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(54) System for traffic control

(57) System for interactive traffic control, wherein traffic lights (1) and the like can be influenced by vehicles (4), such as buses etc., under control of signals that are generated by said vehicles and that are received by control means (2). The disadvantage of the present system is that the installation and maintenance of detection loops is relatively expensive. The hired lines imply considerable costs, too. To prevent this, the us is now proposed of non-cord-dependent transponders (3) at fixed locations, which transmit an identification code (IDt) after reception of a call signal (IDc) transmitted by a passing vehicle, whereupon the vehicle transmits a replica of said transponder-ID to the control means (2) in a wireless way, if necessary together with an identification code (IDv) of the vehicle itself. If in addition the vehicle transmits the replica of the transponder ID and its own vehicle ID to a traffic control centre (9), then the location information of each vehicle can be updated there.

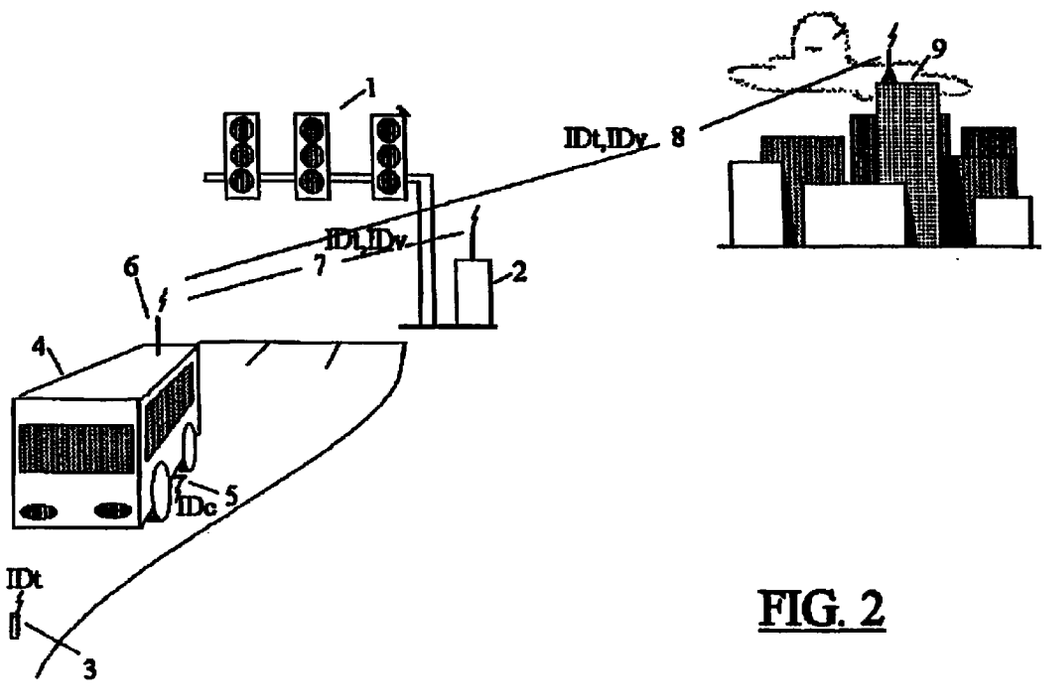

FIG. 2

EP 0 892 380 A1

Description

BACKGROUND OF THE INVENTION

The invention relates to a system for interactive traffic control, wherein traffic lights and the like can be influenced by vehicles, such as public transport vehicles.

Such systems are widely known. In the Netherlands, such a system comprises vehicle detection loops in the road surface, which are connected to a central vehicle monitoring system (e.g. the operations control room of a bus company) and/or to a local traffic control system (e.g. a local traffic light system at a crossroad) by means of hired lines.

A disadvantage of the present system is that installation and maintenance of detection loops is relatively expensive. The hired lines imply considerable costs, too.

SUMMARY OF THE INVENTION

The present invention aims at overcoming the disadvantages by a system that works with wireless components. To this end, the system according to the invention comprises wireless transponders, in stead of detection loops, i.e. transceivers that transmit an identification code (ID) in response to the reception of a (call) signal. Said transponders can operate without external power supply, since the transmission energy is withdrawn from the received signal. According to the invention, the transponder ID is received by a vehicle transceiver and transmitted in a wireless way, either together with a vehicle ID or not, and locally and/or centrally received and processed. Hereafter, the invention is explained in more detail by means of an exemplary embodiment.

EXEMPLARY EMBODIMENTS

Figure 1 shows a local traffic light system 1, controlled by a local control unit 2. Transponders 3 are situated in the road surface. The transponders 3 are compact and can easily be mounted in the road surface because of their cylindrical shape. Upon failure of a transponder, a defective one can, if desired, remain in the road surface and a new one can be mounted next to it in the road surface. The transponders 3 are maintenance free and do not need to be powered electrically, since they withdraw their electrical energy from the received signal. Buses 4 (or other vehicles which are suitable to influence traffic lights) are provided with a transponder-call transmitter 5 and a system transmitter 6 (of both transmitters only the aerials are visible in the Figure). The system transmitters can make radio contact with the control unit 2 of the local system 1 and, if necessary, also with a system receiver in a central (bus) traffic control centre 9.

The principle of operation is as follows: A bus 4 which comes driving up, transmits a (coded) call signal IDc(all) to the transponders 3. The transponders 3 comprise a code filter, whereby they can be activated only by a call signal which is passed through the filter. This is to prevent activation of the transponders by noise signals. Upon reception of the call signal IDc issued by the bus 4, the transponder 3in the immediate vicinity of the bus (the transponder transmitter of the bus has only a small range) transmits an identification code IDt(ransponder), which is specific for that transponder (the different transponder codes IDt⟨1..n⟩ have been programmed into the transponders previously). The bus receives said ID code IDt (which is specific for that single transponder and consequently for the exact location of the bus) and transmits (7) a replica of said code to the control unit 2, which subsequently effects that the bus gets "green lights" as soon as possible (in so far as the traffic light was not yet green).

If necessary, a replica of the bus ID, IDv(ehicle), is also transmitted to the control unit 2. This is usually the case at a crossroad with traffic lanes and associated traffic lights, wherein a transponder has been mounted in the road surface at an ample distance of the crossroad, where there are no traffic lanes yet, in order to increase the circulation of the public transport. This situation is shown in Figure 2. The transponder ID, IDt, now gives no information about the route to be followed by the bus and corresponding traffic light setting. For that reason, the vehicle ID, IDv, is now also transmitted to the control unit 2. The control unit 2 of Figure 2 is provided with a database with vehicle IDs (IDvs) and traffic light settings, which correspond to the different bus routes. Unit 2 reads out the desired drive-on direction of the arriving bus from the database per received IDv value and can timely set the traffic lights so that the bus can drive on unhindered. Since normally the driving route for all buses of the same bus line is the same, the IDv will preferably partly consist of a code which denotes the bus line number, so that the databases in the different control units 2 can remain of limited size. The part of the IDv which is indicative of the bus line, however, must preferably be able to be set manually by e.g. the driver (if necessary simultaneously with the setting of externally visible bus line and route indications), since buses must be able to be employed on different lines.

Preferably, as shown both in Figure 1 and Figure 2, the replica of the transponder ID, IDt, is transmitted by radio way, together with the bus ID, IDv, to the traffic control centre 9 of the bus company (8). There, it can be registered where the bus is located and the location information of each vehicle can be updated by means of the IDv and IDt. For sending the ID codes to the traffic control the radiotelephone system can be used which is already in use by the bus company for voice communication.

Claims

1. System for interactive traffic control, wherein traffic lights (1) and the like can be influenced by vehicles (4), such as public transport vehicles, under control of signals that are generated by said vehicles and that are received by control means (2), characterised by non-cord-dependent transponders (3) at fixed locations, which transmit an identification code (IDt) after reception of a call signal (IDc) transmitted by a passing vehicle, whereupon the vehicle transmits a replica of said transponder-identification code to the control means (2) in a wireless way.

2. System according to claim 1, characterised in that the vehicle furthermore transmits an identification code (IDv) of the vehicle itself to the control means (2) in a wireless way.

3. System according to claim 1 or 2, characterised in that the vehicle transmits a replica of the identification code (IDt) of the transponder (3), together with an identification code (IDv) of the vehicle (4) itself, to reception and registration means in a traffic control centre (9).

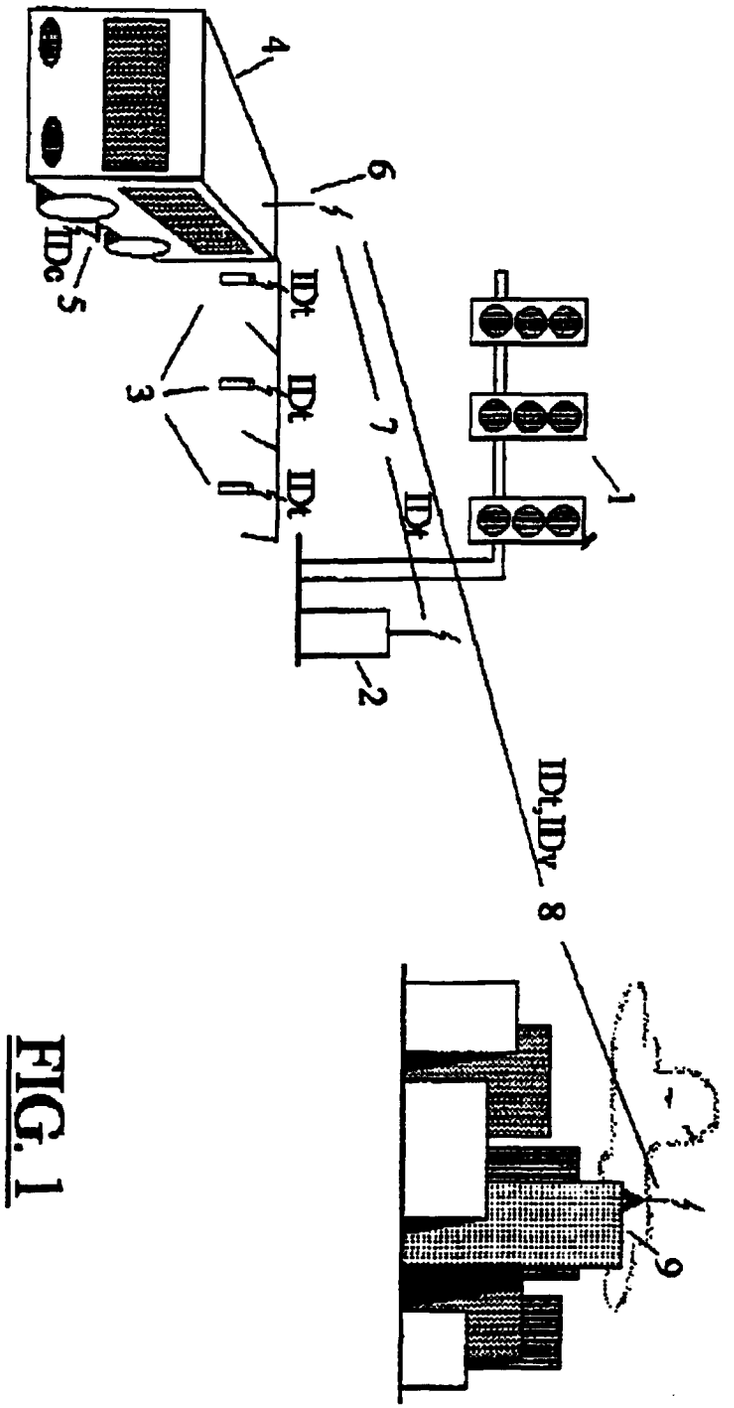

FIG. 1

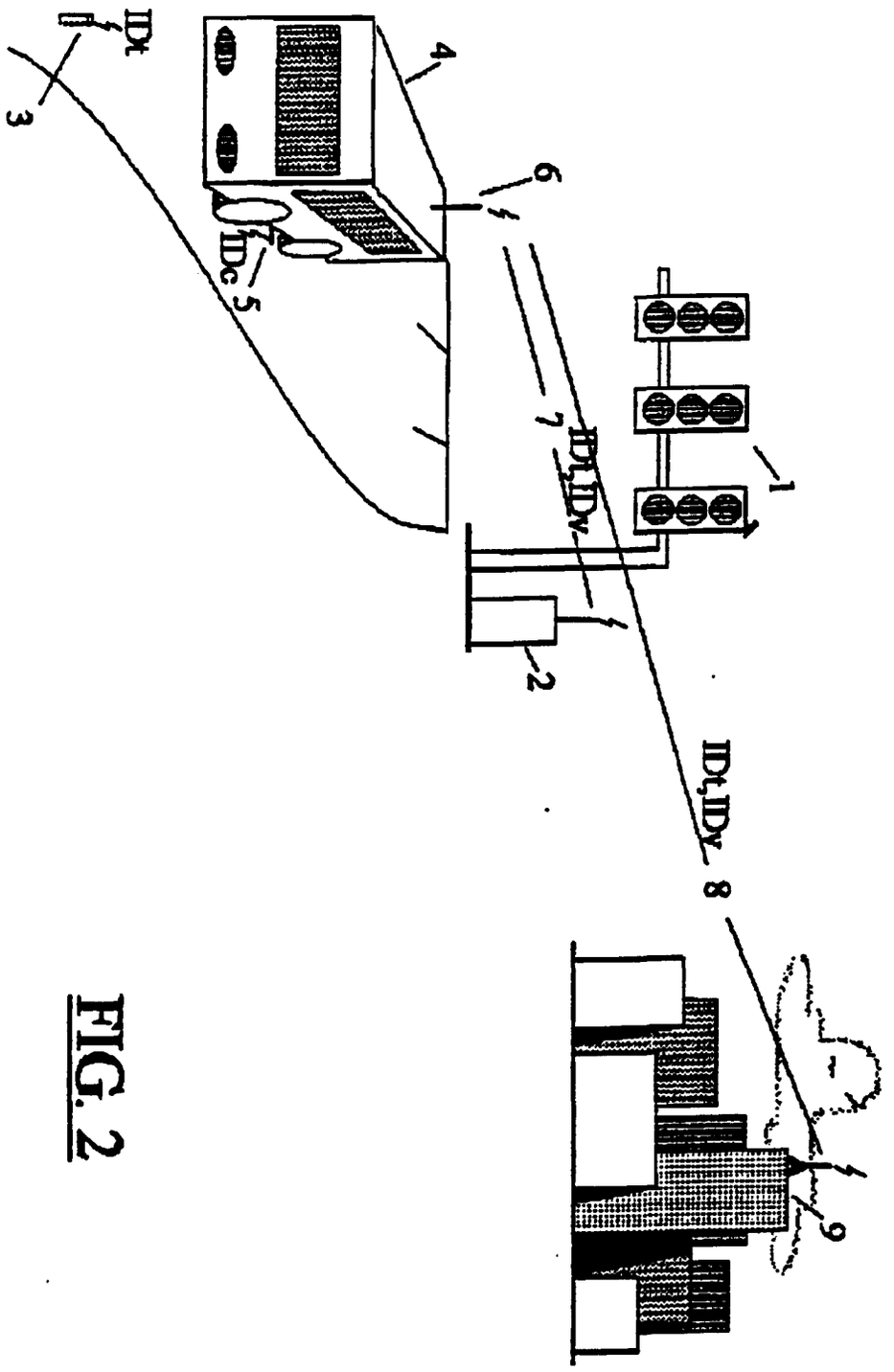

FIG. 2

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EUROPEAN SEARCH REPORT

Application Number
EP 97 20 3631

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Y	WO 94 29827 A (MINNESOTA MINING & MFG) * page 2, line 35 - page 6, line 21; figure 1 *	1-3	G08G1/087 G08G1/123
Y	GB 2 271 692 A (MARCONI GEC LTD) * page 2, line 5 - line 12 * * page 5, line 10 - line 23; figure 1 *	1-3	
A	GB 2 281 141 A (MOTOROLA GMBH) * the whole document *	1-3	
Y	NL 8 203 324 A (PHILIPS NV) * the whole document *	1-3	
A	FR 2 353 913 A (SFIM) * the whole document *	1-3	
A	US 4 321 589 A (KING FREDERICK N) * the whole document *	1	
A	FR 2 511 794 A (GUILLOT FRANCIS)		

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

G08G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	2 April 1998	Reekmans, M

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
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E : earlier patent document, but published on, or after the filing date
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