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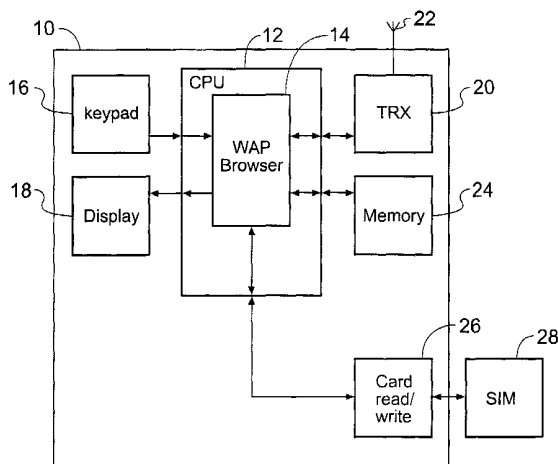
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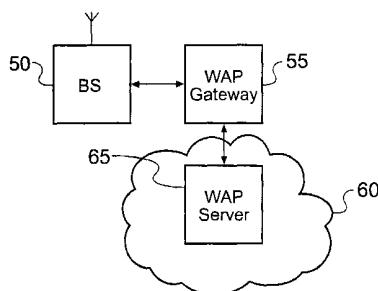
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(54) Title: MOBILE COMMUNICATION DEVICE



(57) Abstract: A mobile communication device such as a WAP-enabled mobile phone has browser software, and has a memory in which it can store bookmarks for use by the browser software. The device also has a smart card reader. Bookmarks are stored in the phone in association with an identifier stored on a SIM card connected to the reader at the time of storage. The browser is then only able to use a bookmark if the stored identifier matches the identifier stored on a SIM card connected to the reader at the time of intended use. This provides security for the subscriber's confidential information because the bookmark, which may relate to a subscriber's personal information, cannot be used if the subscriber has removed his SIM card from the phone.



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MOBILE COMMUNICATIONS DEVICETECHNICAL FIELD OF THE INVENTION

This invention relates to a mobile communication device, and in particular to a mobile communication device which can be used to access information stored on a computer network. More specifically, the invention relates to the use of bookmarks, which can be used by the user to access a specific site on the computer network.

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10BACKGROUND OF THE INVENTION

WO00/69191 describes a mobile communications device, specifically a mobile phone, for use in a cellular radiocommunications network, for example operating in the GSM (Global System for Mobile communications) system. The phone has a smart card reader, so that it can be used with a SIM (Subscriber Identity Module) card, which stores information about the subscriber. Typically, the SIM card contains details of the user's network subscription, and stored phone numbers which make up the user's personal phone book.

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As described in WO00/69191, the SIM card contains a browser, which allows the mobile phone to establish contact with a selected server from a network of servers. The selected server then connects the mobile phone to a selected one of a group of available database service providers.

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The SIM card stores addresses of different servers, allowing the user to access them easily. Also, the SIM card stores at least one secret code, which identifies the user. When the browser accesses a server, and the server requests an identification code for security reasons, the required secret code can then be returned by the browser.

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However, this system requires a large amount of functionality to be provided on the SIM card.

Somewhat similar functionality can be provided on a phone which is able to operate under the Wireless Application Protocol (WAP). Such a device is referred to as a WAP-enabled device. A WAP-enabled device has a reader for a SIM card, which is used to store information about the subscriber in the conventional way. The WAP-enabled device includes WAP browser software, which for example is able to receive user inputs, and convert them into the form required to transmit signals across the wireless communications network, in order to access a computer network. The computer network includes WAP servers, on which information and services are available.

When a user accesses a specific site, or server, to which he thinks he may wish to return, he user is able to store a bookmark to that site. This allows fast access to the site on a future occasion, without having to enter the full address of the site. The bookmark is stored in the memory of the phone itself.

In addition, an identification code and a password can be stored in association with the bookmark. Then, if the browser accesses a specific site, and the server requests an identification code for security reasons, the stored code can be returned by the browser.

JP-A-11-306139 discloses a fixed internet terminal, which is able to store a bookmark in association with an ID and/or a password, and transmits them to an accessed server in response to a request from the server.

However, this arrangement presents the disadvantage that, if the user lends his phone to a second user, then, even if the first user has removed his SIM card and the second user has inserted his own

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SIM card, the second user is able to use the first user's stored bookmarks, including automatically using the first user's stored secret identification code.

5 SUMMARY OF THE INVENTION

In accordance with a first aspect of the invention, there is provided a mobile communications device, having browser software, having a memory in which it can store bookmarks for use by the browser software, and having a smart card reader, wherein
10 bookmarks are stored in association with an identifier stored on a smart card connected to the reader at the time of storage, and wherein the browser is only able to use a bookmark if the identifier stored in
15 association therewith matches the identifier stored on a smart card connected to the reader at the time of intended use.

This provides a measure of security for the subscriber's confidential information.

20 In accordance with a second aspect of the present invention, there is provided a method of operation of a mobile communications device, wherein a bookmark is stored in association with an identifier which is stored on a smart card connected to the device at the
25 time of storage.

In accordance with a third aspect of the present invention, there is provided a method of operation of a mobile communications device, wherein a bookmark is used only if an identifier, stored on the mobile
30 communications device in association therewith, matches the identifier stored on a smart card connected to the reader at the time.

It should be emphasised that the term "comprises/comprising" when used in this specification
35 is taken to specify the presence of stated features,

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integers, steps or components but does not preclude the presence or addition of one or more other features, integers, steps, components or groups thereof.

5 BRIEF DESCRIPTION OF DRAWINGS

Figure 1 is a block schematic diagram of a mobile communications device in accordance with the present invention, in communication with a radiocommunications network.

10 Figure 2 is a flow chart illustrating a method in accordance with the invention.

Figure 3 is a second flow chart illustrating a second method in accordance with the invention.

15 DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Figure 1 shows a mobile phone 10. Although a mobile phone is illustrated, the invention is generally applicable to portable radio communication equipment or mobile radio terminals, such as mobile telephones, pagers, communicators, electronic organisers, smartphones, personal digital assistants (PDAs), or the like.

The phone 10 is under the general control of a central processing unit (CPU) 12, which runs WAP browser software 14, thereby making the phone 10 a WAP-enabled device.

The phone 10 has various functions and features which are conventional, and will not be described further herein. The description below relates only to the features which are required for implementation of the present invention.

The CPU 12 is connected to a keypad 16, for receiving user inputs, and a display 18, for displaying information to the user. It will be appreciated that other forms of man-machine interface can also be used.

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The CPU 12 is in communication with transceiver circuitry 20, which converts signals to and from the formats required for transmission over a wireless interface via an antenna 22, using GSM/GPRS (Global System for Mobile Communication/General Packet Radio System) and WAP (Wireless Application Protocol). It will be appreciated that other communication systems and protocols can also be used.

The CPU further communicates with an internal memory device 24, which can be used to store data, for example as described in more detail below.

Finally, for the purposes of this description, the phone 10 includes a smart card read/write module 26, allowing insertion of a Subscriber Identity Module (SIM) card 28. The SIM card stores details of the subscriber and of his subscription, and the phone is activated only when a valid SIM card is inserted in the card read/write module 26. However, different SIM cards can be used. For example, the phone may be used by a first user who has a first SIM card, and by a second user who has a second SIM card.

Figure 1 also shows, schematically, the relevant parts of the networks to which the mobile phone may be connected over the wireless interface. Thus, the network includes a base station 50, which is connected to a WAP gateway 55. The WAP gateway 55 is connected to a network 60 of WAP servers, of which only a single WAP server 65 is shown in Figure 1.

As is conventional, the browser module 14 in the phone 10 can be used to access information stored on the WAP server 65. For example, a WAP address entered by the user by means of the keypad 16 can be converted by the browser module into an address which can be used to access the server 65. The request to access the server is then converted by the transceiver circuitry

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20 into the appropriate format for transmission to the base station 50, and then to the WAP gateway 55, where the address is used to access the WAP server 65.

Once the full WAP address has been entered manually once, it is convenient for the user to be able to store a bookmark. That is, the full WAP address is stored in the memory 24. A request to access the relevant server can then be made by entering an abbreviated form of the address, or by recalling a full list of stored bookmarks to the display 18, and then indicating a desired address in another way, for example by scrolling down the list.

As an example, the WAP server 65 may be maintained by a bank, credit card company, or other financial institution, with which the user has dealings. In order to be able to access the personal information, stored on the WAP server 65, the user must enter an identification code. For example, the identification code may include an identification number, such as an account number, and a password, known only to the user.

Thus, after the browser module 14 has accessed the desired WAP server 65, the server 65 returns a request for the relevant identification code. Only when the browser returns the identification code is the user able to gain access to the confidential information on the WAP server 65.

Once the identification code has been entered manually once, it is convenient for the user not to have to enter it on every occasion that he wishes to access the server. In order to achieve this, the identification code is stored in the memory 24, in association with the relevant bookmark.

Figure 2 illustrates a process in which the identification code is stored in the memory 24.

Thus, in step 100, a specific WAP server 65 is

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accessed and, in step 102, the browser module 14 of the phone 10 receives a request for an identification code. The phone 10 displays an indication to the user and, on receipt of the identification code entered by the user
5 (step 104), it is transmitted to the WAP server in step 106.

In order to avoid the need for the user to enter the identification code again manually, in response to future requests from the server 65, it is stored. In
10 accordance with the illustrated embodiment of the present invention, the relevant identification code for a particular bookmark is stored in the memory 24, in association with additional information, identifying the SIM card 28 which is present in the card read/write
15 module 26 at the time of storage.

In the preferred embodiment of the invention, for use in a GSM-based system, the MS-ISDN (Mobile Station ISDN number) is used as the identifier for the SIM card.

20 Thus, in step 108, the MS-ISDN is read from the SIM card 28, and, in step 110, the entered identification code, together with the MS-ISDN is stored by the browser module 14 in the memory 24, in association with the relevant bookmark.

25 In an alternative embodiment of the invention, the IMSI (International Mobile Subscriber Identity) could be used as the identifier for the SIM card. Although the IMSI uniquely identifies one specific SIM card, whereas it is possible to issue a replacement SIM card
30 which has the same MS-ISDN as a previous SIM card, the MS-ISDN identifies the SIM card sufficiently well for the purposes of this invention.

In a further alternative, the user's secret PIN number could be used as the identifier for the SIM
35 card.

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Figure 3 is a flow chart illustrating a process in which the bookmark, stored in the memory 24, is used when accessing a WAP server 65.

The user knows that a bookmark has been stored, so he is able to use the keypad 16 to call up a list of stored bookmarks, on the display 18 (step 140). The browser module 14 then receives the user's input in step 142, indicating which of the bookmarks he wishes to use to access his chosen WAP server.

In response to the user's input, in step 144 the browser retrieves the indicated bookmark from the memory 24, together with the associated identification code, and the MS-ISDN, which of course identified the SIM card which was in the card read/write module 26 at the time that the bookmark was stored.

In step 146, the MS-ISDN, identifying the SIM card 28 which is presently in the card read/write module 26, is read.

In step 148, the MS-ISDN read in step 148 is compared with the stored MS-ISDN retrieved in step 146. If the two identifiers match, the process passes to step 150 and continues. That is, the browser establishes the required connection with the required WAP server 65 and, in response to a request therefrom, transmits the necessary identification code.

If the two identifiers do not match in step 148, the process passes to step 152, in which a message is displayed on the display 18, indicating that the required bookmark cannot be used, although the option of deleting the bookmark from the list may still be available.

Thus, for example, in a situation where the user who stored a bookmark has lent his phone to another person, having removed his SIM card, the other person will be able to insert his own SIM card and use the

phone, but will not be able to use any of the first user's stored bookmarks. This therefore provides security for the subscriber's personal and confidential information.

5 In another example, a user may send a bookmark to another user, for example recommending that the other user use the service provided at the bookmarked site. If the first user inadvertently sends his own identification code with the bookmark, the use of the present invention, as described with reference to
10 Figure 3 above, will mean that the bookmark will not be usable, because the bookmark will only be usable in conjunction with the same SIM card as when it was stored.

15 In a further example, the phone may include a smart card reader which allows the insertion of two SIM cards. Using such an arrangement, two users may be able to share the use of a phone, each user activating his or her own SIM card when he or she wants to use the
20 phone. In this case, the bookmark can be stored in the phone in conjunction with an identifier which is specific to the SIM card which is active at the time that the bookmark is stored. The bookmark can then only be used when the same SIM card is active.

25 Again, this allows the users greater privacy when using stored bookmarks.

CLAIMS

1. A mobile communications device, having browser software, and further comprising:

a memory in which it can store bookmarks for use
5 by the browser software, and

a smart card reader,

wherein, when a bookmark is to be stored, the device is adapted to read an identifier stored on a smart card connected to the reader at that time of
10 storage, and to store the bookmark in association with the identifier which is read, and

wherein, when a bookmark is to be used, the device is adapted to read an identifier stored on a smart card connected to the reader at that time of intended use,
15 and the browser is only able to use the bookmark if the identifier stored in association therewith matches the identifier which is read at that time of intended use.

2. A mobile communications device as claimed in claim 1, wherein the identifier is the MS-ISDN.

20 3. A mobile communications device as claimed in claim 1, wherein the device is a WAP-enabled mobile phone.

4. A mobile communications device as claimed in claim 3, wherein the bookmark is an address of a WAP-
25 server.

5. A mobile communications device as claimed in any preceding claim, wherein the device is adapted to store an identification code, entered by a user, in association with a bookmark.

30 6. A mobile communications device as claimed in any preceding claim, wherein the smart card reader is a SIM card reader.

7. A method of operation of a mobile communications device, wherein a bookmark is stored in
35 association with an identifier which is stored on a

smart card connected to the device at the time of storage.

8. A method as claimed in claim 7, wherein the bookmark is a WAP-server address.

5 9. A method as claimed in claim 7, wherein the identifier is a MS-ISDN.

10. A method as claimed in one of claims 7-9, wherein the smart card is a SIM card.

10 11. A method of operation of a mobile communications device, comprising:

when a bookmark is desired to be stored, reading an identifier which is stored on a smart card connected to the device, and

15 storing the bookmark in association with said identifier.

12. A method as claimed in claim 11, wherein the smart card is a SIM card.

13. A method of control of a mobile communications device, comprising permitting use of a bookmark only if an identifier, stored on the mobile communications device in association with said bookmark, matches the identifier stored on a smart card connected to the reader at the time.

14. A method as claimed in claim 13, wherein the bookmark is a WAP-server address.

15 15. A method as claimed in claim 13, wherein the identifier is a MS-ISDN.

16. A method as claimed in one of claims 13-15, wherein the smart card is a SIM card.

30 17. A method of operation of a mobile communications device, comprising, when a stored bookmark is desired to be used:

retrieving the stored bookmark and an associated first identifier;

35 reading a second identifier which is stored on a

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smart card connected to the device;
comparing the first and second identifiers; and
permitting use of the stored bookmark only if the
first and second identifiers match.

5 18. A method as claimed in claim 17, wherein the
smart card is a SIM card.

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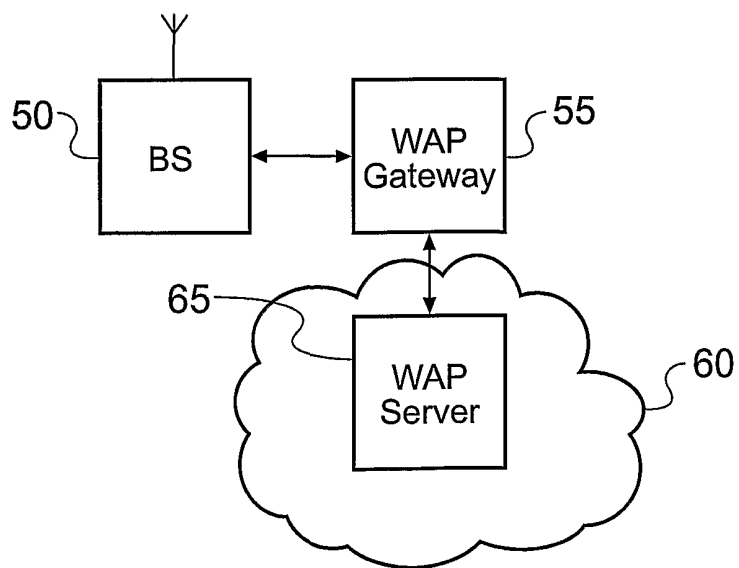
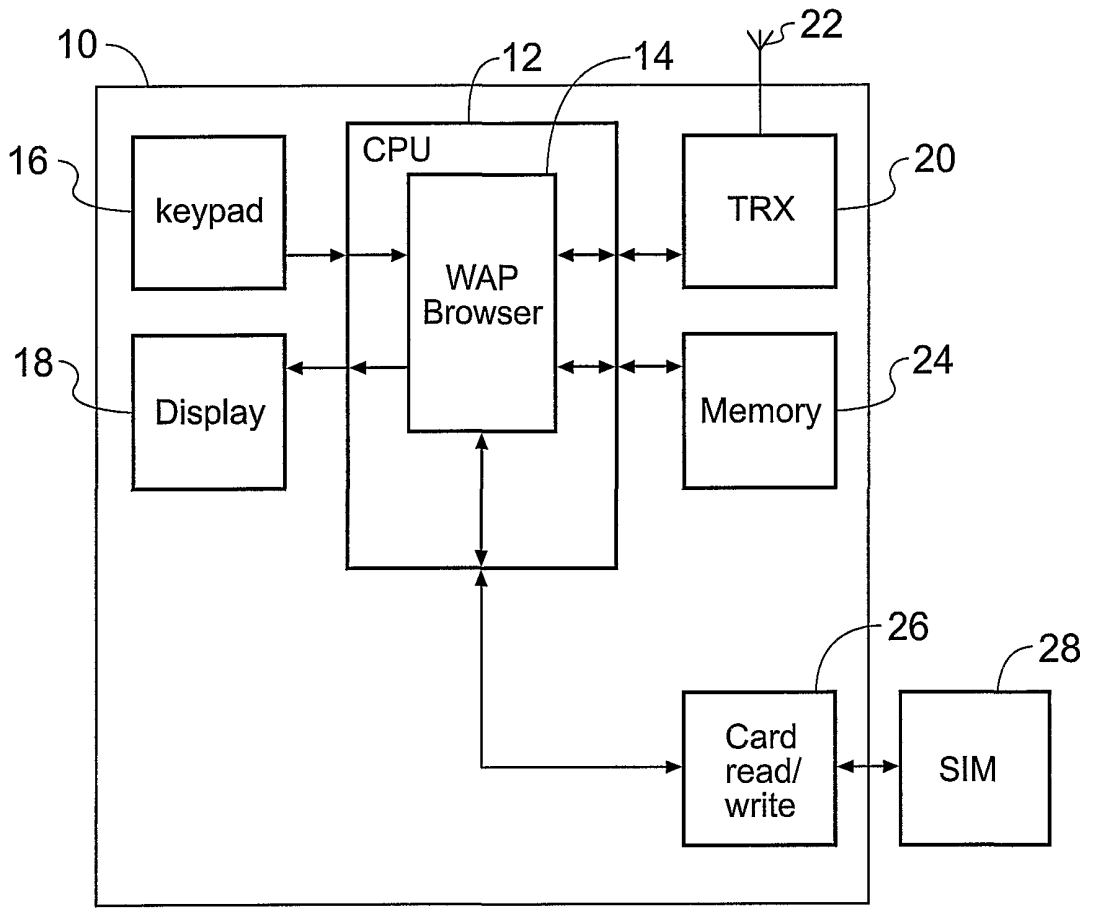


Fig. 1

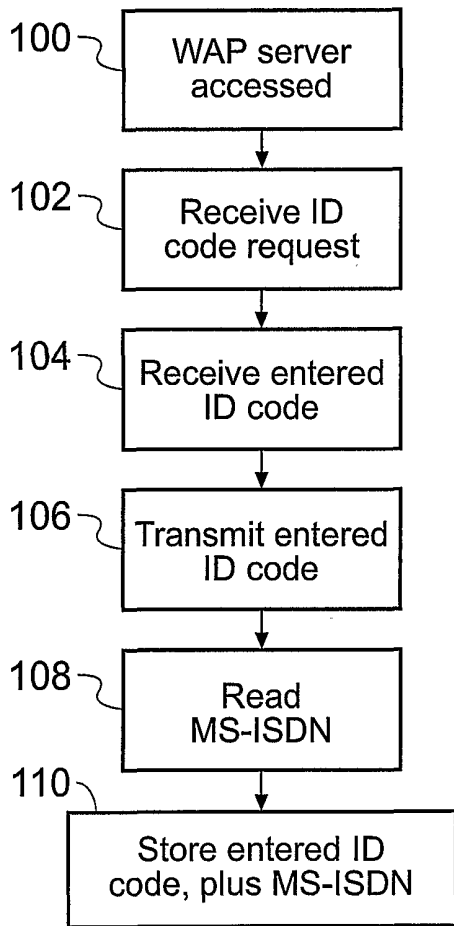


Fig. 2

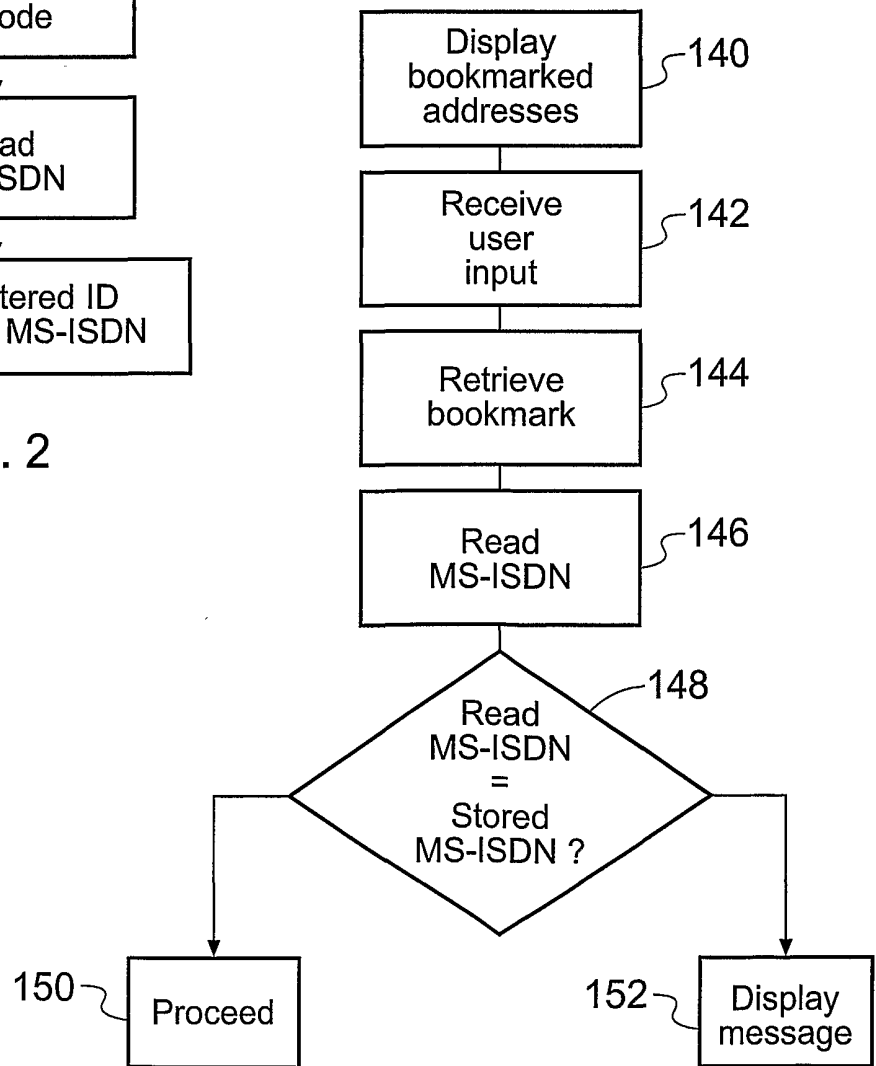


Fig. 3