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Meade, II

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(54) **SYSTEM AND METHOD FOR A MOBILE COMPUTING DEVICE TO CONTROL APPLIANCES**

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H04B 1/18 (2006.01)

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(58) **Field of Classification Search** 455/151.1, 455/151.2, 352, 353, 3.03, 418, 419, 41.2
See application file for complete search history.

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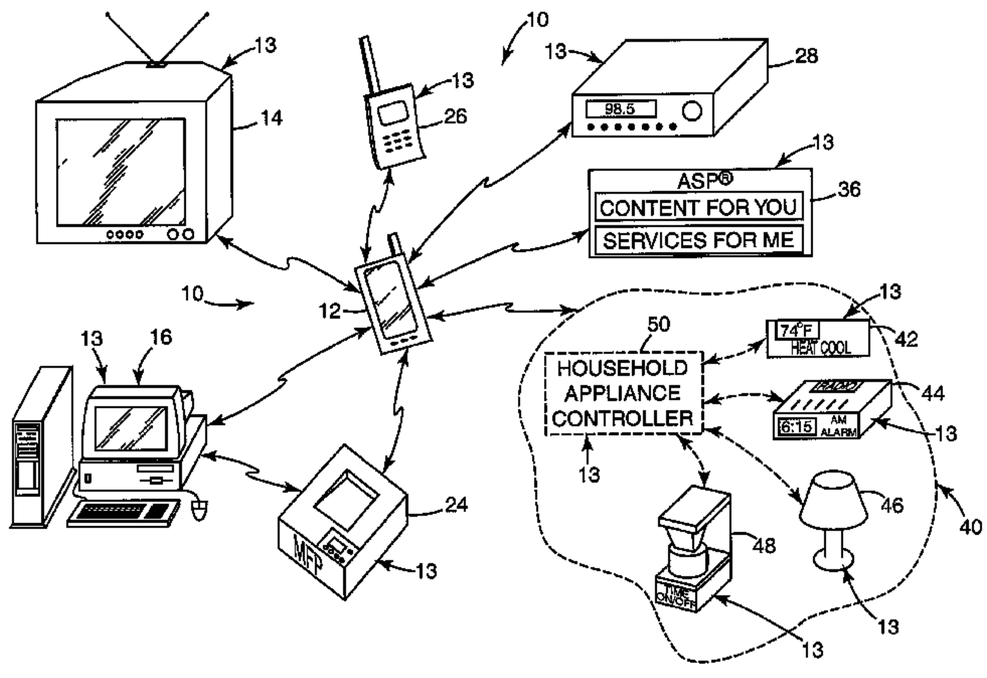
Primary Examiner—Matthew Anderson
Assistant Examiner—Minh Dao

(57) **ABSTRACT**

An appliance control system of the present invention comprises an appliance and a mobile computing device configured for controlling the appliance by at least one of determining an available content for the appliance, selecting the content used by the appliance, and applying user preferences to the appliance.

A method of controlling an appliance of the present invention comprises establishing a wireless communication link between an appliance and a mobile computing device, and controlling the appliance with the mobile computing device includes at least one of determining an available content for the appliance, selecting the content used by the appliance, and applying user preferences to the appliance.

1 Claim, 13 Drawing Sheets



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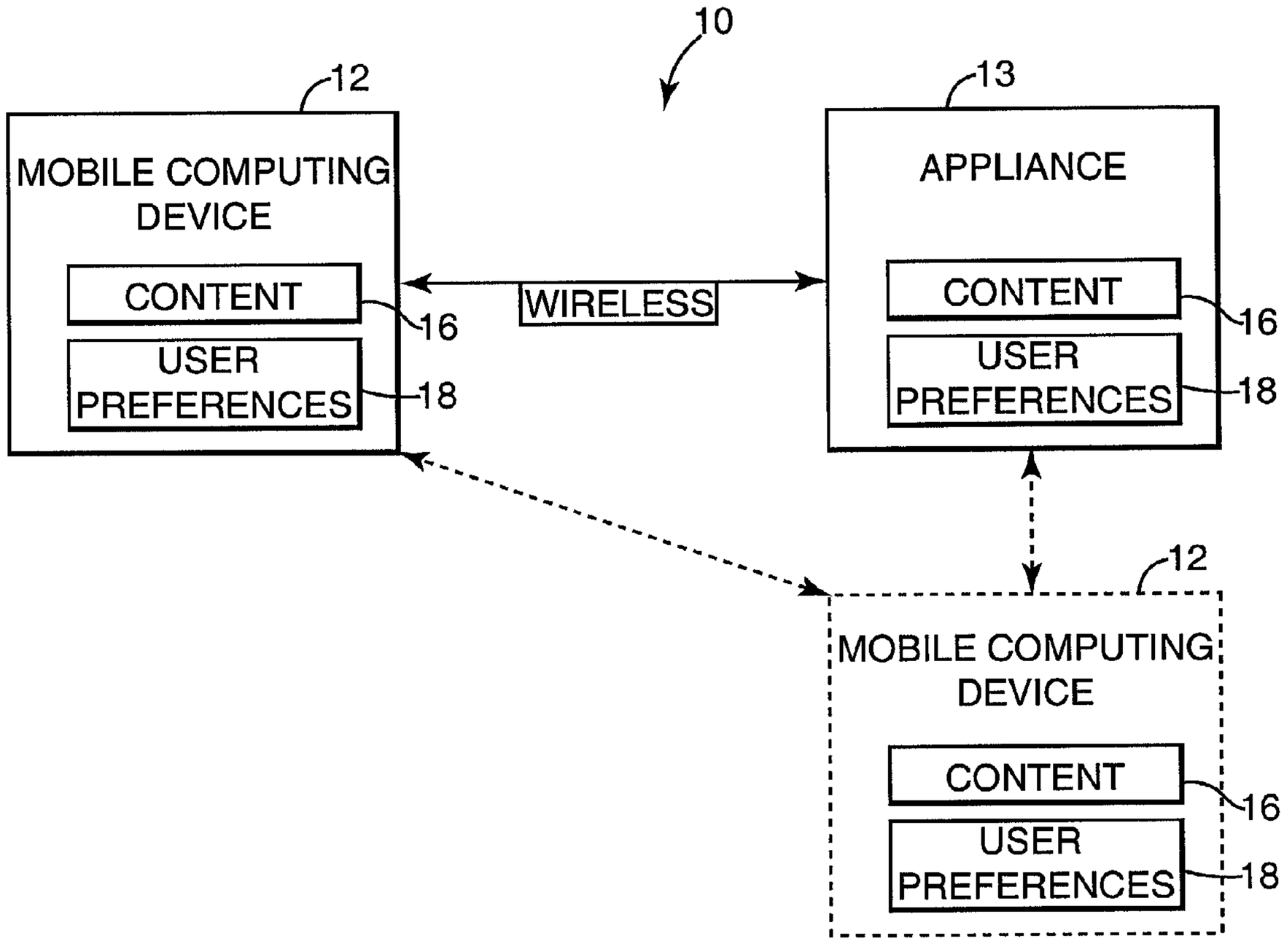

10
12
MOBILE COMPUTING DEVICE
CONTENT
16
USER PREFERENCES
18
WIRELESS
13
APPLIANCE
CONTENT
16
USER PREFERENCES
18
12
MOBILE COMPUTING DEVICE
CONTENT
16
USER PREFERENCES
18

Fig. 1

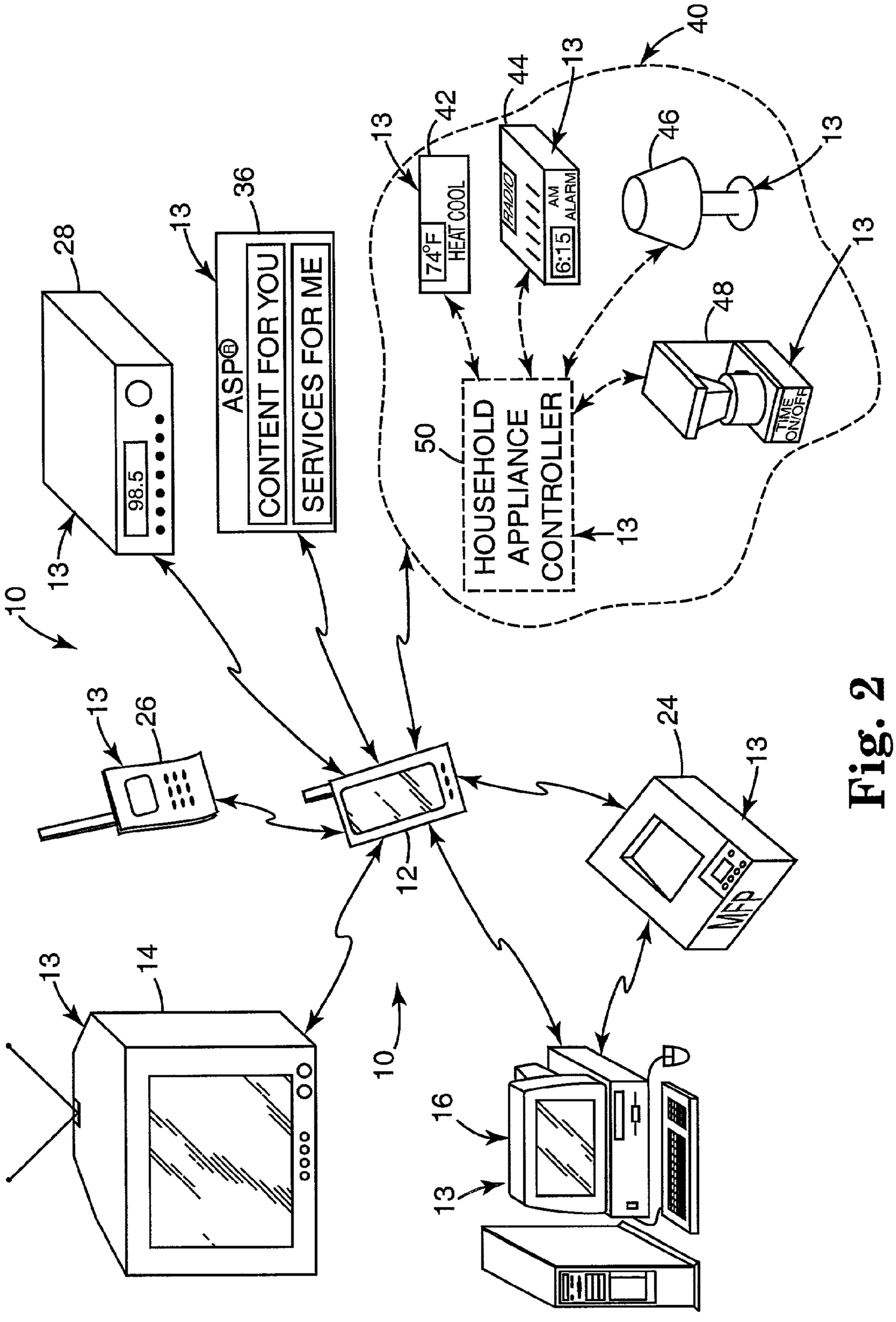

40
13
44
42
46
48
74°F HEAT COOL
RADIO AM ALARM 6:15
TIME ON/OFF
HOUSEHOLD APPLIANCE CONTROLLER
50
36
ASP®
CONTENT FOR YOU
SERVICES FOR ME
28
98.5
10
26
24
MFR
12
14
16

Fig. 2

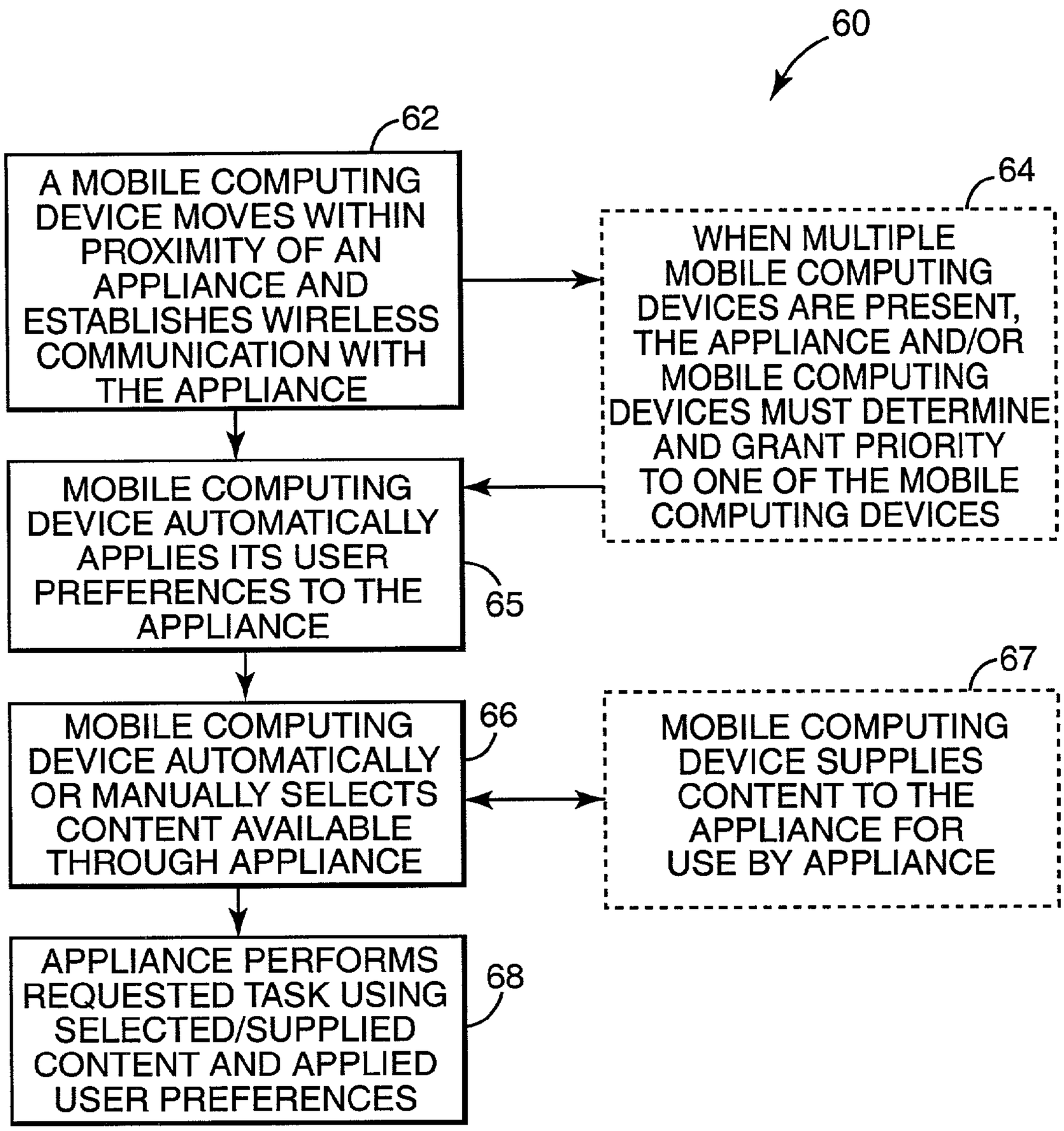

60
62
A MOBILE COMPUTING DEVICE MOVES WITHIN PROXIMITY OF AN APPLIANCE AND ESTABLISHES WIRELESS COMMUNICATION WITH THE APPLIANCE
64
WHEN MULTIPLE MOBILE COMPUTING DEVICES ARE PRESENT, THE APPLIANCE AND/OR MOBILE COMPUTING DEVICES MUST DETERMINE AND GRANT PRIORITY TO ONE OF THE MOBILE COMPUTING DEVICES
MOBILE COMPUTING DEVICE AUTOMATICALLY APPLIES ITS USER PREFERENCES TO THE APPLIANCE
65
67
MOBILE COMPUTING DEVICE AUTOMATICALLY OR MANUALLY SELECTS CONTENT AVAILABLE THROUGH APPLIANCE
66
MOBILE COMPUTING DEVICE SUPPLIES CONTENT TO THE APPLIANCE FOR USE BY APPLIANCE
APPLIANCE PERFORMS REQUESTED TASK USING SELECTED/SUPPLIED CONTENT AND APPLIED USER PREFERENCES
68

Fig. 3

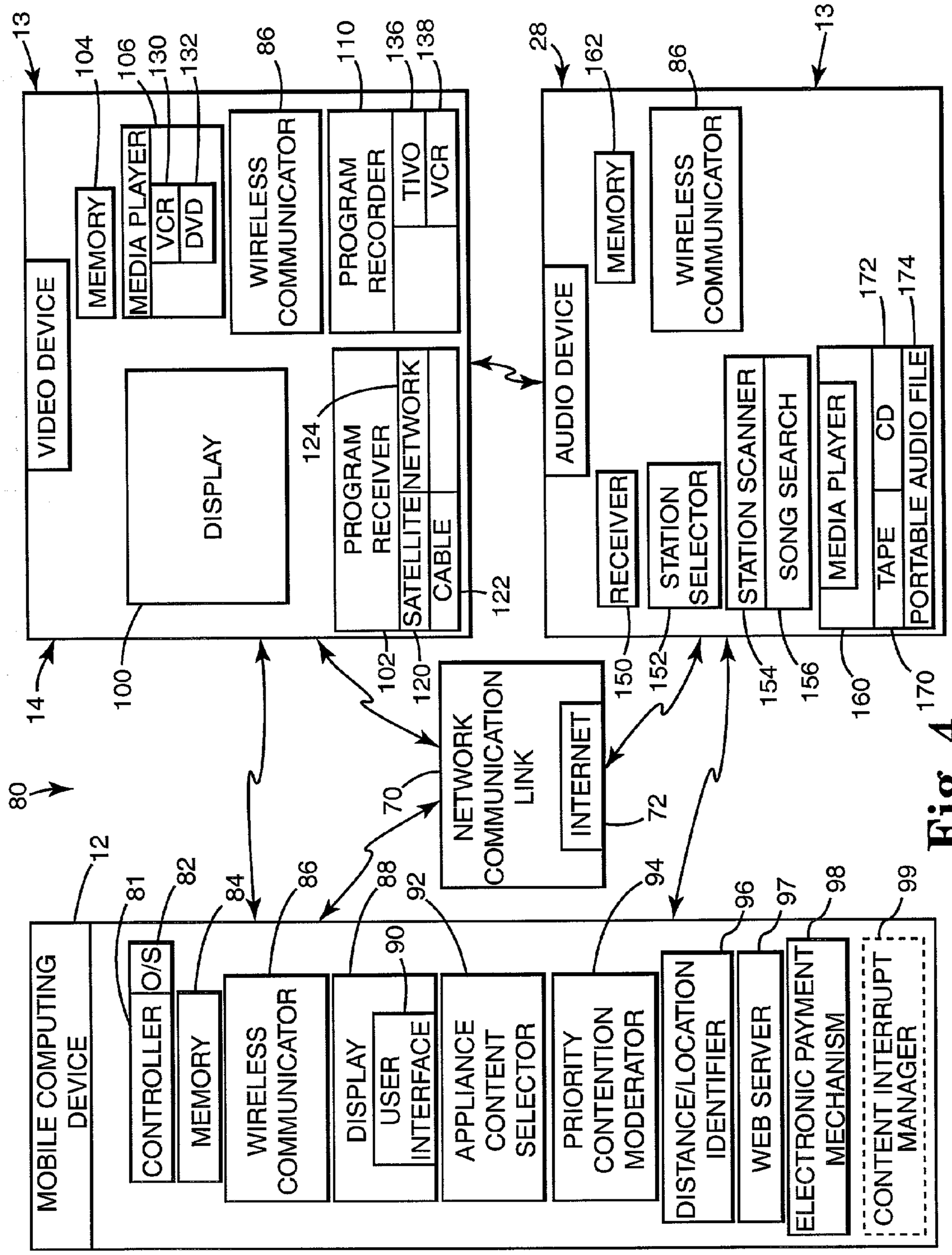

MOBILE COMPUTING DEVICE
12
CONTROLLER
O/S
81
MEMORY
82
84
WIRELESS COMMUNICATOR
86
DISPLAY
USER INTERFACE
88
90
APPLIANCE CONTENT SELECTOR
92
PRIORITY CONTENTION MODERATOR
94
DISTANCE/LOCATION IDENTIFIER
96
WEB SERVER
97
ELECTRONIC PAYMENT MECHANISM
98
CONTENT INTERRUPT MANAGER
99
80
NETWORK COMMUNICATION LINK
70
INTERNET
72
14
VIDEO DEVICE
100
DISPLAY
MEMORY
104
MEDIA PLAYER
106
VCR
130
DVD
132
WIRELESS COMMUNICATOR
86
PROGRAM RECORDER
110
TIVO
136
VCR
138
PROGRAM RECEIVER
124
SATELLITE
NETWORK
CABLE
122
102
120
28
AUDIO DEVICE
MEMORY
162
WIRELESS COMMUNICATOR
86
13
172
174
RECEIVER
150
STATION SELECTOR
152
STATION SCANNER
154
SONG SEARCH
156
MEDIA PLAYER
160
CD
TAPE
PORTABLE AUDIO FILE
170

Fig. 4

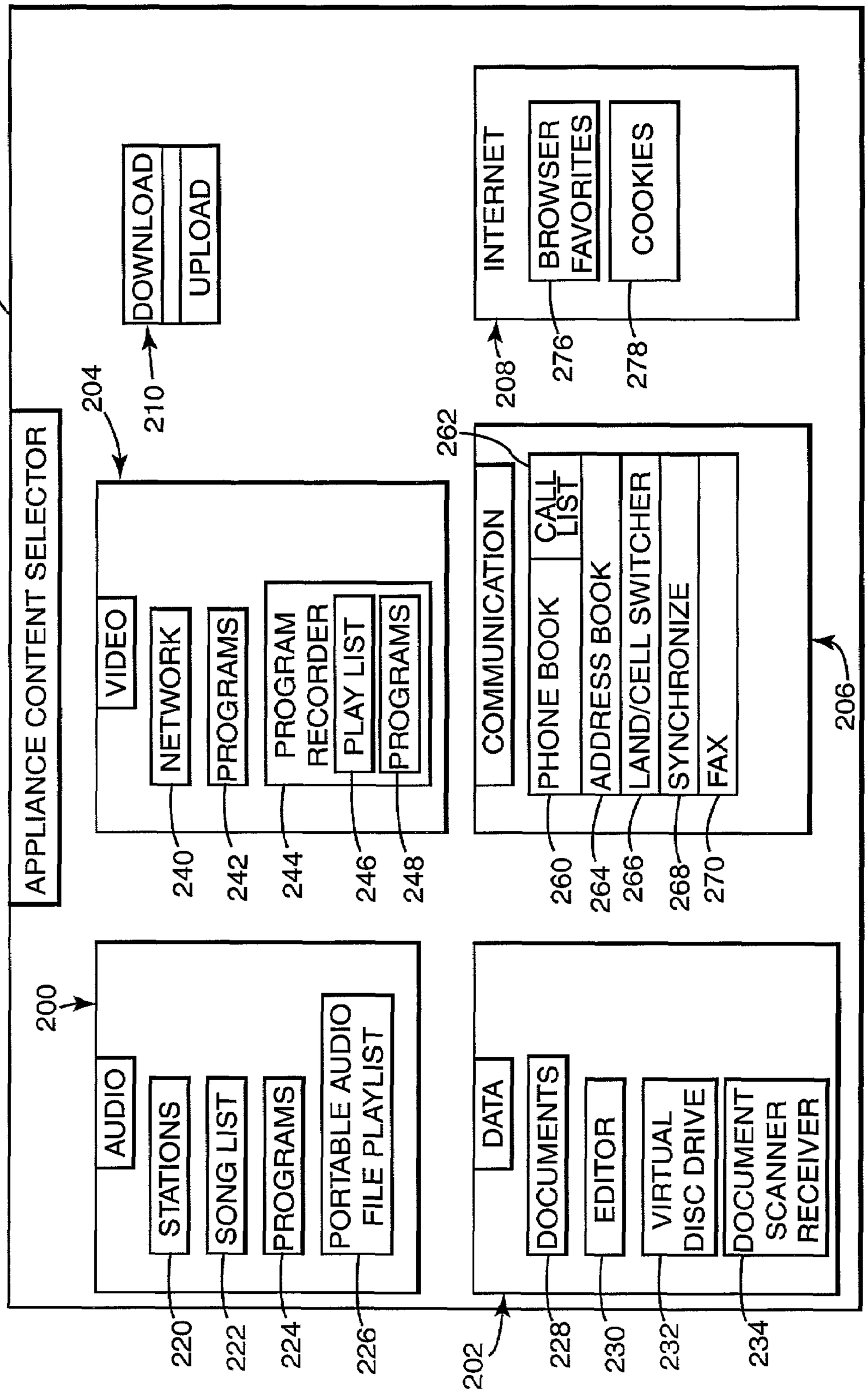

APPLIANCE CONTENT SELECTOR
92
DOWNLOAD
UPLOAD
210
INTERNET
BROWSER FAVORITES
COOKIES
208
276
278
204
VIDEO
NETWORK
PROGRAMS
PROGRAM RECORDER
PLAY LIST
PROGRAMS
240
242
244
246
248
262
COMMUNICATION
PHONE BOOK
CALL LIST
ADDRESS BOOK
LAND/CELL SWITCHER
SYNCHRONIZE
FAX
260
264
266
268
270
206
200
AUDIO
STATIONS
SONG LIST
PROGRAMS
PORTABLE AUDIO FILE PLAYLIST
220
222
224
226
DATA
DOCUMENTS
EDITOR
VIRTUAL DISC DRIVE
DOCUMENT SCANNER RECEIVER
228
230
232
234
202

Fig. 5

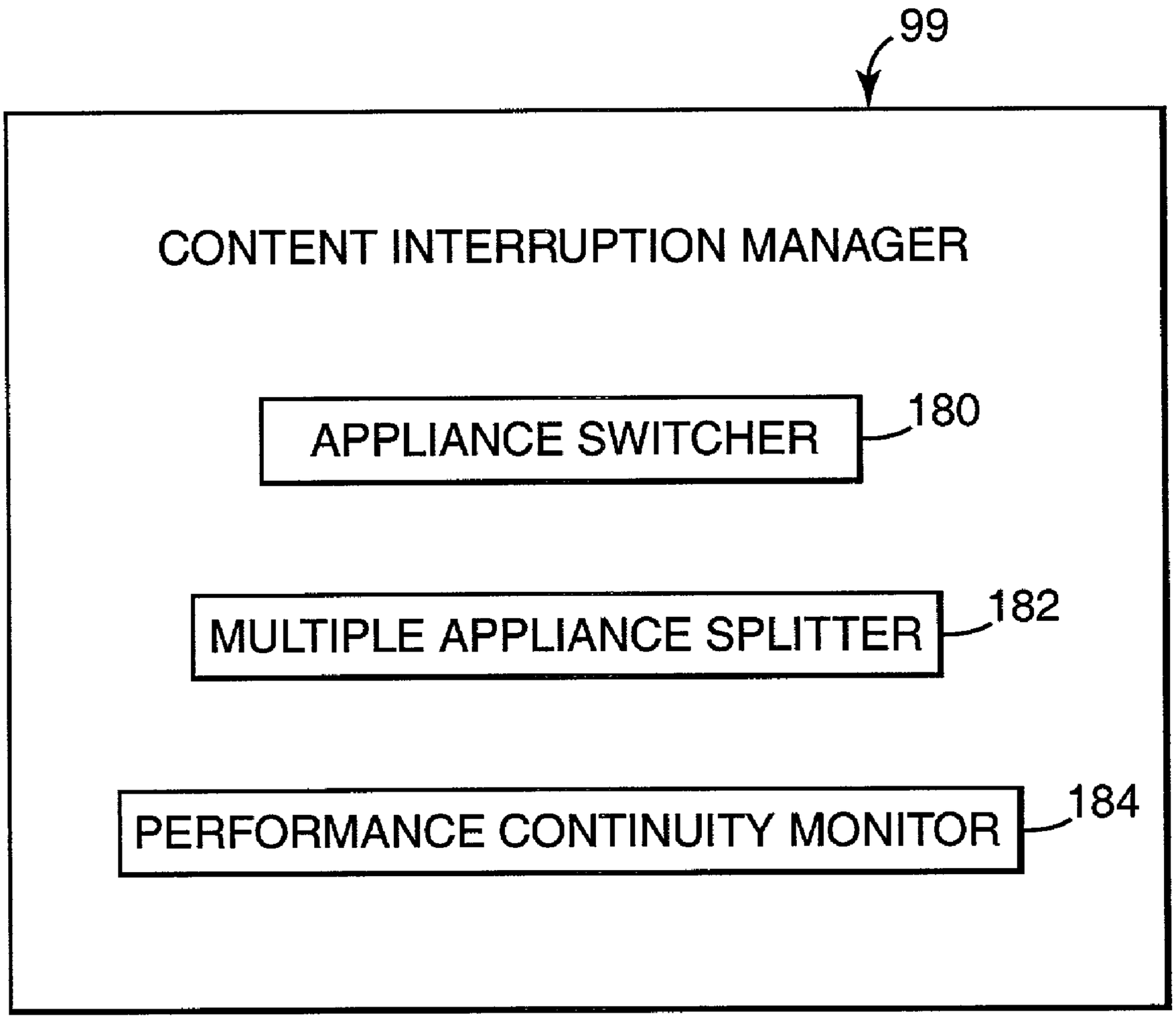

99
CONTENT INTERRUPTION MANAGER
APPLIANCE SWITCHER
180
MULTIPLE APPLIANCE SPLITTER
182
PERFORMANCE CONTINUITY MONITOR
184

Fig. 6

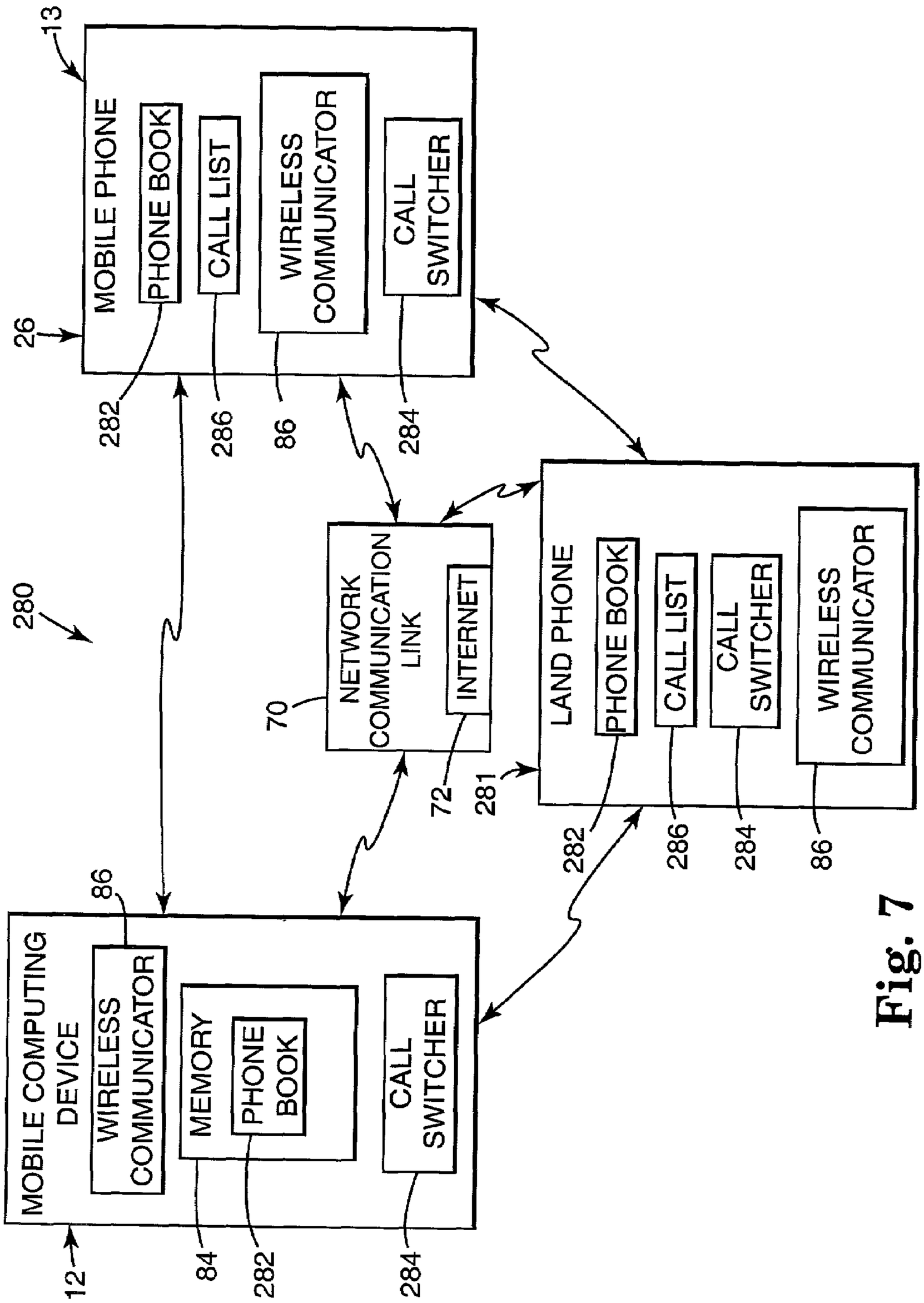

13
MOBILE PHONE
PHONE BOOK
CALL LIST
WIRELESS COMMUNICATOR
CALL SWITCHER
26
282
286
86
284
280
NETWORK COMMUNICATION LINK
INTERNET
70
72
281
LAND PHONE
PHONE BOOK
CALL LIST
CALL SWITCHER
WIRELESS COMMUNICATOR
282
286
284
86
86
MOBILE COMPUTING DEVICE
WIRELESS COMMUNICATOR
MEMORY
PHONE BOOK
CALL SWITCHER
12
84
282
284

Fig. 7

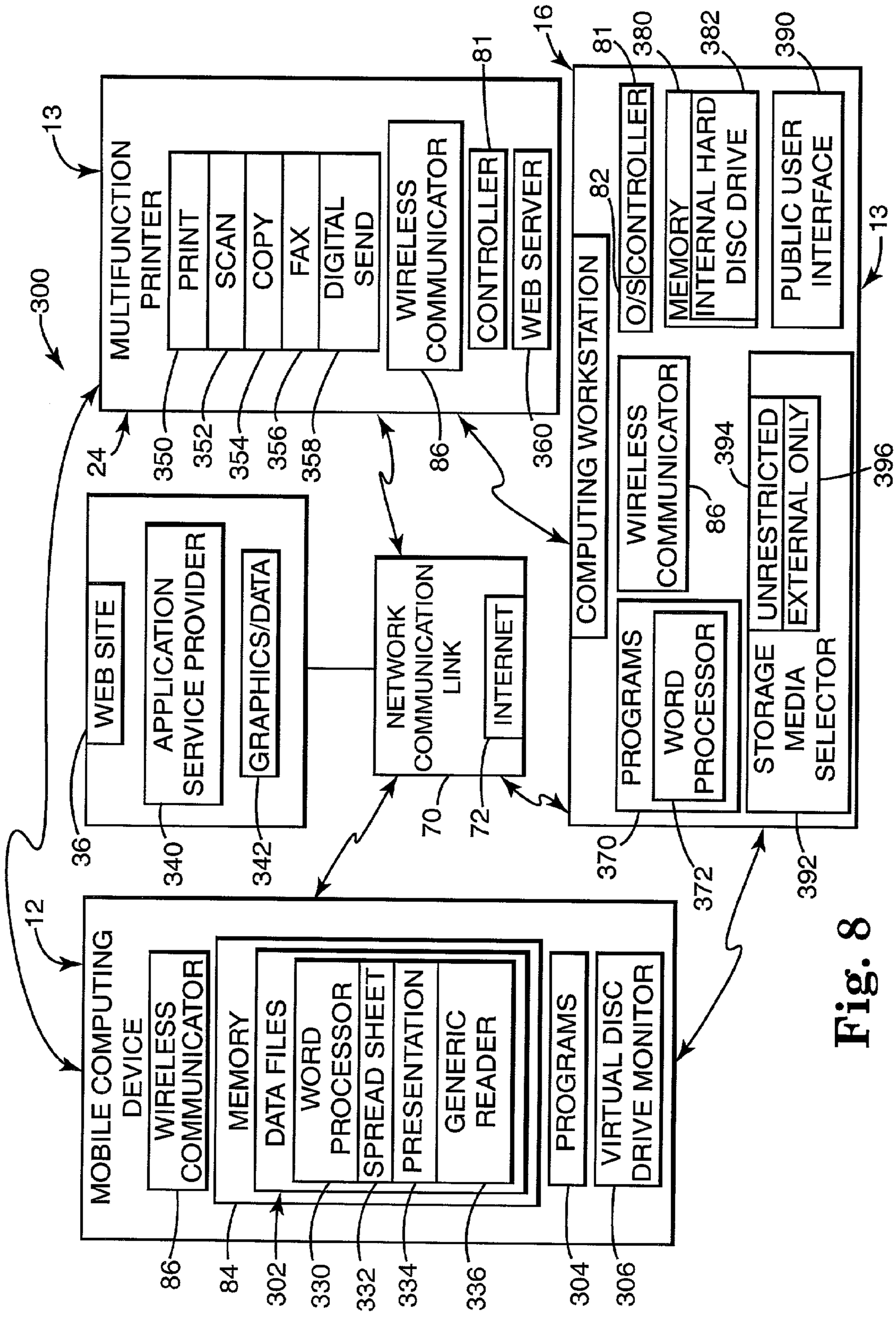

300
MULTIFUNCTION PRINTER
13
PRINT
SCAN
COPY
FAX
DIGITAL SEND
WIRELESS COMMUNICATOR
CONTROLLER
WEB SERVER
81
16
24
350
352
354
356
358
86
360
WEB SITE
APPLICATION SERVICE PROVIDER
GRAPHICS/DATA
36
340
342
NETWORK COMMUNICATION LINK
INTERNET
70
72
COMPUTING WORKSTATION
82
O/S
CONTROLLER
81
380
MEMORY
INTERNAL HARD DISC DRIVE
382
PUBLIC USER INTERFACE
390
13
WIRELESS COMMUNICATOR
86
394
PROGRAMS
WORD PROCESSOR
370
372
STORAGE MEDIA SELECTOR
UNRESTRICTED
EXTERNAL ONLY
392
396
12
MOBILE COMPUTING DEVICE
WIRELESS COMMUNICATOR
MEMORY
DATA FILES
WORD PROCESSOR
SPREAD SHEET
PRESENTATION
GENERIC READER
PROGRAMS
VIRTUAL DISC DRIVE MONITOR
86
84
302
330
332
334
336
304
306

Fig. 8

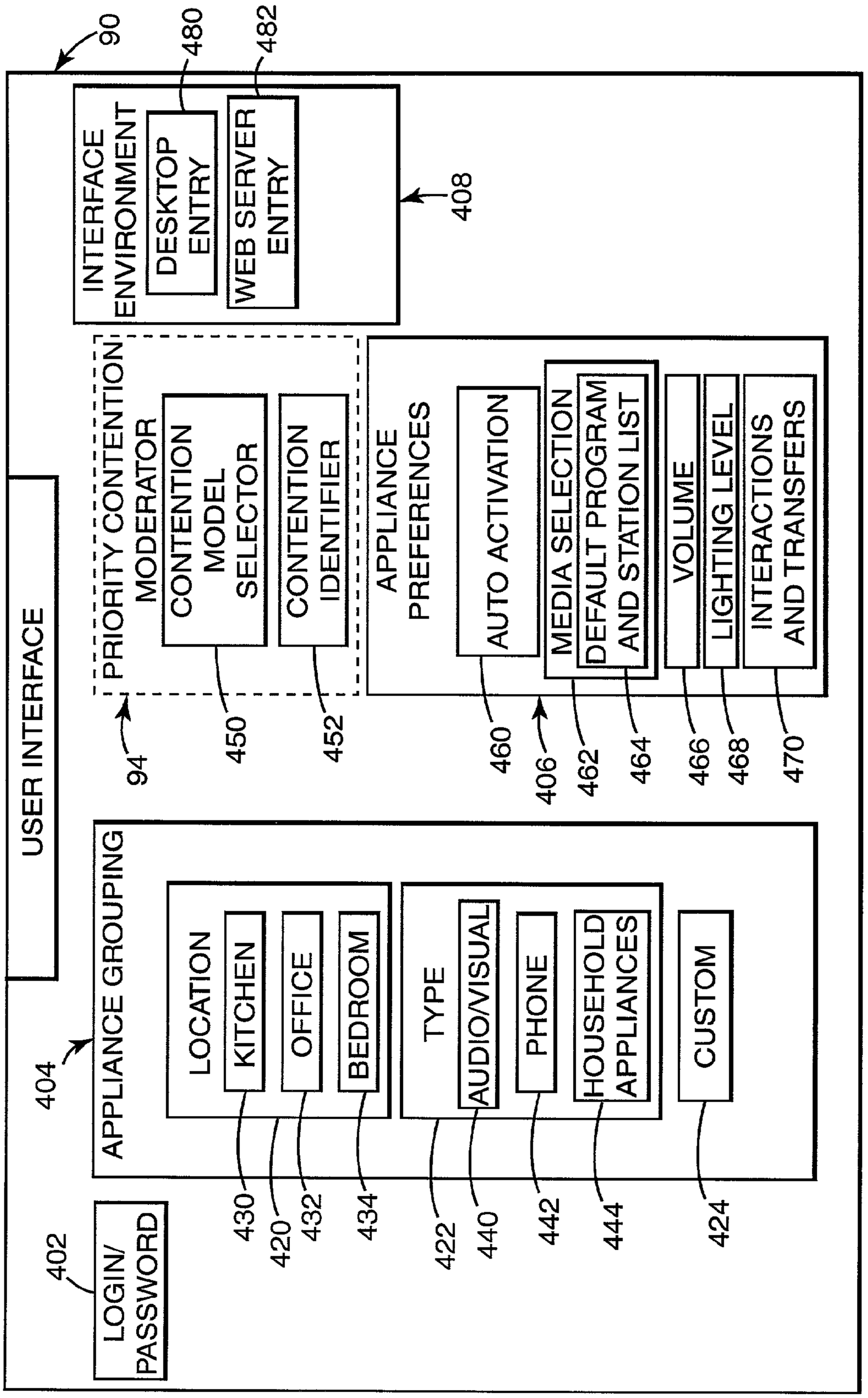

90
480
482
INTERFACE ENVIRONMENT
DESKTOP ENTRY
WEB SERVER ENTRY
408
USER INTERFACE
PRIORITY CONTENTION MODERATOR
CONTENTION MODEL SELECTOR
CONTENTION IDENTIFIER
94
450
452
APPLIANCE PREFERENCES
AUTO ACTIVATION
MEDIA SELECTION
DEFAULT PROGRAM AND STATION LIST
VOLUME
LIGHTING LEVEL
INTERACTIONS AND TRANSFERS
460
406
462
464
466
468
470
APPLIANCE GROUPING
404
LOCATION
KITCHEN
OFFICE
BEDROOM
TYPE
AUDIO/VISUAL
PHONE
HOUSEHOLD APPLIANCES
CUSTOM
430
420
432
434
422
440
442
444
424
LOGIN/ PASSWORD
402

Fig. 9

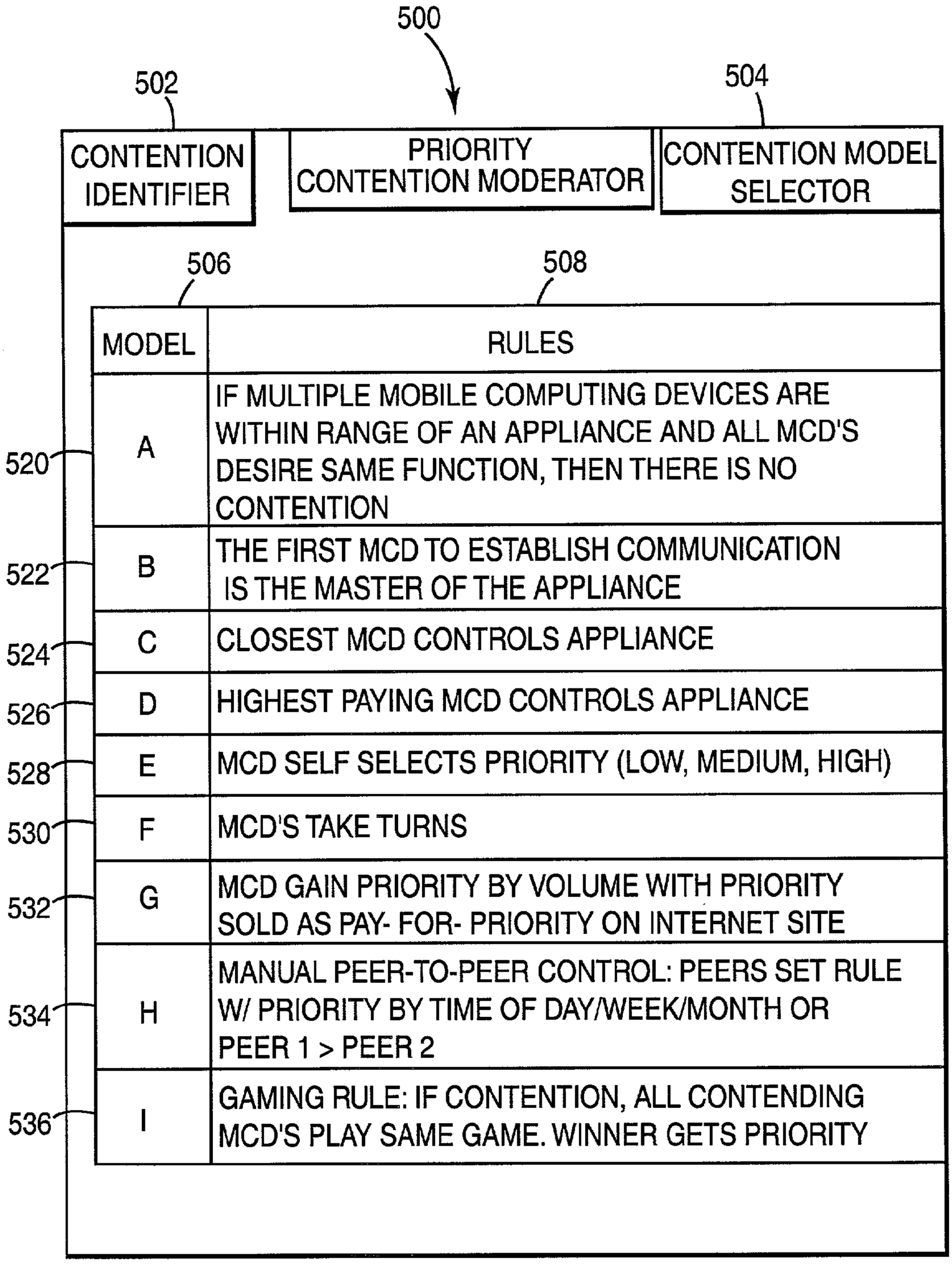

500
502
504
CONTENTION IDENTIFIER
PRIORITY CONTENTION MODERATOR
CONTENTION MODEL SELECTOR
506
508
MODEL
RULES
520
A
IF MULTIPLE MOBILE COMPUTING DEVICES ARE WITHIN RANGE OF AN APPLIANCE AND ALL MCD'S DESIRE SAME FUNCTION, THEN THERE IS NO CONTENTION
522
B
THE FIRST MCD TO ESTABLISH COMMUNICATION IS THE MASTER OF THE APPLIANCE
524
C
CLOSEST MCD CONTROLS APPLIANCE
526
D
HIGHEST PAYING MCD CONTROLS APPLIANCE
528
E
MCD SELF SELECTS PRIORITY (LOW, MEDIUM, HIGH)
530
F
MCD'S TAKE TURNS
532
G
MCD GAIN PRIORITY BY VOLUME WITH PRIORITY SOLD AS PAY- FOR- PRIORITY ON INTERNET SITE
534
H
MANUAL PEER-TO-PEER CONTROL: PEERS SET RULE W/ PRIORITY BY TIME OF DAY/WEEK/MONTH OR PEER 1 > PEER 2
536
I
GAMING RULE: IF CONTENTION, ALL CONTENDING MCD'S PLAY SAME GAME. WINNER GETS PRIORITY

Fig. 10

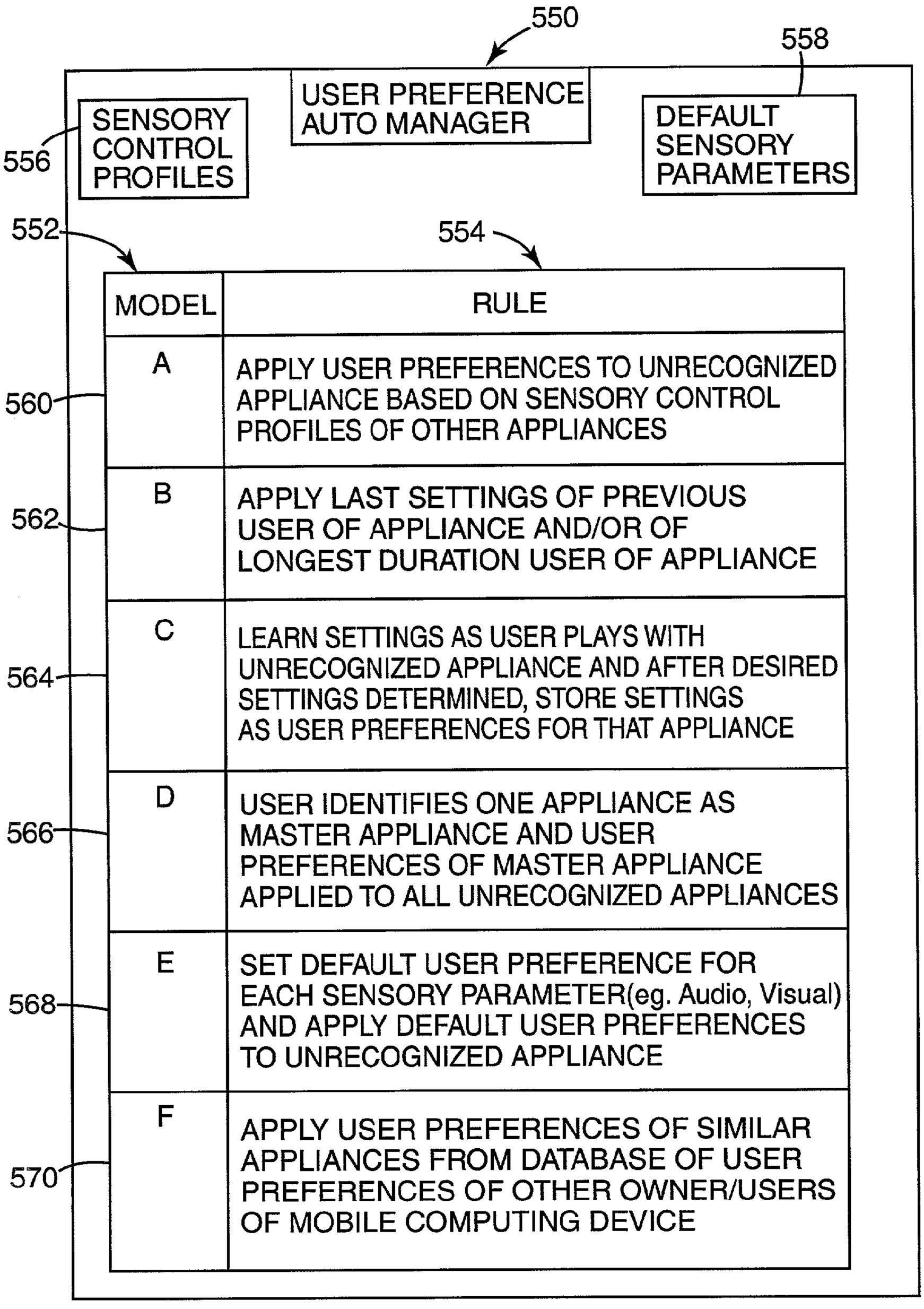

550
558
USER PREFERENCE AUTO MANAGER
DEFAULT SENSORY PARAMETERS
556
SENSORY CONTROL PROFILES
552
554
MODEL
RULE
560
A
APPLY USER PREFERENCES TO UNRECOGNIZED APPLIANCE BASED ON SENSORY CONTROL PROFILES OF OTHER APPLIANCES
562
B
APPLY LAST SETTINGS OF PREVIOUS USER OF APPLIANCE AND/OR OF LONGEST DURATION USER OF APPLIANCE
564
C
LEARN SETTINGS AS USER PLAYS WITH UNRECOGNIZED APPLIANCE AND AFTER DESIRED SETTINGS DETERMINED, STORE SETTINGS AS USER PREFERENCES FOR THAT APPLIANCE
566
D
USER IDENTIFIES ONE APPLIANCE AS MASTER APPLIANCE AND USER PREFERENCES OF MASTER APPLIANCE APPLIED TO ALL UNRECOGNIZED APPLIANCES
568
E
SET DEFAULT USER PREFERENCE FOR EACH SENSORY PARAMETER(eg. Audio, Visual) AND APPLY DEFAULT USER PREFERENCES TO UNRECOGNIZED APPLIANCE
570
F
APPLY USER PREFERENCES OF SIMILAR APPLIANCES FROM DATABASE OF USER PREFERENCES OF OTHER OWNER/USERS OF MOBILE COMPUTING DEVICE

Fig. 11

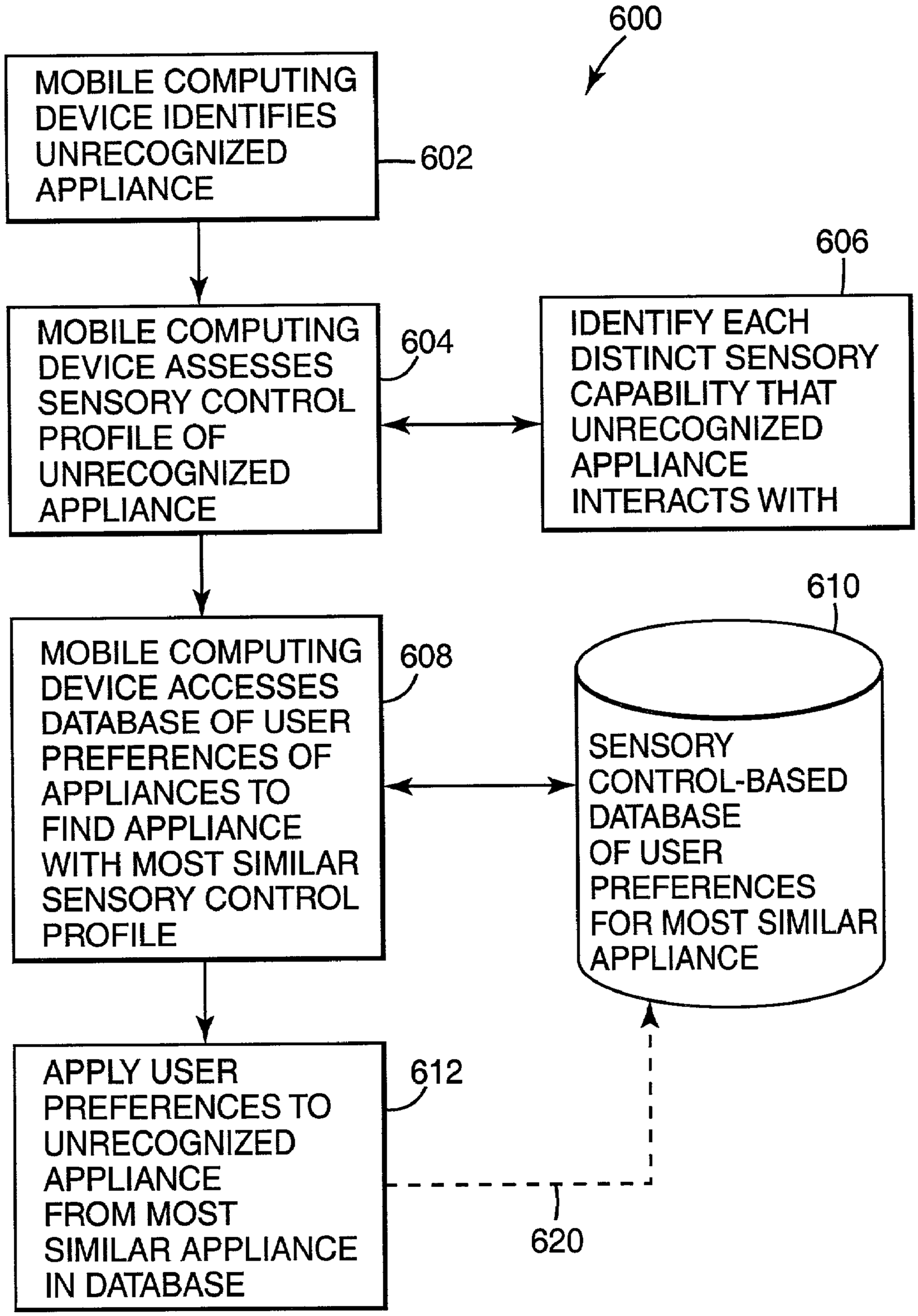

600
MOBILE COMPUTING DEVICE IDENTIFIES UNRECOGNIZED APPLIANCE
602
MOBILE COMPUTING DEVICE ASSESSES SENSORY CONTROL PROFILE OF UNRECOGNIZED APPLIANCE
604
606
IDENTIFY EACH DISTINCT SENSORY CAPABILITY THAT UNRECOGNIZED APPLIANCE INTERACTS WITH
MOBILE COMPUTING DEVICE ACCESSES DATABASE OF USER PREFERENCES OF APPLIANCES TO FIND APPLIANCE WITH MOST SIMILAR SENSORY CONTROL PROFILE
608
610
SENSORY CONTROL-BASED DATABASE OF USER PREFERENCES FOR MOST SIMILAR APPLIANCE
APPLY USER PREFERENCES TO UNRECOGNIZED APPLIANCE FROM MOST SIMILAR APPLIANCE IN DATABASE
612
620

Fig. 12

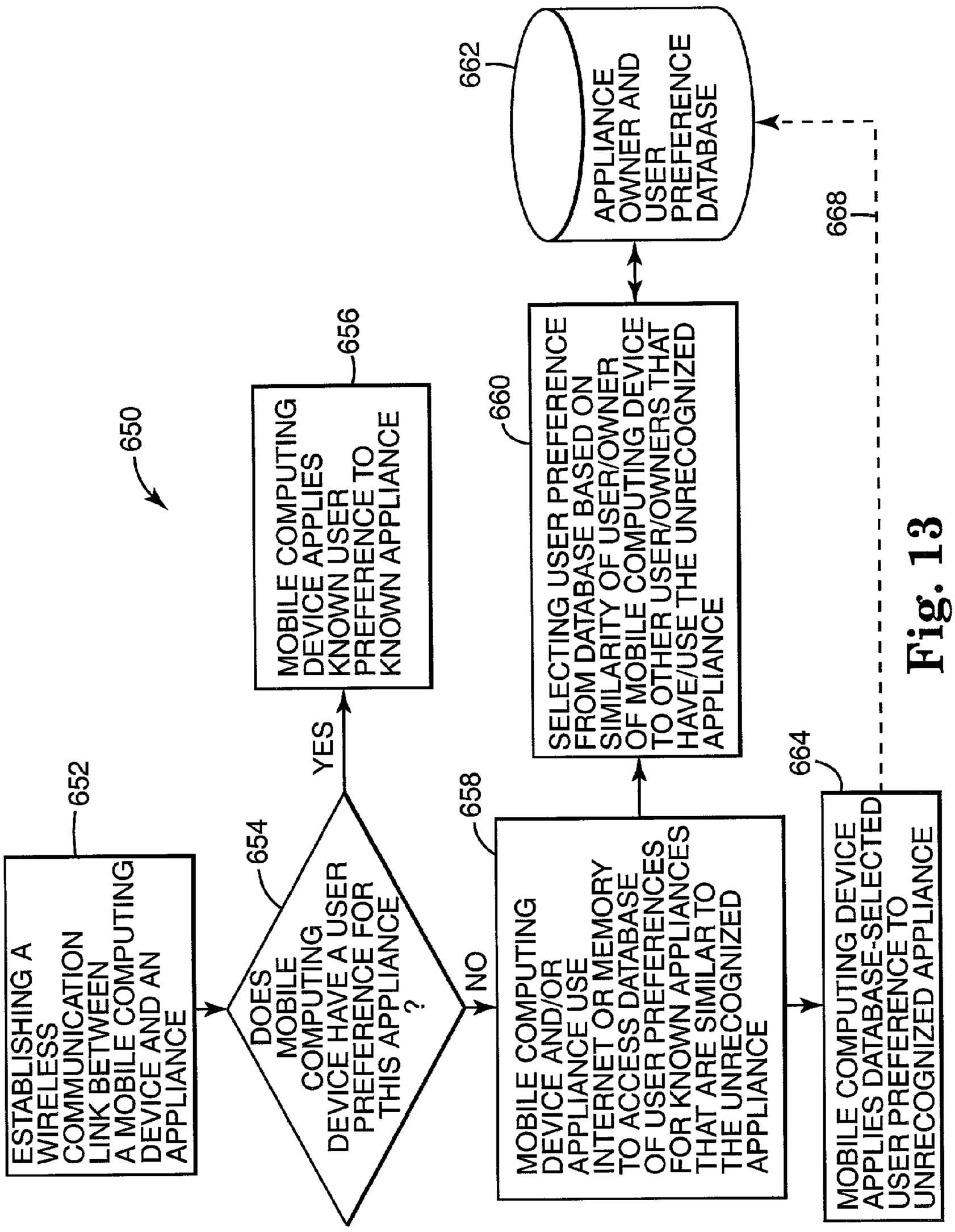

650
652
ESTABLISHING A WIRELESS COMMUNICATION LINK BETWEEN A MOBILE COMPUTING DEVICE AND AN APPLIANCE
654
DOES MOBILE COMPUTING DEVICE HAVE A USER PREFERENCE FOR THIS APPLIANCE ?
YES
656
MOBILE COMPUTING DEVICE APPLIES KNOWN USER PREFERENCE TO KNOWN APPLIANCE
NO
658
MOBILE COMPUTING DEVICE AND/OR APPLIANCE USE INTERNET OR MEMORY TO ACCESS DATABASE OF USER PREFERENCES FOR KNOWN APPLIANCES THAT ARE SIMILAR TO THE UNRECOGNIZED APPLIANCE
660
SELECTING USER PREFERENCE FROM DATABASE BASED ON SIMILARITY OF USER/OWNER OF MOBILE COMPUTING DEVICE TO OTHER USER/OWNERS THAT HAVE/USE THE UNRECOGNIZED APPLIANCE
662
APPLIANCE OWNER AND USER PREFERENCE DATABASE
664
MOBILE COMPUTING DEVICE APPLIES DATABASE-SELECTED USER PREFERENCE TO UNRECOGNIZED APPLIANCE
668

Fig. 13

SYSTEM AND METHOD FOR A MOBILE COMPUTING DEVICE TO CONTROL APPLIANCES

CROSS REFERENCE TO RELATED APPLICATIONS

This patent application is related to the following Non-Provisional U.S. patent applications Ser. No. 09/982,218, entitled "Mobile Computing Device With Method and System for Interrupting Content Performance Among Appliances,"; Ser. No. 09/981,434, entitled "System And Method For Automatically Applying A User Preference From A Mobile Computing Device To An Appliance,"; Ser. No. 09/981,771, entitled "System and Method for Determining Priority Among Multiple Mobile Computing Devices to Control an Appliance," are all assigned to the same assignee as the present application, and are all herein incorporated by reference.

FIELD OF THE INVENTION

The present invention relates to mobile computing devices, and in particular, to mobile computing devices that control appliances.

BACKGROUND OF THE INVENTION

Man has always tried to control his environment. In the last century, man has succeeded in producing totally controlled indoor environments complete with water, light, heating and cooling, sanitary plumbing, and entertainment. We live quite comfortably.

In the last twenty years, the advent of the remote control has further spoiled us. We are disappointed if we cannot point and click to control something. We have separate remote controls for our TVs, stereos, and lights, as well as universal remote controls to permit controlling all these appliances with a single device.

While a remote control can help you navigate a favorites list for TV programming, the favorites list is created through and maintained by the cable or satellite broadcaster, not the remote control. Accordingly, conventional remote controls are limited to assisting a user select content for viewing within the framework already provided by the TV signal broadcaster (e.g. network, cable, satellite, etc). This fact makes the term remote control somewhat misdescriptive since they actually control very little in terms of content. Rather, the conventional remote control merely allows us to select among content that is already chosen for us.

Finally, to the extent that any of our favorite media devices, such as radios, TVs, internet browsers/appliances, etc. permit personalization through favorite lists or user preferences, the information in these devices remain islands unto themselves. Users constantly re-enter favorites and preferences in these devices because it is not currently possible to carry them across devices. Moreover, when a user desires to use a device, such as a TV or web browser on a computer, in a new location such as a hotel room or friend's house, the user no longer has access to their favorites and user preferences which are stored on the same type of device (e.g. TV or web browser) at home.

Accordingly, the personalized use of one electronic device remains isolated and independent of personalized use of other electronic devices available to the user.

SUMMARY OF THE INVENTION

An appliance control system of the present invention comprises an appliance and a mobile computing device configured for controlling the appliance by at least one of determining an available content for the appliance, selecting the content used by the appliance, and applying user preferences to the appliance.

A method of controlling an appliance of the present invention comprises establishing a wireless communication link between an appliance and a mobile computing device, and controlling the appliance with the mobile computing device including at least one of determining an available content for the appliance, selecting the content used by the appliance, and applying user preferences to the appliance.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a block diagram illustrating an appliance control system, according to one embodiment of the present invention.

FIG. **2** is a diagram further illustrating an appliance control system, according to one embodiment of the present invention.

FIG. **3** is a flow diagram of a method of controlling an appliance, according to one embodiment of the present invention.

FIG. **4** is a block diagram of a video device, an audio device, and mobile computing device of an appliance control system, according to one embodiment of the present invention.

FIG. **5** is a block diagram of an appliance content selector of an appliance control system, according to one embodiment of the present invention.

FIG. **6** is a block diagram of a content interrupt manager of an appliance control system, according to one embodiment of the present invention.

FIG. **7** is a block diagram of a mobile phone, a land-line phone, and a mobile computing device of an appliance control system, according to one embodiment of the present invention.

FIG. **8** is a block diagram of a multi-function printer, a computing workstation, a web site and a mobile computing device of an appliance control system, according to one embodiment of the present invention.

FIG. **9** is a block diagram of an user interface of an appliance control system, according to one embodiment of the present invention.

FIG. **10** is a block diagram of a priority contention moderator of an appliance control system, according to one embodiment of the present invention.

FIG. **11** is a block diagram of an user preference auto manager of an appliance control system, according to one embodiment of the present invention.

FIG. **12** is a flow diagram of a method of applying user preferences across appliances, according to one embodiment of the present invention.

FIG. **13** is a flow diagram of a method of applying user preferences across appliances, according to one embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In the following detailed description of the preferred embodiments, reference is made to the accompanying drawings which form a part hereof, and in which is shown by way

of illustration specific embodiments in which the invention may be practiced. It is to be understood that other embodiments may be utilized and structural or logical changes may be made without departing from the scope of the present invention. The following detailed description, therefore, is not to be taken in a limiting sense, and the scope of the present invention is defined by the appended claims.

Components of the wireless access control method and system of the present invention can be implemented in hardware via a microprocessor, programmable logic, or state machine, in firmware, or in software within a given device. In one aspect, at least a portion of the software programming is web-based and written in HTML and JAVA programming languages, including links to graphical user interfaces for data collection, such as a windows based operating system, and each of the main components may communicate via a network using a communication bus protocol. For example, the present invention may or may not use a TCP/IP protocol suite for data transport. Other programming languages and communication bus protocols suitable for use with the present invention will become apparent to those skilled in the art after reading the present application. Components of the present invention may also reside in software on one or more computer-readable mediums. The term computer-readable medium as used herein is defined to include any kind of memory, volatile or non-volatile (e.g., floppy disks, hard disks, CD-ROMs, flash memory, read-only memory (ROM), and random access memory (RAM)).

Preferably, the user interfaces described herein run on a controller, computer, appliance or other device having an operating system which can support one or more applications. The operating system is stored in memory and executes on a processor. The operating system is preferably a multi-tasking operating system which allows simultaneous execution of multiple applications, although aspects of this invention may be implemented using a single-tasking operating system. The operating system employs a graphical user interface windowing environment which presents the applications or documents in specially delineated areas of the display screen called "windows." Each window has its own adjustable boundaries which allow the user to enlarge or shrink the application or document relative to the display screen. Each window can act independently, including its own menu, toolbar, pointers, and other controls, as if it were a virtual display device. Other software tools may be employed via the window, such as a spreadsheet for collecting data. The operating system preferably includes a windows-based dynamic display which allows for the entry or selection of data in dynamic data field locations via an input device such as a keyboard and/or mouse. One preferred operating system is a Windows® brand operating system sold by Microsoft Corporation. However, other operating systems which provide windowing environments may be employed, such as those available from Apple Corporation or IBM. In another embodiment, the operating system does not employ a windowing environment.

An appliance control system of the present invention enables a mobile computing device, such as a personal digital assistant, to control appliances like televisions, radios, printers, etc. The control can take several forms including applying preferences to the appliance such as volume level, activation and deactivation along with determining the content available to the appliance such as supplying a program, song, or file to be acted upon by the appliance. In addition, control can include simply selecting available content to be used by the appliance, such as selecting a TV channel or regularly broadcast program.

For example, upon entry within a room, the mobile computing device can automatically perform these steps: identify an appliance like a TV; activate the TV; turn the TV to a channel carrying a favorite program; and select a preferred volume level. In the event that the favorite program is not being broadcast, the mobile computing device can supply its own content. In particular, the mobile computing device can retrieve an episode of that program or substitute a program from memory of the mobile computing device, transfer that stored program to the TV, and then command the appliance to play the program.

Of course, the mobile computing device contains user preferences for all devices that the user might come into contact with and optionally contains virtually any content that the user might desire to have performed by an appliance. Moreover, control by the mobile computing device is not necessarily limited to appliances owned by the user. Rather, appliances situated in public places, at friends and neighbors homes, etc. can selectively surrender control to a mobile computing device. Accordingly, the user now gains unified control over appliances in their environment, whether at home or out in the world, with a single mobile computing device that permits automatic implementation of their user preferences and automatic performance of their preferred content on the appliances.

With the system and method of the present invention, consumers are no longer relegated to seeking and implementing their preferences and preferred content subject to control by the appliances and subject to the content providers associated with the appliances. Rather, with the system and method of the present invention, the user obtains integrated control over the appliances, becoming the master of the appliances. These subservient appliances become tools to perform tasks using content supplied by the mobile computing device or conventionally supplied by an appliance content provider.

Moreover, user preferences and content that was previously isolated among independent appliances becomes centralized in the mobile computing device and associated with the user. After all, user preferences and content were created for the enjoyment of the user in the first place. Accordingly, the system and method of the present invention keeps the user preferences (and some content) with the user via the mobile computing device instead of with the appliances, letting the user apply the preferences when and where they desire to do so without independent programming of each device regarding those preferences.

An appliance control system **10**, according to one exemplary embodiment of the present invention, is shown in FIG. **1**. Appliance control system **10** includes at least one mobile computing device **12** operating in an environment of one or more appliances **13** in which mobile computing device **12** controls appliance **13**. Both mobile computing device **12** and appliance **13** include content **16** and user preferences **18**. Content **16** generally includes a song, program, or any information that can be performed in a task by appliance **13** while user preference **18** generally includes preferences as to how, when and where that content **16** will be performed by appliances **13**. Both content **16** and user preferences **18** are further defined throughout this application in the following examples of the system and method of the present invention.

Mobile computing device **12** is configured to select content **16** of appliance **13** for performance by appliance **13** and/or configured to supply content **16** from mobile computing device **12** (or from another source as controlled by mobile computing device **12**) to appliance **13** for performance by appliance **13**. Finally, controlling appliance **13**

includes applying user preferences **18**, stored on mobile computing device **12**, to each appliance **13**.

As shown in FIG. **1**, more than one mobile computing device **12** can compete for control over appliance **13**. In this situation, mobile computing device **12** and appliance **13** determine priority between multiple computing devices **12** for control of appliance **13**, as will be described in greater detail later in this application. The mobile computing device **12** that obtains priority to control appliance **13** also optionally can request, command, and/or coordinate another mobile computing device **12** to copy and/or transfer, all or a part, of its content **16** to appliance **13** and/or to the controlling mobile computing device **12**.

As shown in FIG. **2**, appliances **13** in appliance control system **10** include, but are not limited to, video device **14**, computing workstation **16**, multifunction printer **24**, mobile phone **26**, audio device **28**, and web site **36**. Appliance control system **10** further comprises household appliance set **40**, which includes heating and cooling thermostat **42**, alarm clock **44**, lighting unit **46**, and beverage maker **48**. Appliance set **40** also optionally includes conventional household appliance controller **50**, which acts an appliance **13**, for providing local control over household appliances **42**–**48**. Each of these appliances **13** and their interaction with mobile computing device **12** as part of appliance control system **10** is described in further detail in association with FIGS. **3**–**10**.

Appliance control system **10** is used in a method **60** of controlling appliances, as shown in FIG. **3**. Method **60** includes a first step **62** in which mobile computing device **12** moves within proximity of at least one appliance **13** and establishes wireless communication with appliance **13**. First step **62** optionally includes mobile computing device **12** selecting which appliances **13** it will attempt to assert control over.

When multiple computing devices are present, then first step **62** further includes step **64** in which appliances **13** and/or mobile computing devices **12** must determine priority and grant priority of control over appliances **13** to one of the mobile computing devices **12**. Next, the master mobile computing device **12** automatically applies its user preferences to appliance **13** (step **65**). Mobile computing device **12** then automatically or manually selects content available through appliance **13** for performance on appliance **13** (step **66**). Step **66** also optionally includes mobile computing device **12** supplying content to appliance **13** for performance by appliance **13** (step **67**).

Finally, in step **68**, appliance **13** performs the task requested by mobile computing device **12** using content **16** selected and/or supplied by mobile computing device **12** along with the user's preferences **18** applied by mobile computing device **12** to appliance **13**.

System **10** and method **60** of the present invention will now be described in further detail in association with FIGS. **4**–**10**, with specific details regarding the interaction of mobile computing device **12** and each of appliances **13** shown and identified in association with FIG. **2**.

For example, each appliance **13** in household appliance set **40** (FIG. **2**) may be controlled according to user preferences **18** of mobile computing device **12**. When user with mobile computing device **12** comes within the proximity if appliance set **40**, then mobile computing device **12** preferably causes appliance set **40** to adopt operating conditions preferred by the user. In particular, by applying user preferences **18**, mobile computing device **12** sets thermostat **42** at a selected temperature and heating/cooling cycle, sets radio **44** at a favorite station, volume and alarm time, sets lighting **46** at a favorite on/off cycle and intensity level, and sets beverage maker **48** at a favorite on/off cycle. Finally, mobile computing device **12** optionally controls household appliance controller **50**, which in turn controls one or more appliances **13** in household appliance set **40**. Accordingly, mobile computing device **12** carries user preferences **18** of the user's ideal living environment so that mobile computing device **12** automatically controls the surrounding environment using available appliances **13** to accommodate the user tastes.

In another aspect of the invention, as shown in FIG. **4**, an appliance control system of the present invention includes audiovisual subsystem **80** comprising mobile computing device **12** interacting with appliances **13**, such as video device **14** and audio device **28**. Subsystem **80** is not a closed system excluding the interaction of other appliances **13** or mobile computing devices **12** but rather a convenient reference to identify an exemplary interaction between mobile computing device **12**, video device **14**, and audio device **28**.

Video device **14** preferably includes a television, movie player, or video display monitor while audio device **28** preferably includes a stereo system, CD player, or other audio media player. Mobile computing device **12** preferably includes a personal digital assistant, or another computing device such as a handheld computer, laptop computer, etc.

In this embodiment, appliance control subsystem **80** also optionally includes network communication link **70**. Network communication link **70**, as used herein, includes an Internet communication link, an intranet communication link, or similar high-speed communication link. In one preferred embodiment, network communication link **70** includes Internet communication link **72**. Network communication link **70** optionally facilitates communication between mobile computing device **12** and appliances **13**, such as video device **14** and audio device **28**, and provides a route to the internet for obtaining content for performance by appliances **13** under the control of mobile computing device **12**. For audio device **28** this feature would include the ability to obtain audio files such as portable audio files (e.g., MP3, Windows Metafile, etc.) from the web site **36** for performance on audio device **28**.

Mobile computing device **12** includes controller **81** with operating system **82**, memory **84**, wireless communicator **86**, display **88** with user interface **90**, appliance content selector **92**, priority contention moderator **94**, distance/location identifier **96**, embedded web server **97**, electronic payment mechanism **98**, and content interrupt manager **99**.

Controller **81** of mobile computing device **12** includes hardware, software, firmware or combination of these. In one preferred embodiment controller **81** includes a computer server or other microprocessor based system capable of performing a sequence and logic operation and including memory for storing information. Controller **81** supports and cooperates with embedded web server **97**. Operating system **82** preferably has the attributes and features of the previously described operating systems.

Memory **84** of mobile computing device **12** preferably includes a high capacity random access memory system available on an integrated circuit chip, such as SDRAM, DRAM, EDO RAM, etc. Memory **84** also optionally comprises a miniaturized hard drive sized for disposition within mobile computing device **12** or a silicon based, ultra high capacity storage device, such as an atomic resolution storage device, as described in Gibson et. al. U.S. Pat. No. 5,557,596, and which is hereby incorporated by reference.

Wireless communicator **86** of mobile computing device **12** uses one or more known communication and application

protocols such as Wireless Application Protocol (WAP), Bluetooth, Infrared (IrDA, FIR), 802.11, as well as other communication and application protocols known to those skilled in the art, such as UltraWideBand (UWB). Mobile computing device **12** includes communication hardware and software known in the art for implementing these protocols, such as distance/location identifier **96**. Distance/location identifier **96** also optionally incorporates or communicates with a global positioning satellite system (GPS) to provide these functions. Distance/location identifier **96** determines the location and distance of appliances **13** relative to mobile computing device **12** for establishing authorization and priority of mobile computing device(s) **12** to control appliances **13**.

Wireless communication protocols such as infrared (e.g., FIR), Bluetooth, and UltraWide Band (UWB) which permit direct radio or beamed communication between two or more compatible devices that operate independently of a network and independently of network communication link **70**. This feature permits direct one-on-one communication between two similarly configured computing devices without any communication intermediary. In the example of the Bluetooth protocol, the communication link preferably is established by the mere presence of each respective device (e.g., mobile computing device **12** and any appliance having a wireless communicator **86**) in close proximity to each other. This instant synchronization enables the devices to immediately communicate with each other without taking time to manually establish a connection or communication link. Finally, if necessary, mobile computing device **12** also can communicate with other mobile computing devices **12** and/or appliances **13** through more conventional indirect routes such as wired or wireless network links, wired or wireless Internet links, or telecommunications networks.

User interface **90** of mobile computing device **12** can be implemented in hardware via a microprocessor, programmable logic device, or state machine, and firmware, or in software. In one aspect, at least a portion of the software programming is optionally written in Java programming language, and user interface **90** optionally communicates with other mobile computing devices **12** and/or appliances **13** (FIG. **1**) via network communication link **70** using a communication bus protocol. For example, the present invention optionally can use a TCP/IP protocol suite for data transport. In another aspect, the present invention does not use a TCP/IP protocol suite for data transport. Other programming languages and communication bus protocols suitable for use with user interface **90** and appliance control system **10** will be apparent to those skilled in the art, such as ultrawideband (UWB), Bluetooth, and infrared (e.g. FiR), as described in association with wireless communicator **86**. User interface **90** is described in further detail in association with FIGS. **5** and **9**.

Appliance content selector **92** of mobile computing device **12** operates in association with user interface **90** to determine what content is used or performed by appliance **13** (FIG. **1**) and where that content is obtained. Appliance content selector **92** also operates in association with content interrupt manager **99** of mobile computing device **12** to control how and when that content is used or performed by appliance **13** on behalf of the user. Appliance content selector **92** is described in further detail in association with FIG. **5**.

Priority contention moderator **94** of mobile computing device **12** is brought into play to sort priority when more than one mobile computing device **12** seeks to control a given appliance **13**. Priority sorting is required since appliance control system **10** is an open system in which multiple mobile computing devices **12** can compete for control over one or more appliances **13** in one or more appliance environments. Priority contention moderator **94** is described in further detail in association with FIG. **10**.

Finally, embedded web server **97** of mobile computing device **12** produces a web page accessible through Internet communication link **72** for accessing functions of mobile computing device **12**, such as content **16** and user preferences **18** (FIG. **1**). Embedded web server **97** preferably is implemented using techniques such as those described in U.S. Pat. No. 6,170,007, titled EMBEDDING WEB ACCESS FUNCTIONALITY INTO A DEVICE FOR USER INTERFACE FUNCTIONS and U.S. patent, titled EMBEDDING WEB ACCESS MECHANISM IN AN APPLIANCE FOR USER INTERFACE FUNCTIONS INCLUDING A WEB SERVER AND WEB BROWSER, which are both hereby incorporated by reference.

Electronic payment mechanism **98** of mobile computing device **12**, in cooperation with wireless communicator **86**, permits mobile computing device **12** to perform electronic financial transactions including sending and receiving payments for goods and services.

Finally, content interrupt manager **99** of mobile computing device **12** selectively controls how and when content **16** is performed on one or more appliances **13** using one or more media (e.g., video, audio, etc.), and is described in greater detail in association with FIG. **6**.

With these features, mobile computing device **12** is configured to select content **16** and/or supply content **16**, along with user preferences **18**, for performing content **16** on appliances **13**, such as video device **14** and audio device **28**.

As further shown in FIG. **4**, video device **14**, which acts an appliance **13** to mobile computing device **12**, includes display **100**, program receiver **102**, memory **104**, media player **106**, wireless communicator **86**, and program recorder **110**. Program receiver **102** includes satellite function **120**, cable function **122** and network function **124** for obtaining video-based programs from various sources, respectively, such as a satellite TV programming signal (e.g. DirecTV), a cable TV programming signal, and a broadcast network programming signal (e.g., NBC network TV). Memory **104** interacts and communicates with other components of video device **14** to store and implement user preferences **18** and content **16** (FIG. **1**), as instructed by mobile computing device **12**. Media player **106** further includes VCR capability **130** and DVD capability **132** for playing content from external mobile media sources such as videotape movies and/or DVD movies. Wireless communicator **86** facilitates wireless communication with mobile computing device **12** and other suitable devices. Program recorder **110** includes TIVO capability **136** and VCR capability **138** for obtaining and playing recorded video as well as for recording video content. Finally, video device **14** need not include all of the components of video device **14** shown in FIG. **2**.

Audio device **28** includes receiver **150**, station selector **152**, station scanner **154** with song search function **156**, media player **160**, memory **162** and wireless communicator **86**. Media player **160** further includes tape function **170**, CD function **172**, and portable audio file format function **174** for respectively playing audiotapes, CDs, and portable audio format music files (e.g. MP3, Windows Metafile Format (WMF), etc).

Receiver **150** of audio device **28** comprises a tuner configured for receiving radio broadcasts and for playing recorded audio files from CDs, audiotapes, etc. Station

selector **152** permits selection of radio stations while station scanner **154** permits scanning the full radio dial for stations while song search function **156** searches the available radio stations for songs that are preferred by the user. Memory **162** allows a user to store lists as user preferences **18** and/or as content **16** (FIG. **1**) to identify favorite songs, programs, stations etc. in receiver **150** so that a user can more readily access favorite content **16**. In addition, memory **162** also stores songs, programs, etc. as content **16** for replay at a later time as specified by the user.

Using some or all of these functions and features described in association with FIG. **4**, mobile computing device **12** controls video device **14** and audio device **28** to perform content **16** according to user preferences **18**. In particular, as a user carrying mobile computing device **12** approaches video device **14**, such as a TV, and audio device **28**, such as a stereo system, wireless communicator **86** of mobile computing device **12** establishes communication with wireless communicator of audio device **28** and/or video device **14**. If appliance **13** is not currently activated, then mobile computing device **12** automatically activates that appliance **13** at the discretion of the user as determined by user preferences **18** of mobile computing device **12**.

For the greatest convenience, mobile computing device **12** already includes in its user preferences **18** (stored in memory **84**) a listing of the user's favorite TV programs, movies, TV stations, radio stations, radio programs, songs (including multiple renditions), as well as comprehensive program listings for TV and/or radio. Mobile computing device **12** also preferably includes in its content **16** (stored in memory **84**), a library of TV programs, movies, songs, or any other content that can be performed by video device **14** and/or audio device **28**. Armed with this information, mobile computing device **12** automatically applies its user preferences **18** and content **16** (via appliance content selector **92**) to video device **14** and audio device **28**. However, the automatic copying of user preferences **18** and content **16** optionally includes an undo function to optionally reverse the copying process in the event that preferences are erroneously copied between multiple mobile computing devices **12** and/or between mobile computing device **12** and appliances **13**.

Audio device **28** and video device **14** respond to the controlling action of mobile computing device **12** by attempting to perform any requested task using content **16** according to applied user preferences **18**. Since mobile computing device **12** has full and/or selective access to, and control over, all features of audio device **28** including receiver **150**, station selector **152**, station scanner **154**, song search function **156**, media player **160**, memory **162**, any or all of these features are available to mobile computing device **12** to carry out a selected task.

For example, for audio device **28**, one user preference **18** from mobile computing device **12** identifies a single radio station as a favorite station (e.g. 98.5 FM, KTIS or National Public Radio) so that mobile computing device **12** commands station selector **152** of audio device **28** (via wireless communicator **86**) to select the user's favorite station. On a broader level, user preferences **18** and/or content **16** of mobile computing device **12** that are applied to appliance **13** preferably includes a play list of preferred songs, programs, so that song search function **156** can search for real time radio broadcasts for any of those songs or programs and then turn station selector **152** to a station currently playing the favorite song or program. Moreover, if a user's favorite program (e.g. All Things Considered) is not being currently broadcast, then mobile computing device **12** optionally informs the user of the time that the program will be broadcast.

Alternatively, a user can manually cause a favorite song or program to be played on audio device **28**. The user can command station selector **152** with mobile computing device **12** to select a desired station, or use song search **156** to search the dial for a favorite song. The user also can also manually supply a copy of a favorite song to audio device **28** for performance by the audio device **28** using an portable audio file stored in memory **84** of mobile computing device **12**. In this case, mobile computing device **12** not only selects the content to be performed by audio device **28**, but also supplies the content to audio device **28**. This latter process of supplying content to an appliance **13**, such as audio device **28** can also take place automatically.

Of course, many other arrangements are possible between audio device **28** and mobile computing device **12** in which mobile computing device **12** selects the content performed on audio device **28** as well as optionally supplying the content. Both selected and supplied content are used to perform tasks by the appliance **13** according to user preferences **18** automatically applied to audio device **28** from mobile computing device **12**.

In another example, mobile computing device **12** has full and/or selective access to, and control over, any or all of the features and functions of video device **14** including program receiver **102**, memory **104**, media player **106**, and program recorder **110**. Using any or all of these features, mobile computing device **12** uses video device **14** to perform content **16** while applying user preferences **18** of mobile computing device **12**.

Video device **14** preferably is automatically activated and displays the user's favorite TV channel or network. Mobile computing device **12** also optionally transfers its video-related content (e.g., movies, TV programs, etc.) along with preferred play lists from its memory **84** into memory **104** of video device **14**. Mobile computing device **12** is then free to select any desired content **16** that is currently being broadcast or supplied from memory 84,104 for performance by video device **14**.

Supplying a copy of video-related content from video device **14** is optionally performed in association with TIVO capability **136**. Moreover, if the TIVO portion of video device **14** has a program or show that is not on the user's play list on mobile computing device **12**, then that program is downloaded from video device **14** to memory **84** of mobile computing device **12**.

In short, mobile computing device **12** automatically or manually selects content **16** performed on video device **14** as well as optionally supplying content **16**. Content **16** available on video device **14** also can be downloaded into mobile computing device **12**.

Finally, mobile computing device **12** also optionally automatically coordinates control of audio device **28** and video device **14** so that if the user chooses to watch video device **14**, then audio device **28** can be deactivated, or even activated to augment video device **14** in performing the selected content. Simply put, since mobile computing device **12** can control any appliance **13**, mobile computing device **12** controls each appliance **13** with regard to, and in association with, control of other appliances **13**. The coordination of performance of content **16** between and among multiple appliances **13** will be described in greater detail in association with FIG. **6** regarding content interrupt manager **99**.

The selection of content **16** by mobile computing device **12** to be performed by appliance **13** is primarily achieved with appliance content selector **92**, which is available through user interface **90**. With user interface **90**, appliance content selector **92** permits addition, deletion and modification as well as activation of content selections by mobile computing devices **12** for each appliance **13**. Some of the functions of appliance content selector **92** have already been described in association with video device **14** and audio device **28**.

As shown in FIG. **5**, appliance content selector **92** of mobile computing device **12** includes audio monitor **200**, data monitor **202**, video monitor **204**, communication monitor **206**, Internet function **208**, and upload/download function **210**. Each monitor **200**–**208** includes several functions relating to user preferences **18** and content **16** to be applied to the respective types of appliances **13**. All functions of appliance content selector **92** are applied automatically unless the user optionally bypasses a particular function. For each monitor **200**–**208** of appliance content selector **92**, all selected functions and features are preferably stored in memory **84** as user preferences **18**. However, to the extent necessary for performing content **16**, some selected functions and features may require storage in memory **84** as content **16**.

Audio monitor **200** of appliance content selector **92** includes stations function **220**, song list function **222**, programs function **224** and portable audio file playlist function **226**. Using these functions **220**–**226** of audio monitor **200**, a user uses mobile computing device **12** to specify the audio content, in the form of lists of stations, songs, programs and portable audio files, that are to be performed on audio device **28**, and any other suitable appliances **13**. For example, stations function **220** maintains a listing of favorite radio stations while song list function **222** maintains a list of favorite songs that can be played from a radio station, CD, or portable audio file (e.g., MP3, Windows Metafile Format, etc.). Activation of stations function **220** in audio monitor **200** will cause any listed preferred stations to be selected for performance by audio device **28**. Programs function **224** maintains a list of favorite audio programs such as radio or TV talk shows, speeches, regularly scheduled programs (e.g. All Things Considered on National Public Radio). Finally, portable audio file playlist function **226** maintains a list of all portable audio file owned by or available to the user. Activation of any or all of these functions **220**–**226** of audio monitor **200** results in the selected content **16** being performed by audio device **28**.

Video monitor **204** includes network function **240**, program function **242**, program recorder **244** with play list function **246** and program function **248**. Using these functions **240**–**248** of video monitor **204**, a user uses mobile computing device **12** to specify the video content, in the form of lists of networks and programs (including movies) that are to be performed on video device **14**, and any other suitable appliances **13**. Network function **240** maintains a favorite list of TV broadcast, cable or satellite networks. Upon activation of network function **240**, any program being broadcast by a selected network(s) is performed on video device **14**. Program function **242** maintains a list of video and/or TV programs that can be selected for viewing on video device **14**. Finally, using subfunctions playlist function **246** and program function **248**, program recorder **244** specifies desired recording of programs to be recorded from TV (and other sources) as well as designating playback of those recorded programs.

The content identified in the various functions of audio monitor **200** and/or video monitor **204** can either be supplied from a content provider (e.g. television broadcast network, radio, cable, or satellite), memory **84** of mobile computing device **12** (see FIG. **4**), memory **162** of audio device **28**, and/or memory **104** of video device **14** (FIG. **4**).

As further shown in FIG. **5**, communication monitor **206** of appliance content selector **92** assists mobile computing device **12** in monitoring and controlling communications among telecommunication devices such as phones and fax machines. Communication monitor **206** includes phone book function **260** with call list **262**, address book function **264**, land/cell phone switch function **266**, synchronize function **268**, and fax function **270**. Phone book function **260** causes a list of phone numbers with recent call lists **262** in mobile computing device **12** to be applied to a communications appliance such as mobile phone **26** (see FIG. **2**). Similarly, address book function **264** includes address information stored in mobile computing device **12** for application and transfer to mobile phone **26** (FIG. **2**).

As further shown in FIG. **5**, land/cell switch function **266** of communications monitor **206** selectively causes automatic switching between a cell phone (wireless digital) and a land-line phone during an ongoing telephone call (via a call forwarding function). This feature will be described later in further detail in association with FIG. **7**. Synchronize function **268** causes communication features, such as phone books and address books, of multiple appliances to be synchronized relative to one another. Finally, fax function **270** permits fax receipt and transmission via mobile computing device **12**.

Data monitor **202** of appliance content selector **92** assists mobile computing device **12** in monitoring and controlling data operations using computers and Internet resources. As shown in FIG. **5**, data monitor **202** includes documents function **228**, editor function **230**, virtual disc drive function **232**, and document scanner receiver function **234**. Documents function **228** permits printers, such as multi-function printer **24** (FIG. **2**) to print specified documents from mobile computing device **12**. Editor function **230** permits documents and files on mobile computing device **12** to be edited by an appliance such as computing workstation **16** (FIG. **2**) while virtual disc drive function **232** causes mobile computing device **12** to act substantially the same as an internal disc drive of computing workstation **16**. Document scanner receiver function **234** facilitates mobile computing device **12** in receiving scanned document files from a scanner or even from a Digital Sender (available from Hewlett-Packard, Inc.).

As further shown in FIG. **5**, internet monitor **208** of appliance content selector **92** includes web browser favorites **276** (i.e., bookmarks) and cookies **278** so that this information in mobile computing device **12** is automatically applied to computing workstation **16** (FIG. **2**). Internet monitor **208** includes the function of browser favorites **276** optionally being automatically applied and/or downloaded from mobile computing device **12** to all appliances **13**, while mobile computing device **12** automatically receives updates to browser favorites from computing workstation **16** or other sources. Accordingly, browser favorites function **276** coordinates and maintains an updated, synchronized list of browser favorites among mobile computing device **12** and appliances **13**. Finally, upload/download function causes respective uploading and/or downloading of files and programs, as user preference **18** and/or content **16**, between appliances **13** and mobile computing device **12**.

In summary, appliance content selector **92** comprises an aspect of user interface **90** of mobile computing device that is devoted to supplying and selecting content for performance on appliances **13**.

In another aspect of the system and method of the present invention, mobile computing device **12** optionally includes a content interrupt manager **99** (FIG. **4**) for selectively controlling how and when content is performed on one or more appliances involving one or media (audio, video, etc.). Content interrupt manager **99** is further shown in FIG. **6** and includes appliance switcher **180**, multiple appliance splitter **182**, and performance continuity monitor **184**.

Appliance switcher **180** causes content that is being performed on one appliance **13** to be switched to being performed on another appliance **13** as mobile computing device **12** moves from appliance **13** to appliance **13**. For example, a user can watch a movie on a first video device **14** (FIG. **2**) in one room and then move to another room having a second video device **14** to continue watching the movie. Using appliance switcher **180**, the movie stops playing on the first video device **14** and begins playing on the second video device **14** as mobile computing device **12** moves between the respective video devices **14**. Mobile computing device **12**, through appliance switcher **180** initiates and directs the appliance switching.

Performance continuity monitor **184** tracks the performance of content **16** to substantially preserve continuity in the performance of content **16** (such as the movie) during the switch between the respective appliances **13** (such as video devices **14**). For example, performance continuity monitor **184** also optionally permits the user to terminate performance of content when leaving one appliance **13**, such as the first video device **14**, and then resume playing the content at the same place within the content on another appliance **13**, such as second video device **14**. The performance can be resumed immediately so that between the two appliances, the movie never stops playing, or the performance on the second video device can be delayed until a later point in time so that there is a break in the performance. Moreover, performance continuity monitor **184** optionally can cause the performances to overlap so that the performance on the second video device begins with the last thirty seconds (or other time period) of content that were performed on the first video device. Appliance switcher **182**, in coordination with performance continuity monitor **184**, also optionally causes the movie to continue being performed on the first video device **14** while the movie starts playing on the second video device **14** so that the movie is played on both the first and second video devices without interruption in the content being performed.

Multiple appliance splitter **182** coordinates different media aspects of the same content or related content to be performed simultaneously on multiple appliances **13**. For example, multiple appliance splitter **182** coordinates performance of the video component of a football game on video device **14** while performing an independent radio broadcast of the same football game on audio device **28**. In this case, the user identifies in its user preferences **18** that when watching a football game, they prefer listening to a radio broadcast of the event while watching the same football game on video device **14**. Accordingly, mobile computing device **12** uses these preferences **18** to select both audio and video content to be performed together or independently on audio device **28** and/or video device **14**. In this arrangement, mobile computing device **12** directs two independent sources of content (a radio broadcast and a television broadcast) of a single event, a football game, to performed simultaneously in parallel with each other on two independent appliances **13**, video device **14** and audio device **28**.

In another example, multiple appliance splitter **182** cooperates with performance continuity monitor **184** to cause different aspects of a single content to be performed simultaneously by multiple appliances. In particular, some content such as a movie has both more than one type of media components, such as video and audio. The audio portion can be separated from the video portion with the audio portion being performed on a first media-type device such as audio device **28** or video device **14**, and the video portion being performed on a second type media device such as video device **14**.

For example, in applying user preferences **18**, mobile computing device **12** can selectively direct audio device **28**, such as a stereo or radio to begin playing the audio portion of a movie. The audio portion is performed with or without the video portion of the movie being played on an available video device **14**. The audio portion of the movie can be played on audio device **28** wholly on its own, or after a switch from the entire movie (both video and audio portions) being performed on video device **14**. Using this feature, a single content is interrupted into different aspects and performed to provide a cross media experience in which some of the content is performed on appliances **13** not previously associated with the conventional performance of content **16**. In another example, a radio broadcast of a football game is performed through the audio system of video device **14** while a television broadcast is performed on the video screen of video device **14**.

Accordingly, content interrupt manager **99** facilitates mobile computing devices **12** in directing performance of a single content or multiple, related content among and across multiple appliances **13** simultaneously and/or separated in time.

As shown in FIG. **7**, in another aspect of the invention, an appliance control system of the present invention includes telecommunications subsystem **280** having mobile computing device **12**, and telecommunication appliances **13** including mobile phone **26** and land phone **281**. Subsystem **280** is not a closed system but merely a representation of just one of many combinations of appliances **13**, such as telecommunication devices, that interact with mobile computing device **12** in a method and system of the present invention. Moreover, in one aspect, telecommunications subsystem **280** operates together with, or as part of, content interrupt manager **99** of mobile computing device **12** to manage switching an ongoing telephone call between multiple telecommunication appliances **13**.

Mobile computing device **12** includes the same attributes and features as described in association with FIGS. **1–6** including previously described wireless communicator **86**. In addition, mobile computing device **12** further includes phone book **282** in memory **84** and call switcher **284**. Both mobile phone **26** and land-line phone **281** include phone book **282**, call list **286**, wireless communicator **86** and call switcher **284**. Call switcher **284** operates in direct cooperation with, and/or as part of, appliance switcher **180** of content interrupt manager **99** (FIG. **6**) of mobile computing device **12**. In one aspect of mobile computing device **12**, call switcher **284** optionally is completely integrated into appliance switcher **180** of mobile computing device **12**.

Phone book **282** holds the user's phone numbers, names and addresses of contacts while call switcher **284** enables switching between different types of telecommunication devices (e.g., cell phone, land-line phones, etc) during on-going phone calls. Call list **286** contains a list of recently

called persons and phone numbers. Both phone book **282** and call list **286** are preferably stored and handled as user preferences **18** in memory **84** of mobile computing device **12** and as user preferences **18** in telecommunication appliances **13** including mobile phone **26** and land phone **281**.

In use, mobile computing device **12** automatically or manually copies the contents of its phone book **282** into phone book **282** of mobile phone **26**. Similarly, a recent call list **286** in mobile phone **26** is automatically downloaded into phone book **282** of mobile computing device **12**. Moreover, as preferably initiated and controlled by mobile computing device **12**, call list **286** of mobile phone **26** is automatically downloaded into call list **286** and phone book **282** of land-line phone **281** as the user approaches land-line phone **281**. This procedure optionally occurs when the user is participating in an ongoing telephone call on mobile phone **26** and approaches land-line phone **281** for the purpose of switching from mobile phone **26** to land-line phone **281**. In conventional systems, the user would hang up mobile phone **26** and then call their contact with land-line phone **281** in a separate phone call to complete the call with land-line phone **281**.

However, with the system and method of the present invention, at the direction of call switcher **284** of mobile computing device **12**, an ongoing phone call is automatically transferred from mobile phone **26** to land-line phone **281** during the on-going call (via a call forwarding function). While call switcher **284** manages the switch between respective telecommunication appliances **13**, such as phones **26** and **281**, performance continuity monitor **184** of content interrupt manager **99** of mobile computing device **12** (FIG. **6**) acts to maintain the continuity of the on-going phone call, which effectively constitutes content **16** being performed by phones **26** and **281**. During the switch, the most recent call list **286** of mobile phone **26** is optionally copied to land-line phone **281** for availability for the next phone call. In addition, during and/or after the switch, call switcher **284** optionally activates a voice mail function and/or ringer off function on the phone line that is not currently in use (has just been switched off) so that a second phone call is not received during the on-going phone call.

If the phone call is terminated prematurely during the automatic switching between mobile phone **26** and land-line phone **281**, then at the direction of mobile computing device **12**, mobile phone **26** and/or land-line phone **281** can selectively or automatically initiate a call to re-establish the telephone call between the two most recent devices that were communicating. If necessary, call switcher **284** of mobile computing device **12** directs the original devices (i.e., the telecommunication appliances **13** that started the first phone call before the interruption) to re-initiate telecommunication.

As shown in FIG. **8**, in another aspect of the invention, an appliance control system of the present invention includes mobile computing device **12**, Web site **36**, multifunction printer **24**, and computing workstation **16** which together function as computing subsystem **300**. Subsystem **300** is not a closed system but merely a representation of just one of many combinations of appliances **13**, such as computing workstation **16** and printer **24** (FIG. **2**), that interact with mobile computing device **12** in a method and system of the present invention. In this aspect of the present invention, mobile computing device **12** can both supply content to, and receive content from, other computing devices.

In this arrangement, mobile computing device **12** includes the same features and attributes of mobile computing device **12** including wireless communicator **86**, as previously described and illustrated in association with FIGS. **1**–**6**. As shown in FIG. **8**, mobile computing device **12** further includes data files **302** in memory **84**, programs **304** and virtual disc drive monitor **306**. Data files **302** include word processor files **330**, spreadsheet files **332**, presentation files **334** and generic reader files **336** (e.g, portable document files, PDF).

Web site **36** further includes includes application service provider **340** and graphics/data **342**, which provide information, goods, and/or services to mobile computing device **12**.

Multifunction printer **24** includes the following functions: print **350**; scan **352**; copy **354**; facsimile **356**; and digital sending **358**. Multifunction printer **24** further includes wireless communicator **86**, controller **81**, and optional embedded Web server **360**. Alternatively multifunction printer **24** can be replaced by a device performing any one, or more than one, of the functions **350**–**358**. Accordingly, multifunction printer **24** also represents a stand-alone printer, stand-alone copier, stand-alone scanner, stand-alone facsimile machine and/or stand-alone digital sender, or any combination of those functions in a single device or multiple devices.

Computing workstation **16** includes controller **81** with operating system **82**, wireless communicator **86**, programs **370** with word processor **372**, memory **380** with internal hard disk drive **382**, public user interface **390**, and storage media selector **392** with unrestricted access function **394** or external only access function **396**.

Mobile computing device **12** exercises selective access to, and control over, any or all features of computing workstation **16**, multifunction printer **24**, and web site **36**, to the extent permitted by those appliances **13**, for performing content **16** with user preferences **18** on those appliances **13**.

In one example, mobile computing device **12** acts as a mobile printer server in supplying documents and files to be printed at multifunction printer **24**. In particular, anyone of the types of data files **302**, such as word processing files **330**, financial spreadsheet files **332**, presentation files **334**, and generic reader files (e.g., portable document format, PDF) **336** are supplied from memory **84** of mobile computing device **12** to multifunction printer **24** for printing at the direction of mobile computing device **12**. Data monitor **202** of appliance content selector **92** (shown in FIG. **5**) facilitates selection of data files **302** in memory **84** that are printed at multifunction printer **24**.

In another example, mobile computing device **12** receives documents from a scanner such as scan function **352** of multifunction printer **24** for storage in memory **84** of mobile computing device **12**. Document scanner receiver function **234** of data monitor **202** of appliance content selector **92** facilitates receiving and handling the documents.

In another arrangement, as further shown in FIG. **8**, mobile computing device **12** optionally acts as a disc drive for computing workstation **16**. In this arrangement, virtual disc drive monitor **306** of mobile computing device **12** cooperates with storage media selector **392** of computing workstation **16** via their respective wireless communicators **86** to use mobile computing device **12** substantially the same as an internal disc drive of computing workstation **16**. Accordingly, as selectively controlled by mobile computing device **12**, computing workstation **16** accesses data files **302** including word processor files **330**, spreadsheet files **332**, presentation files **334**, and generic reader files **336**, from memory **84** of mobile computing device **12**.

In computing workstation **16**, external only access function **396** of storage media selector **392** is used to restrict file retrieval and storage of computing workstation **16** to exter-

nal devices such as mobile computing device **12**. Alternatively, unrestricted access function **394** of storage media selector **392** in computing workstation **16** permits computing workstation **16** to perform file storage and retrieval with both external media like mobile computing device **12** and internal media such as internal disc drive **382**.

This external only function **396** of storage media selector **392** of computing workstation **16**, in combination with mobile computing device **12** acting as a hard drive to computing workstation **16**, is particularly effective for allowing a user to use computing workstation **16** for editing of files on mobile computing device **12** without leaving a copy of the files on computing workstation **16**. This feature preserves the security of files on mobile computing device **12** while permitting the owner of mobile computing device **12** to conveniently use other peoples computing workstations **16**. For example, computing workstation **16** can be used to retrieve data files **302** from memory **84** of mobile computing device **12** for editing on word processor **372** of computing workstation **16**.

This document editing example can be extended to a public computing environment such as an airport. For example, public user interface **390** of computer workstation **16** provides a user interface suitable for public use such as pay-for-computing station or kiosk at an airport. Public user interface **390** causes computing workstation **16** to permit only limited access to computing workstation **16** sufficient for performing basic tasks such as word processing. Accordingly, in this environment, a user could edit files on their mobile computing device **12** by walking up to the computing workstation **16** and using mobile computing device **12** as an external hard drive to wirelessly retrieve documents from data files **302** of memory **84** of mobile computing device **12**. Using word processor **372** on computing workstation **16**, the user can edit, email, or print the documents (using printer **24**) from mobile computing device **12** without leaving a trace of those documents on the publicly located computer workstation **16**.

Public user interface **390** also optionally can be used to permit a user of mobile computing device **12** to sell their user preferences **18** (FIG. **1**) to a marketing association or other organization. To do so, mobile computing device **12** establishes communication with computing workstation **16** that is incorporated in a kiosk in a public venue (e.g., retail mall) and then uses public user interface **390** to transfer all or select portions of user preferences **18** (e.g. location, type and amount of last ten purchases, last ten phone calls including destination and source locations, etc.) to computing workstation **16** in exchange for an electronic payment made to mobile computing device **12** via electronic payment mechanism **98** of mobile computing device **12**.

Finally, in another example, instead of supplying content **16** to an appliance **13** only from memory **84** of mobile computing device **12** or selecting content that is already available in an appliance **13**, mobile computing device **12** can also obtain content from web site **36**. As shown in FIG. **7**, Web site **36** can supply content as part of a service of application service provider **340** and/or as providing graphics/data **342** as part of the web pages comprising web site **36**. Content from web site **36** can be stored on mobile computing device **12**, printed on multifunction printer **24**, and/or stored on computing workstation **16**.

The use of web site **36** as an appliance is not limited to use in association with computing workstation **16** and/or printer **24**. Content **16** obtained from web site **36**, such as portable audio files, movies, etc. can be used immediately or stored by mobile computing device **12**, and then associated with user preferences **18** of mobile computing device **12** for performance by appliances **13** such as audio device **28** or video device **14**.

Accordingly, mobile computing device **12** conveniently controls and/or facilitates various document handling tasks on appliances **13**, such as computing workstation **16** and multifunction printer **24**.

In interacting in various appliance environments such as subsystem **300** (FIG. **8**), or appliances subsystems **80** and **280** shown in FIGS. **4** and **7**, mobile computing device **12** operates user interface **90** to set and apply user preferences **18**. As shown in FIG. **9**, user interface **90** (see FIG. **4**) includes login/password function **402**, appliance grouping **404**, appliance preferences **406**, and interface environment **408**. User interface **90** optionally includes priority contention moderator **94**, which is later described in further detail in association with FIG. **10**. User interface **90** also is understood to optionally include appliance content selector **92** that is illustrated and described in association with FIG. **5**.

Given the large number and type of appliances **13** that are controllable by mobile computing device **12**, user interface **90** is provided for use on both mobile computing device **12** and appliances **13** for coordinating control of appliances **13** by mobile computing device **12**. Accordingly, user interface **90**, including appliance content selector **92**, are located on mobile computing device **12** and/or appliances **13**.

Appliance grouping **404** of user interface **90** identifies a group of appliances that form a network or association in which mobile computing device **12** has authorization for controlling appliances **13**. Appliance grouping **404** also can partially set the preferences or supply preference choices of mobile computing device **12**. Appliance grouping **404** includes location module **420**, type module **422**, and custom module **424**. Location module **420** permits an appliance group to be based on the location of appliances **13** such as kitchen **430**, office **432** and bedroom **434**. Type module **422** permits an appliance group to be based on the type of appliance **13** such as audiovisual **440**, phone **442** and household appliances **444**. Finally, custom function **424** permits a user, or appliance group administrator, to define which appliances define a group, how mobile computing device **12** gains access to that group, and which preferences are set for that group.

Appliance preferences **406** determines the preferences a user has for appliances **13** they will control. Appliance preferences **406** optionally include a set of preferences for when no other mobile computing devices **12** are present (i.e., the user is alone) and a different set of preferences for when other mobile computing devices **12** are present (i.e., other users are present). However, when user interface **90** is employed by appliance **13**, then appliance **13** can set some preferences that will influence control of that appliance **13** by mobile computing device **12**. Appliance preferences **406** includes auto activation function **460**, media selection **462** with default program and station list **464**, volume **466**, lighting level **468**, and interactions and transfers function **470**. Auto-activation function **460** determines whether appliance **13** will be automatically activated in the presence of mobile computing device **12**. In concert with appliance content selector **92**, media selection **462** determines default content selections for appliance **13**. Volume **466** and lighting level **468** determine, respectively, a desired audio volume level for content performed on mobile computing device **12** and a light level of appliance **13** when appliance **13** is so equipped. For example, volume component **466** of appliance preferences **406** optionally includes a preference to auto-

matically increase the volume of an appliance when the user is alone (i.e. no other mobile computing devices **12** are present).

Interactions and transfers function **470** of appliance preferences **406** governs content interactions and transfers between appliances **13** and mobile computing device **12**. For example, a user can set whether phone numbers stored in phone book **282** of mobile computing device **12** (see FIG. **6**) are downloaded to a TIVO-based video device **14** (FIG. **4**). This download feature can act as a robust backup system to maintain a secure copy of phone book **282** in the event that a virus attacks mobile computing device **12**. In another example, a user can use interactions and transfers function **470** to specify that phone numbers from phone book **282** of mobile phone **26** will be automatically transferred to computing workstation **16** or to another computer such as a laptop computer.

As further shown in FIG. **9**, priority contention moderator **94** (FIG. **4**) is optionally included as part of user interface **90** and operates to determine priority between mobile computing devices **12** that compete for control over one or more appliances **13**. Priority contention moderator **94**, including contention model selector **450** and contention identifier **452**, are described in greater detail in association with FIG. **10**.

Finally, interface environment **408** of user interface **90** specifies how a user prefers to enter user preference information and includes desktop entry function **480** and Web server entry function **482**. Desktop entry function **480** permits a user to access user interface **90** on a desktop computer, such as computer workstation **16**, to manually enter the preference information. Web server entry function **482** includes controller **81** of mobile computing device **12** including embedded web server **97** (FIG. **4**), i.e. that produces a web page corresponding to mobile computing device **12**. The user can use another device, such as computing workstation **16** to access the web page corresponding to mobile computing device **12** and set the preferences and/or store and retrieve content on mobile computing device **12**.

In short, user interface **90** facilitates control of appliances **13** by mobile computing device **12** by permitting specification of user preferences **18** and content selection, and by permitting electronic exchange of user preferences **18** and content selection to avoid manual entry of user preferences **18** and content selection.

As shown in FIG. **10**, priority contention moderator **94** (shown as **500**) includes contention identifier **502** and contention model selector **504**. Contention model selector **504** is configured to select one model of a plurality of models **506** of rules **508** for determining priority between mobile computing devices **12** that are competing for control for an appliance. Priority contention identifier **502** works in combination with wireless communicators **86** of mobile computing device **12** and of appliance **13** to determine if a competing mobile computing device **12** is present. If competing mobile computing devices **12** are present, then the selected model **506** determines priority between the computing devices.

Rule model **520** is a no contention model, in which no priority is established when multiple computing devices **12** are within range of appliance **13** and all mobile computing devices **12** select the same content, function, or user preference on appliance **13**. For example, no priority is established when multiple computing devices **12** desire to watch the same movie on video device **14**, such as television.

Rule model **522** is a first-in-time model in which the first mobile computing device **12** to establish communication with appliance **13** is the master of appliance **13**. The master of the appliance controls activation, preferences and content of appliance **13**.

Rule model **524** is a proximity model in which mobile computing device **12** that is the closest to the appliance controls appliance **13**. Rule model **526** is a monetary model in which the highest-paid mobile computing device **12** controls the appliance.

Rule model **528** is a self-selection model in which each mobile computing device **12** self-selects a priority, such as low, medium or high. If multiple mobile computing devices **12** have self-selected the same priority and are adjacent the single appliance, then one of the other contention models will determine priority.

Rule model **530** is a courtesy model in which mobile computing devices **12** take turns having priority over appliance **13**. In stark contrast, rule model **532** is a pay-for-priority model in which priority is gained on a purchasable volume basis from a pay-for priority Internet site. For example, the user can purchase 500 units of priority and then set a preference in their mobile computing device **12** to pay up to 300 units of priority (or any desired amount) to obtain control over an appliance. The mobile computing device **12** that offers the greatest unit volume priority for the appliance becomes the master of the appliance.

Rule model **534** is a peer-to-peer model in which two or more mobile computing devices **12** set their respective priority manually or with their own custom rules. For example, priority optionally is set by time-of-day/week/month so that one mobile computing device **12** has priority during certain times of the day, week or month. Alternatively, mobile computing devices **12** agree as to which computing device **12** carries priority over the other. For example, one courteous arrangement includes a wife's mobile computing device **12** having priority over the husband's mobile computing device **12**.

Finally, rule model **536** is a gaming rule. All contending mobile computing devices play the same game on the appliance and the winner of the game gets priority over the appliance.

FIGS. **4**, **7**, and **8** illustrate isolated subsystems of various components of an appliance control system of the present invention. However, the components of an appliance control system of the present invention can change at the discretion of the operator of mobile computing device **12** as mobile computing device **12** moves through their environment. For example, as shown in FIG. **8**, subsystem **300** included mobile computing device **12**, computing workstation **16**, multifunction printer **24** and website **36**. By simply selecting components to be included in an appliance control system of the present invention, such as subsystem **300**, or by simply walking to a different portion of a room or any other room, mobile computing device **12** can add other components to subsystem **300** such as land phone **281** (see FIG. **6**) or audio device **28** and video device **14** (FIG. **4**). Similarly, mobile computing device **12** can add other appliances **13**, such as the appliances from household appliance set **40** (see FIG. **2**). In other words, mobile computing device **12** can include or exclude as many appliances **13** as is desired to achieve an optimal control environment. The selection of which appliances to control is preferably included as one of user preferences **18** in appliance grouping function **404** of user interface **90** (FIG. **9**) so that mobile computing device **12** automatically determines which appliances **13** it will control as preferred by the user of mobile computing device **12**.

Appliances **13** optionally include controller **81** or some other form of logic operator for carrying out commands

from mobile computing device **12** and for coordinating operation with mobile computing devices **12**, such as determining priority between competing mobile computing devices **12**.

The system and method of the present invention is also not limited solely to appliances geared toward personal consumption of information. Rather, user preferences **18** can be applied from mobile computing device **12** to almost anything, such as purchase of a good or service from a dispenser. For example, a gasoline pump can act as an appliance **13** in which one user preference **18** includes a preference for premium unleaded gasoline over regular unleaded gasoline. In this instance, a user can purchase gasoline with mobile computing device **12** which automatically selects premium gasoline at a gasoline pump, or selects premium gasoline if it does not cost a set price difference more than regular gasoline (e.g. **15** cents more). Using electronic payment mechanism **98**, mobile computing device **12** uses credit card information or other financial institution information for making wireless payment to the gas pump. Accordingly, both the selection of the type of gasoline and payment of the transaction are carried out automatically through user preferences **18** of mobile computing device **12**.

Mobile computing device **12** (FIG. **1**) optionally further includes a user preference auto manager **550** as shown in FIG. **11**. Auto manager **550** includes a plurality of models **552** for automatically applying user preferences to appliances **13**, as expressed in rules **554**. Auto manager **550** also includes sensory control profiles **556** and default sensory parameters **558**, each used for implementing models **552**. In particular, these models **552** are used by mobile computing device **12** to automatically apply to user preferences to appliances that are unrecognized by mobile computing device **12** so that the user/owner of mobile computing device **12** need not manually determine and set user preferences for the unrecognized appliance. An unrecognized appliance is either a new appliance (never-been-used-before) or an appliance that has been previously controlled by other mobile computing devices, but not by mobile computing device **12**. Moreover, unrecognized appliances can even include an appliance previously controlled by mobile computing device **12** that has been updated with additional features or newer features not previously controlled by mobile computing device **12**. Accordingly, with user preference auto manager **550** of the present invention, user preferences **18** are transposed across appliances **13** so that users can avoid manual transactions with appliances **13**, effectively bypassing the user interfaces of the appliances **13**.

Models **552** include sensory control model **560**, last settings model **562**, play-and-learn model **564**, master appliance model **566**, sensory parameter model **568**, and similar owner model **570**.

In sensory control model **560**, mobile computing device **12** includes in memory **84** (or within an accessible database) a sensory control profile **556** of appliances **13** that have been previously controlled by one or more mobile computing devices **12**. Sensory control profile **556** is part of user preferences **18** for each appliance **13** and identifies a desired appliance setting for each human sensory capability. For example, sensory control profile **556** for a television includes a preferred volume setting for auditory senses and a preferred color tint for visual senses. Sensory control profile **556** includes a complete set of preferred appliance settings for the full range of human sensory capabilities that are applicable for that appliance. A method for implementing sensory control model **560** is described and illustrated more completely in association with FIG. **12**.

In last settings model **562**, mobile computing device **12** applies the last settings on unrecognized appliance **13** (that were used by a previous user of the unrecognized appliance) as user preferences **18** for mobile computing device **12**. Alternatively, mobile computing device **12** applies the settings on appliance **13** that correspond to the longest duration of use of appliance **13**.

In play-and-learn model **564**, the user indicates to mobile computing device **12** that user will play with the settings of unrecognized appliance **13**. Mobile computing device **12** monitors the settings of appliance **13** during this play period and once the desired settings on appliance **13** are achieved by the user, mobile computing device **12** applies those settings as user preferences **18** to appliance **13** and stores those settings in memory **84** as user preferences **18** for that appliance **13**.

In master appliance model **566**, mobile computing device **12** is used to identify a master appliance that has a known set of user preferences. Mobile computing device **12** is instructed to apply that set of user preferences **18** to all unrecognized appliances **13**.

In sensory parameter model **568**, the user sets user preferences **18** to include default sensory parameters **558** in mobile computing device **12** for each human sensory capability (e.g., auditory, visual, touch, smell, etc.) independent of any particular appliance **13**. For example, the auditory sensory setting includes at least a single volume setting for all appliances while the visual sensory setting includes at least a color setting and a light intensity setting. Accordingly, upon encountering an unrecognized appliance, mobile computing device **12** applies its user preferences **18** as a plurality of default sensory parameters **558** to appliance **13** simultaneously. Each default sensory parameter **558** is applied to appliance **13** independently of other default sensory parameters **558**.

In similar owners model **570**, upon encountering an unrecognized appliance **13**, mobile computing device **12** applies user preferences **18** of similar appliances to the unrecognized appliance. In particular, as more fully described in association with FIG. **13**, mobile computing device **12** obtains a set of user preferences **18** from a database of user preferences of owners of other mobile computing devices that are similar to the owner of mobile computing device **12**. In particular, the similarity can focus on the tastes, habits, cultural, and socio-economic attributes between respective owners.

As shown in FIG. **12**, sensory control model **560** is more fully expressed in method **600** of applying user preferences using sensory control profiles. In a first step **602** of method **600**, mobile computing device **12** identifies unrecognized appliance **13** as an appliance that has never been controlled by any mobile computing device or that has not been previously controlled by mobile computing device **12**. Next, mobile computing device **12** assesses sensory control profile **556** of the unrecognized appliance (step **604**). This assessment further includes identifying each distinct human sensory capability (e.g., auditory, visual, touch, etc,) that the appliance interacts with (step **606**). For example, a visual sensory parameter can include preferred lighting levels and color schemes while touch sensory parameters includes air temperature, wet/dry sensations, surface temperature, etc.

After this sensory control assessment in step **606**, mobile computing device **12** accesses database **610** of user preferences **18** for other appliances to find an appliance with a sensory control profile **556** that is most similar to the

unrecognized appliance (step **608**). In a final step **612**, mobile computing device **12** applies user preferences **18** as sensory control profile **556** to unrecognized appliance **13** from the most similar appliance in database **610**. In addition, an optional feedback pathway **620** stores user preferences **18** of mobile computing device **12** that are applied to unrecognized appliance **13** in database **610** for future use by other mobile computing devices **12** and appliances **13**.

Similar owner model **570** is more completely described and illustrated in association with FIG. **13** as method **650**. In first step **652** of method **650**, mobile computing device **12** establishes a wireless communication link with appliance **13**. Mobile computing device **12** then determines whether it has a user preference **18** for appliance **13** (step **654**). If the answer is yes, then step **656** includes mobile computing device **12** applying a known user preference **18** of mobile computing device **12** to appliance **13**. If no user preference is known in mobile computing device **12** for appliance **13**, then appliance **13** is an unrecognized appliance **13**. Accordingly, in step **658**, mobile computing device **12** and/or appliance **13** accesses the internet and/or memory **84** of mobile computing device **12** to access a database **662** of user preferences **18** for known appliances **13** that are similar to the unrecognized appliance **13**. In particular, mobile computing device **12** selects a set of user preferences from database **662** that is based on the similarity of the user/owner of mobile computing device **12** to other users/owners of mobile computing devices that have, or use, unrecognized appliance **13** (i.e., that is unrecognized to mobile computing device **12**). Once a user preference **18** of a similar owner is identified from database **662**, then step **664** includes mobile computing device **12** applying the database-selected user preference **18** to new/unrecognized appliance **13**. Finally, optional feedback pathway **668** permits the database-selected user preference **18** to be stored in database **662** association with user/owner of mobile computing device **12** for future use by other user/owners of mobile computing device **12**. This new user preference **18** is also preferably stored in memory **84** of mobile computing devices **12** in an existing library of user preferences.

A system and method of the present invention carries numerous advantageous features. Foremost, a mobile computing device becomes the master of appliances in its environment, controlling content and user preferences. Previously, personal information, such as user preferences as well as content, was fragmented in isolation among many appliances. This information is now centralized and integrated into a single unified master controller, the mobile computing device. Moreover, selected content is performed on one or more appliances simultaneously, with performance of content switching between suitable appliances when mobile computing device moves away from one appliance toward another appliance. When performance is interrupted from one appliance by mobile computing device to be switched to another appliance, the continuity of performance of the content is maintained by the mobile computing device among and across multiple appliances.

While specific embodiments have been illustrated and described, herein for purposes of description of the preferred embodiment, it will be appreciated by those of ordinary skill in the art that a wide variety of alternate and/or equivalent implementations may be substituted for the specific embodiments shown and described without departing from the scope of the present invention. Those with skill in the chemical, mechanical, electro-mechanical, electrical, and computer arts will readily appreciate that the present invention may be implemented in a very wide variety of embodiments. This application is intended to cover any adaptations or variations of the preferred embodiments discussed herein. Therefore, it is manifestly intended that this invention be limited only by the claims and the equivalents thereof.

What is claimed is:

1. A computer-readable medium having encoded computer-executable instructions for performing a method of setting and applying user preferences for controlling an appliance with a mobile computing device, the method comprising:

grouping the appliances, to carry substantially the same user preferences, by at least one of an appliance location, an appliance type and custom criteria;

automatically performing select tasks with the appliances with at least one of the following user-determined functions: volume level, lighting level, file interactions and file transfers, appliance auto-activation, and default media selections including default program and default station lists; and

entering the user preferences for storage in the mobile computing device from at least one of computer workstation and another appliance via a web page of an embedded web server of the mobile computing device.

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