METHOD AND SYSTEM FOR CHANGING SUBSCRIBER PROFILE BASED ON IDENTITY OF BASE STATION SERVING THE TERMINAL EQUIPMENT

The present invention relates to a method as defined in the preamble of claim 1 for changing a subscriber profile based on the identity of the base station serving the terminal equipment. Moreover, the invention relates to a system as defined in the preamble of claim 4 for changing a subscriber profile based on the identity of the base station serving the terminal equipment.

In the near future it is to be expected that there will be a growing demand for various applications and services that need the identity of the base station serving the terminal equipment in mobile communication networks. Based on subscriber movements, the subscriber profile can be modified, e.g. by limiting/extending services or changing applications, depending on the cell in whose area the subscriber is currently located. An example of this is the home cell pricing policy, according to which the subscriber's calls are charged for at a reduced rate when the terminal equipment is within the area of so-called home cells.

In present mobile communication systems, however, changing the subscriber profile on the basis of base station identity is difficult. This is because base stations do not have a permanent identity (for a period of months - years). The CGI information (Cell Global Identity, CGI) transmitted in the BCCH channel (Broadcast Control Channel, BCCH) contains e.g. a cell identifier, but in network reconfigurations the identifiers occasionally have to be changed. Some of the changes apply to only one base station at a time, so applications and services could be designed to utilise the identifiers of a plurality of base stations, in which case changing the identifier of one of the base stations would not necessarily confuse the application.

Other changes, such as BSC switch-over, apply to a large number of base stations at a time, so in this case the above-mentioned technique of monitoring a plurality of base stations is not applicable. In short, designing and constructing a system for changing the subscriber profile on the basis of base station identity is at present either impossible or at least very expensive.

The object of the present invention is to disclose a new type of method and system to eliminate the drawbacks described above.

A specific object of the invention is to disclose a method for changing the subscriber profile on the basis of the identity of the base station serving the terminal equipment in a mobile communication network. A further object of the invention is to disclose a system for changing the subscriber profile on the basis of the identity of the base station serving the terminal equipment in a mobile communication network.

As for the features characteristic of the invention, reference is made to the claims.

In the method of the present invention for changing the subscriber profile on the basis of the identity of the base station serving the terminal equipment in a mobile communication network, information signals are sent by each base station and the information signals are received by the terminal equipment, which comprises a mobile station provided with a subscriber identity module. A permanent base station identity is included in the information signals sent by each base station, and the subscriber profile is changed on the basis of the permanent identity of the base station serving the terminal equipment.

As compared with prior art, the present invention provides the advantage that a more stable extra identity is created for each base station, and this identity is sent by the base station to the subscribers

in its area. Thus, each terminal device is at all times informed as to the base station in whose area it is currently located. The base station identity is not changed in conjunction with network reconfiguration as in prior-art solutions. Therefore, changing the subscriber profile on the basis of subscriber movements is accomplished flexibly and considerably more easily and at a lower cost than before.

In an embodiment of the method, information signals are transmitted in the cell broadcast channel (CBCH) or some other channel suited for the purpose.

In an embodiment of the method, the mobile communication network is based on digital technology, such as GSM technology, DCS1800 technology or equivalent.

The system of the invention for changing the subscriber profile on the basis of the identity of the base station serving the terminal equipment in a mobile communication network comprises a base station which sends information signals and terminal equipment comprising a mobile station provided with a subscriber identity module, said information signals being received by the mobile station. According to the invention, the system comprises means for including a permanent base station identity in the information signals sent by each base station. Moreover, according to the invention, the terminal equipment comprises means for changing the subscriber profile on the basis of the permanent identity of the base station serving the terminal equipment.

In an embodiment of the system, the information signals are transmitted in the cell broadcast channel (CBCH) or in some other channel suited for the purpose.

In an embodiment of the system, the mobile communication network is based on digital technology, such as GSM technology, DCS1800 technology or equivalent.

In the following, the invention will be described by the aid of a few examples of its embodiments by referring to the attached drawing, wherein

Fig. 1a presents a system according to the present invention;

Fig. 1b presents a system according to the present invention.

The mobile communication system presented in Fig. 1a, which in this example is a system based on GSM technology, comprises four base stations 1^1, 1^2, 1^3 and 1^4. The base stations are connected to a base station controller (BSC) 3, which again is connected to a cell broadcast (CB) server 4. Implemented in the cell broadcast server 4 is supervision software 41, which is used to create an extra identity of permanent nature for each one of the base stations 1^1, 1^2, 1^3 and 1^4. In practice, the identity may consist of e.g. a sequence number. The supervision software 41 and the base station controller 3 see to it that the identity assigned to each base station 1^1, 1^2, 1^3 and 1^4 is included in the information signal sent by the base station. Moreover, the supervision software 41 and the base station controller 3 take care of preserving the same identity for each base station after changes made in the network. The base stations 1^1, 1^2, 1^3 and 1^4 send the information signals e.g. in the cell broadcast channel (CBCH).

Furthermore, Fig. 1a shows a terminal 2, which forms an essential part of the system. The system may comprise an almost unlimited number of terminals. The terminal equipment comprises a mobile station provided with a subscriber identity module. Moreover, the terminal equipment 2 comprises means 5 for changing the subscriber profile on the basis of the identity of the base station currently serving the terminal. These means 5 may consist of e.g. software implemented in the subscriber identity module and/or a separate device

connected to the mobile station. They are used to receive the information signal and with it the permanent identity of the base station serving the terminal equipment. Subscriber profile changes are made on the basis of the permanent identity. A change in subscriber profile may consist of e.g. lower call charges if the subscriber remains within the area of predetermined home cells.

Fig. 1b presents a system corresponding to that in Fig. 1a after BSC switch-over. In BSC switch-over, which is a network reconfiguration procedure commonly used in mobile communication systems, base stations 6^1, 6^2, 6^3 and 6^4 originally controlled by a single base station controller are allotted to several base station controllers 8, 9. In prior-art implementations, this changes the base station identities, whereas the identity according to the invention remains the same, this being taken care of by the supervision software 101 implemented in the cell broadcast server 10 and the base station controllers 8 and 9. The terminal equipment 7 comprises means 11 for changing the subscriber profile on the basis of the identity of the mobile station currently serving the terminal equipment, as in the previous example.

The invention is not restricted to the examples of its embodiments described above, but many variations are possible within the scope of the inventive idea defined by the claims.

CLAIMS

1. Method for changing a subscriber profile on the basis of the identity of the base station serving the terminal equipment in a mobile communication network, in which method information signals are sent by the base station and the information signals are received by the terminal equipment, which comprises a mobile station provided with a subscriber identity module, characterised in that

- a permanent base station identity independent of configuration changes in the mobile communication network is included in the information signals sent by the base station;

- and the subscriber profile is changed on the basis of the permanent base station identity.

2. Method as defined in claim 1, characterised in that the information signals are transmitted in the cell broadcast channel (CBCH).

3. Method as defined in claim 1 or 2, characterised in that the mobile communication network is based on digital technology, such as the GSM technology.

4. System for changing a subscriber profile on the basis of the identity of the base station serving the terminal equipment in a mobile communication network, said system comprising a base station (1^1,...,1^n) which sends information signals and terminal equipment (2) which comprises a mobile station provided with a subscriber identity module and receives the information signals, characterised in that

- the system comprises means (3, 4, 41) for including in the information signals a permanent identity of the base station (1^1,...,1^n) which is independent of configuration changes in the mobile communication network; and

- the terminal equipment (2) comprises means (5) for changing the subscriber profile on the basis of the permanent identity of the base station (1^1,...1^n).

5. System as defined in claim 4, characterised in that the information signals are transmitted in the cell broadcast channel (CBCH).

6. System as defined in claim 4 or 5, characterised in that the mobile communication network is based on digital technology, such as GSM technology.

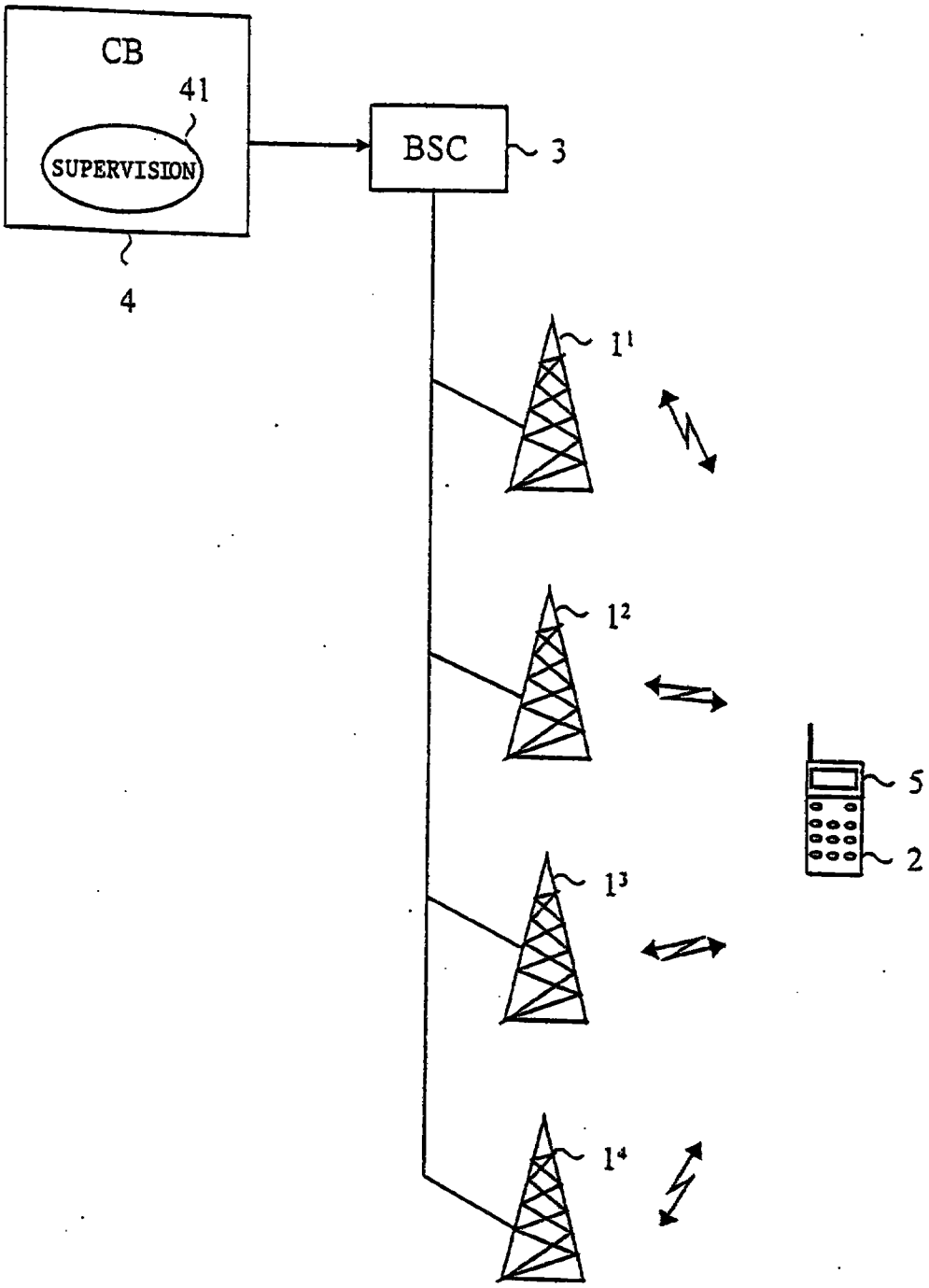


Fig. 1a

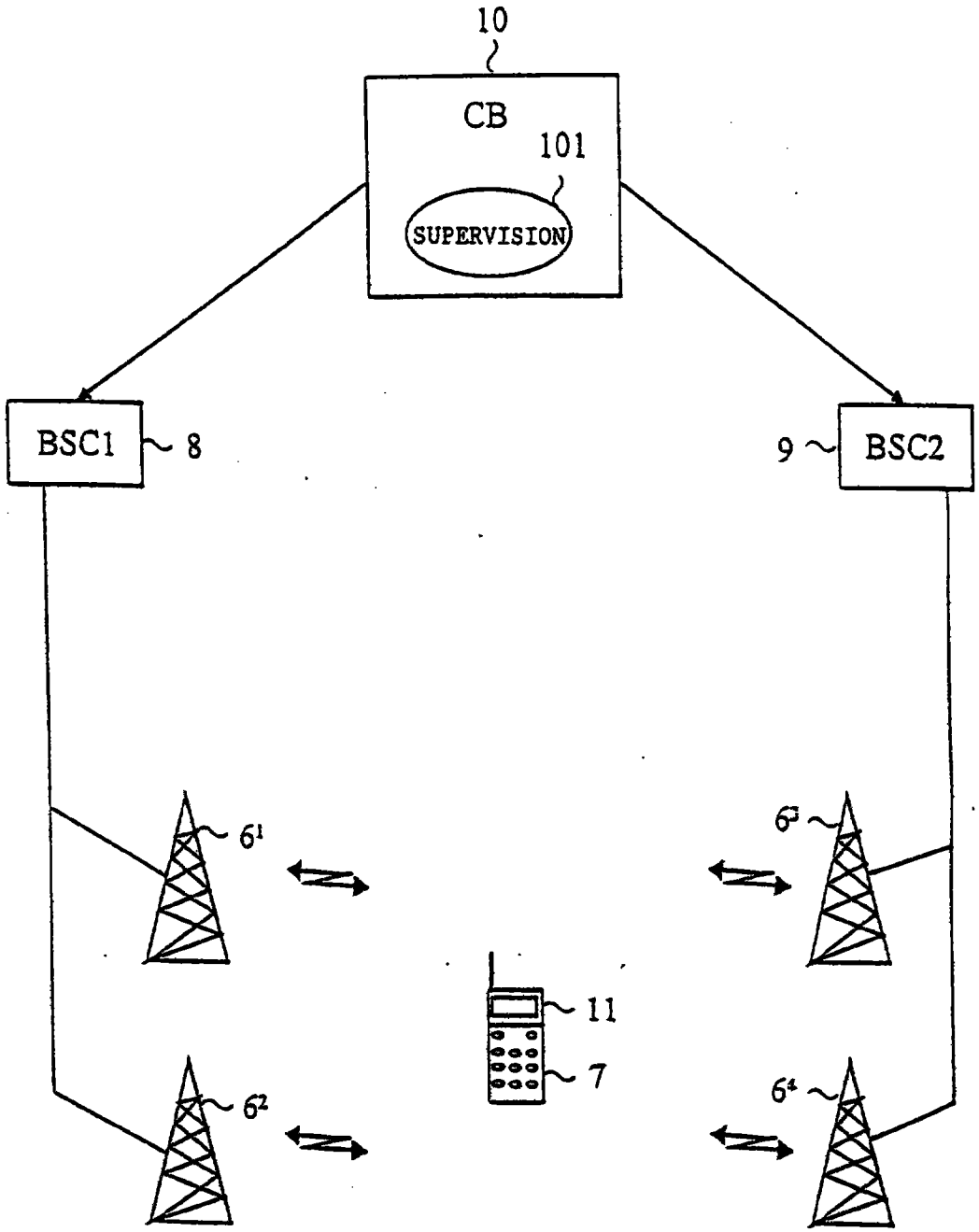


Fig. 1b

PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : H04Q 7/38 | A2

(11) International Publication Number: WO 99/35869

(43) International Publication Date: 15 July 1999 (15.07.99)

(21) International Application Number: PCT/FI99/00010

(22) International Filing Date: 8 January 1999 (08.01.99)

(30) Priority Data:
980036 9 January 1998 (09.01.98) FI

(71) Applicant *(for all designated States except US)*: SONERA OY [FI/FI]; Teollisuuskatu 15, FIN-00510 Helsinki (FI).

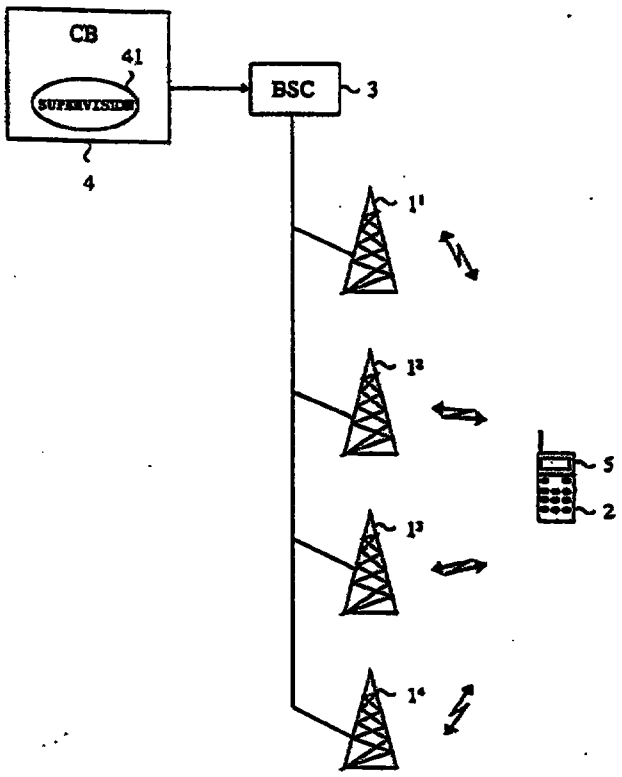
(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: KESKI-HEIKKILÄ, Mika [FI/FI]; Sonera Oy, P.O. Box 049, FIN-00051 Sonera (FI). LINKOLA, Janne [FI/FI]; Kuusikallionkuja 4 F 43, FIN-02210 Espoo (FI). HOKKANEN, Tuomo [FI/FI]; Strömsinlahdenkuja 2 A 13, FIN-00820 Helsinki (FI).

(74) Agent: PAPULA REIN LAHTELA OY; (Fredrikinkatu 61 A), P.O. Box 981, FIN-00101 Helsinki (FI).

(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published
In English translation (filed in Finnish).
Without international search report and to be republished upon receipt of that report.

(54) Title: METHOD AND SYSTEM FOR CHANGING SUBSCRIBER PROFILE BASED ON IDENTITY OF BASE STATION SERVING THE TERMINAL EQUIPMENT

(57) Abstract

The present invention relates to a method for changing a subscriber profile on the basis of the identity of the base station serving the terminal equipment in a mobile communication network. Moreover, the invention relates to a system for changing a subscriber profile on the basis of the identity of the base station serving the terminal equipment in a mobile communication network. According to the present invention, an extra identity of a permanent nature is created for each base station, and this identity is sent by the base station to the subscribers in its area. Changing the subscriber profile on the basis of subscriber movements is accomplished flexibly and considerably more easily and at a lower cost than before.