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End user to mobile service provider message exchange system based on proximity

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ABSTRACT

This invention relates to a method for facilitating direct access from an end user (60) of a service to a mobile service provider (10 or 20) that is typically mobile, wherein the end user is able to select a desired mobile service provider based primarily on their proximity to that end user at the time the end user requires that service.

The method comprises a way of providing to an end user of a service (60) the ability to communicate a message to a mobile service provider (10 or 20), wherein the mobile service provider is capable of accepting a request for a service on the basis of a change of their geographical location, the method comprising the steps of;

a) an end user of a service accessing a means that communicates to that end user the geographical location and type of at least one mobile service provider; and

b) that end user selecting on said means a mobile service provider based on the geographical location of the said selected mobile service provider relative to the current or anticipated geographical location of that end user;

wherein the act of selecting a mobile service provider initiates said means to exchange a message between said end user and said selected mobile service provider to transact the provision of a service according to said message.

The means to provide geographical location information may comprise cellular telephone location determining networks (30) to determine the geographical location of the mobile service providers cellular telephone, working in conjunction with a WEB server (50) which can arrange to display to the end user (60), the position of the one or more available mobile service providers (10 or 20) relative to the geographical location of the end user, and a mechanism to enable the end user to select a service provider based on their proximity to that end users geographical location.

CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A method of providing to an end user of a service a way to communicate a message to a mobile service provider, wherein said mobile service provider is capable of accepting a request for a service on the basis of a change of their geographical location, said method comprises the steps of;

- a) a said end user of a service accessing a means that communicates to said end user the geographical location and type of at least one mobile service provider; and
b) said end user selecting on said means a mobile service provider based on the geographical location of the said selected mobile service provider relative to the current or anticipated geographical location of said end user;

wherein the act of selecting a mobile service provider initiates said means to exchange a message between said end user and said selected mobile service provider to transact the provision of a service according to said message.

2. A method according to claim 1 comprising the further step of;

- c) at least one mobile service provider indicating to said means the service status of said at least one mobile service provider and having said means communicate said status to a said end user.

3. A method according to claim 1 comprising the further step;

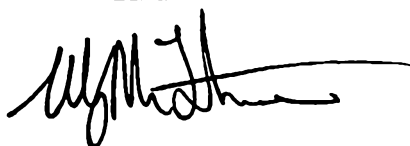
- d) of said means communicating the geographical location and type of at least one mobile service provider by providing a visual display accessible by an end user over a communications network.

Dated this 30th day of May, 2000

ABM INDUSTRIES PTY LTD

By its Patent Attorneys

MADDERN



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COMPLETE SPECIFICATION
FOR A PETTY PATENT
(original)

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Invention Title:	"END USER TO MOBILE SERVICE PROVIDER MESSAGE EXCHANGE SYSTEM BASED ON PROXIMITY"

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

This invention relates to a method and means for facilitating direct access from an end user of a service to the mobile service provider who is typically mobile and wherein the end user is able to select the desired mobile service provider based primarily on their proximity to that end user.

5

BACKGROUND

In this specification a sole operator chauffer service will be used as an example of a mobile service provider. Also in this specification, a person requiring a chauffer service will be used as an example of an end user.

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However, there is potential for use of the described method and means by a great variety of end users and desirably an equally great variety of mobile service providers. Some examples of services which are likely to be mobile and for which proximity of those mobile service providers to an end user is an important factor include couriers, taxis chauffers, plumbers, electricians, home handy persons, transportation drivers, sales persons, health care and fitness program providers are but a few. Furthermore, impulse purchasers or persons wishing to be contacted by sales persons representing the services to be provided may also be encouraged to make contact with these types of mobile service providers if they know that their presence is nearby at the time.

15

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Until the present, an end user would need to know the preferable means of contact for the mobile service provider, typically by making a call to the mobile service providers cellular telephone. The end user needs to know the particular cellular telephone number and even if the mobile service provider is available , they may be too far away to provide prompt delivery of the required service.

25

Central Taxi dispatch services exist because there is a need to efficiently control the provision of a taxi to an end user. However, dispatch services do not put the end user in direct contact with the mobile service provider namely the taxi driver, neither does the end user choose the particular taxi as that is left to the dispatcher or

30

computerised dispatch system. The dispatch system is typically arranged to allocate the nearest available suitable taxi.

5 If the end user has a particular need, such as a five passenger taxi, that may also be accommodated by such a system, but only after additional information is obtained from the end user and the dispatcher or computer system is arranged to accommodate that requirement if indeed that information is available.

10 What the end user does not know is that there could exist a closer available and suitable taxi from another taxi company. The end user only chooses the dispatch service of a particular taxi company and they do not choose the nearest suitable taxi of any particular taxi company.

15 End users are typically faced with limited choices and it is impossible for them to know where typically mobile service providers are located at any one time or their current availability to provide the service required of the end user. It is an aim of this invention to increase the choices available to an end user as well as to eliminate or reduce the problems which currently exist, in the action of an end user obtaining the services of a mobile service provider. Furthermore, it is an aim to provide a means to
20 the end user to directly access a mobile service provider without the need for third party involvement.

There already exist a variety of ways to determine the geographical location of a mobile service provider, for example they may have a Global Positioning Systems
25 (GPS) receiver integrated with a terrestrial radio, or their mobile is geographically locatable using Mobile Positioning Services provided by the mobile network infrastructure. Furthermore, end users of services have both personal computer (PC) and wireless (Cellular Mobile Telephone, etc) technologies capable of providing a means to receive information from the mobile service provider as well as information
30 relating to services and their geographical location. Thus this invention involves a novel combination of these devices, systems and various steps that will allow an end

user to select a mobile service provider based on the geographical location of the mobile service provided relative to that end user.

The invention also provides a means and method to exchange messages so as to transact the provision of a service to an end user by a mobile service provider according to a message sent by the end user.

BRIEF DESCRIPTION OF THE INVENTION

In a broad aspect of the invention a method of providing to an end user of a service a way to communicate a message to a mobile service provider, wherein said mobile service provider is capable of accepting a request for a service on the basis of a change of their geographical location, said method comprises the steps of;

a) a said end user of a service accessing a means that communicates to said end user the geographical location and type of at least one mobile service provider; and

b) said end user selecting on said means a mobile service provider based on the geographical location of the said selected mobile service provider relative to the current or anticipated geographical location of said end user;

wherein the act of selecting a mobile service provider initiates said means to exchange a message between said end user and said selected mobile service provider to transact the provision of a service according to said message.

In a further aspect of the invention, a further step comprises

c) at least one mobile service provider indicating to said means the service status of said at least one mobile service provider and having said means communicate said status to a said end user.

In a yet further aspect of the invention, a further step comprises

d) said means communicating the geographical location and type of at least one mobile service provider by providing a visual display accessible by an end user over a communications network.

Specific embodiments of the invention will now be described in some further detail with reference to and as illustrated in the accompanying figures. These embodiments are illustrative, and are not meant to be restrictive of the scope of the invention. Suggestions and descriptions of other embodiments may be included but they may not be illustrated in the accompanying figures or alternatively features of the invention may be shown in the figures but not described in the specification.

BRIEF DESCRIPTION OF THE FIGURES

Fig. 1 depicts an example of systems used to determine geographical location of a mobile service provider by locating the geographical location of their mobile telephone and other systems that associate that geographical location information with the type of service available from the mobile service provider as well as a means to display that information to an end user via the Internet;

Fig. 2 depicts a display of information compiled by a WEB server based on a specified request of the end user; and

Fig. 3 depicts a further display of information compiled by a WEB server based on a modified request of the end user.

DESCRIPTION OF THE EMBODIMENT OF THE INVENTION

Fig.1 depicts one embodiment of the invention wherein cellular telephones (10, 20) cellular base stations 22, 24 and 26 and respective mobile coverage areas 23, 25 and 27, the cellular network controller 30, computer interface 40 to the cellular telephone network, an Internet WEB server 50 and an end user access means, in this environment, an end user equipment 60, all combine to display to the end user the geographical location of at least one cellular telephone (10, 20) and hence the geographical location of a mobile service provider, in this example, two chauffer service providers, and for the end user to be able to select either of those services providers based on their geographical location relative to that end user.

The term WEB is used to identify that a device has connected to or can connect to the Internet which is a worldwide network of interconnected computers that primarily use TCP/IP to exchange digital data. However, these terms are relatively new and their meaning could evolve as technology which delivers the features described herein changes.

In this embodiment a mobile service provider (chauffer driver) has a cellular telephone 10 which during normal usage communicates with a cellular telephone network to provide voice and data exchange with other telephone users and databases.

The cellular telephone network is also capable of determining the geographical location of a cellular telephone 10 that is referred to as a Network Centric Technique. In a preferred system, it is possible to use a measure of the signal quality of a cellular mobile telephone transmission received by at least three base stations (22,24 and 26). Those signal quality values are used to calculate the geographical location of the cellular telephone.

Signal quality measures may include the signal strength of a control channel received by at least three base stations or the bit error rate of the control/voice channel received by those at least three base stations and by using standardised path loss assumptions, it is possible to triangulate a likely geographical location of the mobile. Since the exact geographical location of each of the base stations is known it is possible to graphically represent this geographical location technique by drawing a circle about each base station representative of the calculated distance the mobile is from the base station and where the three circles intersect the mobile is likely to be in close proximity. The accuracy of the determination of the geographical location of the mobile using this technique is dependant to a large degree on the accuracy of the standardised path loss assumptions which will be most affected by the judgement of the type and density of attenuation elements there are between the mobile telephone and the base stations. At least the worst case would isolate the mobile telephone to

the area of a single network telephony cell but by processing information from adjacent cells it is possible to locate a mobile within 200 metres and sometimes more accurately.

5 The above technique for mobile phone geographical location determination is but one of many currently available, being developed or that will become available in the future. Existing techniques include Angle of Arrival (AOA); Time of Arrival (TOA); Time Difference of Arrival (TDOA) and combinations of them (eg AOA+TOA); as well as Assisted techniques which use a Global Positioning System
10 (GPS) receiver in the mobile phone to improve the accuracy of the geographical location determination within reasonable time constraints.

 As the additional data exchange and processing required of the cellular network is not inconsequential this geographical location-determining feature of the
15 network is not commonly used. However, if a cellular user is also a mobile service provider they may indicate their willingness to have the geographical location of their mobile determined.

 Thus, the geographical location of that cellular telephone 10 is known to the cellular networks at all times. An option on the mobile service providers telephone
20 can be chosen to control when this feature is available. Information as to the mobile service providers current geographical location can then be made available to others and in particular to end users desirous of knowing the geographical location of certain mobile service providers.

25 The mobile service provider may also use options operable via their cellular telephone to indicate their non-availability or other status types. For example, the mobile service provider may be currently unavailable for hire and does not want to be disturbed, alternatively the mobile service provider may be providing a service to
30 a customer but is still available for future booking; or furthermore the service provided may be free for hire, and yet further the mobile service provider may be

able to offer a cheaper rate for their services for a predetermined time so even though they may be further away from an end user, than another mobile service provider, that end user will be presented extra incentive to choose the mobile service provider offering a cheaper fare structure. Other options may also be available.

5

Currently available mobile phones can be customised using a "Subscriber Identification Module (SIM) Card Tool Kit Feature" that allows various options to be pre-programmed into the mobile. Programs can be provided to facilitate one or more of the desirable features described herein in relation to the needs of the mobile service provider.

10

For example, special function can be assigned to the mobile keypad buttons, such as cursor control buttons, #2 for UP, #4 for LEFT, #6 for RIGHT and #8 for DOWN. Another button could be assigned the ACCEPT function, another for the REJECT function and other for an ENGAGED function. Yet others can be used for indicating the operator's status such as FREE, etc.

15

Thus Wireless Application Protocol (WAP) enabled mobile telephones are not necessary for the provision of a simplified version of the invention.

20

More sophisticated SIM cards may be adapted to display mapping features so as to allow the mobile to be used by an end user as well as a mobile service provider to make proximity determined selections.

25

The cellular network may provide cellular telephone and data services using GSM or CDMA communication technologies, both of which, provide mobile cellular phone locating capabilities which until now have only been used by the company controlling the network.

30

In this embodiment however, geographical location information about appropriately authorised cellular telephones plus any other data such as availability,

Geographical location data for each mobile phone needs to be translated into a form suitable for determining its relative geographical location on a display device. The display device will preferably show a predetermined area at any one time in which the end user is located. Preferably, the end user's geographical location is known to the device controlling the display. The end user will preferably provide its geographical location to their own end user equipment 60, which will be used, by that equipment to control the displayed area or is communicated to the computer interface 40 which uses that information.

The actual area displayed on the display, may be arranged to increase or decrease a predetermined amount at the will of the user, but so as to make the display process more accurate and quicker to respond, the computer interface 40 will have previously prepared the relevant values for predetermined display areas, as a way of reducing the processing load caused by these requested variations in the display area.

Alternatively and certainly more preferably, the end user located in the centre of the displayed area and the exact diameter of the area displayed to the user can be varied at the will of the end user. Thus either the computer interface 40 or the WEB server 50 may be required to recalculate the geographical location of one or more mobile service providers in the desired area displayed to the end user. Alternatively, an application running under the user's WEB browser may be capable of performing some or all of the recalculating required.

If a user's personal computer is used to do the recalculating, the WEB server 50 is merely an agent of the end user who has in this embodiment connected their end user equipment 60, such as a personal computer, to the Internet so as to access the WEB server 50.

The mechanism for access by the end user to the WEB server is typically via a

dial up modem connection to an Internet Service Provider (ISP) and in Fig. 1 this is depicted by a Public Switch Telephone Network (PSTN) link to one of the plurality of modems 62 at the ISP location 64. The Internet 66 includes a link from the ISP to an Internet backbone 68, which is in communication with the WEB server 50.

5

In this embodiment, the end user utilises a PC 60 having a WEB browser thereon into which the Universal Resource Locator (URL) of the WEB server 50 is entered. Preferably, access to the WEB server 50 is free for end users and payment by mobile service providers is the price of displaying their service icon and their
10 geographical location to end users. The mobile service provider is therefore charged for this service and/or related bookings consequent to their selection by an end user and this supports the cost of providing the system.

Various forms of advertising can also be displayed to the end user and the cost
15 of that advertising may also support the running costs of the system.

There are however many modes of use of the invention, one of which includes offering a specialised service to large fleet owners or controllers. For example, a select group of end users, such as the personnel at the head office of a courier company, has
20 the need to know the geographical location of each member of its courier fleet. In this situation, as long as each courier driver in the fleet has a cellular telephone or at least a cellular transmit/receive device dedicated to geographical location determination tasks and/or emergency response alert task, the end user in this example, the courier company head office, can log onto a restricted access portion of the WEB server 50
25 and determine the geographical location of each of their fleet at any time. Clearly, this arrangement can be made to operate in the dispatch mode wherein messages directed to any of the fleet members can be communicated with via the transport company's access to the WEB server 50 and thence to the cellular telephone network. Furthermore, it is possible for the courier driver to communicate messages direct to
30 the dispatcher using SMS, possibly from pre-programmed keys, eg. a particular

button on the mobile will transmit an SMS acknowledging receipt of a message and confirmation that it is understood, a further button could indicate successful delivery of a package, etc.

5

The WEB based arrangement described above offers a form of diversity for the dispatching tasks of the courier company, if the courier company offices are unavailable for any reason, access to the relevant WEB server could be achieved using any suitable browser located on any PC which itself could be located
10 anywhere, thus the task of dispatching the courier fleet can be continued at an alternative site even in times of disaster.

WEB server 50 is preferably arranged to provide a WEB page suitable for the monitor being used by the end user. In the example described in detail herein, the
15 display is a PC monitor which supports a large range of colour and resolution and thus is able to display quite detailed small areas and even sufficiently detailed large areas compared to that which is available for example on a cellular telephone display.

20 The invention is however, not limited to use on a PC monitor. It is possible for an end user to require a particular service while they themselves are mobile. An end user may require a chauffeur service from a restaurant in which case, with the embodiment described herein, it will be possible for that mobile end user to access the geographical location of the nearest chauffeur services via the end user's cellular
25 telephone.

Cellular telephones already have the capability of accessing data provided from databases and in a limited fashion access WEB servers containing information. To compensate for the relatively small information displays available in cellular
30 telephones and the variable data exchange rate between the remote server and the cellular telephone, WEB browsers of reduced complexity have been developed to

reside on the cellular telephone (microBrowsers) that are designed to accept modified Hyper Text Markup Language (HTML) code from WEB browsers which use a Wireless Markup Language (WML) to describe the content to be displayed on the mobile screen.

5

The WML is designed to carefully and legibly use the smaller area and resolution of cellular telephone displays for the display of information. For example the options available from the microBrowser menu has been reduced, the fonts displayed are adapted to the resolution available, the size and shape of icons and other displayed data is sized to suit the display and moving elements of the display eliminated or provided at a much reduced resolution or rate compared to that available via other WEB access mediums.

As cellular data rates increase and displays increase in resolution and size, more detail and movement can be made available.

Cellular telephones having a Wireless Application Protocol (WAP) capability will be better able to deliver WEB browsing capabilities to the user of those cellular telephones since they adequately address the small display area and data rate exchange issues at the moment and will only improve in the future.

The end user may also use other types of WEB access devices such as Personal Digital Assistants (PDAs) which have a larger display than current cellular telephones and are purpose designed to allow for data input and display and in particular for limited WEB browsing. These devices will also be enhanced by the use of WAP devices and WML if they use wireless technologies to access the Internet.

Fig. 2 is an example of a display presented to a user by the WEB server 50. This display is provided in response to a request from the end user for information as to the locality of chauffer services in a designated area. In this example, the end user

is displayed centrally thereof and the chauffer services which shown if they are within a radius of 3kms of the geographical location of the end user.

The display may depict streets and landmarks at any level of detail capable of being displayed on the monitor device used by the end user, or that may be specifically requested by the end user. A further feature could be for the WEB server to calculate the estimated times of arrival for each of the mobile service providers displayed, so that as well as distance from the end user, there will be a time associated with the provision of a service to that end user.

The next step in the process, is for the end user to make a selection, in this case, which of the two mobile service providers are to be sent a message requesting their services. The end user, in this embodiment, moves a cursor over the chosen mobile service provider and right clicks to bring up a range of options for selection by the end user and by releasing the cursor over the chosen option makes their selection.

The end user may also be able to pay for or lodge a deposit for the service by enabling electronic funds transfer eg credit card, smart card, electronic wallet payment, etc. The simplest option is for the end users name, address and telephone contact to be sent to the mobile service provider as a Small Message Service (SMS) message or e-mail for WEB enabled cellular telephones.

Selected end users could have their end user equipment arranged to automatically select the nearest mobile service provider of a selected or preselected type. For example, a restaurant that often needs the services of a taxi can automate the selection process by only having to enter the number of passengers to be picked up and the preferred type of transport and the user equipment will determine the closest mobile service provider to meet the criteria and order the service with out further operator involvement. All other details such as who and where are constant and the process is simple enough for a hard working waiter to initiate and report

when the request has been acknowledged. Of some usefulness is the ability of the mobile service provider to send a SMS message to the originating user to inform them that they have arrived at the pick-up location.

5 The SMS message to the mobile service provider will be arranged by the WEB server 50 and computer interface 40 and delivered via the cellular telephone network to the chosen mobile service provider. In that regard the IMEI number is used to ensure that the appropriate mobile service provider receives the SMS message and the previously described SMS toolkit can be used to facilitate easier SMS messaging.

10 The sophistication of the mobile service provider's cellular telephone will determine the ease with which such messages are received, read and responded to. Additional devices including keyboards, data terminals and monitors could be connected to aid the receipt and response to such messages.

15 Acknowledgment (as acceptance or rejection) and receipt of the message can be partly automated and/or partly manual, with the acknowledgment message being constructed by the mobile service provider, as they make their way to the end user's advised geographical location. They can use as described previously, an embedded
20 SMS message using an enhanced SIM card in their cellular telephone.

 If additional information is required by the mobile service provider, the return telephone number sent to it via the above steps can be used by the mobile service provider to voice contact the end user if need be.

25 In Fig. 2, there are shown two chauffer services wherein chauffer service 1 is located 3kms away and chauffer service 2 is located 2.1kms away. In this example, the closest chauffer service (number 2) is chosen. However, if chauffer number 1 were offering reduced standard fares it may be possible for the end user to be made aware
30 of that offer and then be required to make a decision based on the trade off between the convenience of a shorter waiting time against a cheaper fare.

In Fig. 3 the end user has requested information as to the geographical location of plumbers and gas fitters within a 3km range. The display shows that there are 3 mobile service providers in the distance range chosen by the end user. Only one of those mobile service providers is both a plumber and gas fitter. Selection of which mobile service provider is to be used by the end user can be enhanced if the end user is able to obtain additional information about the services provided by each of the displayed mobile service providers. For example, if call out costs and hourly rates were known for each mobile service provider, that information could also be displayed to the end user. It will be possible for individual mobile service providers to choose to register their rates with the WEB server either providing these figures manually to an operator who enters them onto the WEB information available to the users or by way of authorised access to restricted areas of the WEB server database which will allow the mobile service provider to update their own information on an ad hoc basis.

The end user thus may be able to increase their knowledge about the respective mobile service providers by moving the cursor over each of the mobile service provider logos and having presented to them relevant information. Logos may have various visual or audible characteristics that indicate status, discounts, features of the service, etc. relevant to the particular mobile service provider. The end user may also single or double click on an icon representing a mobile service provider to obtain further information from a database held on the WEB server. In a yet further arrangement it may be possible to direct the end user to the home page URL of the mobile service provider.

It will be appreciated by those, that the invention is not restricted in its use to the particular application described and neither is the present invention restricted to its preferred embodiment with regards to the particular elements and/or features

described or depicted herein. It will be appreciated that various modifications can be made without departing from the principles of the invention, therefore, the invention should be understood to include all such modifications within its scope.

CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A method of providing to an end user of a service a way to communicate a message to a mobile service provider, wherein said mobile service provider is capable of accepting a request for a service on the basis of a change of their geographical location, said method comprises the steps of;

a) a said end user of a service accessing a means that communicates to said end user the geographical location and type of at least one mobile service provider; and

b) said end user selecting on said means a mobile service provider based on the geographical location of the said selected mobile service provider relative to the current or anticipated geographical location of said end user;

wherein the act of selecting a mobile service provider initiates said means to exchange a message between said end user and said selected mobile service provider to transact the provision of a service according to said message.

2. A method according to claim 1 comprising the further step of;

c) at least one mobile service provider indicating to said means the service status of said at least one mobile service provider and having said means communicate said status to a said end user.

3. A method according to claim 1 comprising the further step;

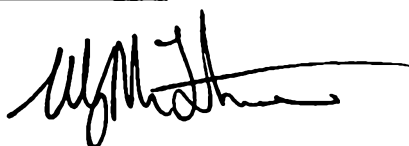
d) of said means communicating the geographical location and type of at least one mobile service provider by providing a visual display accessible by an end user over a communications network.

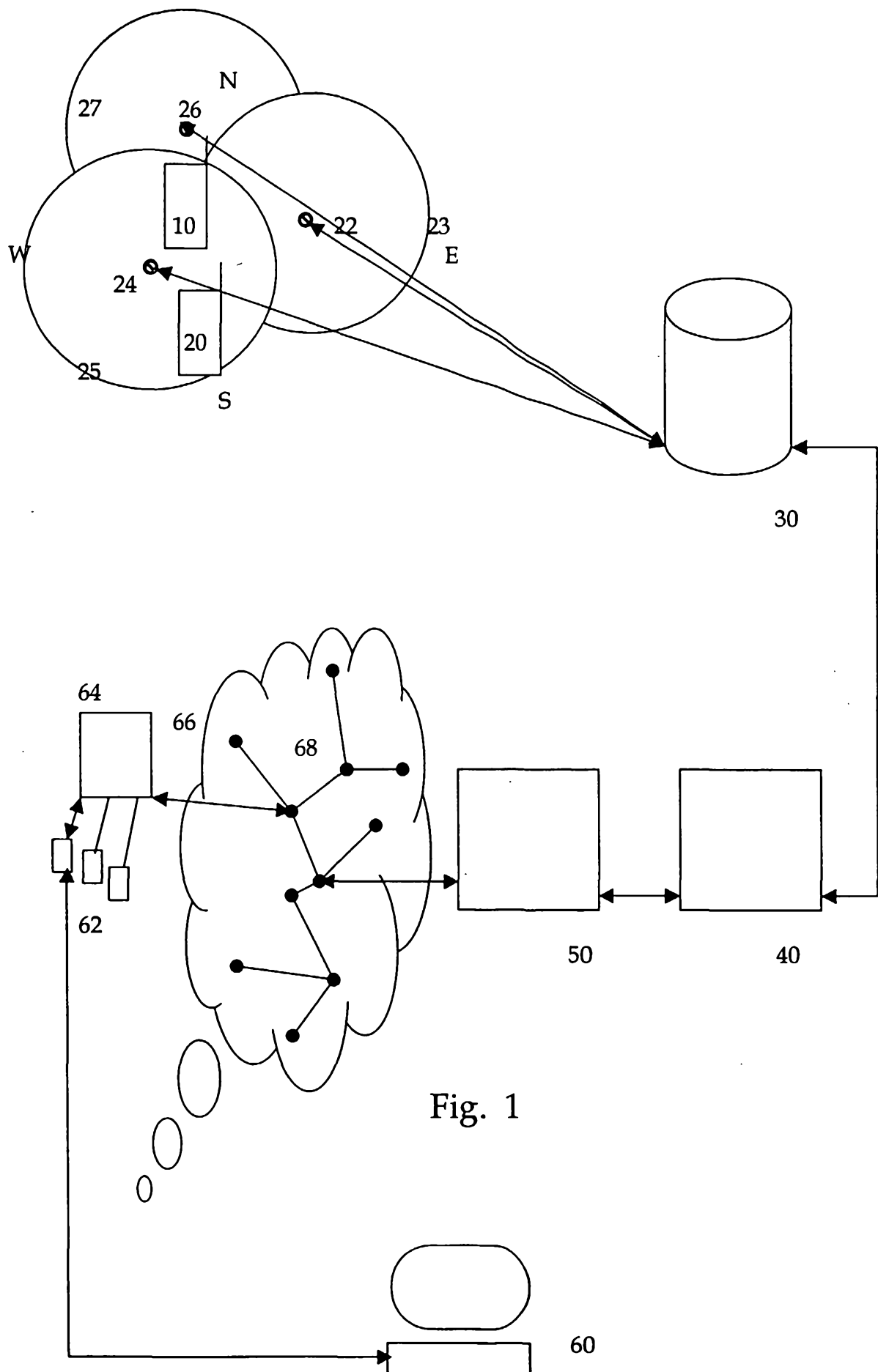
Dated this 30th day of May, 2000

ABM INDUSTRIES PTY LTD

By its Patent Attorneys

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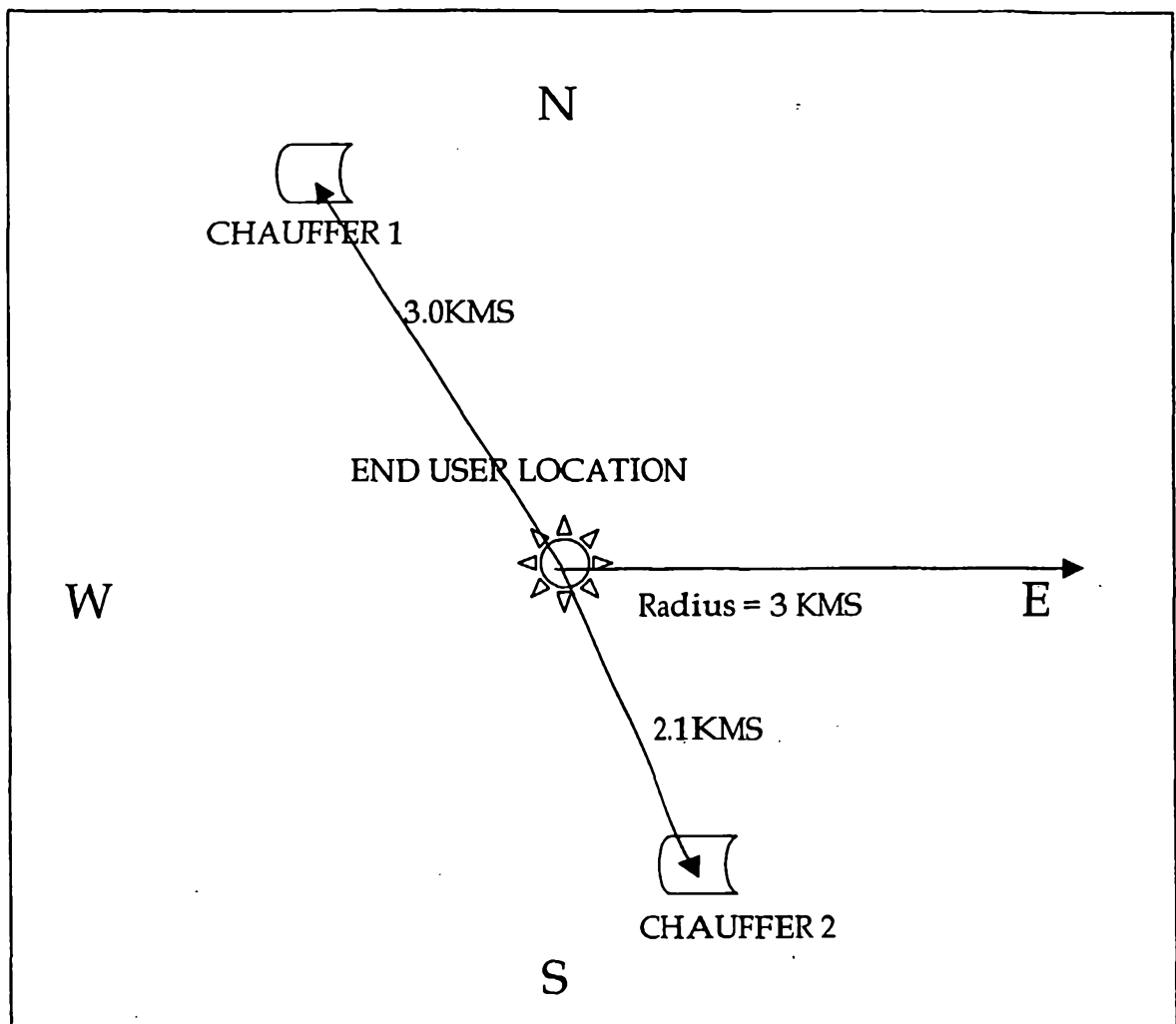


Fig. 2

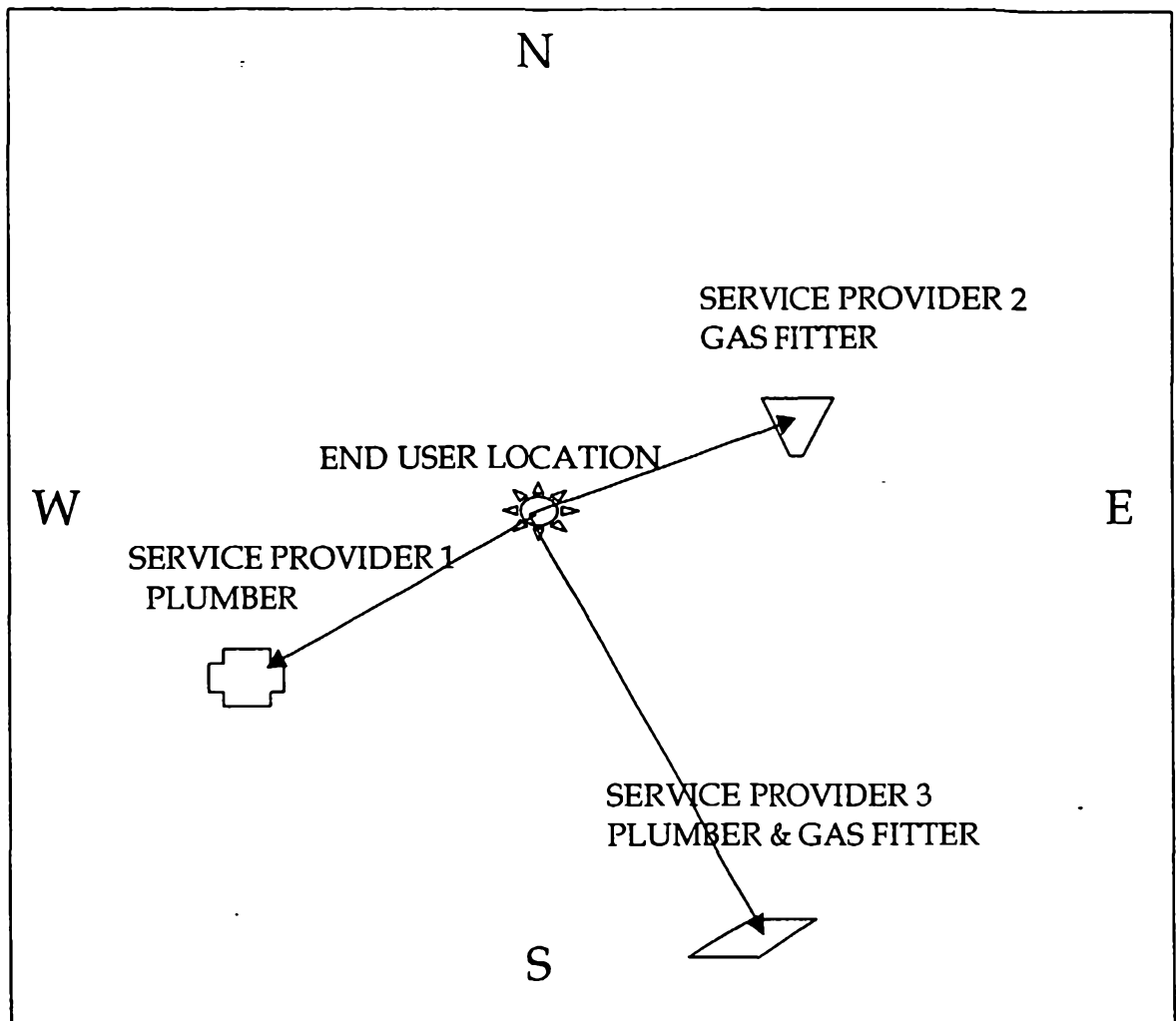


Fig. 3