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(54) Mobile telematic station

(57) A mobile telematic station comprises a telescopic mast (2) detachably attached to a mobile trolley (1) and a control unit (14) to which a modem (15) for data transmission and radar system (7) are connected via evaluating unit (13), wherein following components are attached to the control unit (14): a unit (8) for wireless data transmission, evaluating unit (13), power supply unit (9) and at least one detecting element selected from the group comprising a camera (3), an anemometer (4), a noise monitoring unit (5) and unit (6) to monitor temperature.

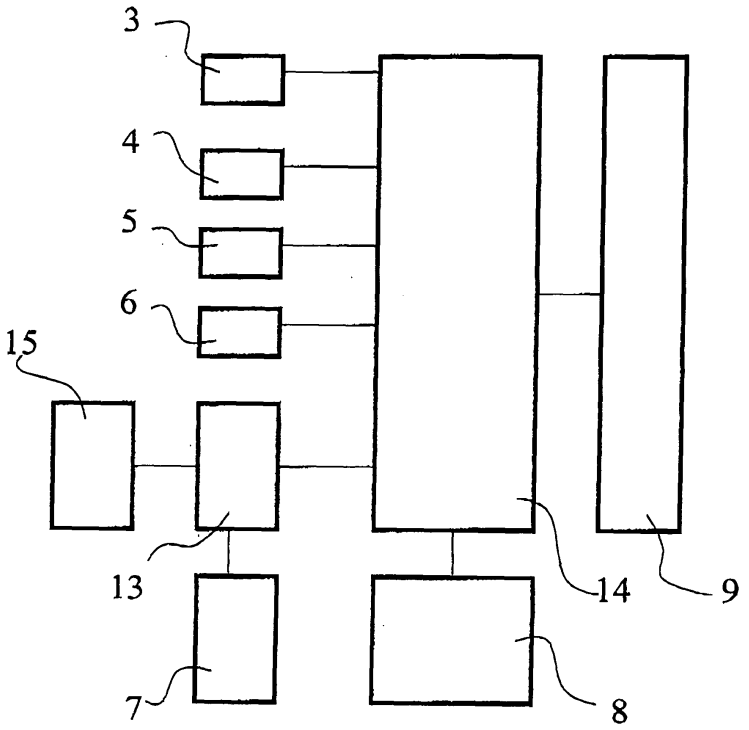

Fig. 2

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Description

Field of the invention

[0001] The invention relates to a mobile telematic station comprising a control unit to which a modem for a transmission of data and a radar system are connected via an evaluating unit.

Background of the invention

[0002] In the Czech Republic, the traffic intensity increases by approximately 3 to 4 % a year. In a great number of locations, the road capacity is drawing near to its maximum values and thus traffic congestions are a frequent phenomenon. In addition to it, many parts of the roads are broken due to a long-term use and repairs of these sites are therefore inevitable. Such repairs bring along a reduction of the throughput in the road network profile and consequently bottle-necks appear in such locations and thus another cause of traffic jams arises. Unfortunately, the traffic jams are also triggered by a large number of traffic accidents. In all the above cases, effective control of the traffic flow is indispensable to reduce the risk of road accidents, to increase the throughput of the road and to reduce driver's stress in traffic jams, which originates in long waiting times accompanied by lack of any information.

[0003] One of the possible solutions is the use of telematic means to monitor the road traffic. At present, stationary systems are known in this field, their drawback consists in a demanding installation and in a necessity to attach the system to a permanent source of electric power and to a fixed electronic data connection.

Summary of the invention

[0004] The above drawbacks are eliminated by the mobile telematic station comprising a control unit to which a modem is connected for data transmission and a radar system, wherein the essence of the invention consists in the fact that the mobile telematic station also comprises a detachable telescopic mast fitted in a mobile trolley and following components connected to the control unit: a unit for wireless data transmission, an evaluating unit, an electrical power-unit and at least one detecting element selected from the group comprising a radar system, a camera, an anemometer and a device to monitor noise and temperature.

[0005] According to a preferred embodiment of the mobile telematic station, the telescopic mast is attached to the frame of the mobile trolley with its base and in its extended condition it is anchored by means of steel ropes and the telescopic mast is fitted with holders to attach the detecting elements.

[0006] In another preferred embodiment of the mobile telematic station, the telescopic mast is fitted with locking safety means to prevent unintentional retraction of the mast when it is in an extended position.

[0007] In yet another preferred embodiment of the mobile telematic station, a car trailer is used instead of the mobile trolley.

[0008] Preferably batteries connected to rechargeable methyl alcohol fuel cells are used as an electrical power supply.

[0009] Preferably the mobile trolley is provided with telescopic legs to ensure the stability of the telematic station and/or it is equipped with a water-resisting compartment provided with a lock to store the evaluating units and/or the equipment for wireless data transmission and/or material for electrical installations and/or tools.

[0010] And, finally, in a yet another preferred embodiment of the mobile telematic station, the camera is an IP camera provided with a video-analyzer to trigger an alarm in case of atypical events.

Brief description of the drawings

[0011] The invention will be hereinafter described in respect to the enclosed drawings, wherein Fig. 1 presents a preferred embodiment of the trolley with its superstructures and Fig. 2 presents a preferred embodiment of the mobile telematic station circuitry.

Preferred embodiments of the invention

[0012] Figs. 1 and 2 show schematic views of a preferred embodiment of the mobile display system. There is a detachable telescopic mast **2** fixed to a mobile trolley **1**. A camera **3**, an anemometer **4**, a unit **5** for monitoring noise and a unit **6** for monitoring temperature are attached to the mast **2**. The mobile telematic unit is further provided with a radar system **7**, with a unit **8** for a wireless data transmission and with an electrical power supply **9**. The electrical power supply **9** is formed by batteries connected to rechargeable methyl alcohol fuel cells. The mobile trolley **1** is provided with extendable legs **10** for ensuring a stability of the display system. The mobile trolley **1** is also fitted with a water-resistant lockable compartment **11** for storing the control unit and/or the unit **8** for a wireless data transmission and/or a material for electrical installations and/or tools.

[0013] A preferred embodiment of the mobile trolley **1** is manufactured as a single axle trailer made of closed sections, hot-dip galvanized and having a hand brake and a height-adjustable shaft with an interchangeable towing assembly for a hitch ball having 50 mm in diameter and an eye for a pin having 40 mm diameter. The trailer is manufactured of rigid galvanized plate made of closed sections. The trailer has no loading surface; but it comprises a battery box, two storage batteries and an automatic battery charger, a charging socket at the side wall of the battery box and a recharging cable. A methyl alcohol fuel cells based generator is firmly attached to the trailer. Adjustment means, a control unit, modems and material for electrical installations are kept in a hollow

box with a lock and a lid which can be opened in the upward direction.

[0014] A preferred embodiment comprises such a telescopic extensible mast **2** which is similar to the mast currently used in a great extent in most fire-fighting units. This telescopic mast **2** is pneumatically extensible and it reaches a height of seven meters (necessary to obtain exact data from the traffic or from the cameras). This height will be even slightly higher, as the telescopic mast **2** comprises a remotely controlled robotic head. The telescopic mast **2** is attached with its base to the frame of the mobile trolley **1** and, in the extended condition, it is anchored by means of steel ropes **12**. The telescopic mast **2** is installed on the trailer or it may be easily installed on a passenger car or a lorry.

[0015] According to a preferred embodiment, the radar system **7** is based on the Doppler principle operating on the frequency of 24 GHz. Using patented technology, it has the ability of a fast configuration and it is suitable for detecting vehicles on roads of all classes. The sensor is suitable for use in mobile applications or in on-line applications, e.g. in linear traffic control. It may be remotely control, configured and upgraded. The radar system **7** is connected to the control unit **14** via an evaluating unit **13**. The evaluating unit **13** is connected to a modem **15** for data transmission.

[0016] As the control unit **14** of the system, a resistant notebook was chosen having a touch sensitive screen and a high resistance in compliance with military standards. The notebook can be connected to almost any wireless network. Thanks to its resistance and high communication flexibility, the device is absolutely suitable for an implementation into a trailer which will be subjected to various climatic and other effects, for example in the course of transport. The device may be remotely controlled by means of a touch sensitive display designed as a highly luminous display and its visibility is therefore not reduced even when exposed to direct sunlight. The notebook was specially developed for mobile outdoor applications and its power output was therefore considerably reduced in comparison with standard computers.

[0017] The unit **9** for wireless data transmission and reception is provided with various technological features for wireless data transmission, namely for the transmission of data within a distance of up to 20 km, transmission of data into internet network and for the check-up of localization, for example by a GPS system. Up to a distance of 20 km, the station is equipped with WiFi technology, thanks to which the station can communicate with mobile telematic stations, which detect vehicles in real time and consequently send the obtained information to the evaluating unit, which is located on the trailer with display panels by means of Bluetooth technology - so there is a possibility of communication by means of PDA without having to open the compartment on the trailer and by means of radio data transmission. It is also possible to transmit data even from more distant locations without using the GSM network. This property offers the possibility of transmitting data from by-pass routes to the displaying devices on highways to inform drivers about actual arrival times from the by-pass routes.

[0018] A reliable, mobile power source is used as a source of energy. It is a methanol burning device. In course of the combustion, no harmful substances are produced and the device is ready to operate in the so-called hybrid mode in combination with solar collectors. The device is very quiet and safe in comparison to power generators of smaller dimensions.

[0019] The equipment recharges the batteries, if they reach the pre-set limits. The battery status is displayed on any connected computer. The equipment also comprises a GPS device and a GPRS modem for remote communication. The methyl alcohol generator operates under any climatic conditions.

[0020] For the purpose of video imaging, IP camera **3** was chosen with a built-in video analyser to launch alarm in case of unusual events, as for example a stationary vehicle, an oncoming vehicle etc. The camera **3** was selected for the purpose of using the state-of-the-art video compression for the transfer of data of lower resolution even via the wireless technology CDMA and GRPS. The IP technology enables to follow the image from any location of the installation in any location around the world provided with internet access.

[0021] The data transmission by means of wireless technology is possible thanks to the video format - MPEG-4. A possibility of a remote control of the camera **3** and of zooming is implied.

[0022] The camera **3** used in the preferred embodiment had following characteristics: Virtual rotation/inclination/zooming in the main display and four user-defined areas in a standard JPEG format, digital image stabilization, flexibility of the whole solution, easy installation and operation, which is a substantial feature of mobile applications, adjustable resolution and frame frequency, possible data transfer by means of WiFi.

[0023] The modular mobile telematic station is a system providing adequate data sources offering ample use in traffic. It may be used for providing on-line traffic information in critical locations, where it can act as a substitute of missing stationary telematic infrastructure or it may temporarily collect data regarding the respective traffic situation as well as meteorological information in a given profile of road network. Similar systems can also find their application in sites of working zones for video supervision or they may form a component part of more complex control systems etc. Another suitable use seems to be in by-pass routes, seasonal routes or in case of special activities.

[0024] The development of telematic stations is oriented to systems that may be easily relocated and adjusted so that the requirements laid on the operating staff in the area of installation might be reduced to a minimum regarding the installation.

[0025] Mobile trailer **1** with detectors is provided with wireless data transmission technologies with the possi-

bility of transmitting images from the location in which the system is employed. The station is IP-addressable and it can offer data in various formats, which can be specified according to local requirements. At the same time, it communicates with mobile display units to enable change of pictograms, messages. A GPS unit for supervising the localisation also forms part of the system.

[0026] A power supply is formed by the batteries, which will be recharged by a hybrid remotely controlled system generating electrical energy by means of methyl alcohol fuel elements and solar panels. Such a power supply may extend the working time of the system without any attendance for up to 40 days.

[0027] Advantages of the telematic station consist in the possibility of a ready and easy launching of the system into operation, in the video supervision of the working zones and in the fact that they may form part of larger systems to control the traffic flow with the possibility of detecting traffic accidents in critical locations. Further advantages consist in the video supervision of the traffic operation, wireless communication with other stations, in the traffic census, data regarding the road surface temperature, air temperature, wind strength and direction and the noise.

[0028] In certain applications, precise information regarding traffic in a special segment of the road network may be obtained.

[0029] It is known that if the individual sensors are located about 500 to 1,500 m from each other, it is possible to obtain absolutely exact information, such as model of the traffic flow, arrival times, data regarding delay, system detecting traffic accidents etc., which can be used for a sophisticated linear control of the traffic flow by means of ITS (Intelligent Transportation System).

[0030] An active management of the traffic flow is implemented as a static application, which is permanently installed in a definite section of the road network, mostly in highways and in the neighbourhood of big cities. The designed mobile system can be theoretically operated as a mobile active management of the traffic flow in a small section of the road system, which can be variably complemented by required telematic elements and it is relatively easy to transfer it to other required locations.

[0031] The mobile telematic applications are usually used in locations lacking active management of the traffic flow or they are used as its effective complement. In certain segments they form a sort of a superstructure, which is flexibly available to offer actual information to the drivers. It is especially the case of the working zones, in which the need of real information is constantly increasing due to the ever-increasing traffic intensity. It is understandable that especially the working zones are seldom fitted with permanent detectors in spite of the fact that they form a critical section of the road network.

Industrial use

[0032] The present invention can be used to provide detection systems to control in particular the automobile traffic.

Claims

1. A mobile telematic station provided with a control unit (14) to which a modem (15) for data transmission and a radar system (7) are connected via an evaluating unit (13), **characterised in that** it further comprises a telescopic mast (2) detachably attached in a mobile trolley (1) and following components connected to the control unit (14): a unit (8) for wireless data transmission, an evaluating unit (13), a power supply (9) and at least one detecting element selected from the group comprising a camera (3), an anemometer (4), a noise monitoring unit (5) and a unit (6) for monitoring temperature.

2. The mobile telematic station according to claim 1, **characterised in that** the telescopic mast (2) is attached to the frame of the mobile trolley (1) with its foot and in its extended condition it is anchored by means of steel ropes (12).

3. The mobile telematic station according to any of the preceding claims, **characterised in that** the telescopic mast (2) is provided with holders for attaching the detecting elements.

4. The mobile telematic station according to any of the preceding claims, **characterised in that** the telescopic mast (2) is provided with locking safety means for preventing accidental retraction of the telescopic mast (2) when in its extended position.

5. The mobile telematic station according to any of the preceding claims, **characterised in that** the mobile trolley (1) is a car trailer.

6. The mobile telematic station according to any of the preceding claims, **characterised in that** the power supply (9) is formed by batteries connected to methyl alcohol fuel cells.

7. The mobile telematic station according to any of the preceding claims, **characterised in that** the mobile trolley (1) is fitted with extensible legs (10) for ensuring stability of the telematic station.

8. The mobile telematic station according to any of the preceding claims, **characterised in that** the mobile trolley (1) is provided with a lockable water-resisting compartment (11) for storing of the evaluating unit (13) and/or of the unit (8) for wireless data transmission and/or of wiring material and/or tools.

9. The mobile telematic station according to any of the

preceding claims, **characterised in that** the camera (3) is an IP camera.

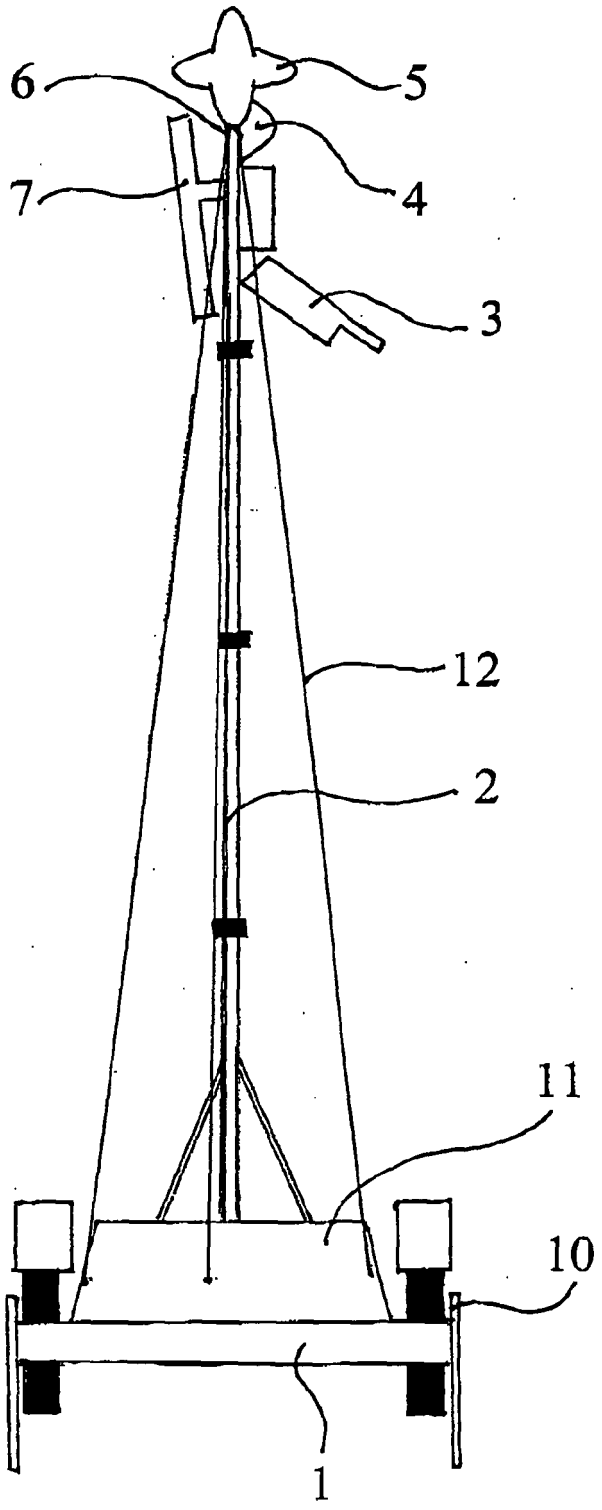

Fig. 1

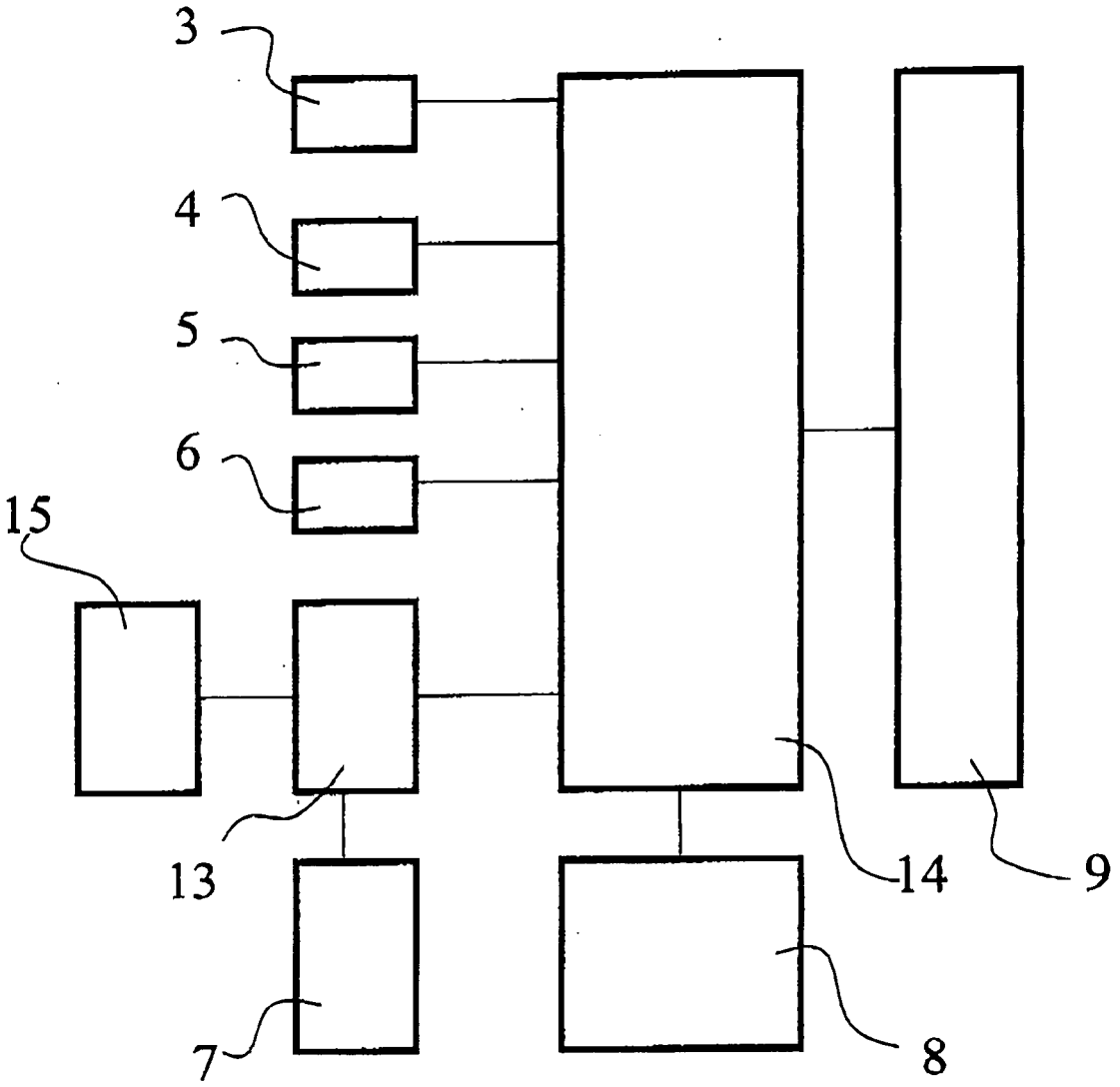

Fig. 2

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EUROPEAN SEARCH REPORT

Application Number
EP 10 46 6003

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	GB 2 399 715 A (BELL MALCOLM [GB]) 22 September 2004 (2004-09-22) * page 3, line 14 - line 24; figure 2 * * page 4, line 17 - line 21 * -----	1-9	INV. G08G1/04
Y	US 4 815 757 A (HAMILTON MARK L [US]) 28 March 1989 (1989-03-28) * figure 5 * -----	1-9	
A	DE 296 03 291 U1 (JT ELEKTRONIK GMBH [DE]) 6 February 1997 (1997-02-06) * the whole document * -----	1-9	
			TECHNICAL FIELDS SEARCHED (IPC) G08G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	14 December 2010	Crêchet, Patrick

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 10 46 6003

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14-12-2010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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US 4815757 A	28-03-1989	NONE	
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82