

EXHIBIT O

Subclass
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ISSUE CLASSIFICATION

ABANDONED

UTILITY SERIAL NUMBER **08 050952** PATENT DATE PATENT NUMBER

| SERIAL NUMBER | FILING DATE | CLASS | SUBCLASS | GROUP ART UNIT | EXAMINER |
|---------------|---------------------|-------|----------|----------------|-----------|
| 08/050,952 | 04/21/93 RULE 60 | 340 | 815 340 | 2604 | Zimmerman |

APPLICANTS MARY B. FLANDERS, WOOD DALE, IL; LOUIS D. FINKELSTEIN, WHEELING, IL; LARRY C. PUHL, SLEEPY HOLLOW, IL.

CONTINUING DATA***
 VERIFIED THIS APPLN IS A CON OF 07/626,227 12/07/90 PN 85,239,239
BZ

FOREIGN/PCT APPLICATIONS***
 VERIFIED
BZ none

NOTE - DISCLAIMER
 The term of this patent subsequent to 08/24/90 has been disclaimed

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|---|--|---------------------|------------------------|--------------|--------------------|---------------|-----------------------------------|------------------------------------|
| Foreign priority claimed 35 USC 119 conditions met | <input type="checkbox"/> yes <input checked="" type="checkbox"/> no <i>BZ</i> | AS FILED | STATE OR COUNTRY IL | SHEETS DRWGS | TOTAL CLAIMS 15 | INDEP. CLAIMS | FILING FEE RECEIVED \$1,895.00 | ATTORNEY'S DOCKET NO. 850212853 |
| Verified and Acknowledged | | Examiner's Initials | | | | | | |

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 SCHAUMBURG, IL 60196

TITLE METHOD FOR AUTHENTICATION AND PROTECTION OF SUBSCRIBERS IN TELECOMMUNICATION SYSTEMS
Method and apparatus for authentication & communication system

PARTS OF APPLICATION FILED SEPARATELY

NOTICE OF ALLOWANCE MAILED CLAIMS ALLOWED

ISSUE FEE

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| Amount Due | Date Paid | Amount Due | Date Paid |
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FORM PTO 436A (Rev. 8-92)

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Form PTO-436A (Rev. 8-92)



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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS : FLANDERS ET AL. EXAMINER : N/A
CONTINUATION OF
SERIAL NO. : 07/626,227 GROUP : N/A
PARENT FILED : 12/7/90 CASE NO. : CE02132RP3
ENTITLED : METHOD FOR AUTHENTICATION AND PROTECTION OF
SUBSCRIBERS IN TELECOMMUNICATION SYSTEMS

Motorola, Inc.
Corporate Offices
1303 E. Algonquin Road
Schaumburg, IL 60196
April 21, 1993

PRELIMINARY AMENDMENT

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

Sir:

After granting a filing date, please amend the above-identified patent application as follows:

In the Title

Please delete "METHOD FOR AUTHENTICATION AND PROTECTION OF SUBSCRIBERS IN TELECOMMUNICATION SYSTEMS" and insert therefor -- METHOD AND APPARATUS FOR AUTHENTICATION IN A COMMUNICATION SYSTEM--.

In the Drawings

In FIG. 1, as indicted in the enclosed marked up drawing sheet, please rotate the text of element entitled "Microprocessing stage" within element 20 by 180°. Similarly, please rotate the text of element 12 by 180°.

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In the Specification

Page 1, line 10, please delete "Application Serial Number 7-176951", and insert therefore --Number 4,992,783--.

In the Claims

HP [Please delete claim 28.]

Please add the following new claims:

*Step 1
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17
125. (New) A method of authentication between a subscriber unit and a communication unit of a communication system, comprising:
(a) maintaining an historic non-arbitrary value in the subscriber unit;
(b) generating an authentication message in the subscriber unit as a function of the at least part of the historic non-arbitrary value; and
(c) transmitting the authentication message to the communication unit.

16
126. (New) The method of claim *125* wherein the historic non-arbitrary value comprises a record of pseudo random communication events associated with the subscriber unit selected from the group consisting essentially of the number of telephone calls attributed to the subscriber unit, the number of channel handoffs attributed to the subscriber unit, a frame count assigned to the subscriber unit, and a slot count assigned to the subscriber unit.

18
127. (New) A method of authentication between a subscriber unit and a communication unit of a communication system, comprising:
(a) receiving an authentication message at the communication unit;
(b) maintaining an historic non-arbitrary value in the communication unit;
and
(c) determining in the communication unit, through the use of the received authentication message and the maintained historic non-arbitrary value, whether a received service request is authentic.

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cont

¹⁹
~~128.~~ (New) The method of claim ~~127~~ wherein the historic non-arbitrary value comprises a record of pseudo random communication events associated with the subscriber unit selected from the group consisting essentially of the number of telephone calls attributed to the subscriber unit, the number of channel handoffs attributed to the subscriber unit, a frame count assigned to the subscriber unit, and a slot count assigned to the subscriber unit.

²⁰
~~129.~~ (New) A method of authentication between a subscriber unit and a communication unit of a communication system, comprising:
(a) providing the subscriber unit with at least part of a plurality of dialed digits which uniquely identify a target communication unit;
(b) generating an authentication message in the subscriber unit as a function of the at least part of the plurality of dialed digits; and
(c) transmitting the authentication message and the at least part of the plurality of dialed digits from the subscriber unit to the communication unit.

²¹ ²⁰
~~130.~~ (New) The method of claim ~~129~~ wherein:
(a) the subscriber unit is provided with an identification number; and
(b) the authentication message is generated in the subscriber unit further as a function of the identification number.

²² ²⁰
~~131.~~ (New) The method of claim ~~129~~ wherein the authentication message is generated in the subscriber unit further as a function of a random number known to the subscriber unit.

²³ ²⁰
~~132.~~ (New) The method of claim ~~129~~ wherein the authentication message is transmitted during a communication session on a communication medium selected from the group consisting essentially of a radio communication link, satellite link, fiber optic cable, coaxial cable, and wireline.

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Cont

133. (New) A method of authentication between a subscriber unit and a communication unit of a communication system, comprising:
- (a) receiving an authentication message and at least part of a plurality of dialed digits which uniquely identifies a target communication unit, the authentication message being derived from the received dialed digits; and
 - (b) determining in the communication unit, through the use of the received authentication message and the received dialed digits, whether a received service request is authentic.
- 25
134. (New) The method of claim 133 wherein:
- (a) the communication unit is provided with information regarding an identification number; and
 - (b) the determination in the communication unit of whether a received service request is authentic further occurs through the use of the information regarding the identification number.
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135. (New) The method of claim 133 wherein the authentication message is further derived from a random number known to the communication unit.
- 27
136. (New) The method of claim 133 wherein the authentication message is received during a communication session on a communication medium selected from the group consisting essentially of a radio communication link, satellite link, fiber optic cable, coaxial cable, and wireline.
- 28
137. (New) The method of claim 133 wherein the step of determining further comprises:
- (a) granting communication between the subscriber unit and the target communication unit uniquely identified by the received dialed digits, if the received authentication message was substantially derived from the received dialed digits; and
 - (b) providing output indicating that a multiple user is attempting to access the communication system, if the received authentication message was not substantially derived from the received digits.

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Cont

138. (New) A method of authentication between a subscriber unit and a communication unit of a communication system, comprising:
(a) providing the subscriber unit with at least part of a plurality of information bits which uniquely identify a target communication unit;
(b) generating an authentication message in the subscriber unit as a function of the at least part of the plurality of information bits; and
(c) transmitting the authentication message and the at least part of the plurality of information bits from the subscriber unit to the communication unit.

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139. (New) The method of claim 138 wherein:
(a) the subscriber unit is provided with an identification number; and
(b) the authentication message is generated in the subscriber unit further as a function of the identification number.

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140. (New) The method of claim 138 wherein the authentication message is generated in the subscriber unit further as a function of a random number known to the subscriber unit.

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141. (New) The method of claim 138 wherein the authentication message is transmitted during a communication session on a communication medium selected from the group consisting essentially of a radio communication link, satellite link, fiber optic cable, coaxial cable, and wireline.

~~142~~ 33

142. (New) A method of authentication between a subscriber unit and a communication unit of a communication system, comprising:
(a) receiving an authentication message and at least part of a plurality of information bits which uniquely identifies a target communication unit, the authentication message being derived from the received information bits; and
(b) determining in the communication unit, through the use of the received authentication message and the received at least part of the plurality of information bits, whether a received service request is authentic.

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143. (New) The method of claim 142 wherein:
(a) the communication unit is provided with information regarding an identification number; and
(b) the determination in the communication unit of whether a received service request is authentic further occurs through the use of the information regarding the identification number.

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144. (New) The method of claim 142 wherein the authentication message is further derived from a random number known to the communication unit.

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145. (New) The method of claim 142 wherein the authentication message is received during a communication session on a communication medium selected from the group consisting essentially of a radio communication link, satellite link, fiber optic cable, coaxial cable, and wireline.

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146. (New) The method of claim 142 wherein the step of determining further comprises:

- (a) granting communication between the subscriber unit and the target communication unit uniquely identified by the received information bits, if the received authentication message was substantially derived from the received information bits; and
- (b) providing output indicating that a multiple user is attempting to access the communication system, if the received authentication message was not substantially derived from the received digits.

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~~147.~~

147. (New) A subscriber unit which authenticates communications with a communication unit of a communication system, comprising:
(a) memory means for maintaining an historic non-arbitrary value;
(b) processor means for generating an authentication message as a function of the at least part of the historic non-arbitrary value; and
(c) transmitter means for transmitting the authentication message to the communication unit.

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148. (New) The subscriber unit of claim 147 wherein the historic non-arbitrary value comprises a record of pseudo random communication events associated with the subscriber unit selected from the group consisting essentially of the number of telephone calls attributed to the subscriber unit, the number of channel handoffs attributed to the subscriber unit, a frame count assigned to the subscriber unit, and a slot count assigned to the subscriber unit.

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149. (New) A communication unit which authenticates communications with a subscriber unit of a communication system, comprising:
(a) receiver means for receiving an authentication message;
(b) memory means for maintaining an historic non-arbitrary value; and
(c) processor means for determining, through the use of the received authentication message and the maintained historic non-arbitrary value, whether a received service request is authentic.

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150. (New) The communication unit of claim 149 wherein the historic non-arbitrary value comprises a record of pseudo random communication events associated with the subscriber unit selected from the group consisting essentially of the number of telephone calls attributed to the subscriber unit, the number of channel handoffs attributed to the subscriber unit, a frame count assigned to the subscriber unit, and a slot count assigned to the subscriber unit.

42
151. (New) A subscriber unit which authenticates communications with a communication unit of a communication system, comprising:
(a) input means for obtaining at least part of a plurality of dialed digits which uniquely identifies a target communication unit;
(b) processor means for generating an authentication message as a function of the at least part of the plurality of dialed digits; and
(c) transmitter means for transmitting the authentication message and the at least part of the plurality of dialed digits to the communication unit.

⁴³⁴
152. (New) The subscriber unit of claim ~~151~~⁴²³:
(a) further comprising memory means for providing an identification number;
and
(b) wherein the processor means comprises means for generating the authentication message further as a function of the identification number.

⁴⁴⁵
153. (New) The subscriber unit of claim ~~151~~⁴²³ wherein the processor means comprises means for generating the authentication message further as a function of a random number known to the subscriber unit.

⁴⁴⁶
154. (New) The subscriber unit of claim ~~151~~⁴²³ wherein the transmitter means transmits the authentication message during a communication session on a communication medium selected from the group consisting essentially of a radio communication link, satellite link, fiber optic cable, coaxial cable, and wireline.

⁴⁴⁶
~~155. (New) A communication unit which authenticates communications with a subscriber unit of a communication system, comprising:
(a) receiver means for receiving an authentication message and at least part of a plurality of dialed digits which uniquely identify a target communication unit, the authentication message being derived from the received dialed digits; and
(b) processor means for determining, through the use of the received authentication message and the received dialed digits, whether a received service request is authentic.~~

⁴⁷
156. (New) The communication unit of claim ~~155~~⁴⁶:
(a) further comprising memory means for providing information regarding an identification number; and
(b) wherein the processor means for determining whether the received service request is authentic further utilizes the information regarding the identification number.

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⁴⁸
157. (New) The communication unit of claim 155 wherein the received authentication message is further derived from a random number known to the communication unit.

⁴⁹ ⁴⁶
158. (New) The communication unit of claim 155 wherein the receiver means receives the authentication message during a communication session on a communication medium selected from the group consisting essentially of a radio communication link, satellite link, fiber optic cable, coaxial cable, and wireline.

⁵⁰ ⁴⁶
159. (New) The communication unit of claim 155 wherein the processor means further comprises:
(a) means for granting communication between the subscriber unit and the target communication unit uniquely identified by the received dialed digits, if the received authentication message was substantially derived from the received dialed digits; and
(b) means for providing output indicating that a multiple user is attempting to access the communication system, if the received authentication message was not substantially derived from the received dialed digits.

⁵¹
160. (New) A subscriber unit which authenticates communications with a communication unit of a communication system, comprising:
(a) input means for obtaining at least part of a plurality of information bits which uniquely identifies a target communication unit;
(b) processor means for generating an authentication message as a function of the at least part of the plurality of information bits; and
(c) transmitter means for transmitting the authentication message and the at least part of the plurality of information bits to the communication unit.

⁵² ⁵¹⁷
161. (New) The subscriber unit of claim 160:
(a) further comprising memory means for providing an identification number; and
(b) wherein the processor means comprises means for generating the authentication message further as a function of the identification number.

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⁵³⁹
162. (New) The subscriber unit of claim ~~160~~⁵⁴⁷ wherein the processor means comprises means for generating the authentication message further as a function of a random number known to the subscriber unit.

⁵⁴⁰
163. (New) The subscriber unit of claim ~~160~~⁵⁴⁷ wherein the transmitter means transmits the authentication message during a communication session on a communication medium selected from the group consisting essentially of a radio communication link, satellite link, fiber optic cable, coaxial cable, and wireline.

~~164. (New) A communication unit which authenticates communications with a subscriber unit of a communication system, comprising:~~

- (a) receiver means for receiving an authentication message and at least part of a plurality of information bits which uniquely identify a target communication unit, the authentication message being derived from the received information bits; and
- (b) processor means for determining, through the use of the received authentication message and the received information bits, whether a received service request is authentic.

⁵⁶
165. (New) The communication unit of claim ~~164~~⁵⁵:
(a) further comprising memory means for providing information regarding an identification number; and
(b) wherein the processor means for determining whether the received service request is authentic further utilizes the information regarding the identification number.

⁵⁷
166. (New) The communication unit of claim ~~164~~⁵⁵ wherein the received authentication message is further derived from a random number known to the communication unit.

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167.

(New) The communication unit of claim 164 wherein the receiver means receives the authentication message during a communication session on a communication medium selected from the group consisting essentially of a radio communication link, satellite link, fiber optic cable, coaxial cable, and wireline.

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168.

(New) The communication unit of claim 164 wherein the processor means further comprises:

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- (a) means for granting communication between the subscriber unit and the target communication unit uniquely identified by the received information bits, if the received authentication message was substantially derived from the received information bits; and
- (b) means for providing output indicating that a multiple user is attempting to access the communication system, if the received authentication message was not substantially derived from the received information bits.

In the Abstract

Please delete the abstract, and insert therefor,

METHOD AND APPARATUS FOR
AUTHENTICATION IN A COMMUNICATION SYSTEM

Abstract of the Disclosure

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A method and apparatus for authentication between a subscriber unit and a communication unit is provided. The authentication process includes: maintaining an historic non-arbitrary value in the subscriber unit, generating an authentication message in the subscriber unit as a function of at least part of the historic non-arbitrary value, and transmitting the authentication message to the communication unit. In addition, the authentication process includes: receiving an authentication message at a communication unit, maintaining an historic non-arbitrary value in the communication unit, and determining, in the communication unit, through the use of the received authentication message and the maintained historic non-arbitrary value, whether a received service request is authentic. In another embodiment, the authentication process includes: providing the subscriber unit with at least part of a plurality of dialed digits which uniquely identify a target communication unit, generating an authentication message in the subscriber unit as a function of the at least part of the plurality of dialed digits, and transmitting the authentication message and the at least part of the plurality of dialed digits from the subscriber unit to the communication unit. In addition the other embodiment authentication process includes: receiving an authentication message and at least part of a plurality of dialed digits which uniquely identifies a target communication unit, the authentication message being derived from the received dialed digits, and determining in the communication unit, through the use of the received authentication message and the received dialed digits, whether a received service request is authentic.--

Remarks

The Applicant has amended the title, corrected typographical errors in the drawings and the specification, deleted claim 28, added new claims 125-168, and amended the abstract to more closely correspond to the subject matter which the Applicants regards as their invention. In addition, a new oath and declaration is

provided to cover the claims as amended by this preliminary amendment. It is submitted that these amendments do not constitute new matter. Claims 125-168 are pending in the application.

In accordance with the Examiner's suggestions in the parent patent application, a new substitute specification has been provided under 37 C.F.R. 1.125 (M.P.E.P. 608.01(q)) to facilitate processing of the patent application. This substitute specification does not contain any new matter, except for that which was added by amendment in the July 13, 1990 and December 7, 1990 amendments. In addition, a corresponding marked-up copy has also been provided which details the locations of each insertion and deletion of text in the specification.

Favorable action with respect to the present application is respectfully requested. If there are any question or comments regarding the prosecution of the present application, please do not hesitate to contact the undersigned by telephone or facsimile.

Respectfully submitted,

FLANDERS ET AL.

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"Express Mail" FB 390892315
Date of Deposit 4.21.93

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" Service under 37CFR 1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Diane Paczka
Name of person mailing paper or fee
Diane Paczka 4.21.93
Signature Date

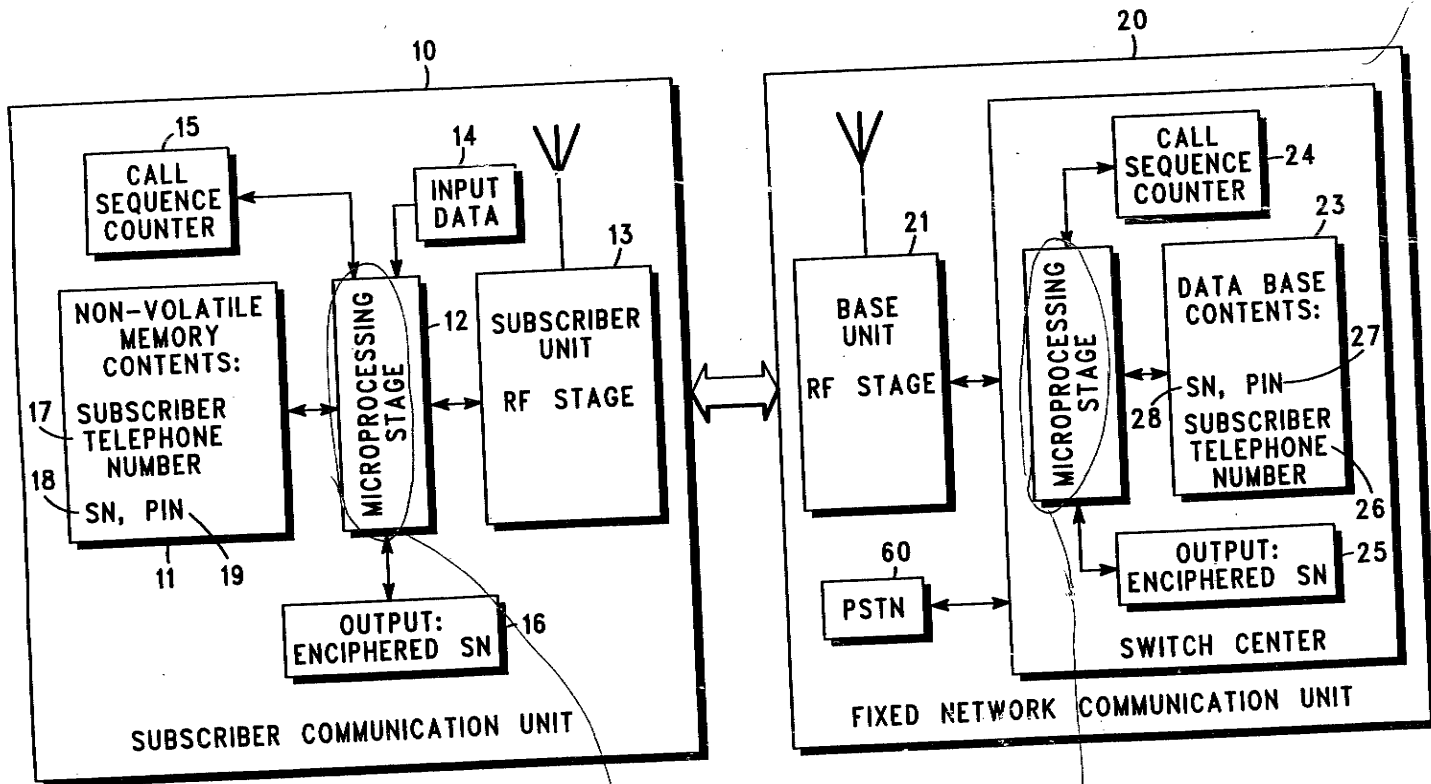


FIG. 1

Patent 180

Patent 180

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Approved
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 02/5/81

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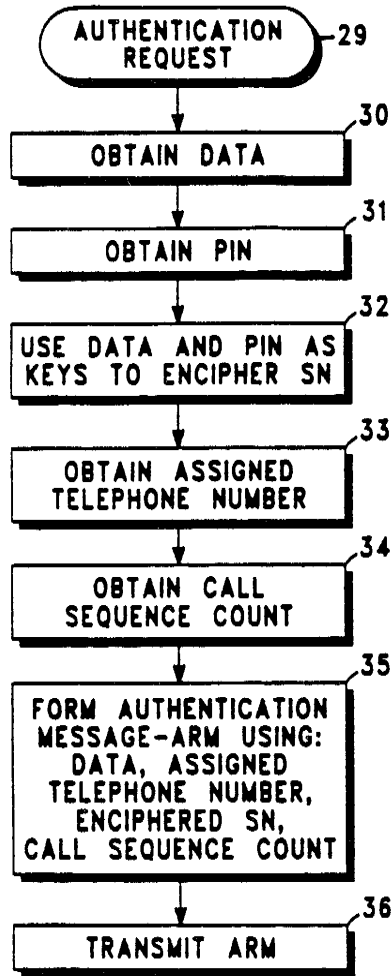


FIG. 2

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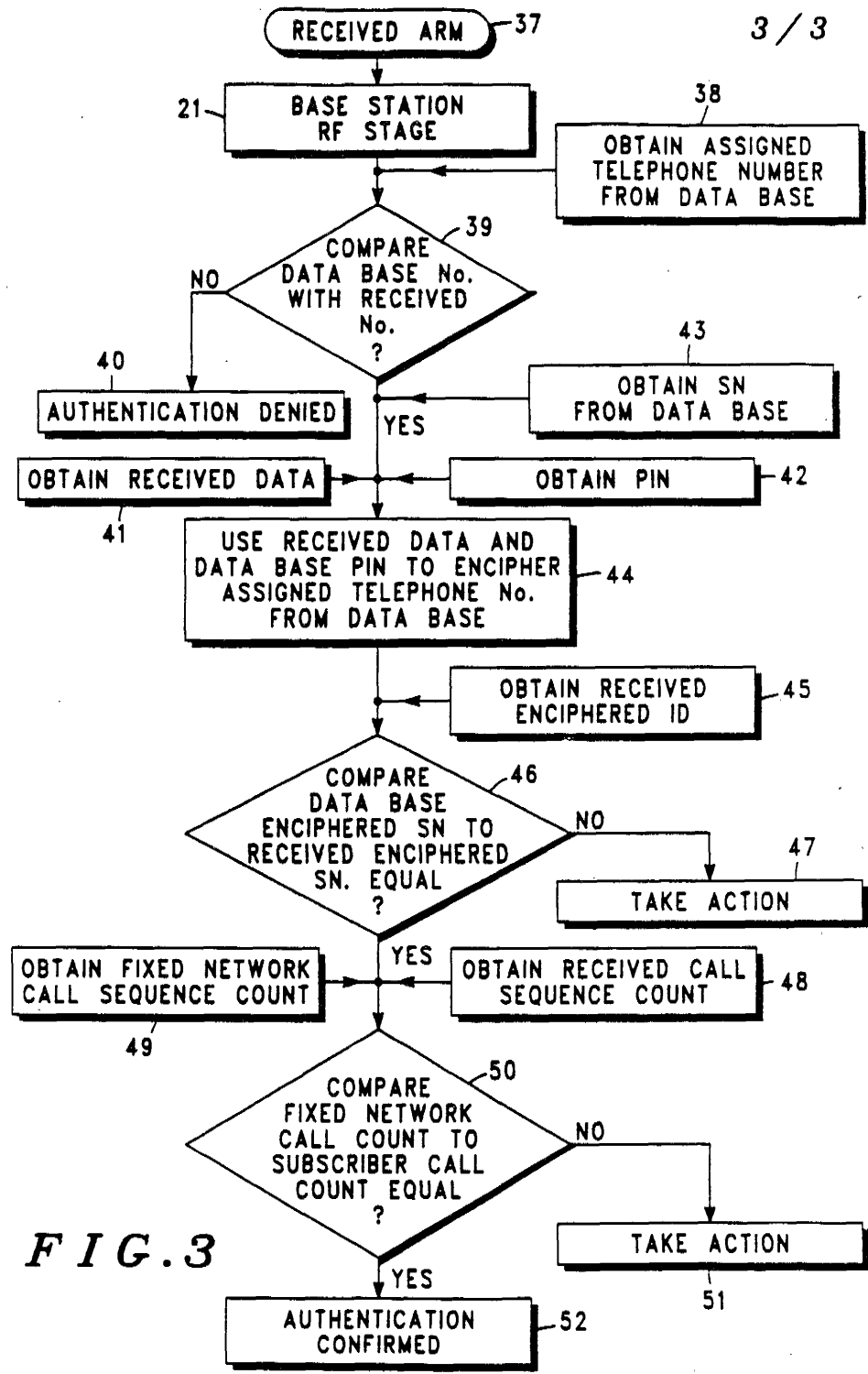


FIG. 3

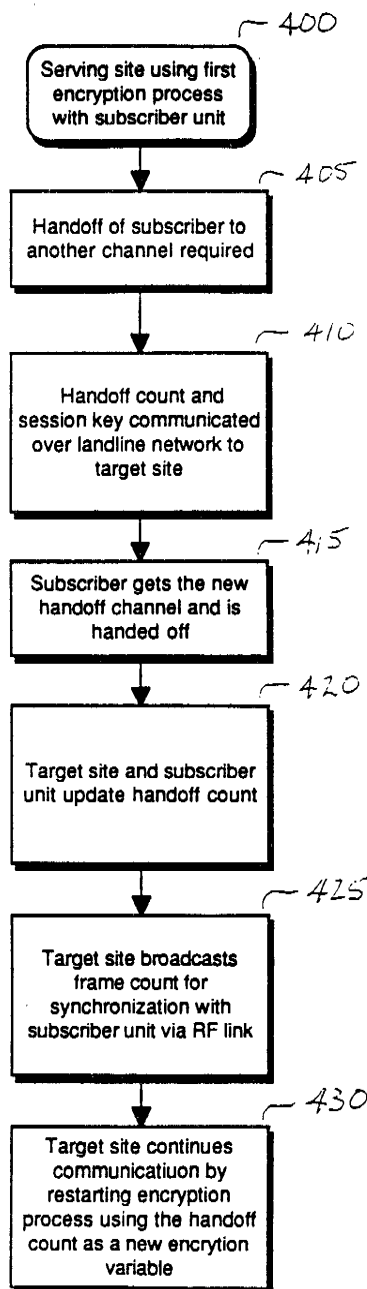


FIG. 4

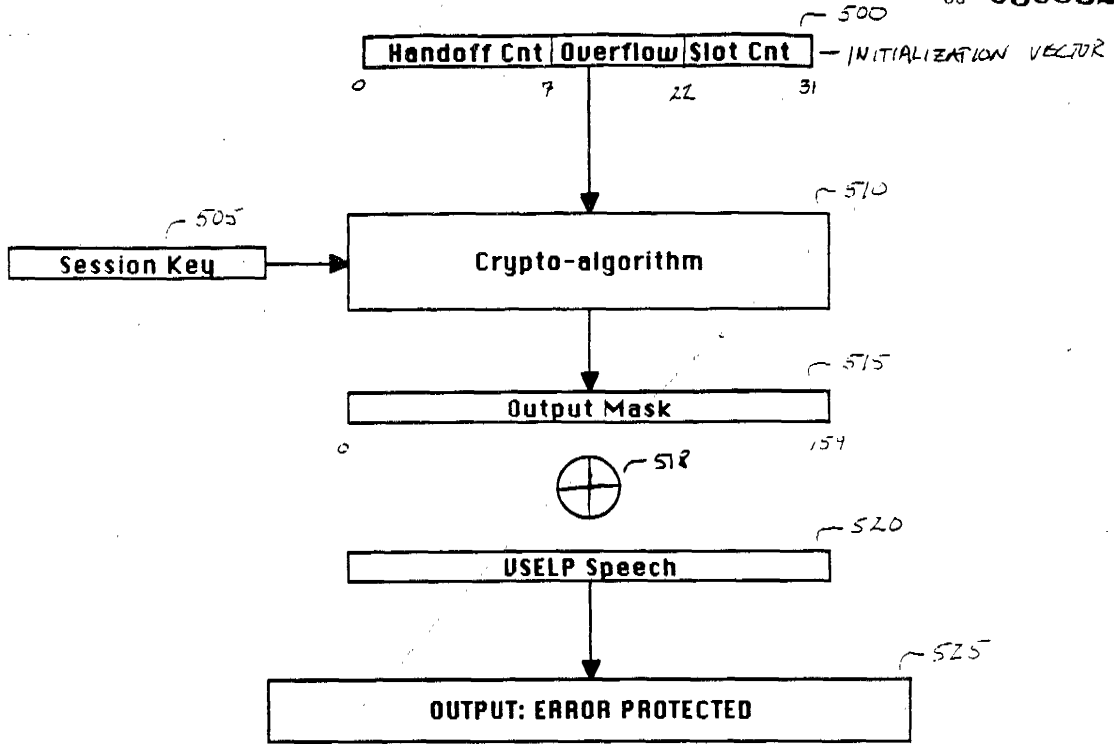


FIG. 5

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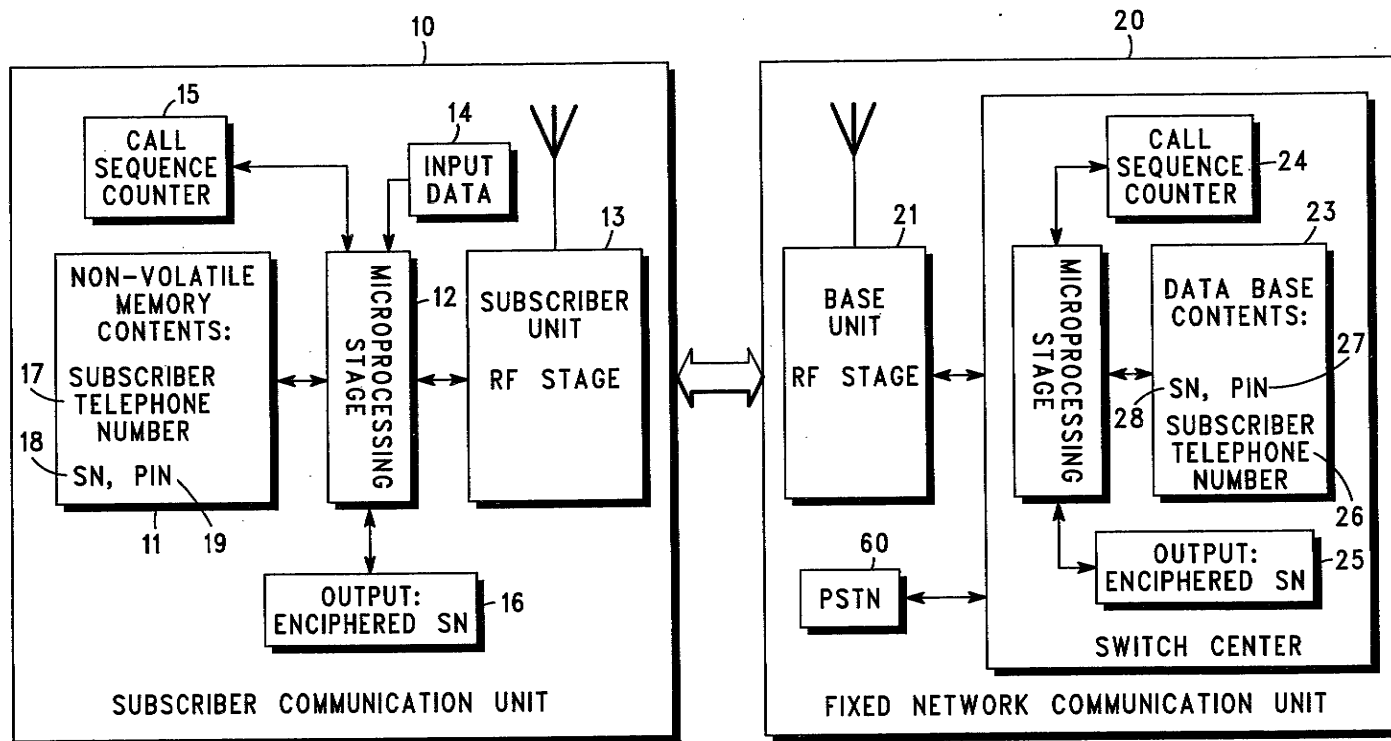


FIG. 1

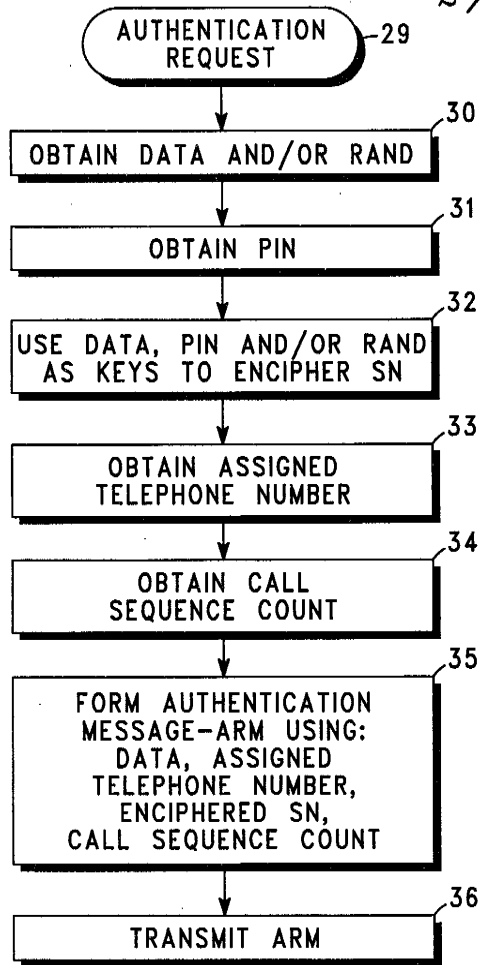
1/5

Handwritten notes and stamps:

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- 295178
- 3 COM ENG & MFG
- 295173
- OR 050952

08 050952

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FIG. 2

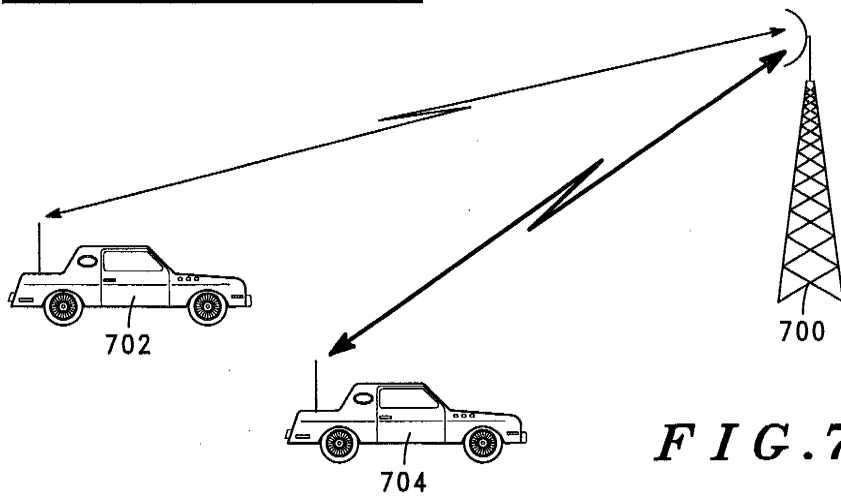


FIG. 7

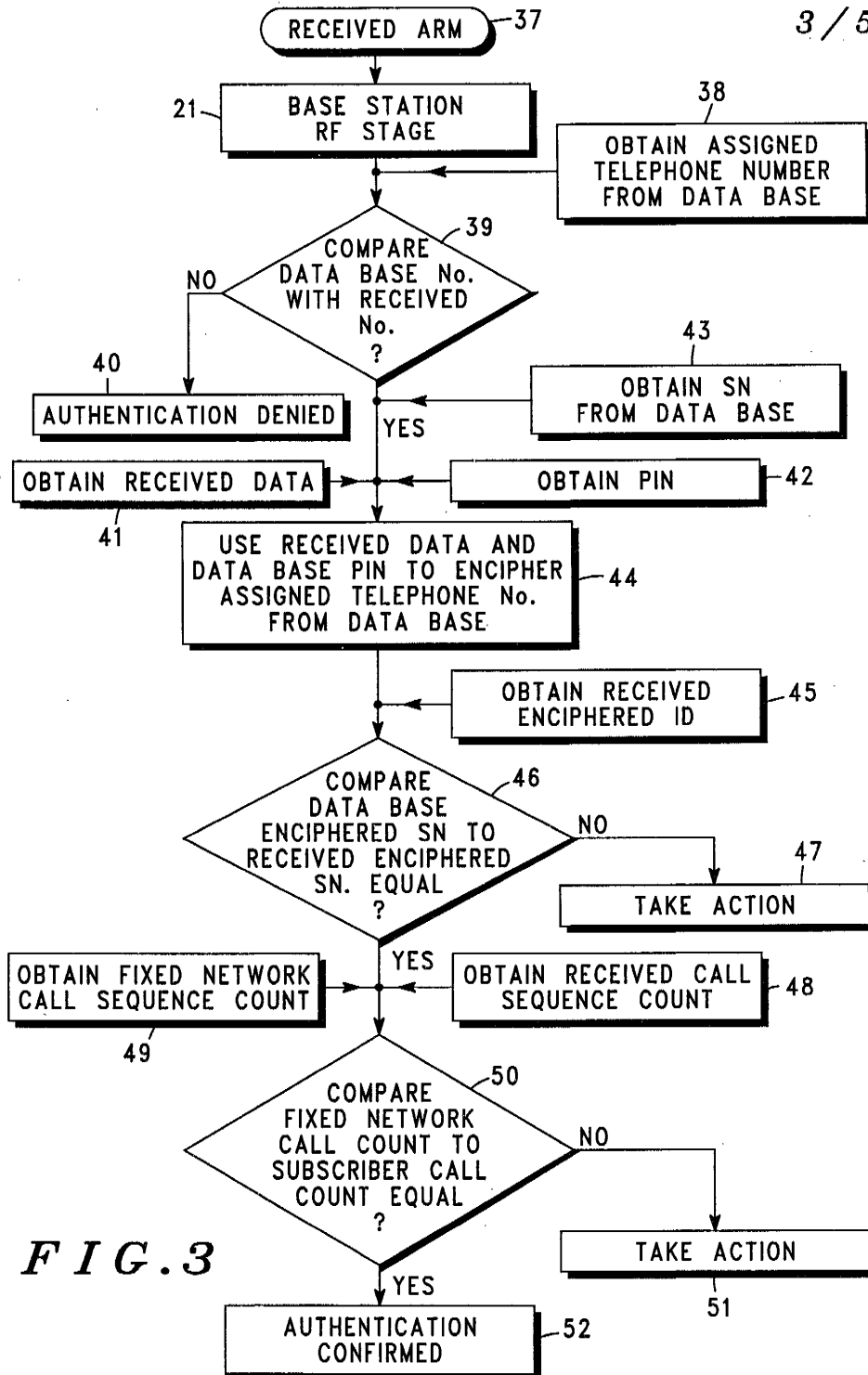


FIG. 3

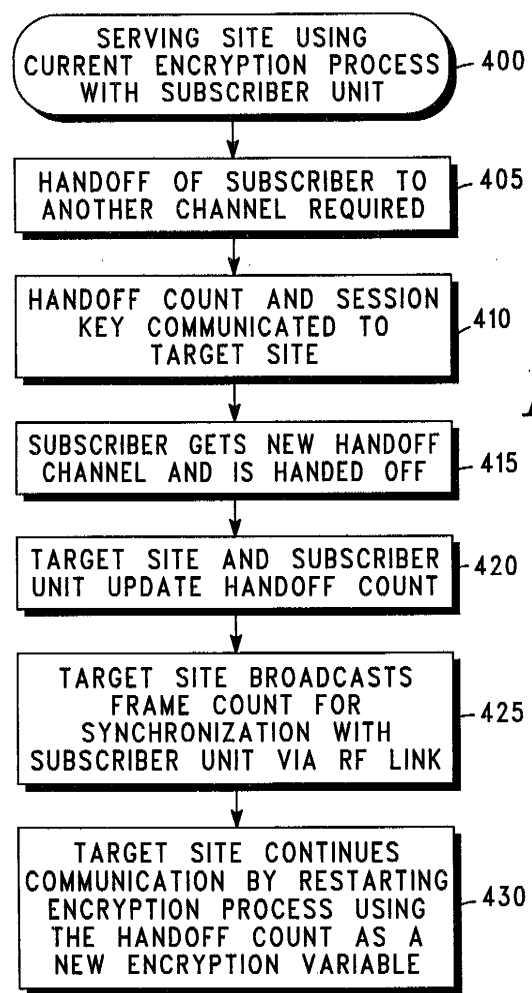


FIG. 4

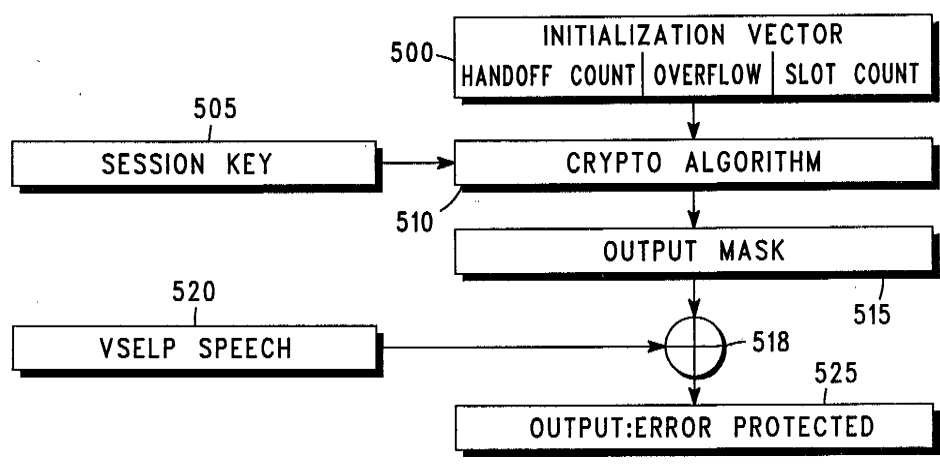


FIG. 5

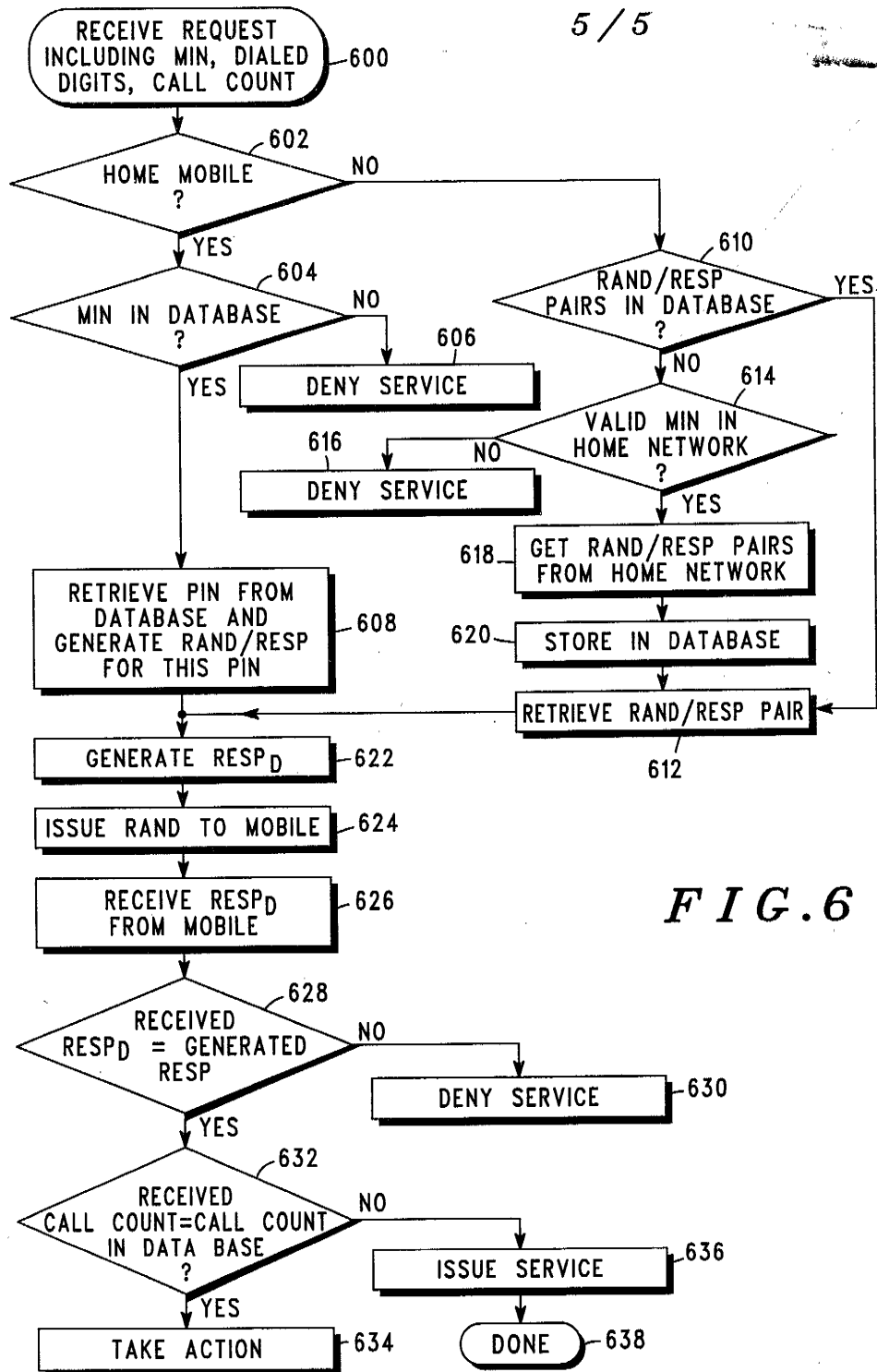


FIG. 6

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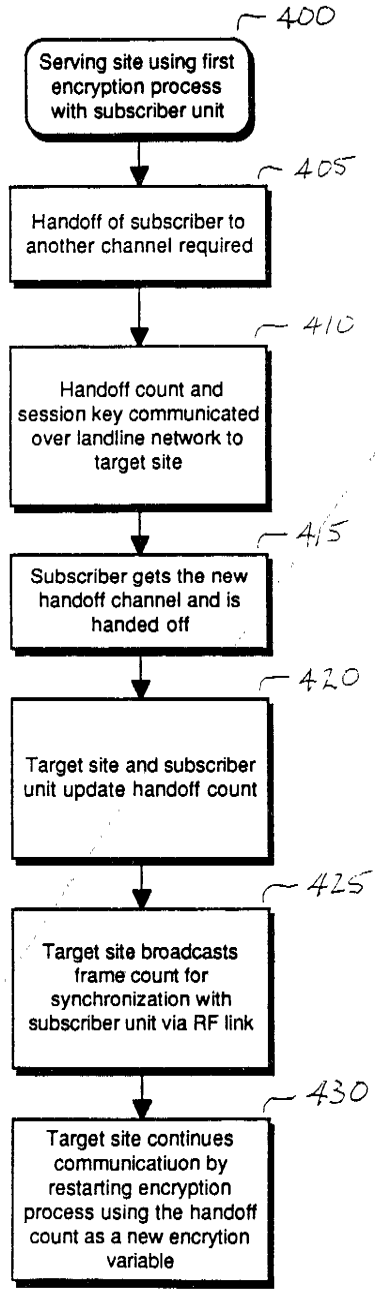


FIG. 4

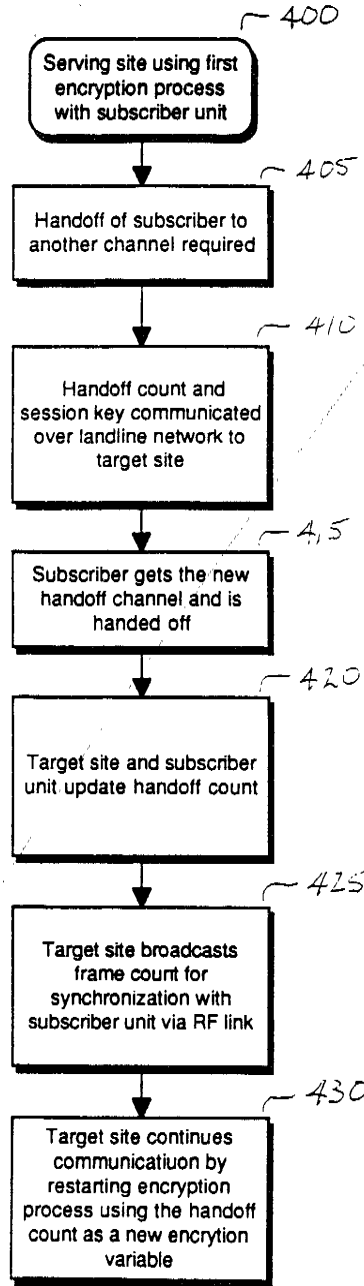


FIG. 4