

(12) **UK Patent Application** (19) **GB** (11) **2 401 981** (13) **A**

(43) Date of A Publication **24.11.2004**

(21) Application No: **0407027.2**
(22) Date of Filing: **29.03.2004**
(30) Priority Data:
(31) **10314440** (32) **31.03.2003** (33) **DE**

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(51) INT CL⁷:
G07F 7/00 , G08G 1/123

(52) UK CL (Edition W):
G4V VAKC V302E V305 V314

(56) Documents Cited:
EP 1431946 A **US 5243652 A**
US 20020052786 A1

(58) Field of Search:
UK CL (Edition W) **G4V**
Other: **WPI, EPODOC, JAPIO**

(54) Abstract Title: **Position-dependant supply of data to a vehicle**

(57) Authorisation of the use of data supplied to a vehicle is granted depending on the road or region in which the vehicle is travelling. For example, encrypted data comprising a radio programme, music, video or the Internet may be made available only during the use of a particular toll road.

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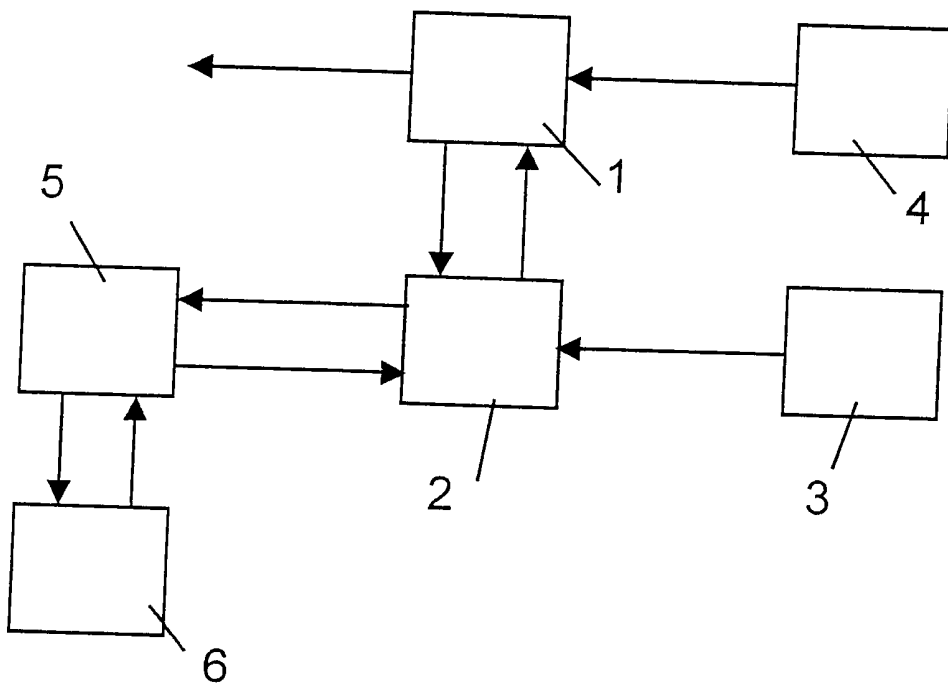


Fig.

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The present invention relates to a method for issuing
5 protected, in particular encoded, user data in a vehicle as
well as a system for implementing such a method.

Cashless and wireless toll systems are known from the prior
art, in which when travelling on toll sections the
10 appropriate toll fees are automatically debited either from
the driver's account or from a credit account with the
operator of the toll section. Such a system, the so-called
toll-box, generally operates independently and in certain
circumstances is connected to further vehicle systems.
15

Furthermore it is known to reproduce data in vehicles with
a radio-based or media-based content, so-called user data.
Examples of a radio-based content is broadcasting in
analogue as well as in digital form. A GSM-based streaming
20 is also possible in this case. Media-based content
includes the conventional media such as cassettes, CDs or
DVDs; alternative storage media such as CD-ROM or flash
storage cards may likewise be used.

25 Also known are methods for digital rights management (DRM),
in which the user data to be reproduced are transferred
separately from the rights to the use of these data and
generally in encoded form. The encoded transfer of the
user data may for example take place as a complete data
30 file or in the form of streaming data. The right to use or
the licence to reproduce the data file or the streaming
data is obtained separately from the encoded user data and

as a rule also from another source. This licence includes on the one hand the key for decoding the user data and on the other hand also the rights to use acquired with the licence.

5

On the basis of the aforescribed prior art the object of the invention is to provide a method and a system by means of which user data can be made available to a defined user group for purposes of reproduction.

10

According to the invention this object is achieved in that an authorisation of use of the data in the vehicle is granted depending on the road or the region through which the vehicle is travelling. The system envisages that a reproduction unit is coupled to an entitlement evaluation unit that checks whether a location-dependent right to use exists for the encoded user data to be reproduced, so that the said user data can be reproduced, and whether the vehicle is present in the region or on the road for which an authorisation of use exists.

The system and method according to the invention enable encoded user data to be made accessible in a locally restricted manner so that for example the reproduction of contents protected by DRM methods is coupled to the use of toll sections or to driving through specific regions. For this purpose a right to use is transferred either together with or separately from the actual user data, present in encoded form, which right to use allows the contents to be reproduced only if a specific road or a specific region or a defined group of roads is simultaneously used.

30

A modification of the method envisages that the user data are transmitted via a radio signal to the vehicle, though in this case the data exist in encoded form and cannot be meaningfully reproduced without a decoding key. As an
5 alternative to this the user data exist on a storage medium in the vehicle, which for example can be given to the driver of the vehicle at a toll point or at an issue point. The user data also exist in encoded form on the storage medium, so that reproduction is not possible without a
10 corresponding decoding key.

Advantageously the authorisation of use is transmitted via a radio signal to the vehicle, the time of the transfer of the rights being coupled for example to the vehicles
15 passing a toll point with a transponder or the vehicles driving over a specific region boundary, so that starting from the time at which the vehicle is on the toll stretch or in a specific region, the user data can be decoded and reproduced. As an alternative to a radio data transmission
20 of the authorisation of use, this may exist on a storage medium in the vehicle and be activated as soon as the vehicle drives into a specific region or on a specific road.

25 Advantageously it is determined by means of a navigation system whether the vehicle is located within a specific region for which an authorisation of use has already been granted, or whether the vehicle is on a specific road or toll section or a group of toll sections for which an
30 authorisation of use is being granted. In this way an authorisation of use can automatically be checked depending

on the place where the vehicle is located, and if confirmed the protected data can be decoded.

Since the use of protected data normally involves costs, a
5 fee for the authorisation of use is advantageously electronically deducted as soon as the user data is requested or reproduced, or as soon as the vehicle drives into a specific region or on a specific road for which the authorisation of use has been requested.

10

A variant of the method envisages that an entitlement evaluation unit that is coupled to a reproduction unit checks whether a right of use exists at all for the user data to be reproduced. If this is the case, then a
15 decoding of the user data takes place either in the entitlement evaluation unit, or alternatively a decoding key is transferred from the entitlement evaluation unit to the reproduction unit, where the user data are then decoded and prepared for reproduction.

20

A development envisages that the right of use is granted for a certain length of time, so that the authorisation of use is also time-dependent in addition to being location-dependent. Likewise, it is possible for the right of use
25 to be granted only for a specific type of road, in particular for toll sections of a specific operating company, so that the contents of the user data can also be utilised company-wide.

30 The system for implementing the method envisages that a reproduction unit is coupled to an entitlement evaluation unit, wherein the entitlement evaluation unit checks

whether a location-dependent right of use exists for the encoded user data to be reproduced. Apart from a pure location dependence, a road-dependent right of use may also exist, so that driving on certain types of roads authorises
5 the use of specific data. Provided that a right of use exists the user data may be reproduced, in which connection it is checked whether the vehicle is located in the region or on the road for which the authorisation of use exists.

10 Advantageously the entitlement evaluation unit is coupled to a navigation system in order to determine the actual positional data of the vehicle and on the basis of these positional data to check whether the necessary parameters for the use of the data transferred to the vehicle or
15 existing in the vehicle are satisfied.

By means of the method and system according to the invention it is possible to distribute contents via generally accessible media such as radio, CD, DVD, etc.,
20 and to make them accessible only to the actual users of a toll section or road, a type of road or a region. Examples of such transferred contents are radio programmes, music, videos, maps and route maps for navigation systems, traffic, journey, hotel or restaurant information, weather
25 or stockmarket information, or Internet data. The transferred data are protected by means of the DRM method employed against unauthorised use, so that copyright protection is guaranteed. Defined target groups are approached through the restricted and controlled circle of
30 users, so that licence fees can be set more favourably for the suppliers of these contents.

One embodiment of the invention is described in more detail hereinafter with the aid of the single figure.

The figure is a block diagram of the method and system.
5 The block diagram shows a multimedia reproduction unit 1, which is bidirectionally coupled to an entitlement evaluation unit 2. A storage unit 3 for digital rights is coupled to the entitlement evaluation unit 2, so that from the storage unit 3 for digital rights the latter can be
10 transferred to the entitlement evaluation unit 2. This transfer may take place either by radio or by introducing a storage medium. The reproduction unit 1 is connected to a data memory 4 for multimedia data or to a receiver unit for user data, these user data being transferred in encoded
15 form to the reproduction unit 1.

In a first modification a request is directed from the reproduction unit 1 to the entitlement evaluation unit 2 to check whether a corresponding key for the encoded data
20 exists. If such a key exists, this is transferred to the reproduction unit 1, where the decoding is carried out and the multimedia data can be output in the vehicle.

The variant relating to this method envisages that encoded
25 data from the multimedia reproduction unit 1 that have been received by the data memory or the receiver unit 4, are transferred to the entitlement evaluation unit 2, in which the encoded data are decoded and transferred back to the reproduction unit 1.

30

The entitlement evaluation unit 2 is coupled to a so-called toll-box 5 via which information can be obtained as to

whether the vehicle is located on a specific section or whether a vehicle is located on a specific type of section, for example toll sections of a specific operating company. This toll box 5, may be coupled to a navigation system 6 in which, following a corresponding request from the toll box 5, the navigation system 6 transfers the present position of the vehicle.

The entitlement evaluation unit 2 accordingly evaluates the right transferred from the storage unit for digital rights 3 and checks whether the vehicle is on a section that justifies a use of the data. With this information the entitlement evaluation unit 2 can then decide whether the encoded contents of the user data can be made available for reproduction. In this way it is possible to couple the use of a toll section with the reception and/or reproduction of multimedia data.

In the transfer of the user data from the data memory 4 or receiver unit 4 protected user data are transferred to the reproduction unit 1; as already mentioned, this may take place in the form of a data carrier or via an analogue or digital radio signal.

In principle, in a transmission over a radio section the encoded user data signal may be received by a number of people greater than the number of people authorised to use the data. Similarly, data carriers may be freely distributed, though it is envisaged that the protected contents of the user data are available only to an actual authorised user, preferably a user of a toll section, by transferring a right of use separately from the user data.

This right of use permits the use of the contents of the transferred data for the corresponding toll section or road or within the specific region.

5 If the user wishes to reproduce the data contents, the reproduction unit 1 establishes that the data contents are encoded, since they are protected by a DRM method. The entitlement evaluation unit 2 is then asked whether a right of use exists for the desired data set. The entitlement
10 evaluation unit 2 then checks whether a right of use exists; if this is the case, the conditions for the reproduction of the data contents are checked. This check includes, in addition to the usual DRM-specific conditions, such as for example the restriction of the period of time
15 within which the reproduction of the data contents may take place, whether the vehicle is located on a specified section or within a specific region.

For the check procedure the entitlement evaluation unit 2
20 evaluates the right of use associated with the respective data contents. If a right of use exists that permits the reproduction only when a specific section is used, the entitlement evaluation unit 2 requests the current status from the toll box 5. If this enquiry shows that the
25 vehicle is located on a toll section that is covered by the right of use, the entitlement evaluation unit 2 then enquires about the current position from the toll box 5. Optionally, in order to determine the position the toll box 5 operates in conjunction with a navigation system 6 that
30 is installed in the vehicle. A further option envisages that the entitlement evaluation unit 2 is directly connected to the navigation system 6.

If the conditions mentioned above are met, the reproduction unit 1 receives from the entitlement evaluation unit 2 a key in order to decode the encoded user data set and process it for reproduction. Alternatively, the user data set is transferred to the entitlement evaluation unit 2 and is decoded there. In order to be able to restrict the range of reproduction as precisely as possible, the entitlement evaluation unit is interrogated at regular intervals whether the conditions for the reproduction of the user data set are still satisfied, and in particular whether the utilisation time has expired and whether the vehicle is still in the specified region in which a right of use has been granted.

15 An example of use envisages that a motorway operating company would like to transmit certain songs to its customers on a certain section. For this purpose it issues at its offices/sales outlets, or also by post, CDs that contain in each case the actual songs in a compressed and DRM-based audio format. These CDs accordingly cannot be reproduced without a corresponding digital right since they exist in encoded form. When a vehicle travels on the specific toll section, then together with the automatic and electronic debiting of the toll fee from the customer's credit account a digital right is transferred that allows the reproduction of the pieces of music contained on the CD while travelling on the toll section. It is also envisaged that this right to reproduce the pieces of music is valid only for a certain period of time.

In connection with the reproduction of radio services, it may be the case that a motorway operating company would like to make its own radio programme available. In order to save licence fees for the music reproduction, it is
5 sensible to make the radio programme accessible only to actual customers. The programme is therefore transmitted digitally using a DRM method within the radius of its motorway sections. Without a right to use that exists either via radio or on a storage medium in the vehicle, a
10 programme cannot be decoded and therefore also cannot be reproduced. When a user account for payment of toll fees is applied for and set up, the customer at the same time receives a digital right, for example on a memory card, that allows the customer to play the programme in their
15 reproduction equipment 1. When travelling on a section managed by a motorway operator, the reproduction of the radio programme is permitted by the right to use and the DRM system.

20 In addition to the reproduction of audio signals, it is envisaged that various media such as images, videos, internet, etc., may be made available in combination with audio signals. Advantageously these media are available only during the use of the specified toll road, in which
25 connection it may be envisaged that a use is permitted for a certain period before and/or after the use of the toll road so that a song can be heard completely or a film can be viewed to the end, or so that an episode can be followed to completion.

30

In addition to a time restriction it is also envisaged that only a limited number of "visits" is available before, after

or during the use of the toll road, so that a certain number of pieces of music can be accessed for a specific maximum number of times, or a film can be viewed just once. It is also envisaged that one or more encoded digital or
5 analogue radio or TV programmes are transmitted in encoded form. It is likewise envisaged that the transmitted data are transmitted from a data server to the vehicle user via a wireless radio connection.

10 In addition it is possible for the rights of use to be acquired before starting the journey by the user at their place of work, on the Internet or by radio, and to be incorporated into the vehicle. This is possible as an exchangeable data carrier, PDA or via a wireless
15 connection. Likewise it is possible for the digital rights of use to be transferred continuously or periodically in a wireless manner to the vehicle during the use of the toll section, so as to enable the duration of use to be determined precisely.

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Patent Claims

- 5 1. Method for issuing protected, in particular encoded,
user data in a vehicle, characterised in that an
authorisation of use of the data in the vehicle is
granted depending on the road or region in which the
vehicle travels.
- 10 2. Method according to claim 1, characterised in that the
user data are transmitted via a radio signal to the
vehicle or exist on a storage medium in the vehicle.
- 15 3. Method according to claim 1 or 2, characterised in
that the authorisation of use is transmitted via a
radio signal to the vehicle or is present on a storage
medium in the vehicle.
- 20 4. Method according to one of the preceding claims,
characterised in that it is determined by means of a
navigation system whether the vehicle is located
within the region for which an authorisation of use
has been granted.
- 25 5. Method according to one of the preceding claims,
characterised in that a fee for the authorisation of
use is electronically deducted as soon as the user
data are reproduced or as soon as a specific region or
30 a specific road are used.

6. Method according to one of the preceding claims, characterised in that in an entitlement evaluation unit that is coupled to a reproduced unit it is checked whether a right of use exists for the user data to be reproduced, and that either a decoding of the user data takes place in the entitlement evaluation unit or a decoding key is transferred from the said entitlement evaluation unit to the reproduction unit, by means of which the user data in the reproduction unit are decoded.
7. Method according to one of the preceding claims, characterised in that the right of use is granted for a specific length of time.
8. Method according to one of the preceding claims, characterised in that the right of use is granted for a certain type of road, in particular for toll sections of an operating company.
9. System for the implementation of the method according to one of the preceding claims, characterised in that a reproduction unit (1) is coupled to an entitlement evaluation unit (2) in which it is checked whether a location-dependent or road-dependent right of use exists for the encoded user data to be reproduced, so that the said user data can be reproduced, and whether the vehicle is located in the region or on the road for which an authorisation of use exists.
10. System according to claim 9, characterised in that the entitlement evaluation unit (2) is coupled to a

navigation system (6) in order to determine the current positional data of the vehicle.

11. Method substantially as hereinbefore described with
5 reference to the accompanying drawings.

12. System substantially as hereinbefore described with reference to the accompanying drawings.

10



Application No: GB0407027.2

Examiner: Tom Sutherland

Claims searched: 1 - 10

Date of search: 17 September 2004

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X,E	1 - 6, 8 - 10	EP 1431946 A (OCTO TELEMATICS) Whole document relevant, note particularly paragraphs 0024 to 0031.
X	1 - 4, 9, 10	US 2002/0052786 A1 (KIM et al) See paragraphs 0062 - 0065, 0072
X	1, 3, 4, 6, 9, 10	US 5243652 A (TEARE et al) See Figs 1 and 2, column 2 lines 11 to 26, 39 to 42.

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category	P	Document published on or after the declared priority date but before the filing date of this invention
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^W :

G4V

Worldwide search of patent documents classified in the following areas of the IPC⁰⁷

The following online and other databases have been used in the preparation of this search report

WPI, EPODOC, JAPIO