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(54) **Apparatus and method for inputting telephone dialling commands to a telephone communication system.**

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## Description

This invention relates to telephone dialling apparatus for, and method of inputting telephone dialling commands to a telephone communication system.

User interactive display-based systems are becoming popular for enabling a user to select commands for controlling the operation of a system, as is taught by document IEEE Spectrum, Vol. 20, October 1983, No. 10, New-York, USA, pages 40 to 45 in an article entitled "Experiments in teleterminal design". In these display-based systems, the number of command items (such as telephone numbers, names, or computer commands) available on a display for selection by the user is limited, at any given time, by the finite size of the display. Since the number of command items available for execution is generally much larger than the number that can be simultaneously accommodated by the display, it is desirable that the items actually displayed be those most likely to be selected, at the given time, by the user. Present systems do not offer such a capability.

Two methods exist today for the selection of items for display. One method, used today in most repertory dialers, is to have the user explicitly select, or program, the normally displayed command items. Another method, used in some computer systems, is to store and optionally display a history of past commands, and allow the user to explicitly search this history for command items to be re-executed. Each of the above methods requires that the user perform some task, either programming the repertory or searching through a command history, in addition to the actual activation of the command item. User surveys indicate that many users would prefer not to have to perform such programming or searching tasks.

According to one aspect of this invention there is provided a telephone dialling apparatus as claimed in claim 1.

According to another aspect of this invention there is provided a method as claimed in claim 8.

The present invention enables the user to be provided with one-touch access to telephone calling information (e.g. telephone numbers) - hereafter referred to as command items - most likely to be needed, without requiring either explicit user programming of a command repertoire or user searching through the history of previous commands.

In one embodiment, command items are displayed automatically by the system according to the likelihood of each command's selection by a user based upon the past usage pattern of the command items. The displayed command items are selected using a "frequency" heuristic which determines which command items are most likely

to be executed by a user based on the command items most frequently executed in the past. Other heuristics are utilized to select display command items including "recently executed" command items, "attempted" but unsuccessful command items, and "context" related command items. Other embodiments utilize various combinations of these heuristics to select command items for display.

The invention will now be described with reference to the accompanying drawings, in which:

FIG. 1 is a block diagram of a communication system useful in describing the present invention;

FIG. 2 shows a flowchart useful in describing the present invention;

FIG. 3 illustrates a group of tables which are utilized in conjunction with the flowchart of FIG. 2; and

FIG. 4 shows an illustrative display of information presented to the user.

Shown in FIG. 1 is an illustrative block diagram of a communication system useful for describing the operation of the present invention. The system includes common control unit 100 which connects to one or more central office (CO) or PBX lines, such as 105, and which connects to one or more station sets (e.g., 106) or terminals (e.g., 107), via facilities 108 and 109, respectively. Control unit 100 establishes and controls all intercom and CO or PBX line communications. Program memory 102 provides instructions to central processor unit (CPU) 101 for controlling the various operating features and functions of the system. Data memory 103 is utilized by the CPU for storing and accessing data associated with performing the various functions and features programmed in program memory 102. In one embodiment, CPU 101 is a microprocessor, program memory 102 is read-only-memory (ROM) and data memory 103 is random-access-memory (RAM). The interface circuit 104 contains well-known switching, network control, and line circuits required by the system to establish, maintain and terminate communication connections between a station set or terminal and the CO or PBX lines.

Terminal 107 as utilized with the present invention may be a computer, or a workstation having an interactive display capability, and an associated telephone or internal dialing capability. Terminal 107 may also enable any of the calling features available at other telephone station sets of the system. While terminal 107 is illustrated as connected through a communication system to CO lines, it could also be directly connected to CO lines.

A program as illustrated by the flowchart of FIG. 2 enables a user at terminal 107 one-touch access to telephone calling information, hereinafter

referred to as command items (such as telephone numbers, names or telephone dialling commands), which are most likely to be needed, without requiring the user to either explicitly program a command repertoire or to search through a list of command items. The flowchart of FIG. 2 and the table of FIG. 3 associated therewith may be partially or totally implemented in either control unit 100 or terminal 107.

Thus, in order to avoid confusion and in order to enable those skilled in the art to practice the claimed invention, this specification will describe the operation of the present invention using the flowchart of FIG. 2 together with the table of FIG. 3 which together describe the logical steps and the various parameters required to implement the present invention.

With reference to FIGS. 2 and 3, the present invention is implemented in two parts: command implementation and command selection. The first part (201-212) of the implementation is carried out whenever the user attempts the execution of a command item—for example, by entering a command to a computer software system, or by dialing a telephone number, or by selecting a command item from a displayed menu of such items. The second part (not shown) is carried out whenever there is a need to display, or to update the display of, a menu of selected command items for rapid selection by the user.

A system implementing the present invention also incorporates software, as needed, to identify the command item selected from the menu by the user, and to attempt its execution. In addition, because the first part of the implementation uses information storage capacity, this implementation also incorporates procedures for selecting least relevant information and for purging this information from storage whenever it becomes likely that the amount of information being stored would exceed the storage allocated to the heuristic in the system on which it is implemented.

Procedures for the command selection part of the implementation, which includes two procedures known to computer software programmers as "command selection" and "garbage collection", will not be described in detail below, since they are independent of the new method, and since procedures for carrying them out are already widely known among software developers. Display command selection may utilize a touch sensitive screen whereby the user touches the command which he or she wants to activate. Garbage collection, for example, may be accomplished by simply limiting the size of the tables of FIG. 3 and letting least relevant information fall out the bottom of the tables.

The first part of the implementation is carried out whenever the user attempts the execution of a command item, as shown in the flowchart of FIG. 2. First, the program is started (201) and the command item is identified (202). Identifying a new command may include dialing a number or selecting an existing displayed number. At this point, the flow of control separates into two paths, which may be executed in either order or simultaneously. One path (step 207) attempts execution of the command item and waits until it is known whether the attempt succeeded or failed.

The other path (steps 203-206) determines in step 203 whether the command item matches a previous entry in a list or directory of command items (204), or is new (203). If the command item is new, an entry is created for it (step 205) in the stored list or table of command items (302 of table 300 of FIG. 3). Table 300 contains a list of all of the command items—e.g., phone numbers—dialed by the user. As previously noted, the system design decides how large table 300 should be and how the least relevant information should be disposed. If the command item is not new, the cumulative frequency count (301 of FIG. 3) for the command item is incremented in step 204. In either case, the list or table of command item frequency is updated (205).

When both paths complete execution, the system determines in step 208 whether the attempt to execute the command item has succeeded or failed. If it succeeded and the command item is new, it is added to the recency list or table with a timestamp (310 of FIG. 3), or if the command item is old, its timestamp 311 is updated in step 209 to indicate a successful execution. If it failed, the failed-retry list, table 320, or timestamp (321 of FIG. 3) is updated in step 210. That is, the first time a command fails, it is added to table 320 with a timestamp; the next time that command fails, the timestamp is updated in step 210. Note, while separate tables or lists are shown in FIG. 3, the frequency or usage count 301, recency timestamp 311 or failed timestamp 321 could all be located in one table or list.

In addition to the timestamp, the system might store additional information, as needed by more sophisticated versions of the heuristic, in step 211. For example, to enable the detection and automatic presentation of the next command in frequently repeated sequences of commands, the system would update, in this step, information on the conditional probability with which the current command has occurred immediately following the preceding command item. The heuristic then returns control to the system in step 212.

The second part of the implementation depends on whether command item menus are nor-

mally displayed or normally hidden, and in the latter case on whether several menus controlled by the implementation are displayed together, or only one menu is displayed at a time. Shown in FIG. 4 is dial 450 and buttons 451 utilized to activate the various system telephone features. Fig. 4 displays Frequent (410), Recent (420) and Retry (430) menus. These menus (410, 420 and 430) are a display of tables 300, 310 and 320, respectively. If the command items are normally displayed, this part is carried out whenever any data in the command item directory used by the procedure of FIG. 2 has changed. If the menu or menus of command items (410, 420, 430 and 440) are normally hidden, this part is carried out whenever one or more menus of command items need to be displayed--for example, in response to a request from the user.

The items displayed in any given menu are shown in order, such as top to bottom (401) or left to right (not shown), according to their rating on a stored criterion. Thus, the command items in a specific menu might be displayed, for example, in alphabetical or numerical order; or in order of cumulative frequency, most frequent first, for a "Frequent" command item menu (401); or in order of recency, most recent first, for a "Recent" or "Retry" menu (402). Where the system has access to the appropriate database, the name associated with each telephone number can also be displayed (e.g., 403).

If more than one menu is displayed at the same time, as in FIG. 4, a given command item need not appear on more than one menu. Thus, if an item would otherwise be displayed on more than one menu at the same time, it might be displayed only in the menu having the highest priority in this regard, according to stored ordering, for example (Frequent, Recent, Rétry). This is done by displaying the menus in order of priority; displaying all the command items that can be displayed in the given menu before displaying the next menu; and checking each item, in a menu other than the highest priority menu, against items already displayed; finally displaying only those items not already displayed.

The saved menu 440 is for special command items which the user wishes to enter via dial 450. An associated table (not shown) would store these saved command items. The items in the saved menu may or may not be entries in any of the other menus 410, 420 and 430.

The command selection part of the implementation is carried out whenever the system detects that the user has carried out the action conveying the selection of an item from a menu--for example, by touching the item's location on a touchscreen, typing a key sequence corresponding to the item,

or moving and clicking a pointer device, such as a "mouse", at the item. The "garbage collection" procedure is performed whenever, in the process of carrying out the first part of the implementation, as described above, the system detects a potential shortage of available storage capacity.

It is contemplated that the frequency of use table 300 may be based on the user past frequency, the past frequency of usage from that terminal, the past frequency of usage for the particular function being performed. This frequency heuristic could also be made dependent on the time of day, day of week, month or other parameters. Moreover, the frequency heuristic can be made to be dependent on the previous user-selected command. For example, once the user selects one command for operation by the system, the system would display a frequency table of commands (300) which most frequently followed the previous entered command. Additionally, the system could list all commands which are part of frequently repeated sequences of commands entered by the user.

In yet another embodiment of the present invention, the system may use a previously entered predetermined model of a system user to list the commands most likely to be selected by a user conforming to said model at a particular time. This model would characterize the functions to be performed by the user and would specify the commands which enable the user to carry out these functions.

What has been described is merely illustrative of the present invention. Other embodiments will occur to those skilled in the art.

## Claims

1. Telephone dialing apparatus for use with a telephone communication system for enabling a user to select a telephone dialing command for input to and execution by said system, said apparatus including means for identifying (e.g., 100, 202) each telephone dialing command of a group of telephone dialing commands inputted into said system, and CHARACTERIZED IN THAT said apparatus includes means for determining (e.g. 101, 102, 211) a conditional probability that said each inputted telephone dialing command is functionally related to another telephone dialing command, table memory means (e.g. 103) for listing a functionally related telephone dialing command based on the conditional probability that said functionally related telephone dialing command follows a previously executed telephone dialing command, the conditional probability being determined from the user's prior inputted telephone

- dialing commands or from a previously entered predetermined list of telephone dialing commands, and selection means operable by said user for selecting (e.g. 450, 451) one of the listed telephone dialing commands from said table memory means for input to said system.
2. Apparatus as claimed in claim 1 including means responsive to said identifying means for counting the number of times each telephone dialing command is identified, and memory means responsive to any change in the count of said counting means for listing a plurality of frequently identified telephone dialing commands which have the highest accumulated count, said selection means being operable by said user for selecting one of said plurality of frequently identified telephone dialing commands from said table memory means for input to said system.
  3. Apparatus as claimed in claim 1 including means for determining if said user selected telephone dialing command inputted to said system has been executed by said system, and wherein said table memory means includes recency list means responsive to said determining means for listing telephone dialing commands which have recently been selected by the user, and said selection means includes means for accessing telephone dialing commands in said recency list means for input to said system.
  4. Apparatus as claimed in claim 1 including means for determining if said user selected telephone dialing command inputted to said system has been executed by said system, and wherein said table memory means includes retry list means for listing said user selected telephone dialing command which has failed to be executed by said system.
  5. Apparatus as claimed in claim 1 wherein said identifying means detects a specially designated telephone dialing command dialed by the user, and said table memory means includes saved list means for listing said specially designated telephone dialing command as identified by said identifying means which has been inputted to the system by the user.
  6. Apparatus as claimed in claim 1 including means for accepting and utilizing a predetermined model of said system user's telephone dialing command usage pattern to initially list one or more telephone dialing commands in said table memory means.
  7. Apparatus as claimed in claim 2 wherein said frequently identified telephone dialing commands in said table memory means are based on the present user's past identified telephone dialing command usage pattern.
  8. A method of inputting telephone dialing commands to a telephone communication system including the step of identifying (e.g. 202) each telephone dialing command of a group of telephone dialing commands inputted into said system, and CHARACTERIZED BY the steps of determining (e.g. 211, 101, 102) a conditional probability that said each inputted telephone dialing command is functionally related to another telephone dialing command, listing in a table memory means (e.g. 211) a functionally related telephone dialing command based on the conditional probability that said functionally related telephone dialing command follows a previously executed telephone dialing command, the conditional probability being determined from the user's prior inputted telephone dialing commands or from a previously entered predetermined list of telephone dialing commands, and selecting (e.g. 450, 451) by said user one of said listed telephone dialing commands from said table memory means for input to said system.
  9. A method as claimed in claim 8 including the steps of determining if said user selected telephone dialing command has been executed by said system, and listing a telephone dialing command, which has previously been selected by a user but which has failed to be executed by said system, in a retry list means for future selection by said user.

#### Patentansprüche

1. Fernsprechwählvorrichtung zur Verwendung bei einem Fernsprechkommunikationssystem, um die Auswahl eines Fernsprechwählbefehls zur Eingabe in und Ausführung durch das besagte System von einem Benutzer zu ermöglichen, wobei die besagte Vorrichtung Mittel zum Identifizieren (z.B. 100, 202) des jeweiligen Fernsprechwählbefehls aus einer in das besagte System eingegebenen Gruppe von Fernsprechwählbefehlen enthält, und dadurch gekennzeichnet, daß die besagte Vorrichtung Mittel zum Bestimmen (z.B. 101, 102, 211) einer bedingten Wahrscheinlichkeit enthält, daß der besagte jeweilige eingegebene Fernsprechwählbefehl funktionsmäßig mit einem anderen Fernsprechwählbefehl in Beziehung steht, Tabellenspeichermittel (z.B. 103) zum

- Auflisten eines funktionsmäßig bezogenen Fernsprechwählbefehls auf Grundlage der bedingten Wahrscheinlichkeit, daß der besagte funktionsmäßig bezogene Fernsprechwählbefehl einem vorher ausgeführten Fernsprechwählbefehl folgt, wobei die bedingte Wahrscheinlichkeit aus den vorher eingegebenen Fernsprechwählbefehlen des Benutzers oder aus einer vorher eingegebenen vorbestimmten Liste von Fernsprechwählbefehlen bestimmt wird, und vom besagten Benutzer betätigbare Auswahlmittel zum Auswählen (z.B. 450, 451) eines der aufgelisteten Fernsprechwählbefehle aus dem besagten Tabellenspeichermittel zur Eingabe in das besagte System.
2. Vorrichtung nach Anspruch 1 mit auf das besagte Identifizierungsmittel reagierenden Mitteln zum Zählen, wieviel Male jeder Fernsprechwählbefehl identifiziert wird, und auf jede Veränderung im Zählstand des besagten Zählmittels reagierenden Speichermitteln zum Auflisten einer Mehrzahl von häufig identifizierten Fernsprechwählbefehlen, die den höchsten summierten Zählstand aufweisen, wobei die besagten Auswahlmittel vom besagten Benutzer zur Auswahl eines der besagten Mehrzahl von häufig identifizierten Fernsprechwählbefehlen aus dem besagten Tabellenspeichermittel zur Eingabe in das besagte System betätigt werden können.
  3. Vorrichtung nach Anspruch 1 mit Mitteln zum Bestimmen, ob der in das besagte System eingegebene, vom Benutzer ausgewählte Fernsprechwählbefehl vom besagten System ausgeführt worden ist, und wobei das besagte Tabellenspeichermittel auf das besagte Bestimmungsmittel reagierende Neuheitslistenmittel zum Auflisten von Fernsprechwählbefehlen enthält, die vor kurzem vom Benutzer ausgewählt worden sind, und das besagte Auswahlmittel Mittel zum Zugreifen auf Fernsprechwählbefehle in dem besagten Neuheitslistenmittel zur Eingabe in das besagte System enthält.
  4. Vorrichtung nach Anspruch 1 mit Mitteln zum Bestimmen, ob der in das besagte System eingegebene, vom Benutzer ausgewählte Fernsprechwählbefehl vom besagten System ausgeführt worden ist, und wobei das besagte Tabellenspeichermittel Wiederversuchslistenmittel zum Auflisten des besagten vom Benutzer ausgewählten Fernsprechwählbefehls enthält, der nicht vom besagten System ausgeführt worden ist.
  5. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß das besagte Identifizierungsmittel einen vom Benutzer gewählten besonders bezeichneten Fernsprechwählbefehl erkennt und das besagte Tabellenspeichermittel gesicherte Listenmittel zum Auflisten des vom besagten Identifizierungsmittel identifizierten besonders bezeichneten Fernsprechwählbefehls enthält, der vom Benutzer in das System eingegeben worden ist.
  6. Vorrichtung nach Anspruch 1 mit Mitteln zum Aufnehmen und Benutzen eines vorbestimmten Modells des Benutzungsmusters des Fernsprechwählbefehls des besagten Systembenutzers zur anfänglichen Auflistung eines oder mehrerer Fernsprechwählbefehle im besagten Tabellenspeichermittel.
  7. Vorrichtung nach Anspruch 2, dadurch gekennzeichnet, daß die besagten häufig identifizierten Fernsprechwählbefehle im besagten Tabellenspeichermittel auf dem vergangenen identifizierten Benutzungsmuster des Fernsprechwählbefehls des gegenwärtigen Benutzers basieren.
  8. Verfahren zur Eingabe von Fernsprechwählbefehlen in ein Fernsprechkommunikationssystem mit dem Schritt des Identifizierens (z.B. 202) jedes Fernsprechwählbefehls aus einer Gruppe von in das besagte System eingegebenen Fernsprechwählbefehlen, und gekennzeichnet durch die Schritte des Bestimmens (z.B. 211, 101, 102) einer bedingten Wahrscheinlichkeit, daß jeder besagte jeweilige eingegebene Fernsprechwählbefehl funktionsmäßig mit einem anderen Fernsprechwählbefehl in Beziehung steht, Auflistens in einem Tabellenspeichermittel (z.B. 211) eines funktionsmäßig bezogenen Fernsprechwählbefehls auf Grundlage der bedingten Wahrscheinlichkeit, daß der besagte funktionsmäßig bezogene Fernsprechwählbefehl einem vorher ausgeführten Fernsprechwählbefehl folgt, wobei die bedingte Wahrscheinlichkeit aus den vorherigen eingegebenen Fernsprechwählbefehlen des Benutzers oder aus einer vorher eingegebenen vorbestimmten Liste von Fernsprechwählbefehlen bestimmt wird, und Auswählens (z.B. 450, 451) eines der besagten aufgelisteten Fernsprechwählbefehle aus dem besagten Tabellenspeichermittel vom besagten Benutzer zur Eingabe in das besagte System.
  9. Verfahren nach Anspruch 8 mit den Schritten des Bestimmens, ob der besagte vom Benutzer ausgewählte Fernsprechwählbefehl vom

besagten System ausgeführt worden ist, und Auflistens eines Fernsprechwahlbefehls, der vorher von einem Benutzer ausgewählt worden, aber nicht vom besagten System ausgeführt worden ist, in einem Wiederversuchsmittel für zukünftige Auswahl vom besagten Benutzer.

### Revendications

1. Appareil de composition de numéro de téléphone pour l'utilisation dans un système de communication téléphonique pour permettre à un utilisateur de sélectionner une commande de composition de numéro de téléphone à introduire dans et devant être exécutée par ledit système, ledit appareil comportant un moyen pour identifier (par ex. 100, 202) chaque commande de composition de numéro de téléphone d'un groupe de commandes de composition de numéro de téléphone introduites dans ledit système, et CARACTERISE EN CE QUE ledit appareil comporte un moyen pour déterminer (par ex. 101, 102, 211) une probabilité conditionnelle que chaque commande de composition de numéro de téléphone introduite soit fonctionnellement reliée à une autre commande de composition de numéro de téléphone, un moyen de mémorisation en tableau (par ex. 103) pour lister une commande de composition de numéro de téléphone fonctionnellement reliée, basé sur la probabilité conditionnelle que ladite commande de composition de numéro de téléphone fonctionnellement reliée suive une commande de composition de numéro de téléphone précédemment exécutée, la probabilité conditionnelle étant déterminée à partir des commandes de composition de numéro de téléphone précédemment introduites par l'utilisateur ou à partir d'une liste prédéterminée précédemment introduite de commandes de composition de numéro de téléphone, et un moyen de sélection actionnable par ledit utilisateur pour sélectionner (par ex. 450, 451) l'une des commandes de composition de numéro de téléphone listées à partir dudit moyen de mémorisation en tableau pour l'introduction dans ledit système.
2. Appareil selon la revendication 1, comportant un moyen répondant audit moyen d'identification pour compter le nombre de fois que chaque commande de composition de numéro de téléphone est identifiée, et un moyen de mémorisation répondant à un changement quelconque du compte dudit moyen de comptage pour lister une pluralité de commandes de composition de numéro de téléphone fréquemment identifiées qui ont le plus haut compte cumulé, ledit moyen de sélection étant actionnable par ledit utilisateur pour sélectionner l'une de ladite pluralité de commandes de composition de numéro de téléphone fréquemment identifiées à partir dudit moyen de mémorisation en tableau pour l'introduction dans ledit système.
3. Appareil selon la revendication 1, comportant un moyen pour déterminer si ladite commande de composition de numéro de téléphone sélectionnée par l'utilisateur et introduite dans ledit système a été exécutée par ledit système, et dans lequel ledit moyen de mémorisation en tableau comporte un moyen de liste de récence répondant audit moyen de détermination pour lister les commandes de composition de numéro de téléphone qui ont été récemment sélectionnées par l'utilisateur, et ledit moyen de sélection comporte un moyen pour accéder aux commandes de composition de numéro de téléphone dans ledit moyen de liste de récence pour l'introduction dans ledit système.
4. Appareil selon la revendication 1, comportant un moyen pour déterminer si ladite commande de composition de numéro de téléphone sélectionnée par l'utilisateur et introduite dans ledit système a été exécutée par ledit système, et dans lequel ledit moyen de mémorisation en tableau comporte un moyen de liste de tentatives pour lister ladite commande de composition de numéro de téléphone sélectionnée par l'utilisateur qui n'a pas été exécutée par ledit système.
5. Appareil selon la revendication 1, dans lequel ledit moyen d'identification détecte une commande de composition de numéro de téléphone spécialement désignée composée par l'utilisateur, et ledit moyen de mémorisation en tableau comporte un moyen de liste sauvegardée pour lister ladite commande de composition de numéro de téléphone spécialement désignée telle qu'elle est identifiée par ledit moyen d'identification qui a été introduite dans le système par l'utilisateur.
6. Appareil selon la revendication 1, comportant un moyen pour accepter et utiliser un modèle prédéterminé de la forme d'utilisation des commandes de composition de numéro de téléphone par l'utilisateur dudit système pour lister initialement une ou plusieurs commandes de composition de numéro de téléphone dans ledit moyen de mémorisation en tableau.

7. Appareil selon la revendication 2, dans lequel lesdites commandes de composition de numéro de téléphone fréquemment identifiées dans ledit moyen de mémorisation en tableau sont basées sur la forme d'utilisation des commandes de composition de numéro de téléphone antérieurement identifiées du présent utilisateur. 5
8. Méthode d'introduction de commandes de composition de numéro de téléphone dans un système de communication téléphonique comportant l'étape d'identification (par ex. 202) de chaque commande de composition de numéro de téléphone d'un groupe de commandes de composition de numéro de téléphone introduites dans ledit système, et CARACTERISEE PAR les étapes de détermination (par ex. 211, 101, 102) d'une probabilité conditionnelle que chaque dite commande de composition de numéro de téléphone soit fonctionnellement reliée à une autre commande de composition de numéro de téléphone, de listage dans un moyen de mémorisation en tableau (par ex. 211) d'une commande de composition de numéro de téléphone fonctionnellement reliée, basé sur la probabilité conditionnelle que ladite commande de composition de numéro de téléphone fonctionnellement reliée suive une commande de composition de numéro de téléphone précédemment exécutée, la probabilité conditionnelle étant déterminée à partir des commandes de composition de numéro de téléphone précédemment introduites par l'utilisateur ou à partir d'une liste prédéterminée précédemment introduite de commandes de composition de numéro de téléphone, et de sélection (par ex. 450, 451) par ledit utilisateur d'une desdites commandes de composition de numéro de téléphone à partir dudit moyen de mémorisation en tableau pour l'introduction dans ledit système. 10  
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9. Méthode selon la revendication 8, comportant les étapes de détermination de l'exécution ou non par ledit système de ladite commande de composition de numéro de téléphone sélectionnée par l'utilisateur, et de listage d'une commande de composition de numéro de téléphone, qui a été antérieurement sélectionnée par un utilisateur mais qui n'a pas été exécutée par ledit système, dans un moyen de liste de retentatives pour une sélection future par ledit utilisateur. 45  
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FIG. 1

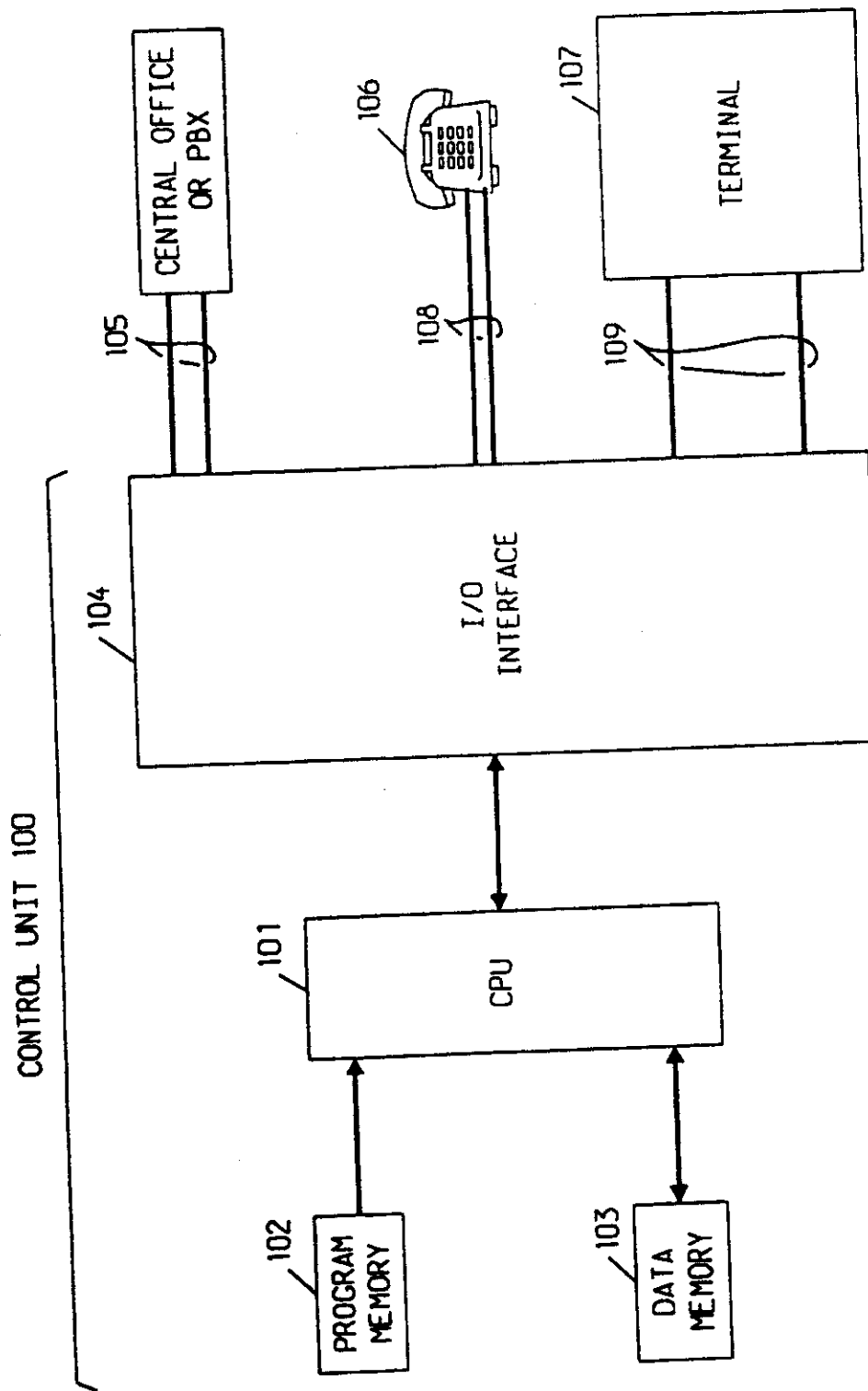


FIG. 2

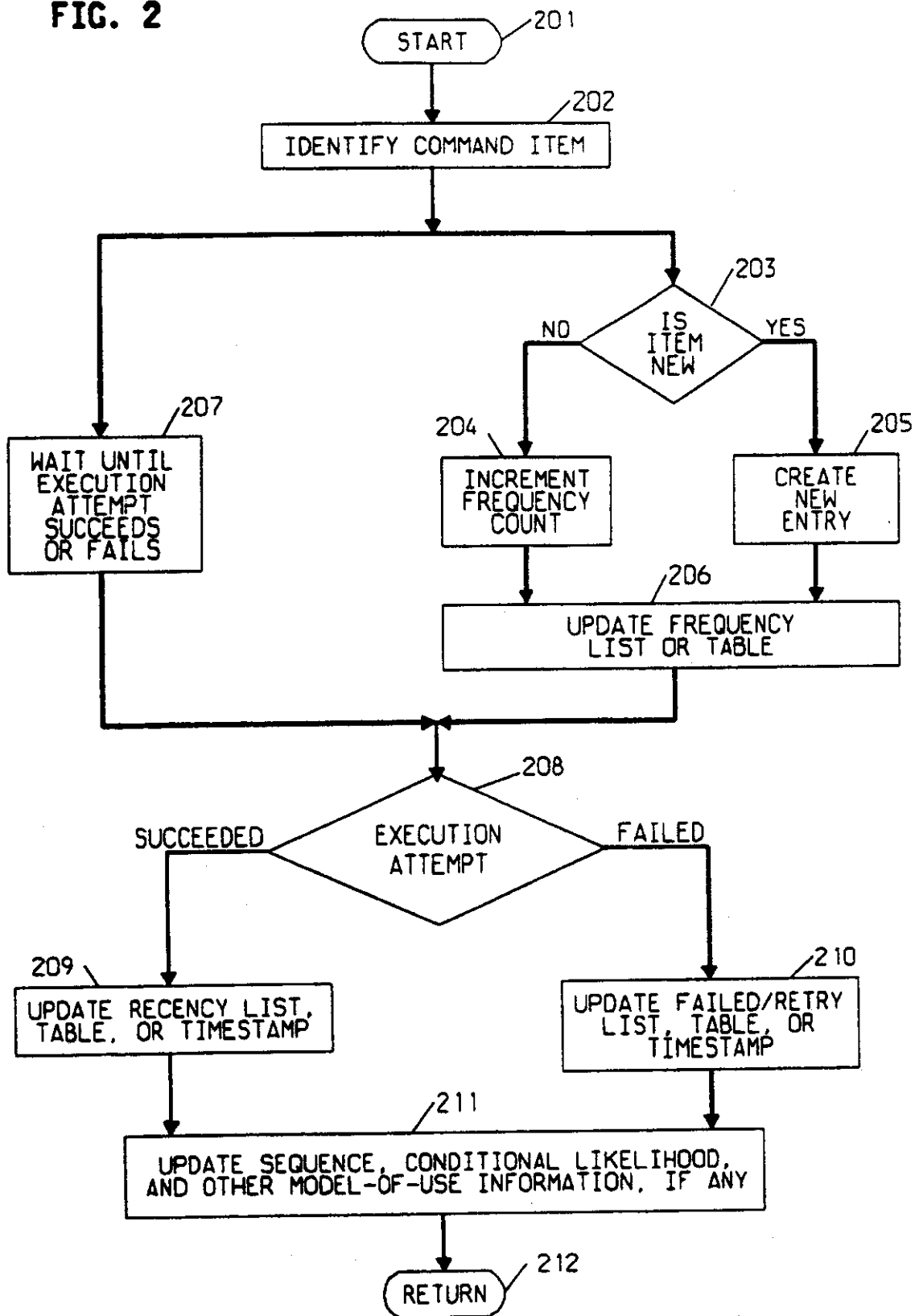


FIG. 3

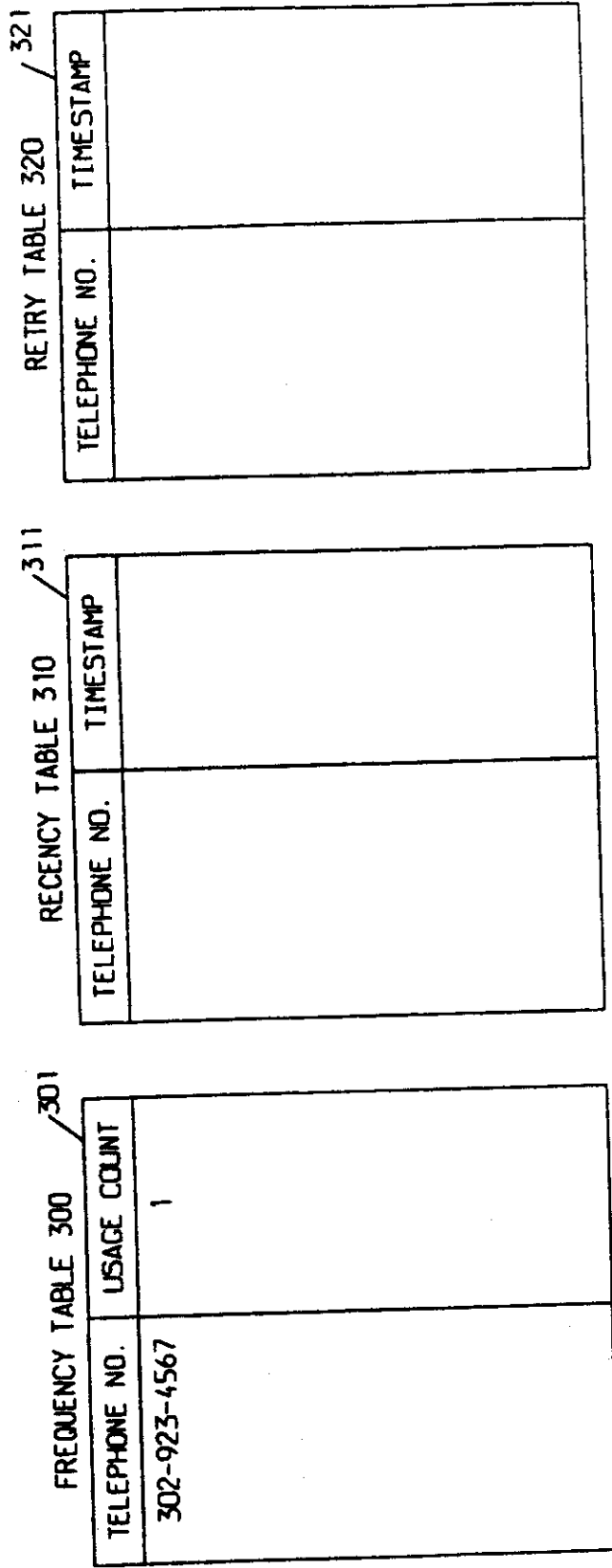


FIG. 4

Tue Dec 10, 1985, 6:03 pm

<p>451</p> <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; width: 30px; height: 30px;"></div> <div style="border: 1px solid black; width: 30px; height: 30px;"></div> <div style="border: 1px solid black; width: 30px; height: 30px;"></div> </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <div style="border: 1px solid black; width: 30px; height: 30px;"></div> <div style="border: 1px solid black; width: 30px; height: 30px;"></div> <div style="border: 1px solid black; width: 30px; height: 30px;"></div> </div> <p style="text-align: center;">450</p> <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 2px;">1</div> <div style="border: 1px solid black; padding: 2px;">ABC 2</div> <div style="border: 1px solid black; padding: 2px;">DEF 3</div> </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <div style="border: 1px solid black; padding: 2px;">CHI 4</div> <div style="border: 1px solid black; padding: 2px;">JKL 5</div> <div style="border: 1px solid black; padding: 2px;">MNO 6</div> </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <div style="border: 1px solid black; padding: 2px;">PRS 7</div> <div style="border: 1px solid black; padding: 2px;">TUV 8</div> <div style="border: 1px solid black; padding: 2px;">WXY 9</div> </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <div style="border: 1px solid black; padding: 2px;">*</div> <div style="border: 1px solid black; padding: 2px;">OPR 0</div> <div style="border: 1px solid black; padding: 2px;">#</div> </div>	<p>^</p> <p>SAVED 440 v</p> <p>215-462-1472</p> <p>201-940-1321 HOME</p> <p>201-321-4000 POLICE</p> <p>201-445-3200 BANK</p> <p>201-458-3121 TAXI</p>	<p>^</p> <p>FREQUENT 410 v</p> <p>201-957-1234</p> <p>201-957-3284 MR. SMITH</p> <p>201-740-1941 MR. REED) 403</p> <p>609-456-0245 MR. JONES</p> <p>201-861-7801 SUB SHOP</p> <p>201-215-3215</p>
	<p>^</p> <p>RECENT 420 v</p> <p>212-463-2904</p> <p>201-548-3128 MS. FOX</p> <p>201-741-4290</p> <p>516-920-4848 HARRIS</p> <p>516-242-4844 XYZ, INC.</p> <p>201-702-2204</p>	<p>^</p> <p>RETRY 430 v</p> <p>212-364-5261</p> <p>201-591-5292 MS. BEIGER</p> <p>201-940-1321 HOME</p>

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