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[54] **METHOD AND APPARATUS FOR ALERTING MULTIPLE TELEPHONES FOR AN INCOMING CALL**

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[57] **ABSTRACT**

A system for alerting a plurality of telephones in response to an incoming call to a destination directory number. A handling switch sends a query to a centralized database requesting routing instructions, and the database returns the directory numbers of the plurality of telephones to be alerted for incoming calls to the destination directory number. The busy/idle status of all of the plurality of telephones is checked, and an alerting signal is sent to all idle telephones. The handling switch is notified as to which alerted telephone has an off-hook appearance first, and the incoming call is routed to that telephone.

9 Claims, 3 Drawing Sheets
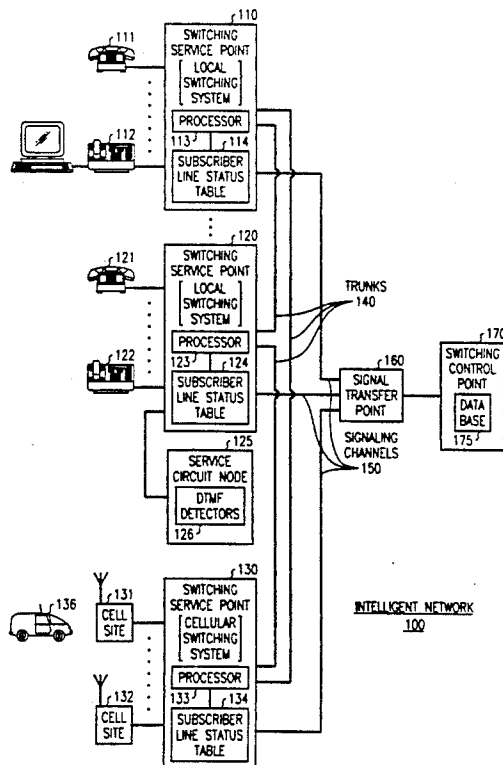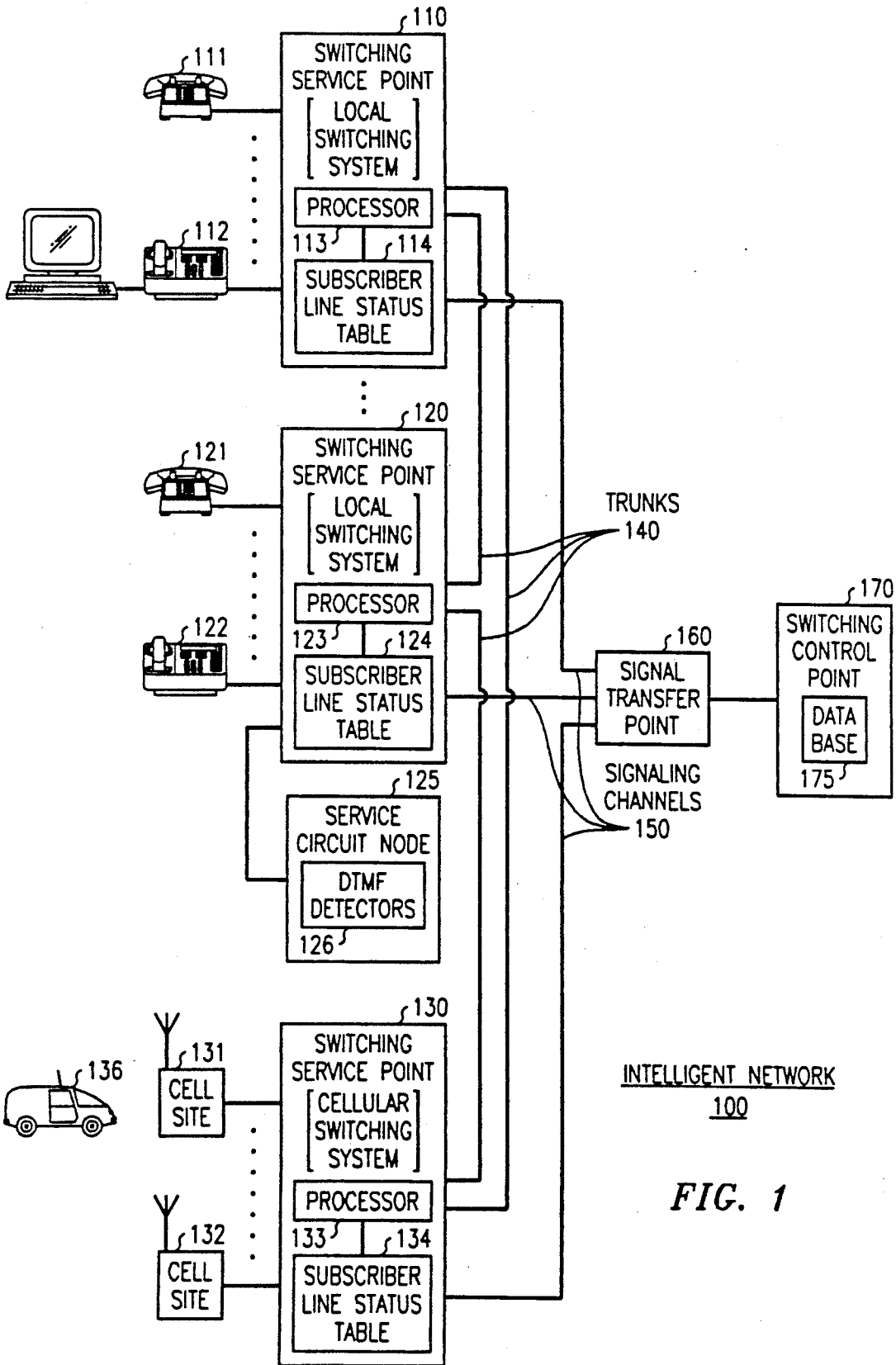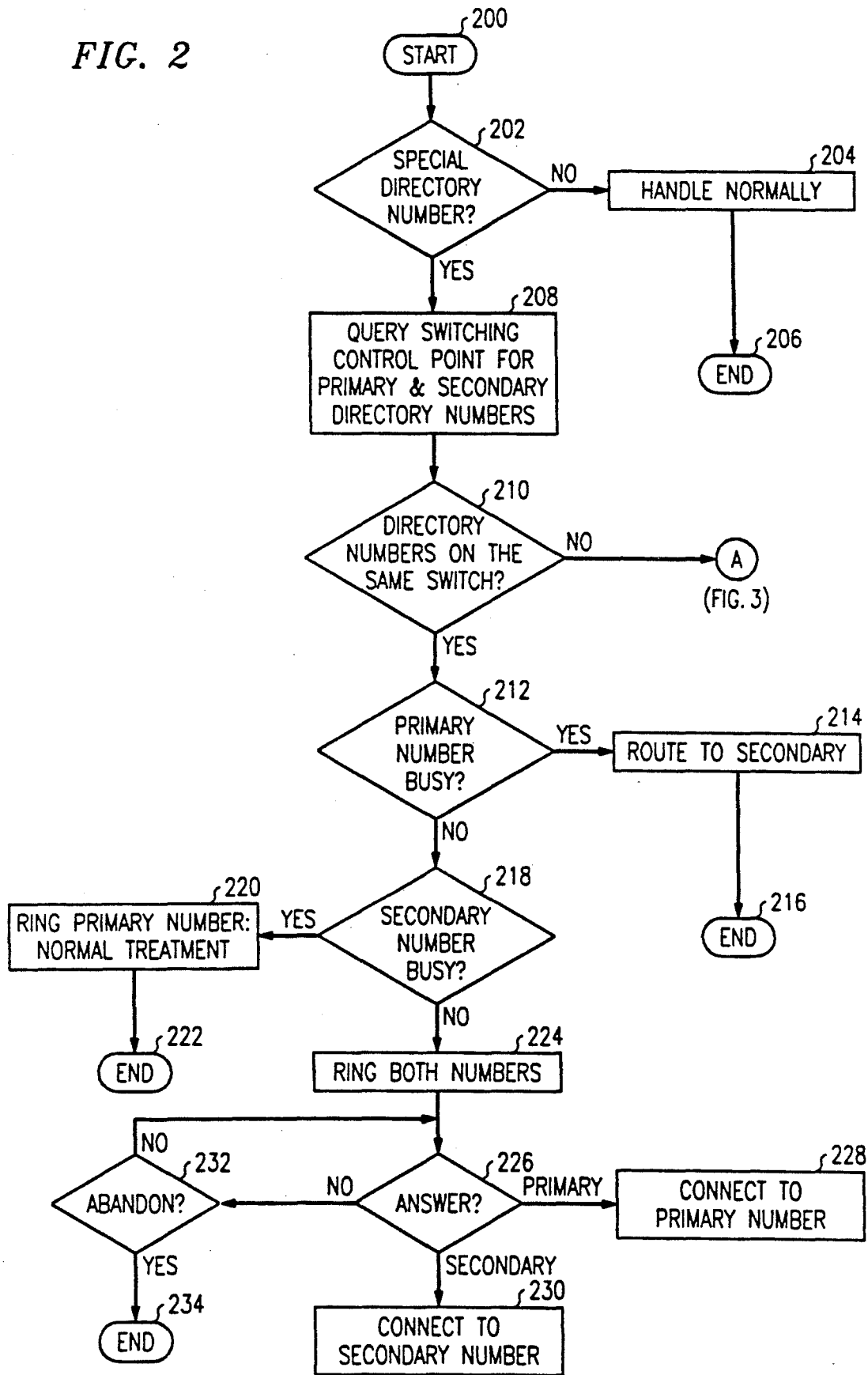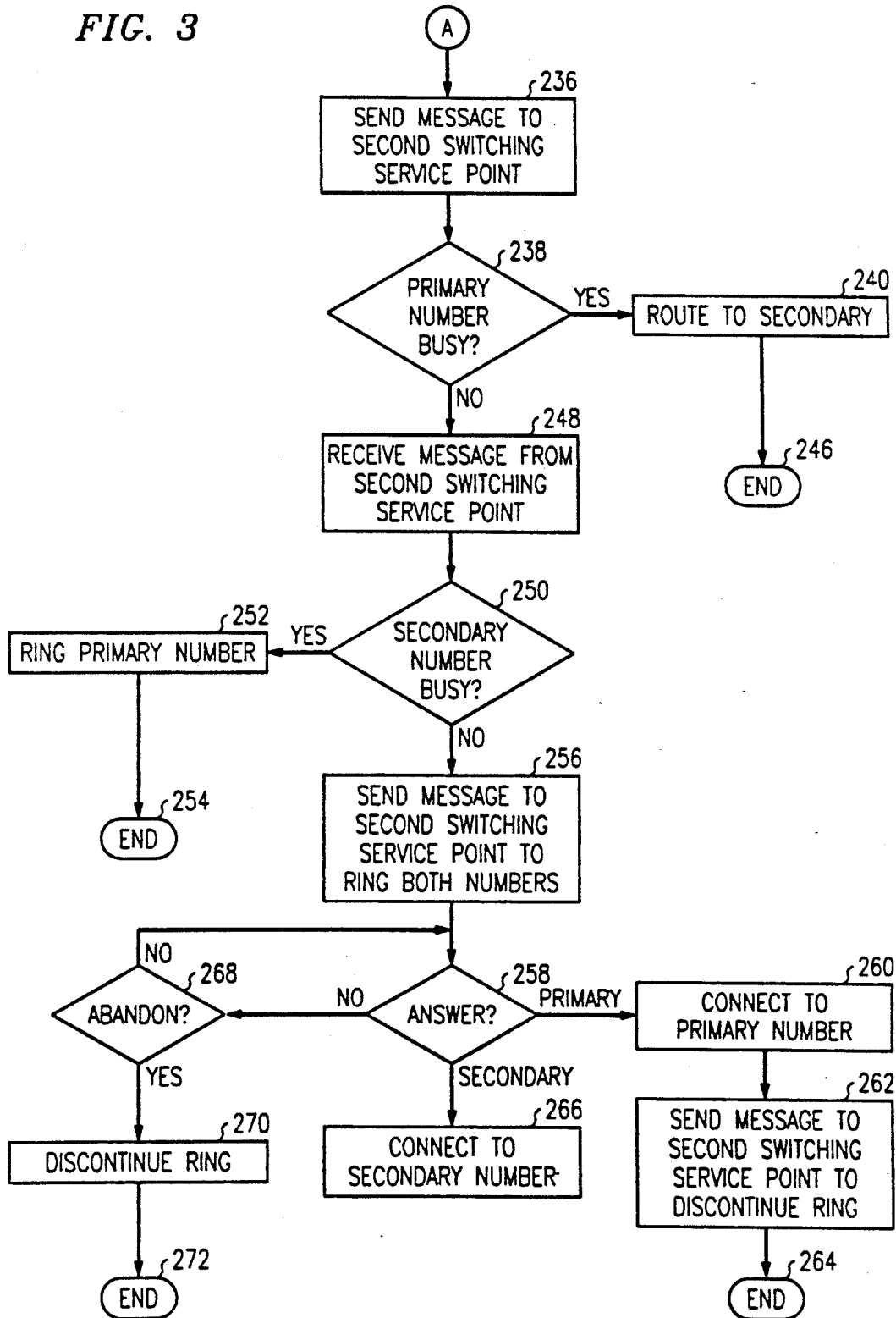
INTELLIGENT NETWORK
100

FIG. 1

FIG. 2

FIG. 3

METHOD AND APPARATUS FOR ALERTING MULTIPLE TELEPHONES FOR AN INCOMING CALL

TECHNICAL FIELD

This invention relates to the field of local telephone switching systems, and more specifically to sending alerting to a plurality of telephones on different switching systems in response to an incoming telephone call.

BACKGROUND OF THE INVENTION

Being "in touch" has become increasingly important for some people, i.e., doctors, business executives, attorneys, etc., who have a strong need to be reached wherever they are. Many of these people have a telephone for business, a telephone for home, a mobile cellular telephone for the car and/or a transportable telephone that can be carried around when not near one of the other telephones. Additionally, some professionals have multiple offices with a telephone in each office. Some work at home in conjunction with an office at a business location for when they are "on premises", with at least one telephone at each location. All of these telephones generally have different telephone numbers and are frequently on different local offices with different prefixes. This requires the caller to know or look up multiple telephone numbers, and frequently to make multiple calls in order to reach a person.

While there are several telephone equipment features and telephone company services designed to ease the problem of multiple telephone numbers, they do not solve all the problems. For example, call forwarding provides call redirection from one telephone to another. However, once the subscriber activates call forwarding, he or she cannot answer the primary telephone until the feature is deactivated. Additionally, calls can only be forwarded to one telephone, so that the user must know where he or she is going to be in order to forward calls effectively. Without remote activation, subscribers must turn on call forwarding from their primary telephone.

A second attempt to solve this problem requires the addition of expensive customer premises equipment connected to the primary telephone and either a second telephone line or three-way calling. In this system, when a call comes in, the system sets up a three-way call to a pre-programmed telephone number, and either simultaneously alerts the attached telephone and the remote telephone or alerts the remote telephone after a predetermined number of rings. The system determines whether the attached telephone or the remote telephone answers first. If the attached telephone answers first, the system terminates the connection to the remote telephone. If the remote telephone answers first, the system bridges the incoming call to that telephone or, for three-way calling, simply drops off the connection. This system is limited in the number of other telephones that the may be alerted, and involves installing and programming customer premises equipment that occupies space at or near the customer's telephone, and requires an additional line or coordination with three-way calling.

Some central offices have the capability to alert two telephones in response to an incoming call, and terminate the incoming call to the first of the telephones from which an off-hook signal is detected. This system is

limited in that both of the alerted telephones must be connected to the same central office.

Therefore, a problem in the art is that there is no low cost, network based solution to the problem of alerting a plurality of telephones connected to more than one central office for a single incoming call.

SUMMARY OF THE INVENTION

This problem is solved and a technical advance is achieved in the art by a method performed in a local switching system which, in response to an incoming call comprising a destination directory number, translates the directory number into one or more identifications of lines served by the local switching system, and one or more directory numbers not served by the local switching system, alerts the identified lines, places outgoing calls to the directory numbers, and terminates the incoming call to the line or lines from which answer is detected. Advantageously, translating the destination directory number comprises sending a message to a database shared by a plurality of local switching systems. The shared database returns the one or more directory numbers and the one or more line identifications.

A method in accordance with one embodiment of this invention provides alerting to multiple telephones in response to one incoming call implemented in an intelligent network comprising a plurality of switching service points interconnected by a plurality of communication links via a signaling transfer point and a plurality of voice and data trunks. A shared database is also connected to the signaling transfer point. A call is received at one of the switching service points, wherein the call comprises a directory number. The switching service point recognizes the directory number as a unique number requiring database action and sends a query to the shared database. The shared database returns routing numbers, which the switching service point translates, associated with primary and secondary telephones that are to be alerted for incoming calls to the directory number. The local switching system sends messages over the signaling channel to the identified local switching systems requesting busy/idle status of the lines associated with the primary and secondary directory numbers. The identified local switching systems return the requested information, and the local switching system requests, via a further message, that alerting be applied to the lines associated with the primary and secondary directory numbers if they are idle. When one of the lines reports off-hook, it is reported to the local switching system and the incoming call is routed over a trunk to the local switching system that reported the off-hook. The other call (or calls) is dropped.

In another embodiment, an incoming call is routed to a switching service point, wherein the switching service point comprises a local switching system that serves the primary number. The switching service point determines that the primary number requires database action, and sends a message to a shared database. The shared database returns the numbers of the secondary telephone or telephones to be alerted for incoming calls to the directory number. The switching service point checks its own busy/idle status table and sends a message to the local switching systems serving the secondary telephone(s) for busy/idle status. The switching service point applies alerting to the line associated with the primary directory number, and sends a message to the local switching system(s) to apply alerting to the

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