660208 AUSTRALIA

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PATENTS ACT 1990

PATENT REQUEST: STANDARD PATENT

I/We, the Applicant(s)/Nominated Person(s) specified below, request I/We be granted a patent for the invention disclosed in the accompanying standard complete specification.

[70,71] Applicant(s)/Nominated Person(s):

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[54] Invention Title:

Telephone Apparatus having Automatic Display Function

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Details of Basic Application(s):

[31] Appl'n No(s):	[33] Country:	[32] Application Date:
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NEC Corporation

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Registered Patent Attorney

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IRN: 230206

INSTR CODE: 55801

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Australia

Patents Act 1990

NOTICE OF ENTITLEMENT

I, John Gordon Hinde, of Spruson & Ferguson, St Martins Tower, 31 Market Street, Sydney, New South Wales 2000, Australia, being the patent attorney for the Applicant(s)/Nominated Person(s) in respect of an application entitled:

Telephone Apparatus Having
Automatic Display Function

state the following:-

The Applicant(s)/Nominated Person(s) has/have entitlement from the actual inventor(s) as follows:-

The Applicant(s)/Nominated Person(s) is/are the assignee(s) of the actual inventor(s).

The Applicant(s)/Nominated Person(s) is/are the applicant(s) of the basic application(s) listed on the Patent Request.

The basic application(s) listed on the Patent Request is/are the application(s) first made in a Convention Country in respect of the invention.

DATED this 1st day of March 1993

.....

John Gordon Hinde

IRN: 230206

INSTR CODE: 55801

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(54) Title
TELEPHONE APPARATUS HAVING AUTOMATIC DISPLAY FUNCTION

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(56) Prior Art Documents
US 5157719
US 5020091
US 4726059

(57) Claim

1. An information displaying method for a mobile telephone apparatus, the method comprising the steps of:

storing a plurality of telephone numbers in first memory means;

storing a currently-assigned telephone number in second memory means;

displaying data having a language and content determined in accordance with a geographical area or country dependent on a part of the currently-assigned telephone number; and

selecting one of the plurality of telephone numbers;

and whereby said currently-assigned telephone number storing step then stores the selected telephone number as the currently-assigned telephone number.

5. A mobile telephone apparatus comprising:

a first nonvolatile memory for storing a currently-assigned telephone number;

a display unit for displaying data having a language and content determined in accordance with a geographical area or country dependent on a part of the currently-assigned telephone number;

a second nonvolatile memory for storing a plurality of telephone numbers;

.../2

means for selecting one of the plurality of telephone numbers, said first nonvolatile memory storing the selected telephone number as the currently-assigned telephone number;

a read-only memory for storing a plurality of display routines; and

means for selecting one of the plurality of display routines in accordance with the part of the currently-assigned telephone number;

and wherein said display unit displays the data in accordance with the selected display routine.

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AUSTRALIA

PATENTS ACT 1990

COMPLETE SPECIFICATION

FOR A STANDARD PATENT

ORIGINAL

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Invention Title: Telephone Apparatus having Automatic Display Function

The following statement is a full description of this invention, including the best method of performing it known to me/us:-

TELEPHONE APPARATUS HAVING AUTOMATIC DISPLAY FUNCTION

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a mobile telephone apparatus such as an automobile telephone apparatus or a portable telephone apparatus, and more particularly, to the improvement of a display system of the mobile telephone apparatus.

Description of the Related Art

Generally, the hardware of a mobile telephone apparatus may be used commonly in various geographical areas or countries such as the United Kingdom, Ireland, Malta, Austria, Italy and Spain.

In a prior art mobile telephone apparatus, a single program is incorporated for displaying messages in a display unit, and as a result, the language and contents of the displayed messages are fixed for a specific area (country). Therefore, if this prior art mobile telephone apparatus is to be used in another country, it is necessary to exchange the program with another program, i.e., to exchange a read-only memory (ROM) with another one even when the telephone apparatus incorporates a plurality of telephone numbers for a plurality of countries.

Also, in another prior art mobile telephone apparatus which incorporates a plurality of programs to provide a plurality of display modes for a plurality of countries, it is necessary to select one of the display modes in advance.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a method and mobile telephone apparatus for automatically displaying messages whose language and contents are determined in accordance with a geographical

area or country in which the mobile telephone apparatus is currently being used.

Therefore the invention discloses an information displaying method for a mobile telephone apparatus, the method comprising the steps of:

storing a plurality of telephone numbers in first memory means;

storing a currently-assigned telephone number in second memory means;

displaying data having a language and content determined in accordance with a geographical area or country dependent on a part of the currently-assigned telephone number; and

selecting one of the plurality of telephone numbers;

and whereby said currently-assigned telephone number storing step then stores the selected telephone number as the currently-assigned telephone number.

The invention further discloses a mobile telephone apparatus comprising:

a first nonvolatile memory for storing a currently-assigned telephone number;

a display unit for displaying data having a language and content determined in accordance with a geographical area or country dependent on a part of the currently-assigned telephone number;

a second nonvolatile memory for storing a plurality of telephone numbers;

means for selecting one of the plurality of telephone numbers, said first nonvolatile memory storing the selected telephone number as the currently-assigned telephone number;

a read-only memory for storing a plurality of display routines; and

means for selecting one of the plurality of display routines in accordance with the part of the currently-assigned telephone number;

and wherein said display unit displays the data in accordance with the selected display routine.

The invention yet further discloses an information displaying method for mobile telephone apparatus, the method comprising the steps of:

(a) storing a plurality of telephone numbers in a first memory of said mobile telephone apparatus;

(b) displaying said plurality of telephone numbers stored in said first memory of said mobile telephone apparatus;

(c) receiving a user-selected choice of one of said plurality of telephone numbers as a user-selected telephone number for said mobile telephone apparatus;

(d) storing said user-selected telephone number in a second memory in said mobile telephone apparatus; and

(e) displaying data having a language and content determined in accordance with a geographical area or country dependent on said user-selected telephone number.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block circuit diagram illustrating an embodiment of the mobile telephone apparatus according to the present invention;

Fig. 2 is a diagram showing an example of the correspondence table of Fig. 1;

Figs. 3A, 3B and 3C are flowcharts showing the operation of the main CPU of Fig. 1; and

Figs. 4A, 4B, 4C and 4D are diagrams showing display examples of the display unit of Fig. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In Fig. 1, which illustrates an embodiment of the present invention, reference numeral 1 designates a main central processing unit (CPU) for accessing nonvolatile memories such as EEPROM's 2 and 3 for storing telephone numbers and a ROM 4 for storing programs and fixed data. The EEPROM 2 stores one or more telephone numbers specialised for one or more countries, and the EEPROM 3 stores a currently-assigned telephone number selected from the EEPROM 2. The content of the EEPROM 2 is preset by telephone service operator companies or the like, and the content of the EEPROM 3 is set by a user of the mobile telephone apparatus.

Stored in the ROM 4 are a main routine (program), a display routine for the United Kingdom, a display routine for Ireland, a display routine for Malta, a

display routine for Austria, a display routine for Italy, a display routine for Spain, a display routine for a default mode, and a correspondence table between the six geographical areas (countries) and the three most significant digits (MSD's) of telephone numbers. Note that, generally in Europe, a telephone number for a mobile telephone number is formed by ten digits whose three MSD's correspond to codes in conformity with the International Telegraph and Telephone Consultative Committee (CCITT), as shown in Fig. 2. Note also that the content of the EEPROM 2 is preset by telephone service operator companies or the like simultaneously with the presetting of the EEPROM 2.

Also, in Fig. 1, reference numeral 5 designates a sub CPU for accessing a display unit such as a liquid crystal device (LCD) 6 and a keyboard 7.

In the mobile telephone apparatus of Fig. 1, an area name (country name) is identified from the currently-~~used~~ assigned telephone number stored in the EEPROM 3 using the correspondence table stored in the ROM 4, to thereby automatically switch the display mode to the identified area (country).

The operation of the main CPU 1 will now be explained with reference to Figs. 3A, 3B and 3C which show the main routine stored in the ROM 4.

When the mobile telephone apparatus is powered ON, the routine of Figs. 3A, 3B and 3C is started by step 301 of Fig. 3A. Then, at step 302, the main CPU 1 reads a currently-~~used~~ assigned telephone number out of the EEPROM 3, and at step 303, it is determined whether or not the three MSD's of the telephone number are "234" (United Kingdom code). As a result, if the three MSD's are "234", the control proceeds to step 304 which causes a display mode number M to be "1". Otherwise, the control proceeds to step 305. At step 305, it is determined whether or not the three MSD's of the telephone number are "272" (Ireland code). As a result, if the three

MSD ' s are " 272 " , the control proceeds to step 306 which causes the display mode number M to be " 2 " . Otherwise, the control proceeds to step 307. At step 307, it is determined whether or not the three MSD ' s of the telephone number are " 278 " (Malta code). As a result, if the three MSD ' s are " 278 " , the control proceeds to step 308 which causes the display mode number M to be " 3 " . Otherwise, the control proceeds to step 309. At step 309, it is determined whether or not the three MSD ' s of the telephone number are " 232 " (Austria code). As a result, if the three MSD ' s are " 232 " , the control proceeds to step 310 which causes the display mode number M to be " 4 " . Otherwise, the control proceeds to step 311. At step 311, it is determined whether or not the three MSD ' s of the telephone number are " 222 " (Italy code). As a result, if the three MSD ' s are " 222 " , the control proceeds to step 312 which causes the display mode number M to be " 5 " . Otherwise, the control proceeds to step 313. At step 313, it is determined whether or not the three MSD ' s of the telephone number are " 214 " (Spain code). As a result, if the three MSD ' s are " 214 " , the control proceeds to step 314 which causes the display mode number M to be " 6 " . Otherwise, the control proceeds to step 315 which causes the display mode number M to be " 0 " for a default mode.

The control at step 304, 306, 308, 310, 312, 314 or 315 proceeds to step 316 of Fig. 3B. At step 316, it is determined whether or not the display mode number M is " 1 " . As a result, if M equals " 1 " , the control proceeds to step 317 which initiates the United Kingdom display routine. In the United Kingdom display routine, for example, the main CPU 1 transmits a serial display data " VODAFONE " or " Cellnet " to the sub CPU 5, thereby displaying the data " VODAFONE " or " Cellnet " as shown in Fig. 4A or 4B. Note that " VODAFONE " and " Cellnet " are names of United Kingdom service operator companies. Otherwise, the control proceeds to step 318. At

step 318, it is determined whether or not the display mode number M is "2". As a result, if M equals "2", the control proceeds to step 319 which initiates the Ireland display routine. In the Ireland display routine, the main CPU 1 transmits a serial display data of an Irish service operator company. Otherwise, the control proceeds to step 320. At step 320, it is determined whether or not the display mode number M is "3". As a result, if M equals "3", the control proceeds to step 321 which initiates the Malta display routine. In the Malta display routine, the main CPU 1 transmits a serial display data of a Malta service operator company. Otherwise, the control proceeds to step 322. At step 322, it is determined whether or not the display mode number M is "4". As a result, if M equals "4", the control proceeds to step 323 which initiates the Austrian display routine. In the Austrian display routine, the main CPU 1 transmits a serial display data of an Austrian service operator company. Otherwise, the control proceeds to step 324. At step 324, it is determined whether or not the display mode number M is "5". As a result, if M equals "5", the control proceeds to step 325 which initiates the Italian display routine. In the Italian display routine, the main CPU 1 transmits a serial display data of an Italian service operator company. Otherwise, the control proceeds to step 326. At step 326, it is determined whether or not the display mode number M is "6". As a result, if M equals "6", the control proceeds to step 327 which initiates the Spanish display routine. In the Spanish display routine, the main CPU 1 transmits a serial display data of a Spanish service operator company. Otherwise, since the currently ~~used~~ assigned telephone number is not located in the correspondence table, the control proceeds to step 328 which initiates the default display routine. In the default display routine, for example, the main CPU 1 transmits a serial display data "Service-A" or "Service-B" to the sub

CPU 5, thereby displaying the data "Service-A" or "Service-B" as shown in Fig. 4C or 4D.

The control at step 317, 319, 321, 323, 325, 327 or 328 proceeds to step 329 of Fig. 3C.

At step 329, the main CPU 1 determines whether or not key input data from the keyboard 7 requesting a change of the "currently-used" or assigned telephone number is received by the sub CPU 5. As a result, if such key input data is received by the sub CPU 5, the control proceeds to step 330 which renews the currently-assigned telephone number in the EEPROM 3. In other words, the main CPU 1 selects another of the present telephone numbers in the EEPROM 2 and writes it into the EEPROM 3. Then, the control is returned to step 302 of Fig. 3A.

The above-described process is repeated by step 331 until a request for a power-OFF of the mobile telephone apparatus occurs. That is, when such a request occurs, the control proceeds to step 332 which turns OFF the power to the mobile telephone apparatus. Then, this main routine is completed by step 333.

In the above-described embodiment, although a mobile telephone apparatus used in Europe is exemplified, it is clear that the present invention can be applied to other areas or countries. Also, a larger number of kinds of display routines (programs) can be stored in the ROM 4.

As explained hereinbefore, according to the present invention, a geographical area (or country) is identified in accordance with a currently-assigned telephone number, to automatically switch the display mode, thereby displaying the current area or country based on the currently-assigned telephone number.

The claims defining the invention are as follows:

1. An information displaying method for a mobile telephone apparatus, the method comprising the steps of:

storing a plurality of telephone numbers in first memory means;

storing a currently-assigned telephone number in second memory means;

displaying data having a language and content determined in accordance with a geographical area or country dependent on a part of the currently-assigned telephone number; and

selecting one of the plurality of telephone numbers;

and whereby said currently-assigned telephone number storing step then stores the selected telephone number as the currently-assigned telephone number.

2. A method as claimed in claim 1, further comprising the steps of:

storing a plurality of display routines in third memory means; and

selecting one of the plurality of display routines in accordance with the part of the currently-assigned telephone number;

and whereby said data displaying step then displays the data in accordance with the selected display routine.

3. A method as claimed in claim 1, further comprising the steps of:

storing a plurality of display routines, each corresponding to one of a plurality of predetermined geographical areas, in third memory means; and

determining what predetermined geographical area said telephone apparatus is located in in accordance with the part of the currently-assigned telephone number;

and whereby said data displaying step then displays one of the display routines corresponding to the determined geographical area.

4. A method as claimed in claim 3, wherein, when said geographical area determining step determines that said telephone apparatus is not located in any of said predetermined geographical areas, said data displaying step displays a default routine.

5. A mobile telephone apparatus comprising:

a first nonvolatile memory for storing a currently-assigned telephone number;

a display unit for displaying data having a language and content determined in accordance with a geographical area or country dependent on a part of the currently-assigned telephone number;

a second nonvolatile memory for storing a plurality of telephone numbers;

means for selecting one of the plurality of telephone numbers, said first nonvolatile memory storing the selected telephone number as the currently-assigned telephone number;

a read-only memory for storing a plurality of display routines; and

means for selecting one of the plurality of display routines in accordance with the part of the currently-assigned telephone number;

and wherein said display unit displays the data in accordance with the selected display routine.

6. A mobile telephone apparatus as claimed in claim 5, further comprising:

a read-only memory for storing a plurality of display routines each corresponding to one of a plurality of predetermined geographical areas; and

means for determining what predetermined geographical area said telephone apparatus is located in in accordance with the part of the currently-assigned telephone number;

and wherein said display unit displaying one of the display routines corresponding to the determined geographical area.

7. A mobile telephone apparatus as set forth in claim 6, wherein, when said geographical area determining means determines that said telephone apparatus is not located in any of said predetermined geographical areas, said display unit displays a default routine.

8. An information displaying method for mobile telephone apparatus, the method comprising the steps of:

(a) storing a plurality of telephone numbers in a first memory of said mobile telephone apparatus;

(b) displaying said plurality of telephone numbers stored in said first memory of said mobile telephone apparatus;

(c) receiving a user-selected choice of one of said plurality of telephone numbers as a user-selected telephone number for said mobile telephone apparatus;

(d) storing said user-selected telephone number in a second memory in said mobile telephone apparatus; and

(e) displaying data having a language and content determined in accordance with a geographical area or country dependent on said user-selected telephone number.

9. A displaying method for a mobile telephone apparatus as claimed in claim 8, wherein said data displayed in the step (e) includes the name of a telephone system that said user-selected telephone number is assigned to.

10. A displaying method for a mobile telephone apparatus as claimed in claim 9, wherein said data displayed in the step (e) further includes a geographical location of the telephone system that said user-selected telephone number is assigned to.

11. A displaying method for mobile telephone apparatus substantially as described herein with reference to Figs. 1, 2, 3A to 3C and 4A to 4D of the accompanying diagrams.

12. A mobile telephone apparatus substantially as described herein with reference to Figs. 1, 2, 3A to 3C, and 4A to 4D of the accompanying diagrams.

DATED this Thirty-first Day of March 1995

NEC Corporation

Patent Attorneys for the Applicant

SPRUSON & FERGUSON

Telephone Apparatus having Automatic Display Function

ABSTRACT

In a mobile telephone apparatus, a currently-used telephone number is stored in an EEPROM (3), and a display mode corresponding to a part of the currently-used telephone number is displayed in a display unit (6). In this way, based upon the country or other area code of the currently-used telephone number, all displayed messages will be in the appropriate language. Other displayed information can include an indication of the country in which the the mobile telephone is being operated, or other directory/service information.

Figure 1

ch/9548W

Fig. 1

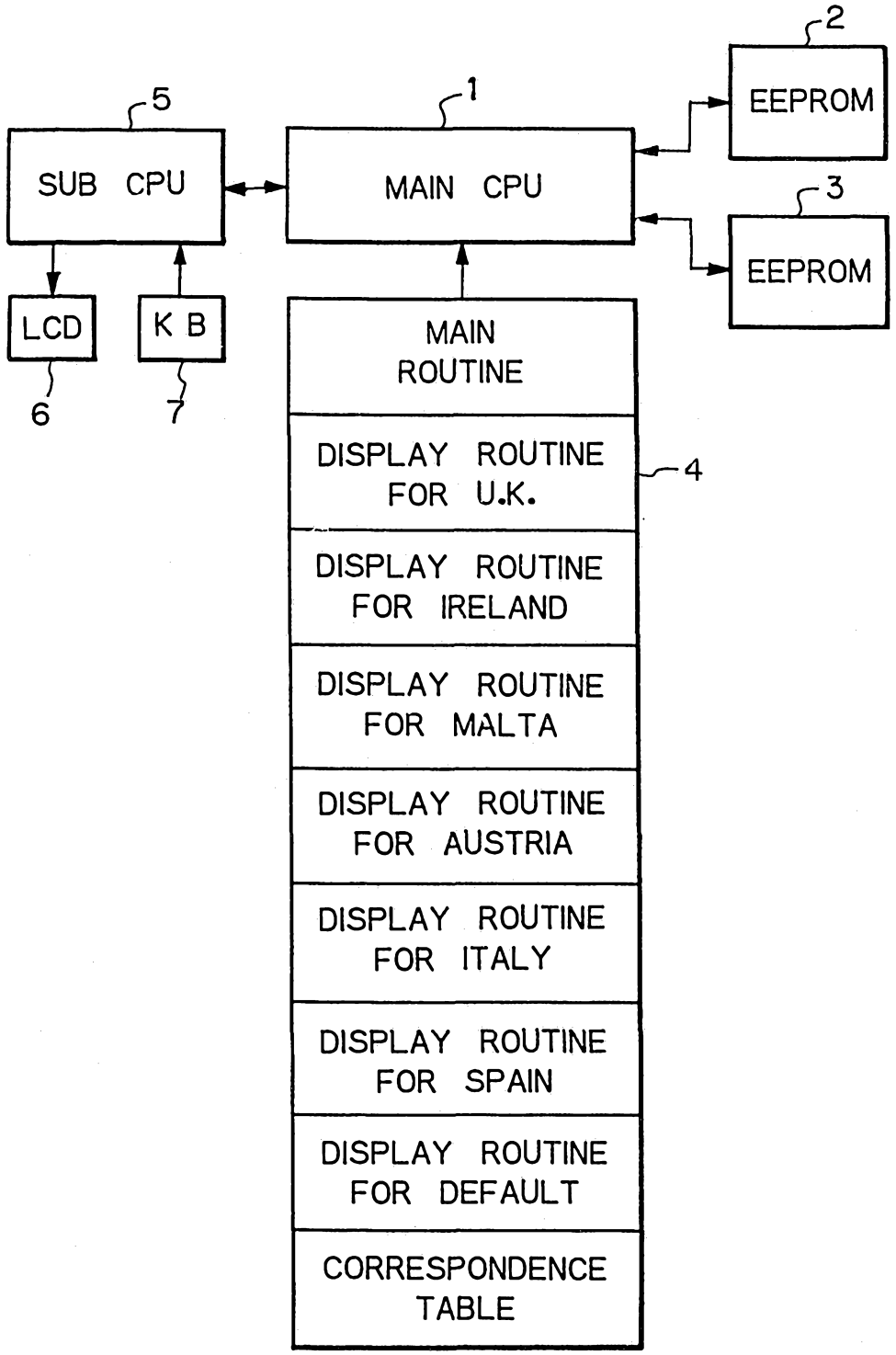

2
EEPROM
5
1
SUB CPU
MAIN CPU
3
EEPROM
LCD
K B
6
7
MAIN ROUTINE
DISPLAY ROUTINE FOR U.K.
4
DISPLAY ROUTINE FOR IRELAND
DISPLAY ROUTINE FOR MALTA
DISPLAY ROUTINE FOR AUSTRIA
DISPLAY ROUTINE FOR ITALY
DISPLAY ROUTINE FOR SPAIN
DISPLAY ROUTINE FOR DEFAULT
CORRESPONDENCE TABLE

Fig. 2

CODE	GEOGRAPHICAL AREA
234	U. K.
272	IRELAND
278	MALTA
232	AUSTRIA
222	ITALY
214	SPAIN

Fig. 4A

VODAFONE

Fig. 4B

Cellnet

Fig. 4C

Service—A

Fig. 4D

Service—B

Fig. 3A

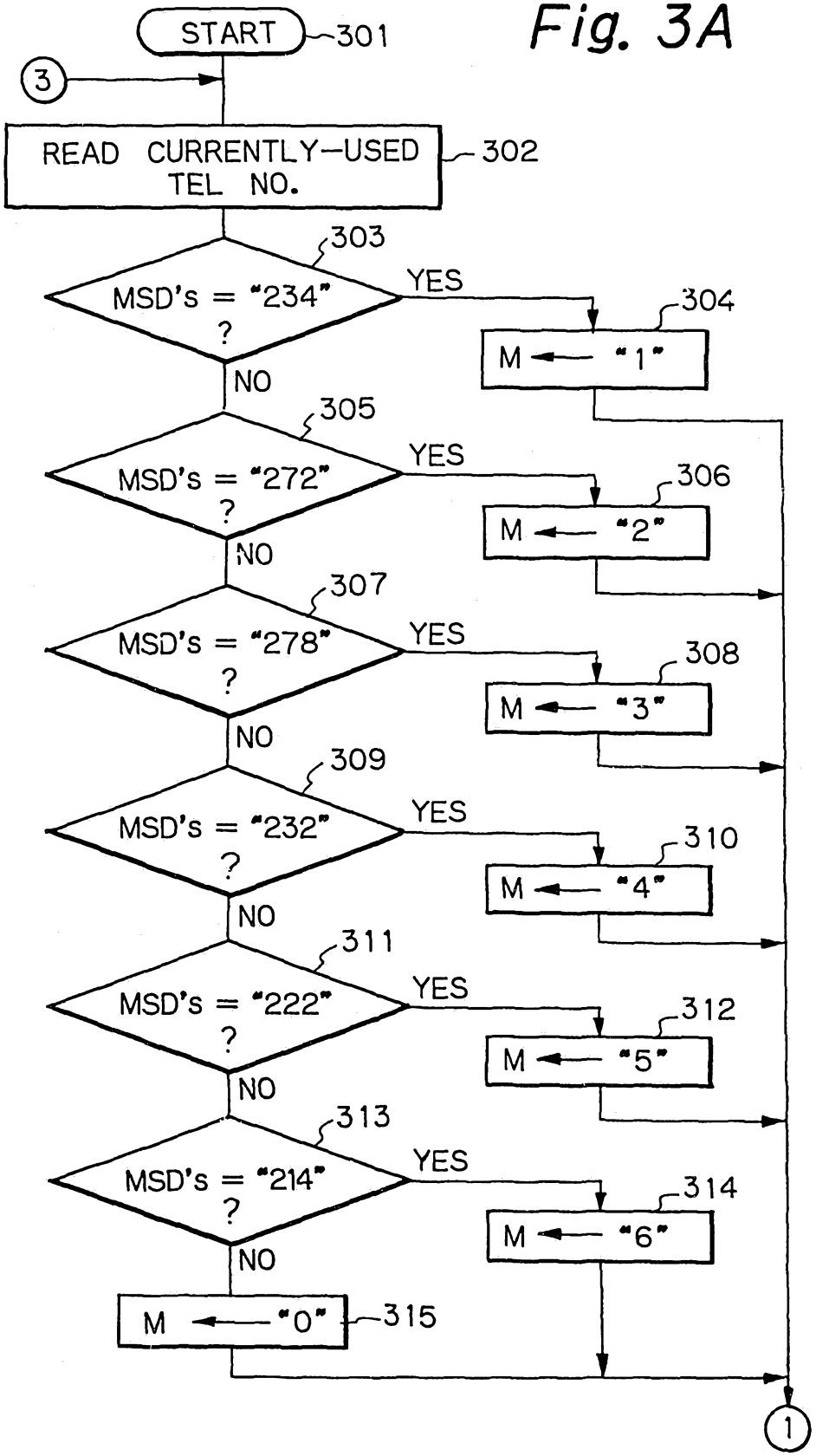

START
301
3
READ CURRENTLY-USED TEL NO.
302
303
MSD's = "234" ?
YES
304
M ← "1"
NO
305
MSD's = "272" ?
YES
306
M ← "2"
NO
307
MSD's = "278" ?
YES
308
M ← "3"
NO
309
MSD's = "232" ?
YES
310
M ← "4"
NO
311
MSD's = "222" ?
YES
312
M ← "5"
NO
313
MSD's = "214" ?
YES
314
M ← "6"
NO
M ← "0"
315
1

Fig. 3B

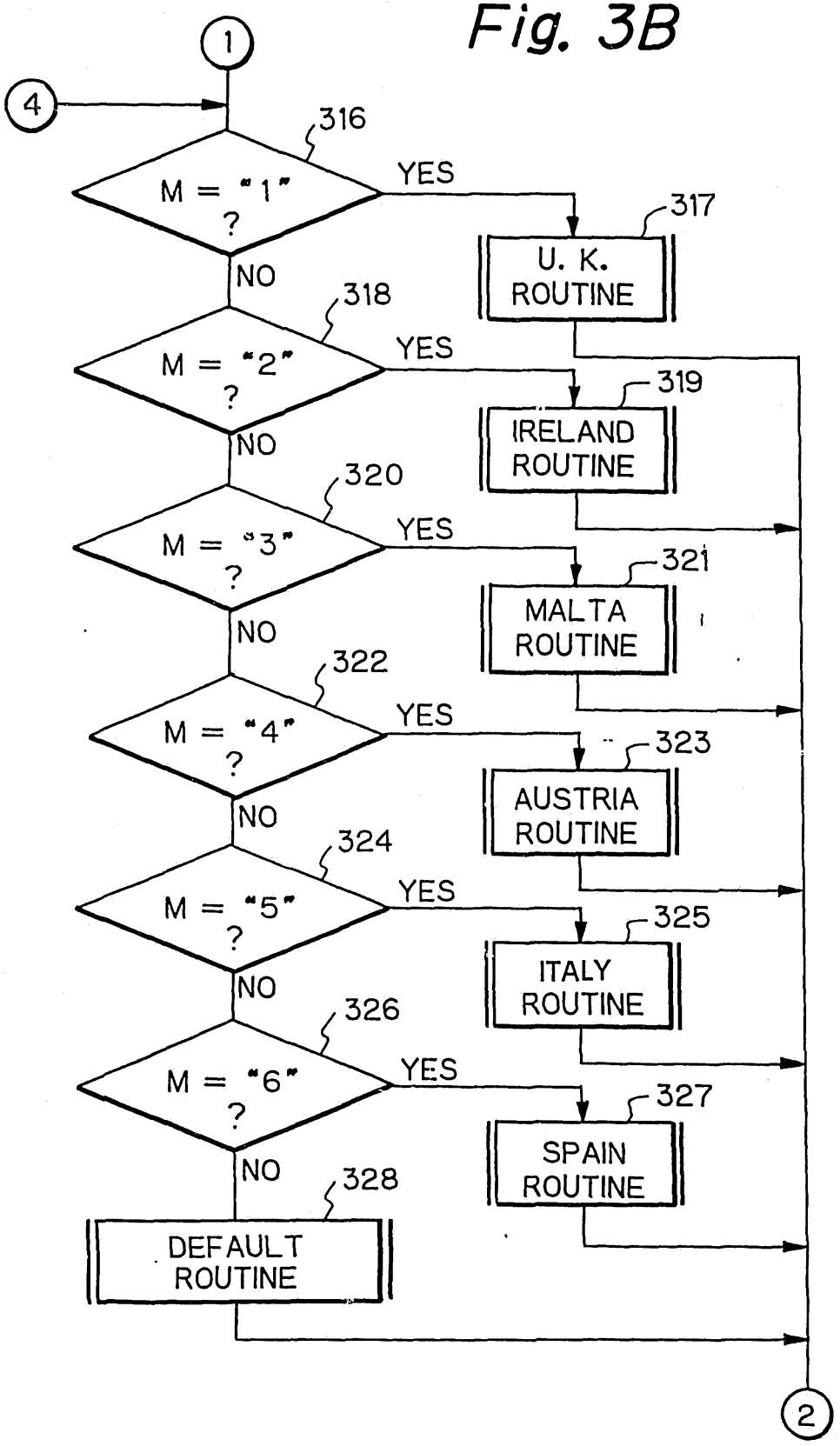
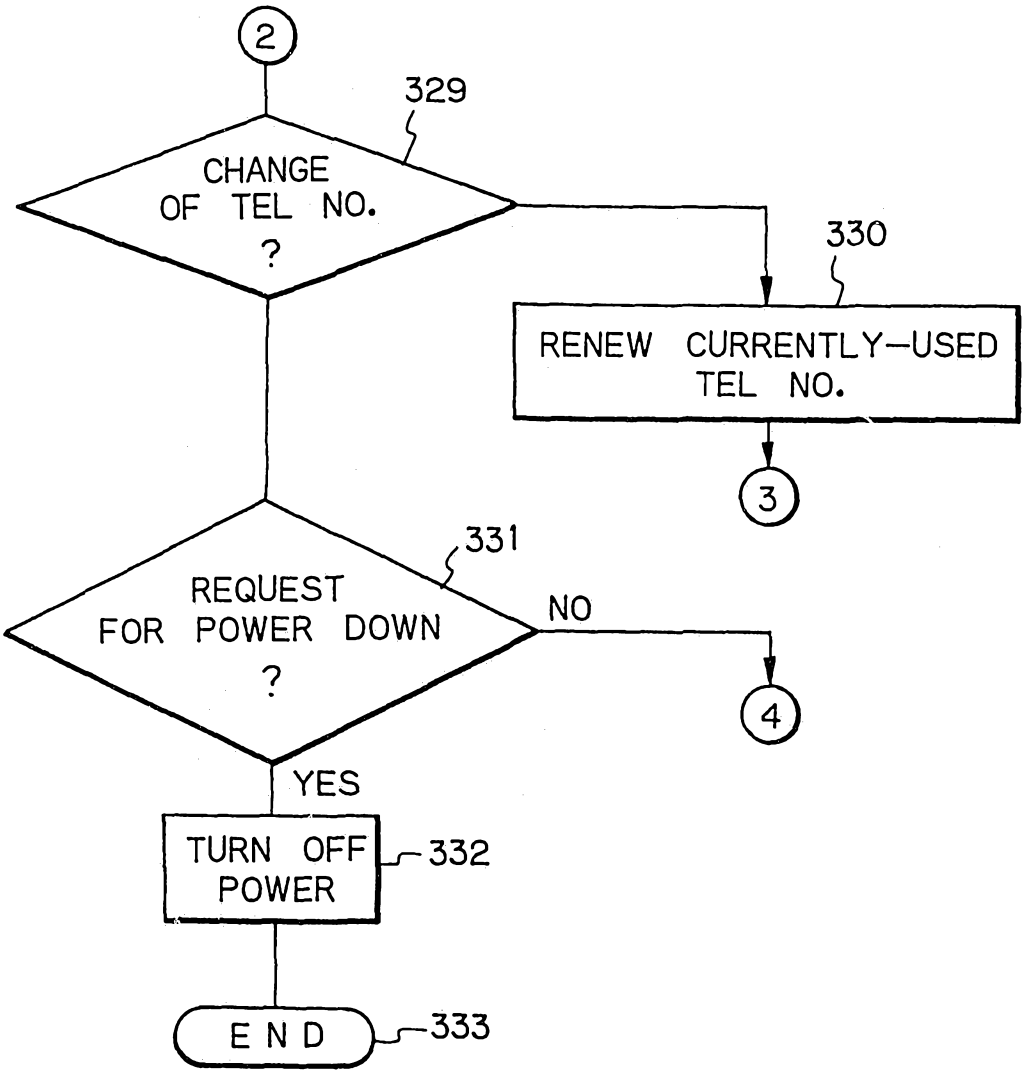

1
4
316
M = "1" ?
YES
317
U. K. ROUTINE
NO
318
M = "2" ?
YES
319
IRELAND ROUTINE
NO
320
M = "3" ?
YES
321
MALTA ROUTINE
NO
322
M = "4" ?
YES
323
AUSTRIA ROUTINE
NO
324
M = "5" ?
YES
325
ITALY ROUTINE
NO
326
M = "6" ?
YES
327
SPAIN ROUTINE
NO
328
DEFAULT ROUTINE
2

Fig. 3C


2
329
CHANGE OF TEL NO. ?
330
RENEW CURRENTLY-USED TEL NO.
3
331
REQUEST FOR POWER DOWN ?
NO
4
YES
TURN OFF POWER
332
END
333