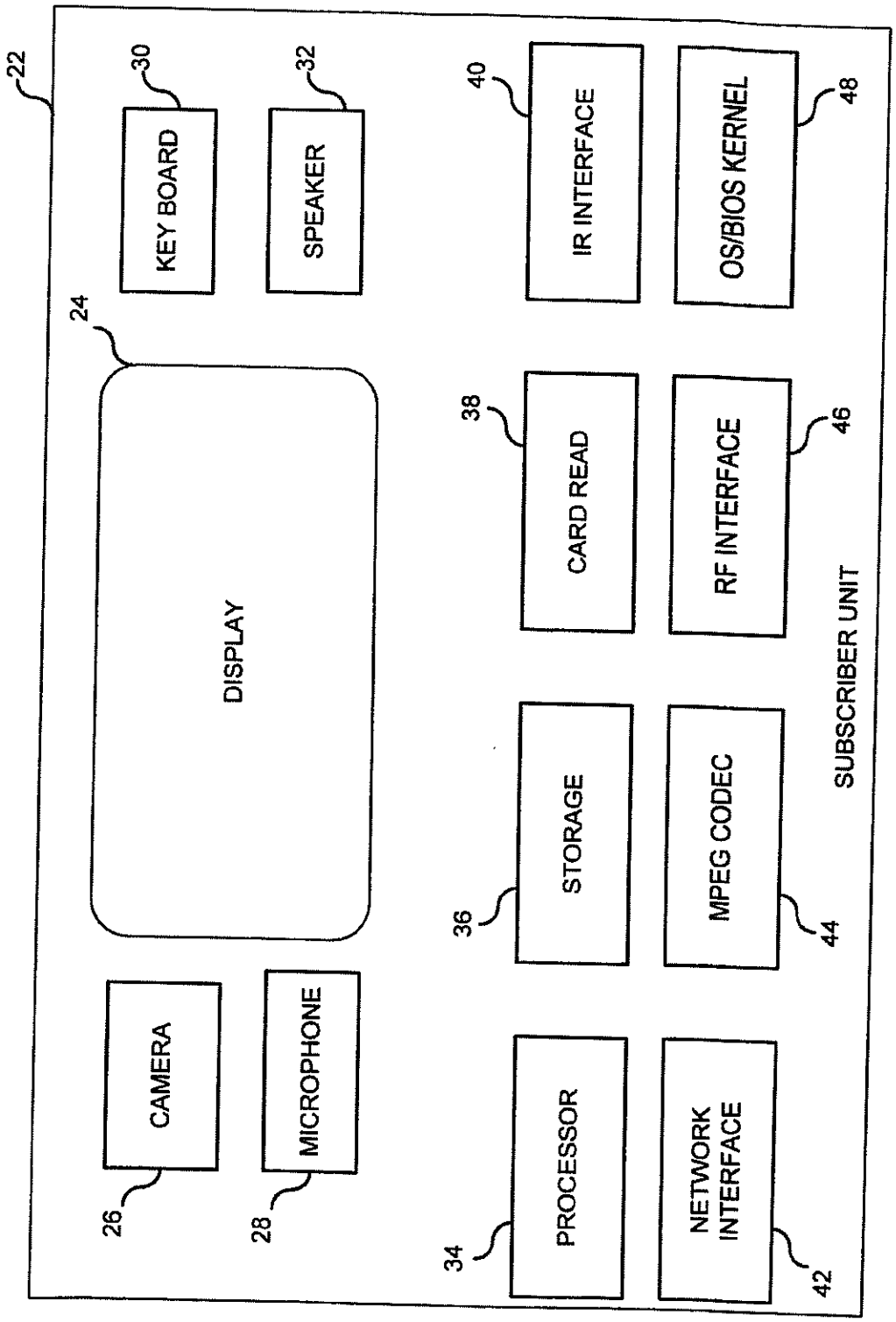
22
SUBSCRIBER UNIT
KEY BOARD
30
SPEAKER
32
IR INTERFACE
40
OS/BIOS KERNEL
48
24
DISPLAY
CARD READ
38
RF INTERFACE
46
CAMERA
26
MICROPHONE
28
STORAGE
36
MPEG CODEC
44
PROCESSOR
34
NETWORK INTERFACE
42

FIG. 3

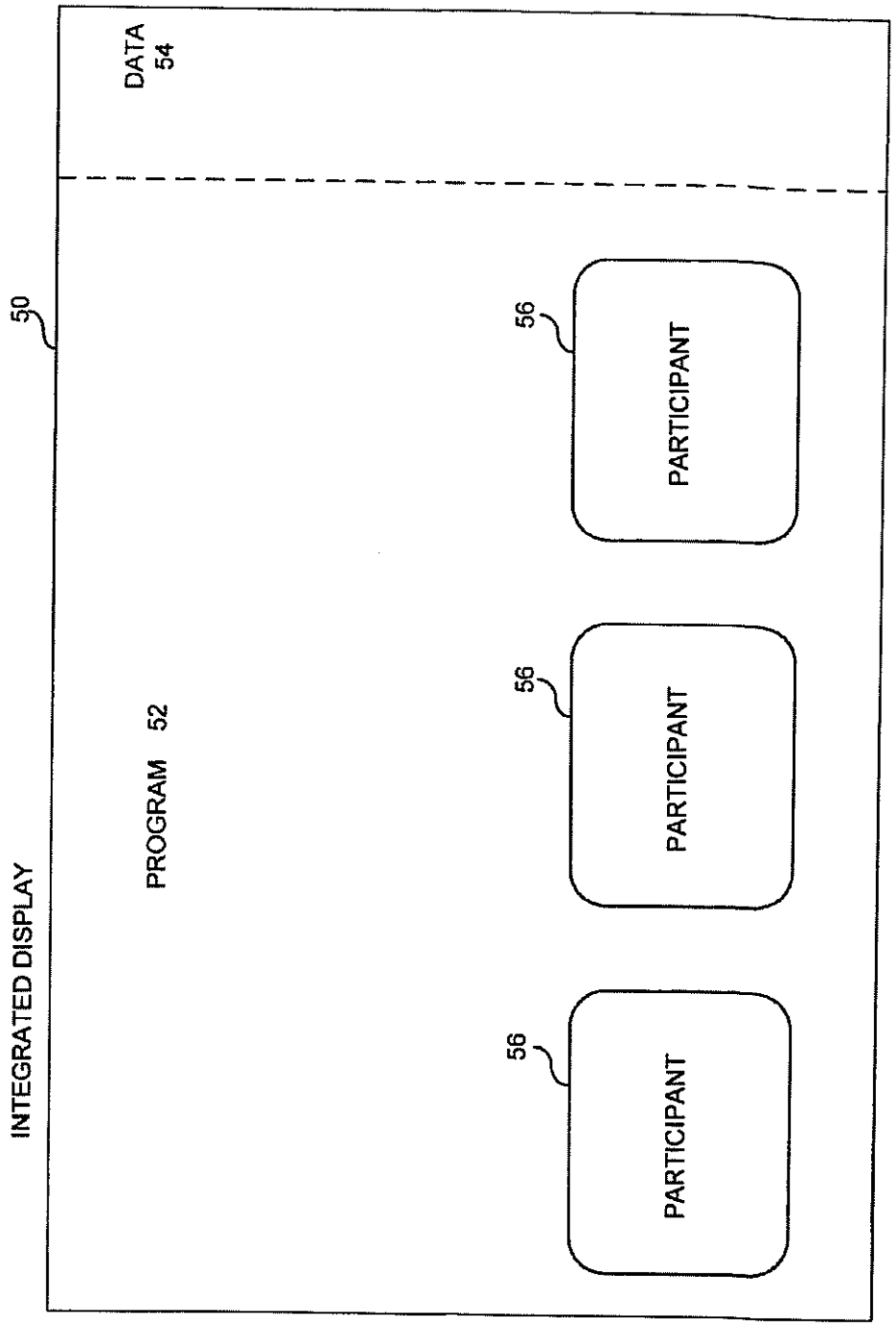
50
INTEGRATED DISPLAY
DATA
54
PROGRAM 52
56
PARTICIPANT
56
PARTICIPANT
56
PARTICIPANT

FIG. 4

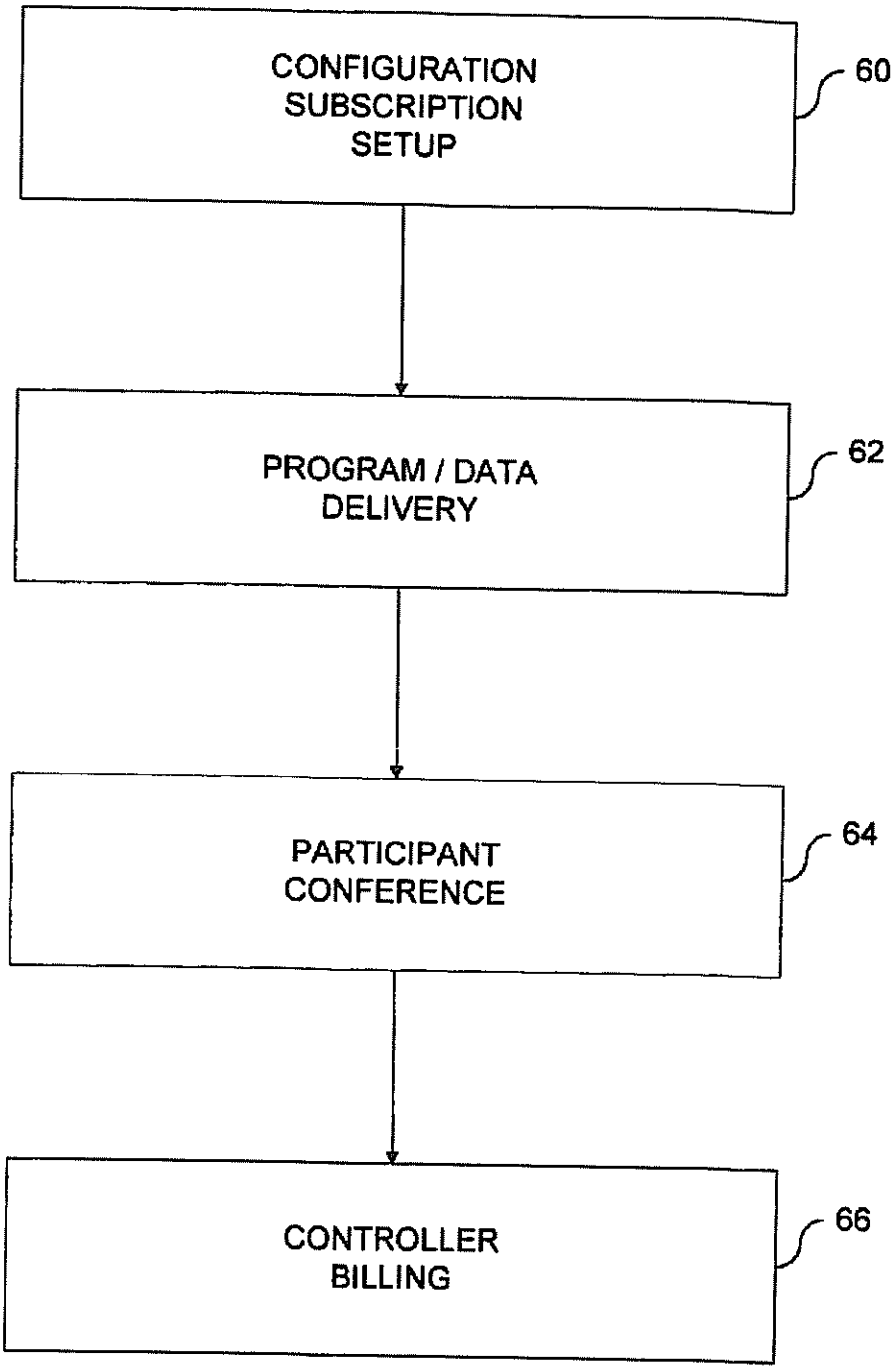
CONFIGURATION SUBSCRIPTION SETUP
60
PROGRAM / DATA DELIVERY
62
PARTICIPANT CONFERENCE
64
CONTROLLER BILLING
66

FIG. 5

DIGITAL TELEVISION WITH SUBSCRIBER CONFERENCE OVERLAY

CROSS-REFERENCE TO RELATED APPLICATION

This application is a continuation of the U.S. patent application Ser. No. 10/444,261 filed originally on May 22, 2003 now U.S. Pat. No. 7,221,387, which is a continuation of the U.S. patent application Ser. No. 10/026,095 filed on Dec. 21, 2001, now issued as U.S. Pat. No. 6,590,602, which is a divisional of the U.S. patent application Ser. No. 09/095,390 filed originally on Jun. 10, 1998, now issued as U.S. Pat. No. 6,339,842.

FIELD OF INVENTION

The invention relates to digital television systems, particularly to subscriber video conferencing with conventional programming.

BACKGROUND OF INVENTION

Digital television (DTV) attributes have been standardized by industry (e.g., Advanced Television Systems Committee (ATSC) and government (U.S. Federal Communications Commission (FCC)). Such DTV standards, which provide enhanced multimedia quality, as well as interactive data services, are hereby incorporated by reference. Generally, however, DTV specifications contemplate program delivery to various receiver units, but not necessarily communication between receiver units. Accordingly, there may be need for conferencing between units receiving digital system programming.

SUMMARY OF INVENTION

The invention resides in digital television system configured for subscriber conference overlay during program delivery. Billing and advertisement may be personalized according to actual program viewing and/or conferencing activity by DTV receiver. Receiver unit includes media input/output device for multi-user conferencing. Subscribers may be added or removed during programming.

BRIEF DESCRIPTION OF DRAWINGS

FIG. **1** is block diagram of integrated digital television program and data delivery system for enabling present invention.

FIG. **2** is simplified diagram of novel overlay of subscriber conferencing over program and/or data delivery.

FIG. **3** is representative digital TV subscriber unit used according to present invention.

FIG. **4** is sample digital TV display according to present invention.

FIG. **5** is flow chart of operational steps of present invention.

DETAILED DESCRIPTION

FIG. **1** is block diagram of integrated digital television program and data delivery system, including one or more residential **12**, mobile **14** and business **16** subscriber, receiver and/or digital television (DTV) units coupled over broadcast **6** and/or network **10** channels respectively to program **2** and/or data **4** sources. Controller **8**, which is one

or more processor, server, computer or other functionally equivalent controller functionality coupled to broadcast **6** and/or network **10** channel, may affect network **10** and broadcast **6** functionality as described herein.

Program source **2** comprises one or more source for broadcasting one or more video and/or data programs, or other functionally equivalent information signal stream, according to conventional digital and/or analog program broadcasting, accessible or addressable publicly or privately over various broadcast **6** equipment, medium, or other functionally equivalent channels, such as cable, optical fiber, microwave, wireless radio frequency (RF) transmission, direct broadcast satellite (DBS), multichannel multipoint distribution system (MMDS), local multipoint distribution service (LMDS), etc. For example, program **2** may comprise live sports or entertainment performance event, such as professional football game, broadcast over restricted pay-per-view television channels.

Data source **4** comprises one or more source for providing two-way or interactive access to one or more database, file, directory, or other functionally equivalent data repository site or signal source, accessible or addressable publicly or privately over conventional network **10**, such as local or wide area network, world-wide web Internet/intranet, or combination thereof, including, for example, network switch, router, bridge, gateway, hub, or other wired and/or wireless networking connection equipment for enabling ISDN, SONET, ATM, frame relay, gigabit Ethernet, TCP/IP, virtual private networks, xDSL, or other similar functionality. Additionally, data **4** may comprise text, graphics, video, or other digital or media information, such as current news update, photographic images, video or audio clips, sports statistics or analysis, stock quotes or financial data, weather forecast report, research data, commercial transaction details, product pricing, etc.

In accordance with important aspect of present invention, digital television system includes multiple receivers coupled selectively or programmably to program **2** and/or data **4** source over broadcast **6** and/or network **10** communications infrastructure, wherein conferencing or communication among DTV subscribers **18** occurs during program and/or data delivery. Consequently, controller **8** may send or transmit service bill indication to participating DTV units per actual program view or conference usage. As used herein, term "conference" or "conferencing" is interpreted broadly and understood to mean any communication between multiple parties.

Additionally, controller may facilitate electronic narrowcast delivery of personalized or customized commercial and/or non-commercial message to select DTV units. Controller **8** and/or subscribers **18** may employ one or more intelligent agents or functionally equivalent software constructs to search, obtain, or transact certain information or activity across network **10**. Controller **8** or subscriber unit **18** processor may selectively restrict or censor pre-defined program or data classes or titles, for example, to content screening criteria and/or procedure provided for so-called V-chip specifications. Preferably, each DTV receiver includes searchable and/or identifiable address and various multimedia input/output device capability for enabling video conferencing. Moreover, DTV units may be added or removed during conference period.

Accordingly, FIG. **2** shows overlay of subscriber conferencing **20** over program and/or data delivery to subscribers **18**. In this networked configuration, controller **8** effectively serves as broadband system headend processor for generating, forwarding, modifying, storing, accessing or otherwise

controlling program/data delivery to subscribers **18**, while generating, forwarding, modifying, storing, accessing or otherwise controlling video conferencing signal transmission between subscribers **18**.

Preferably, such program/data signal generated, transmitted or otherwise processed to receiver units comply with established DTV standards, such as ATSC or other generally accepted industry DTV information or signal format and/or protocol interface, and video conferencing signal generated, transmitted or otherwise processed between receiver units comply with established video conferencing standards, such as H.323, H.324, H.320, T.120 or other generally accepted industry video/data conferencing information or signal format and/or protocol interface, such currently published or online-accessible standards being hereby incorporated by reference.

FIG. **3** shows digital television subscriber unit **22**, which may be implemented as one or more DTV receivers **12**, **14**, or **16** of FIG. **1**. Preferably, DTV unit **22**, which functions in compliance with Advanced Television Systems Committee (ATSC) standard for DTV equipment and system operation, substantially includes display panel or screen with video frame buffer **24**, digital video-conferencing camera or image sensor **26**, microphone **28**, keyboard and/or mouse **30**, speaker(s) **32**, processor or controller **34**, digital memory or recordable video disk storage **36**, peripheral card reader **38**, remote control infrared interface **40**, network interface or modem **42** (e.g., for coupling to network channel **10**), digital compressed video encoder/decoder (i.e., according to Moving Pictures Experts Group (MPEG) industry standards)), radio frequency (RF), broadband or wireless communications interface **46** (e.g., for coupling to broadcast channel **6**), and operating system, BIOS, browser, or other associated kernel software **48** for generally enabling system and controller **34** operation and network communications.

It is contemplated that ATSC-compliant DTV unit **22** may be embodied as well in personal or network computer, workstation, set-top television device, or functionally equivalent processing and associated network equipment, as configured to operate as specified herein according to present invention.

Moreover, controllers **8**, **34** execute one or more computer programs for performing functions as described herein, preferably according to embedded or real-time software syntax, such as JAVA and/or Windows CE, which currently published or on-line specifications are hereby incorporated by reference.

When DTV unit **22** operates according to present invention, sample display **24** screen output may be as represented in FIG. **4**. In particular, display **24** may integrate, combine, mix, or otherwise include program **52** and/or data **54**, effectively through video frame buffer, with video conferencing windows from current (i.e., self) and/or other DTV participants **56** coupled thereto, preferably during program/data delivery. For example, each screen element **52**, **54**, **56** may be shown as picture within or adjacent to another picture element. In this overlaid manner, each DTV unit in select set displays common program and/or data stream, as well as conference video and audio signal output as generated from video camera and microphone from other participant DTV units.

Preferably, such program and/or video signals are compressed and encoded according to industry standard such as MPEG format. Display **50** may also show whiteboard-type screen commonly among participants **56** for jointly communicating text, graphics, or other observable or audible program or data, such as for workgroup or class collaboration to review or discuss draft documents, faxes, or other forms or files.

FIG. **5** shows operational flow chart, including steps for system configuration and subscription set-up **60**, program and/or data delivery **62**, participant conference **64**, and controller billing **66**. Preferably, controller **8**, serves as central processor to coordinate DTV unit set-up, user smartcard account authorization or identity authentication program/data and/or conference scheduling, programming, viewing, output formatting, conference access and communication, billing, advertising, and other associated activity, particularly for managing access to program **2**, data **4**, as well as DTV video conferencing signals **20**. To reduce latency, controller **8** may transmit static image instead of live video.

For example, controller **8** may authorize or cause certain DTV units to be added or removed dynamically from one or more video conferencing active set or selected logical group, as well as restrict select DTV unit(s) from viewing certain program and/or data. Moreover, controller **8** monitors one or more actual program/data viewing and/or conferencing usage for appropriate billing. Furthermore, controller **8** may direct personalized or targeted commercial, incentive, or advertising messages to certain recognized demographic interest group, DTV subscribers or participant video conferencing parties.

Preferably, controller **8** directs such messages dynamically or adaptively according to current subscriber or participant information activity or needs, as well as product availability, market pricing, or other commercial attribute. Additionally, controller **8** may take corrective action or functional adjustment to redirect, restrict, control, or otherwise manage network, program/data, or other system resources, upon detecting actual or possible performance bottlenecks or other equipment or connection fault causing undesirable impact on such information delivery.

In one embodiment of present invention, DTV system is configured for luxury-suite type or other effectively exclusive membership multi-user conferenced viewing of live sports event, such that professional football, basketball, baseball, hockey, soccer, or other competitive individual, team, or tournament telecast is provided as program **2** through broadcast channel **6**, including preferably statistical or background data **4** about player, team, or other related game aspect. In particular, controller **8** provides proper access by authorized DTV subscribers **18** to such sports program and/or data. Additionally, controller **8** coordinates or monitors video conferencing activity occurring directly or indirectly between DTV units watching common program/data stream.

Hence, for example, initially, during configuration subscription setup phase **60**, system or headend controller **8** begins to identify system configuration, network address, program order and account status of any subscriber units coupled thereto over broadcast **6** and/or network **10** channels. Commercial transaction may occur to define DTV receiver unit user subscriptions, particularly for authenticating, billing, scheduling, notifying, requesting or otherwise providing desired access to any upcoming or current program **2** or database **4**. As appropriate, controller **8** may conduct remote diagnostics over such channels to various units **12**, **14**, **16** to ensure proper functioning for signal delivery.

Next, program and/or data delivery may commence according to controller **8** programmable selection to enable digital transmission for electronic signal delivery **62** of

certain program **2** and/or data **4** for presentation in integrated display **50** of selected or addressed DTV subscriber units **18**. Then, thereafter, prior, or simultaneously, select participants **56** are enabled for video conferencing **20**, particularly by allowing such participants to be monitored by activated video camera **26** and/or microphone **28**, for transmission of monitored static image or live motion video compressed encoded digital signal for presentation in display screen **50**. Upon completion of program/data delivery and conferencing activity, controller **8** may send proper billing indications to participant DTV units. Controller **8** may appropriately add or delete subscriber **18** in active database.

Therefore, in this combined DTV program/data viewing and select viewer conferencing scheme, important objective of emulating luxury-suite or otherwise more collaborative, intimate or personal conditions among associated audience members located at different locations is achieved effectively.

Optionally, while receiving program/data, conferenced subscriber may also send or receive electronic text message to other subscribers or other mail account addressable through network **10**, or run various application programs locally or in distributed client-server networked manner, preferably in common with other conferenced DTV units, such as for multi-user simulation or gaming application.

To improve system program/data broadcast or video conferencing performance, for example, when restricted effectively by channel bandwidth or traffic congestion, controllers **8**, **34** may reduce or eliminate actual transmission of full content video signal, and preferably transmit information subset, such as static image, text and/or voice.

Foregoing described embodiments of invention are provided as illustration and description. It is not intended to limit invention to precise form described. Other variations and embodiments are possible in light of above teaching, and it is thus intended that scope of invention not be limited by detailed description, but rather by claims as follow.

We claim:

1. Integrated television conferencing apparatus with centrally-integrated personalized screening of DTV content overlaid with conferencing comprising:

means for video-conferencing a television user comprising a DTV unit with a network processor before, while or after a program broadcast or data application is accessed from memory or via a network data interface or broadcast program channel, whereby such conference and access are integrated centrally and overlaid functionally for management or coordination by a user transaction controller, the controller or processor restricting or permitting such overlaid user access to the program broadcast or data application from memory or via the network by censoring or authorizing one or more program broadcast or data application selectively according to privately pre-defined content-screening criteria using one or more program or data classes or titles, such controller or processor further enabled to restrict or permit the conference by dynamically adding or removing the DTV unit to or from one or more video conferencing active set or selected logical group, whereby television and conferencing services are centrally integrated for personalized screening such that effectively the same controller or processor that functionally overlays management or coordination of user access to the program broadcast or data application according to privately pre-defined content-screening criteria using one or more program or data classes or titles for censoring or authorizing such access, also manages or coordinates user conferencing according to privately pre-defined active set or selected logical group for restricting or permitting such conferencing, such centralized integration of screening criteria being pre-defined privately by a pre-defining user for both television and conferencing thereby enabling privately accessed personal television and conferencing services.

2. Apparatus of claim 1 wherein:

the program broadcast or data application comprises a professional football game, statistics or analysis, whereby a virtual game or simulation program is run locally by the user in common with the network processor.

3. Apparatus of claim 1 wherein:

the controller identifies a user media capability or address, program or data content, or actual or possible channel bandwidth congestion or network connection fault, thereby enabling restricted, redirected, or reduced transmission effectively to improve such conference or access.

4. Apparatus of claim 1 wherein:

the controller or user uses an intelligent software agent to run a network search, thereby enabling selection of the program broadcast or data application for scheduled viewing, storage or delivery to the user or network processor.

5. Apparatus of claim 1 wherein:

the controller directs a personalized or targeted commercial or advertisement to the user or network processor for customized screen display or incentive messaging dynamically or adaptively according to user or network processor action or commercial attribute, thereby enabling the controller to integrate, combine or mix graphically such commercial or advertisement with or within the program broadcast or data application.

6. Apparatus of claim 1 wherein:

the controller authorizes or authenticates such conference or access via user or network processor smart-card, thereby enabling set-top television device authorization or authentication for internet, cable, satellite, optical fiber, microwave, MMDS, LMDS, wireless or other delivery source of the program broadcast or data application.

7. Integrated television conference transaction method with centrally-integrated personalized screening of DTV content overlaid with conferencing comprising the step of:

transacting by a television user comprising a DTV unit video-conferencing with a network processor before, while or after a program broadcast or data application is accessed from memory or via a network data interface or broadcast program channel, whereby such conference and access are integrated centrally and overlaid functionally for management or coordination by a user transaction controller, the controller or processor restricting or permitting such overlaid user access to the program broadcast or data application from memory or via the network by censoring or authorizing one or more program broadcast or data application selectively according to privately pre-defined content-screening criteria using one or more program or data classes or titles, such controller or processor further enabled to restrict or permit the conference by dynamically adding or removing the DTV unit to or from one or more video conferencing active set or selected logical group, whereby television and conferencing services are centrally integrated for personalized screening such that effectively the same controller or processor that func-

tionally overlays management or coordination of user access to the program broadcast or data application according to privately pre-defined content-screening criteria using one or more program or data classes or titles for censoring or authorizing such access, also manages or coordinates user conferencing according to privately pre-defined active set or selected logical group for restricting or permitting such conferencing, such centralized integration of screening criteria being pre-defined privately by a pre-defining user for both television and conferencing thereby enabling privately accessed personal television and conferencing services.

8. Method of claim 7 wherein:

the program broadcast or data application comprises a professional football game, statistics or analysis, whereby a virtual game or simulation program is run locally by the user in common with the network processor.

9. Method of claim 7 wherein:

the controller identifies a user media capability or address, program or data content, or actual or possible channel bandwidth congestion or network connection fault, thereby enabling restricted, redirected, or reduced transmission effectively to improve such conference or access.

10. Method of claim 7 wherein:

the controller or user uses an intelligent software agent to run a network search, thereby enabling selection of the program broadcast or data application for scheduled viewing, storage or delivery to the user or network processor.

11. Method of claim 7 wherein:

the controller directs a personalized or targeted commercial or advertisement to the user or network processor for customized screen display or incentive messaging dynamically or adaptively according to user or network processor action or commercial attribute, thereby enabling the controller to integrate, combine or mix graphically such commercial or advertisement with or within the program broadcast or data application.

12. Method of claim 7 wherein:

the controller authorizes or authenticates such conference or access via user or network processor smart-card, thereby enabling set-top television device authorization or authentication for internet, cable, satellite, optical fiber, microwave, MMDS, LMDS, wireless or other delivery source of the program broadcast or data application.

13. Integrated television conferencing software with centrally-integrated personalized screening of DTV content overlaid with conferencing comprising:

reconfigurable program or firmware for enabling a video-conference between a television user comprising a DTV unit and a network processor before, while or after a program broadcast or data application is accessed from memory or via a network data interface or broadcast program channel, whereby such conference and access are integrated centrally and overlaid functionally for management or coordination by a user transaction controller, the controller or processor restricting or permitting such overlaid user access to the program broadcast or data application from memory or via the network by censoring or authorizing one or more program broadcast or data application selectively according to privately pre-defined content-screening criteria using one or more program or data classes or titles, such controller or processor further enabled to restrict or permit the conference by dynamically adding or removing the DTV unit to or from one or more video conferencing active set or selected logical group, whereby television and conferencing services are centrally integrated for personalized screening such that effectively the same controller or processor that functionally overlays management or coordination of user access to the program broadcast or data application according to privately pre-defined content-screening criteria using one or more program or data classes or titles for censoring or authorizing such access, also manages or coordinates user conferencing according to privately pre-defined active set or selected logical group for restricting or permitting such conferencing, such centralized integration of screening criteria being pre-definable privately by one or more pre-defining user for television or conferencing thereby enabling privately accessed personal television and conferencing services.

14. Software of claim 13 wherein:

the program broadcast or data application comprises a professional football game, statistics or analysis, whereby a virtual game or simulation program is run locally by the user in common with the network processor.

15. Software of claim 13 wherein:

the controller identifies a user media capability or address, program or data content, or actual or possible channel bandwidth congestion or network connection fault, thereby enabling restricted, redirected, or reduced transmission effectively to improve such conference or access.

16. Software of claim 13 wherein:

the controller or user uses an intelligent software agent to run a network search, thereby enabling selection of the program broadcast or data application for scheduled viewing, storage or delivery to the user or network processor.

17. Software of claim 13 wherein:

the controller directs a personalized or targeted commercial or advertisement to the user or network processor for customized screen display or incentive messaging dynamically or adaptively according to user or network processor action or commercial attribute, thereby enabling the controller to integrate, combine or mix graphically such commercial or advertisement with or within the program broadcast or data application.

18. Software of claim 13 wherein:

the controller authorizes or authenticates such conference or access via user or network processor smart-card, thereby enabling set-top television device authorization or authentication for internet, cable, satellite, optical fiber, microwave, MMDS, LMDS, wireless or other delivery source of the program broadcast or data application.

19. ATSC-compliant digital video signal processor with centrally-integrated personalized screening of DTV content overlaid with conferencing comprising:

a processor for video-conferencing a video user comprising an ATSC-compliant DTV unit with a network source before, while or after a program broadcast or video application is accessed from memory or via a network data interface or broadcast program channel, whereby such conference and access are integrated and overlaid functionally for management or coordination, the network source or processor restricting or permitting such overlaid user access to the program broadcast

or video application from memory or via the network by censoring or authorizing one or more program broadcast or video application selectively according to privately pre-defined content-screening criteria using one or more program or video classes or titles, whereby DTV content and conferencing are centrally integrated for personalized screening such that effectively the same processor or network source that functionally overlays management or coordination of user access to the program broadcast or video application according to privately pre-defined content-screening criteria using one or more program or video classes or titles for censoring or authorizing such access, also manages or coordinates conferencing according to privately pre-defined active set or selected logical group for restricting or permitting such conferencing, such centralized integration of screening criteria for both DTV content and conferencing thereby enabling privately accessed personal DTV content and conferencing services; and

a digital video codec for processing an accessed or conferenced signal, such controller or processor further enabled to restrict or permit the conference by dynamically adding or removing the DTV unit to or from one or more video conferencing active set or selected logical group.

20. Digital video signal processor of claim **19** wherein:

the program broadcast or video application comprises a sport or game, whereby a virtual game or simulation program is run during the sport or game access.

21. Digital video signal processor of claim **19** wherein:

the processor identifies a user media capability or address, program or data content, or actual or possible channel bandwidth congestion or network connection fault, thereby enabling restricted, redirected, or reduced transmission of the conference or access.

22. Digital video signal processor of claim **19** wherein:

a software agent runs a network search of one or more program broadcast or video application.

23. Digital video signal processor of claim **19** wherein:

a personalized or targeted commercial or advertisement is accessed for customized screen display or incentive messaging dynamically or adaptively, thereby enabling the processor to integrate, combine or mix graphically such commercial or advertisement with or within the program broadcast or video application.

24. Digital video signal processor of claim **19** wherein:

the conference or access is authorized or authenticated via a set-top television device coupled to internet, cable, satellite, optical fiber, microwave, MMDS, LMDS, wireless or other delivery source of the program broadcast or video application.

25. ATSC-compliant digital video signal processing method with centrally-integrated personalized screening of DTV content overlaid with conferencing comprising the steps of:

video-conferencing a video user comprising an ATSC-compliant DTV unit with a network source before, while or after a program broadcast or video application is accessed and overlaid functionally from memory or via a network data interface or broadcast program channel, the network source or DTV unit restricting or permitting such overlaid user access to the program broadcast or video application from memory or via the network by censoring or authorizing one or more program broadcast or video application selectively according to privately pre-defined content-screening criteria using one or more program or video classes or titles, such network source further enabled to restrict or permit the conference by dynamically adding or removing the DTV unit to or from one or more video conferencing active set or selected logical group, whereby DTV content and conferencing are centrally integrated for personalized screening such that effectively the same network source or DTV unit that functionally overlays management or coordination of user access to the program broadcast or video application according to privately pre-defined content-screening criteria using one or more program or video classes or titles for censoring or authorizing such access, also manages or coordinates user conferencing according to privately pre-defined active set or selected logical group for restricting or permitting such conferencing, such centralized integration of screening criteria for both DTV content and conferencing thereby enabling privately accessed personal DTV content and conferencing services; and

processing an accessed or conferenced signal using a digital video codec.

26. Method of claim **25** wherein:

the program broadcast or video application comprises a sport or game, whereby a virtual game or simulation program is run during the sport or game access.

27. Method of claim **25** wherein:

a user media capability or address, program or data content, or actual or possible channel bandwidth congestion or network connection fault is identified for enabling restricted, redirected, or reduced transmission of the conference or access.

28. Method of claim **25** further comprising step of:

running a network search of one or more program broadcast or video application.

29. Method of claim **25** wherein:

a personalized or targeted commercial or advertisement is accessed for customized screen display or incentive messaging dynamically or adaptively, such commercial or advertisement being integrated, combined or mixed graphically with or within the program broadcast or video application.

30. Method of claim **25** wherein:

the conference or access is authorized or authenticated via a set-top television device coupled to internet, cable, satellite, optical fiber, microwave, MMDS, LMDS, wireless or other delivery source of the program broadcast or video application.

31. Functionally-overlaid advertising for ATSC-compliant DTV conferencing subscribers with centrally-integrated personalized screening of DTV content overlaid with conferencing comprising steps:

monitoring at least one ATSC-compliant DTV virtual audience subscribing to a logical group, such group comprising a plurality of conferencing virtual audiences; and

advertising to at least one functionally-overlaid conferencing virtual audience;

wherein such overlaid virtual audience access to the advertising is restricted or permitted by censoring or authorizing selectively according to privately pre-defined content-screening criteria using one or more advertising class or title, such virtual audience conference being restricted or permitted by dynamically adding or removing such virtual audience to or from one or more video conferencing active set or selected logical group, whereby advertising and conferencing services

are centrally integrated for personalized screening such that effectively same controller or processor that functionally overlays management or coordination of virtual audience access to the advertising according to privately pre-defined content-screening criteria using one or more advertising classes or titles for censoring or authorizing such access, also manages or coordinates conferencing according to privately pre-defined active set or selected logical group for restricting or permitting such conferencing, such centralized integration of screening criteria being pre-definable privately by one or more pre-defining virtual audience for advertising or conferencing thereby enabling privately accessed personal advertising and conferencing services.

32. Advertising of claim 31 wherein:

at least one of the conferencing virtual audience comprises a digital television, wherein the advertisement comprises a personalized game for execution by the digital television.

33. Advertising of claim 32 wherein:

the digital television runs an intelligent agent to search for one or more game application.

34. Advertising of claim 31 wherein:

the advertisement comprises a message targeted to one or more audience demographic interest or viewing activity.

35. DTV subscriber unit for real-time functionally-overlaid collaborative network gaming with centrally-integrated personalized screening of DTV content overlaid with conferencing comprising:

a processor; and an interface;

wherein the processor runs a game application locally or across a network via the interface in common with a DTV subscriber unit effectively running the game application, whereby the other subscriber is coupled via the interface to enable video conferencing or messaging between coupled subscriber units effectively playing the game application during such conferencing or messaging, the interface being coupled to a broadband system headend controller for centrally controlling access in common or selectively by one or more subscriber units to the conferencing or messaging and the game application, wherein the controller functionally overlays the game application that is accessed by a plurality of subscriber units, with the conference or messaging, the controller or processor restricting or permitting one or more overlaid subscriber unit access to the game application locally or across the network by censoring or authorizing one or more game application selectively according to privately pre-defined content-screening criteria using one or more program or data class or title, such controller or processor further enabled to restrict or permit the conference or message by dynamically adding or removing the DTV unit to or from one or more video conferencing or messaging active set or selected logical group, whereby gaming and conferencing or messaging services are centrally integrated for personalized screening such that effectively the same controller or processor that functionally overlays management or coordination of subscriber access to the gaming application according to privately pre-defined content-screening criteria using one or more program or data classes or titles for censoring or authorizing such access, also manages or coordinates conferencing or messaging according to privately pre-defined active set or selected logical group for restricting or permitting such conferencing or messaging, such centralized integration of screening criteria being pre-definable privately by a pre-defining subscriber for both gaming and conferencing or messaging thereby enabling privately accessed personal gaming and conferencing or messaging services.

36. Subscriber unit of claim 35 wherein:

the processor runs a software program or an intelligent agent for searching or transacting via the network, thereby enabling network delivery of or access to one or more multi-user game application.

37. Subscriber unit of claim 35 further comprising:

a user interface for displaying at least one screen element representing a subscriber playing the game application while conferencing or messaging.

38. DTV communication controller for providing functionally-overlaid real-time gaming and conferencing between multiple subscriber units with centrally-integrated personalized screening of DTV content overlaid with conferencing comprising:

means for coupling to a first subscriber unit playing a multi-user game application; and

means for coupling to a DTV subscriber unit playing effectively the same multi-user game application;

whereby a video conference or message is enabled and functionally overlaid between both subscriber units while, after or before playing effectively the same multi-user game application, such that the communication controller functions effectively as a system headend controller in an integrated broadband services network for multi-user gaming and conferencing or messaging, thereby enabling centralized network control of subscriber access selectively by one or more subscriber units to both conferencing or messaging and multi-user game application services, the controller restricting or permitting one or more overlaid subscriber unit access to the game application by censoring or authorizing one or more game application selectively according to privately pre-defined content-screening criteria using one or more program or data class or title, such controller further enabled to restrict or permit the conference or message by dynamically adding or removing the DTV unit to or from one or more video conferencing or messaging active set or selected logical group, whereby gaming and conferencing or messaging services are centrally integrated for personalized screening such that effectively the same controller that functionally overlays management or coordination of subscriber access to the game application according to privately pre-defined content-screening criteria using one or more program or data classes or titles for censoring or authorizing such access, also manages or coordinates conferencing or messaging according to privately pre-defined active set or selected logical group for restricting or permitting such conferencing or messaging, such centralized integration of screening criteria being pre-definable privately by a pre-defining subscriber for both gaming and conferencing or messaging thereby enabling privately accessed personal gaming and conferencing or messaging services.

39. Communication controller of claim 38 further comprising:

means for controlling or restricting access to the conference or message by an additional subscriber unit playing effectively the same multi-user game application.

40. The communication controller of claim 38 further comprising:

means for sending a message to the first or second subscriber unit adaptively or dynamically in response to such subscriber unit gaming, conferencing or messaging action, thereby enabling network transaction or billing according to gaming or conferencing usage by such subscriber unit.

41. Communication method between DTV subscriber units for functionally-overlaid real-time collaborative gaming with centrally-integrated personalized screening of DTV content overlaid with conferencing comprising the steps of:

running a multi-user game application effectively in common by a plurality of DTV subscriber units locally or across a network; and

functionally-overlaid conferencing or messaging between the subscriber units via the network while running the multi-user game application;

wherein a system headend controller for multi-user gaming and conferencing or messaging controls access by one or more subscriber units to conferencing or messaging while, before or after such one or more subscriber units runs the multi-user game application, the controller restricting or permitting one or more overlaid subscriber unit access to the game application locally or across the network by censoring or authorizing one or more game application selectively according to privately pre-defined content-screening criteria using one or more program or data classes or titles, such controller further enabled to restrict or permit the conference or message by dynamically adding or removing the DTV unit to or from one or more video conferencing or messaging active set or selected logical group, whereby gaming and conferencing or messaging services are centrally integrated for personalized screening such that effectively the same controller that functionally overlays management or coordination of subscriber access to the game application according to privately pre-defined content-screening criteria using one or more program or data classes or titles for censoring or authorizing such access, also manages or coordinates conferencing or messaging according to privately pre-defined active set or selected logical group for restricting or permitting such conferencing or messaging, such centralized integration of screening criteria being pre-definable privately by one or more pre-defining subscriber for both gaming and conferencing or messaging thereby enabling privately accessed personal gaming and conferencing or messaging services.

42. Communication method of claim 41 wherein:

the multi-user game application comprises a simulated sports game, whereby a screen element representing at least one subscriber unit playing the multi-user game application is displayed during the conference or message.

43. Communication method of claim 41 wherein:

one or more subscriber unit receives a personalized message or bill for actual usage of or participation in such game application, conference or messaging.

44. Communication method of claim 41 wherein:

the conference and broadcast enabled to be accessed by a non-mobile subscriber unit comprising a residential or business set-top device, digital television, or personal computer.

45. Multi-user game application for DTV users with centrally-integrated personalized screening of DTV content overlaid with conferencing comprising:

a simulator or gaming program for access by a plurality of DTV users via a network; and

means for functionally-overlaid conferencing between the users, thereby enabling a virtual community among on-line players;

wherein a broadband headend system processor for integrated multi-user gaming and conferencing controls access by one or more users to conferencing while, before or after one or more user accesses the simulator or gaming program, the processor restricting or permitting one or more overlaid user access to the program by censoring or authorizing one or more program selectively according to privately pre-defined content-screening criteria using one or more program class or title, such processor further enabled to restrict or permit the conference by dynamically adding or removing a DTV user to or from one or more conferencing active set or selected logical group, whereby gaming and conferencing services are centrally integrated for personalized screening such that effectively the same processor that functionally overlays management or coordination of user access to the program according to privately pre-defined content-screening criteria using one or more program class or title for censoring or authorizing such access, also manages or coordinates user conferencing according to privately pre-defined active set or selected logical group for restricting or permitting such conferencing, such centralized integration of screening criteria being pre-definable privately by one or more pre-defining user for gaming or conferencing thereby enabling privately accessed personal gaming and conferencing services.

46. Application of claim 45 wherein:

one or more of the users is billable or receives an advertisement according to a controller for controlling user access to the program.

47. DTV integrated television gaming and conferencing console with centrally-integrated personalized screening of DTV content overlaid with conferencing comprising:

means for functionally-overlaid conferencing a first user with a DTV integrated television gaming and conferencing user for video, audio or text messaging or conferencing before, while or after a television or gaming program broadcast or data application is accessed commonly by both users from memory or via a network data interface or broadcast program channel, whereby such conference and common access are integrated functionally for management or coordination by a television or gaming access and user-conference controller coupled to users for delivering or enabling a combined broadband television gaming and conferencing service, the controller restricting or permitting one or more overlaid user access to the program or application from memory or via the network by censoring or authorizing one or more program or application selectively according to privately pre-defined content-screening criteria using one or more program or application class or title, such controller further enabled to restrict or permit the conference or message by dynamically adding or removing the DTV user to or from one or more conferencing or messaging active set or selected logical group, whereby television and conferencing or messaging services are centrally integrated for personalized screening such that effectively the same controller that functionally overlays management or coordination of user access to the program broadcast or data application according to privately pre-defined content-screening criteria using one or more program or application class or title for censoring or authorizing

such access, also manages or coordinates user conferencing or messaging according to privately pre-defined active set or selected logical group for restricting or permitting such conferencing or messaging, such centralized integration of screening criteria being pre-definable privately by a pre-defining user for both television and conferencing or messaging thereby enabling privately accessed personal television and conferencing or messaging services.

48. Console of claim 47 wherein:

the program broadcast or data application comprises a video game or simulation program run locally by one or more users, whereby the controller bills one or more user for gaming or conferencing service.

49. Console of claim 47 wherein:

the controller or console identifies a user capability or address, program or data content, or actual or possible channel bandwidth congestion or network connection fault according to a program for restricting, redirecting, or reducing transmission of the conference or access.

50. Console of claim 47 wherein:

the controller or console runs software for searching for the program broadcast or data application for delivery to or access by a virtual audience of users authorized for such delivery or access.

51. Console of claim 47 wherein:

the controller directs a narrowcast message to one or more user for customized or personalized screen display or incentive messaging dynamically or adaptively according to user action or commercial attribute, wherein the commercial, advertisement or message is integrated, combined or mixed with or within the program broadcast or data application.

52. Console of claim 47 wherein:

the controller authorizes the combined service by authenticating a set-top box or interface device coupled via internet, cable, satellite, optical fiber, microwave, MMDS, LMDS, or wireless channel.

53. In a networked DTV device, a programmable broadband functionally-overlaid service software with centrally-integrated personalized screening of DTV content overlaid with conferencing comprising:

firmware or computer code for authorizing a functionally-overlaid conference between a first broadband subscriber unit and a DTV broadband subscriber unit before, while or after a program broadcast or data application is accessed from memory or via a network data interface or broadcast program channel by at least one subscriber unit, whereby both the conferencing and accessing are authorized by an integrated broadband service provider centrally coupled to such subscriber units, the service provider restricting or permitting one or more overlaid subscriber unit access to the program broadcast or data application from memory or via the network by censoring or authorizing one or more program or application selectively according to privately pre-defined content-screening criteria using one or more program or application class or title, such service provider further enabled to restrict or permit the conference by dynamically adding or removing the DTV unit to or from one or more conferencing active set or selected logical group, whereby DTV content and conferencing services are centrally integrated for personalized screening such that effectively the same service provider that functionally overlays management or coordination of subscriber access to the program or application according to privately pre-defined content-screening criteria using one or more program or application class or title for censoring or authorizing such access, also manages or coordinates conferencing according to privately pre-defined active set or selected logical group for restricting or permitting such conferencing, such centralized integration of screening criteria being pre-definable privately by a pre-defining subscriber for DTV content or conferencing thereby enabling privately accessed personal DTV content and conferencing services.

54. Software of claim 53 wherein:

the program broadcast or data application is selectable programmably according to a software search, whereby a message adapted to such search is integrated, combined or mixed with or within the common program broadcast or data application.

55. In an interactive system comprising a data management system for authorizing DTV subscriber service with centrally-integrated personalized screening of DTV content overlaid with conferencing, a database comprising:

a database representing one or more DTV subscriber account authorized to access a program or data for online broadband service, and conduct a functionally-overlaid conference between authorized subscribers while, after or before such subscribers access the program or data;

wherein a controller authorizes the access to both the program or data and the conference, the controller restricting or permitting one or more overlaid subscriber access to the program or data by censoring or authorizing one or more program or data selectively according to privately pre-defined content-screening criteria using one or more program or data class or title, such controller further enabled to restrict or permit the conference by dynamically adding or removing the DTV unit to or from one or more conferencing active set or selected logical group, whereby DTV content and conferencing services are centrally integrated for personalized screening such that effectively the same controller that functionally overlays management or coordination of subscriber access to the program or application according to privately pre-defined content-screening criteria using one or more program or application class or title for censoring or authorizing such access, also manages or coordinates conferencing according to privately pre-defined active set or selected logical group for restricting or permitting such conferencing, such centralized integration of screening criteria being pre-definable privately by a pre-defining subscriber for DTV content or conferencing thereby enabling privately accessed personal DTV content and conferencing services.

56. Database of claim 55 wherein:

the program or data comprises one or more multi-user gaming or digital television program or signal, whereby a plurality of authorized subscribers access in common the multi-user gaming or digital television program or signal, while, after or before the conference is conducted between the plurality of subscribers.

57. In an interactive network device for accessing a gaming program or data signal and conferencing with DTV interactive network device while, before or after accessing the same program or data signal, a method for integrating functionally-overlaid broadband service with centrally-integrated personalized screening of DTV content overlaid with conferencing comprising steps of:

outputting by a DTV network device interactively a gaming program or data signal; and

integrating functionally in such output at least one participant accessing the gaming program or data signal,

wherein a controller coupled centrally to each conferencing network device authorizes access by a plurality of participants to the gaming program or data signal while, before or after the authorized participants conduct a conference with each other, the controller restricting or permitting one or more overlaid participant access to the gaming program or data signal by censoring or authorizing one or more gaming program or data signal selectively according to privately pre-defined content-screening criteria using one or more program or data class or title, such controller further enabled to restrict or permit the conference by dynamically adding or removing the DTV device to or from one or more conferencing active set or selected logical group, whereby gaming and conferencing services are centrally integrated for personalized screening such that effectively the same controller that functionally overlays management or coordination of participant access to the gaming program or data signal according to privately pre-defined content-screening criteria using one or more program or data class or title for censoring or authorizing such access, also manages or coordinates conferencing according to privately pre-defined active set or selected logical group for restricting or permitting such conferencing, such centralized integration of screening criteria being pre-definable privately by a pre-defining participant for gaming or conferencing thereby enabling privately accessed personal gaming and conferencing services.

58. A set-top gaming device for coupling to a DTV media output with centrally-integrated personalized screening of DTV content overlaid with conferencing comprising:

a DTV set-top processor, and a network interface;

wherein the set-top processor enables a functionally-overlaid conference by a subscriber with another subscriber during, before or after access by both subscribers to a multi-subscriber gaming program; the media output generating an integration of one or more conferencing subscriber and the accessed gaming program, wherein a controller couples to the network interface for authorizing centrally the access and conference as a combined subscription service for on-line gaming community, the controller or processor restricting or permitting one or more overlaid subscriber access to the gaming program by censoring or authorizing one or more gaming program selectively according to privately pre-defined content-screening criteria using one or more program class or title, such controller or processor further enabled to restrict or permit the conference by dynamically adding or removing the DTV subscriber to or from one or more conferencing active set or selected logical group, whereby gaming and conferencing services are centrally integrated for personalized screening such that effectively the same controller or processor that functionally overlays management or coordination of subscriber access to the gaming program according to privately pre-defined content-screening criteria using one or more program or data class or title for censoring or authorizing such access, also manages or coordinates conferencing according to privately pre-defined active set or selected logical group for restricting or permitting such conferencing, such centralized integration of screening criteria being pre-definable privately by a pre-defining subscriber for gaming or conferencing thereby enabling privately accessed personal gaming and conferencing services.

* * * * *

EXHIBIT C

US006339842B1

(12) **United States Patent**
Fernandez et al.

(10) **Patent No.: US 6,339,842 B1**
(45) **Date of Patent: Jan. 15, 2002**

(54) **DIGITAL TELEVISION WITH SUBSCRIBER CONFERENCE OVERLAY**

(76) Inventors: **Dennis Sunga Fernandez; Irene Hu Fernandez**, both of 2085 Portola Rd., Woodside, CA (US) 94062

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(22) Filed: **Jun. 10, 1998**

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(52) **U.S. Cl.** **725/133**; 348/14.04; 348/14.07; 370/260; 379/90.01; 725/1; 725/34; 725/37; 725/105

(58) **Field of Search** 348/1, 3, 7, 12, 348/13, 15, 16, 17, 14, 556, 564, 906, 14.01, 14.04, 14.07; 455/4.2, 5.1; 379/90.01; 395/34, 35, 36, 652; 370/260–272; 725/1, 34, 37, 105, 106, 131, 133; H04N 7/16, 7/14, 7/15, 7/173

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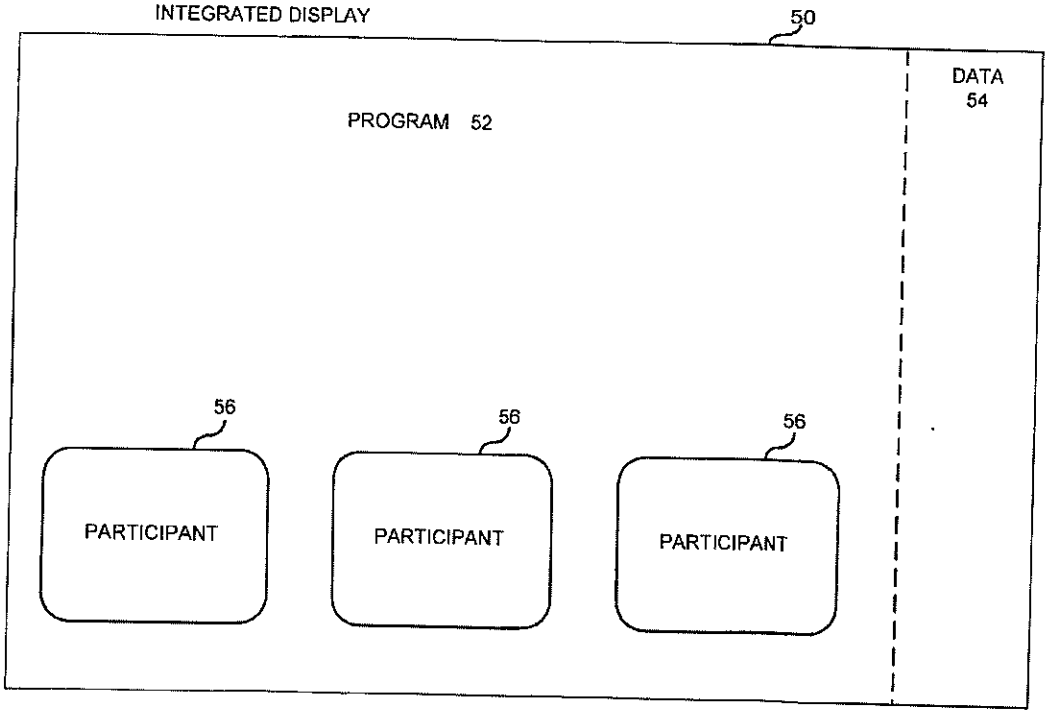
Primary Examiner—John W. Miller

(57) **ABSTRACT**

Digital television system overlays subscriber two-way communication during broadcast program delivery to create virtual audience community. Individual or group billing and advertisement is personalized per DTV receiver program viewing and/or conferencing activity. Subscriber receiver includes camera and other media I/O device for multi-way video conferencing. Participants may be added or removed dynamically during programming or conferencing.

10 Claims, 5 Drawing Sheets



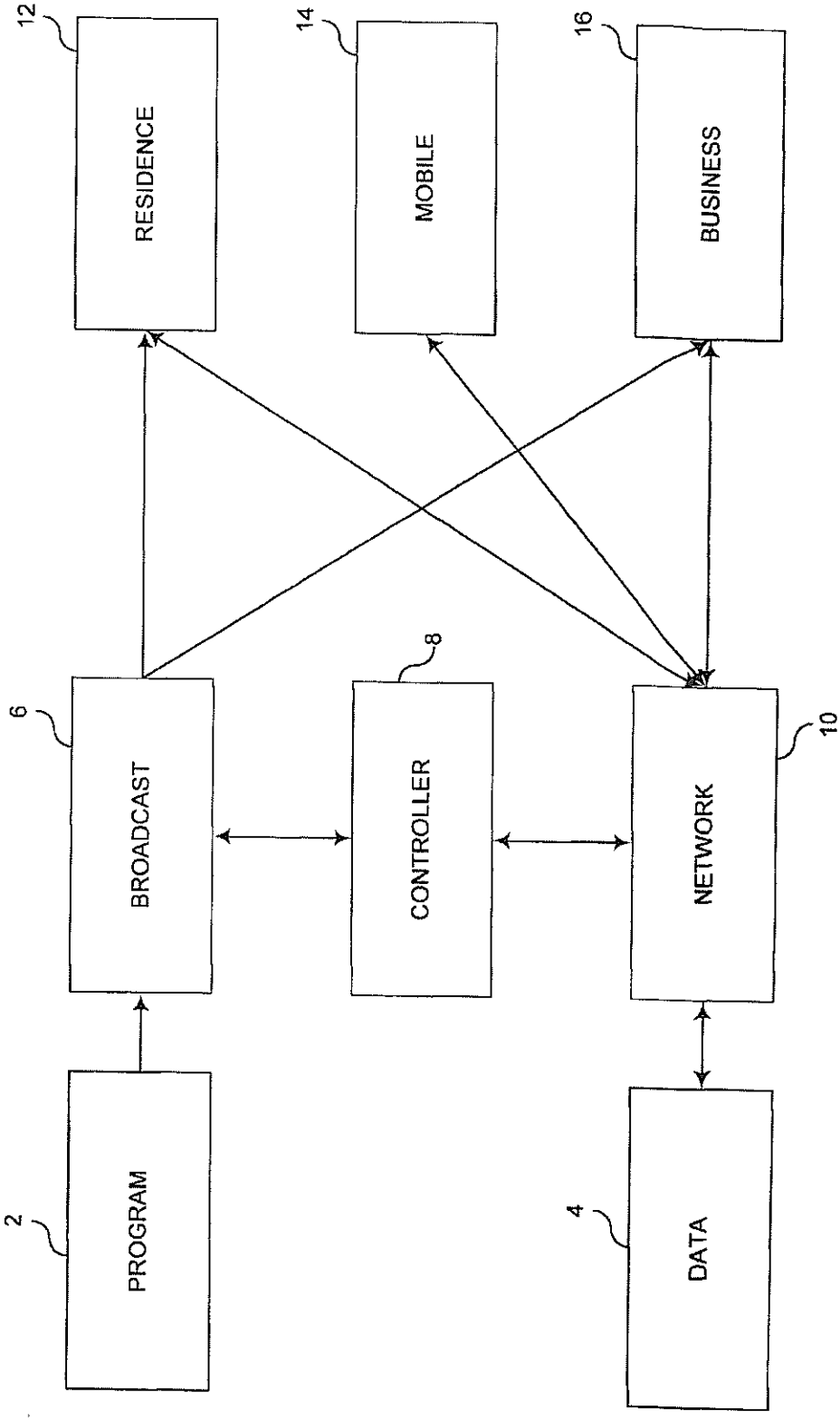

12
RESIDENCE
14
MOBILE
16
BUSINESS
6
BROADCAST
8
CONTROLLER
10
NETWORK
2
PROGRAM
4
DATA

FIG. 1

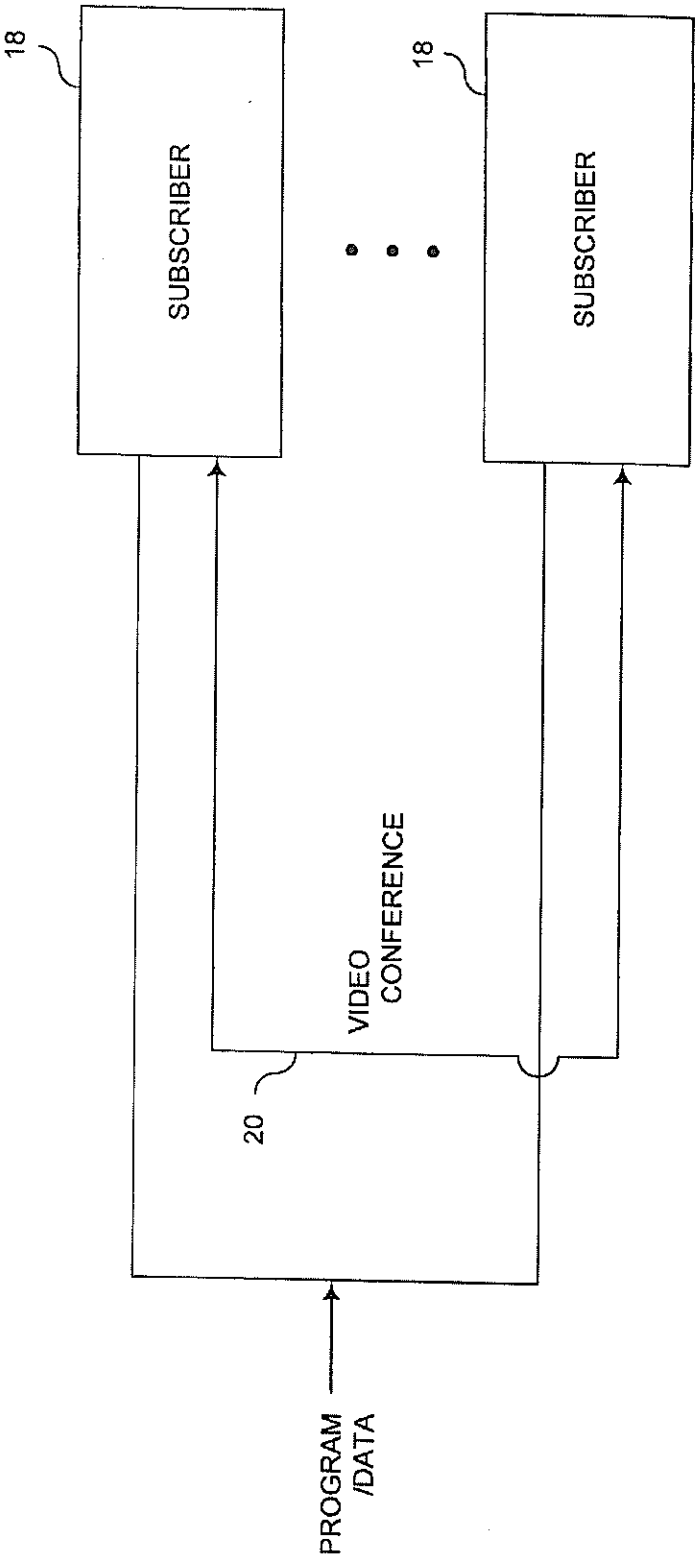

18
SUBSCRIBER
18
SUBSCRIBER
VIDEO CONFERENCE
20
PROGRAM /DATA

FIG. 2

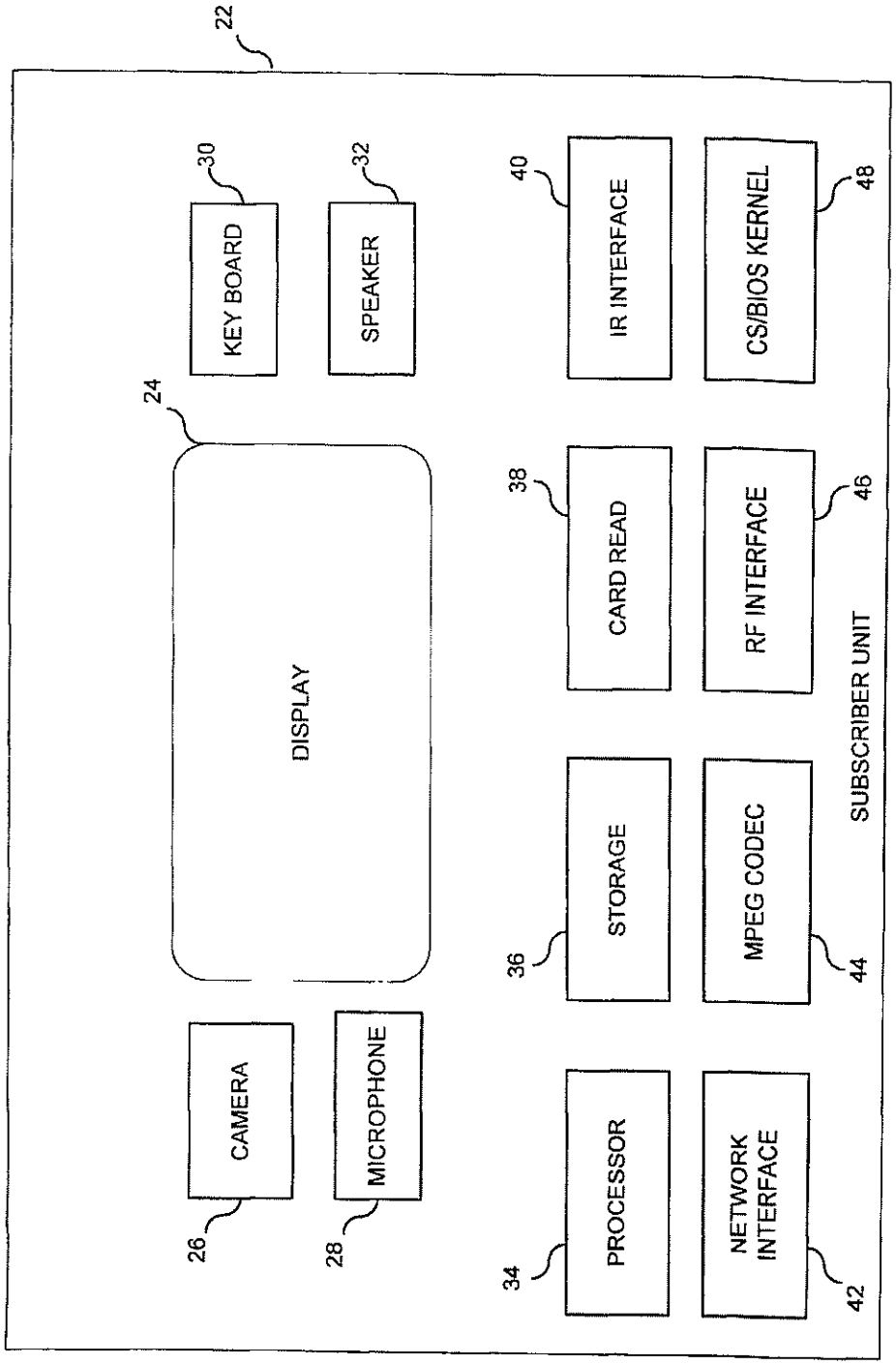

22
SUBSCRIBER UNIT
KEY BOARD
30
SPEAKER
32
IR INTERFACE
40
CS/BIOS KERNEL
48
24
DISPLAY
CARD READ
38
RF INTERFACE
46
STORAGE
36
MPEG CODEC
44
CAMERA
26
MICROPHONE
28
PROCESSOR
34
NETWORK INTERFACE
42

FIG. 3

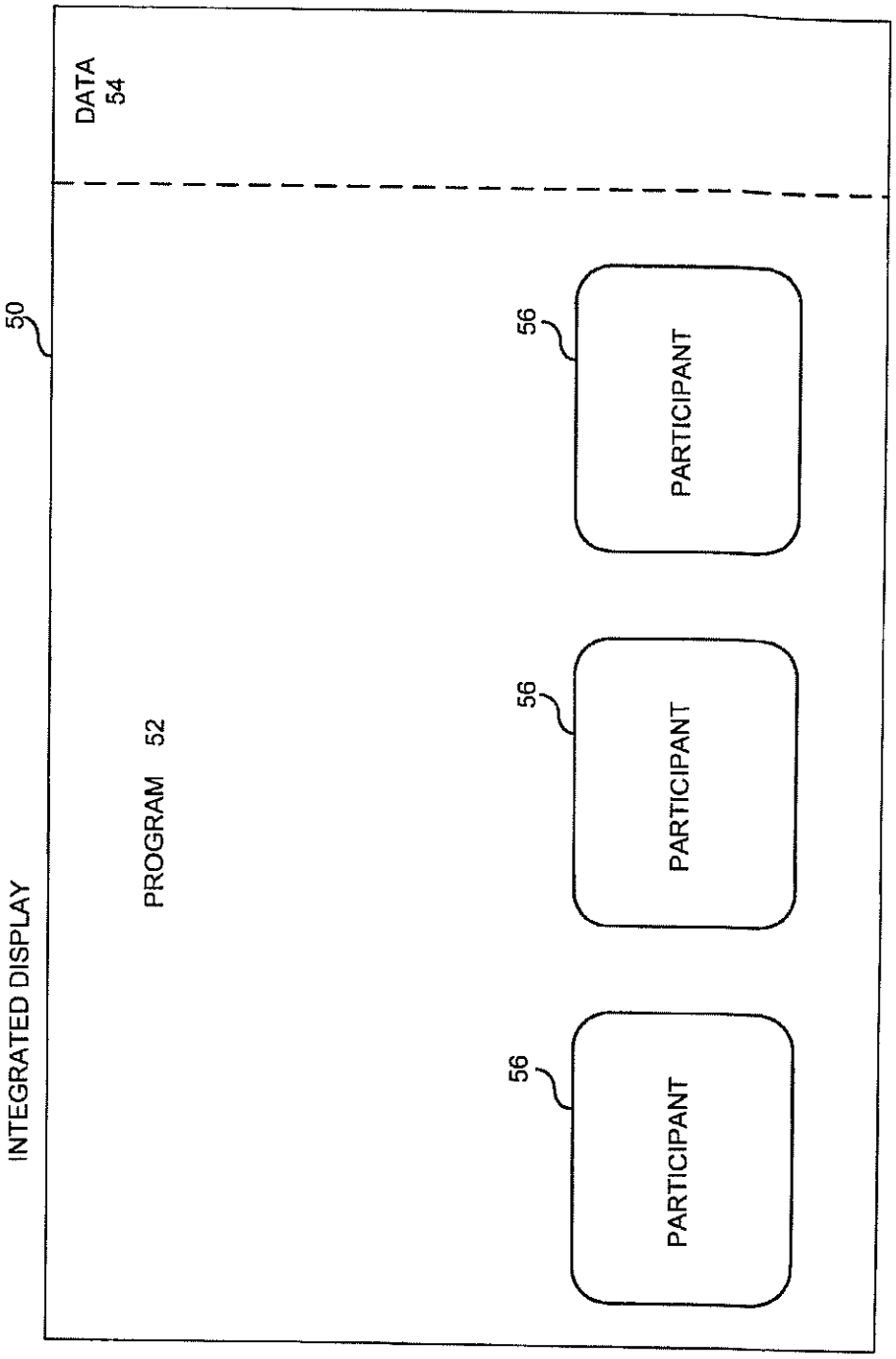

DATA
54
50
PROGRAM 52
INTEGRATED DISPLAY
56
PARTICIPANT
56
PARTICIPANT
56
PARTICIPANT

FIG. 4

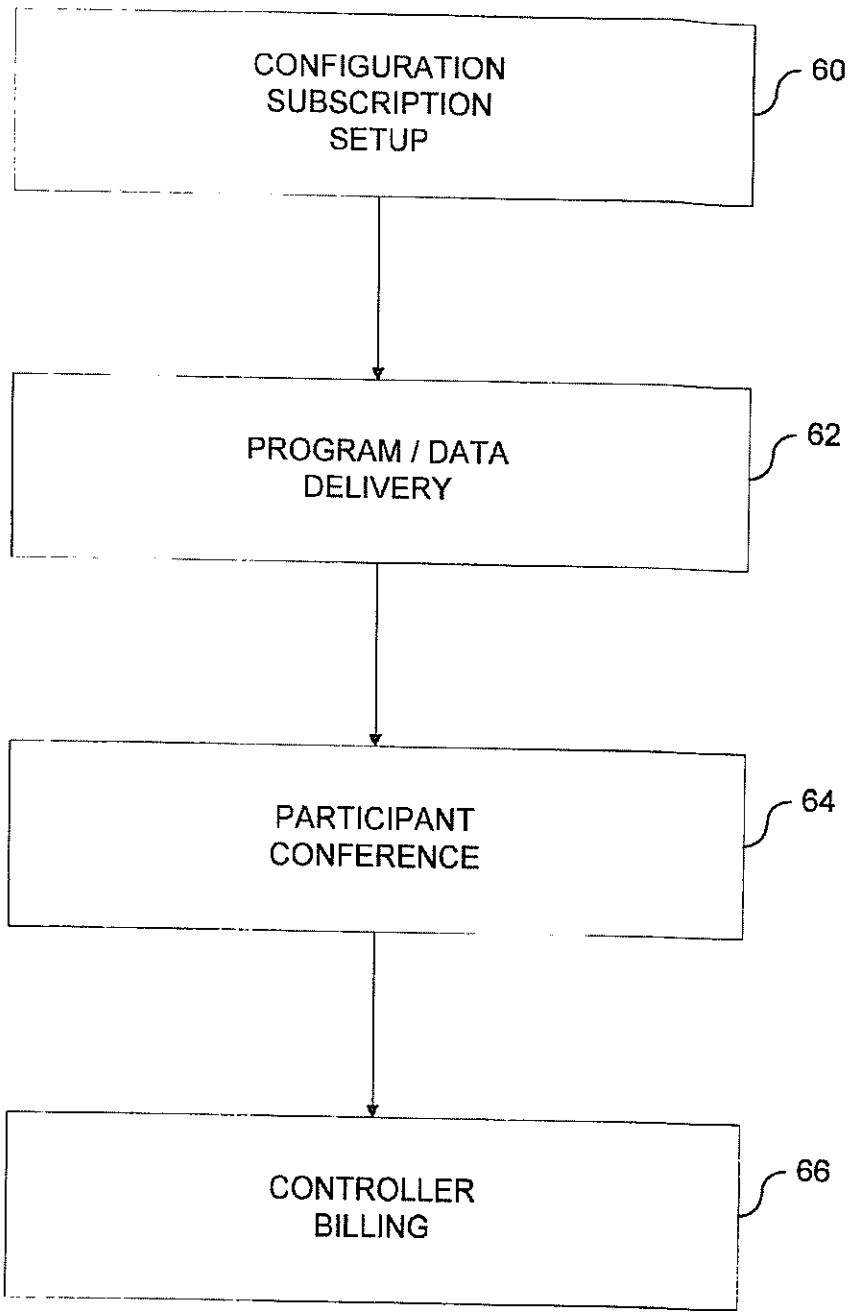

CONFIGURATION SUBSCRIPTION SETUP
60
PROGRAM / DATA DELIVERY
62
PARTICIPANT CONFERENCE
64
CONTROLLER BILLING
66

FIG. 5

DIGITAL TELEVISION WITH SUBSCRIBER CONFERENCE OVERLAY

FIELD OF INVENTION

The invention relates to digital television systems, particularly to subscriber video conferencing with conventional programming.

BACKGROUND OF INVENTION

Digital television (DTV) attributes have been standardized by industry (e.g., Advanced Television Systems Committee (ATSC) and government (U.S. Federal Communications Commission (FCC)). Such DTV standards, which provide enhanced multimedia quality, as well as interactive data services, are hereby incorporated by reference. Generally, however, DTV specifications contemplate program delivery to various receiver units, but not necessarily communication between receiver units. Accordingly, there may be need for conferencing between units receiving digital system programming.

SUMMARY OF INVENTION

The invention resides in digital television system configured for subscriber conference overlay during program delivery. Billing and advertisement may be personalized according to actual program viewing and/or conferencing activity by DTV receiver. Receiver unit includes media input/output device for multi-user conferencing. Subscribers may be added or removed during programming.

BRIEF DESCRIPTION OF DRAWINGS

FIG. **1** is block diagram of integrated digital television program and data delivery system for enabling present invention.

FIG. **2** is simplified diagram of novel overlay of subscriber conferencing over program and/or data delivery.

FIG. **3** is representative digital TV subscriber unit used according to present invention.

FIG. **4** is sample digital TV display according to present invention.

FIG. **5** is flow chart of operational steps of present invention.

DETAILED DESCRIPTION

FIG. **1** is block diagram of integrated digital television program and data delivery system, including one or more residential **12**, mobile **14** and business **16** subscriber, receiver and/or digital television (DTV) units coupled over broadcast **6** and/or network **10** channels respectively to program **2** and/or data **4** sources. Controller **8**, which is one or more processor, server, computer or other functionally equivalent controller functionality coupled to broadcast **6** and/or network **10** channel, may affect network **10** and broadcast **6** functionality as described herein.

Program source **2** comprises one or more source for broadcasting one or more video and/or data programs, or other functionally equivalent information signal stream, according to conventional digital and/or analog program broadcasting, accessible or addressable publicly or privately over various broadcast **6** equipment, medium, or other functionally equivalent channels, such as cable, optical fiber, microwave, wireless radio frequency (RF) transmission, direct broadcast satellite (DBS), multichannel multipoint distribution system (MMDS), local multipoint distribution

service (LMDS), etc. For example, program **2** may comprise live sports or entertainment performance event, such as professional football game, broadcast over restricted pay-per-view television channels.

Data source **2** comprises one or more source for providing two-way or interactive access to one or more database, file, directory, or other functionally equivalent data repository site or signal source, accessible or addressable publicly or privately over conventional network **10**, such as local or wide area network, world-wide web Internet/intranet, or combination thereof, including, for example, network switch, router, bridge, gateway, hub, or other wired and/or wireless networking connection equipment for enabling ISDN, SONET, ATM, frame relay, gigabit Ethernet, TCP/IP, virtual private networks, xDSL, or other similar functionality. Additionally, data **2** may comprise text, graphics, video, or other digital or media information, such as current news update, photographic images, video or audio clips, sports statistics or analysis, stock quotes or financial data, weather forecast report, research data, commercial transaction details, product pricing, etc.

In accordance with important aspect of present invention, digital television system includes multiple receivers coupled selectively or programmably to program **2** and/or data **4** source over broadcast **6** and/or network **10** communications infrastructure, wherein conferencing or communication among DTV subscribers **18** occurs during program and/or data delivery. Consequently, controller **8** may send or transmit service bill indication to participating DTV units per actual program view or conference usage. As used herein, term "conference" or "conferencing" is interpreted broadly and understood to mean any communication between multiple parties.

Additionally, controller may facilitate electronic narrowcast delivery of personalized or customized commercial and/or non-commercial message to select DTV units. Controller **8** and/or subscribers **18** may employ one or more intelligent agents or functionally equivalent software constructs to search, obtain, or transact certain information or activity across network **10**. Controller **8** or subscriber unit **18** processor may selectively restrict or censor pre-defined program or data classes or titles, for example, to content screening criteria and/or procedure provided for so-called V-chip specifications. Preferably, each DTV receiver includes searchable and/or identifiable address and various multimedia input/output device capability for enabling video conferencing. Moreover, DTV units may be added or removed during conference period.

Accordingly, FIG. **2** shows overlay of subscriber conferencing **20** over program and/or data delivery to subscribers **18**. In this networked configuration, controller **8** effectively serves as broadband system headend processor for generating, forwarding, modifying, storing, accessing or otherwise controlling program/data delivery to subscribers **18**, while generating, forwarding, modifying, storing, accessing or otherwise controlling video conferencing signal transmission between subscribers **18**.

Preferably, such program/data signal generated, transmitted or otherwise processed to receiver units comply with established DTV standards, such as ATSC or other generally accepted industry DTV information or signal format and/or protocol interface, and video conferencing signal generated, transmitted or otherwise processed between receiver units comply with established video conferencing standards, such as H.323, H.324, H.320, T.120 or other generally accepted industry video/data conferencing information or signal for-

mat and/or protocol interface, such currently published or online-accessible standards being hereby incorporated by reference.

FIG. **3** shows digital television subscriber unit **22**, which may be implemented as one or more DTV receivers **12**, **14**, or **16** of FIG. **1**. Preferably, DTV unit **22**, which functions in compliance with Advanced Television Systems Committee (ATSC) standard for DTV equipment and system operation, substantially includes display panel or screen with video frame buffer **24**, digital video-conferencing camera or image sensor **26**, microphone **28**, keyboard and/or mouse **30**, speaker(s) **32**, processor or controller **34**, digital memory or recordable video disk storage **36**, peripheral card reader **38**, remote control infrared interface **40**, network interface or modem **42** (e.g., for coupling to network channel **10**), digital compressed video encoder/decoder (i.e., according to Moving Pictures Experts Group (MPEG) industry standards)), radio frequency (RF), broadband or wireless communications interface **46** (e.g., for coupling to broadcast channel **6**), and operating system, BIOS, browser, or other associated kernel software **48** for generally enabling system and controller **34** operation and network communications.

It is contemplated that ATSC-compliant DTV unit **22** may be embodied as well in personal or network computer, workstation, set-top television device, or functionally equivalent processing and associated network equipment, as configured to operate as specified herein according to present invention.

Moreover, controllers **8**, **34** execute one or more computer programs for performing functions as described herein, preferably according to embedded or real-time software syntax, such as JAVA and/or Windows CE, which currently published or on-line specifications are hereby incorporated by reference.

When DTV unit **22** operates according to present invention, sample display **24** screen output may be as represented in FIG. **4**. In particular, display **24** may integrate, combine, mix, or otherwise include program **52** and/or data **54**, effectively through video frame buffer, with video conferencing windows from current (i.e., self) and/or other DTV participants **56** coupled thereto, preferably during program/data delivery. For example, each screen element **52**, **54**, **56** may be shown as picture within or adjacent to another picture element. In this overlaid manner, each DTV unit in select set displays common program and/or data stream, as well as conference video and audio signal output as generated from video camera and microphone from other participant DTV units.

Preferably, such program and/or video signals are compressed and encoded according to industry standard such as MPEG format. Display **50** may also show whiteboard-type screen commonly among participants **56** for jointly communicating text, graphics, or other observable or audible program or data, such as for workgroup or class collaboration to review or discuss draft documents, faxes, or other forms or files.

FIG. **5** shows operational flow chart, including steps for system configuration and subscription set-up **60**, program and/or data delivery **62**, participant conference **64**, and controller billing **66**. Preferably, controller **8**, serves as central processor to coordinate DTV unit set-up, user smart-card account authorization or identity authentication program/data and/or conference scheduling, programming, viewing, output formatting, conference access and communication, billing, advertising, and other associated activity, particularly for managing access to program **2**, data **4**, as well as DTV video conferencing signals **20**. To reduce latency, controller **8** may transmit static image instead of live video.

For example, controller **8** may authorize or cause certain DTV units to be added or removed dynamically from one or more video conferencing active set or selected logical group, as well as restrict select DTV unit(s) from viewing certain program and/or data. Moreover, controller **8** monitors one or more actual program/data viewing and/or conferencing usage for appropriate billing. Furthermore, controller **8** may direct personalized or targeted commercial, incentive, or advertising messages to certain recognized demographic interest group, DTV subscribers or participant video conferencing parties.

Preferably, controller **8** directs such messages dynamically or adaptively according to current subscriber or participant information activity or needs, as well as product availability, market pricing, or other commercial attribute. Additionally, controller **8** may take corrective action or functional adjustment to redirect, restrict, control, or otherwise manage network, program/data, or other system resources, upon detecting actual or possible performance bottlenecks or other equipment or connection fault causing undesirable impact on such information delivery.

In one embodiment of present invention, DTV system is configured for luxury-suite type or other effectively exclusive membership multi-user conferenced viewing of live sports event, such that professional football, basketball, baseball, hockey, soccer, or other competitive individual, team, or tournament telecast is provided as program **2** through broadcast channel **6**, including preferably statistical or background data **4** about player, team, or other related game aspect. In particular, controller **8** provides proper access by authorized DTV subscribers **18** to such sports program and/or data. Additionally, controller **8** coordinates or monitors video conferencing activity occurring directly or indirectly between DTV units watching common program/data stream.

Hence, for example, initially, during configuration subscription setup phase **60**, system or headend controller **8** begins to identify system configuration, network address, program order and account status of any subscriber units coupled thereto over broadcast **6** and/or network **10** channels. Commercial transaction may occur to define DTV receiver unit user subscriptions, particularly for authenticating, billing, scheduling, notifying, requesting or otherwise providing desired access to any upcoming or current program **2** or database **4**. As appropriate, controller **8** may conduct remote diagnostics over such channels to various units **12**, **14**, **16** to ensure proper functioning for signal delivery.

Next, program and/or data delivery may commence according to controller **8** programmable selection to enable digital transmission for electronic signal delivery **62** of certain program **2** and/or data **4** for presentation in integrated display **50** of selected or addressed DTV subscriber units **18**. Then, thereafter, prior, or simultaneously, select participants **56** are enabled for video conferencing **20**, particularly by allowing such participants to be monitored by activated video camera **26** and/or microphone **28**, for transmission of monitored static image or live motion video compressed encoded digital signal for presentation in display screen **50**. Upon completion of program/data delivery and conferencing activity, controller **8** may send proper billing indications to participant DTV units. Controller **8** may appropriately add or delete subscriber **18** in active database.

Therefore, in this combined DTV program/data viewing and select viewer conferencing scheme, important objective of emulating luxury-suite or otherwise more collaborative, intimate or personal conditions among associated audience members located at different locations is achieved effectively.

Optionally, while receiving program/data, conferenced subscriber may also send or receive electronic text message to other subscribers or other mail account addressable through network **10**, or run various application programs locally or in distributed client-server networked manner, preferably in common with other conferenced DTV units, such as for multi-user simulation or gaming application.

To improve system program/data broadcast or video conferencing performance, for example, when restricted effectively by channel bandwidth or traffic congestion, controllers **8**, **34** may reduce or eliminate actual transmission of full content video signal, and preferably transmit information subset, such as static image, text and/or voice.

Foregoing described embodiments of invention are provided as illustration and description. It is not intended to limit invention to precise form described. Other variations and embodiments are possible in light of above teaching, and it is thus intended that scope of invention not be limited by detailed description, but rather by claims as follow.

We claim:

1. In a digital television system comprising a plurality of receivers coupled to a program source, a method for providing subscriber conferencing with program delivery comprising the steps of:

coupling a program source to a plurality of digital television (DTV) receivers;

delivering a program from the program source to the DTV receivers coupled thereto; and

enabling a conference between the coupled DTV receivers during program delivery, the conference comprising a video conference session being conducted between such coupled DTV receivers, each DTV receiver comprising a video camera and a display, such coupled DTV receivers being associated with a plurality of selected subscribers belonging to a logical group, the conference being enabled within the logical group simultaneously with the program delivery to the selected subscribers of the logical group, the display of each coupled DTV receiver displaying the delivered program and at least one selected subscriber in the conference, whereby collaboration is effectively enabled by video conferencing among the selected subscribers while a common program is delivered simultaneously to such selected subscribers.

2. The method of claim **1** further comprising the step of:

sending a billing message to one or more of the coupled DTV receivers according to program viewing or conferencing activity, the billing message representing a charge for simultaneous program delivery and video conferencing service.

3. The method of claim **1** further comprising the step of:

providing to one or more coupled DTV receiver a personalized commercial message, the personalized commercial message being provided to the selected subscribers belonging to the logical group during the video conferencing session.

4. The method of claim **1** wherein:

each coupled DTV receiver comprises a controller for coordinating simultaneous program delivery and video conferencing among the selected subscribers.

5. The method of claim **1** further comprising the step of:

adding or removing a DTV receiver coupled to the program source during program delivery, thereby dynamically modifying an active set of the selected subscribers belonging to the logical group for simultaneous video conferencing and common program delivery.

6. A digital television system comprising:

a program source, and

a plurality of digital television (DTV) receivers coupled to the program source;

wherein a program is deliverable from the program source to the DTV receivers, and a conference is enabled between the coupled DTV receivers, the conference comprising a video conference session being conducted between such coupled DTV receivers, each DTV receiver comprising a video camera and a display, such coupled DTV receivers being associated with a plurality of selected subscribers belonging to a logical group, the conference being enabled within the logical group simultaneously with the program delivery to the selected subscribers of the logical group, the display of each coupled DTV receiver displaying the delivered program and at least one selected subscriber in the conference, whereby collaboration is effectively enabled by video conferencing among the selected subscribers while a common program is delivered simultaneously to such selected subscribers.

7. The system of claim **6** wherein:

each DTV receiver comprises a processor for coordinating simultaneous program delivery and video conferencing among the selected subscribers.

8. Digital television apparatus comprising:

a display, a camera, and an interface;

wherein the interface couples to a program source for presentation of a program by the display, the interface receiving a conference signal from a conference participant for presentation of a video conference by the display, and the camera generating a video signal for transmission to the conference participant, the video conference comprising a session being conducted with the conference participant during the presentation of the program, the display integrating through a frame buffer the program and the received conference signal according to an active set, thereby graphically combining video conferencing with the conference participant during the program delivery.

9. The apparatus of claim **8** further comprising:

a controller for controlling simultaneous program delivery and video conferencing within the active set, the controller being able to modify the active set dynamically by adding or removing one or more conference participants.

10. The apparatus of claim **8** wherein:

the interface receives a billing message representing a charge for simultaneous program delivery and video conferencing service or a commercial message associated with the active set.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,339,842 B1
DATED : January 15, 2002
INVENTOR(S) : Fernandez et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

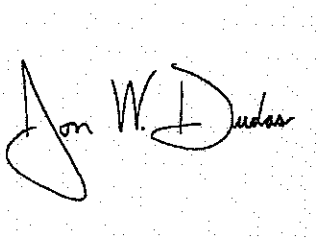
Delete Drawing Sheets 1 and 3 and substitute the attached Drawing Sheets 1 and 3.

Column 2,
Lines 5 and 16, delete "2" and insert -- 2 --.

Column 5,
Line 19, delete "fill" and insert -- full --.

Signed and Sealed this

Twentieth Day of December, 2005



JON W. DUDAS
Director of the United States Patent and Trademark Office

U.S. Patent Jan. 15, 2002 Sheet 1 of 5 6,339,842 B1

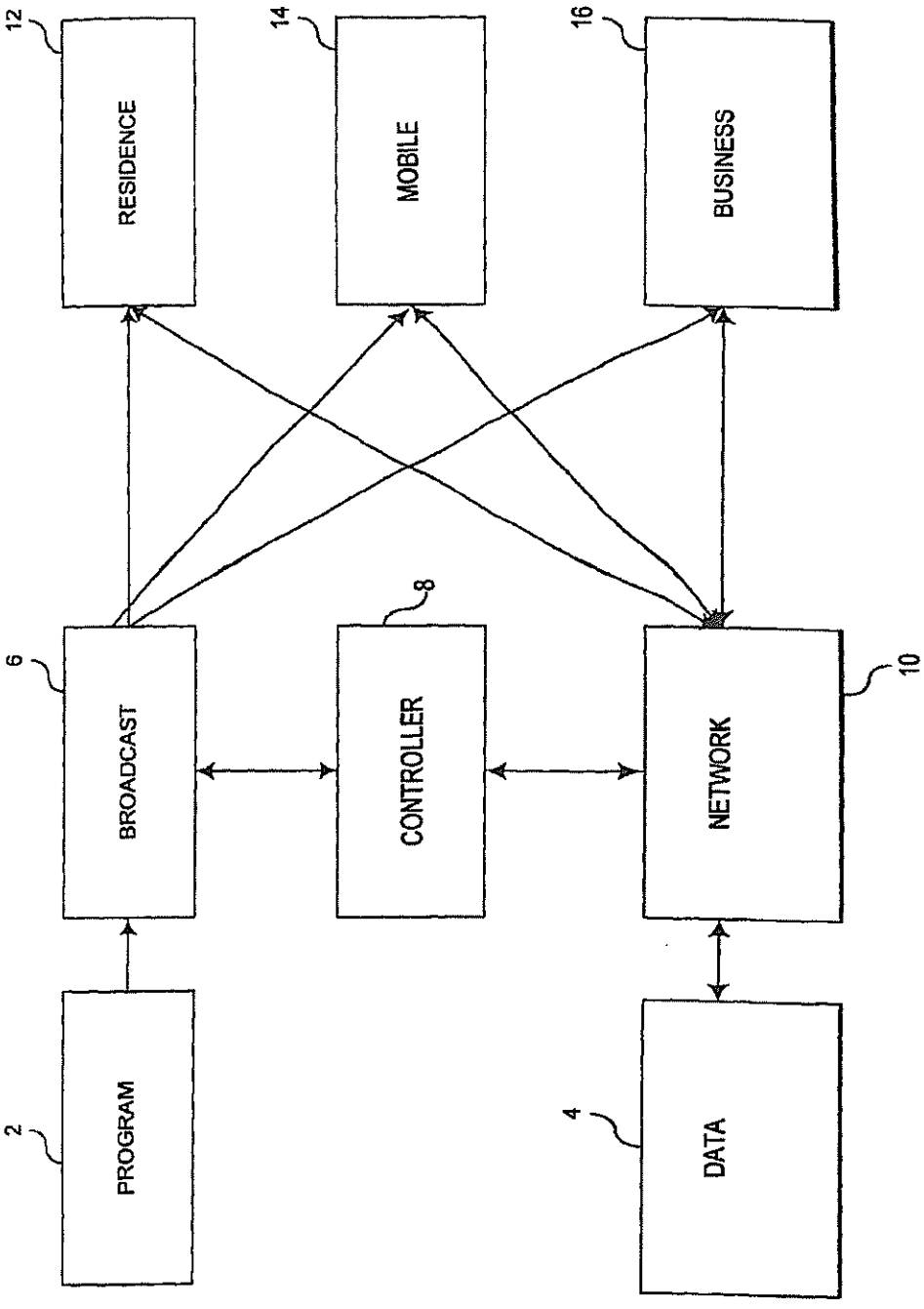


FIG. 1

U.S. Patent Jan. 15, 2002 Sheet 3 of 5 6,339,842 B1

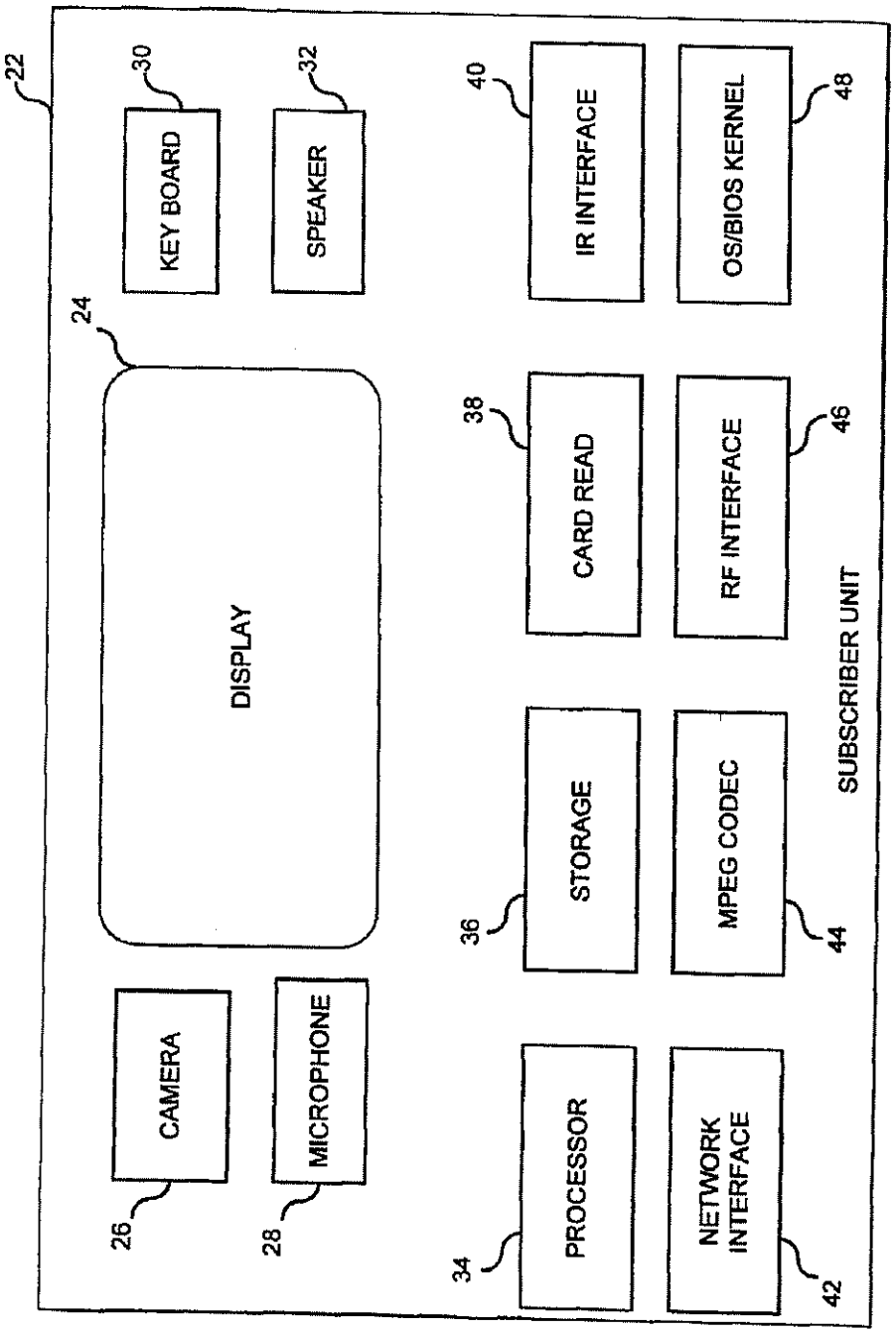


FIG. 3

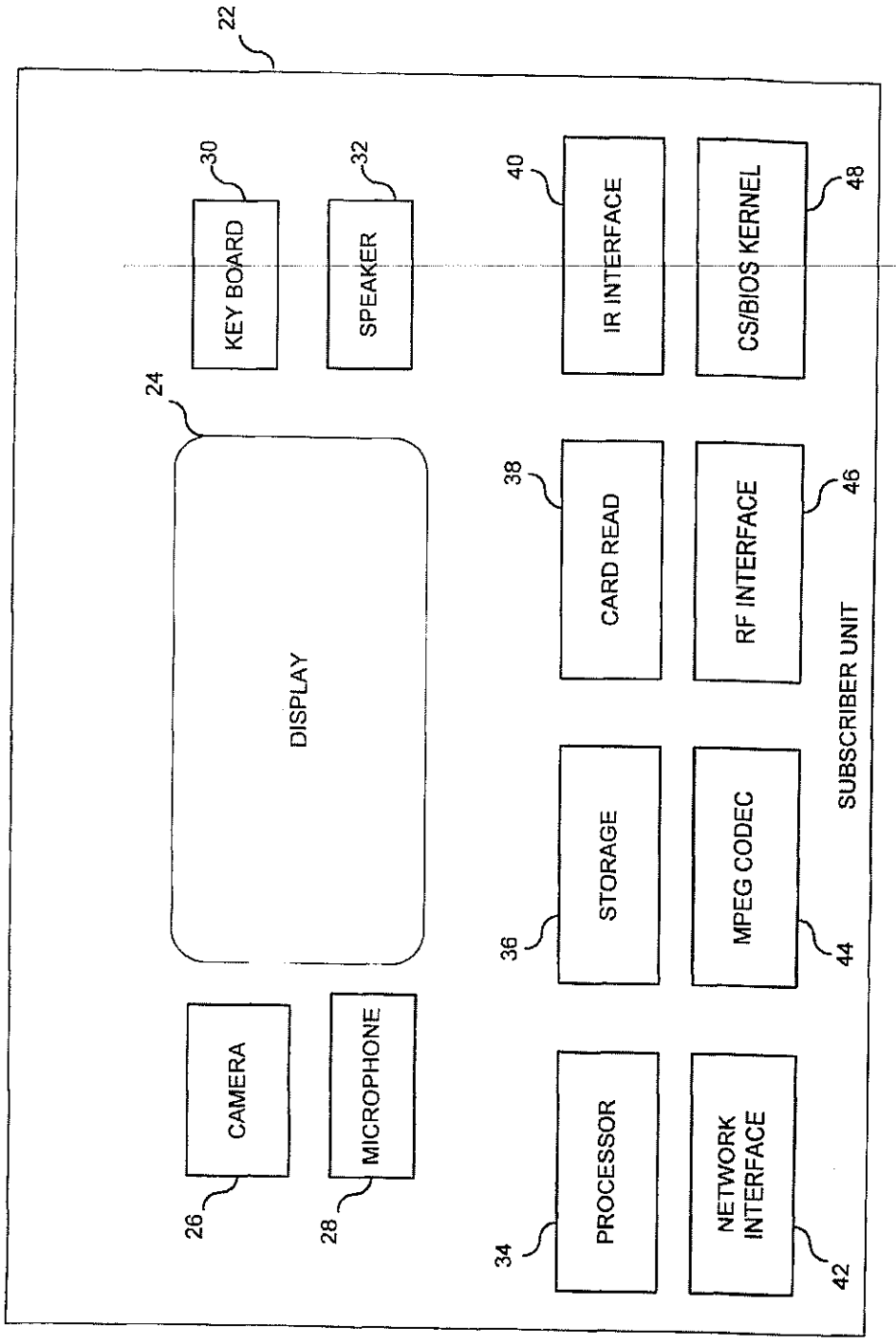

22
30
KEY BOARD
32
SPEAKER
40
IR INTERFACE
48
CS/BIOS KERNEL
24
DISPLAY
38
CARD READ
46
RF INTERFACE
SUBSCRIBER UNIT
36
STORAGE
44
MPEG CODEC
CAMERA
MICROPHONE
26
28
34
PROCESSOR
NETWORK INTERFACE
42

FIG. 3

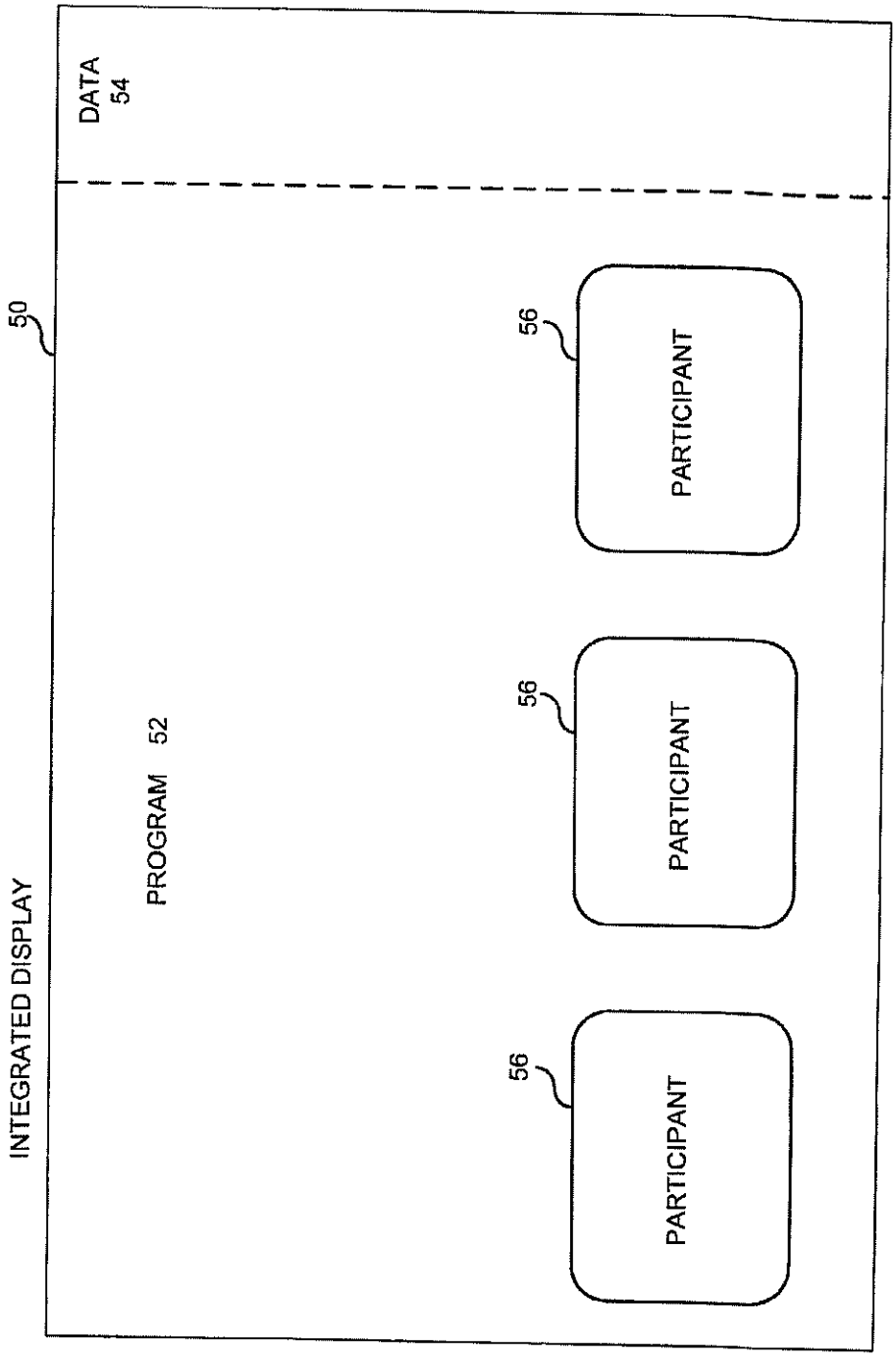

DATA
54
50
56
PARTICIPANT
56
PARTICIPANT
56
PARTICIPANT
PROGRAM 52
INTEGRATED DISPLAY

FIG. 4

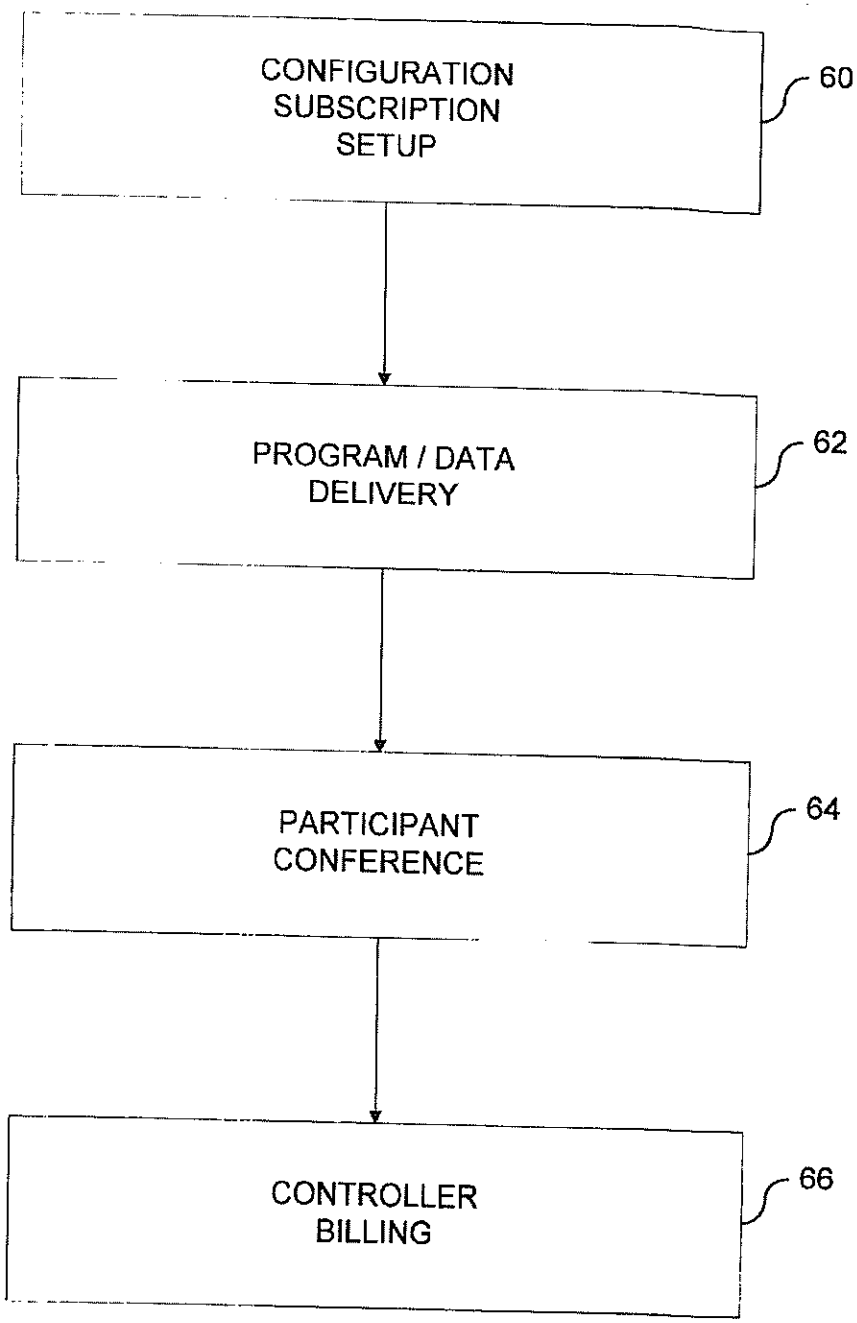

CONFIGURATION SUBSCRIPTION SETUP
60
PROGRAM / DATA DELIVERY
62
PARTICIPANT CONFERENCE
64
CONTROLLER BILLING
66

FIG. 5

DIGITAL TELEVISION WITH SUBSCRIBER CONFERENCE OVERLAY

FIELD OF INVENTION

The invention relates to digital television systems, particularly to subscriber video conferencing with conventional programming.

BACKGROUND OF INVENTION

Digital television (DTV) attributes have been standardized by industry (e.g., Advanced Television Systems Committee (ATSC) and government (U.S. Federal Communications Commission (FCC)). Such DTV standards, which provide enhanced multimedia quality, as well as interactive data services, are hereby incorporated by reference. Generally, however, DTV specifications contemplate program delivery to various receiver units, but not necessarily communication between receiver units. Accordingly, there may be need for conferencing between units receiving digital system programming.

SUMMARY OF INVENTION

The invention resides in digital television system configured for subscriber conference overlay during program delivery. Billing and advertisement may be personalized according to actual program viewing and/or conferencing activity by DTV receiver. Receiver unit includes media input/output device for multi-user conferencing. Subscribers may be added or removed during programming.

BRIEF DESCRIPTION OF DRAWINGS

FIG. **1** is block diagram of integrated digital television program and data delivery system for enabling present invention.

FIG. **2** is simplified diagram of novel overlay of subscriber conferencing over program and/or data delivery.

FIG. **3** is representative digital TV subscriber unit used according to present invention.

FIG. **4** is sample digital TV display according to present invention.

FIG. **5** is flow chart of operational steps of present invention.

DETAILED DESCRIPTION

FIG. **1** is block diagram of integrated digital television program and data delivery system, including one or more residential **12**, mobile **14** and business **16** subscriber, receiver and/or digital television (DTV) units coupled over broadcast **6** and/or network **10** channels respectively to program **2** and/or data **4** sources. Controller **8**, which is one or more processor, server, computer or other functionally equivalent controller functionality coupled to broadcast **6** and/or network **10** channel, may affect network **10** and broadcast **6** functionality as described herein.

Program source **2** comprises one or more source for broadcasting one or more video and/or data programs, or other functionally equivalent information signal stream, according to conventional digital and/or analog program broadcasting, accessible or addressable publicly or privately over various broadcast **6** equipment, medium, or other functionally equivalent channels, such as cable, optical fiber, microwave, wireless radio frequency (RF) transmission, direct broadcast satellite (DBS), multichannel multipoint distribution system (MMDS), local multipoint distribution

service (LMDS), etc. For example, program **2** may comprise live sports or entertainment performance event, such as professional football game, broadcast over restricted pay-per-view television channels.

Data source **2** comprises one or more source for providing two-way or interactive access to one or more database, file, directory, or other functionally equivalent data repository site or signal source, accessible or addressable publicly or privately over conventional network **10**, such as local or wide area network, world-wide web Internet/intranet, or combination thereof, including, for example, network switch, router, bridge, gateway, hub, or other wired and/or wireless networking connection equipment for enabling ISDN, SONET, ATM, frame relay, gigabit Ethernet, TCP/IP, virtual private networks, xDSL, or other similar functionality. Additionally, data **2** may comprise text, graphics, video, or other digital or media information, such as current news update, photographic images, video or audio clips, sports statistics or analysis, stock quotes or financial data, weather forecast report, research data, commercial transaction details, product pricing, etc.

In accordance with important aspect of present invention, digital television system includes multiple receivers coupled selectively or programmably to program **2** and/or data **4** source over broadcast **6** and/or network **10** communications infrastructure, wherein conferencing or communication among DTV subscribers **18** occurs during program and/or data delivery. Consequently, controller **8** may send or transmit service bill indication to participating DTV units per actual program view or conference usage. As used herein, term "conference" or "conferencing" is interpreted broadly and understood to mean any communication between multiple parties.

Additionally, controller may facilitate electronic narrowcast delivery of personalized or customized commercial and/or non-commercial message to select DTV units. Controller **8** and/or subscribers **18** may employ one or more intelligent agents or functionally equivalent software constructs to search, obtain, or transact certain information or activity across network **10**. Controller **8** or subscriber unit **18** processor may selectively restrict or censor pre-defined program or data classes or titles, for example, to content screening criteria and/or procedure provided for so-called V-chip specifications. Preferably, each DTV receiver includes searchable and/or identifiable address and various multimedia input/output device capability for enabling video conferencing. Moreover, DTV units may be added or removed during conference period.

Accordingly, FIG. **2** shows overlay of subscriber conferencing **20** over program and/or data delivery to subscribers **18**. In this networked configuration, controller **8** effectively serves as broadband system headend processor for generating, forwarding, modifying, storing, accessing or otherwise controlling program/data delivery to subscribers **18**, while generating, forwarding, modifying, storing, accessing or otherwise controlling video conferencing signal transmission between subscribers **18**.

Preferably, such program/data signal generated, transmitted or otherwise processed to receiver units comply with established DTV standards, such as ATSC or other generally accepted industry DTV information or signal format and/or protocol interface, and video conferencing signal generated, transmitted or otherwise processed between receiver units comply with established video conferencing standards, such as H.323, H.324, H.320, T.120 or other generally accepted industry video/data conferencing information or signal for-

mat and/or protocol interface, such currently published or online-accessible standards being hereby incorporated by reference.

FIG. **3** shows digital television subscriber unit **22**, which may be implemented as one or more DTV receivers **12**, **14**, or **16** of FIG. **1**. Preferably, DTV unit **22**, which functions in compliance with Advanced Television Systems Committee (ATSC) standard for DTV equipment and system operation, substantially includes display panel or screen with video frame buffer **24**, digital video-conferencing camera or image sensor **26**, microphone **28**, keyboard and/or mouse **30**, speaker(s) **32**, processor or controller **34**, digital memory or recordable video disk storage **36**, peripheral card reader **38**, remote control infrared interface **40**, network interface or modem **42** (e.g., for coupling to network channel **10**), digital compressed video encoder/decoder (i.e., according to Moving Pictures Experts Group (MPEG) industry standards)), radio frequency (RF), broadband or wireless communications interface **46** (e.g., for coupling to broadcast channel **6**), and operating system, BIOS, browser, or other associated kernel software **48** for generally enabling system and controller **34** operation and network communications.

It is contemplated that ATSC-compliant DTV unit **22** may be embodied as well in personal or network computer, workstation, set-top television device, or functionally equivalent processing and associated network equipment, as configured to operate as specified herein according to present invention.

Moreover, controllers **8**, **34** execute one or more computer programs for performing functions as described herein, preferably according to embedded or real-time software syntax, such as JAVA and/or Windows CE, which currently published or on-line specifications are hereby incorporated by reference.

When DTV unit **22** operates according to present invention, sample display **24** screen output may be as represented in FIG. **4**. In particular, display **24** may integrate, combine, mix, or otherwise include program **52** and/or data **54**, effectively through video frame buffer, with video conferencing windows from current (i.e., self) and/or other DTV participants **56** coupled thereto, preferably during program/data delivery. For example, each screen element **52**, **54**, **56** may be shown as picture within or adjacent to another picture element. In this overlaid manner, each DTV unit in select set displays common program and/or data stream, as well as conference video and audio signal output as generated from video camera and microphone from other participant DTV units.

Preferably, such program and/or video signals are compressed and encoded according to industry standard such as MPEG format. Display **50** may also show whiteboard-type screen commonly among participants **56** for jointly communicating text, graphics, or other observable or audible program or data, such as for workgroup or class collaboration to review or discuss draft documents, faxes, or other forms or files.

FIG. **5** shows operational flow chart, including steps for system configuration and subscription set-up **60**, program and/or data delivery **62**, participant conference **64**, and controller billing **66**. Preferably, controller **8**, serves as central processor to coordinate DTV unit set-up, user smart-card account authorization or identity authentication program/data and/or conference scheduling, programming, viewing, output formatting, conference access and communication, billing, advertising, and other associated activity, particularly for managing access to program **2**, data **4**, as well as DTV video conferencing signals **20**. To reduce latency, controller **8** may transmit static image instead of live video.

For example, controller **8** may authorize or cause certain DTV units to be added or removed dynamically from one or more video conferencing active set or selected logical group, as well as restrict select DTV unit(s) from viewing certain program and/or data. Moreover, controller **8** monitors one or more actual program/data viewing and/or conferencing usage for appropriate billing. Furthermore, controller **8** may direct personalized or targeted commercial, incentive, or advertising messages to certain recognized demographic interest group, DTV subscribers or participant video conferencing parties.

Preferably, controller **8** directs such messages dynamically or adaptively according to current subscriber or participant information activity or needs, as well as product availability, market pricing, or other commercial attribute. Additionally, controller **8** may take corrective action or functional adjustment to redirect, restrict, control, or otherwise manage network, program/data, or other system resources, upon detecting actual or possible performance bottlenecks or other equipment or connection fault causing undesirable impact on such information delivery.

In one embodiment of present invention, DTV system is configured for luxury-suite type or other effectively exclusive membership multi-user conferenced viewing of live sports event, such that professional football, basketball, baseball, hockey, soccer, or other competitive individual, team, or tournament telecast is provided as program **2** through broadcast channel **6**, including preferably statistical or background data **4** about player, team, or other related game aspect. In particular, controller **8** provides proper access by authorized DTV subscribers **18** to such sports program and/or data. Additionally, controller **8** coordinates or monitors video conferencing activity occurring directly or indirectly between DTV units watching common program/data stream.

Hence, for example, initially, during configuration subscription setup phase **60**, system or headend controller **8** begins to identify system configuration, network address, program order and account status of any subscriber units coupled thereto over broadcast **6** and/or network **10** channels. Commercial transaction may occur to define DTV receiver unit user subscriptions, particularly for authenticating, billing, scheduling, notifying, requesting or otherwise providing desired access to any upcoming or current program **2** or database **4**. As appropriate, controller **8** may conduct remote diagnostics over such channels to various units **12**, **14**, **16** to ensure proper functioning for signal delivery.

Next, program and/or data delivery may commence according to controller **8** programmable selection to enable digital transmission for electronic signal delivery **62** of certain program **2** and/or data **4** for presentation in integrated display **50** of selected or addressed DTV subscriber units **18**. Then, thereafter, prior, or simultaneously, select participants **56** are enabled for video conferencing **20**, particularly by allowing such participants to be monitored by activated video camera **26** and/or microphone **28**, for transmission of monitored static image or live motion video compressed encoded digital signal for presentation in display screen **50**. Upon completion of program/data delivery and conferencing activity, controller **8** may send proper billing indications to participant DTV units. Controller **8** may appropriately add or delete subscriber **18** in active database.

Therefore, in this combined DTV program/data viewing and select viewer conferencing scheme, important objective of emulating luxury-suite or otherwise more collaborative, intimate or personal conditions among associated audience members located at different locations is achieved effectively.

Optionally, while receiving program/data, conferenced subscriber may also send or receive electronic text message to other subscribers or other mail account addressable through network **10**, or run various application programs locally or in distributed client-server networked manner, preferably in common with other conferenced DTV units, such as for multi-user simulation or gaming application.

To improve system program/data broadcast or video conferencing performance, for example, when restricted effectively by channel bandwidth or traffic congestion, controllers **8**, **34** may reduce or eliminate actual transmission of fill content video signal, and preferably transmit information subset, such as static image, text and/or voice.

Foregoing described embodiments of invention are provided as illustration and description. It is not intended to limit invention to precise form described. Other variations and embodiments are possible in light of above teaching, and it is thus intended that scope of invention not be limited by detailed description, but rather by claims as follow.

We claim:

1. In a digital television system comprising a plurality of receivers coupled to a program source, a method for providing subscriber conferencing with program delivery comprising the steps of:

coupling a program source to a plurality of digital television (DTV) receivers;

delivering a program from the program source to the DTV receivers coupled thereto; and

enabling a conference between the coupled DTV receivers during program delivery, the conference comprising a video conference session being conducted between such coupled DTV receivers, each DTV receiver comprising a video camera and a display, such coupled DTV receivers being associated with a plurality of selected subscribers belonging to a logical group, the conference being enabled within the logical group simultaneously with the program delivery to the selected subscribers of the logical group, the display of each coupled DTV receiver displaying the delivered program and at least one selected subscriber in the conference, whereby collaboration is effectively enabled by video conferencing among the selected subscribers while a common program is delivered simultaneously to such selected subscribers.

2. The method of claim **1** further comprising the step of:

sending a billing message to one or more of the coupled DTV receivers according to program viewing or conferencing activity, the billing message representing a charge for simultaneous program delivery and video conferencing service.

3. The method of claim **1** further comprising the step of:

providing to one or more coupled DTV receiver a personalized commercial message, the personalized commercial message being provided to the selected subscribers belonging to the logical group during the video conferencing session.

4. The method of claim **1** wherein:

each coupled DTV receiver comprises a controller for coordinating simultaneous program delivery and video conferencing among the selected subscribers.

5. The method of claim **1** further comprising the step of:

adding or removing a DTV receiver coupled to the program source during program delivery, thereby dynamically modifying an active set of the selected subscribers belonging to the logical group for simultaneous video conferencing and common program delivery.

6. A digital television system comprising:

a program source, and

a plurality of digital television (DTV) receivers coupled to the program source;

wherein a program is deliverable from the program source to the DTV receivers, and a conference is enabled between the coupled DTV receivers, the conference comprising a video conference session being conducted between such coupled DTV receivers, each DTV receiver comprising a video camera and a display, such coupled DTV receivers being associated with a plurality of selected subscribers belonging to a logical group, the conference being enabled within the logical group simultaneously with the program delivery to the selected subscribers of the logical group, the display of each coupled DTV receiver displaying the delivered program and at least one selected subscriber in the conference, whereby collaboration is effectively enabled by video conferencing among the selected subscribers while a common program is delivered simultaneously to such selected subscribers.

7. The system of claim **6** wherein:

each DTV receiver comprises a processor for coordinating simultaneous program delivery and video conferencing among the selected subscribers.

8. Digital television apparatus comprising:

a display, a camera, and an interface;

wherein the interface couples to a program source for presentation of a program by the display, the interface receiving a conference signal from a conference participant for presentation of a video conference by the display, and the camera generating a video signal for transmission to the conference participant, the video conference comprising a session being conducted with the conference participant during the presentation of the program, the display integrating through a frame buffer the program and the received conference signal according to an active set, thereby graphically combining video conferencing with the conference participant during the program delivery.

9. The apparatus of claim **8** further comprising:

a controller for controlling simultaneous program delivery and video conferencing within the active set, the controller being able to modify the active set dynamically by adding or removing one or more conference participants.

10. The apparatus of claim **8** wherein:

the interface receives a billing message representing a charge for simultaneous program delivery and video conferencing service or a commercial message associated with the active set.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,339,842 B1
DATED : January 15, 2002
INVENTOR(S) : Fernandez et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

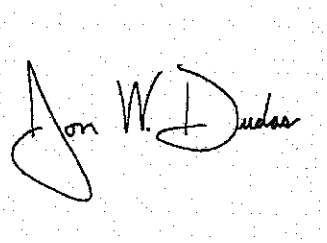
Delete Drawing Sheets 1 and 3 and substitute the attached Drawing Sheets 1 and 3.

Column 2,
Lines 5 and 16, delete "**2**" and insert -- 2 --.

Column 5,
Line 19, delete "fill" and insert -- full --.

Signed and Sealed this

Twentieth Day of December, 2005



JON W. DUDAS
Director of the United States Patent and Trademark Office

U.S. Patent Jan. 15, 2002 Sheet 1 of 5 6,339,842 B1

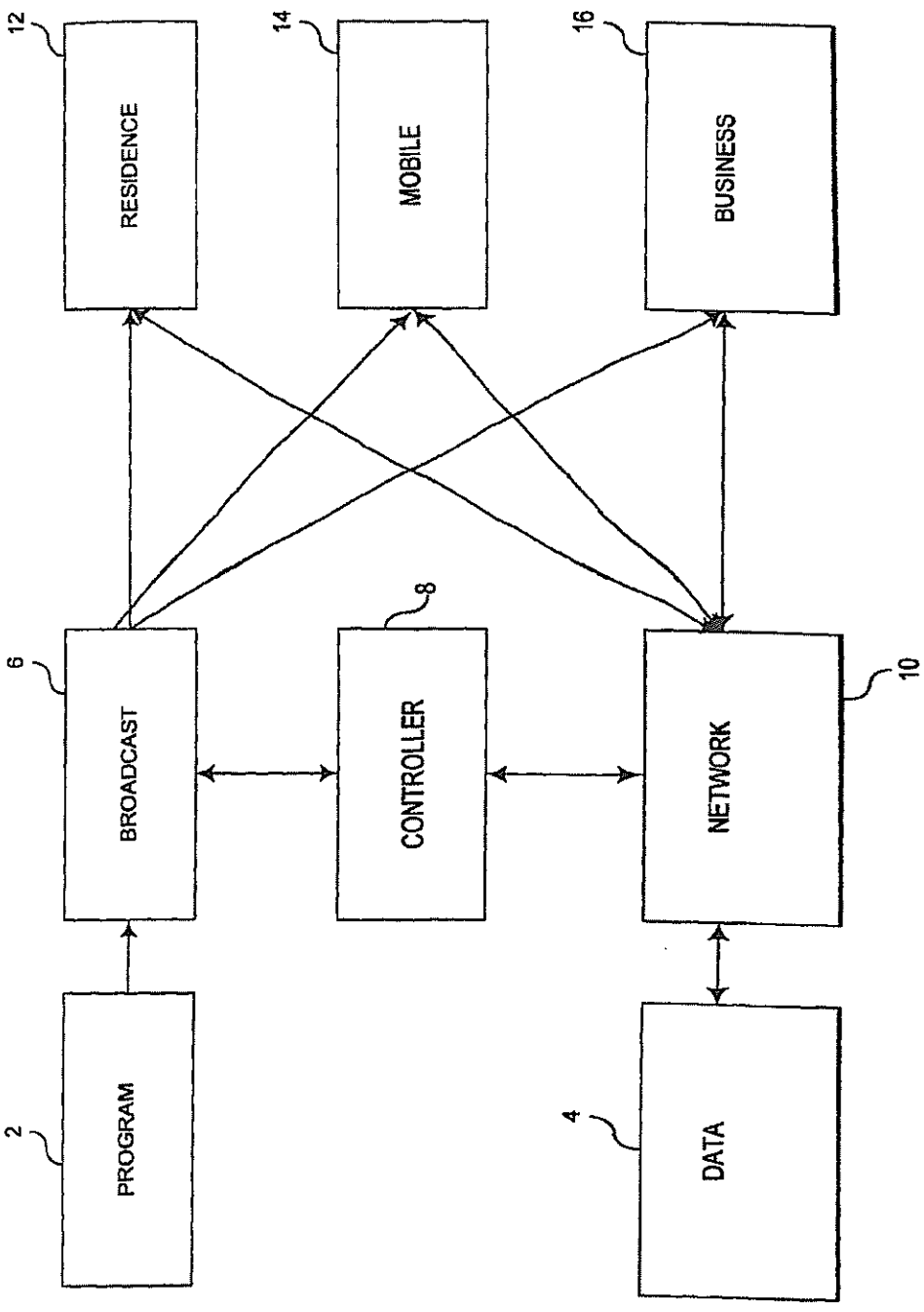


FIG. 1

U.S. Patent Jan. 15, 2002 Sheet 3 of 5 6,339,842 B1

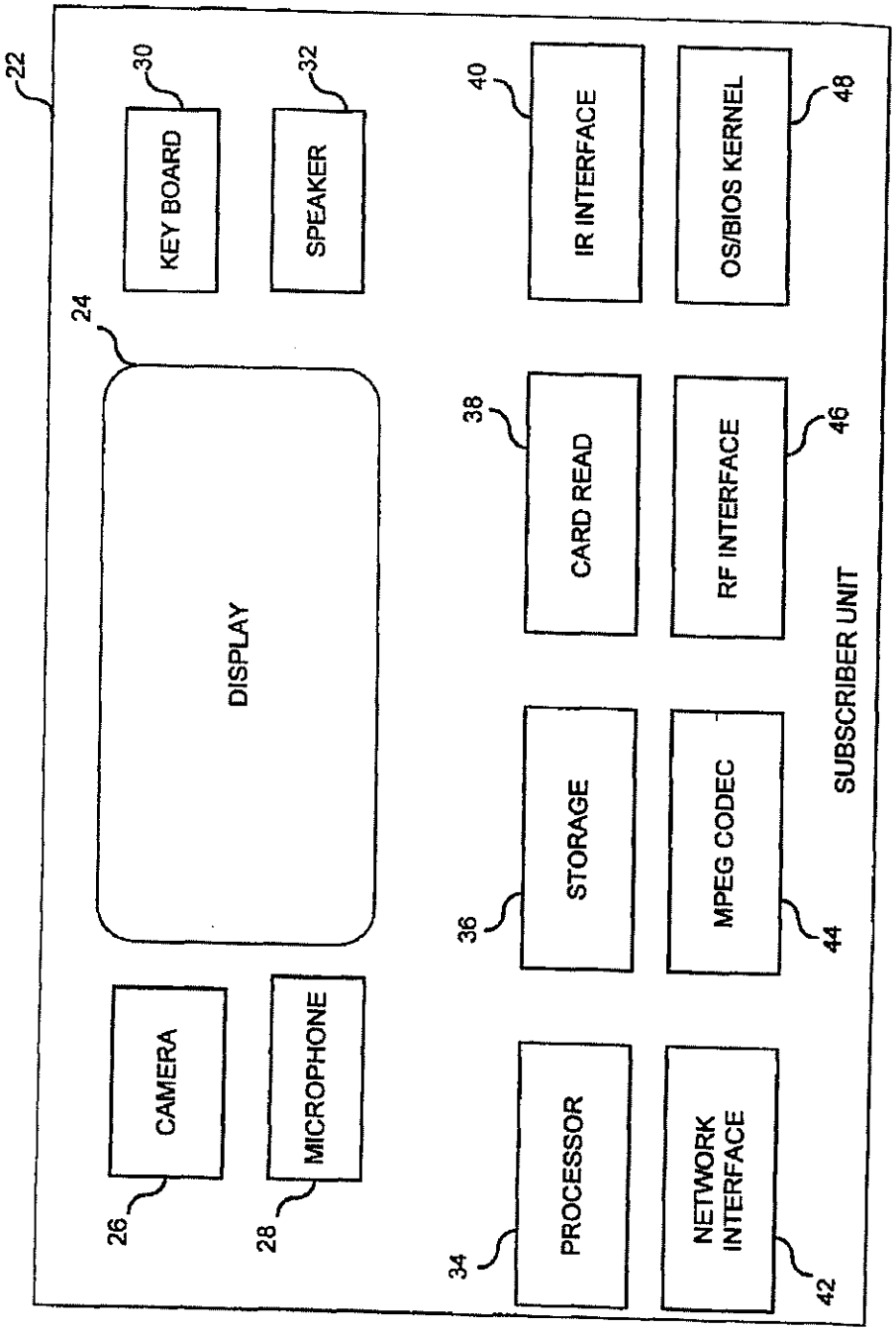


FIG. 3

Exhibit D

US008032915B1

(12) **United States Patent**
Fernandez et al.

(10) **Patent No.: US 8,032,915 B1**
(45) **Date of Patent: Oct. 4, 2011**

(54) **DIGITAL TELEVISION WITH SUBSCRIBER CONFERENCE OVERLAY**

(76) Inventors: **Dennis Sunga Fernandez**, Atherton, CA (US); **Irene Y. Hu**, Sunnyvale, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 46 days.

(21) Appl. No.: **12/541,034**

(22) Filed: **Aug. 13, 2009**

Related U.S. Application Data

(63) Continuation of application No. 11/585,393, filed on Oct. 23, 2006, now Pat. No. 7,917,937.

(51) **Int. Cl.**
H04N 7/173 (2006.01)

(52) **U.S. Cl.** **725/105**; 725/1; 725/34; 725/37; 725/52; 725/53; 725/133; 725/141; 725/153; 709/205; 709/230

(58) **Field of Classification Search** 725/133, 725/141, 153, 1, 34, 37, 52, 53, 105; 709/205, 709/230
See application file for complete search history.

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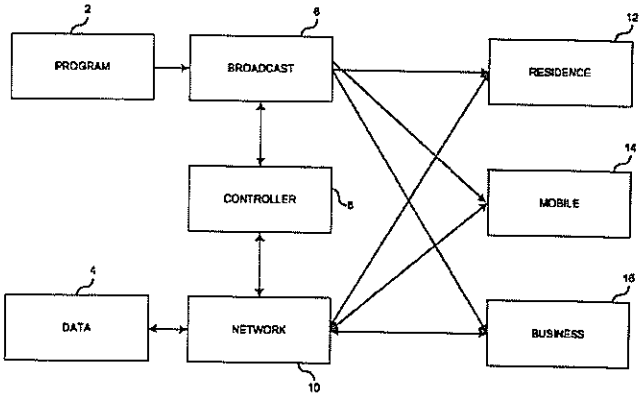
(57) **ABSTRACT**

Digital television system overlays subscriber two-way communication during broadcast program delivery to create virtual audience community. Individual or group billing and advertisement is personalized per DTV receiver program viewing and/or conferencing activity. Subscriber receiver includes camera and other media I/O device for multi-way video conferencing. Participants may be added or removed dynamically during programming or conferencing.

11 Claims, 5 Drawing Sheets



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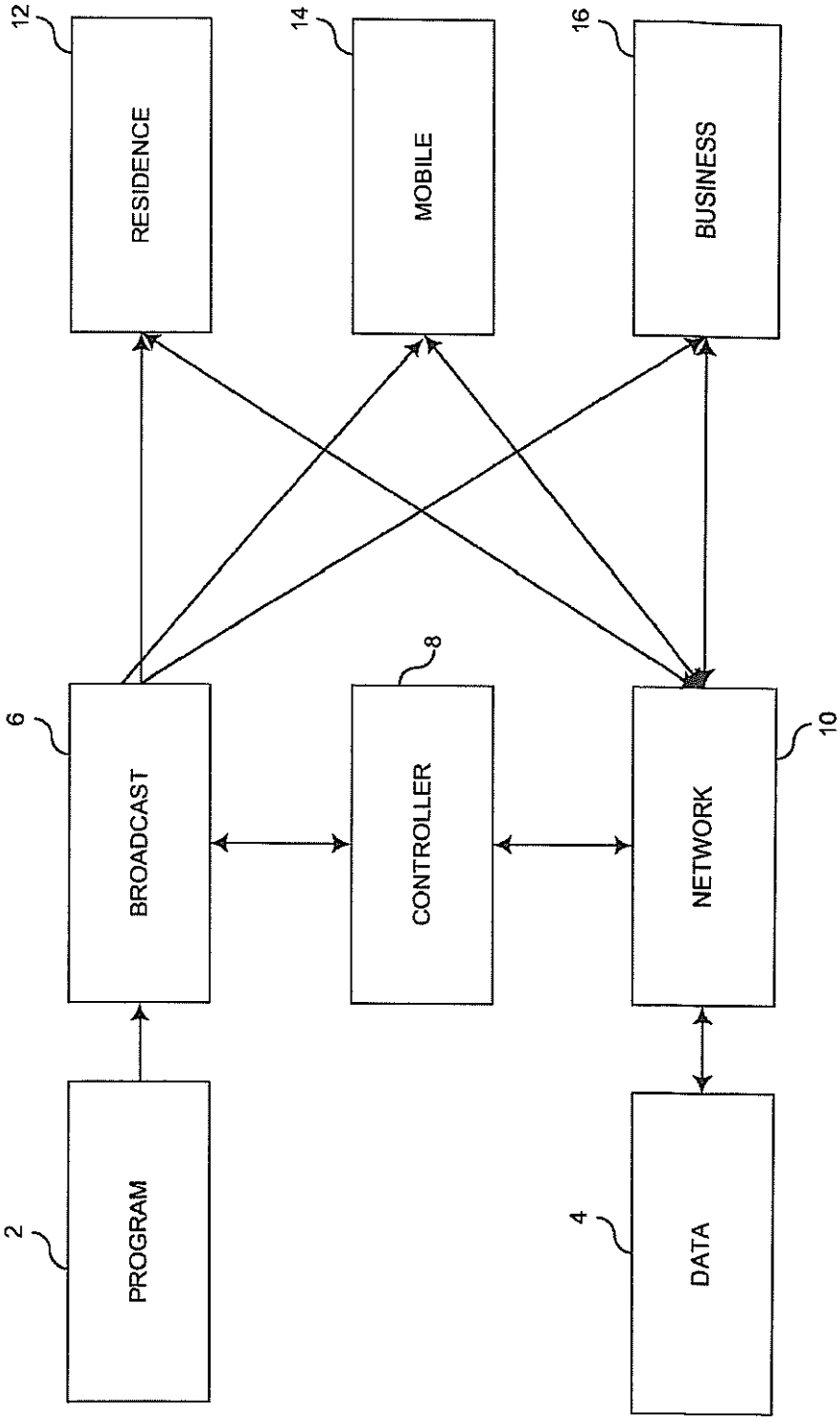
12
RESIDENCE
14
MOBILE
16
BUSINESS
6
BROADCAST
8
CONTROLLER
10
NETWORK
2
PROGRAM
4
DATA

FIG. 1

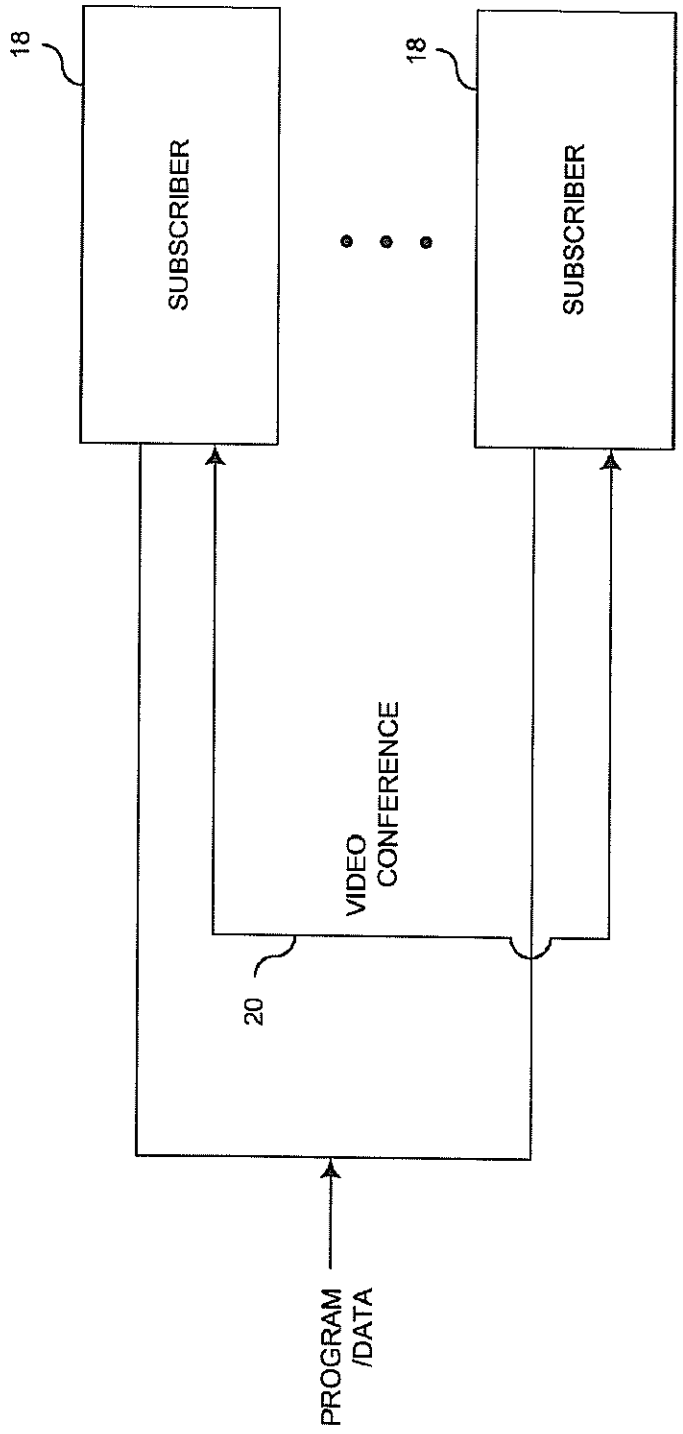
18
SUBSCRIBER
18
SUBSCRIBER
VIDEO CONFERENCE
20
PROGRAM /DATA

FIG. 2

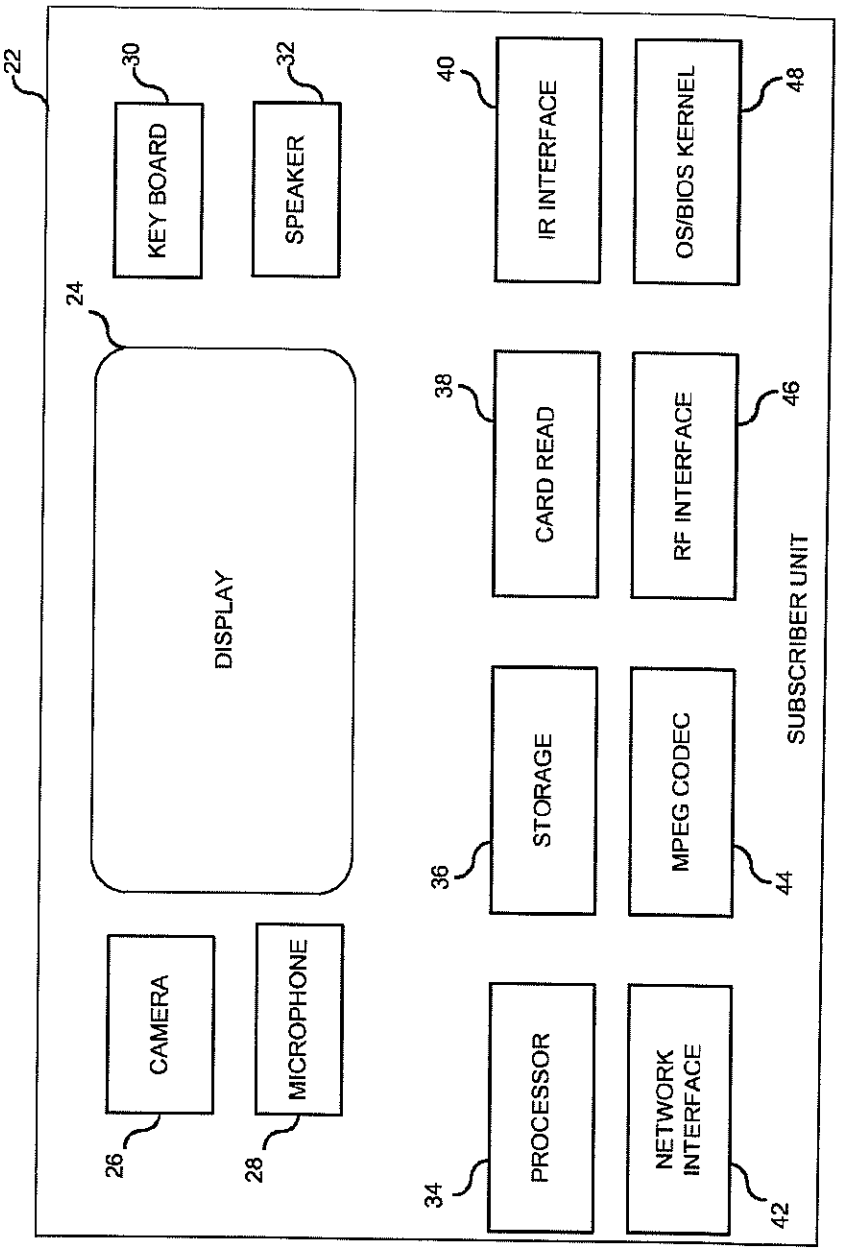
22
SUBSCRIBER UNIT
KEY BOARD
30
SPEAKER
32
IR INTERFACE
40
OS/BIOS KERNEL
48
24
DISPLAY
CARD READ
38
RF INTERFACE
46
CAMERA
26
MICROPHONE
28
STORAGE
36
MPEG CODEC
44
PROCESSOR
34
NETWORK INTERFACE
42

FIG. 3

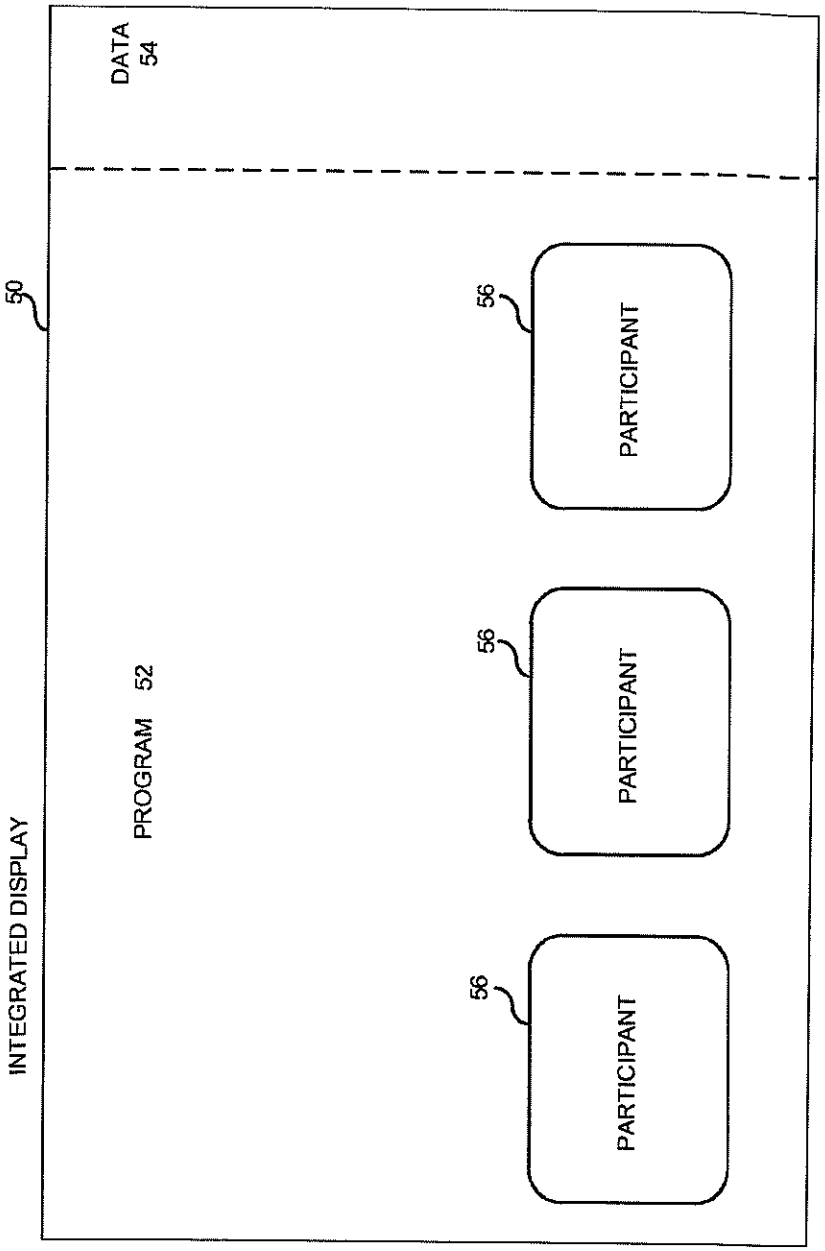
50
INTEGRATED DISPLAY
PROGRAM 52
DATA 54
56
PARTICIPANT
56
PARTICIPANT
56
PARTICIPANT

FIG. 4

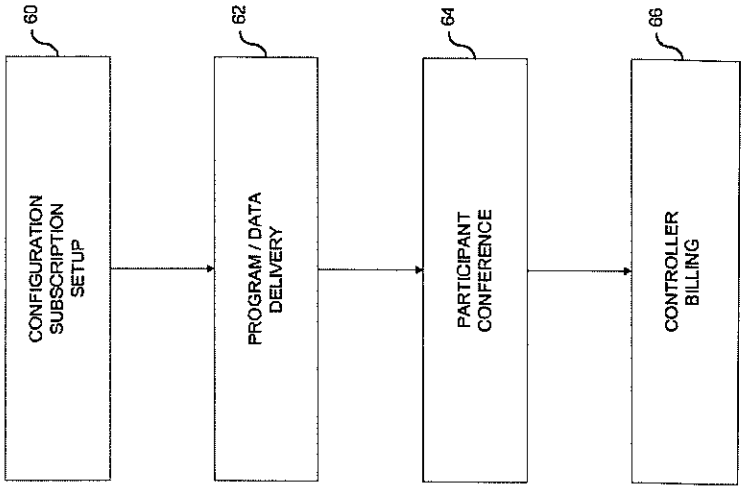
60
CONFIGURATION SUBSCRIPTION SETUP
62
PROGRAM / DATA DELIVERY
64
PARTICIPANT CONFERENCE
66
CONTROLLER BILLING

FIG. 5

DIGITAL TELEVISION WITH SUBSCRIBER CONFERENCE OVERLAY

RELATED U.S. APPLICATION DATA

This application is a continuation of U.S. patent application Ser. No. 11/585,393 filed originally on Oct. 23, 2006, which is a continuation of U.S. patent application Ser. No. 11/514,647, filed originally on Sep. 1, 2006, which is a continuation on the U.S. patent application Ser. No. 11/507,963 filed originally on Aug. 21, 2006, which is a continuation of the U.S. patent application Ser. No. 11/059,611 filed originally on Feb. 15, 2005, which is a continuation of the U.S. patent application Ser. No. 10/444,261 filed originally on May 22, 2003, which is a continuation of the U.S. patent application Ser. No. 10/026,095 filed on Dec. 21, 2001, now issued as U.S. Pat. No. 6,590,602, which is a divisional of the U.S. patent application Ser. No. 09/095,390 filed originally on Jun. 10, 1998, now issued as U.S. Pat. No. 6,339,842.

FIELD OF INVENTION

The invention relates to digital television systems, particularly to subscriber video conferencing with conventional programming.

BACKGROUND OF INVENTION

Digital television (DTV) attributes have been standardized by industry (e.g., Advanced Television Systems Committee (ATSC) and government (U.S. Federal Communications Commission (FCC)). Such DTV standards, which provide enhanced multimedia quality, as well as interactive data services, are hereby incorporated by reference. Generally, however, DTV specifications contemplate program delivery to various receiver units, but not necessarily communication between receiver units. Accordingly, there may be need for conferencing between units receiving digital system programming.

SUMMARY OF INVENTION

The invention resides in digital television system configured for subscriber conference overlay during program delivery. Billing and advertisement may be personalized according to actual program viewing and/or conferencing activity by DTV receiver. Receiver unit includes media input/output device for multi-user conferencing. Subscribers may be added or removed during programming.

BRIEF DESCRIPTION OF DRAWINGS

FIG. **1** is block diagram of integrated digital television program and data delivery system for enabling present invention.

FIG. **2** is simplified diagram of novel overlay of subscriber conferencing over program and/or data delivery.

FIG. **3** is representative digital TV subscriber unit used according to present invention.

FIG. **4** is sample digital TV display according to present invention.

FIG. **5** is flow chart of operational steps of present invention.

DETAILED DESCRIPTION

FIG. **1** is block diagram of integrated digital television program and data delivery system, including one or more

residential **12**, mobile **14** and business **16** subscriber, receiver and/or digital television (DTV) units coupled over broadcast **6** and/or network **10** channels respectively to program **2** and/or data **4** sources. Controller **8**, which is one or more processor, server, computer or other functionally equivalent controller functionality coupled to broadcast **6** and/or network **10** channel, may affect network **10** and broadcast **6** functionality as described herein.

Program source **2** comprises one or more source for broadcasting one or more video and/or data programs, or other functionally equivalent information signal stream, according to conventional digital and/or analog program broadcasting, accessible or addressable publicly or privately over various broadcast **6** equipment, medium, or other functionally equivalent channels, such as cable, optical fiber, microwave, wireless radio frequency (RF) transmission, direct broadcast satellite (DBS), multichannel multipoint distribution system (MMDS), local multipoint distribution service (LMDS), etc. For example, program **2** may comprise live sports or entertainment performance event, such as professional football game, broadcast over restricted pay-per-view television channels.

Data source **2** comprises one or more source for providing two-way or interactive access to one or more database, file, directory, or other functionally equivalent data repository site or signal source, accessible or addressable publicly or privately over conventional network **10**, such as local or wide area network, world-wide web Internet/intranet, or combination thereof, including, for example, network switch, router, bridge, gateway, hub, or other wired and/or wireless networking connection equipment for enabling ISDN, SONET, ATM, frame relay, gigabit Ethernet, TCP/IP, virtual private networks, xDSL, or other similar functionality. Additionally, data **2** may comprise text, graphics, video, or other digital or media information, such as current news update, photographic images, video or audio clips, sports statistics or analysis, stock quotes or financial data, weather forecast report, research data, commercial transaction details, product pricing, etc.

In accordance with important aspect of present invention, digital television system includes multiple receivers coupled selectively or programmably to program **2** and/or data **4** source over broadcast **6** and/or network **10** communications infrastructure, wherein conferencing or communication among DTV subscribers **18** occurs during program and/or data delivery. Consequently, controller **8** may send or transmit service bill indication to participating DTV units per actual program view or conference usage. As used herein, term "conference" or "conferencing" is interpreted broadly and understood to mean any communication between multiple parties.

Additionally, controller may facilitate electronic narrowcast delivery of personalized or customized commercial and/or non-commercial message to select DTV units. Controller **8** and/or subscribers **18** may employ one or more intelligent agents or functionally equivalent software constructs to search, obtain, or transact certain information or activity across network **10**. Controller **8** or subscriber unit **18** processor may selectively restrict or censor pre-defined program or data classes or titles, for example, to content screening criteria and/or procedure provided for so-called V-chip specifications. Preferably, each DTV receiver includes searchable and/or identifiable address and various multimedia input/output device capability for enabling video conferencing. Moreover, DTV units may be added or removed during conference period.

Accordingly, FIG. **2** shows overlay of subscriber conferencing **20** over program and/or data delivery to subscribers **18**. In this networked configuration, controller **8** effectively serves as broadband system headend processor for generating, forwarding, modifying, storing, accessing or otherwise controlling program/data delivery to subscribers **18**, while generating, forwarding, modifying, storing, accessing or otherwise controlling video conferencing signal transmission between subscribers **18**.

Preferably, such program/data signal generated, transmitted or otherwise processed to receiver units comply with established DTV standards, such as ATSC or other generally accepted industry DTV information or signal format and/or protocol interface, and video conferencing signal generated, transmitted or otherwise processed between receiver units comply with established video conferencing standards, such as H.323, H.324, H.320, T.120 or other generally accepted industry video/data conferencing information or signal format and/or protocol interface, such currently published or online-accessible standards being hereby incorporated by reference.

FIG. **3** shows digital television subscriber unit **22**, which may be implemented as one or more DTV receivers **12**, **14**, or **16** of FIG. **1**. Preferably, DTV unit **22**, which functions in compliance with Advanced Television Systems Committee (ATSC) standard for DTV equipment and system operation, substantially includes display panel or screen with video frame buffer **24**, digital video-conferencing camera or image sensor **26**, microphone **28**, keyboard and/or mouse **30**, speaker(s) **32**, processor or controller **34**, digital memory or recordable video disk storage **36**, peripheral card reader **38**, remote control infrared interface **40**, network interface or modem **42** (e.g., for coupling to network channel **10**), digital compressed video encoder/decoder (i.e., according to Moving Pictures Experts Group (MPEG) industry standards)), radio frequency (RF), broadband or wireless communications interface **46** (e.g., for coupling to broadcast channel **6**), and operating system, BIOS, browser, or other associated kernel software **48** for generally enabling system and controller **34** operation and network communications.

It is contemplated that ATSC-compliant DTV unit **22** may be embodied as well in personal or network computer, workstation, set-top television device, or functionally equivalent processing and associated network equipment, as configured to operate as specified herein according to present invention.

Moreover, controllers **8**, **34** execute one or more computer programs for performing functions as described herein, preferably according to embedded or real-time software syntax, such as JAVA and/or Windows CE, which currently published or on-line specifications are hereby incorporated by reference.

When DTV unit **22** operates according to present invention, sample display **24** screen output may be as represented in FIG. **4**. In particular, display **24** may integrate, combine, mix, or otherwise include program **52** and/or data **54**, effectively through video frame buffer, with video conferencing windows from current (i.e., self) and/or other DTV participants **56** coupled thereto, preferably during program/data delivery. For example, each screen element **52**, **54**, **56** may be shown as picture within or adjacent to another picture element. In this overlaid manner, each DTV unit in select set displays common program and/or data stream, as well as conference video and audio signal output as generated from video camera and microphone from other participant DTV units.

Preferably, such program and/or video signals are compressed and encoded according to industry standard such as MPEG format. Display **50** may also show whiteboard-type screen commonly among participants **56** for jointly communicating text, graphics, or other observable or audible program or data, such as for workgroup or class collaboration to review or discuss draft documents, faxes, or other forms or files.

FIG. **5** shows operational flow chart, including steps for system configuration and subscription set-up **60**, program and/or data delivery **62**, participant conference **64**, and controller billing **66**. Preferably, controller **8**, serves as central processor to coordinate DTV unit set-up, user smart-card account authorization or identity authentication program/data and/or conference scheduling, programming, viewing, output formatting, conference access and communication, billing, advertising, and other associated activity, particularly for managing access to program **2**, data **4**, as well as DTV video conferencing signals **20**. To reduce latency, controller **8** may transmit static image instead of live video.

For example, controller **8** may authorize or cause certain DTV units to be added or removed dynamically from one or more video conferencing active set or selected logical group, as well as restrict select DTV unit(s) from viewing certain program and/or data. Moreover, controller **8** monitors one or more actual program/data viewing and/or conferencing usage for appropriate billing. Furthermore, controller **8** may direct personalized or targeted commercial, incentive, or advertising messages to certain recognized demographic interest group, DTV subscribers or participant video conferencing parties.

Preferably, controller **8** directs such messages dynamically or adaptively according to current subscriber or participant information activity or needs, as well as product availability, market pricing, or other commercial attribute. Additionally, controller **8** may take corrective action or functional adjustment to redirect, restrict, control, or otherwise manage network, program/data, or other system resources, upon detecting actual or possible performance bottlenecks or other equipment or connection fault causing undesirable impact on such information delivery.

In one embodiment of present invention, DTV system is configured for luxury-suite type or other effectively exclusive membership multi-user conferenced viewing of live sports event, such that professional football, basketball, baseball, hockey, soccer, or other competitive individual, team, or tournament telecast is provided as program **2** through broadcast channel **6**, including preferably statistical or background data **4** about player, team, or other related game aspect. In particular, controller **8** provides proper access by authorized DTV subscribers **18** to such sports program and/or data. Additionally, controller **8** coordinates or monitors video conferencing activity occurring directly or indirectly between DTV units watching common program/data stream.

Hence, for example, initially, during configuration subscription setup phase **60**, system or headend controller **8** begins to identify system configuration, network address, program order and account status of any subscriber units coupled thereto over broadcast **6** and/or network **10** channels. Commercial transaction may occur to define DTV receiver unit user subscriptions, particularly for authenticating, billing, scheduling, notifying, requesting or otherwise providing desired access to any upcoming or current program **2** or database **4**. As appropriate, controller **8** may conduct remote diagnostics over such channels to various units **12**, **14**, **16** to ensure proper functioning for signal delivery.

Next, program and/or data delivery may commence according to controller **8** programmable selection to enable digital transmission for electronic signal delivery **62** of cer-

tain program **2** and/or data **4** for presentation in integrated display **50** of selected or addressed DTV subscriber units **18**. Then, thereafter, prior, or simultaneously, select participants **56** are enabled for video conferencing **20**, particularly by allowing such participants to be monitored by activated video camera **26** and/or microphone **28**, for transmission of monitored static image or live motion video compressed encoded digital signal for presentation in display screen **50**. Upon completion of program/data delivery and conferencing activity, controller **8** may send proper billing indications to participant DTV units. Controller **8** may appropriately add or delete subscriber **18** in active database.

Therefore, in this combined DTV program/data viewing and select viewer conferencing scheme, important objective of emulating luxury-suite or otherwise more collaborative, intimate or personal conditions among associated audience members located at different locations is achieved effectively.

Optionally, while receiving program/data, conferenced subscriber may also send or receive electronic text message to other subscribers or other mail account addressable through network **10**, or run various application programs locally or in distributed client-server networked manner, preferably in common with other conferenced DTV units, such as for multi-user simulation or gaming application.

To improve system program/data broadcast or video conferencing performance, for example, when restricted effectively by channel bandwidth or traffic congestion, controllers **8, 34** may reduce or eliminate actual transmission of full content video signal, and preferably transmit information subset, such as static image, text and/or voice.

Foregoing described embodiments of invention are provided as illustration and description. It is not intended to limit invention to precise form described. Other variations and embodiments are possible in light of above teaching, and it is thus intended that scope of invention not be limited by detailed description, but rather by claims as follow.

We claim:

1. Integrated digital television program and multi-user simulation data delivery system for residential, mobile and business subscribers, the system comprising:

a broadcast server coupled to a program source;

a network server coupled to a multi-user simulation data source; and

a broadband system headend processor or controller coupled to the broadcast server and the network server, the headend processor or controller integrating digital television broadcast program and multi-user simulation network data services with overlaid conferencing among a plurality of residential, mobile and business digital television subscriber units;

wherein the headend processor or controller integrates broadband broadcast and multi-user simulation data services comprising a digital television program stream from the program source and a multi-user simulation network data stream from the multi-user simulation data source to enable search-based transaction using an integrated display comprising a DTV screen coupled to an intelligent software agent that enables network search of digital television broadcast program and multi-user simulation network data services, whereby the search-based transaction is restricted selectively according to a network address authorized with one or more transacting subscriber unit, wherein one or more authorized transacting subscriber unit accesses one or more multi-user simulation application effectively in common with one or more other authorized transacting subscriber unit before, during or after authorized transacting subscriber unit conferencing service is overlaid effectively to create authorized transacting subscriber unit audience community collaborating virtually via different authorized transacting subscriber unit locations, but each such authorized transacting one or more subscriber unit displays on its DTV screen respectively one or more picture element associated exclusively with various related aspects of running by such displaying subscriber unit such one or more multi-user simulation application in a collaboratively exclusive client-server network manner, such that each authorized one or more transacting subscriber unit is enabled individually to transact subscriber unit conferencing and multi-user simulation activity variously with other transacting subscriber units authorized in common effectively to collaborate by accessing one or more multi-user simulation applications accessible across the distributed client-server network, but enabling each authorized one or more transacting subscriber unit to display exclusively various related aspects of running such one or more multi-user simulation application effectively in common before, during or after authorized transacting subscriber unit conferencing with other such authorized transacting one or more subscriber unit.

2. System of claim **1** wherein the headend processor or controller generates, forwards, modifies, stores, accesses and controls the digital television program or data.

3. System of claim **1** wherein each residential, mobile and business digital television subscriber unit comprises a display panel or frame buffer, a digital video camera or image sensor, a microphone, a keyboard or speaker, a processor, a digital memory or recordable video storage, a network interface, a digital compressed video encoder/decoder, an RF wireless communication interface, and a BIOS or kernel software.

4. System of claim **1** wherein the headend processor or controller centrally coordinates subscriber unit user account authorization or authentication, program or data service scheduling, programming, formatting, billing and advertising.

5. System of claim **1** wherein the headend processor or controller electronically delivers narrowcast personal or custom commercial incentive or non-commercial message dynamically or adaptively to one or more subscriber unit according to subscriber unit user activity, need, demography or interest, or product availability and market pricing.

6. Integrated digital television program and multi-user simulation data delivery method for residential, mobile and business subscribers, the method comprising steps:

coupling a broadcast server coupled to a program source;

coupling a network server coupled to a multi-user simulation data source; and

coupling a broadband system headend processor or controller to the broadcast server and the network server, the headend processor or controller integrating digital television broadcast program and multi-user simulation network data services with overlaid conferencing among a plurality of residential, mobile and business digital television subscriber units;

wherein the headend processor or controller integrates broadband broadcast and multi-user simulation data services comprising a digital television program stream from the program source and a multi-user simulation network data stream from the multi-user simulation data source to enable search-based transaction using an integrated display comprising a DTV screen coupled to an intelligent software agent that enables network search of digital television broadcast program and multi-user

simulation network data services, whereby the searched-based transaction is restricted selectively according to a network address authorized with one or more transacting subscriber unit, wherein one or more authorized transacting subscriber unit accesses one or more multi-user simulation application effectively in common with one or more other authorized transacting subscriber unit before, during or after authorized transacting subscriber unit conferencing service is overlaid effectively to create authorized transacting subscriber unit audience community collaborating virtually via different authorized transacting subscriber unit locations, but each such authorized transacting one or more subscriber unit displays on its DTV screen respectively one or more picture element associated exclusively with various related aspects of running by such displaying subscriber unit such one or more multi-user simulation application in a collaboratively exclusive client-server network manner, such that each authorized one or more transacting subscriber unit is enabled individually to transact subscriber unit conferencing and multi-user simulation activity variously with other transacting subscriber units authorized in common effectively to collaborate by accessing one or more multi-user simulation applications accessible across the distributed client-server network, but enabling each authorized one or more transacting subscriber unit to display exclusively various related aspects of running such one or more multi-user simulation application effectively in common before, during or after authorized transacting subscriber unit conferencing with other such authorized transacting one or more subscriber unit.

7. Method of claim 6 wherein the headend processor or controller generates, forwards, modifies, stores, accesses and controls the digital television program or data.

8. Method of claim 6 wherein each residential, mobile and business digital television subscriber unit comprises a display panel or frame buffer, a digital video camera or image sensor, a microphone, a keyboard or speaker, a processor, a digital memory or recordable video storage, a network interface, a digital compressed video encoder/decoder, an RF wireless communication interface, and a BIOS or kernel software.

9. Method of claim 6 wherein the headend processor or controller centrally coordinates subscriber unit user account authorization or authentication, program or data service scheduling, programming, formatting, billing and advertising.

10. Method of claim 6 wherein the headend processor or controller electronically delivers narrowcast personal or custom commercial incentive or non-commercial message dynamically or adaptively to one or more subscriber unit according to subscriber unit user activity, need, demography or interest, or product availability and market pricing.

11. Subscriber unit comprising:

at least one subscriber unit processor or controller running network communications kernel software that integrates collaboratively exclusive subscriber access to video-conferencing service, broadband broadcast service comprising a digital television program from a program source, and multi-user simulation data service comprising multi-user simulation network data from a multi-user simulation data source;

wherein the at least one subscriber unit processor or controller enables subscriber search-based transaction whereby the network communications kernel software enables local or network search of video-conferencing, digital television broadcast program or multi-user simulation network data service, such that the search-based transaction is accessed or restricted collaboratively or exclusively according to one or more network address authorizing or restricting one or more transacting subscriber unit video-conferencing, digital television broadcast program, or multi-user simulation network data service,

wherein one or more authorized transacting subscriber unit accesses one or more multi-user simulation application collaboratively within a logical group or active set including one or more other authorized transacting subscriber unit before, during or after authorized transacting subscriber unit video conferencing service effectively to create virtual subscriber community via authorized transacting subscriber unit network addresses, but one or more such authorized transacting subscriber unit still being enabled exclusively to generate one or more graphical element associated variously with related or personalized aspects of running such one or more multi-user simulation application by the exclusively authorized transacting subscriber unit,

accordingly the network communications kernel software thereby integrating service access in a collaborative yet exclusive manner whereby authorized subscriber units transact video conferencing and multi-user simulation activity collaboratively, but each transacting subscriber unit processor or controller runs related or personalized aspects of multi-user simulation applications exclusively.

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