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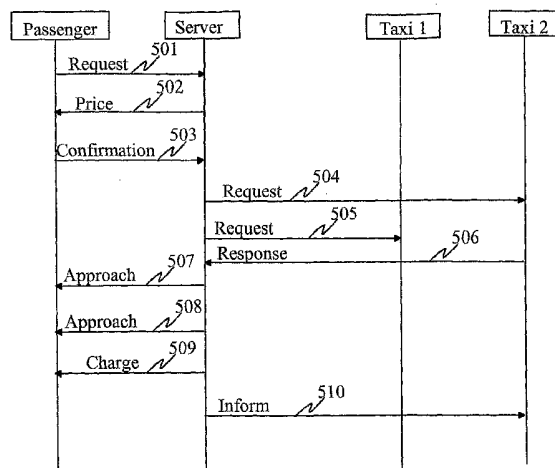
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(54) Title: ORDERING OF TRANSPORTATION VEHICLE



(57) Abstract: A method and system for arranging transportation for at least one person having a first communication device (102, 103, 104) being capable of establishing a communication connection to a server (101). Said server (101) is capable of establishing a communication connection to at least one driver of a transportation vehicle (105, 106) having a second communication device. The method comprises following steps at the server (101). Receiving a transportation request (501) from said person, said request comprising at least an origination and a destination of a transportation, calculating charge information of said transportation on the basis of said origination and destination, sending said charge information (502) to said communication device of said person, receiving a confirmation message (503) from said person, said message (503) indicating acceptance for said charge and confirmation for said transportation, sending a transportation request to at least one communication device of a driver of a transportation vehicle (105, 106).

Ordering of transportation vehicle

The present invention relates to ordering a transportation vehicle for a person and particularly, for improving reliability and early indication of approaching when
5 ordering a transportation vehicle.

Background of the invention

Ordering transportation from an origination to destination has been made easier nowadays. Patent application PCT/FI01/00285, published as WO 01/72078 describes ordering a taxi using a mobile station (MS). A client sends and a taxi
10 center receives a digital order message, which directly or indirectly indicates the vehicle order address. This makes it possible to process the order address automatically in the taxi center. Teaching of the application belongs to a class of inventions describing fleet management type of services.

Currently after reserving a taxi, the customer does not have knowledge what the taxi
15 ride will cost. This situation in services is very rare, since normally as the customer purchases some service, the price is agreed upon and only after that the service is delivered. For example, in Finland the law requires the service providers to show the final cost to the customer. For practical reasons taxi rides have been an exception of the rule. The current situation is not satisfactory for the customer and it
20 also enables a possibility for a taxi driver to cheat the customer, for example by selecting a route between the pick-up and drop-off locations that is not the fastest and shortest. The currently used system also leaves all the risks of traffic problems etc. to the customer. Another drawback in the present ordering system is that information of the exact time of arrival of the taxi to the pick-up location is not
25 delivered to the passenger. When the taxi has been ordered beforehand, it may be difficult for the customer to concentrate to the normal routines when constantly worrying about the arrival of the taxi.

Summary of the invention

The present invention describes a solution wherein the customer is given the exact
30 cost of the taxi ride as a part of the reservation process. The solution according to the present invention provides better service to the consumers. The proposed solution obviates the possibility for the taxi driver to cheat the customer and it transfers the risk of traffic etc. problems to the taxi company. By using the proposed

system the customer knows exactly how much the service will cost before agreeing to purchase the taxi service. After implementation of the proposed solution the taxi service will behave as other services, the customer knows what he/she has to pay before agreeing to take the service.

- 5 For the taxi reservation system the process creates knowledge about the destinations of taxis. This information can be used for fleet management purposes.

In addition the present invention also provides a solution of delivering the exact time of arrival of the taxi to the pick-up location. This information is usable for the customer e.g. in cases the taxi has been ordered well before the scheduled trip
10 should take place. It enables the customer to concentrate to the normal routines instead of constantly worrying about the arrival of the taxi.

According to a first aspect of the invention a method is provided for arranging transportation for at least one person. Said person has a communication device that is capable of establishing a communication connection to a server, and said server is
15 capable of establishing a communication connection to at least one driver of a transportation vehicle having a second communication device. The method comprises at the server:

- receiving a transportation request from said person, said transportation request comprising an origination and a destination of a transportation, and
- 20 - sending said transportation request to a communication device of a driver of a transportation vehicle.

It is characteristic to the method that it comprises at the server:

- calculating charge information of said transportation on the basis of said origination and destination,
- 25 - sending said charge information to said communication device of said person, and
- receiving a confirmation message from said person, said message indicating acceptance for said charge and confirmation for said transportation.

According to a second aspect of the invention an electronic device is provided for
30 arranging transportation for a user. Said electronic device comprises:

- receiving means for receiving a transportation request from a first communication device of a user,

- establishing means for establishing a communication connection to a driver of a transportation vehicle having a second communication device, and
- receiving means for receiving a transportation request from said person, said transportation request comprising at least an origination and a destination of a transportation and sending means for sending said transportation request to at least one communication device of a driver of a transportation vehicle.

It is characteristic to the electronic device that:

- the device comprises calculating means for calculating charge information of said transportation on the basis of said origination and destination, and sending means for sending said charge information to said communication device of said person, and
- the receiving means are further arranged to receive a confirmation message from said person, said message indicating acceptance for said charge and confirmation for said transportation.

According to a third aspect of the invention a computer program product for an electronic device is provided for arranging transportation for at least one person. The computer program product comprises:

- computer program code for arranging the electronic device to receive a transportation request from a first communication device of a person requesting transportation, said transportation request comprising at least an origination and a destination of a transportation and
- computer program code for arranging the electronic device to send said transportation request to at least one communication device of a driver of a transportation vehicle.

It is characteristic to the computer program product that is comprises:

- computer program code for arranging the electronic device to calculate charge information of said transportation on the basis of said origination and destination,
- computer program code for arranging the electronic device to send said charge information to said first communication device, and
- computer program code for arranging the electronic device to receive a confirmation message from said first communication device, said message indicating acceptance for said charge and confirmation for said transportation.

In the following, the invention will be described in greater detail with reference to the accompanying drawings, in which

Brief description of the drawings

Figure 1 illustrates a system according to an embodiment of the invention;

5 Figure 2 illustrates a block diagram of a device according to an embodiment of the invention.

Figure 3 illustrates a flow diagram of a method according to an embodiment of the invention;

10 Figure 4 illustrates a flow diagram of a method according to an alternative embodiment of the invention;

Figure 5 illustrates a signaling diagram of a method according to an embodiment of the invention.

Detailed description of the invention

15 Figure 1 illustrates a system according to an embodiment of the invention. The system comprises a transportation server 101, which is capable of communicating with different wireless and/or wireline communication systems, like a PSTN (Public Switched Telephone Network) 107, Internet 108 or GSM system 109 for example. Passengers are able to use their communication devices in order to request transportation from the transportation server 101. A passenger can use a regular
20 wireline telephone 102 for making the request. In a digital network the passenger can make his/hers request for example by listening information given by the transportation server (e.g. synthesized voice) giving and/or selecting commands via the keyboard of the telephone.

25 Alternatively the passenger can use an Internet access by using a computer 103 that can be a desktop or a laptop computer having a connection (e.g. cable modem or ISDN connection) to the Internet network 108. The user enters a www address of the service provider and gives necessary information on the Internet page.

30 Further the passenger can use his/hers mobile telephone 104 operating in a mobile communication network, such as GSM network 109 for example. The user can make his/her request in a similar way as in the wireline telephone case disclosed previously. Alternatively the passenger can use SMS or MMS messages to send the

request to the mobile telephone number of the service provider. The message can comprise e.g. few characters indicating type of the message (e.g. "tr" for transportation), pick up location that comprises at least street name and number (e.g. "pihlajakatu 2") and destination location that comprises at least street name and number (e.g. "kotikatu 4"). The message can be e.g. "tr pihlajakatu 2 kotikatu 4". Further the mobile telephone user can use other services, such as WAP services via GSM or GPRS connection. In this case the user connects to the WAP pages of the service provider and enters information with his/hers device.

The system further comprises transportation vehicles 105, 106 that are in connection to the server 101 e.g. via mobile communication network 109, or via another network, e.g. a private network 110 of the transportation service provider.

Figure 2 illustrates a block diagram of a device according to an embodiment of the invention. The device 200 comprises a processor 201 and a memory 202 for processing the tasks to be performed in the device. The memory 202 can comprise for example random access memory (RAM) and/or read only memory (ROM). The device further comprises a storage medium 203, for example like a hard disk of a desktop computer or a RAM memory, which further comprises an application 204 (Transportation application) that may be for example a computer program product according to an aspect of the invention. The device further comprises another application 205 (Calculator application) for making estimates about travel time and travel distance and for calculating price for transportation on the basis of said travel distance and travel time. The device further comprises input/output means 206 for connecting the device to different types of communication networks as illustrated in figure 1.

Figure 3 illustrates a flow diagram of a method according to an embodiment of the invention. The steps of the method can be implemented for example in a computer program code stored in a memory of an electronic device such as the server in figures 1 and 2. A reference has been made to the signaling diagram in figure 5.

The customer orders transportation, e.g. a taxi at step 301. First a communication connection is established between the communication device (102-104 in figure 1) of the customer and a transportation server (101 in figure 1). The customer makes his request (501 in figure 5) using a suitable method as illustrated previously with reference to figure 1. At this stage the customer tells the reservation system the pick-up and drop-off locations. At step 302 the server receives the request and then calculates (step 303) (using e.g. existing technologies) estimates for the travel

distance and for the travel time. The cost for the passenger is calculated at step 304 as a function of travel distance and travel time using the estimates calculated previously. In currently used systems this is done by calculating using the actual travel time and travel distance – and after the trip is made. The system responds to the customer at step 305 with the exact price for the ride and optionally further with estimates of travel time and distance (502 in figure 5). Optionally the system may also deliver route details to the customer. At step 306 the server waits for confirmation message from the customer. The customer confirms (503 in figure 5) that the price is agreed by sending a reply message to the server. If the customer does not send the confirmation to the server within the predetermined time limit, the server can resend the information to the customer and again wait a predetermined time. If the server does not receive the confirmation from the customer, this indicates that the customer does not accept the price of the transportation. The system can therefore cancel the request and the flow proceeds to step 309 wherein the process ends.

If the server receives the confirmation e.g. within a predetermined time limit, it delivers a ride request to at least one driver of a transportation vehicle (504 and 505 in figure 5), such as a taxi (step 307). Said ride request may be an exact copy of the transportation request made by the customer at step 301, or the server may use the customer's request as a basis for deriving a specific request to the transportation vehicles. The first driver that responds to the request gets the customer (506 in figure 5). Alternatively the system can deliver the request to the driver that is located closest to the customer. This however requires the system to locate all the vehicles e.g. by using the GPS system. The taxi picks up the customer and drives the customer to the destination. At step 308 the system bills the passenger and informs the taxi about it (509 and 510 in figure 5). In billing of customer known technologies such as mobile payment or paypal-like payment mechanisms can be utilized. Optionally the cost of travel can be sent to driver and driver enters the amount to the payment terminal. Third option is that the system rewards the taxi company, the passenger message indicating that the request has been delivered is used as confirmation in this scenario. Billing information is sent to the customer as e-mail or as conventional mail. The request is completed at step 309.

Figure 4 illustrates a flow diagram of a method according to another embodiment of the invention. The steps of the method can be implemented for example in a computer program code stored in a memory of an electronic device such as the

server in figures 1 and 2. A reference has been made to the signaling diagram in figure 5.

5 The steps 401 to 407 are similar to the steps 301 to 307 in figure 3. Next, at step 408, it is checked if the driver has arrived to the pick-up point. If not, the system estimates the distance of the driver from the pick-up point and estimates on the basis of the distance the time of arrival and sends it to the passenger as a message or by other suitable method. As taxi is arriving to the pick-up location one or several approaching messages is sent to the customer (507 and 508 in figure 5). If the vehicle is equipped with a positioning system (such as GPS or mobile phone which
10 can be located) the proposed taxi system can deliver an indication about the arrival of the taxi near to the customer. The location of the vehicle is constantly updated and if the location of the vehicle is close enough to the pick-up location of the passenger a message indicating it is sent to the passenger.

15 The closeness can be simple direct distance of the vehicle from the pick-up location or it can be entrance of the vehicle to the area from which the drive-time to pick-up location is below a certain limit. Widely available commercial tools can be used to define a geographical area with a given maximum drive time to a certain location.

20 The entrance to the close area can be decided in the central system (in this case the locations of the vehicles are periodically delivered to the central system) or in the vehicle (in this case the pick-up location is delivered to the vehicle navigation system either together with the close area definition or with the instructions for calculation of close area). There can be several areas of closeness defined, for example, five minutes to the arrival to the pick-up location, one minute to the arrival etc.

25 The proposed method can be used to indicate entrance of anything to a closeness of any given location. Anything can be for instance any vehicle, a person or valuable goods. The "anything" has to be able to locate itself and to deliver the location to the system for instance with wireless data such as GPRS.

30 Equally important with obtaining the information about actual closeness of the taxi is the capability for delivering that information to the passenger at low cost. The location information or indication about entering to the close area can be delivered from the vehicle to the central system using known wireless data methods or similar methods as ones used to deliver the indication from central system to the passenger as explained in below.

To deliver the information from the server to the passenger the known wireless data carrier methods can be utilized. In addition to the well known methods several other means can be used.

5 Using voice call. The system calls to the passenger and plays recorded message (“Your taxi is five minutes from your pick-up location” etc). A software can be installed to the vehicle navigation system that makes a voice call and the central server does not have to make the call.

10 Using calls without voice. In this case a phone with aliasing capability for the numbers (eq. calls from numbers in the phonebook are displayed with a names not with numbers). For each close area a dedicated phone number is given (eq. 122222 could be “Taxi 5 minutes”, 122211 could be “Taxi 1 minute” etc.). The system calls to the customer’s phone using the dedicated phone number and hangs up upon or even before answering. This leaves to the customer’s phone a message indicating the time to pick-up.

15 Also wireless packet switched data can be used for delivering messages, such as GPRS. However the exemplary mentioned term GPRS is used to define all packet switched data carriers. In this case a mobile phone is in connection to the email account of the phone owner. The email account can be his/her own normal email or it can be a dedicated email account created for this purpose.

20 Further on, as a part of email based indication system, software is added to the phone (Java, symbian etc. program). After the indication of an email is received this program fetches the email to the phone and optionally composes a multimedia message from it and finally uses a ring tone to indicate the passenger about the arrival of the message. This message can contain any other information instead of
25 the arrival of the taxi, for example messages currently transmitted using normal SMS or MMS.

When the taxi has been arrived to the pick up location, the taxi picks up the customer and delivers the request. At the destination or during the trip the passenger optionally informs the system at step 410 that the request has been delivered. This
30 step can be optionally combined with the payment step (next step).

The system bills the passenger and informs the taxi about it at step 411 (509 and 510 in figure 5). In billing of customer the same technologies can be utilized as illustrated previously relating to figure 3. At step 412 the request is completed and the process ends.

The above disclosure illustrates the implementation of the invention and its embodiments by means of examples. A person skilled in the art will find it apparent that the invention is not restricted to the details of the above-described embodiments and that there are also other ways of implementing the invention without deviating from the characteristics of the invention. The above embodiments should thus be considered as illustrative and not restrictive. Hence the possibilities of implementing and using the invention are only restricted by the accompanying claims and therefore the different alternative implementations of the invention, including equivalent implementations, defined in the claims also belong to the scope of the invention.

Claims

1. A method for arranging transportation for at least one person, said person having a first communication device (102, 103, 104) being capable of establishing a communication connection to a server (101), said server (101) being capable of
5 establishing a communication connection to at least one driver of a transportation vehicle (105, 106) having a second communication device, the method comprising at the server (101):

receiving (302, 402) a first transportation request (501) from said first communication device (102, 103, 104), said first transportation request (501)
10 indicating an origination and a destination of a transportation, and

sending (307, 407) a second transportation request (504, 505) based on said first transportation request (501) to a second communication device of a driver of a transportation vehicle (105, 106);

characterized by the method comprising at the server (101):

15 calculating (304, 404) charge information of said transportation on the basis of said origination and destination,

sending (305, 405) said charge information (502) to said first communication device (102, 103, 104), and

receiving (306, 406) a confirmation message (503) from said first
20 communication device (102, 103, 104), said confirmation message (503) indicating acceptance for said charge and confirmation for said transportation.

2. A method according to claim 1, characterized by the method further comprising at the server (101):

receiving a transportation offering (506) from at least one second
25 communication device of a driver of a transportation vehicle (105, 106).

3. A method according to claims 1 or 2, characterized by the method further comprising at the server (101):

sending (308, 411) said charge information (510) to said second communication device of a driver of a transportation vehicle (105, 106).

30 4. A method according to any of claims 1 to 3, characterized by the method further comprising at the server (101):

calculating an estimated time of arrival using a measured or estimated location of the transportation vehicle (105, 106) and an address at which the transportation vehicle (105, 106) is to arrive.

- 5 5. A method according to claim 4, characterized by the method further comprising at the server (101):

enabling location tracking of said second communication device in order to calculate estimated time of arrival information of the transportation vehicle (105, 106).

- 10 6. A method according to claim 4, characterized by the method further comprising at the server (101):

sending (409) said time of arrival information (507, 508) to said first communication device (102, 103, 104).

- 15 7. A method according to claim 6, characterized in that the step of sending (409) said time of arrival information (507, 508) to said first communication device (102, 103, 104) comprises one of the following:

- 20 sending (409) said time of arrival information (507, 508) using a voice call
sending (409) said time of arrival information (507, 508) using a call that appears to come from a certain predefined telephone number, which telephone number has been defined to correspond to certain time of arrival information
20 sending (409) said time of arrival information (507, 508) using wireless packet switched data adapted for delivering messages.

8. A method according to any of claims 1 to 3, characterized by the method further comprising:

- 25 at the server (101), sending a definition of a closeness area of an origination location to the second communication device,
through operations performed within a transportation vehicle (105, 106), detecting entrance to a closeness area and
as a response to detecting entrance to a closeness area, sending time of arrival information to said first communication device (102, 103, 104).

- 30 9. An electronic device (101, 200) for arranging transportation for a user, said electronic device (101, 200) comprising:

establishing means (206) for establishing a communication connection to a driver of a transportation vehicle (105, 106) having a second communication device, and

5 receiving means (206) for receiving a first transportation request (501) from said user, said first transportation request (501) comprising at least an origination and a destination of a transportation, and sending means (206) for sending a second transportation request (504, 505) based on said first transportation request (501) to at least one communication device of a driver of a transportation vehicle (105, 106), characterized in that:

10 the device (101, 200) comprises calculating means (205) for calculating charge information of said transportation on the basis of said origination and destination, and sending means (206) for sending said charge information to said first communication device (102, 103, 104), and

15 the receiving means (206) are further arranged to receive a confirmation message from said first communication device (102, 103, 104), said message indicating acceptance for said charge and confirmation for said transportation.

10. An electronic device (101, 200) according to claim 9, characterized in that the calculating means (205) are arranged to calculate estimated travel distance and travel time and to calculate said charge information on the basis of said estimated
20 travel distance and travel time.

11. An electronic device (101, 200) according to claim 9 or 10, characterized in that the receiving means (206) are further arranged to receive a transportation offering from at least one driver of a transportation vehicle (105, 106).

25 12. An electronic device (101, 200) according to any of claims 9 to 11, characterized in that said sending means (206) are further arranged to send said charge information to a second communication device, which is a communication device of a driver of a transportation vehicle (105, 106).

30 13. An electronic device (101, 200) according to any of claims 9 to 12, characterized in that said sending means (206) are further arranged to send additional information to a second communication device, which is a communication device of a driver of a transportation vehicle (105, 106), which additional information comprises at least one of the following:

a phone number of a user requesting transportation,
an email account identifier of a user requesting transportation,

a definition of a closeness area of an origination location,
target location and estimated time of arrival.

14. An electronic device (101, 200) according to any of claims 9 to 13,
characterized in that the device further comprises enabling means (204, 201, 202)
5 for enabling location tracking of said second communication device in order to
calculate estimated time of arrival information of the transportation vehicle (105,
106).

15. An electronic device (101, 200) according to claim 14, characterized in that
said sending means (206) are further arranged to send said time of arrival
10 information to said first communication device (102, 103, 104).

16. An electronic device (101, 200) according to claim 15, characterized that said
sending means (206) comprise at least one of the following:

voice call initiation means for sending said time of arrival information to said
first communication device (102, 103, 104) using voice call

15 phone call initiation means with aliasing capability for sending said time of
arrival information to said first communication device (102, 103, 104) using a call
that appears to come from a dedicated phone number

email sending means for sending said time of arrival information to an email
account of a user.

20 17. An electronic arrangement for arranging transportation for a user, said
electronic arrangement comprising:

a server (101, 200)

establishing means (206) for establishing a communication connection from
the server (101, 200) to a driver of a transportation vehicle (105, 106) having a
25 communication device, and

receiving means (206) for receiving at the server (101, 200) a first
transportation request (501) from said user, said first transportation request
comprising at least an origination and a destination of a transportation, and sending
means (206) for sending a second transportation request (504, 505) based on said
30 first transportation request (501) from the server (101, 200) to at least one
communication device of a driver of a transportation vehicle (105, 106),
characterized in that:

the server (101, 200) comprises calculating means (205) for calculating charge information of said transportation on the basis of said origination and destination, and sending means (206) for sending said charge information to said user,

5 the receiving means (206) are further arranged to receive a confirmation message (503) from said user, said message (503) indicating acceptance for said charge and confirmation for said transportation,

the sending means (206) are further arranged to send a definition of a closeness area of an origination location to a communication device of a driver of a transportation vehicle (105, 106), and

10 the arrangement comprises, at said transportation vehicle (105, 106), means for detecting entrance to a closeness area and means for sending time of arrival information to said first communication device (102, 103, 104) as a response to detecting entrance to a closeness area.

18. A computer program product for an electronic device for arranging transportation for at least one person, which computer program product comprises:

computer program code for arranging the electronic device to receive a first transportation request (501) from a first communication device (102, 103, 104) of a person requesting transportation, said first transportation request (501) comprising at least an origination and a destination of a transportation and

20 computer program code for arranging the electronic device to send a second transportation request (504, 505) based on said first transportation request (501) to at least one communication device of a driver of a transportation vehicle (105, 106), characterized in that the computer program product comprises:

25 computer program code for arranging the electronic device to calculate charge information (502) of said transportation on the basis of said origination and destination,

computer program code for arranging the electronic device to send said charge information (502) to said first communication device (102, 103, 104),

30 computer program code for arranging the electronic device to receive a confirmation message (503) from said first communication device (102, 103, 104), said message indicating acceptance for said charge and confirmation for said transportation.

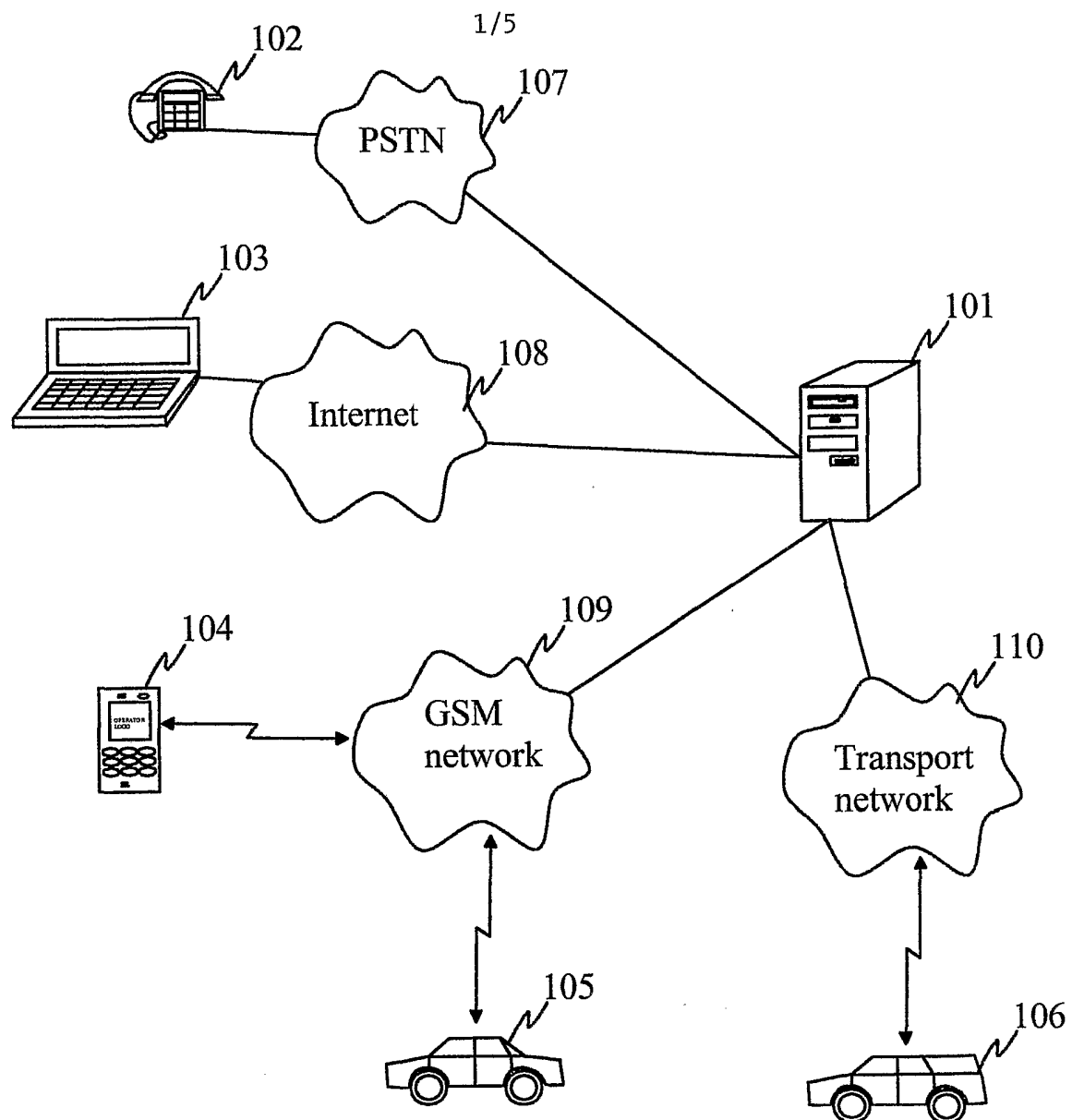


Fig. 1

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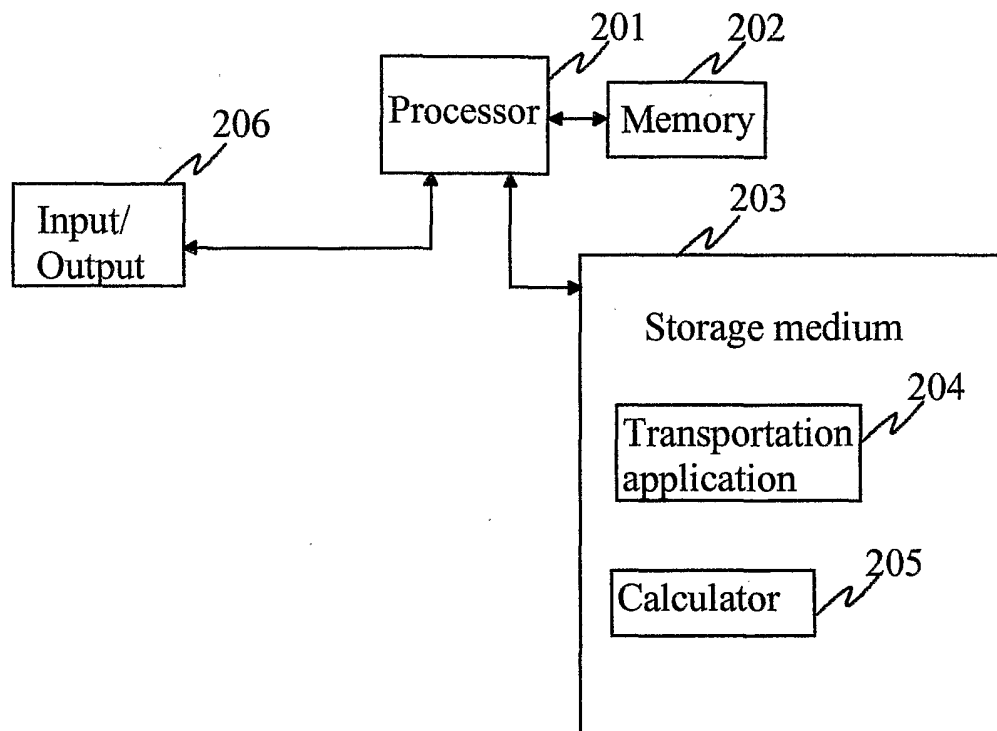
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Fig. 2

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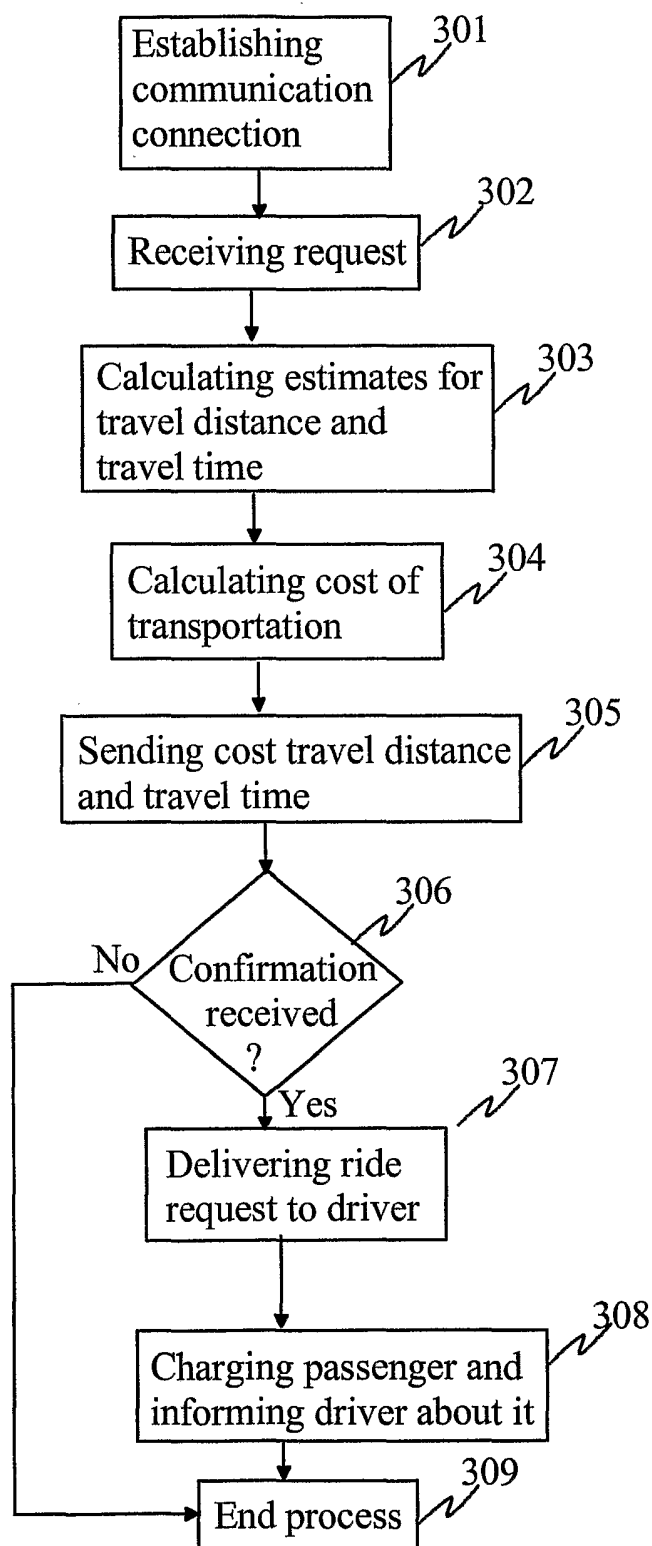


Fig. 3

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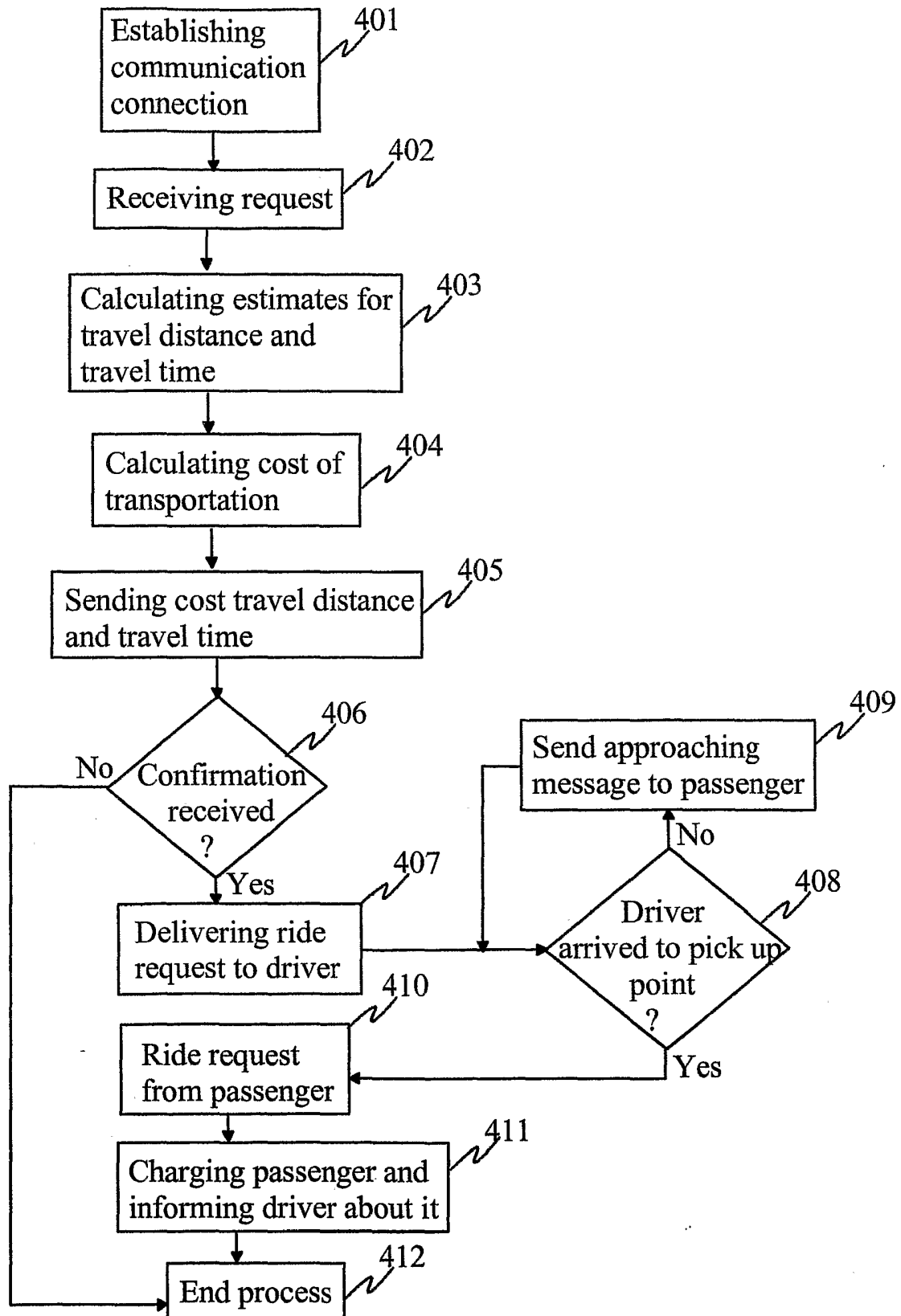


Fig. 4

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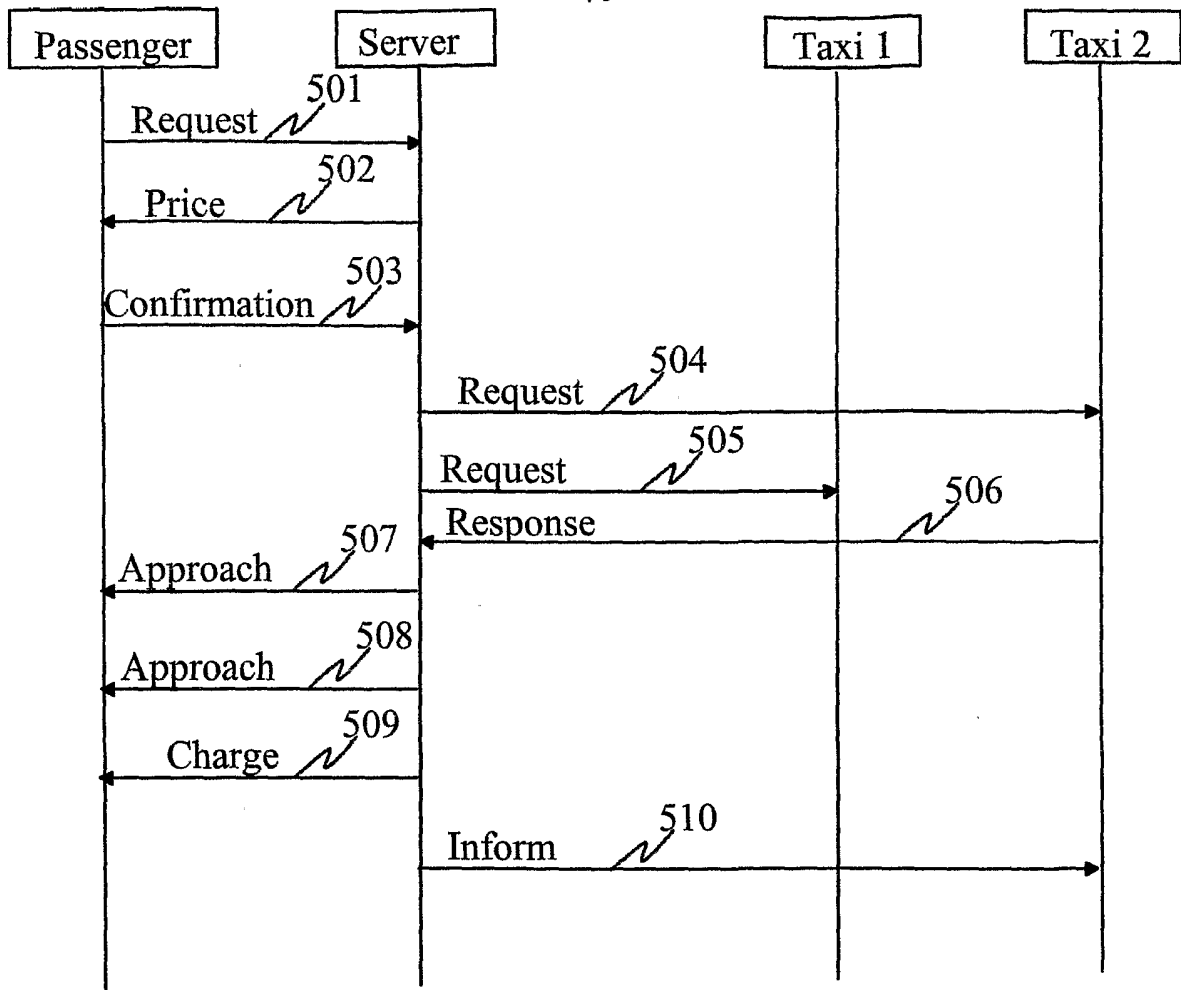


Fig. 5

INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 2004/000500

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: G06F 17/60, G08G 1/123

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI,EPO-INTERNAL,PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol.2002,no.07, 3 July 2002 (2002-07-03) & JP 2002-074119 A (JRS:KK), 15 March 2002 (2002-03-05)	1-7,9-16,18
Y	--	8,17
Y	PATENT ABSTRACTS OF JAPAN, vol.2003,no.03, 5 May 2003 (2003-05-05) & JP 2002-334395 A (YAZAKI CORP) 22 November 2002 (2002-11-22)	8,17
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☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:

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INTERNATIONAL SEARCH REPORT

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR 2782814 A1 (BRAUNWALD PIERRE-FR.), 3 March 2000 (03.03.2000), abstract -----	1-18

INTERNATIONAL SEARCH REPORT

Information on patent family members

30/10/2004

International application No.

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FR 2782814 A1 03/03/2000 NONE
