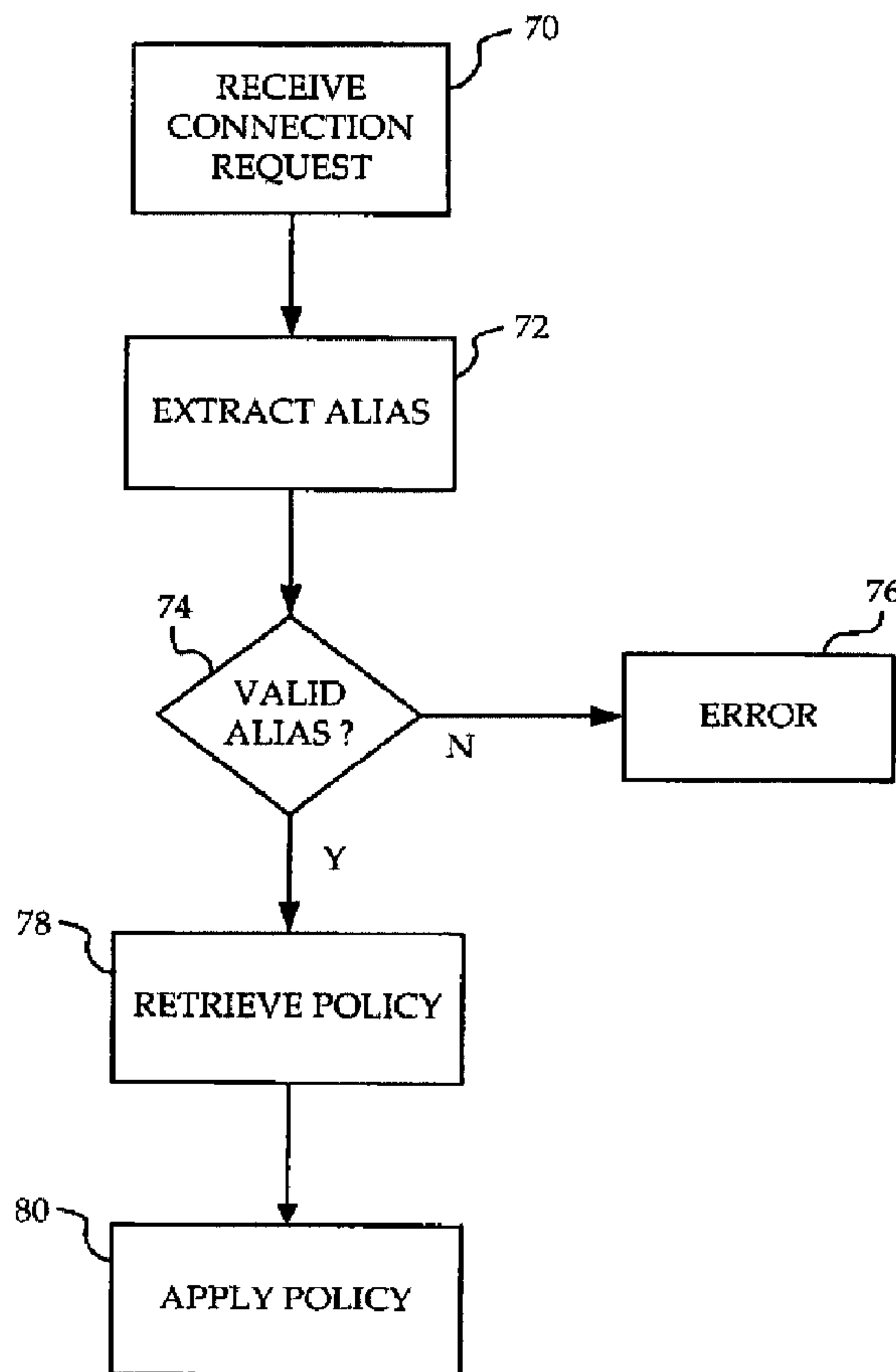




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(54) Title: ADAPTABLE COMMUNICATION PROFILES IN TELEPHONE NETWORKS



(57) **Abrégé/Abstract:**

A system and method are provided for providing multiple aliases for a user of a VoIP communication system. The user configures a multitude of aliases by which others can contact the user, and associates with each policy a respective policy at a user terminal.

(57) Abrégé(suite)/Abstract(continued):

These aliases are stored in association with contact information for the user terminal. A proxy processes connection requests by determining the contact information based on an alias entered by the caller. The user terminal processes incoming calls using the policy associated with the alias entered by the caller.

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Abstract

A system and method are provided for providing multiple aliases for a user of a VoIP communication system. The user configures a multitude of aliases by which others can contact the user, and associates with each policy a respective policy at a user terminal. These aliases are stored in association with contact information for the user terminal. A proxy processes connection requests by determining the contact information based on an alias entered by the caller. The user terminal processes incoming calls using the policy associated with the alias entered by the caller.

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ADAPTABLE COMMUNICATION PROFILES IN TELEPHONE NETWORKS

Field of the invention

[01] The invention relates to call management by a user in telephony, and more particularly to the use of aliases in Voice over IP.

Background of the invention

[02] A user gives telephony contact information to other people so that the user may receive calls. Typically, a single piece of contact information (such as a telephone number) is provided by the user to a wide range of people and businesses, including friends, family, business contacts, employers, charitable organizations, and service providers such as credit card companies. The contact information may also be provided when completing forms for joining organizations and sports teams, for entering draws, for requesting consumer information, for subscribing to magazines, or for registering with an Internet organization. The contact information can also be passed to third parties unbeknownst to the user.

[03] The vast number of people and organizations which can have access to the user's contact information can prove burdensome to the user, particularly with respect to telemarketing. Even when the caller is legitimate, the user has little way of knowing who is calling before answering the telephone. Whether a call is from a family member, a particular group of friends, another group of friends, from an employer, or from a potential client, the user must treat all such calls in the same manner until the user takes the call and the caller identifies himself or herself. The problem is compounded when the contact information is shared among several people, as in a family sharing a telephone line.

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[04] Systems for providing Caller Identification (Caller ID) can assist in identifying callers and screening unwanted callers, for example by allowing the user to identify the calling number as that of a particular friend. However, Caller IDs are limited in that they are tied to the calling device and not to the calling party. This results in a degree of caller anonymity on the part of the caller. The user can choose to block calls from unrecognized numbers, or to block calls from specified numbers, but in either case the problem of managing the call is based on the identification of the calling device. If calls from unrecognized numbers are blocked, a friend calling from someone else's phone or a public phone will be unable to reach the user. If calls from specified numbers are blocked, unwanted callers will reach the user when calling from devices not previously recognized by the user. In either case, the call is treated based on the device from which the call originates, and not based on who is actually making the call. Furthermore, Caller ID can be disabled by the calling party by using an anonymity service. And even if a caller is correctly identified using Caller ID, management of the call is limited to either blocking or allowing the call.

[05] A user may wish to manage calls in other ways other than just blocking or allowing a call. For example, the user may wish to forward calls from certain callers to voicemail with a particular announcement, personally answer the call in a business like manner (e.g. "ABC Services, Peter speaking"), block calls from certain callers and play a specific message, or forward calls from certain users to another terminal.

[06] Bell Teen ServicesTM allows up to four telephone numbers per residential line, with a distinctive ring for each number. This allows, for example, parents of a household to distribute one telephone number to their friends and contacts and a child to distribute a different telephone number to his or her friends. In this way, when the telephone rings it will be clear whether the caller is one of the child's friends or one of the parents' friends or contacts. However, the

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number of different telephone numbers is limited, and the numbers can only be chosen when setting up the service. The numbers can also not be withdrawn by the user. Furthermore, the user's telephone treats each called number differently simply by presenting a different ring pattern.

[07] A system which allowed a user to configure any number of personalized aliases at any time would allow the user to dynamically customize means by which he or she could be contacted, providing greater control by the user over his or her privacy. Use of temporary aliases would allow the user to distribute contact information of limited duration.

Summary of the invention

In accordance with one aspect of the invention, a method is provided for establishing connections in a VoIP communication network. A plurality of aliases for a user terminal are configured, the user terminal having contact information. A connection request is received at a proxy for establishing a connection to the user terminal, the connection request including one of the aliases. The contact information corresponding to the alias included in the connection request is determined, and a connection is established to the user terminal.

In one embodiment, a policy associated with each alias is stored at the user terminal. The user terminal determines the alias included in the connection request, and processes the call in accordance with the policy associated with the alias.

[08] Apparatus are provided for carrying out the methods of the invention. The methods may be stored in the form of software instructions on computer-readable media.

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[09] The methods and apparatus of the present invention allow a user to dynamically configure means by which he or she can be contacted. By allowing the user to configure aliases as he or she chooses, aliases can be tied to the user device for as long or as briefly as the user wishes. The user has control over who can contact him or her, and to be alerted of who is calling independent of the particular calling device. The user can configure the user device to perform different actions depending on which alias was used to contact the user device, such as displaying a description of the alias. For example, a user wishing to sell a car may create and distribute an alias for precisely that purpose. Potential purchasers will use the distributed alias, and the user will be alerted when a call is received from someone using the distributed alias, regardless of from where the caller is calling. This allows the user to ignore such calls when desired. Once the car is sold, the user can configure the user device to inform calls to the distributed alias that the car has been sold, and after a while disable the alias altogether.

Brief description of the drawings

[10] The features and advantages of the invention will become more apparent from the following detailed description of the preferred embodiment(s) with reference to the attached figures, wherein:

FIG. 1 is a block diagram of a portion of a communication network;

FIG. 2 is a block diagram of the user device of FIG. 1 according to one embodiment of the invention;

FIG. 3 is a flowchart of a method by which the alias manager of FIG. 2 configures aliases according to one embodiment of the invention;

FIG. 4 is a flowchart of a method by which the call processor of FIG. 2 processes incoming calls according to one embodiment of the invention; and

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FIG. 5 is a flowchart of a method by which the proxy of FIG. 1 processes connection requests according to one embodiment of the invention.

[11] It will be noted that in the attached figures, like features bear similar labels.

Detailed description of the embodiments

[12] Referring to FIG. 1, a block diagram of a portion of a Voice Over Internet Protocol (VoIP) communication network is shown. A user receives calls through the communication network at a user device 10, such as a VoIP-enabled telephone. The user interacts with a registrar 12 through the user device 10 to manage user-defined aliases. The registrar 12 deposits the user-defined aliases on a location server 14. A caller wishing to contact the user accesses the communication network through a caller device 16, such as a VoIP-enabled telephone. The caller device 16 contacts a proxy 18, which consults the location server 14 to retrieve a contact address of the user device 10. The proxy 18 establishes a connection between the caller device 16 and the user device 10. The user device 10, registrar 12, location server 14, caller device 16, and proxy 18 are SIP-enabled devices and intercommunicate using SIP signaling, in conformance with J. Rosenberg *et al.*, "SIP: Session Initiation Protocol", IETF RFC 3261, June 2002. The registrar 12, location server 14, and proxy 18 are preferably administered by a single administrative entity 20 which provides the adaptable communication profile service of the invention.

[13] Broadly, in operation the user defines a set of at least one alias to be stored on the location server. Each alias acts as an address-of-record, and is stored on the location server 14. The user distributes the aliases to people and organizations by whom the user wishes to be contacted. The definition and distribution of the aliases is entirely up to the user. A caller wishing to contact the user will have been informed of one of the aliases by the user (for example,

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the user may say to the particular caller "You can reach me at this address"). The caller enters the alias at the caller device. When the proxy receives the SIP-connection message from the caller device, the proxy extracts the alias. The proxy determines from the location server the contact address that corresponds to the alias, the correspondence between the alias and the contact address having been defined by the user and entered in the location server through the registrar. The proxy establishes a connection between the caller device and the contact address corresponding to the alias. The user device receives the connection request and extracts the alias, which is stored in the signal header information as the address-of-record. The user device determines a policy to be applied to the alias, and applies the policy.

[14] Referring to FIG. 2, a block diagram of the user device 10 according to one embodiment of the invention is shown. The user device 10 includes a user interface 22, through which the user interacts with an alias manager 24. The alias manager 24 can send SIP signals to the registrar 12. Calls and connection requests are received at the user device 10 through a call processor 26. The alias manager 24 and the call processor 26 each have access to a memory 28 of the user device 10. The call processor 26 displays information on the user interface 22.

[15] The alias manager 24 and the call processor 26 are preferably in the form of software instructions within one or more processors in the user device 10, but may more generally be in the form of any combination of software and hardware, including hardware within an integrated circuit.

[16] Referring to FIG. 3, a method by which the alias manager 24 configures aliases according to one embodiment of the invention is shown. The method is executed when the user selects an alias management function through the user interface 22. At step 40 the alias manager 24 retrieves the current alias information, if any, from the memory 28. The alias information includes at least one alias and a corresponding policy associated with each alias. The policy

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preferably is a display name to be displayed on the user interface when receiving calls directed to the alias (for example, "Fred", "Family", "Car buyers"), but may additionally or alternatively include instructions for treating calls directed to the alias. Examples of such instructions for treating calls include redirecting the call to a different device or contact address, or playing a recorded message particular to the alias if the call is received at certain times of the day.

[17] At step 42 the alias manager 24 presents the current alias information to the user through the user interface 22, possibly in abbreviated form. At step 44 the alias manager 24 receives a modification request from the user through the user interface 22. If at step 46 the alias manager 24 determines that the modification request is to delete an alias, then at step 48 the alias manager 24 sends an SIP REGISTER signal to the registrar 12 indicating that the alias is to be no longer associated with the contact address of the user device, and deletes the alias from the memory 28 at step 50. The alias manager 24 then updates the display of the alias information at step 42.

[18] If the alias manager 24 determines at step 46 that the modification request is not to delete an alias, then at step 52 the alias manager 24 determines whether the modification request is to modify an alias. If so, then at step 53 the alias manager 24 receives a new policy to be associated with the alias, such as a new display name. At step 54 the alias manager 24 updates the memory 28 so as to include the new policy, and updates the display of the alias information at step 42. No signaling to the registrar is needed, as the policy is only stored locally on the user device 10.

[19] If the alias manager 24 determines at step 52 that the alias is not to be modified, then the modification request is to add a new alias and associated policy. At step 56 the alias manager 24 receives the new alias and the new policy from the user through the user interface 22. At step 58 the alias manager 24 sends an SIP REGISTER signal to the registrar 12 identifying the new alias to

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be associated with the contact address of the user device 10. The registrar 12 ensures that the alias chosen by the user is unique to the domain of the user device, in order to ensure global uniqueness of the alias. The registrar 12 signals to the alias manager 24 whether the alias chosen by the user is acceptable. At step 60 the alias manager 24 learns whether the alias was acceptable. If the alias was acceptable, then at step 62 the alias manager updates the memory 28 to insert the new alias and the new associated policy. Once the memory is updated, or if the alias was not acceptable, the alias manager 24 updates the display of the alias information at step 42.

[20] Referring to FIG. 4, a method by which the call processor 26 processes connection requests received from the proxy according to one embodiment of the invention is shown. At step 70 the call processor 26 receives a connection request from the proxy 20 in the form of an SIP INVITE signal. At 72 the call processor 26 extracts the alias of the connection request, which is stored in the SIP signal header information as the address-of-record. At step 74 the call processor 26 determines whether the extracted alias is valid by consulting the memory 28. Any alias contained in the SIP signal header should have been defined by the user and stored in the memory 28, as these are the only addresses-of-record which the proxy has for the user device 10. If at step 74 the call processor 26 is unable to locate the extracted alias within the memory 28 then the extracted alias is an invalid, and the call is rejected by the call processor 26. In the preferred embodiment, the call processor also alerts the user of the "false" alias, in order to inform the user that the aliases stored locally on the user device and the aliases registered through the registrar 12 have somehow become out-of-sync. If the call processor 26 determines at step 74 that the extracted alias is valid, then at step 78 the call processor 26 retrieves from memory 28 the policy corresponding to the extracted alias. The call processor 26 applies the policy at step 80.

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[21] In order to further protect the privacy of a user of the caller device 16 which also implements the adaptable communication profile system of the invention, the contact address of the caller device 16 should not appear on a Caller ID display of the user device 10. One solution would be to allow the caller to select one of the caller's aliases as the calling number. However, this would allow the caller to defeat any Caller Block function at the user device 10. In the preferred embodiment, the proxy 12 defines a unique calling alias for the caller device 16.

[22] Referring to FIG. 5, a method by which the proxy 18 processes connection attempts from the caller device to the user device according to one embodiment of the invention is shown. At step 90 the proxy receives a connection request from the caller device 16 in the form of an SIP INVITE signal. At step 92 the proxy determines the unique identification of the caller device, such as by extracting the contact address from the header information of the SIP signal. At step 94 the proxy generates a unique outgoing alias for the caller device, or alternatively may retrieve a pre-generated outgoing alias for the caller device from a database. An example method of generating a unique outgoing alias for a given caller device is to hash a concatenation of the contact address of the caller device and a long string of characters unlikely to be chosen by users. The generation of the unique outgoing alias must be reproducible, so that any call blocking at the user device will be able to consistently identify the caller device as the originator of calls. At step 96 the proxy generates an SIP INVITE signal to be sent to the user device to request a connection, inserting the outgoing alias into the header information of the SIP signal as the Calling Number.

[23] The caller's unique outgoing alias will not have been configured by the caller, and will therefore not be stored in the location server in association with the contact address of the caller. If the user attempts to return the call to the caller device using the caller's outgoing alias which appears on the user's Caller

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ID display, the proxy 18 will be unable to locate a contact address corresponding to the alias entered by the user, and the connection will not be established. This allows the outgoing alias to be used for identifying the caller device 16 for the purposes of blocking calls, but not to be used for contacting the caller device 16.

[24] In one embodiment, the proxy 18 applies policies to incoming calls to the user device 10. The policies are configured in a memory of the proxy by the owner of the proxy upon request by the user. When the proxy 18 extracts the address-of-record upon receipt of a connection request from the caller device 16, the proxy 18 consults a local memory to determine at least one policy to be applied to the call. An example of a policy applied to calls for an address-of-record is to bill the call to a particular customer account number. This allows the user to group calls to various aliases into separate billing accounts.

[25] As has been described above, the user configures and manages aliases through the user interface of the user device 10. In an alternative embodiment, the alias manager is located on an alias management interface device, which is a separate device from the user device which receives calls. For example, a management interface may be provided on a personal computer. The management interface communicates with the registrar using SIP signaling as described for the alias manager 24 described above. Once the user has configured aliases at the registrar using the alias management device, the user then updates aliases and policies on the user device so that that aliases recognized by the user device will match aliases recognized by the proxy. In such an embodiment, the alias manager on the user device would not signal the registrar 12, and the steps 48, 58, and 60 of FIG. 3 would be omitted from the method carried out by the alias manager of the user interface.

[26] The invention has been described as implemented using SIP-enabled devices. This allows existing SIP signaling to be used during configuration of the aliases by the user, and existing address-of-record lookup methods to be

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used by the proxy. Alternatively, other VoIP signaling protocols could be employed. The methods and system of the invention may be implemented in a network employing any VoIP protocols which allow the establishment of multiple aliases and the associating of these aliases with contact information for a user terminal, and in which a proxy establishing a connection to the user terminal determines contact information from an alias entered by the caller.

[27] The embodiments presented are exemplary only and persons skilled in the art would appreciate that variations to the embodiments described above may be made without departing from the spirit of the invention. Methods that are logically equivalent or similar to the methods described above with reference to FIG. 3, FIG. 4, and FIG. 5 may be used to implement the methods of the invention. The scope of the invention is solely defined by the appended claims.

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I/WE CLAIM:

1. A method of establishing connections in a VoIP communication network, comprising:

configuring a plurality of aliases for a user terminal having contact information;

receiving a connection request at a proxy for establishing a connection to the user terminal, the connection request including one of the aliases;

determining the contact information corresponding to the alias included in the connection request; and

establishing the connection to the user terminal.

2. The method of claim 1 comprising the further steps of:

for each alias, storing at the user terminal a policy associated with the alias;

at the user terminal, determining the alias included in the connection request; and

processing the call in accordance with the policy associated with the alias.

3. A system for carrying out the method defined in claim 1.

4. A system for carrying out the method defined in claim 2.

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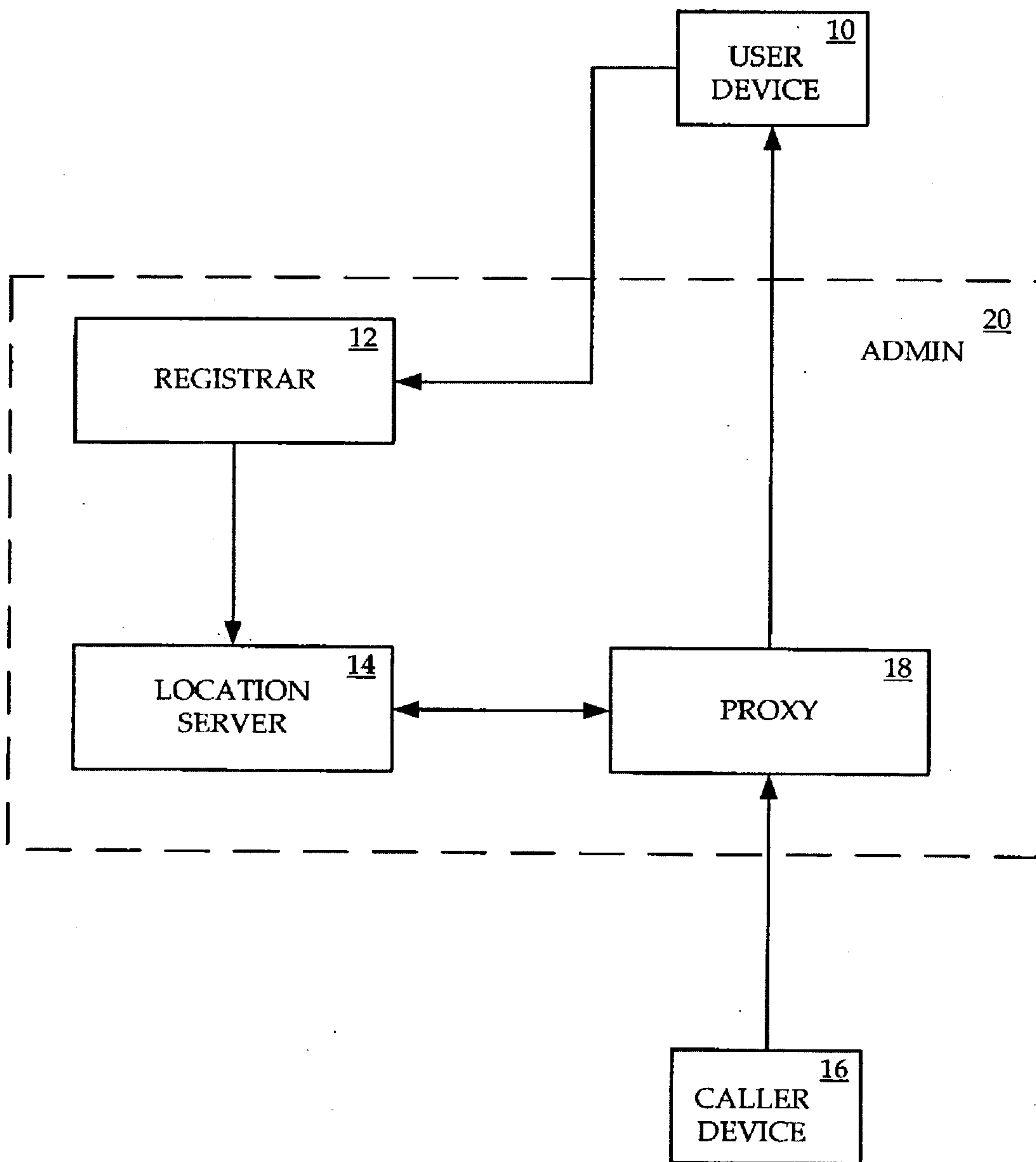


FIG. 1

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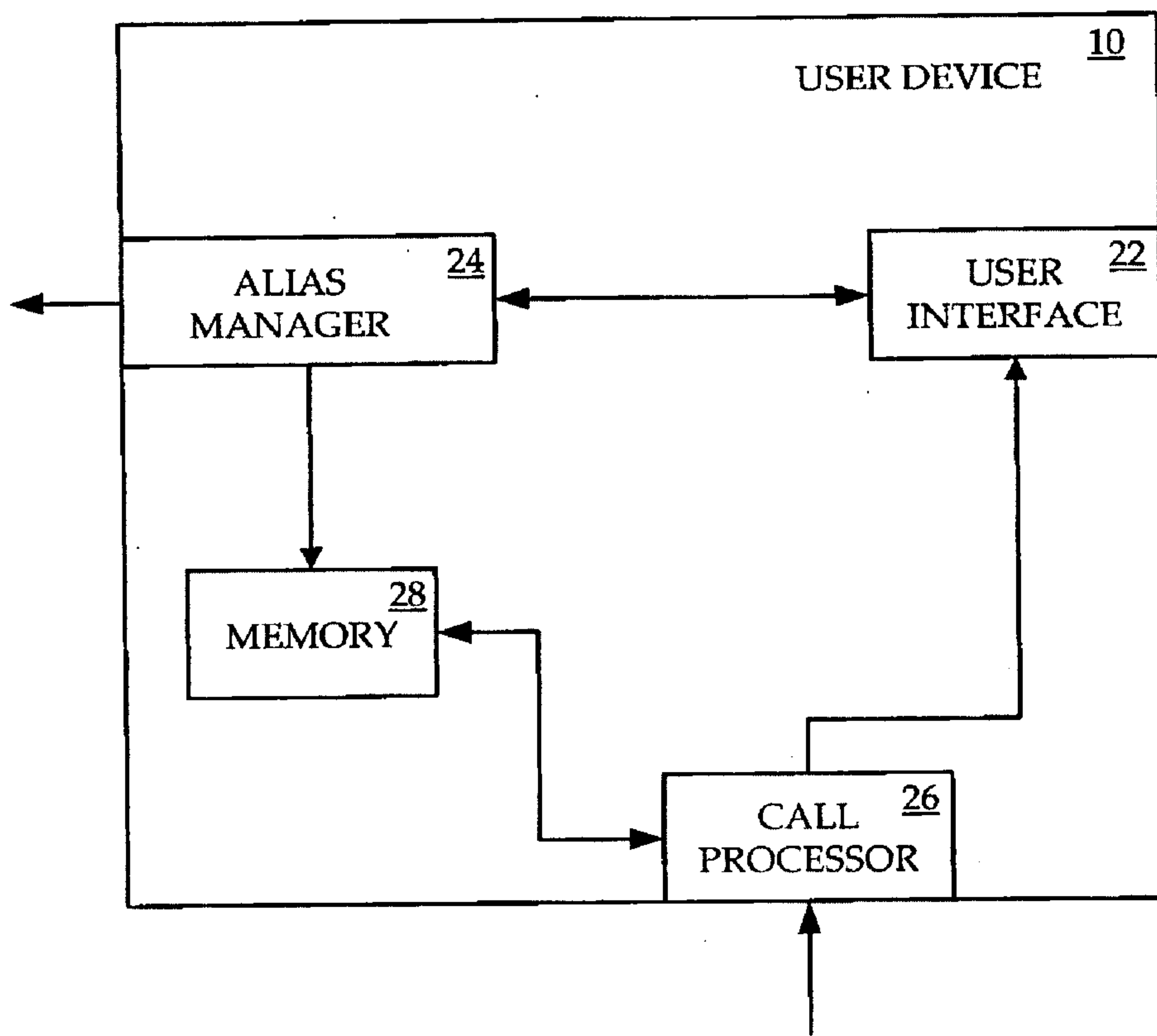


FIG. 2

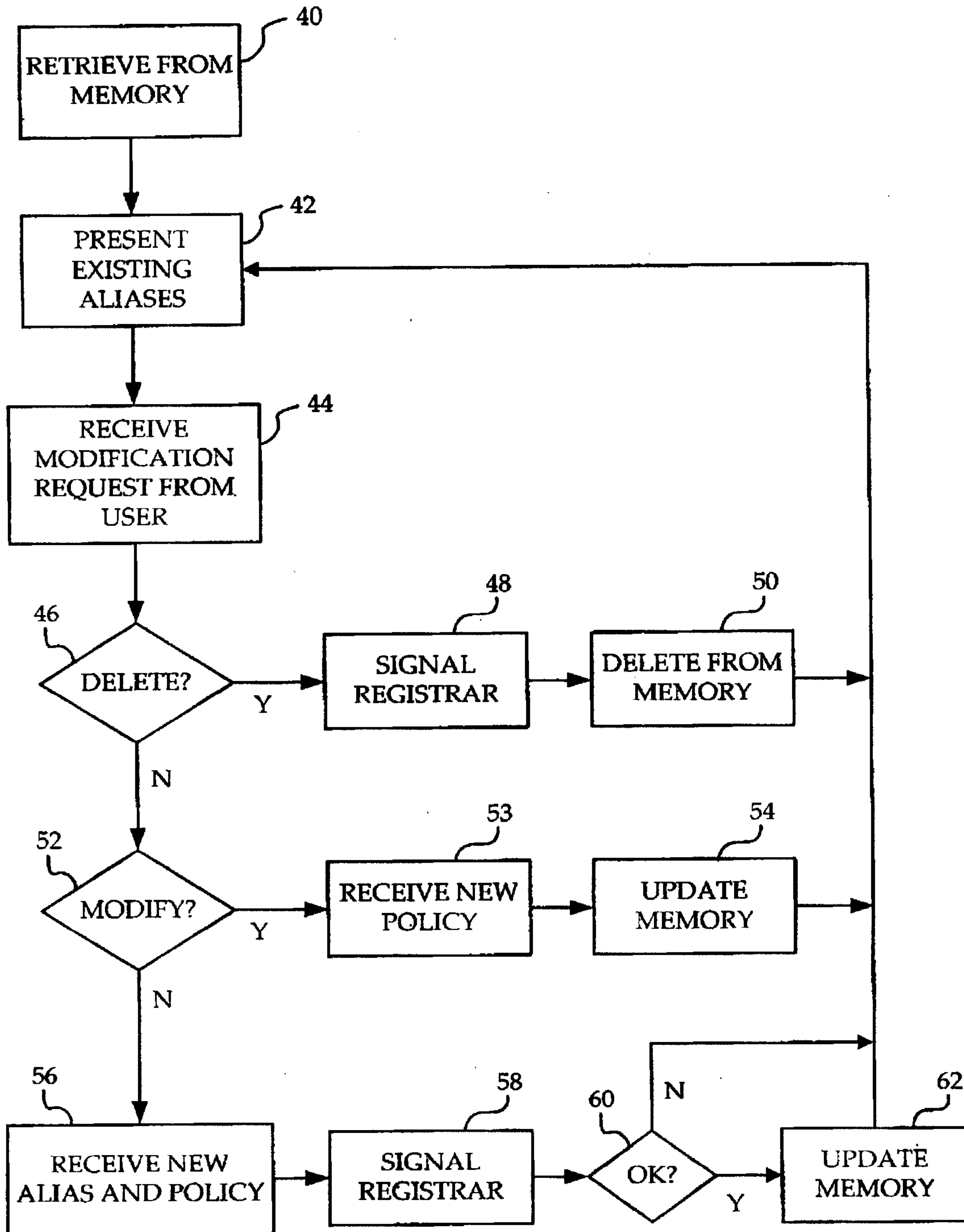


FIG. 3

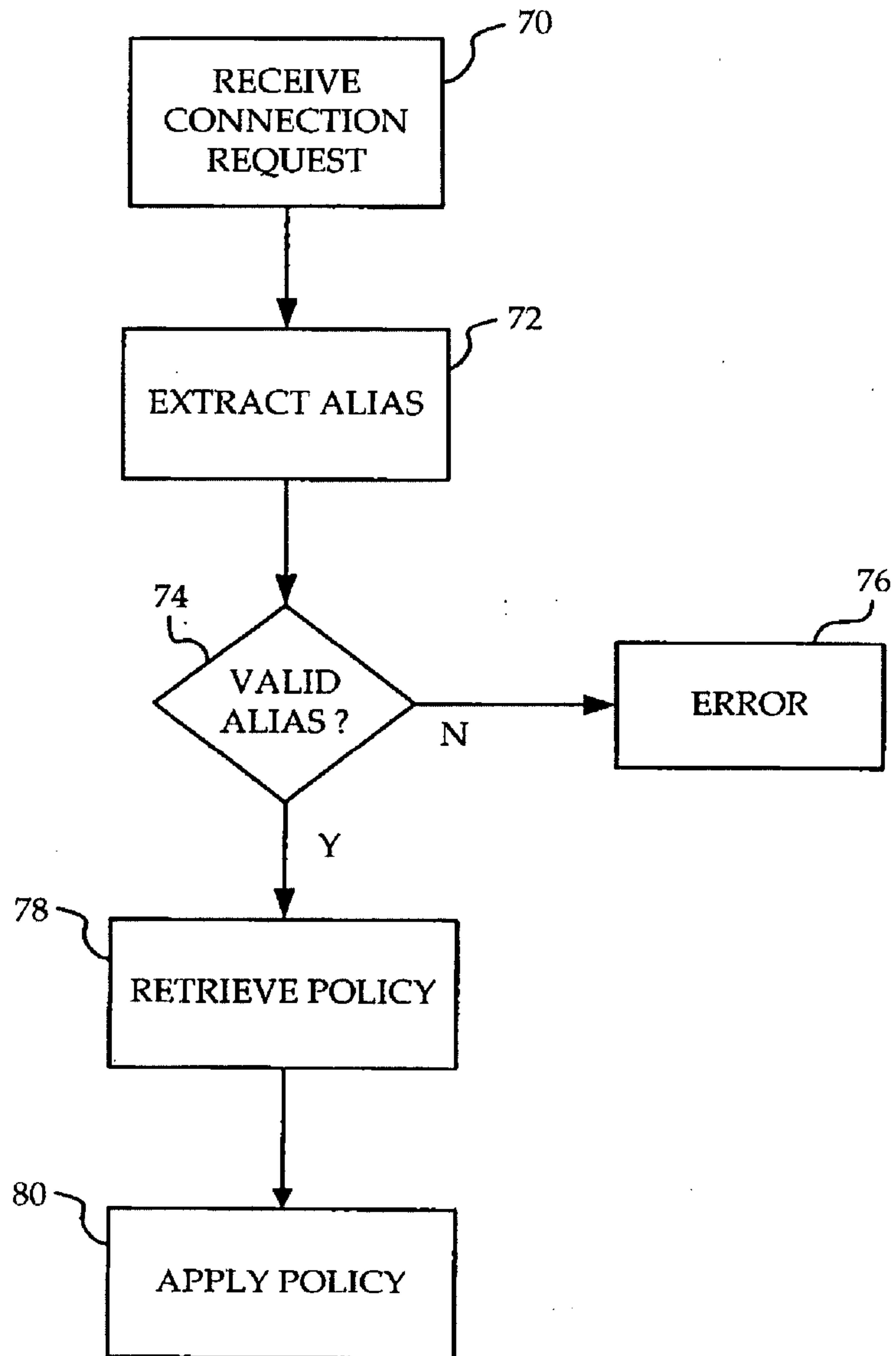


FIG. 4

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