IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF PENNSYLVANIA

CASE MANAGEMENT TRACK DESIGNATION FORM

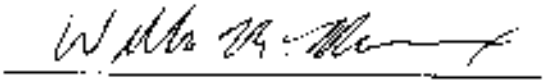
JOHN GAMMING	:	CIVIL ACTION
	:	
v.	:	
	:	
VERIZON COMMUNICATIONS, INC., ET AL.	:	NO.

In accordance with the Civil Justice Expense and Delay Reduction Plan of this court, counsel for plaintiff shall complete a Case Management Track Designation Form in all civil cases at the time of filing the complaint and serve a copy on all defendants. (See § 1:03 of the plan set forth on the reverse side of this form.) In the event that a defendant does not agree with the plaintiff regarding said designation, that defendant shall, with its first appearance, submit to the clerk of court and serve on the plaintiff and all other parties, a case management track designation form specifying the track to which that defendant believes the case should be assigned.

SELECT ONE OF THE FOLLOWING CASE MANAGEMENT TRACKS:

(a)	Habeas Corpus -- Cases brought under 28 U.S.C. §2241 through §2255.	( )
(b)	Social Security -- Cases requesting review of a decision of the Secretary of Health and Human Services denying plaintiff Social Security Benefits.	( )
(c)	Arbitration -- Cases required to be designated for arbitration under Local Civil Rule 8.	( )
(d)	Asbestos -- Cases involving claims for personal injury or property damage from exposure to asbestos.	( )
(e)	Special Management -- Cases that do not fall into tracks (a) through (d) that are commonly referred to as complex and that need special or intense management by the court. (See reverse side of this form for a detailed explanation of special management cases.)	(X)
(f)	Standard Management -- Cases that do not fall into any one of the other tracks.	( )

October 6, 2003
(Date)



Attorney-at-law

K. Mark Mullineaux

Attorney for Plaintiff

(Civ. 660)
1/92

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF PENNSYLVANIA

JOHN R. GAMMINO	:	
Plaintiff	:	CIVIL ACTION NO.
v.	:	
VERIZON COMMUNICATIONS, INC.,	:	JURY TRIAL DEMANDED
VERIZON PENNSYLVANIA, INC.,	:	
VERIZON NEW JERSEY, INC.,	:	
VERIZON NEW YORK, INC.,	:	
VERIZON DELAWARE, INC.,	:	
VERIZON CALIFORNIA, INC.,	:	
VERIZON FLORIDA, INC.,	:	
VERIZON HAWAII, INC.,	:	
VERIZON MARYLAND, INC.,	:	
VERIZON VIRGINIA, INC.,	:	
VERIZON WASHINGTON DC, INC.,	:	
VERIZON WEST VIRGINIA, INC.,	:	
VERIZON NEW ENGLAND, INC.,	:	
VERIZON NORTH, INC.,	:	
VERIZON NORTHWEST, INC.,	:	
VERIZON SOUTH, INC.,	:	
GTE SOUTHWEST, INC.,	:	
DBA VERIZON SOUTHWEST,	:	
CONTEL OF THE SOUTH, INC.,	:	
DBA VERIZON MID-STATES	:	
GTE MIDWEST, INC.	:	
DBA VERIZON MIDWEST,	:	
PUERTO RICO TELEPHONE CO., INC.	:	
Defendants	:	

COMPLAINT

Plaintiff, John R. Gammino, ("Mr. Gammino") by his attorneys, Flamm, Boroff & Bacine, P.C., makes this Complaint against Defendants, Verizon

Communications, Inc., and all of the above-captioned subsidiaries of Verizon Communications. Inc.

PARTIES

1. Plaintiff, John R. Gammino, is an adult individual and a resident of the State of Florida and operates his patent licensing business out of the Commonwealth of Pennsylvania.

2. Defendant Verizon Communications, Inc. is a corporation organized and existing under the laws of the State of Delaware with a regular and established place of business at 1515 Market Street, Suite 1210, Philadelphia, PA 19102.

3. The following Defendants are subsidiaries of Verizon Communications, Inc. and they are incorporated under the laws of the States listed below with registered offices listed below:

Corporate Name	Incorporated	Registered Office
Verizon New Jersey, Inc.	NJ	c/o Bruce D. Cohen 540 Broad Street, 20th Floor Newark, NJ 07102-3178
Verizon Pennsylvania, Inc.	PA	1717 Arch Street, 32nd Floor Philadelphia, PA 19103
Verizon New York, Inc.	NY	c/o CT Corporation System 111 Eighth Avenue New York, NY 10011
Verizon Delaware, Inc.	DE	c/o The Corporation Trust Company Corporation Trust Center 1209 Orange Street Wilmington, DE 19801

Corporate Name	Incorporated	Registered Office
Verizon California, Inc.	CA	c/o CT Corporation System 818 West Seventh Street Los Angeles, CA 90017
Verizon Florida, Inc.	FL	c/o CT Corporation System 1200 South Pine Island Road Plantation, FL 33324
Verizon Hawaii, Inc.	HI	c/o Warren H. Haruki 1177 Bishop Street Honolulu, HI 96813
Verizon Maryland, Inc.	MD	c/o Robert D. Lynd 1 East Pratt Street Constellation Place Baltimore, MD 21202
Verizon Virginia, Inc.	VA	c/o Robert W. Woltz, Jr. 600 E. Main Street, Suite 1100 Richmond, VA 23219
Verizon Washington DC, Inc.	NY	c/o CT Corporation System 111 Eighth Avenue New York, NY 10011
Verizon West Virginia, Inc.	WV	c/o Gale Y. Given 1500 MacCorkle Avenue Charleston, WV 25314
Verizon New England, Inc.	NY	c/o CT Corporation System 111 Eighth Avenue New York, NY 10011
Verizon North, Inc.	WI	c/o CT Corporation System 8025 Excelsior Drive, Suite 200 Madison, WI 53717
Verizon Northwest, Inc.	WA	c/o CT Corporation System 520 Pike Street Seattle, WA 98101

Corporate Name	Incorporated	Registered Office
Verizon South, Inc.	VA	c/o Commonwealth Legal Services Corporation 4701 Cox Road, Suite 301 Glen Allen, VA 23060-6802
GTE Southwest, Inc. d.b.a. Verizon Southwest	DE	c/o The Corporation Trust Company Corporation Trust Center 1209 Orange Street Wilmington, DE 19801
Puerto Rico Telephone Co., Inc.	PR	c/o Joaquin Marquez 1500 "K" Street NW Suite 1100 Washington, DC 20005-1209
Contel of the South, Inc. d.b.a. Verizon Mid-States	GA	c/o CT Corporation System 1201 Peachtree Street NE Atlanta, GA 30361
GTE Midwest, Inc. d.b.a. Verizon Midwest	DE	c/o The Corporation Trust Company Corporation Trust Center 1209 Orange Street Wilmington, DE 19801

The above-listed subsidiary corporations at times are collectively referred to herein as "Verizon Subsidiaries." Further, Verizon Subsidiaries together with Verizon Communications, Inc., at times are collectively referred to herein as "Verizon."

JURISDICTION AND VENUE

4. This Court has jurisdiction over the subject matter of this action pursuant to the provisions of 28 U.S.C. §§ 1331 and 1338, in that the claims in this action arise under the Patent Act of the United States, 35 U.S.C. §101 et seq.

5. Venue in the Eastern District of Pennsylvania is proper pursuant to (a) 28 U.S.C. §1391(b)(2) in that a substantial part of the events or omissions giving rise to the claim occurred in this district; and (b) 28 U.S.C. §1400(b) in that this is a civil action for patent infringement and each Defendant either (i) resides in this judicial district, (ii) committed acts of infringement in this judicial district, and/or (iii) has a regular and established place of business in this judicial district. including Defendants that have established a place of business and/or infringed in this district by operating in concert with the other Defendants or operating as one functioning entity with the other Defendants.

6. This Court has jurisdiction over Verizon Communications, Inc. and the Verizon Subsidiaries and venue is proper because Verizon Communications, Inc. and the Verizon Subsidiaries, operating either in concert or effectively as one functioning entity regularly conduct business in Pennsylvania and this judicial district by providing services to its customers situated therein and elsewhere. It is these services, provided by Verizon Communications, Inc. and the Verizon Subsidiaries, which serve as the basis for the patent infringement claim against Verizon Communications, Inc. and the Verizon Subsidiaries in this Complaint.

7. As an example of Verizon Communications, Inc. and the Verizon Subsidiaries effectively acting as one functioning entity, when a customer receives a bill for services for a phone in Pennsylvania, the customer does not receive a bill from the subsidiary defendant, Verizon Pennsylvania, Inc. but receives a bill from "Verizon."

8. In addition, Verizon Communications, Inc. and the Verizon Subsidiaries interact and conduct business with the public over the Internet on its Website (www.verizon.com) (the "Verizon Website"), which engages the residents of this judicial district in business and consumer transactions. Through the Verizon Website, residents of the Commonwealth of Pennsylvania and this judicial district contract regularly and directly with "Verizon" without reference to any of the subsidiaries that may provide the actual service. In fact, upon information and belief, in order to purchase services from any of the Verizon Subsidiaries online, a Pennsylvania customer would be compelled to visit the Verizon Website. In other words, a Pennsylvania resident, situated in this judicial district has the ability to contract directly with Verizon or any of the Verizon Subsidiaries listed above without ever leaving the jurisdiction, simply by typing www.verizon.com into the computer keyboard. This active solicitation by Verizon and the Verizon Subsidiaries indicates that Verizon has intentionally targeted the Commonwealth of Pennsylvania and this judicial district and tailored its services to the needs of the residents situated therein. Additionally, the potentially thousands of contracts that are formed over the Verizon Website on a daily basis provide evidence that Verizon Communications, Inc. and all of the Verizon Subsidiaries have continuous and systematic contacts with the Commonwealth of Pennsylvania and this judicial district.

9. Moreover, all Verizon Subsidiaries have customers who use phone services of that subsidiary to make telephone calls into Pennsylvania. At least subsidiaries Verizon Pennsylvania, Inc. and Verizon North, Inc. have customers

situated in Pennsylvania who use the phone services in Pennsylvania, and all Verizon Subsidiaries operate "switches" which have an impact on calls in and out of Pennsylvania. Also, the Verizon Subsidiaries sell mobile phones, which are used in Pennsylvania and the use in Pennsylvania is serviced by Verizon Subsidiaries.

BACKGROUND FACTS AND INVENTION

10. In this country, there had been a major problem of people making fraudulent international telephone calls on payphones and other devices. That fraud led to losses of billions of dollars to telecommunications companies.

11. The international pay phone fraud escalated in the early 1990s after the FCC pursuant to new federal law prohibited Verizon and others from blocking access codes that permit the consumer to reach the operator service provider of the consumer's choice. Once the access codes were unblocked in payphones and at certain other locations, the fraudulent use of payphones for international calls skyrocketed. At certain payphone sites, losses due to international calls were reaching an average of $1,500 a month per phone. Fortunately, Mr. Gammino invented a solution that prevents that fraud.

12. In 1991, the Port Authority of New York and New Jersey (the "Port Authority") had massive fraud problems with international calls on payphones, particularly at the Port Authority Bus Terminal in New York City. The Port Authority brought in major phone companies including New York Telephone (which is now part of Verizon and will be referred to herein as "Verizon") to solve the problem. Verizon could not solve the Port Authority's fraud problem. The

Port Authority said that, "New York Telephone (now Verizon) and others were telling us that a solution to our problem was not technically possible." See Declaration of Ken Philmus of the Port Authority, dated April 2, 1994, attached as Exhibit "A," at pages 2-3.

13. In 1991, John Gammino was hired by the Port Authority to try and do what no one else could do – stop the fraud.

14. Mr. Gammino virtually eliminated international payphone fraud at the Bus Terminal. The solution invented by Mr. Gammino comprises an algorithm that can distinguish international calls from other types of calls and can selectively block international calls (the "Solution"). The Solution received extensive and positive press coverage in 1992 and 1993. More specifically, a leading publication in the industry, Public Communications Magazine, in May 1993 recognized that it was Mr. Gammino's Solution that solved the problem. Other press reports also recognized Mr. Gammino's solution to the Port Authority's fraud problem.

15. The Port Authority recognized Mr. Gammino's Solution when it said the following in a letter to Mr. Gammino:

> [T]he telephone hustler problem has been virtually eliminated at the Bus Terminal due to the technological changes you [Mr. Gammino] were able to have implemented. This problem had been plaguing us for several years and we were frustrated by the lack of a technological solution.

See Port Authority letter of July 28, 1992, attached as Exhibit "B". (Emphasis supplied).

16. Only Mr. Gammino solved the fraudulent international payphone problem while the telecommunications giants, including Verizon, could not solve the problem.

17. In 1992, Mr. Gammino's Solution was placed into all of the payphones at the Bus Terminal, including those owned by Verizon.

PATENTS

18. Mr. Gammino filed for patent protection for the Solution, which ultimately resulted in U.S. Patent No. 5,809,125 ("the '125 Patent") being duly and legally issued to Mr. Gammino on September 15, 1998, and U.S. Patent No. 5,812,650 ("the '650 Patent") being duly and legally issued to Mr. Gammino on September 22, 1998 (collectively, the "Gammino Patents"). Copies of the Gammino Patents are attached hereto, made a part hereof, and marked as Exhibits "C" and "D", respectively. Hereinafter, for the time period after September 15, 1998, the Solution shall be referred to as the "Patented Solution."

19. The '125 Patent and '650 Patent relate to methods and apparatus for preventing potentially fraudulent international telephone calls.

20. A telephone call is initiated by dialing a sequence of digits. Each dialing sequence is made up of a "plurality" of dialing signals. A plurality is a set of two or more signals. For example, someone might dial "101-0288-011-41-21-619-0670" to attempt an international call using AT&T as the carrier (AT&T's code is 0288). For this example in that call, the first plurality (or set) could be 101 which is an access code to provide access to carriers, the second plurality could be 0288 which is a code identifying AT&T as the carrier desired, and the

third plurality could be 011 which is a code that indicates that the call is a direct dialed international call. As additional examples, the plurality of dialing signals are further shown in the following formulas (X is a "don't care"[1] value):

101 First plurality of dialing signals	XXXX Second plurality of dialing signals	011 Third plurality of dialing signals
950 First plurality of dialing signals	XXXX Second plurality of dialing signals	011 Third plurality of dialing signals
1-800 First plurality of dialing signals	XXX-XXXX Second plurality of dialing signals	011 Third plurality of dialing signals

As an example, in at least one of the claims of the '125 or '650 Patents a call is blocked if, inter alia, the first plurality of dialing signals are determined to be predetermined signals and the third plurality of dialing signals are determined to be predetermined signals used for international dialing.

COUNT I

PATENT INFRINGEMENT OF UNITED STATES PATENT NO. 5,809,125

21. The averments in paragraphs 1 through 20 above are incorporated herein by reference.

22. In 1992, Verizon received Mr. Gammino's Solution and Verizon put the Solution in its payphones.

[1] "Don't care" value means that, for purposes of determining whether to block a call, it does not matter what the value is in that position. Of course, a caller and a carrier like AT&T care about the "don't care" values for other purposes, such as identifying the carrier.

23. Verizon Communications, Inc. and Verizon Subsidiaries have used and continue to use Mr. Gammino's Patented Solution across the United States in order to prevent fraudulent international telephone calls, resulting in millions of dollars in savings.

24. Verizon Communications, Inc. and the Verizon Subsidiaries offer the Patented Solution for a profit and collect revenues from others in connection with the deployment of the Patented Solution in pay phones and other devices.

25. Verizon is using the methods in the claims of '125 Patent and '650 Patent in its payphones, network switches, PBX lines, Centrex lines, Business Exchange lines and other lines. Further, there is probable cause to believe that Verizon is using the Patented Solution with its wireless phones and that belief will be confirmed in discovery. Verizon's use of the claims of the Gammino Patents is massive.

26. In a letter dated April 16, 1992 (Exhibit "E") from Verizon to the Port Authority, Verizon said it would implement international call blocking. Verizon stated:

> "In developing software that will block specific international calls, we propose to screen the following All Calls Dialed (sic):
>
> 10xxx – 01
> 950-10xx-01
> 1800 – xxx – xxxx - 01
> 800 – xxx - xxxx – 01
> 950 – 10xx – 809
> 1800 – xxx – xxxx – 809
> 800 – xxx – xxxx – 809

See Exhibit "E"

27. After Verizon sent its letter of April 16, 1992 (Exhibit E), Verizon used some or all of the formulas in that letter.

28. The formulas in Verizon's letter of April 16, 1992 have a first plurality of predetermined dialing signals and a third plurality of dialing signals that are predetermined signals used for international dialing. This is demonstrated by the formula of 10xxx-01 with 10 being the first plurality of predetermined dialing signals and with 01 being the third plurality of dialing signals that are predetermined signals used for international calls.

29. In filed FCC tariffs, Verizon has disclosed it offers an International Direct Dial Blocking Service. That service is used to block any attempt to dial the international direct dial sequence of 011+ or 101xxxx011+. In one of those tariffs, Verizon reports that:

> This arrangement recognizes and blocks, by routing such calls to a recorded announcement, any attempt to dial international direct dialed sequences of 011+ or 101xxxx 011+.

See Exhibit "F", Verizon Tariff FCC No. 11. original page 13-18.

30. Verizon's tariff formula of 101xxxx-011 has a first plurality of predetermined dialing signals (101) and a third plurality of dialing signals that are predetermined signals used for international dialing (011).

31. Verizon infringed the '125 Patent and '650 Patent with its international direct dial blocking service.

32. Recent onsite testing of Verizon payphones by using the dialing sequences has confirmed that Verizon still blocks international calls by using the Patented Solution.

33. As a result of the foregoing conduct, Verizon Communications, Inc. and the Verizon Subsidiaries infringe one or more of the claims of the '125 Patent under 35 U.S.C. §271(a) and have caused Mr. Gammino damages as a direct and proximate result thereby. Verizon Communications, Inc. and the Verizon Subsidiaries are jointly and severally liable to Mr. Gammino for all damages suffered by Mr. Gammino as a result of the infringement of the '125 Patent including lost income, profits, and/or royalties, the elimination and/or reduction of business opportunities, market erosion, and other damages.

34. Based upon Verizon's own data concerning the number of its public lines, the fact that all of those lines have international call blocking, and what Verizon charges its customers for that service, Mr. Gammino's damages for Verizon's infringement of both the '125 Patent and '650 Patent include, but are not limited to, the loss of $66,168,352 in royalty fees resulting from Verizon's use of the Patented Solution in 486,532 public lines ("Public Line Use Damages"). Mr. Gammino's damages further include the loss of millions of dollars in royalty fees resulting from Verizon's use of the Patented Solution in some portion of its more than 19 million business lines and in some portion of its more than 36 million residential lines, plus royalty fees that are due in the event that Verizon uses the Patented Solution with wireless phones or with any other service.

COUNT II

PATENT INFRINGEMENT OF UNITED STATES PATENT NO. 5,812,650

35. The averments in paragraphs 1 through and including 34 above are incorporated herein by reference

36. The actions of Verizon Communications, Inc. and the Verizon Subsidiaries as set forth above constitute infringements of one or more of the claims of the '650 Patent under 35 U.S.C. §271(a) and have caused Mr. Gammino damages as a direct and proximate result thereby. Verizon Communications, Inc. and the Verizon Subsidiaries are jointly and severally liable to Mr. Gammino for all damages suffered by Mr. Gammino as a result of the infringement of the '650 Patent including lost income, profits, and/or royalties, the elimination and/or reduction of business opportunities, market erosion, the Public Line Use Damages, and other damages.

COUNT III

INDUCEMENT TO INFRINGE OF UNITED STATES PATENT NO. 5,809,125

37. The averments set forth in paragraphs 1 through 36 above are incorporated herein by reference.

38. The actions of Verizon Communications, Inc. and Verizon Subsidiaries as set forth above constitute an active inducement to infringe the '125 Patent under 35 U.S.C. §271(b) and have caused Mr. Gammino damages as a direct and proximate result thereby. Verizon Communications, Inc. and the Verizon Subsidiaries are jointly and severally liable to Mr. Gammino for all damages suffered by Mr. Gammino as a result of the infringement of the '125 Patent including lost income, profits, and/or royalties, the elimination and/or reduction of business opportunities, market erosion, the Public Line Use Damages, and other damages.

COUNT IV

INDUCEMENT TO INFRINGE OF UNITED STATES PATENT NO. 5,812,650

39. The averments set forth in paragraphs 1 through 38 above are incorporated herein by reference.

40. The actions of Verizon Communications, Inc. and Verizon Subsidiaries as set forth above constitute an active inducement to infringe the '650 Patent under 35 U.S.C. §271(b) and have caused Mr. Gammino damages as a direct result and proximate result thereby. Verizon Communications, Inc. and the Verizon Subsidiaries are jointly and severally liable to Mr. Gammino for all damages suffered by Mr. Gammino as a result of the infringement of the '650 Patent including lost income, profits, and/or royalties, the elimination and/or reduction of business opportunities, market erosion, the Public Line Use Damages, and other damages.

WHEREFORE, Plaintiff John R. Gammino prays:

(a) that Verizon Communications, Inc. and the Verizon Subsidiaries be adjudged to have infringed United States Letters Patent No. 5,809,125;

(b) that Verizon Communications, Inc. and the Verizon Subsidiaries be adjudged to have infringed United States Letters Patent No. 5,812,650;

(c) that Verizon Communications, Inc. and the Verizon Subsidiaries, their respective officers, agents, servants, employees and attorneys, and those persons in active concert or participation with them who

receive actual notice of the Order, be preliminarily and permanently enjoined from infringing United States Letters Patent No. 5,809,125:

(d) that Verizon Communications, Inc. and the Verizon Subsidiaries, their respective officers, agents, servants, employees and attorneys, and those persons in active concert or participation with them who receive actual notice of the Order, be preliminarily and permanently enjoined from infringing United States Letters Patent No. 5,812,650;

(e) that Verizon Communications, Inc. and the Verizon Subsidiaries account for damages to John R. Gammino for its infringement of United States Letters Patent No. 5,809,125;

(f) that Verizon Communications, Inc. and the Verizon Subsidiaries account for damages to John R. Gammino for its infringement of United States Letters Patent No. 5,812,650;

(g) that the damages in this judgment be trebled in accordance with 35 U.S.C. §284 for the willful and deliberate infringement of United States Letters Patent No. 5,809,125;

(h) that the damages in this judgment be trebled in accordance with 35 U.S.C. §284 for the willful and deliberate infringement of United States Letters Patent No. 5,812,650;

(i) that John R. Gammino be awarded punitive and exemplary damages against Verizon Communications, Inc. and the Verizon Subsidiaries;

(j) that an assessment be awarded to plaintiff of interest on the damages so computed;

(k) that the Court declare this case exceptional and award John R. Gammino his reasonable attorney fees and costs pursuant to 35 U.S.C. §285: and

(l) that John R. Gammino receive such other and further relief as this Honorable Court shall deem just and proper.

JURY TRIAL DEMANDED

FLAMM, BOROFF & BACINE, P.C.

BY: _____

W. MARK MULLINEAUX
Attorney I.D. No. 40964
RICHARD J. JOYCE
Attorney I.D. No. 85520
925 Harvest Drive, Suite 220
Blue Bell, PA 19422
(215) 239-6000

Attorneys for Plaintiff

EXHIBIT A

OAM 312

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: John R. Gerling : Art Unit 2641
Serial No.: 08/186,420 : Examiner: A. Matar
Filed: January 26, 1994 :
FOR: METHOD AND APPARATUS FOR :
INTERCEPTING POTENTIALLY :
FRAUDULENT TELEPHONE CALLS

DECLARATION UNDER 37 C.F.R. 1.132

Honorable Commissioner of Patents and Trademarks
Washington, D.C. 20231

S I R :

I, Tom Whitney, am Manager of the Port Authority Bus Terminal located in New York City. I was previously Program Director of the Comprehensive Improvement Program of the Port Authority Bus Terminal. I have held these positions for over two years.

When I came to the Port Authority Bus Terminal, one of the most difficult and seemingly irresolvable problems facing us was international pay telephone fraud. The problem has existed and remained unresolved for years (See New York Times, Phone Codes; Newest Scam on the Street, May 18 1987, Section A, Page 1, Column 1). The bus terminal had unfortunately become one of, if not the, primary retail center in New York City for criminals to offer lengthy international telephone calls to the general public for minimal prices. These calls were made through our extensive pay telephone system at the bus

GAK-312

terminal with stolen credit card numbers. The problem, however, went much deeper than simply having to cope with this scam. Despite having over a hundred and fifty pay phones in the terminal, the legitimate customers were finding it almost impossible to gain access to a phone when needed. Even worse, a very significant amount of multilateral crime was developing related to the international scam as disputes arose between the sellers of the illegal service and their customers.

Because police action was proving ineffective and costly for solving this problem, we suggested the cooperation of several telecommunications companies in order to assist us. For example, we discussed this problem at a meeting attended by long distance service providers which took place during the fall of 1991 (See letter from me to John Cummins of February 11, 1992). As you can see, the attendees included representatives from AT&T, Sprint, MCI, and New York Telephone. Despite their technical expertise, many of the companies represented at that meeting were able at the time to develop a solution to the telephone fraud problem which we were experiencing.

This is not to say that the companies did not try. For example, as shown by the internal memorandum (dated February 17, 1992) between myself and Ed Barker (Police Deputy Inspector), an agreement was reached with AT&T to block direct international calling from our facility's pay phones. However, this proved to be only a very temporary solution as the scammers utilized access to other long distance carriers, such as MCI and Sprint to make their way around AT&T. Furthermore, New York

Telephone and others were telling us that a solution to our problem was not technically possible.

What we finally did adopt, as enunciated in the March 27, 1992 letter from Carol Bolcher to Thomas Peterson, was the development of software that will block international calls while permitting interstate and intrastate calls when the user dials 10XXX, 950 or 800 to reach an interstate carrier. Specifically, as indicated by that letter, we wanted the following sequences of digits to be recognized and screened.

a) 10XXX 01
b) 950-10XX 01
c) 1 800-XXX XXXX-01.

This solution was recommended to us by John Cummino.

Within two days of the implementation of John Cummino's solution on our telephones (and without any other changes at the GSA Terminal), the noise literally disappeared from the building (see letter from Carol Bolcher to John Cummino of July 28, 1992). We have regained control of our terminal's payphones. Our commuter customers can now get to pay phones to make legitimate calls.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like

GAM-017

- 1 -

so made are punishable by fine or imprisonment or both under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent which may issue thereon.

Respectfully Submitted,

Kathleen Gallinaro
Manager, Corporate Intellectual Property Department
420 Lexington Avenue
New York, New York 10170
(212) 490-2418

Date

LEA/sb
Encls: Letters of 9/10/97, 9/11/97, 9/15/97, & 9/25/97
Memorandum & List of Addresses

Dated: April 26, 1998

500 N. Gulph Road
P.O. Box 980
Valley Forge, PA 19482
(610) 265-5656

May 13, 1997, Tuesday, Late City Final Edition

SECTION: Section A; Page 1, Column 1; Metropolitan Desk

LENGTH: 1281 words

HEADLINE: PHONE CODES: NEWEST SCAM ON THE STREET

BYLINE: By ROBERT D. McFADDEN

BODY:

At bus and rail terminals and other pockets of anonymity in cities across the country, a new breed of hustler has made an appearance as the point man of a fast-growing, multimillion-dollar scam selling illicit long-distance telephone calls.

With the aggressive, sometimes falsely solicitous patter of hustlers who sell sex and drugs, these high-tech vagabonds seek out prospective customers at banks of pay telephones with offers of calls of unlimited duration at black-market rates.

At the Port Authority Bus Terminal in midtown Manhattan, hustlers charge $1 for calls anywhere in the country and as little as $4 for calls almost anywhere in the world. The hustlers do the dialing, using billing codes stolen from long-distance telephone companies by computer hackers and distributed through loose networks of middlemen in much the same way that drugs are trafficked.

The best customers are immigrants, shady entrepreneurs and others who know it is a crime but find it hard to resist what they call cheap reliable, no-frills telephonic service. Like patrons of a drug pusher, they wait for the hustlers, furtively buy calls and speak for hours to faraway relatives, friends and business associates.

"It's a serious business for all the telephone companies, including us," said John Houser, a spokesman for the MCI Telecommunications Corporation, one of the long-distance companies that have arisen in recent years since the breakup of the American Telephone and Telegraph Company.

While total losses to the scam are unknown, experts say it accounts for a substantial portion of the nation's $500 million annual cost of illegal calls. Long-distance companies — and indirectly the millions of clients who subscribe to them — are the victims. Neither the clients nor the recipients of calls are charged for them because there is no proof they were aware the calls were made fraudulently, officials say.

Sophisticated Methods

Hundreds of phone hustlers have been arrested across the country, including 150 in New York City alone last year. But the police assign a low priority to catching them and phone companies, despite aggressive crackdown efforts, have been overwhelmed by the volume of the calls and by the sophisticated methods of the hustlers.

According to the Communications Fraud Control Association, an independent group formed by MCI, U S Sprint and AT&T in 1986 to fight crimes involving communications, the phone hustlers gravitate to the action - especially to cities with large immigrant populations.

Raul S. Abuwarda, the association's executive director, said the fraud had mushroomed in the last two years with the growth of long-distance telephone companies like MCI and U S Sprint, whose billing codes and interconnect dialing systems have been found particularly vulnerable by communications crooks.

Not Just 'Computer Whizzes'

The fraud usually begins with a computer hacker, and investigators say the culprits are not just the stereotypical pimple-faced teen-age whiz-kids playing around between sessions of Pac Man and Pole Position.

''Years ago,'' said Gel Viardo-Sai, the general counsel of U S Sprint, ''we thought these were just computer whizzes. But now we're finding out there are housewives, doctors and lawyers who are hacking codes out of the system to sell.''

Penetrating a telephone company's electronic files and extracting secret billing codes - the numbers it uses to determine who makes a call and whom to bill - is a difficult but not insurmountable task for a hacker with a relatively simple program and a telephone-modem hookup.

To hackers, most billing codes are too much trouble to ferret out. Of MCI's eight million customers, for example, seven million use their home numbers as well as a four-digit suffix, so a hacker would have to crack a 14-digit code. But one million still make calls on an old system - slowly being phased out - using five-digit codes, and these are vulnerable.

How It's Done

The hacker has his computer call MCI, for example, using one of the seven-digit numbers that patrons normally call to gain access to a long-distance line. These access numbers are widely known among hackers. Once on a line, a hacker, like a legitimate customer, dials an area code and number, and then adds a five-digit billing code.

Each MCI access number is assigned 100,000 billing codes, and there are scores of access numbers in use around the country. This allows for millions of billing codes, only a fraction of which are in use. Other companies use different systems. U S Sprint, for example, has customers over the country dial a single access number from pay phones, followed by a nine-digit code for billing.

Legitimate customers each have a personal billing code, so the company knows who is calling and whom to bill. Without a valid code, the telephone equipment will not put the call through. Hackers seeking billing codes set their computers searching for them.

Since there are only 100,000 combinations of five-digit numbers on each access line, a hacker just has his computer ''crunch'' through the

(3)

possibilities, one after the other. When a call goes through, it means the computer has hit upon a valid billing code and the computer records it. Running the program a little while, investigators say, produces numerous codes.

The hacker sells the codes in batches to middlemen, usually people who are contacted through computer billboard services, and they are distributed to hustlers. The price for a single code is up to $400, Mr. Wronowski said.

Hustlers must act fast to capitalize on their investment, for the life of a stolen code is short, perhaps only a few days. That is because the phone companies watch for any sudden surge in calls made for a code number. If the code's owner has not made the calls, the code is quickly canceled.

The hustlers' procedure is simple, as shown on a recent day at the Port Authority Bus Terminal. After agreeing to a price, a customer gave a hustler the desired number and he dialed it, along with the telephone company's access number and a billing code.

When the party answered, the hustler collected his money, handed over the receiver and left. When the call was over, he was back to offer another call. During one complex call, he had to summon a nearby "supervisor" to instruct him in dialing procedure. Long calls to California and Massachusetts were $1 each. For $4, calls were placed abroad for two Great Barrier Island, a man from Ecuador, several West Indians and several Americans.

Investigators said hustlers sometimes sold codes in their dying hours of usefulness. But such offers were suspect, they said, because surrendering valid codes only hastened their demise.

Because many long-distance companies are not equipped to reach all countries abroad, investigators say, it is sometimes necessary for a hustler to use a more complex method of patching a call through. This involves a confederate, often in another city, using special equipment to tap into an A.T.& T. long-distance line to complete the call abroad.

These clandestine "operators," often used by a network of hustlers in various cities, also use stolen billing codes to complete calls.

Telephone companies say they are aggressive about tracing illegal calls, hackers who steal codes and clandestine operators.

But telephone companies competing for customers are reluctant to make billing code systems more complicated, and they are simply overwhelmed by the volume of illegal calls.

"There are a lot of entrepreneurs out there who want to create their own telephone companies," said Mr. Abuladze. "The way the system is set up now, they can do it."

SUBJECT: TELEPHONES; STATIONS AND TERMINALS (PASSENGER); FRAUDS AND SWINDLING; DATA PROCESSING

NAMES: MCFADDEN, ROBERT D

THE PORT AUTHORITY OF NY & NJ

Port Authority
Bus Terminal

625 Eighth Avenue
New York, N.Y. 10018
(212) 564-7526
(201) 432-6200

February 15, 1994

John Richard Associates, Inc.
Management Consultants
24 Village Court
Hazlet, NJ 07730

Attention: John R. Cannizzo

Dear John,

Thanks for the excellent presentation last week to Dick Kelly and other Interstate Transportation Department senior staff. It was well received and I believe that we are on the right track.

By the time you receive this letter we will have scheduled a meeting with the Bus Terminal Police staff and Dan Seltzer to further go over local law enforcement concerns and issues.

Attached you will find the list that Dan Seltzer provided. This was an attendance list for a meeting of long distance service providers and Bus Terminal staff. The meeting was held sometime during the late Fall of this past year. Also attached are my notes from our 2/7 meeting.

Once again, thanks for the excellent presentation and I look forward to hearing from you regarding a date for your next update.

Sincerely,

Dan Seltzer
Program Director, Bus
Comprehensive Improvement Plan

/sv

FEB 17 '94 21:07PT 104 CHRO REGY P.7

TEL WTHR

Name	Company	#
Jeff Bagley	MCI - Allentown	800-222-0
John F. Bo	Dauphin - PPSD	502-2521
Jim Bowers (Federal)	Telecom Resources Group (Local)	412-967-2756
	Pub Com - NJ Tel.	718-596-2011
BOB SORENSEN	N.Y.TEL. PUB COMM	212-960-4106
BILL TRACY	N.Y.TEL SECURITY	212-395-8502
STEVE GRADY	ATT Security	212 219 4919
VICTOR HICKEN	FCC	212 620-3437/8
LARRY AMICKER	USSS	212/466-4400
TOM ANDROS	US SPRINT	914 935-7926
ROGER R SANFILIPPO	MCI	914-933-6212
BARRY BENHAM	ATT	908-528-8221
RICK PETRILLO	ATT	908 580-8259
JAMES KOMITO	Port Authority Police	(212) 564-2365
THOMAS FERRELL	" "	(212) 564-2508
[illegible] Gilbert	MCI	914 251-2105
Patricia Gomes	MCI	914 251-2040

PORT AUTHORITY OF NEW YORK AND NEW JERSEY

MEMORANDUM

TO: Ed Forker
FROM: Ken Philmus
DATE: June 17, 1993
SUBJ: EFFORTS TO MINIMIZE LONG DISTANCE SCAMMING ON PART PAYPHONES

CC: J. Beltzer

As we both noted yesterday there has been a virtual elimination of telephone scamming from the pay phones here at the Bus Terminal. So that all can fully understand where we are at present you requested an update on where we are and work yet to come.

PABT management, PAPD Police and the Investigative Unit have long been frustrated with the problem of finding an effective way to deal with the selling of international calls here at the BT. Not only was this activity illegal in and of itself but it was also creating a significant amount of "collateral crime" that resulted from disputes at the phones and often was so prevalent as to make it difficult for legitimate customers to find an available phone when needed. An agreement was reached with AT&T to block direct international calling from the facility's pay phones but this proved to be only a very temporary solution as the scammers utilized access to other long distance carriers such as MCI and Sprint to make their way around AT&T. In addition, the scammers had developed methods for utilizing private voice mail systems and switchboards that allowed them to make international calls without directly using any of the long distance carriers. Clearly, a more comprehensive solution had to be found and since New York Telephone and others were telling us that at this point in time a solution was not technically possible. It was clear that the Port Authority would have to do some investigating of possible solutions on its own and this was made part of my charge as Director of the Comprehensive Improvement Program.

As part of an analysis of advanced telephone technology for the replacement of all Port Authority pay phones, 48 "smart" phones were installed at various locations throughout the Terminal. "Smart" phones are smart since they have advanced internal software which allows tremendous flexibility in monitoring and controlling what happens on the phones. A nationally recognized telephone consultant was retained to work with the Comprehensive Improvement Program team to advise us as to whether or not we could utilize these phones as a means to deal with the scamming here at the BT and also to help us encourage New York Telephone to develop their own solution. In cooperation with the manufacturer of the "smart" phones, the consultant was able to develop a test solution that blocked all international calls made through the use of stolen credit cards as well as through the use of private switchboards. This change has been in place for well over a month at the BT on all phones that show "TCG" as the manufacturer and appears to be completely successful.

During this same time period, a Request for Proposals for pay telephone service at all Port Authority facilities was being developed. Since we now knew that there was a solution that could work, we took the step to include international calling fraud prevention at the PABT as a requirement to all bidders desiring to provide pay phones for all Port Authority facilities. It was at this point in time that New York Telephone indicated that they too had now developed a method for dealing with this problem and would begin installing it on the 200 phones in the Terminal that were theirs. Our consultant will be immediately evaluating the effectiveness of their proposal and we sincerely hope it will work as well as the blocking we now have on the "TCO" phones. The change to the New York Telephone pay phones at the BT should be completed by the end of next week. Assuming it is as effective as New York Telephone claims, we will then have fully blocked the scamming from within the building.

Needless to say, we all know that the scammers are a resourceful bunch and will likely be seeking out new ways to maintain what has been a very lucrative livelihood. As such, we have received Board authorization to have the telephone consultant immediately available to us should the problem resurface in some new form. It's working for now and we are all particularly pleased that New York Telephone is implementing a solution of their own throughout the city at selected locations in addition to the PABT. Perhaps this will put a damper on this business as a whole. There is a small down side, however, to both the New York Telephone and "smart" phone solutions in that legitimate international calls will not be able to be made from within the building. Furthermore, BT customers will also be unable to access their corporate voice mail systems or dial up beepers. Per other discussions we've had, the loss of beeper capability also has an up side as well.

Rest assured that Comprehensive Improvement and our consultant will continue to keep a very close watch on the situation. If you, or anyone on your staff notices a degradation in the situation please let me know right away so we can deal with it as quickly as possible.

Ken Philmus
Program Director, PABT
Comprehensive Improvement

THE PORT AUTHORITY OF NY & NJ

Port Authority
Bus Terminal

625 Eighth Avenue
New York, N.Y. 10018
(212) 502-[illegible]

July 28, 1992

Mr. John Gamming
John Richard Associates, Inc.
24 Village Court
Hazlet, N.J. 07730

Dear John:

As you are aware the telephone hustler problem has been virtually eliminated at the Bus Terminal due to the technological changes you were able to have implemented. This problem had been plaguing us for several years and we were frustrated by the lack of a technological solution.

Your work with Ken Philmus and the Comprehensive Improvement Program was done effectively and in a short timeframe enabling us to see quick improvement.

I appreciate your fine work and expertise and wish you continued success.

Janis M. Bellows
Manager
Port Authority Bus Terminal

JMB/lb

CC: K. Philmus

EXHIBIT B

THE PORT AUTHORITY

July 28, 1992

Mr. John Gammino
John Richard Associates, Inc.
24 Village Court
Hazlet, N.J. 07730

Dear John:

As you are aware the telephone hustler problem has been virtually eliminated at the Bus Terminal due to the technological changes you were able to have implemented. This problem had been plaguing us for several years and we were frustrated by the lack of a technological solution.

Your work with Ken Philmus and the Comprehensive Improvement Program was done effectively and in a short timeframe enabling us to see quick improvement.

I appreciate your fine work and expertise and wish you continued success.

Janis M. Beltzer
Manager
Port Authority Bus Terminal

JMB/lb

CC: K. Philmus

EXHIBIT C

US005809125A

United States Patent [19]

Gammino

[11] Patent Number: 5,809,125

[45] Date of Patent: Sep. 15, 1998

[54] METHOD AND APPARATUS FOR INTERCEPTING POTENTIALLY FRAUDULENT TELEPHONE CALLS

[76] Inventor: John R. Gammino, [illegible], Linwood, N.J. [illegible]

[21] Appl. No.: 186,820

[22] Filed: Jan. 25, 1994

Related U.S. Application Data

[63] Continuation of [illegible], abandoned.

[51] Int. Cl.[6] H04M 3/38

[52] U.S. Cl. .... 379/180; [illegible]

[58] Field of Search .... [illegible]

[56] References Cited

U.S. PATENT DOCUMENTS

[illegible]

FOREIGN PATENT DOCUMENTS

[illegible] Japan [illegible]

[illegible] United Kingdom [illegible]

OTHER PUBLICATIONS

Worldwide Videotex Article Titled "Fraud Protection [illegible] ..." [illegible], Nov. [illegible]

Worldwide Videotex Article Titled "[illegible]" [illegible]

(List continued on next page.)

Primary Examiner—[illegible]

Attorney, Agent, or Firm—[illegible]

[57] ABSTRACT

Potentially fraudulent telephone calls are intercepted from public telephones. As the digits which correspond to a telephone number are entered into a telecommunications device, each number is [illegible] compared with a predetermined number. If, according to the comparison, telephone numbers which include certain digits of particular locations in the dialing sequence are entered, the telephone call is blocked. This technique may be implemented by including appropriate software in microprocessor controlled [illegible] telephones, or public telephones which are not microprocessor controlled. [illegible] system can be interposed between the public telephone and the telephone lines [illegible]. [illegible] be implemented in conjunction with a PBX system. When a PBX system is being accessed from a [illegible] telephone in order to establish a telephone call using the PBX outgoing lines, the telephone numbers which are entered on the PBX can be compared with predetermined number sequences in the manner described above. A warning signal can be generated or the call can be blocked if particular dialing sequences are entered. Velocity checking can also be implemented [illegible] of the above systems [illegible] potentially fraudulent telephone calls.

49 Claims, 5 Drawing Sheets

OTHER PUBLICATIONS

FCC Gen CC Docket No. 90-571, Policies and Rules Concerning Operator Service Access and Pay Telephone Compensation, Report and Order, pp. 1-43 (Released Apr. 3, 1992).

"The Brave New World of Toll Fraud," Rural Telephone (publication) Journal (May 1992), vol. 11, No. 2, pp. 14-20 by David Bolton.

"NATA Offers Payphone Operators New Weapon Against Toll Fraud," Voice Technology News, (Jun. 30, 1991, vol. 1, No. 13.

Most RBOCs Want Bell FCC Effort to Impose Interstate Call Blocking", Communications Daily (Mar. 12, 1992).

"AmeriVox Public Communications Granted (APCC) Has Asked FCC", Common Carrier Week (Jan. 13, 1992).

Newsletter Published by Gerald Publications, Inc. Intelligent Network News, 4 Mar. 92, vol. 1, No. 5, entitled Independent Sets Network Growth Predicted

FCC Catalog for CC 1991-92, "Program Abbreviations and Service Call Control Codes".

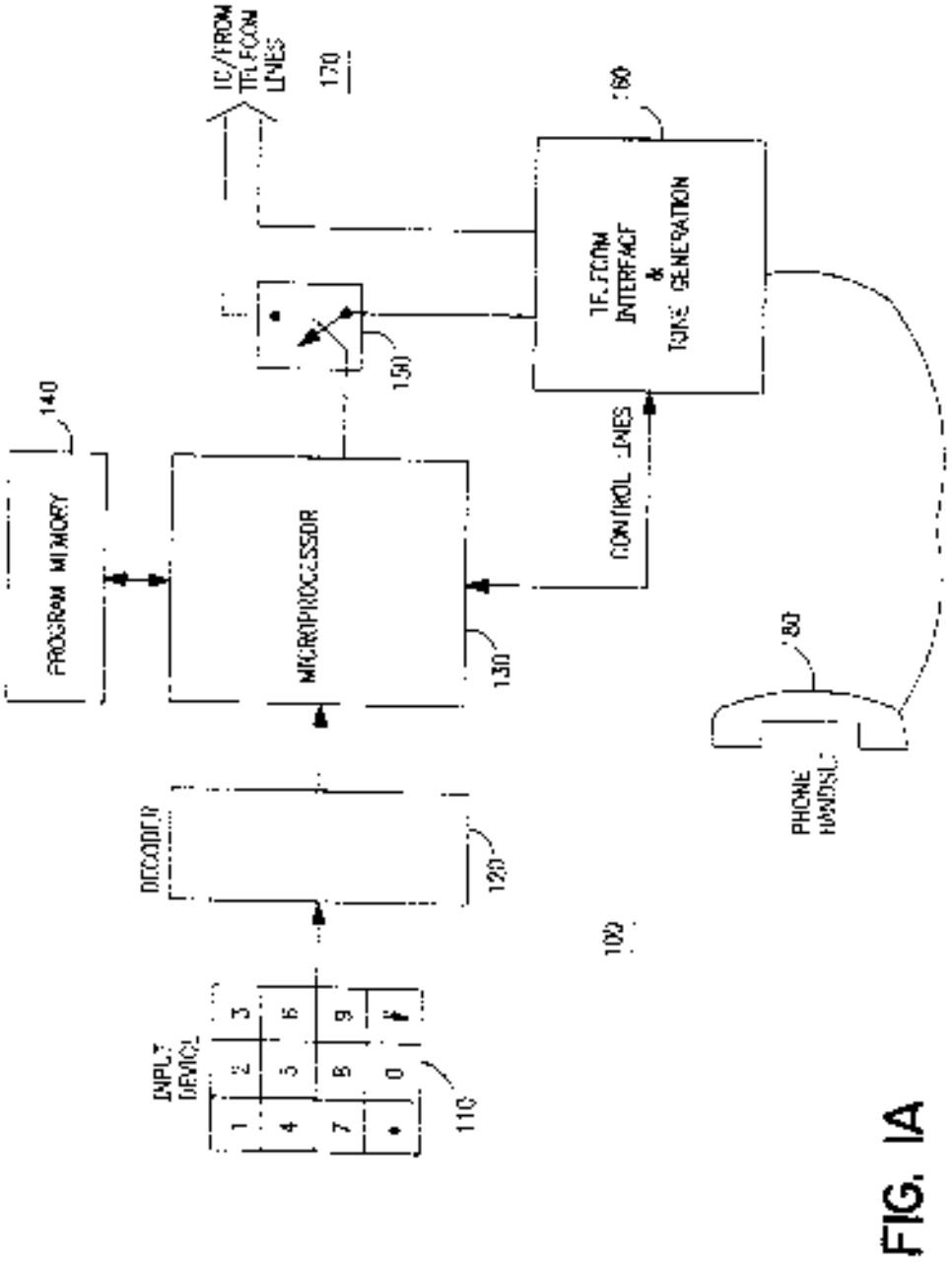

TO/FROM TELEPHONE LINES
170
160
TELEPHONE INTERFACE & TONE GENERATION
150
140
PROGRAM MEMORY
MICROPROCESSOR
CONTROL LINES
130
180
PHONE HANDSET
DECODER
120
102
INPUT DEVICE
110

FIG. 1A

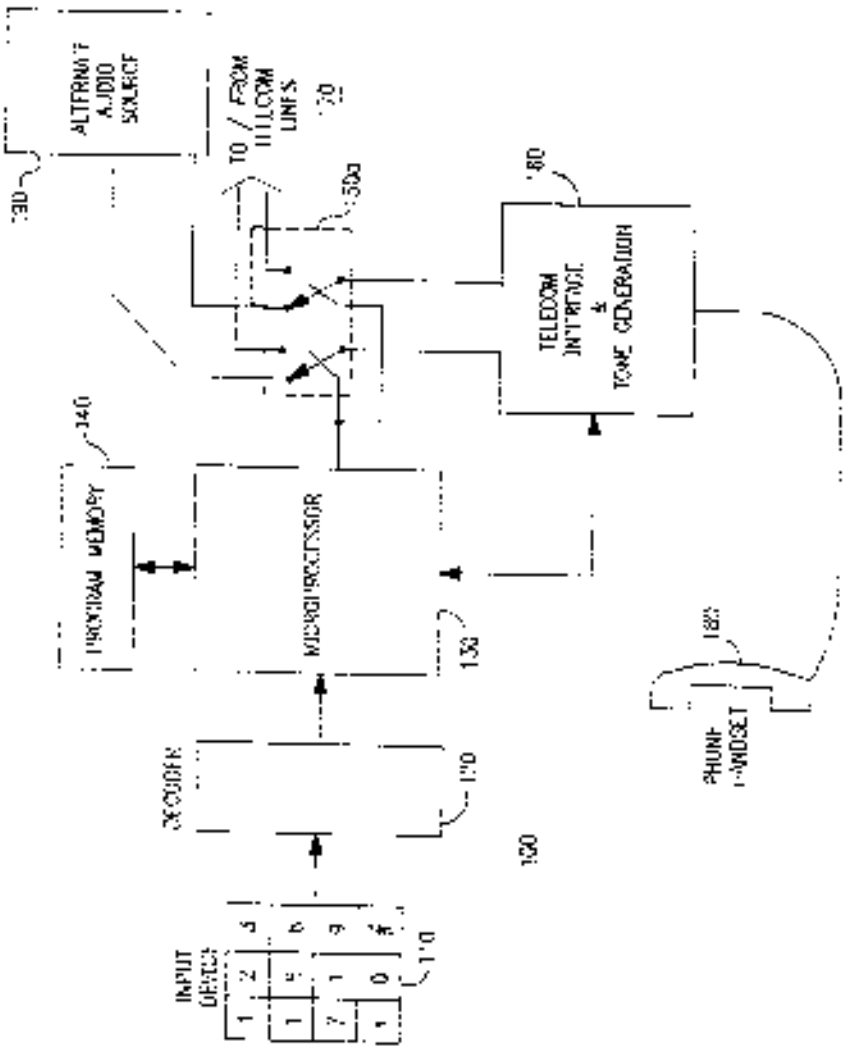

ALTERNATE AUDIO SOURCE
TO / FROM TELECOM LINES
TELECOM INTERFACE & TONE GENERATION
PROGRAM MEMORY
MICROPROCESSOR
CODEC
INPUT DEVICE
PHONE HANDSET
130
180
185

FIG. 1B

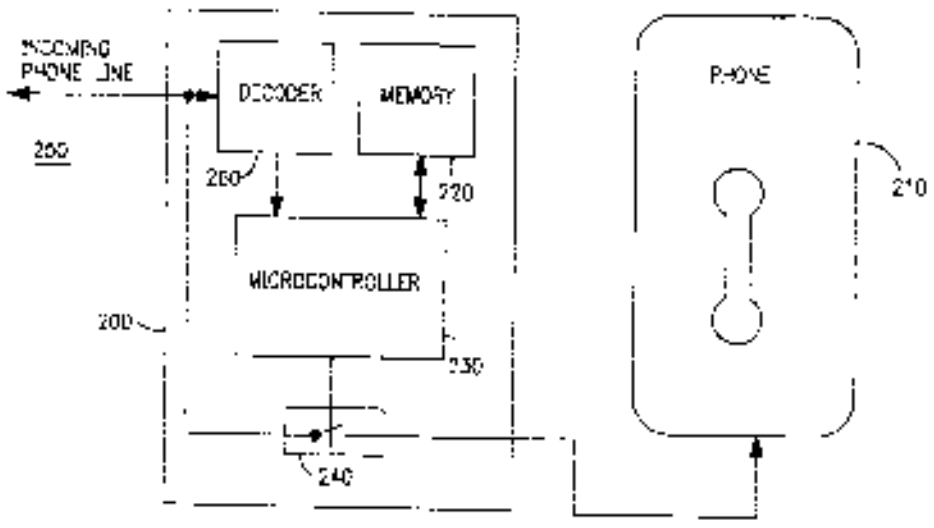

INCOMING
PHONE LINE
250
DECODER
MEMORY
260
220
MICROCONTROLLER
200
230
240
PHONE
210

FIG. 2A

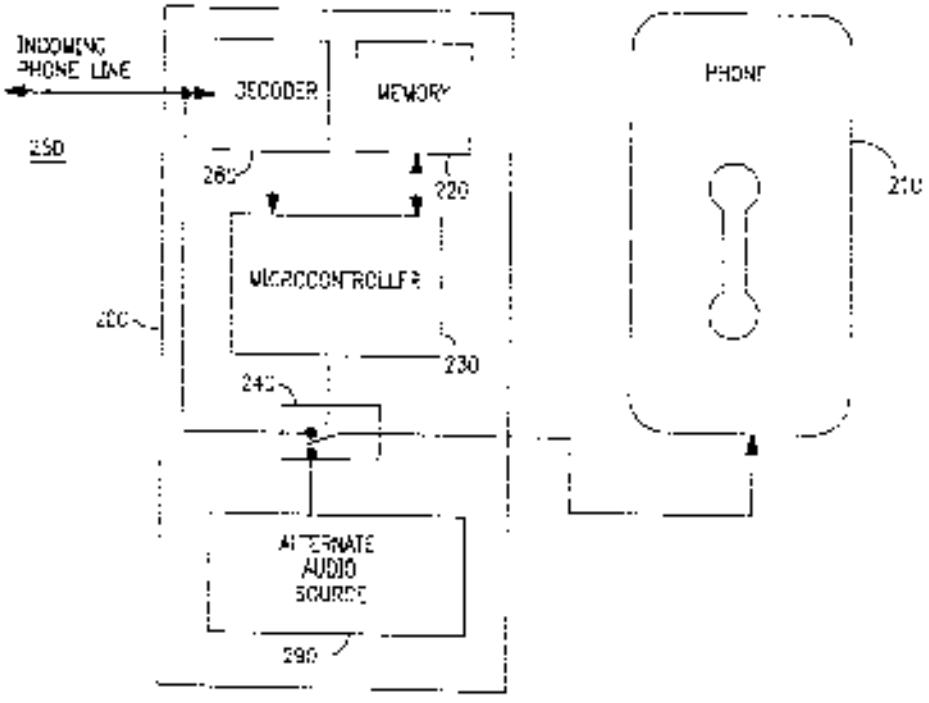

INCOMING
PHONE LINE
250
DECODER
MEMORY
260
220
MICROCONTROLLER
200
230
240
ALTERNATE
AUDIO
SOURCE
290
PHONE
210

FIG. 2B

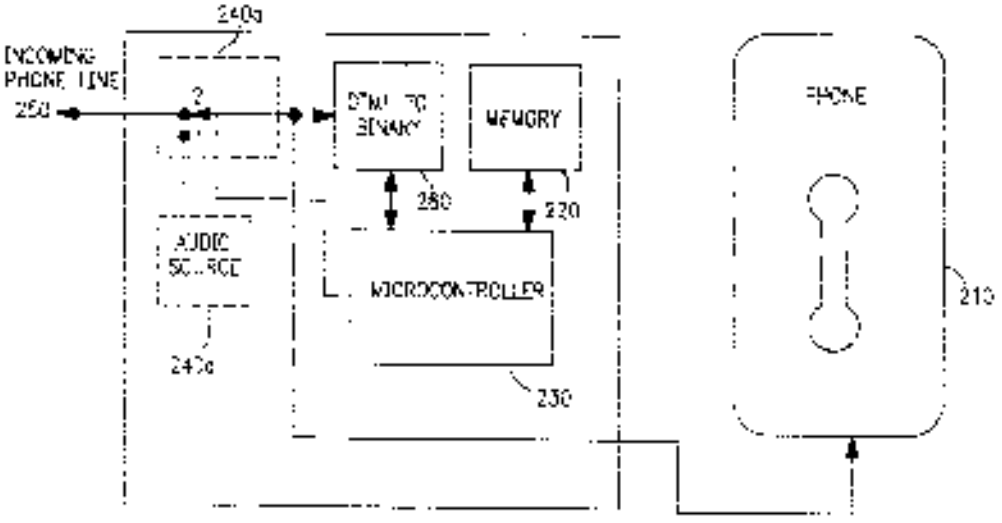

240a
INCOMING PHONE LINE
250
2
MEMORY
260
220
AUDIO SOURCE
MICROCONTROLLER
240c
230
PHONE
210

FIG. 2C

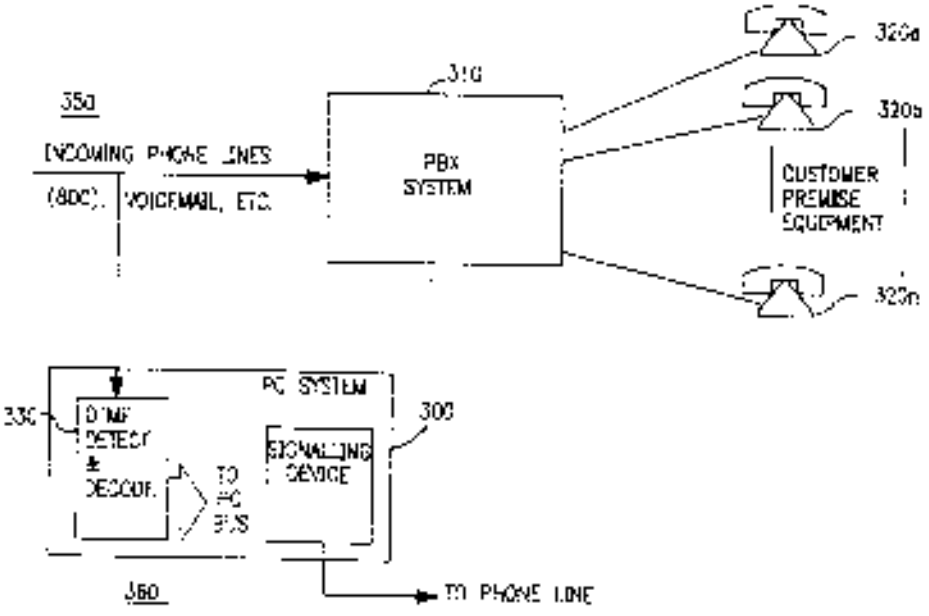

350
INCOMING PHONE LINES
(800), VOICEMAIL, ETC.
310
PBX SYSTEM
320a
320b
320n
CUSTOMER PREMISE EQUIPMENT
PC SYSTEM
330
DTMF DETECT & DECODE
TO PC BUS
SIGNALLING DEVICE
300
360
TO PHONE LINE

FIG. 3A

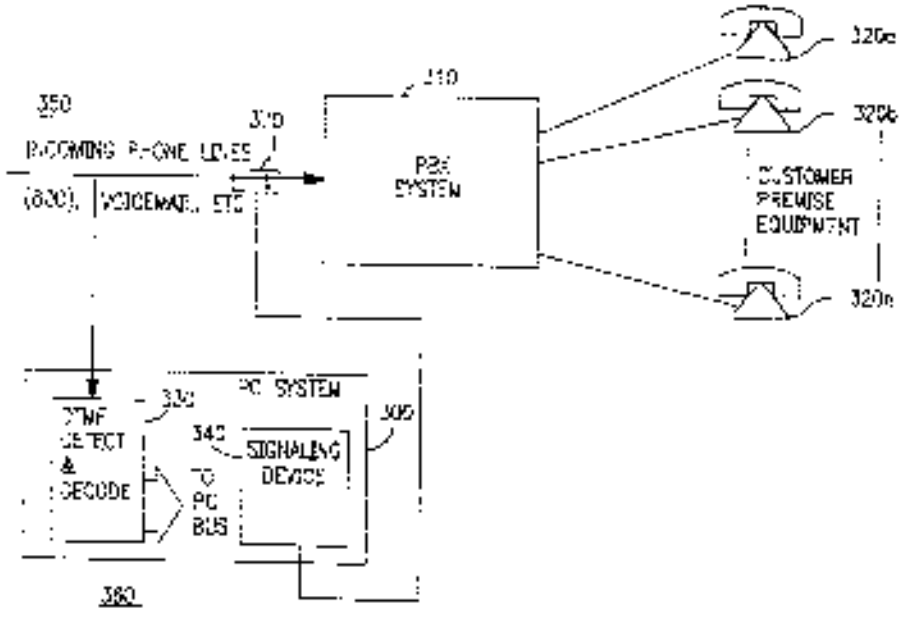

350
INCOMING PHONE LINES
(800), VOICEMAIL, ETC.
310
PBX SYSTEM
320a
320b
320n
CUSTOMER PREMISE EQUIPMENT
PC SYSTEM
330
DTMF DETECT & DECODE
340
SIGNALING DEVICE
TO PC BUS
300
360

FIG. 3B

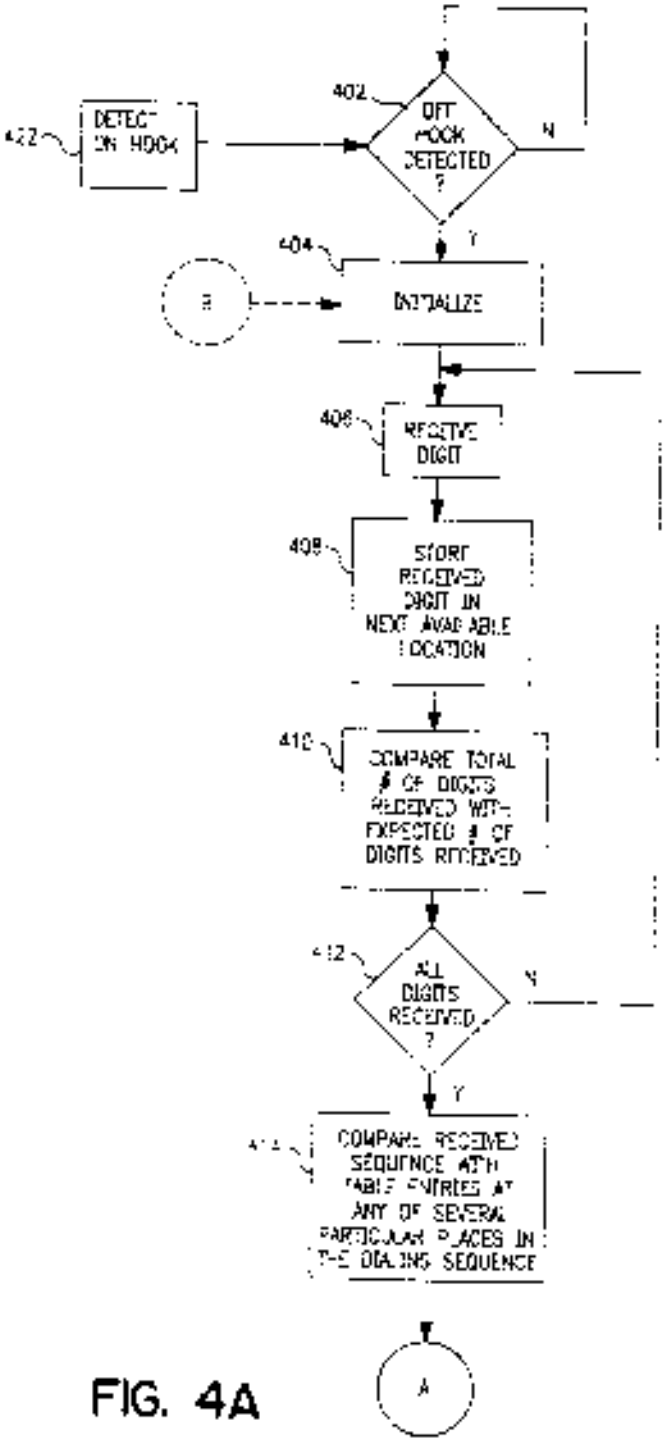

402
OFF HOOK DETECTED ?
N
Y
422
DETECT ON HOOK
404
INITIALIZE
B
406
RECEIVE DIGIT
408
STORE RECEIVED DIGIT IN NEXT AVAILABLE LOCATION
410
COMPARE TOTAL # OF DIGITS RECEIVED WITH EXPECTED # OF DIGITS RECEIVED
412
ALL DIGITS RECEIVED ?
N
Y
414
COMPARE RECEIVED SEQUENCE WITH TABLE ENTRIES AT ANY OF SEVERAL PARTICULAR PLACES IN THE DIALING SEQUENCE
A

FIG. 4A

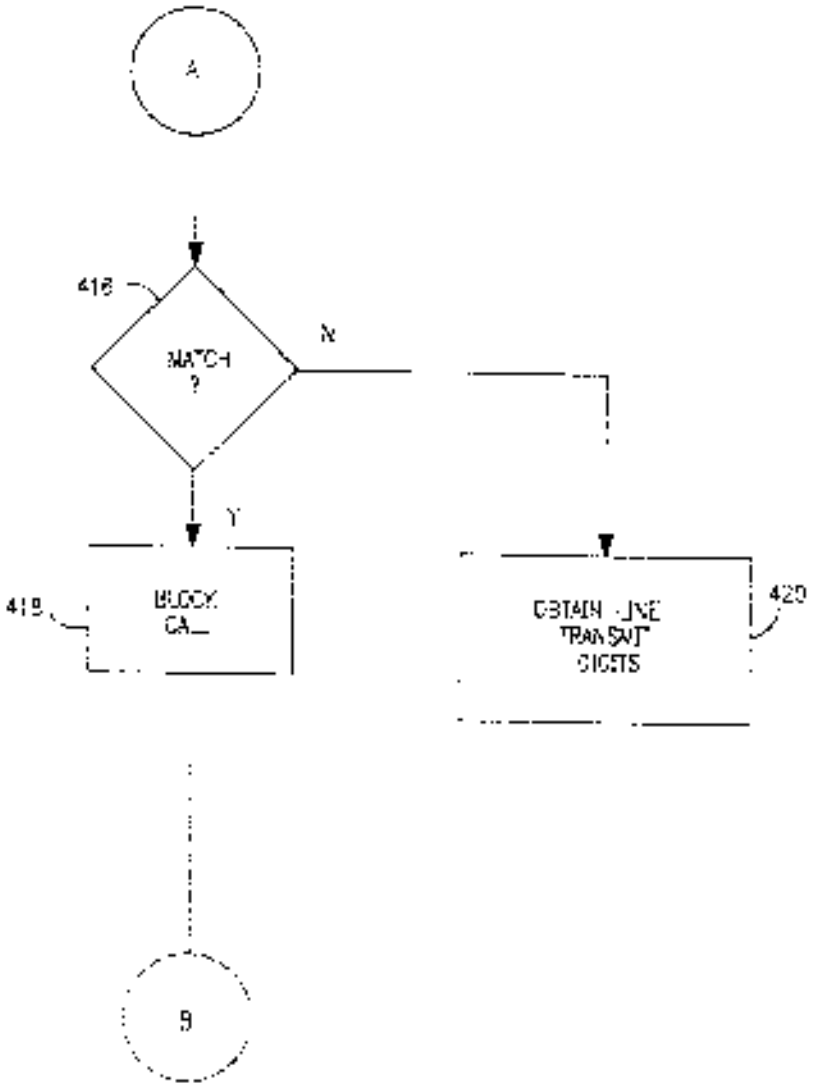


FIG. 4B

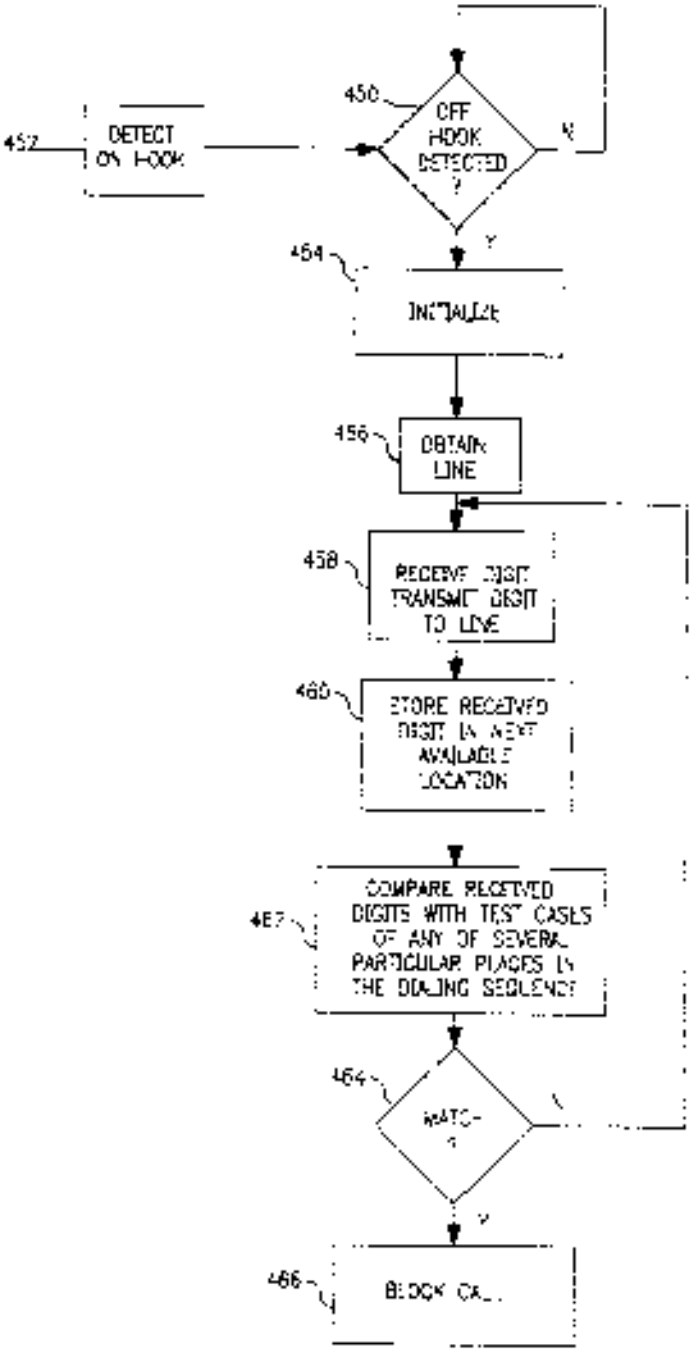

450
OFF HOOK DETECTED ?
N
Y
452
DETECT ON HOOK
454
INITIALIZE
456
OBTAIN LINE
458
RECEIVE DIGIT TRANSMIT DIGIT TO LINE
460
STORE RECEIVED DIGIT IN NEXT AVAILABLE LOCATION
462
COMPARE RECEIVED DIGITS WITH TEST CASES OF ANY OF SEVERAL PARTICULAR PLACES IN THE DIALING SEQUENCE
464
MATCH ?
Y
466
BLOCK CALL

FIG. 4C

METHOD AND APPARATUS FOR INTERCEPTING POTENTIALLY FRAUDULENT TELEPHONE CALLS

This application is a [illegible] of application Ser. No. [illegible] filed [illegible] 1992, now [illegible].

FIELD OF THE INVENTION

The present invention relates to [illegible] more specifically to the selective [illegible] of telecommunication devices. [illegible] a method and apparatus is disclosed for [illegible] a sequence of digits [illegible] telecommunication device and selectively disabling the telecommunication device if particular digits are detected [illegible] of locations in the sequence.

BACKGROUND OF THE INVENTION

A [illegible] method for [illegible] a telecommunication device (e.g. a pay telephone) is through the use of [illegible] numbers. [illegible] a sequence of digits which [illegible] a telephone [illegible] by entering [illegible] the [illegible] placed call [illegible] calling card account. The charges [illegible] account [illegible] calling card [illegible] becomes the responsibility of [illegible] calling card [illegible] an [illegible] who can use a pay telephone without [illegible] the device.

[illegible] sequence [illegible] calling card [illegible] is requested [illegible] of the [illegible]. [illegible] prevented.

[illegible] international [illegible] calling card [illegible] international access [illegible] the [illegible] telephone [illegible].

[illegible] systems [illegible] answer [illegible] voice response systems. [illegible] access code, the system [illegible] telephone [illegible] in the world. [illegible] owner of the [illegible] system [illegible] An exemplary system of this type is described in U.S. Pat. No. [illegible] entitled TELEPHONE CALL CONTROL SYSTEM [illegible] automated voice response systems. [illegible] accessing [illegible] access codes [illegible].

Although the methods described above appear to be secure, there are several ways in which unauthorized calls can be made using such systems. Calling card numbers may

be stolen, for example, by watching an unsuspecting user enter the numbers. Until the theft has been discovered and the account cancelled, these numbers can be used by the thief to fraudulently place phone calls. The calling card account [illegible] is then charged for the cost of the calls. By using stolen calling card numbers in this manner, it is possible to fraudulently place many international calls which originate from the United States.

Similarly, fraudulent calls may be placed using night answer and automated voice response systems. Again, [illegible] digits, unknowingly obtained by a thief, can be entered into a telephone [illegible] in order to signal a night answer or automated voice response system to place a long distance or international call. In this manner, the owner of the [illegible] is [illegible] for the cost of such a call without the corporation's consent.

One solution which minimizes [illegible] is to [illegible] telephones [illegible] number sequences which access international [illegible] services. Such services are often accessed from public telephones by [illegible] the digit sequence 011. [illegible] in the United States can provide a [illegible] of alternative [illegible] for placing international calls. [illegible]

In addition to accessing international telecommunications services, the codeset [illegible] may be used for accessing long distance services (e.g. [illegible]). [illegible] law prevents the blocking of [illegible] calls to public telephones when these calls are placed using [illegible] access codes. Thus, although the blocking of calls based solely on the detection of the number sequences specified above would prevent access to [illegible] services, the [illegible] of calls based solely on [illegible] detection of the number sequences specified above [illegible] [illegible] would be blocked as well.

Additional access codes may be created [illegible] accessing [illegible] telecommunication services. [illegible] the blocking of these [illegible] access codes.

SUMMARY OF THE INVENTION

The present invention relates to a method and apparatus [illegible] potentially fraudulent telephone calls which originate [illegible] dialing sequence [illegible] plurality of [illegible] followed by [illegible] dialing digits followed by [illegible] of dialing [illegible] the first [illegible] and the [illegible] dialing [illegible] respectively [illegible].

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1A is a block diagram which illustrates [illegible] exemplary embodiment of the present invention.

FIG. 1B is a block diagram which illustrates [illegible] exemplary embodiment.

FIG. 2A is a block diagram which illustrates [illegible] exemplary embodiment of the present invention.

FIG. 2B is a block diagram which illustrates [illegible] exemplary embodiment of the present invention.

FIG. 2C is a block diagram which illustrates [illegible] exemplary embodiment of the present invention.

FIG. 3A is a block diagram which illustrates [illegible] exemplary embodiment of the present invention.

FIG. 3B is a block diagram which illustrates a seventh exemplary embodiment of the present invention.

FIG. 4A is a portion of a flow chart diagram which illustrates the operation of an exemplary embodiment of the present invention.

FIG. 4B is a further portion of the flow chart diagram of FIG. 4A which illustrates the operation of an exemplary embodiment of the present invention.

FIG. 4C is a flow chart diagram which illustrates the operation of a further exemplary embodiment of the present invention.

DETAILED DESCRIPTION

A first exemplary embodiment of the present invention is illustrated in FIG. 1A. As shown in FIG. 1A, a telecommunications device 200 is coupled to telecommunications lines 170 through telecommunications interface and tone generation circuitry 160. In an exemplary embodiment of the present invention, [illegible] 160 includes a [illegible] device [illegible] TP5088 [illegible] by National Semiconductor [illegible] Corporation [illegible]. The telecommunications interface may be implemented using circuit configurations which are well known to those skilled in the art of designing telecommunications systems.

Telecommunication line 170 can be used for a variety of different functions, for example, for connecting to any type of [illegible] telephone network. Alternatively, telecommunication line 170 may be used for interfacing to any type of private network including, but not limited to, government or [illegible] networks. Furthermore, telecommunication line 170 may be used for interfacing to a [illegible] of networks. For example, telecommunication line which has been [illegible] identified by a [illegible] an [illegible] signaling protocol. Furthermore, telecommunication line 170 [illegible] or [illegible] networks [illegible] may be used [illegible].

Switch 150 [illegible] 160 [illegible] line 170 [illegible] switch 150, [illegible] device 100 [illegible] lines 170 [illegible] switch 150 [illegible] 150 [illegible] 170. However, [illegible] 160 [illegible] 170.

The [illegible] switch 150 [illegible] microprocessor 130. In an exemplary embodiment of the present invention, microprocessor 130 may be [illegible] 7.8 [illegible] device 6800 [illegible]. Microprocessor 130 is [illegible] program memory 140 [illegible] appropriate [illegible] microprocessor 130 [illegible] programs for [illegible] processor 130 [illegible] described [illegible] FIGS. 4A, 4B and 4C.

As shown in FIG. 1A, input device 110 may be used for [illegible] telecommunications device 100. Input device 110 is coupled to decoder 120. In an exemplary embodiment of the present invention, decoder 120 [illegible] 74C923 [illegible] National Semiconductor. [illegible] entered using input device 110 [illegible] by decoder 120. Decoder 120 [illegible] microprocessor 130. Microprocessor 130 then transmits appropriate signals to telecommunication interface and tone generation 160.

In an exemplary embodiment of the present invention, a user enters a plurality of numbers using input device 110. Based on the particular digit sequence which is entered, microprocessor 130 causes telecommunication interface and tone generator 160 to produce appropriate DTMF tones. Assuming switch 150 is in the closed position, the DTMF tones are transmitted to telecommunication line 170.

Furthermore, in an exemplary embodiment of the present invention, numbers are entered using a telephone keypad. However, it is contemplated that alternative methods for entering telephone digits may be used in order to produce appropriate tones to telecommunication interface and tone generating circuitry 160. For example, a desired number sequence may be entered using a traditional rotary device (not shown). Alternatively, a digit sequence may be stored in a [illegible] medium (not shown) (e.g. [illegible] card magnetic strips, a smart card, etc.). The telecommunications device may include a reader (not shown) which is capable of reading the digit sequence from the storage medium, the smart card, etc.). Alternatively, a digit sequence may be spoken by the user and the [illegible] into appropriate electrical signals by voice recognition circuitry (not shown). Thus, it is understood that the digits which may be entered [illegible] input device 100 [illegible] variety of ways.

Program memory 140 includes appropriate software [illegible] in order to [illegible] the use of telecommunications device 100 if particular conditions are met. In particular, microprocessor 130 examines the sequence of digits which are entered by input device 110. If microprocessor 130 determines that particular digits have been entered in particular [illegible] in the dialing sequence, microprocessor 130 signals switch 150 to open, thus disconnecting the call. Such a determination may be performed, for example, by comparing the entered telephone digits with [illegible] telephone digit [illegible] microprocessor 130. [illegible] sequences of telephone digits [illegible] sequences [illegible] for [illegible] telephone [illegible] may be [illegible] in two groups of dialing digits [illegible] dialing digits [illegible] their corresponding [illegible] signals [illegible] signals [illegible] the second group of dialing digits [illegible] dialing [illegible] to determine if the [illegible] However, [illegible] the dialing [illegible] dialing signals [illegible] corresponding [illegible] compared to [illegible] values [illegible] second [illegible] two groups [illegible]. The signal values may be compared [illegible] to make this determination [illegible] may proceed to [illegible] either or both of the two groups of dialing digits. [illegible] skilled in the art.

[illegible] groups of dialing digits may include a country code, a city code and a local number. This local number includes [illegible] exchange code which [illegible] through which the [illegible] the destination is [illegible]. The use of [illegible] terminology is illustrated [illegible] 33 [illegible] the city code. [illegible] North [illegible] United States, the [illegible] value [illegible]

Again, the telephone number will also include a [illegible] exchange area [illegible] exchange area [illegible] of several [illegible] through which the call will proceed before reaching the destination [illegible] number.

In an exemplary embodiment of the present invention, detection of one or more of the following digit sequences in the dialing sequence results in the blocking of a telephone call.

TABLE I

[illegible]
[illegible]
[illegible]

In addition, it is possible to block international calls which are accessed using a three digit [illegible] code. Exemplary [illegible] telephone numbers which result in a blocked call include:

TABLE II

[illegible]
[illegible]
[illegible]

It should be [illegible] telecommunications [illegible] which [illegible] with the present invention [illegible] particular [illegible] Additionally [illegible] place any [illegible] or [illegible] blocking [illegible] digit sequences [illegible] enumerated [illegible] and [illegible] may be effectively prevented.

In [illegible] sequences [illegible] telecommunications [illegible] These [illegible] predetermined digits which [illegible] dialing sequence. The [illegible] at the beginning [illegible] the end of the dialing sequence. Furthermore, [illegible] digits may be interposed between the predetermined digits. Microprocessor 130 [illegible] memory 140 [illegible] and [illegible] switch 150 [illegible] digits.

[illegible] exemplary embodiment [illegible] as illustrated by FIG. 1B. FIG. 1B is similar to FIG. 1A. However, switch 150 has been replaced by switch 150A. [illegible] 150A is coupled [illegible] alternate audio source 190. The [illegible] calls which [illegible]

[illegible] in the exemplary embodiment [illegible] FIG. 1A. However, in the exemplary embodiment which is shown in FIG. 1B, when predetermined digits are [illegible] in the dialing sequence, microprocessor 130 signals switch 150A to [illegible] tone and time generator 160 [illegible] telecommunications line 170. [illegible] the signal which is transmitted to [illegible] switch 150A causes switch 150 to connect [illegible] tone and time generator 160 to alternate audio source 190. [illegible] source 190 may transmit a message to the telephone user explaining [illegible] the user that a telephone call [illegible] from telephone 100 using the telephone number which [illegible] entered.

[illegible] embodiments of the present invention which are illustrated by FIGS. 1A and 1B, [illegible]

phone calls can be handled by both embodiments in one of two ways. First, the telephone call can be terminated immediately upon detection of predetermined digits at particular places in the dialing stream. Thus, each digit in the dialed telephone number is transmitted to telecommunications line 170 as the digit is entered by the telephone user. Alternatively, as each digit is entered, it may be stored in microprocessor 130. In this instance, none of the dialed digits is transmitted to telecommunication line 170 until all the digits in the dialed telephone number have been entered. If predetermined digits are detected in specified locations in the dialing sequence, then the entered telephone number is not transmitted to telecommunication line 170. Furthermore, as shown in the exemplary embodiment of the present invention which is illustrated by FIG. 1B, the telephone user may then receive a message from alternate audio source 190 indicating that the attempted telephone call will not be allowed to proceed. Alternatively, if the predetermined digits are detected, the call [illegible] may be automatically [illegible] to [illegible] management of the [illegible] containing the public telephone [illegible]

In a further exemplary embodiment of the present invention, switch 150 of FIG. 1A and switch 150A of FIG. 1B are [illegible]. Thus, [illegible] tone and time generation circuitry 160 [illegible] communication lines 170. Upon the detection of predetermined digits in particular places in the dialing sequence, the user is prevented from entering additional digits corresponding to a telephone number into telecommunications device 100. The user may be prevented from entering these further digits in several ways. For example, a signal from microprocessor 130 may disable input device 110. Alternatively, microprocessor 130 may [illegible] decoder 120. Microprocessor 130 may also be programmed to ignore subsequent [illegible] processing with [illegible] device 100 [illegible] signal (such as [illegible]) [illegible] device 100 [illegible] inoperable.

In FIGS. 1A and 1B, switches 150 and 150A [illegible] shown as a [illegible] switch. However, it is understood that switches 150 and 150A may be implemented as mechanical switches, electronic switches, etc. Furthermore, switches 150 and 150A may be constructed [illegible] capable of [illegible] with the switch [illegible] physical connections are [illegible]

A further exemplary embodiment of the present invention [illegible] by FIG. 2A. In FIG. 2A, telecommunications device 210 is connected to telecommunications lines 250 [illegible] 200. As in the exemplary embodiment [illegible] present invention which is illustrated by Figure 1A, [illegible] 240 may [illegible] of different [illegible]

[illegible] which is illustrated by FIG. 2A, [illegible] microcontroller 230 [illegible] from memory 220. Decoder (DTMF generator) 260 receives a plurality of telephone numbers which are provided by telecommunications device 210. The telephone number sequence is converted to electrical signals which are transmitted to microcontroller 230. If microcontroller 230 [illegible] that specific predetermined digits have been entered in particular locations in the dialing sequence (as in the embodiment illustrated by FIG. 1A), microcontroller 230 may signal switch 240 [illegible]. This causes termination of the telephone call.

Although switch 240 is shown connected between telecommunications device 210 and tone converter 260, it is

contemplated that switch 240 can be located anywhere between telecommunications device 210 and telecommunications lines 250 which will cause the telephone call to be terminated when the switch is opened.

A further exemplary embodiment of the present invention is illustrated by FIG. 2B. As shown in FIG. 2B, microcontroller 230 may determine that at least two predetermined digits have been entered at appropriate locations in the dialing sequence (as in the embodiment illustrated by FIG. 1A). Microcontroller 230 may then instruct switch 240 to connect phone 210 to alternate audio source 290. In this manner, a message is transmitted from alternate audio source 290 to phone 210 which indicates that an attempted telephone call is not allowed.

The exemplary embodiments of the present invention which are illustrated by FIG. 2A and 2B may have various features which are included in the exemplary embodiments which are illustrated by FIGS. 1A and 1B. One skilled in the art would readily implement any of the features which are illustrated by FIGS. 1A and 1B into the embodiments which are illustrated by FIGS. 2A and 2B.

A further exemplary embodiment of the present invention is illustrated by FIG. 2C. In this exemplary embodiment, switch 240A can be [illegible] in position 2 until microcontroller 230 determines that predetermined digits have been entered [illegible] specified locations in the dialing sequence (as in the embodiment illustrated by FIG. 1A). [illegible] switch 240A can be moved to position 1. Alternate source 290A is [illegible] 290A is [illegible] message that is transmitted to the user of phone 210 [illegible] 230 places switch 240A in position 1.

Alternatively switch 240A can be maintained in position 1 [illegible] from telephone 210. [illegible] digits have been [illegible] microcontroller 230 [illegible] switch 240A can be moved to position 2. Microcontroller 230 [illegible] 260 [illegible] the telephone number [illegible] 250.

[illegible] further exemplary embodiment of the present [illegible] checking [illegible] may be [illegible] Velocity checking may be used [illegible] same phone [illegible] telephone [illegible]

[illegible] further exemplary embodiment of the present [illegible] velocity checking [illegible] calling card numbers may be implemented [illegible] calling card [illegible] in the [illegible] entered dialing sequences [illegible] of a single calling card number for [illegible] may be [illegible] If the calling card number is found to be used [illegible] a certain threshold [illegible] the telecommunications device may be disabled.

[illegible] velocity checking [illegible] data compression [illegible] algorithms may be applied to entered phone numbers and calling card numbers and multiple levels of testing may be used in order to reduce the amount of memory storage required. For example, as a first level of testing, velocity checking based solely on area codes or international codes may be implemented. At a second level of testing, velocity checking on frequently used exchanges within frequently used area codes may be implemented. Furthermore, a second level of testing may be implemented in conjunction with the first level of testing. At a third level of testing, the last four digits of the [illegible] frequently used area codes and exchange combinations may be examined to determine specific telephone numbers being dialed. In addition, the frequency of these calls may be determined. This allows the ability to [illegible] a few [illegible] ten digit telephone numbers (out of approximately ten billion combinations) of high usage calls using a small subset of that amount of data storage memory [illegible] thousand [illegible]

Velocity checking may also be used to determine groupings of entered digits besides or in addition to those combinations of entered digits stated above. For example, a similar type of compression may be implemented [illegible] calling card numbers or patterns thereof in accordance with practices which are well known to one skilled in the art.

The information which is gathered while conducting velocity checking as described above may be transmitted by the telecommunications device [illegible] The telecommunications device [illegible] detailed reports of phone activity [illegible] given period of time.

Furthermore, a group of telephones may be networked so that [illegible] data is collected in a remote computer [illegible] At this remote computer, another level of velocity checking can be performed on the combined data from networking. This is the detection [illegible] groups of perpetrators are placing fraudulent calls from several telephones which are in close physical proximity. [illegible] of the occurrence of this [illegible] thus [illegible]

Furthermore, in accordance with the velocity [illegible] signals [illegible] transmitted [illegible] telephone [illegible] a velocity [illegible] exceeded [illegible] responsive to these signals, a [illegible] numbers can be [illegible] explained above.

A further exemplary embodiment of the present invention is illustrated by FIG. 3A. Telecommunications lines 350 are connected to PBX System 310. PBX System 310 [illegible] the customer premises equipment 320A [illegible] 320N. FC System 360 is [illegible] telecommunications lines 350. FC System 360 [illegible] DTMF detector 330 [illegible] signaling device 340. DTMF detector 330 [illegible] signals received [illegible] line 350 [illegible] FC System 360. If FC System 360 determines using velocity checking that predetermined digits have been entered at appropriate [illegible] dialing sequence, a message may be sent [illegible] signaling device 340 by FC System 360 [illegible] potentially fraudulent activity is occurring. [illegible] devices may [illegible] further action, such as terminating the call [illegible] call, etc.

[illegible] exemplary embodiment of the present invention which is illustrated by FIG. 3B, the output of signaling device 340 is transmitted to switch 370. Thus, upon the detection of predetermined digits at appropriate locations in the dialing sequence by FC System 360, the connection between the incoming phone line 350 and PBX System 310 is terminated. Thus, the telephone call is [illegible] terminated.

The embodiments of the present invention which are illustrated by FIG. 3A and FIG. 3D can also be used with a [illegible] type system. [illegible] the [illegible] use of a PBX [illegible] call [illegible] message [illegible] may be effectively [illegible] [illegible].

In a further exemplary embodiment of the present invention, the output of signalling device 340 is connected directly (not shown) to PBX System 310. In this manner, PBX System 310 receives an appropriate signal which prevents use of the PBX System for placing the fraudulent calls.

A flowchart diagram which illustrates the operation of the present invention is shown in FIG. 4A. At step 402, microprocessor 130 waits for an off hook condition. When an off hook condition is detected, the appropriate software is initiated at step 404. At step 406, as the user enters each digit into the telecommunications device, each digit is received. At step 408, each digit is stored in a memory [illegible] which is associated with microprocessor 130. At step 410, the total number of digits which have been received is compared with the expected number of received digits. The expected number of received digits is determined in accordance with [illegible] the United States [illegible] [illegible] [illegible] by the [illegible] of [illegible] digits in the dialing sequence. [illegible] in place of step 410, [illegible] may [illegible] presence of [illegible] [illegible]. At step 412, [illegible] all digits have not been [illegible] execution of the [illegible] software [illegible] to step 406, at which point [illegible] entered by the user is [illegible]. [illegible] at step 414 the [illegible] sequence of digits is compared with [illegible] of any of several [illegible] [illegible] dialing sequences such as those [illegible] in Tables 1 and 2 above. [illegible] of the [illegible] proceeds to step 416 [illegible] page [illegible]. [illegible] at step 414, a match is [illegible] at step 418 [illegible] to step 418 [illegible] the call is [illegible]. [illegible] at step 416, [illegible] is [illegible] [illegible] to step 420 at which point [illegible] [illegible] [illegible] the [illegible] to [illegible] the call.

In an alternative embodiment of the present invention, [illegible] step 418, [illegible] to step 404 at which point the [illegible] software [illegible] [illegible] and [illegible] sequence of digits may [illegible]. At any time, [illegible] [illegible] is detected at step 422, [illegible] to the start of step 402.

A further exemplary embodiment of the present invention is [illegible] by FIG. 4B. At step 450, when an off-hook condition [illegible] the appropriate software is initiated. At step 452 [illegible]. At step 454, a dialing digit is received from the telephone user. This dialing digit is transmitted [illegible] line. At step 460, the received dialing digit is stored [illegible] associated with microprocessor 130. At step 456, the received digits are compared with a plurality of stored numbers [illegible] several [illegible] dialing sequences. At step 464, [illegible] is found, then, at step 466, the call is disabled. [illegible] at step 464, execution of the [illegible] software continues at step 458, at which point another dialing digit is received from the telephone user. [illegible] [illegible] [illegible] at step 464, the call is allowed to [illegible]. If, at any time, an on hook condition is detected (step 452), then processing [illegible] returns to step 450.

The exemplary embodiments of the present invention which are illustrated by FIGS. 4A, 4B and 4C may be

slightly modified so that there [illegible] may be used in accordance with the exemplary embodiments of the present invention which are illustrated by FIGS. 3A and 3D. By implementing these flowcharts in conjunction with [illegible] checking, a signal can be transmitted which [illegible] [illegible] of devices that potentially fraudulent telephone calls are occurring. Furthermore, such a signal can be used for preventing the PBX from completing the call by opening a switch on a telecommunications line which is connected to the PBX, selectively disabling operation of a [illegible] line or transmitting a separate signal to the PBX in order to disable at least a portion of the PBX.

In the above description, numerous references have been made to the blocking of a telephone call in the context of fraudulent activity. It is understood that any of a variety of methods may be used to prevent fraudulent use of the telecommunications device including, but not limited to, severing appropriate connections, muting the [illegible], disabling the digit entry device (e.g. the keypad), etc.

While the invention has been described in terms of exemplary embodiments, it is contemplated that it may be practiced as outlined above with modifications within the spirit and scope of the appended claims.

What is claimed is:

1. Telecommunications apparatus for selectively preventing establishment of a telephone call to a telephone number having a central office exchange code, said telecommunications apparatus being capable of transmitting a dialing sequence which includes a first plurality of dialing signals followed by a second plurality of dialing signals followed by a [illegible] plurality of dialing signals, said telecommunications apparatus comprising:

means for receiving said dialing sequence [illegible] including said central office exchange code;

means for [illegible] said [illegible] plurality of dialing signals and for preventing establishment of said telephone call if said [illegible] plurality of dialing signals are determined to be [illegible] said dialing sequence [illegible] [illegible] dialing [illegible] respective predetermined signals which are used for [illegible] dialing [illegible] plurality of dialing signals.

2. Telecommunications apparatus according to claim 1, wherein [illegible] signals which are used for [illegible] dialing correspond to [illegible] dialing sequence.

3. Telecommunications apparatus according to claim 1, wherein said means for [illegible] said third plurality of dialing signals includes means for [illegible] the said first plurality of dialing signals and for preventing establishment of said telephone call if said evaluated first plurality of dialing signals are determined to be [illegible] [illegible] signals.

4. Telecommunications apparatus according to claim 1, wherein said [illegible] said dialing sequence [illegible] by [illegible] dialing [illegible] wherein said dialing sequence which indicates that said dialing sequence is [illegible] international dialing.

5. Telecommunications apparatus according to claim 1, wherein said means for evaluating said [illegible] plurality of dialing signals [illegible] said first plurality of dialing signals and said [illegible] plurality of dialing signals [illegible] said third plurality of dialing signals.

6. Telecommunications apparatus according to claim 1, wherein said respective predetermined signals which are used for [illegible] dialing are one of [illegible] access code [illegible] an international area code.

7. Telecommunications apparatus according to claim 5, wherein said means for evaluating said third plurality of

[illegible] selectively prevents establishment of said telephone call by preventing said telecommunications apparatus from transmitting at least a portion of said dialing sequence.

8. Telecommunications apparatus for selectively preventing establishment of a telephone call to a telephone number [illegible] effect exchange code over a communications network, said telecommunications apparatus being capable of transmitting a dialing sequence which includes a first plurality of dialing signals followed by a second plurality of dialing signals followed by a third plurality of dialing signals, said telecommunications apparatus comprising:

means for receiving said dialing sequence prior to receiving said central office exchange code;

means for evaluating said first plurality of dialing signals contained in said dialing sequence and for determining said first plurality of dialing signals are used to accomplish international dialing;

means for preventing said dialing sequence from being transmitted by:

said evaluating said first plurality of dialing signals contained in said dialing sequence when it is determined said first plurality of dialing signals are used to accomplish international dialing; and

preventing said second plurality of dialing signals from being transmitted.

9. Telecommunications apparatus according to claim 8, wherein said first plurality of dialing signals comprises [illegible] dialing signals.

10. Telecommunications apparatus according to claim 8, wherein said means for evaluating said first plurality of dialing signals determines said first plurality of dialing signals are used to accomplish international dialing when said first plurality of dialing signals [illegible] dialing signals.

11. Telecommunications apparatus according to claim 8, wherein said dialing sequence comprises a plurality of dialing signals [illegible] dialing signals which indicate said dialing sequence is for accomplishing international dialing.

12. Telecommunications apparatus according to claim 8, wherein said means for evaluating said first plurality of dialing signals identifies said first plurality of dialing signals [illegible] dialing signals.

13. Telecommunications apparatus according to claim 8, wherein said first plurality of dialing signals [illegible] dialing signals which indicate said dialing sequence is for accomplishing international dialing.

14. Telecommunications apparatus according to claim 13, further comprising means for preventing said telecommunications apparatus from transmitting [illegible] said plurality of dialing signals.

15. Telecommunications apparatus for preventing establishment of a telephone call to a telephone number having a central office exchange code which is [illegible] a communications network, said telecommunications apparatus being capable of transmitting a dialing sequence corresponding to said telephone number, said dialing sequence including a first plurality of dialing signals [illegible] dialing signals, said telecommunications apparatus comprising:

means for receiving said dialing sequence prior to receiving said central office exchange code;

means for evaluating said first plurality of dialing signals contained in said dialing sequence and for determining said first plurality of dialing signals are used to accomplish international dialing;

means for preventing said dialing sequence from being transmitted by:

said evaluating said first plurality of dialing signals contained in said dialing sequence when it is determined said first plurality of dialing signals are used to accomplish international dialing; and

preventing said first plurality of dialing signals from being transmitted.

16. Telecommunications apparatus according to claim 15, wherein said first plurality of dialing signals comprises [illegible] dialing signals.

17. Telecommunications apparatus according to claim 15, wherein said means for evaluating said first plurality of dialing signals determines said first plurality of dialing signals are used to accomplish international dialing when said first plurality of dialing signals [illegible] dialing signals.

18. Telecommunications apparatus according to claim 15, wherein said first plurality of dialing signals comprises a plurality of dialing signals which indicate said dialing sequence is for accomplishing international dialing.

19. Telecommunications apparatus according to claim 15, wherein said means for evaluating said first plurality of dialing signals identifies said first plurality of dialing signals [illegible] dialing signals.

20. Telecommunications apparatus according to claim 15, wherein said first plurality of dialing signals [illegible] dialing signals which indicate said dialing sequence is for accomplishing international dialing.

21. Telecommunications apparatus according to claim 19, wherein said means for evaluating said first plurality of dialing signals prevents establishment of said telephone call by preventing said telecommunications apparatus from transmitting at least a portion of said dialing sequence.

22. A method for at least partially preventing operation of a telecommunications device which is capable of transmitting a plurality of signal values, said method comprising the steps of:

a) receiving said plurality of signal values;

b) comparing at least a portion of said plurality of signal values to a predetermined plurality of signal values stored in a memory device, wherein said predetermined plurality of signal values are used to accomplish international dialing, and wherein said plurality of signal values are [illegible] other signal values; and

c) at least partially preventing operation of said telecommunications device in response to said plurality of signal values matching said predetermined plurality of signal values, wherein said predetermined plurality of signal values are used to accomplish international dialing, and wherein said step of at least partially preventing operation of said telecommunications device includes preventing said plurality of signal values from being transmitted to the central office of said further signal values.

23. The method of claim 22 wherein said digital sequence [illegible] dialing sequence.

24. A method according to claim 22, wherein said predetermined plurality of signal values are used to accomplish international dialing when said plurality of signal values which indicates a predetermined plurality of signal values are used to accomplish international dialing.

25. A method according to claim 22, further comprising the step of identifying said further signal value and said plurality of further signal values from at least two of said plurality of signal values.

26. A method according to claim 22, wherein said respective predetermined signals which are used for international dialing are one of (a) international access codes and (b) an international area code.

27. The method of claim 26, wherein said plurality of signal values corresponds to one of the characters 1, 2, 3, 4, 5, 6, 7, 8, 9, 0, # and *.

28. The method of claim 22, wherein said telecommunications device is coupled to a telecommunications pathway and wherein operation of said telecommunications device is at least partially prevented by severing a connection between said telecommunications device and said telecommunications pathway.

29. A method of controlling the operation of a telecommunications device having a keypad of buttons having a dialing sequence which includes a first plurality of dialing signals, a second plurality of dialing signals following a third plurality of dialing signals for transmitting a connection request, said method comprising the steps of:

(a) receiving said dialing sequence;

(b) analyzing said third plurality of dialing signals;

(c) at least partially preventing operation of said telecommunications device irrespective of said second plurality of dialing signals of said evaluation of said plurality of dialing signals is determined to be one of (i) a sequence in said dialing sequence that corresponds to a predetermined plurality of sequences of predetermined signal values which are used for international dialing, and (ii) the first plurality of dialing signals; and

(d) connecting said dialing sequence to said telecommunications pathway to enable said telecommunications device to establish a connection request in accordance with said second plurality of dialing signals if said evaluation of said third plurality of dialing signals is determined to be not one of (i) a sequence in said dialing sequence that corresponds to a predetermined plurality of sequences of predetermined signal values which are used for international dialing, and (ii) the first plurality of dialing signals.

30. The method of claim 29, wherein said predetermined signal sequences are area code dialing sequences.

31. A method of controlling the operation of a telecommunications device according to claim 29, wherein step (b) includes the step of identifying said first plurality of dialing signals and wherein said step (c) includes the step of at least partially preventing operation of said telecommunications device if said evaluation of said plurality of dialing signals is determined to be one of (i) a sequence in said dialing sequence that corresponds to a predetermined plurality of sequences of predetermined signal values which are used for international dialing, and (ii) the first plurality of dialing signals.

32. A method according to claim 29, wherein said step (b) includes the step of comparing said first plurality of dialing signals with a plurality of predetermined signal values which indicate that said dialing sequence is for international dialing.

33. A method according to claim 29, further comprising the step of identifying said first plurality of dialing signals and said second plurality of dialing signals from said identified third plurality of dialing signals.

34. A method according to claim 29, wherein said plurality of predetermined signal values which are used for international dialing are one of international access codes and international area codes.

35. A method for at least partially preventing operation of a telecommunications device, comprising the steps of:

(a) receiving a plurality of signal values which are generated by said telecommunications device, wherein said plurality of signal values include a first group of signal values followed by a second group of signal values followed by a third group of signal values;

(b) comparing said received third group of signal values with a plurality of predetermined signal value sequences which are used for international dialing; and

(c) at least partially preventing operation of said telecommunications device if said third group of signal values is in a location within said plurality of signal values which is used to identify international dialing and for which the third group of signal values corresponds to one of said plurality of predetermined signal value sequences irrespective of said second group of signal values.

36. The method of claim 35, wherein each of said signal values corresponds to one of the characters 1, 2, 3, 4, 5, 6, 7, 8, 9, 0, # and *.

37. The method of claim 35, wherein said telecommunications device is coupled to a telecommunications pathway and wherein operation of said telecommunications device is at least partially prevented by severing a connection between said telecommunications device and said telecommunications pathway.

38. A method for at least partially preventing operation of a telecommunications device according to claim 35, wherein step (b) includes the step of comparing said received third group of signal values with a plurality of second predetermined signal value sequences and step (c) includes the step of at least partially preventing use of said telecommunications device if said third group of signal values is found to be connected to said plurality of second predetermined signal value sequences.

39. A method according to claim 35, wherein said location within said plurality of signal values which is used to accomplish international dialing is an earliest location within said plurality of signal values such that each of said plurality of signal values is one of said predetermined international dialing.

40. A method according to claim 39, further comprising the step of identifying said first group of signal values and said second group of signal values in order to identify said third group of signal values.

41. A method according to claim 35, wherein said plurality of predetermined signal value sequences which are used for international dialing are one of international access codes and area code dialing sequences.

42. Apparatus for use with a telecommunications device for selectively preventing communications between said telecommunications device and a telecommunications pathway, said apparatus comprising:

means for interposing said apparatus between said telecommunications device and said telecommunications pathway when said device is connected to said pathway;

means for receiving a plurality of signals which are generated from said telecommunications device prior to said telecommunications device establishing a connection to said pathway in response to dialing signals corresponding to a telephone number, said plurality of signals comprising a first plurality of signals, followed by a second plurality of signals, followed by a third plurality of signals;

processing means for selectively preventing communications between said telecommunications device and said pathway when said plurality of signals are determined to (a) be in a location within said plurality of signals which is used for accomplishing international dialing and (b) include a sequence of a plurality of first signals for accomplishing international dialing irrespective of said second plurality of signals.

44. The apparatus of claim 42, wherein each of said signals corresponds to one of the characters 1, 2, 3, 4, 5, 6, 7, 8, 9, 0, * and #.

45. The apparatus of claim 42, wherein said at least telecommunications device is coupled to a telecommunications pathway, and wherein said prevention means includes means for preventing a connection between said telecommunications device and said telecommunications pathway.

46. The apparatus of claim 42, wherein said plurality of test signals corresponds to digit sequence 011.

47. Apparatus according to claim 42, wherein said plurality of test signals corresponds to a 011 dialing sequence.

48. Apparatus according to claim 42, wherein said prevention means selectively prevents communications between said telecommunications device and said [illegible] telecommunications device if said plurality of signals are determined to be [illegible] within said plurality of signals which indicates that said plurality of signals are for accomplishing international dialing.

49. Apparatus according to claim 42, wherein said prevention means detects said plurality of signals and said second plurality of signals in response to said plurality of signals.

50. Apparatus according to claim 42, wherein said plurality of test signals which are used for accomplishing international dialing are comprised of an international access code and an international area code.

EXHIBIT D

US005812650A

United States Patent [19]

Gumming

[11] Patent Number: 5,812,650

[45] Date of Patent: *Sep. 22, 1998

[54] METHOD AND APPARATUS FOR INTERCEPTING POTENTIALLY FRAUDULENT

[75] Inventors: John R. Gumming; [illegible] Lincoln, [illegible]

[*] Notice: The portion of the term of this patent subsequent to [illegible] has been disclaimed.

[21] Appl. No.: 200,045

[22] Filed: Feb. 23, 1994

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. [illegible] abandoned [illegible]

[51] Int. Cl.[6] H04M 3/38

[52] U.S. Cl. ..... 379/201; 379/[illegible]; 379/[illegible]; 379/[illegible]

[58] Field of Search ..... 379/[illegible]

[56] References Cited

U.S. PATENT DOCUMENTS

[illegible]

FOREIGN PATENT DOCUMENTS

[illegible] Germany [illegible]
[illegible] United Kingdom [illegible]

OTHER PUBLICATIONS

[illegible]

Primary Examiner—[illegible]
Attorney, Agent, or Firm—[illegible]

[57] ABSTRACT

[illegible]

4 Claims, 8 Drawing Sheets

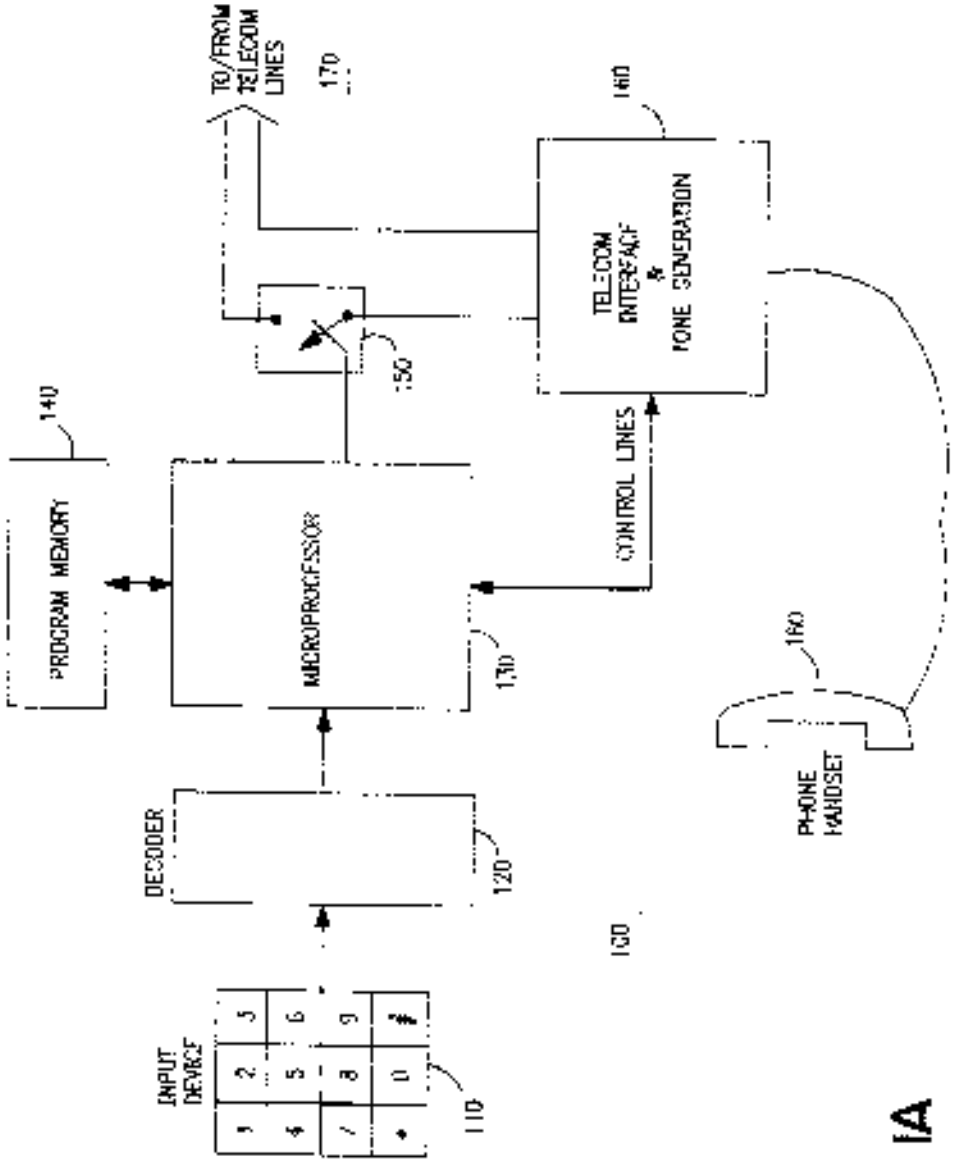

TO/FROM TELECOM LINES
170
160
TELECOM INTERFACE & TONE GENERATION
150
140
PROGRAM MEMORY
MICROPROCESSOR
CONTROL LINES
130
180
PHONE HANDSET
DECODER
120
100
INPUT DEVICE
110

FIG. 1A

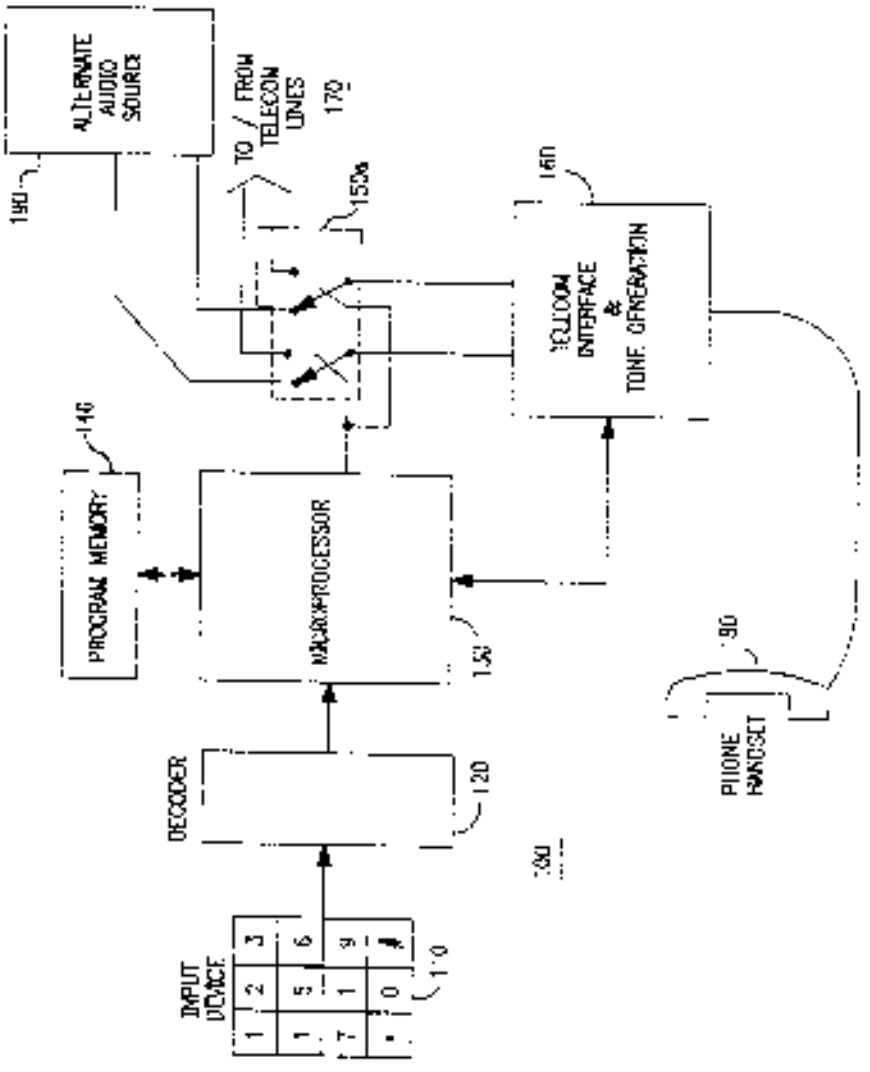

ALTERNATE AUDIO SOURCE
190
TO / FROM TELECOM LINES
170
155a
160
TELECOM INTERFACE & TONE GENERATION
PROGRAM MEMORY
140
MICROPROCESSOR
150
90
PHONE HANDSET
DECODER
120
INPUT DEVICE
110
100

FIG. 1B

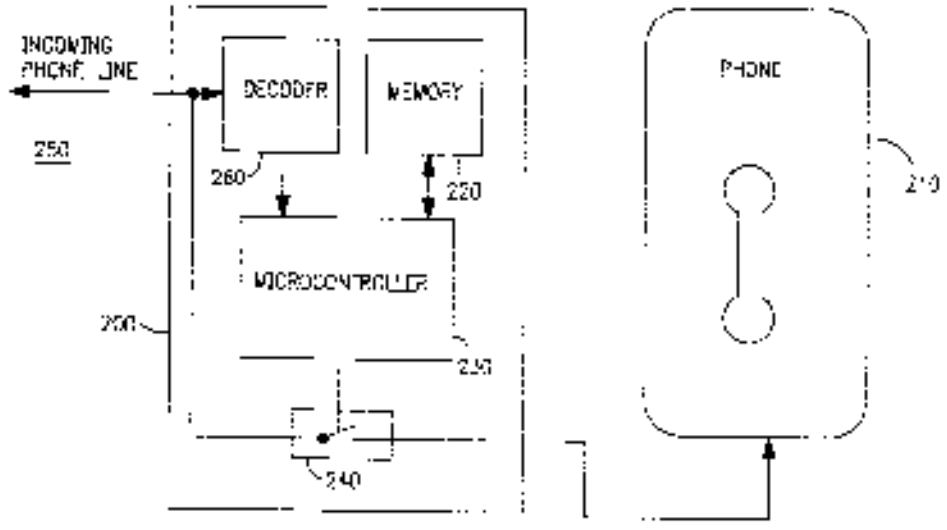

INCOMING
PHONE LINE
250
DECODER
MEMORY
260
220
MICROCONTROLLER
200
230
240
PHONE
210

FIG. 2A

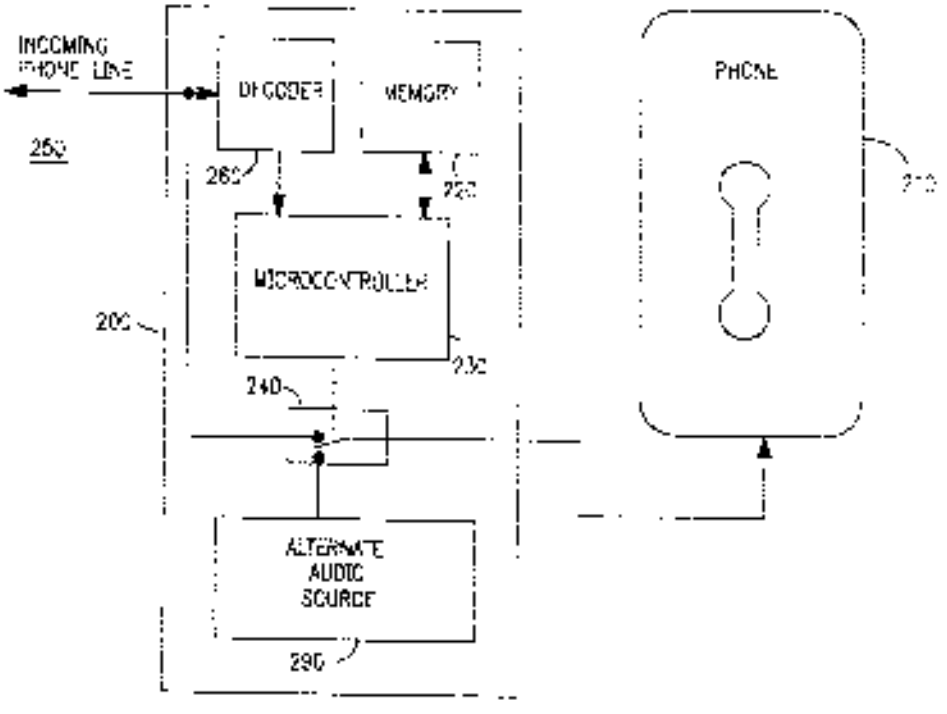

INCOMING
PHONE LINE
250
DECODER
MEMORY
260
220
MICROCONTROLLER
200
230
240
ALTERNATE
AUDIO
SOURCE
290
PHONE
210

FIG. 2B

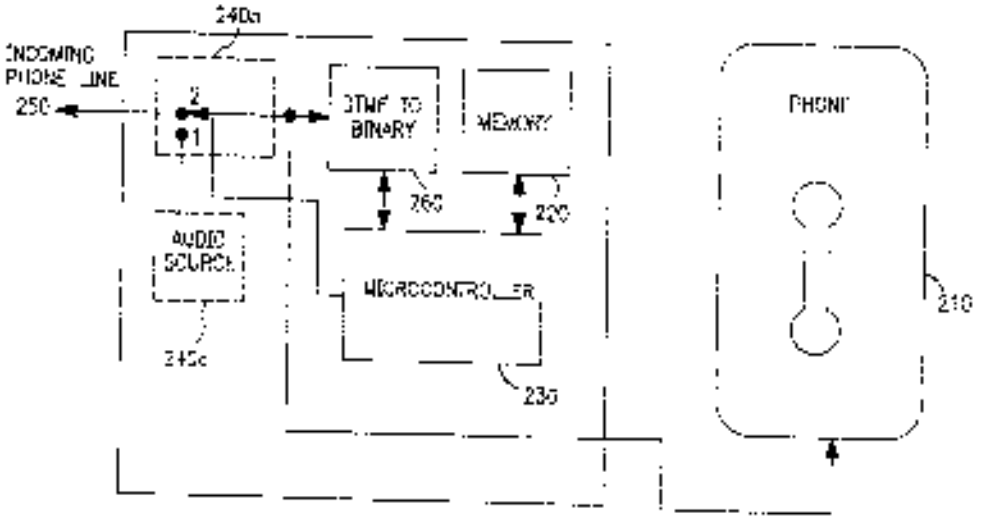

240a
INCOMING PHONE LINE
250
2
1
DTMF TO BINARY
MEMORY
260
220
AUDIO SOURCE
MICROCONTROLLER
245c
230
PHONE
210

FIG. 2C

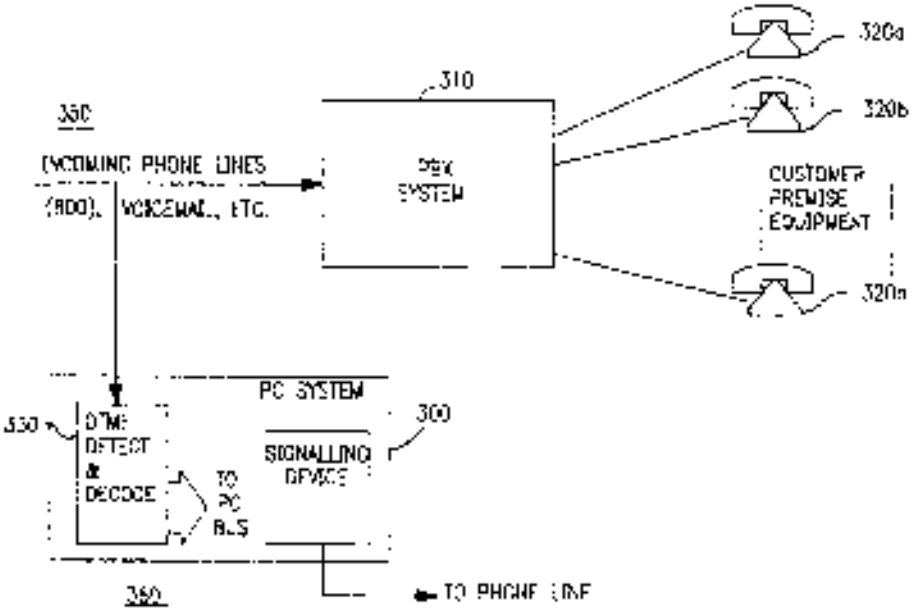

320a
320b
320n
310
350
INCOMING PHONE LINES
(800), VOICEMAIL, ETC.
PBX SYSTEM
CUSTOMER PREMISE EQUIPMENT
PC SYSTEM
330
DTMF DETECT & DECODE
TO PC BUS
SIGNALLING DEVICE
300
360
TO PHONE LINE

FIG. 3A

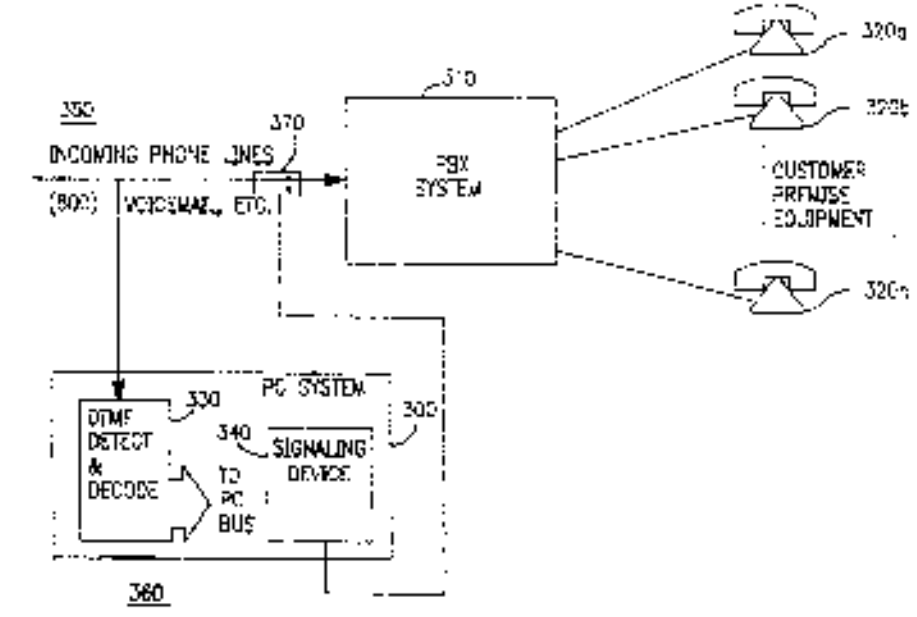

320a
320b
320n
310
350
370
INCOMING PHONE LINES
(800) VOICEMAIL, ETC.
PBX SYSTEM
CUSTOMER PREMISE EQUIPMENT
PC SYSTEM
330
340
300
DTMF DETECT & DECODE
TO PC BUS
SIGNALING DEVICE
360

FIG. 3B

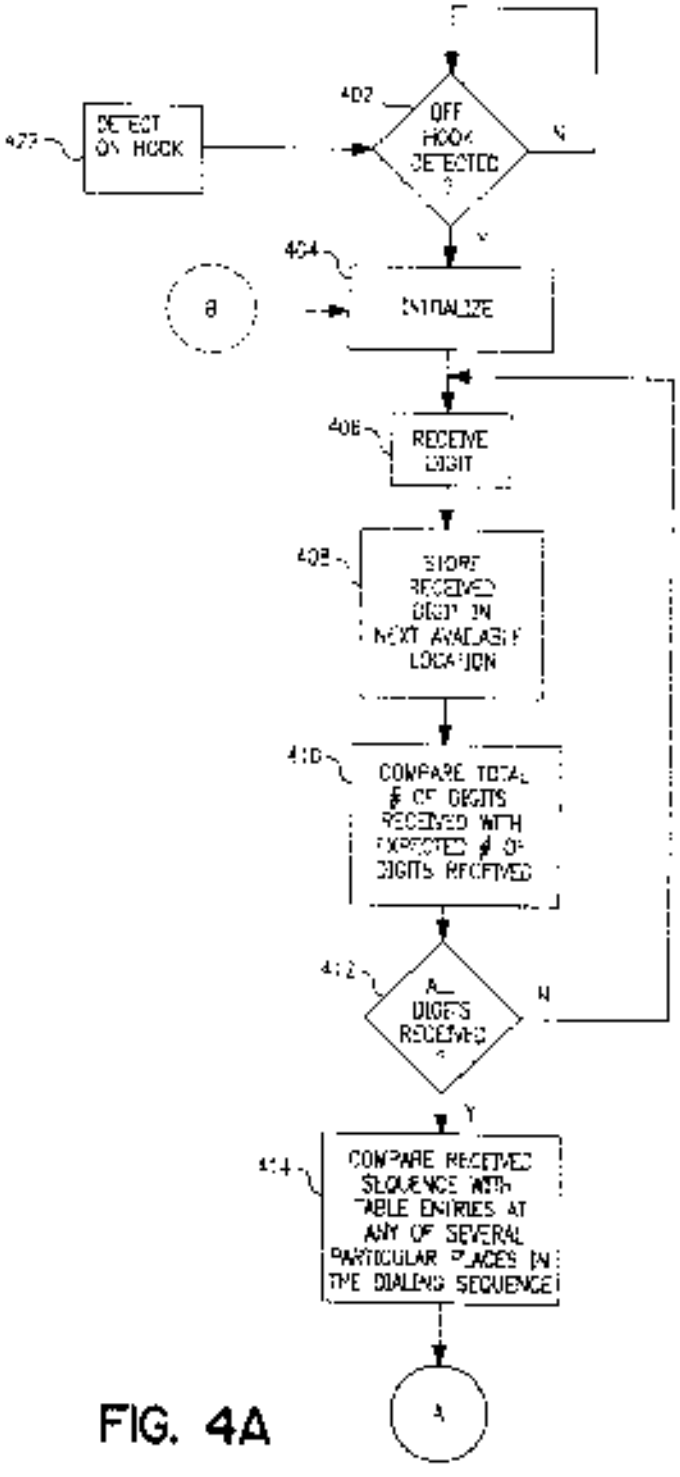

402
OFF HOOK DETECTED ?
N
Y
422
DETECT ON HOOK
404
INITIALIZE
B
406
RECEIVE DIGIT
408
STORE RECEIVED DIGIT IN NEXT AVAILABLE LOCATION
410
COMPARE TOTAL # OF DIGITS RECEIVED WITH EXPECTED # OF DIGITS RECEIVED
412
DIGITS RECEIVED ?
N
Y
414
COMPARE RECEIVED SEQUENCE WITH TABLE ENTRIES AT ANY OF SEVERAL PARTICULAR PLACES IN THE DIALING SEQUENCE
A

FIG. 4A

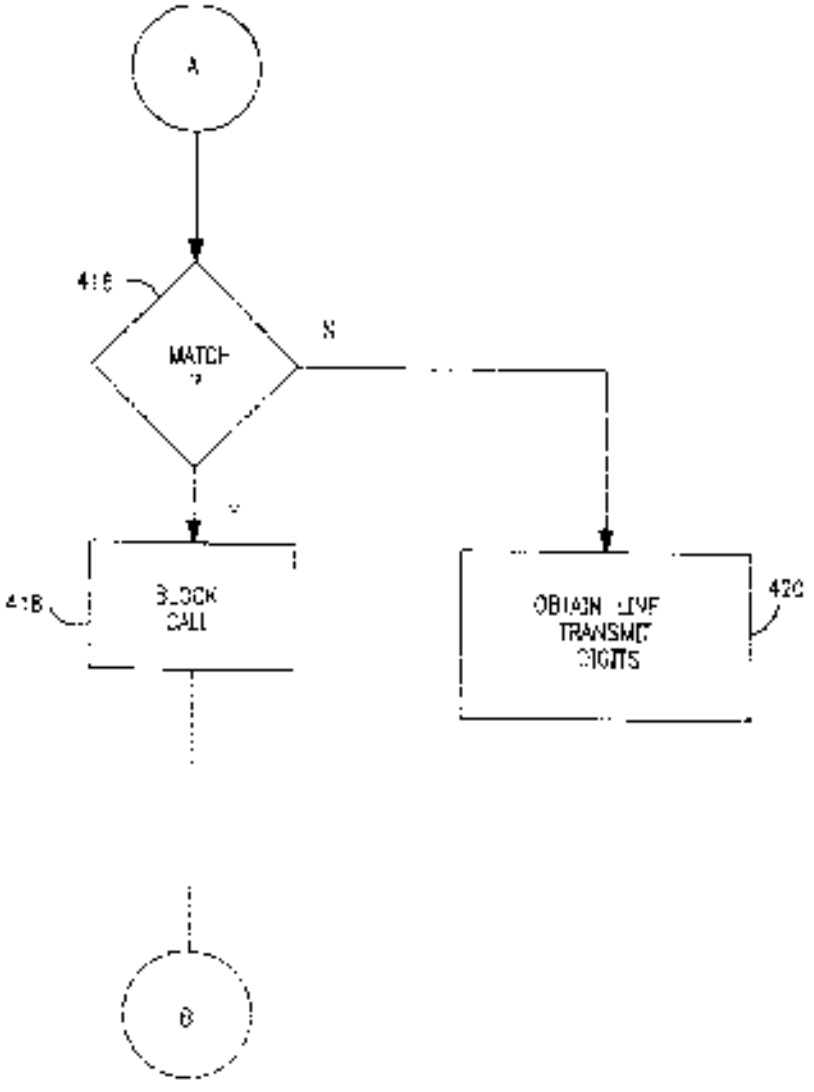

A
416
MATCH
N
Y
418
BLOCK CALL
420
OBTAIN LIVE TRANSMIT DIGITS
B

FIG. 4B

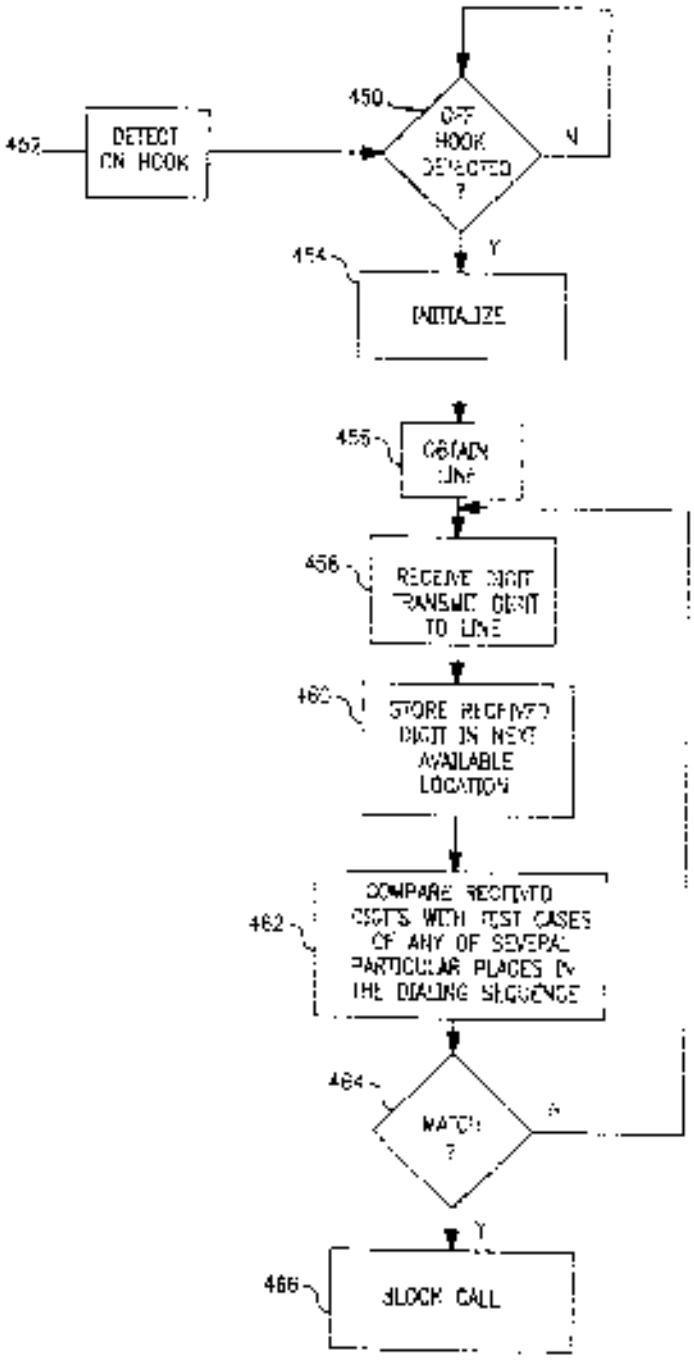

450
OFF HOOK DETECTED ?
N
Y
452
DETECT ON HOOK
454
INITIALIZE
456
RECEIVE DIGIT TRANSMIT DIGIT TO LINE
458
STORE RECEIVED DIGIT IN NEXT AVAILABLE LOCATION
462
COMPARE RECEIVED DIGITS WITH TEST CASES OF ANY OF SEVERAL PARTICULAR PLACES IN THE DIALING SEQUENCE
464
MATCH ?
Y
466
BLOCK CALL

FIG. 4C

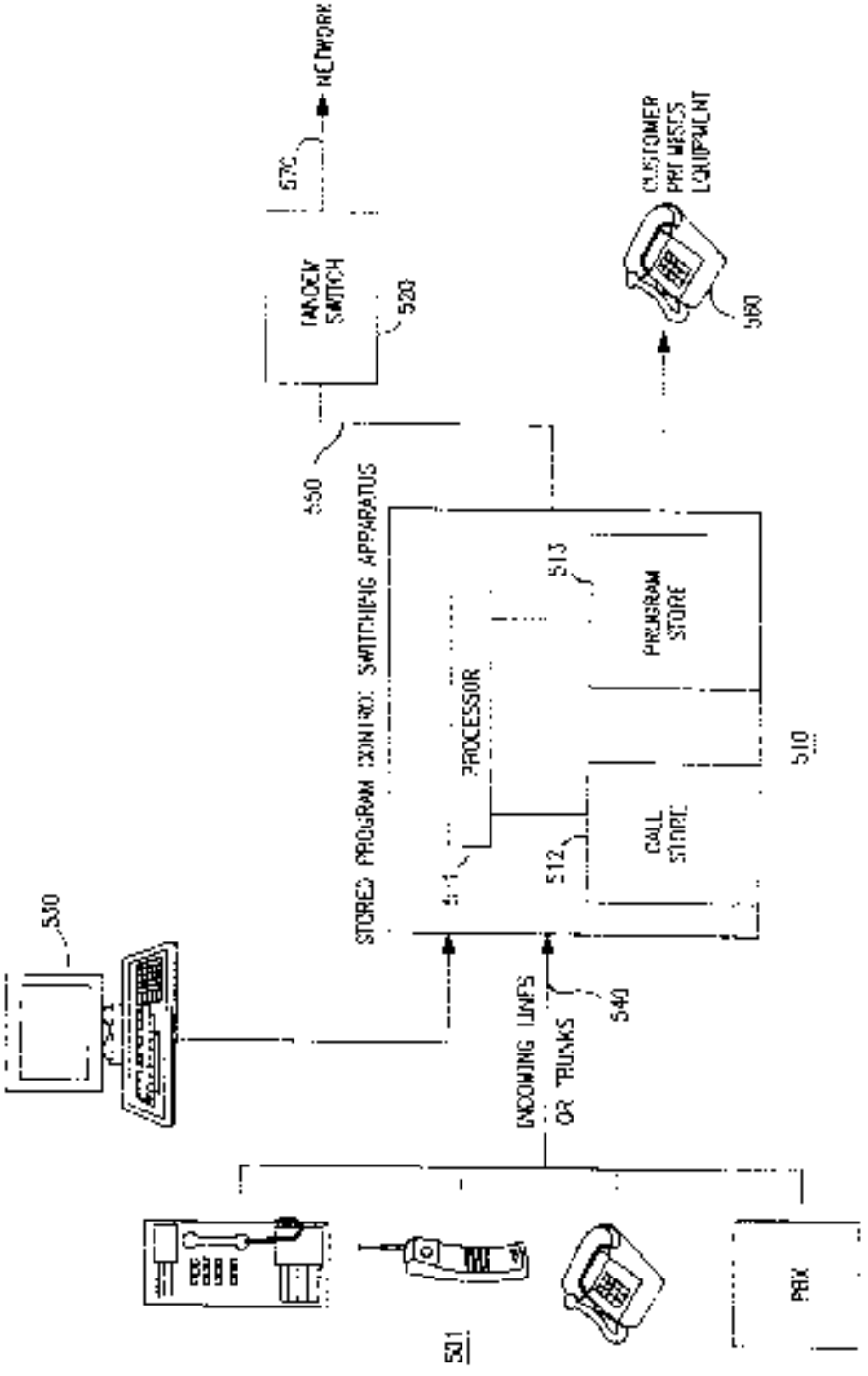

NETWORK
570
TANDEM SWITCH
520
CUSTOMER PREMISES EQUIPMENT
560
550
STORED PROGRAM CONTROL SWITCHING APPARATUS
PROCESSOR
513
PROGRAM STORE
511
512
CALL STORE
510
530
INCOMING LINES OR TRUNKS
540
501
PBX

FIG. 5

METHOD AND APPARATUS FOR INTERCEPTING POTENTIALLY FRAUDULENT

This application is a [illegible] of application Ser. No. [illegible] filed [illegible], now abandoned, which was a continuation in part of application Ser. No. [illegible] filed Jul. [illegible], now [illegible].

FIELD OF THE INVENTION

The present invention relates to telecommunications and more specifically to the selective disablement of telecommunication devices. In particular, a method and apparatus is [illegible] for monitoring a sequence of digits [illegible] telecommunication device and selectively disabling [illegible] [illegible] of particular digits [illegible] sequence.

BACKGROUND OF THE INVENTION

A common method for placing a call with a telecommunications device (e.g. a pay telephone) is through the use of calling card numbers. A calling card number is a sequence of digits which may be used as input to a telecommunications device by a telecommunications user. By entering a calling card number, the cost of a telephone call may be charged to a calling card account. The number which [illegible] a particular calling card account is provided to the [illegible] of the calling card account holder (e.g. [illegible] individual or corporation). [illegible] [illegible] without the user [illegible] [illegible].

[illegible] sequence of digits [illegible] calling card [illegible] requested, the call is allowed to complete. [illegible] telecommunications company [illegible] the sequence of [illegible] calling card [illegible] [illegible] the [illegible] complete. [illegible] calling card number [illegible] the [illegible] number [illegible] the calling card [illegible] number unauthorized [illegible] the calling card [illegible] [illegible] prevented.

Using the United States as an exemplary [illegible] [illegible] call [illegible] telephone call [illegible] [illegible] [illegible] [illegible] international access code (e.g. 011 or 01) followed by the country code, the city code and the number of the party being called. The caller would then [illegible]. He would [illegible] the number of the calling card [illegible] telephone [illegible] be [illegible], for example, by pressing [illegible] [illegible] buttons on a DTMF keypad.

An alternative way to place calls using a telecommunications device is through the use of [illegible] answer and automated voice response systems. By entering a series of digits which will [illegible] of these systems, [illegible] to the system is obtained. Then, by entering additional digits (e.g. an access code), the system can be directed to place a telephone call to anywhere in the world. The owner of the system (e.g. a corporation) is billed for the cost of any call which is completed by the system. An exemplary system of this type is described in U.S. Pat. No. [illegible] entitled "PBX TELEPHONE CALL CONTROL SYSTEM" which is incorporated by reference for its teachings in the field of automated voice response systems. Again, the security in preventing unauthorized use of such a system [illegible] maintaining the confidentiality of any access codes which enable system operation.

Although the methods described above appear to be secure, there are several ways in which unauthorized calls

can be made by [illegible] [illegible] may be [illegible], for example, [illegible] numbers. Until the theft has been discovered and the account cancelled, these [illegible] fraudulent [illegible] phone calls. The calling card account holder is then charged for the cost of the calls. By [illegible] numbers in this manner, it is possible [illegible] place [illegible] [illegible] of the [illegible].

[illegible] fraudulent calls may be placed [illegible] [illegible] voice response systems. [illegible] [illegible] can be [illegible] [illegible] answer or automated voice response system [illegible] long distance or international call. [illegible] the [illegible] call [illegible] operation [illegible].

One [illegible] calls from [illegible] telephones [illegible] access [illegible] [illegible] accessed from pay telephones [illegible] [illegible] 911 [illegible] the United States [illegible] of alternative [illegible] [illegible] [illegible] [illegible] [illegible] 10xxx, 950, and 1-800.

In addition [illegible] telecommunications services [illegible] [illegible] long distance services [illegible] United States [illegible] [illegible] from mobile telephones [illegible] access codes. [illegible] solely on the [illegible] of the [illegible] sequence [illegible] [illegible] [illegible] [illegible] [illegible] based solely on the [illegible] [illegible] [illegible] [illegible] would be [illegible] [illegible] [illegible] [illegible].

Additional access codes [illegible] accessing long distance [illegible] [illegible] services. [illegible] United States [illegible] [illegible] [illegible] access codes.

SUMMARY OF THE INVENTION

The present invention relates to a method and apparatus for intercepting potentially fraudulent telephone calls which [illegible] with a dialing sequence which includes a first plurality of dialing digits followed by a second plurality of dialing digits [illegible] a third plurality of dialing digits. The call is [illegible] if the [illegible] plurality of dialing digits [illegible] the third plurality of dialing digits are determined to be respective predetermined digits.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1A is a block diagram which illustrates a first exemplary embodiment of the present invention.

FIG. 1B is a block diagram which illustrates a second exemplary embodiment.

FIG. 2A is a block diagram which illustrates a third exemplary embodiment of the present invention.

FIG. 2B is a block diagram which illustrates a fourth exemplary embodiment of the present invention.

FIG. 2C is a block diagram which illustrates a fifth exemplary embodiment of the present invention.

FIG. 3A is a block diagram which illustrates a sixth exemplary embodiment of the present invention.

FIG. 3B is a block diagram which illustrates a seventh exemplary embodiment of the present invention.

...the operation of the exemplary telephone system of the present invention.

FIG. 4B is a flow chart of the first alternative embodiment of FIG. 4A which illustrates the operation of the exemplary telephone system of the present invention.

FIG. 4C is a flow chart of the second alternative embodiment of the exemplary telephone system of the present invention.

FIG. 5 is a block diagram of the circuitry of the exemplary telephone system of the present invention.

DETAILED DESCRIPTION

A first exemplary embodiment of the present invention is illustrated in FIG. 1A. As shown in FIG. 1A, a telephone system 100 is coupled to a telephone line 170 for communication therebetween. The telephone system 100 includes a microprocessor 120 and a memory device 140. The microprocessor 120 includes a CMOS 11-bit microprocessor device 74C923 manufactured by National Semiconductor Corporation. Each digit which is entered using the keypad 110 is detected by the microprocessor 120. The microprocessor 120 then transmits the information to the memory device 140. Memory device 140 is used to store the appropriate digits for subsequent retrieval by the microprocessor 120.

In an exemplary embodiment of the present invention, a user enters a plurality of numbers using the keypad 110. The microprocessor 120 then detects which of the numbers have been entered. The microprocessor 120 then retrieves the appropriate digits from the memory device 140 and transmits the digits to the telephone line 170.

In an exemplary embodiment of the present invention, numbers are entered using a touch-tone keypad 110. However, it is contemplated that alternative methods for entering telephone digits may be used. For example, digits may be entered from a communications interface device (not shown) coupled to the microprocessor 120. The communications interface device may be coupled to a data source such as a computer or modem. The data source may be a digital source or an analog source. If the data source is an analog source, then the communications interface device may be required to convert the analog signals into digital signals for processing by the microprocessor 120. The communications interface device may be implemented using a variety of known techniques and may be implemented using a variety of known protocols. For example, the communications interface device may be implemented using a serial interface device conforming to well known EIA specifications. Alternatively, the communications interface device may be implemented using a parallel interface device conforming to well known IEEE specifications. It is contemplated that other communications interface devices may be implemented without departing from the spirit and scope of the present invention.

Power-on reset circuit 160 includes a group of resistors and a capacitor to provide the power-on reset signal to microprocessor 120. Microprocessor 120 is coupled to memory device 140 via a plurality of address lines 150 and a plurality of data lines 152. Microprocessor 120 provides the address of the memory location to be accessed to memory device 140 via address lines 150. Memory device 140 then provides the data stored at the memory location specified by the address lines 150 to microprocessor 120 via data lines 152. Microprocessor 120 is coupled to telephone line 170 via a plurality of control lines 154. Microprocessor 120 controls the particular digits to be transmitted to the particular circuits in the analog section of the system over control lines 154 in response to the stored program. Overall control and data manipulation may be performed, for example, by executing the instructions stored in memory device 140 with a plurality of telephone status flags stored in the RAM memory section of microprocessor 120. The status flags are used to control various functions and operations of the telephone system. For example, the status flags may serve as a form of memory for the telephone call. These flags include values that may be stored between two groups of dialing digits (such as area code digits and telephone digits). Furthermore, the flags may indicate the current operating mode of the system (such as whether the system is operating in a first group of dialing digits (such as area code digits) or a second group of dialing digits (such as telephone digits). Each of these flags, or control signals, are then decoded to determine if the call should be switched during the transmission of the two groups of dialing digits and if so, corresponding control values may be generated for the control signal values and the second group of dialing digits that corresponds to the control values may be transmitted to the memory device to make the determination. Other control values may be processed or stored within the RAM for the two groups of dialing digits and the corresponding algorithm to control is executed by the microprocessor 120.

Exemplary dialing digits which follow the second group of dialing digits may include a country code, a city code and a local number. This local number includes a central office exchange code which indicates an exchange area and one of several central offices through which the call will proceed before reaching the destination subscriber. The use of this terminology is illustrated by a call to Paris

[illegible] the city code [illegible] in North American portion of the United States the [illegible] simply contain a local number [illegible] country code and a city code. [illegible] telephone number [illegible] central office exchange code to indicate the exchange [illegible] of several central offices through which the call [illegible] the destination subscriber.

[illegible] exemplary [illegible] of the present [illegible] of one or more of the following digit sequences in the dialing sequence [illegible] telephone call:

TABLE I

10XXX01
950XXXX011
1800XXXXXXX011

In addition it is possible [illegible] international [illegible] accessed using a three digit [illegible] Exemplary international telephone [illegible]

TABLE II

950XXXX0809
1800XXXXXXX0809
10XXX0809

[illegible] telecommunications device [illegible] in accordance with the present invention [illegible] sequences allow an individual [illegible] to be charged [illegible] without [illegible] long distance and international calls [illegible] permitted.

It is contemplated that additional numerical sequences may allow an individual to access long distance and international communication services. These numerical sequences include two or more predetermined digits which are located at particular places in the dialing sequence. The particular places [illegible] at the beginning, the middle [illegible] end of the dialing sequence. Furthermore, additional digits [illegible] be interposed between the predetermined digits. Microprocessor 130 [illegible] (or [illegible] 140) [illegible] these digits have been entered, and to cause switch 150 to open upon detection of these digits.

A further exemplary embodiment of the present invention is illustrated by FIG. 1B. FIG. 1B is similar to FIG. 1A. However, switch 150 has been replaced with switch 150A. [illegible] switch 150A is connected to alternate audio source 190. The plurality of digits which are entered for making a telephone call are received, as in the exemplary embodiment which is illustrated by FIG. 1A. However, in the exemplary embodiment which is shown by FIG. 1B, when predetermined digits are located at particular locations in the dialing sequence, microprocessor 130 signals switch 150A to disconnect telecommunications interface and tone generation 160 from telecommunication lines 170. Furthermore, the signal which is transmitted from microprocessor 130 causes switch 150A to connect telecommunications interface and tone generation 160 to alternate audio source 190. Alternate audio source 190 may transmit a message to the telephone user explaining [illegible] that a telephone call cannot be made from telephone unit 100 using the telephone number which has been entered.

In the embodiments of the present invention [illegible] illustrated by FIGS. 1A and 1B, possibly [illegible] telephone calls [illegible] in one of two ways. [illegible] immediately [illegible] predetermined digits [illegible] places in the dialing sequence. [illegible] in the dialed telephone number is transmitted to telecommunication line 170 as the digit is entered by the telephone user. Alternatively, [illegible] in microprocessor 130. In this instance, none of the dialed digits [illegible] communication line 170 [illegible] of the digits [illegible] telephone number have been entered. [illegible] digits are detected at specified locations in the dialing sequence, the [illegible] telephone number is not transmitted to telecommunication line 170. Furthermore, as shown in the exemplary embodiment of the present invention which is illustrated by FIG. 1B, the telephone user may then receive a message [illegible] audio source 190 indicating that the attempted telephone call will not be allowed to proceed. Alternatively, [illegible] the call may be automatically routed to the [illegible] of the [illegible] the public telephone [illegible]

In a further exemplary embodiment [illegible] switch 150 of FIG. 1A and switch 150A of FIG. 1B [illegible] Thus, telecommunications interface and tone generation 160 is [illegible] telecommunication lines 170. Upon the detection [illegible] predetermined digits at particular places in the dialing sequence, [illegible] from entering additional digits [illegible] telecommunications device 100. [illegible] from entering these [illegible] digits [illegible] For example, a signal from microprocessor 130 may disable input device 110. Alternatively, microprocessor 130 may disable keypad 120. Microprocessor 130 may [illegible] processing within telecommunications device 100 [illegible] telecommunications device 100 is effectively suspended.

In a further exemplary embodiment of the present invention [illegible] telecommunication lines 170 [illegible] in the dialing sequence which has [illegible] plurality of dialing sequences [illegible] stored with telecommunications device 100. [illegible] a particular dialing sequence [illegible] corresponding to the [illegible] numbers which are not [illegible] telecommunications device 100, a signal from microprocessor 130 [illegible] to disable input device 110. Alternatively, microprocessor 130 may disable keypad 120. In this manner [illegible] telecommunications device 100 is only allowed [illegible] telephone numbers have been entered.

In FIGS. 1A and 1B, switches 150 and 150A are each shown as a physical switch. However, it is understood that switches 150 and 150A may be implemented as mechanical switches, electronic switches, etc. Furthermore, switches 150 and 150A may be constructed in a manner such that they are capable of achieving electrical isolation between different terminals associated with the switch, while appropriate physical connections are maintained.

A further exemplary embodiment of the present invention is illustrated by FIG. 2A. In FIG. 2A, telecommunications device 210 is connected to telecommunication lines 250 via interface unit 200. As in the exemplary embodiment of the present invention which is illustrated by FIG. 1A, telecommunications line 250 may have a variety of different functions.

The exemplary embodiment of FIG. 2 illustrated by FIG. 2A includes microcontroller 230 which receives instructions from memory 220. In order to initiate a telephone call, a user of telephone device 210 may enter a telephone number which is provided to microcontroller 230 via telephone device 210. The telephone number sequence is converted to a series of signals which are transmitted to microcontroller 230. Microcontroller 230 retrieves specific predetermined digits from memory 220 which correspond to the calling sequence for the telephone call. For example, microcontroller 230 may send signals to switch 240 to open. This causes termination of the telephone call.

Although switch 240 is shown connected between telephone device 210 and telephone line 250, it is contemplated that switch 240 may be physically interposed between telephone device 210 and telephone line 250 which would cause switch 240 to open or close to terminate or initiate the call, respectively.

A further exemplary embodiment of the present invention is illustrated by FIG. 2A. As shown in FIG. 2A, microcontroller 230 may be programmed to recognize at least one predetermined digit or digits that have been entered in appropriate locations in the dialing sequence (i.e., the particular digit or digits of the 10 digit telephone number). Microcontroller 230 may then send signals to switch 240 to cause switch 240 to open or close. For example, switch 240 may be caused to open or close in response to a predetermined digit or digits in the dialing sequence (i.e., the particular digit or digits of the 10 digit telephone number).

A further exemplary embodiment of the present invention is illustrated by FIG. 2B. As shown in FIG. 2B, microcontroller 230 may be programmed to recognize at least one predetermined digit or digits that have been entered in appropriate locations in the dialing sequence (i.e., the particular digit or digits of the 10 digit telephone number). Microcontroller 230 may then send signals to switch 240 to cause switch 240 to open or close. For example, switch 240 may be caused to open or close in response to a predetermined digit or digits in the dialing sequence (i.e., the particular digit or digits of the 10 digit telephone number). Microcontroller 230 may also send signals to switch 240A to cause switch 240A to open or close. For example, switch 240A may be caused to open or close in response to a predetermined digit or digits in the dialing sequence (i.e., the particular digit or digits of the 10 digit telephone number).

A further exemplary embodiment of the present invention is illustrated by FIG. 2C. As shown in FIG. 2C, microcontroller 230 may be programmed to recognize at least one predetermined digit or digits that have been entered in appropriate locations in the dialing sequence (i.e., the particular digit or digits of the 10 digit telephone number). Microcontroller 230 may then send signals to switch 240 to cause switch 240 to open or close. For example, switch 240 may be caused to open or close in response to a predetermined digit or digits in the dialing sequence (i.e., the particular digit or digits of the 10 digit telephone number). Microcontroller 230 may also send signals to switch 240A to cause switch 240A to open or close. For example, switch 240A may be caused to open or close in response to a predetermined digit or digits in the dialing sequence (i.e., the particular digit or digits of the 10 digit telephone number).

Automatic switch 240A may be maintained open as a result of the number of attempted telephone calls 230. After a predetermined number of attempts have been detected, microcontroller 230 has determined that a valid telephone number has been entered, switch 240A may be caused to close. Microcontroller 230 may then send signals to switch 240 which cause switch 240 to open.

Automatic switch 240A may be maintained open as a result of the number of attempted telephone calls 230. After a predetermined number of attempts have been detected, microcontroller 230 has determined that a valid telephone number has been entered, switch 240A may be caused to close. Microcontroller 230 may then send signals to switch 240 which cause switch 240 to open. This causes termination of the telephone call.

In a further exemplary embodiment of the present invention, velocity checking on calling card numbers may be implemented. Velocity checking may be used to prevent dialing of the same phone number for persons that dial in excess of a predetermined number of times over a certain time period. In response to velocity checking, the telecommunications device can be interrogated in order to prevent fraudulent telephone activity.

Thus, for example, if a first signal is sent and a second signal is sent a predetermined number of times within a certain time period corresponding to the same phone number, the telephone generating these signals can be selectively disabled. This may also apply to other numbers (e.g., calling card numbers) as set forth above.

In a further exemplary embodiment of the present invention, velocity checking on calling card numbers may be implemented. For example, a calling card number (or the last eight digits thereof) may be determined. If this calling card number is found to be used in excess of a predetermined threshold over a certain time period, the telecommunications device may be disabled.

In an exemplary embodiment of the present invention, velocity checking may be used to prevent phone numbers and calling card numbers from being used at excessive levels or testing may be used to prevent excessive attempts of incorrect codings required. For example, a predetermined level of velocity checking may be implemented. As a second level of velocity checking, velocity checking may be implemented. Further, velocity checking may be implemented. Velocity checking may be implemented by implementing a velocity checking algorithm. For example, a predetermined level of velocity checking may be implemented. Further, velocity checking may be implemented by implementing a velocity checking algorithm. For example, a predetermined level of velocity checking may be implemented.

Velocity checking may be performed on a cumulative basis over a period of time. For example, in addition to phone numbers entered by the user, velocity checking may be performed on calling card numbers. For example, velocity checking may be performed on calling card numbers which are used to make a call.

The velocity checking may be performed on a cumulative basis over a period of time. For example, velocity checking may be performed on a cumulative basis over a period of time. For example, velocity checking may be performed on a cumulative basis over a period of time.

Further, a group of telephone numbers may be monitored for velocity checking. For example, a group of telephone numbers may be monitored for velocity checking. For example, a group of telephone numbers may be monitored for velocity checking. For example, a group of telephone numbers may be monitored for velocity checking.

In addition, velocity checking may be performed on a cumulative basis over a period of time. For example, velocity checking may be performed on a cumulative basis over a period of time. For example, velocity checking may be performed on a cumulative basis over a period of time.

Further, velocity checking may be performed on a cumulative basis over a period of time. For example, velocity checking may be performed on a cumulative basis over a period of time. For example, velocity checking may be performed on a cumulative basis over a period of time.

A further exemplary embodiment of the present invention is illustrated by FIG. 3A. Telecommunications device 350 is connected to PBX System 340. PBX system 340 is connected to premise equipment 320A through 320N. PC System 360 is connected to telecommunications line 350. PC System 360 includes DTMF detector 330 and a polling device 340. DTMF detector 330 detects DTMF signals received from telecommunications line 350 and provides signals which are transmitted to PC System 360. If PC System 360 determines, by polling, that a predetermined sequence of specific events or a predetermined sequence of specific events or a predetermined sequence of specific events, a message may be sent to polling device 340, by PC System 360 to indicate that potentially fraudulent activity is occurring. An appropriate

[illegible] an appropriate automated device) may then take further action such as terminating the call, recording the call, etc.

In a further exemplary embodiment of the present invention which is illustrated by FIG. 3B, the output of signalling device 340 is transmitted to switch 370. Thus, upon the detection of predetermined digits at appropriate places [illegible] the dialing sequence by PC System 360, the connection between the incoming phone line 350 and PBX system 390 is terminated. Thus, the telephone call is automatically terminated.

The embodiments of the present invention which are illustrated by FIG. 3A and FIG. 3B [illegible] with a [illegible] type system. Thus, the fraudulent use of a PBX in [illegible] message environment can be effectively [illegible].

In a further exemplary embodiment of the present invention, the output of signalling device 340 is [illegible] (not shown) to PBX System 310. In [illegible] PBX System 310 receives an appropriate signal which prevents [illegible] the PBX System [illegible] the fraudulent [illegible].

A flow chart [illegible] which illustrates the operation of the present invention is shown in FIG. 4A. At step 402, [illegible] processor 130 [illegible] off hook condition. When an off-hook condition is detected, the appropriate software [illegible] step 404. At step 406, as the caller enters each digit [illegible] communications device [illegible] is received. At step 408, each digit is stored [illegible] associated with microprocessor 130. At step 410, [illegible] number of digits which have been received [illegible] compared with the expected [illegible] of received digits. The expected number of received digits [illegible] United States [illegible] dialing [illegible] sequence. Alternatively, in place of step 410, processing may continue after a predetermined [illegible] has elapsed. At step 412, if all digits have not been received, execution of the computer software proceeds to step 406, at which point [illegible] digit entered by the user is processed. Otherwise, at step 414, the received [illegible] of digits is compared with [illegible] entries at any of several particular places in the dialing sequence such as [illegible] in Tables 1 and 2 above. Execution of the [illegible] proceeds to step 414 [illegible] page [illegible]. If, at step 414, a match is determined, [illegible] step 416, [illegible] step 418 at which point the call is blocked. Alternatively, at step 416, if no match is found, control continues to step 420 at which point a line is obtained and the entered digits are transmitted to the telephone line to initiate the call.

In an alternative embodiment of the present invention, after the call is blocked at step 418 control continues to step 404 at which point the computer software is [illegible] and a new sequence of digits may be entered. At any time, if an on-hook condition is detected (step 422), then control is transferred to step 402.

A further exemplary embodiment of the present invention is illustrated by FIG. 4B. At step 450, when an off-hook condition is detected, the computer software is initialized. At step 454, a line is obtained. At step 456, a dialing digit is received from the telephone user. This dialing digit is transmitted to the available line. At step 460, the received dialing digit is stored in a [illegible] available memory associated with microprocessor 130. At step 456, the stored digits are compared with a plurality of stored numbers at any of several particular places in the dialing sequence. At step 464, if a match is found, then [illegible] step 466, the call is blocked. Alternatively, [illegible] at step 464, [illegible] the computer software continues at step 458, at which point [illegible] dialing digit is received [illegible] digits have been entered [illegible] At step 464 the call is allowed to complete. [illegible] on-hook condition is detected (step 452), the processing automatically [illegible] step 450.

The exemplary embodiments of the present invention which are illustrated by FIGS. 4A, 4B and [illegible] slightly modified so that [illegible] used in [illegible] with the exemplary embodiments of the present invention which are illustrated by FIGS. 3A and 3B. By implementing these algorithms in conjunction with [illegible] a signal [illegible] transmitted which alerts [illegible] automated device of potentially fraudulent telephone calls [illegible] such a signal can be used for preventing the PBX [illegible] the call by [illegible] which is [illegible] the PBX [illegible] a separate [illegible] PBX [illegible] the PBX.

In a further exemplary embodiment of the present invention, [illegible] signal values (such as a dialing sequence), received [illegible] 110 are [illegible] of signal values [illegible] processor 130 [illegible] of the entered signal values corresponds to one of [illegible] sequences [illegible] is made by [illegible] signal value sequences [illegible] embodiment of the present invention [illegible] the signal value sequences [illegible] such as 800 [illegible] signal value [illegible] of the signal value sequences [illegible] the communications pathway is prevented [illegible] further signal values [illegible] DTMF tones [illegible] an appropriate signal [illegible] signal is received [illegible] by signalling device 110, dialing detector 120, [illegible] processor 130 [illegible] dialing signals [illegible] transmission over the [illegible] pathway to which communications device 100 is [illegible]. This technique is particularly useful for preventing [illegible] from dialing [illegible] a PBX system and then dialing [illegible] the communications pathway [illegible] to the PBX system.

In a further exemplary embodiment of the present invention, the communications pathway is prevented from receiving further signal values if the signal values which have been received do correspond to any one of the dialing sequences which serves as the basis of the [illegible].

In the above description, numerous references have been made to the blocking of a telephone call or the control of fraudulent activity. It is understood that any of a variety of methods may be used to prevent fraudulent use of the telecommunications [illegible] by [illegible] appropriate [illegible] the [illegible] the digit entry device (i.e. the keypad), etc.

A further exemplary embodiment of the present invention is illustrated by FIG. 5. Originating Party Unit 501 is coupled to Stored Program Control Switching Apparatus 510 through [illegible] lines 540. Originating Party Unit 501 may be a residential telephone, a business

telephone [illegible] of public telephones (e.g. a local telephone). Stored Program Control Switching Apparatus 510 may be included in an End Office (not shown) and may be categorized, for example, as a Class 5 switch. Stored Program Control Switching Apparatus 510 may be coupled to Terminating Party Unit 590. Stored Program Control Switching Apparatus 510 may also be coupled to a network 570 through another switch 520. [illegible] switch 520 may be, for example, a Class 4 switch. Other structures which would be obvious to one skilled in the art (e.g. DTMF receivers) are not shown for purposes of clarity.

Stored Program Control Switching Apparatus 510 includes a call store 512. Call store 512 receives and stores dialing signals which are generated as a result of the use of Originating Party Unit 501. Program store 513 includes instructions for processing the dialing signals which are [illegible] stored by call store 512. Processor 511 receives instructions from program store 513 and performs steps for the processing of the dialing signals stored in call store 512.

Processor 511 [illegible] dialing signals from call store 512 and instructions from program store 513. Under the control of program store 513, processor 511 is able to determine whether a sufficient number of signals [illegible] been received by call store 512 to establish a connection to another switch (or local telephone) or to take other actions, e.g. play a recording or collect [illegible]. The contents of program store 513 can be updated from a remote terminal (e.g. [illegible] programming [illegible] 580) so that instructions for call processing can be added, deleted or changed.

[illegible] program store 513 can include [illegible] that processor 511 prevents [illegible] attempts. In particular, program store 513 can include [illegible] implement [illegible] above. For example, program store 513 can include [illegible] when dialing sequences [illegible] in TABLE [illegible] TABLE II [illegible]. Alternatively, program store 513 can include instructions for preventing calls [illegible] with the velocity checking algorithms set forth above. Furthermore, program store 513 can include algorithms for converting [illegible] dialing sequences [illegible] corresponding [illegible] plurality of dialing sequences [illegible] TABLE [illegible] readily modify any of the algorithms set forth above with respect to FIGS. [illegible] any of the exemplary embodiments set forth above for use in conjunction with respect to the system illustrated by FIG. 5.

In an alternative embodiment of the present invention, Stored Program Control Switching Apparatus 510 is [illegible] in another [illegible] switch or any other switch situated at any point along a telecommunications network or PBX and the algorithms set forth above are implemented for use in the switch which includes Stored Program Control Switching Apparatus 510. Thus, the algorithms set forth above may be implemented within Program Control Switching Apparatus 510 at any point within a telecommunications network or a PBX.

While the invention has been described in terms of an exemplary embodiment, it is contemplated that it may be practiced as outlined above with modifications within the spirit and scope of the appended claims.

What is claimed:

1. Telecommunications apparatus for selectively [illegible] establishment of a telephone call to a telephone [illegible]

[illegible] central office exchange code, said telecommunications apparatus being capable of receiving a transmitted dialing sequence which includes a first plurality of dialing signals followed by a second plurality of dialing signals followed by a third plurality of dialing signals, wherein said telephone call is placed through a telecommunications network, said telecommunications apparatus comprising:

means for receiving said dialing sequence [illegible] receiving said central office exchange code;

means for evaluating said third plurality of dialing signals and for preventing said telecommunications switch from establishing said telephone call if

said evaluated third plurality of dialing signals are determined to [illegible] in said dialing sequence to [illegible] dialing and to be respective predetermined signals which are used for attempting [illegible] dialing irrespective of said second plurality of dialing signals.

2. Telecommunications apparatus according to claim 1, wherein said means for evaluating said third plurality of dialing signals and [illegible] means for evaluating said first plurality of dialing signals and for preventing said telecommunications switch from establishing said telephone call if said evaluated third plurality of dialing signals are determined to be respective predetermined signals which are used for [illegible] dialing and [illegible] said first plurality of dialing signals are determined to be further respective predetermined signals.

3. A method of controlling the operation of a telecommunications switch which is coupled to a telecommunications line which is capable of transmitting a sequence of signals which includes a first plurality of digits followed by a second plurality of digits followed by a third plurality of digits followed by a central office exchange code to a telephone call to a telephone [illegible] having said central office exchange code, said method comprising the steps of:

a) receiving said sequence [illegible] signals [illegible] including said central office exchange code;

b) evaluating said third plurality of digits;

c) preventing said telecommunications switch from establishing said telephone call if said evaluated third plurality of digits are determined to [illegible] in said dialing sequence to [illegible] dialing and to be a respective predetermined digit sequence which is used for [illegible] dialing irrespective of said second plurality of digits; and

d) [illegible] said telecommunications switch to [illegible] said telephone call if said evaluated digits are determined to be respectively predetermined digit sequences.

4. A method of controlling the operation of a telecommunications switch according to claim 3, wherein step (b) includes the step of evaluating said first plurality of digits and step (c) includes the step of preventing said telecommunications switch from establishing said telephone call if said third plurality of digits are determined to be said respectively predetermined digit sequence which is used for [illegible] dialing and said first plurality of digits are determined to be a further respectively predetermined digit sequence.

* * * * *

EXHIBIT E

New York Telephone
A NYNEX Company
Building #137 Kennedy Airport
Jamaica, New York 11430

April 16, 1992

J. M. Beitzer
Manager
THE PORT AUTHORITY BUS TERMINAL
625 Eighth Avenue
New York, New York 10018

Dear Jan,

In response to your letter dated March 26th, we are working toward implementing solutions within specified timelines to address 42nd Street Bus Terminal fraud issues. In developing software that will block specific international calls, we propose to screen the following:

All Calls Dialed:

10xxx - 01
950-10xx-01
1800 - xxx - xxxx - 01
800 - xxx - xxxx - 01
950 - 10xx - 809
1800 - xxx - xxxx - 809
800 - xxx - xxxx - 809

Also, instead of disabling the keypad as requested, we propose to reprogram the # and * keys. Use of either key would simulate an on-hook off-hook condition and generate a new dial tone therefore not permitting sequence dialing through a PBX.

We are anxious to proceed and request your concurrence with our method in dealing with PABT fraud as it modifies your original solution.

If I may be of assistance, please contact me on 718-632-8201.

Sincerely,

T. Pedersen

TCP:vp

cc: D. Torres
J. Chichester
S. O'Connell
J. Dunn
B. Sorenson
P. Schroeder

EXHIBIT F

ACCESS SERVICE

13. Additional Engineering, Additional Labor and Miscellaneous Services (Cont'd)

13.3 Miscellaneous Services (Cont'd)

13.3.1 Presubscription (Cont'd)

(C) International Direct Dial Blocking Service (IDDBS)

(1) International Direct Dial Blocking Service (IDDBS) is an arrangement that prevents the use of certain line-side exchange services for the completion of international direct dialed calls. This arrangement recognizes and blocks, by routing announcement, any attempt to dial international direct dialed sequences of 011 or 10XXXX 011.

International Direct Dial Blocking Service is available for use with the following line-side exchange services.

- Centrex

- Private Branch Exchange Service (PBX)

  Public Interconnection Service

  Business Exchange

- Wireless (CMRS)

In addition, IDDBS will be provided with intercept announcement services to the individual party to all blocked international calls. Where technically feasible, multilingual announcements will be provided.

IDDBS will be provided upon subscription request by a new customer as specified in Section 2 following. Tariff F.C.C. No. 1

(2) Rate Regulations

Interexchange charges apply for International Direct Dial Blocking Service. The appropriate interexchange charges (i.e., DS0) for the intraLATA, or from service areas as specified in connection with the original call, for interexchange activity. A separate nonrecurring charge will apply when IDDBS service is installed at service subsequent to the initial installation of an exchange service.

Charges for International Direct Dial Blocking Service are set forth in 13.10 following.

(C) (C)

Issued: April 19, 2001

Effective: April 23, 2001

Vice President
2900 Fairview Park Drive, Falls Church, VA 22042