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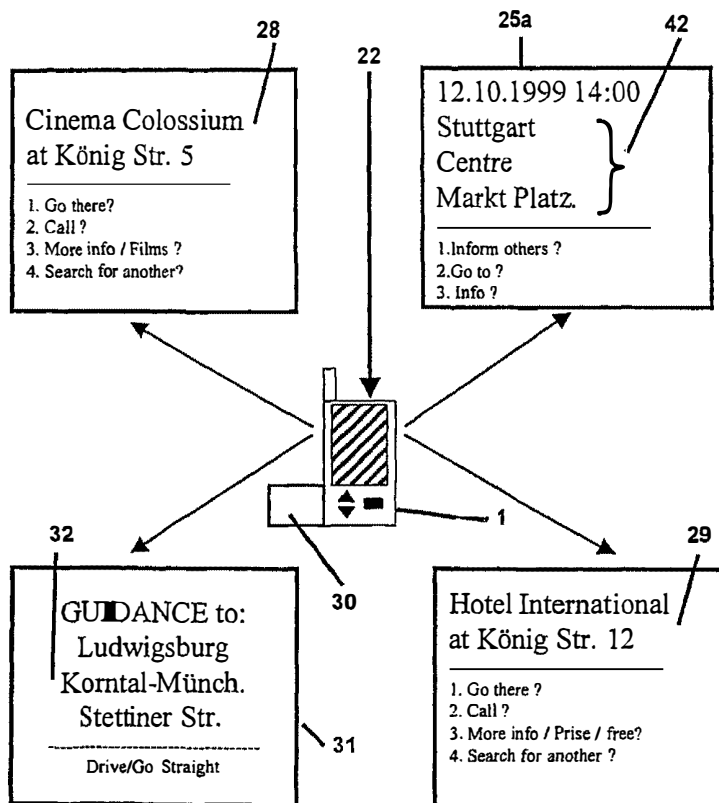
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(54) Title: DOWNLOADING GEOGRAPHICAL DATA TO A MOBILE STATION AND DISPLAYING A MAP



(57) Abstract: A mobile station (1) of a mobile communication network system (2), said mobile station (1) comprising a geographical position localising module (3) for localising a geographical position (24c) of said mobile station (1), storage means for storing geographical related base data, and display means (4) for displaying geographical related data as a map (24) and/or as a text string, characterised in that said geographical related data displayed on said display means (4) has been at least partly provided by wireless transmission from said network station (2) and is limited to a predeterminable extent depending on said geographical position (24c) of said mobile station (1), a mobile communication network system (2) comprising such a mobile station (1) and a method of operating such a mobile communication network system (2).



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## DOWNLOADING GEOGRAPHICAL DATA TO A MOBILE STATION AND DISPLAYING A MAP

A mobile station comprising a GPS and/or GSM/UMTS based localising module for displaying location dependent data and related information, a corresponding mobile communication network system, and a method of operating same.

The present invention relates to a mobile station comprising a GPS and/or GSM/UMTS based localising module for displaying location dependent data, preferably Cell or Local Area dependent data, and related information, a corresponding mobile communication network system, and a method of  
5 operating same according to the preambles of the accompanying independent claims.

Geographical position localising methods and modules are known for example from the satellite based Geographical Positioning System (GPS)  
10 standard. They are used for example in navigation systems. Some map information is provided by data storage means, for example CD-ROMs, or can be downloaded from a database, for example via internet.

The problem arises that the map and other data loading via a Compact Disk  
15 (CD) is extensive and bulky, internet connections for loading are not

everywhere available and are expensive since overall loading time is enormous, and loading of comprehensive world data is impossible due to storage or memory capacity limitations. For example the map data potentially necessary for the user of the mobile station either exceeds the  
5 capacity of presently available portable data storage means, such as plug-in cards, or results in large and heavy mobile station equipment.

It is an object of the present invention to provide a mobile station, a corresponding mobile communication network system, and a method of  
10 operating same, which provides the necessary geographical related data in a suitable form at the mobile station with low costs, low weight, and small size. It is a further object to combine GPS and other mobile based localisation means with mobile communication network system in such a way that loading and handling of the localisation data and local area  
15 information data are done in a very efficient way.

The object is solved by the subject matters of accompanying independent claims. Some preferred embodiments of the invention are defined in the accompanying dependent claims.

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Mobile station can display a position marked out map, a position text string, and/or Local Area information data at an idle mode, i.e. at a standby mode. Thus there are no extra costs for the user of the mobile station, and no extra work involved in trying to find the data needed, such as maps, location  
25 surrounding or Local Area data etc., or in loading data from a CD or via an internet connection. Only when data of a special area is needed or normal loading process is interrupted, then a service call loading can be activated. Otherwise the loadable data is available as network broadcasts, similar as known from Video Text in the technical are of television, or loaded by

network during the Local Area Update Procedure known from the GSM standard.

- 5 A check on possibly already existing stored version of data at said mobile station, e.g. by comparing version numbers, date of loadable parts etc., can be performed. Loading is done only if the mobile station has an older version or missing parts. In case of a Location Update Procedure loading or Service Call loading, mobile station informs the network about the existing data version of the Local Area and the network decides if and what to load.
- 10 In case of Network Broadcast Service loading mobile station decides on downloading or not. Latest mobile available data are stored at said mobile station even after power-off, the amount depending on the availability of the memory capacity of the mobile station end equipment.
- 15 The invention relates in one embodiment to a mobile station of a mobile communication network system, said mobile station comprising a geographical position localising module for localising a geographical position of said mobile station, storage means, preferably a built-in or plug-in Integrated Circuit memory card, for storing geographical related base
- 20 data, and display means for displaying geographical related data as a map and/or a text string. The geographical related data displayed on said display means has been at least partly provided by wireless transmission from said network system and is limited to a predeterminable extent depending on said geographical position of the mobile station. The geographical data has
- 25 been at least partly provided, in particular in addition to already available data at the mobile station from previous loading, by a Network Broadcast Service, and/or by a Location Update Procedure, and/or by a Network Service Call.

For the geographical position localising module, a global positioning system (GPS) module as known in the prior art providing position information as geographical co-ordinates can be used and/or a GSM/UMTS localising system for mobile stations using signal strength measurements, for example  
5 of own and/or neighbour cell signal strength, and/or base stations antenna position information, and/or base stations to mobile stations distance information, for example based on timing advance (TA) measurements, and/or other position characteristic measurements as for example disclosed in the parallel pending European patent application no. 99 120 291.2, filing  
10 date October 12, 1999, and the parallel pending PCT-application no. PCT/EP00/00852, filing date February 3, 2000. Mobile station can employ one or the other or both positioning modules depending to its present surroundings.

15 The geographical position calculation can be performed by the mobile station itself, i. e. only assistance from the network system is performed by a general broadcast information of normal operational and location dependent information to all the mobile stations within the network system cell. The position is computed in the mobile station, in particular translated  
20 into localisation data as for example translated into a street or building name in which the mobile station is presently located, and local area background data and information is added if necessary or desired, for example data of restaurants, hotels or events nearby to the present location of the mobile station. All this information is shown to the user on said map  
25 or as name string. The mobile station can provide guidance information about how to reach to a desired destination, in particular the mobile station can display a location dependent categorical information and combine this information with the localisation system for further guidance.

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