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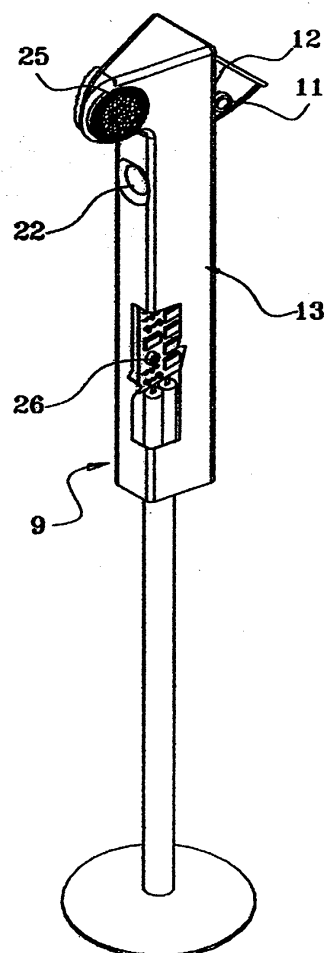
(54) **Traffic control system for signalling timely any obstruction on the road**

(57) Traffic control system for roads and motorways, adapted to display the traffic on particular routes by signalling the situation to suitable checking boards.

The system comprises a plurality of detectors (9) adapted to display the traffic situation and which can be identified singularly with an own code and are supported on containers (23) having preferably the form of kerb-stone or road signalizations.

These detectors are co-operating with each enabled checking board, in such a way that on each detected traffic situation it is found each detector (9) involved on the visual display of the same situation, in order to perform the display from the checking board.

**figure 5**



## Description

**[0001]** The invention relates to a control system for roads and motorways adapted to display the traffic on determinate road and motorway routes, by signalling timely the traffic situation to suitable checking boards such for instance one or more operative rooms.

**[0002]** Control systems for checking the traffic on roads and motorways are known, which are constituted by towers or trestles equipped with television cameras positioned on particularly critical points for the road and motorways traffic, in order to signal timely and continuously the traffic situation to suitable traffic checking boards operatively connected to such control systems.

**[0003]** Still being operating in a satisfactory manner, such systems are displaying only partially and limitedly the traffic on determinate routes of the roads and motorways, and also need the use of various very expensive apparatuses.

**[0004]** However, in the practice for displaying correctly a traffic situation, it should be necessary to display it directly on the interested routes, for example to evaluate if an accident has been occurred, so as to be able to come into succour in a time as short as possible with one or more maintenance vehicles and to restore the road condition and/or with ambulances to rescue any wounded man. Moreover, such control systems are not able sometimes to display dangerous situations for persons and vehicles, such as for instance throwing stones from overpasses on to the moving vehicles or from the road border or dangerous drive, motor-vehicle competitions etc., which may compromise the person's safety and damage the vehicles. Therefore, it would be advisable and is the object of the present invention, to eliminate the drawbacks and limits of the traffic control systems which are currently used, by means of a traffic control system adapted to display continuously and directly some road and motorway routes, by informing timely on the traffic situation the checking boards which are operatively connected with the same control system.

**[0005]** This control system is made with the constructive characteristics substantially described, with particular reference to the enclosed patent claims.

**[0006]** The invention will be better understood from the following description, given solely by way of a non-limitative example and with reference to the accompanying drawings in which :

- Fig. 1 shows the block diagram of the control system according to the invention;
- Fig. 2 shows the block diagram of an electronic component of the control system of Fig. 1, connected to a traffic detecting unit on a road ;
- Fig. 3 shows a front perspective view of a container of the control system according to the invention ;
- Fig. 4 shows a rear perspective view of the container of Fig. 3 ;
- Fig. 5 shows a front perspective view of the same

container of both Figs. 3 and 4, which is coupled with a further road traffic control system ;

- Fig. 6 shows a rear perspective view of the container of Fig. 5 ;
- Fig. 7 shows a perspective view of a portion of motorway equipped with the system according to the invention.

**[0007]** The above mentioned Figures schematically illustrate the different constructive components of the traffic control system 8 for roads and motorways in accordance to the invention, adapted to display the road traffic on particular road and motorway routes, by signalling timely the traffic situation to suitable checking boards such as for example one or more adequate operative rooms.

**[0008]** Such control system is substantially constituted by a plurality of detecting units 9, see Fig. 1, which are formed by one or more electronic displaying units 10 made preferably like television cameras, and operatively connected to an electronic control circuit constituted as it will be described later and formed by a plurality of electronic components, introduced on a corresponding series of containers 12 shaped preferably with the form of road signalizations or like a kerbstone, said displaying units being connected to an equipped operative room, in order to permit the personnel to display at will any point of the road which can be reached by the system television units, in order to detect the instantaneous situation of the road and motorway traffic.

**[0009]** Such television cameras 10 are connected, by means of a central control unit 14, with radio receiver and emitter units of radio signals formed by at least an emitting unit 15 and a receiving unit 16, performing the function to emit and receive signals with respect to a central operative room, and this transmission and reception of electromagnetic signals normally occurs either directly by a cable or by appropriate radio links (not shown), by Internet or by satellite or other suitable radio transmitter and receiver systems. Such central control unit is arranged to control the different circuital components of the control system, by processing all the inputted and outputted coded informations, and also recognizing the inputted signals based on their codes, so as to control adequately the various circuital components, as well as checking if the interlocutor with whom the information exchange occurs, is enabled or not enabled to be connected to the control system, and finally by signalling the presence of any operative fault or failure of the same system.

**[0010]** The emitting units 15 are able to transmit both audio and television signals, such as for example images coded in a digital mode, or also on other adequate modes, thus without departing from the protection sphere of the present invention. In turn, the receiving units 16 are arranged to receive radio signals which are decoded and used for activating the television cameras during operation thereof. Preferably, each detector 9 in-

cludes in its interior at least a sound alarm unit 21, adapted to emit a signal such as for example an audio signal when the television cameras are activated, so as to warn any person situated on the operative range thereof.

**[0011]** All the electronic components constituting the detector 9, besides being supplied from outer electric energy sources which are not indicated, are provided preferably with at least an autonomous supply voltage composed of at least a photosensitive cells panel 17 which, by interacting with a charge control unit 18 connected with a set of electric voltage supply batteries 19, provides to guarantee a steady maximum charge to such batteries, with consequent continuous electric supply of the detector 9 at any operative condition thereof. Each detector 9 is associated with an appropriate identifying code, in a manner to permit the identification thereof from the operative room, with consequent possibility of activating any detector and therefore, if this is the case, also a television camera associated therewith. Each container 13, see Figs. 3 and 4, is provided with a box-like element 12 supporting the objectives 11 of the television cameras 10 and can be operated by means of the control means 20 and, therefore, by an adequate mechanism (not shown) which in case can be operated from the operative room, so as to be movable from a protected position thereof to an exposed position thereof, visible from the Figs. 3 and 4, so as to displace the objectives 11 in a manner to be turned toward the zones to be displayed, and to return then, when the display isn't requested, to a rest position in the interior of the container 13, with consequent protection of the objectives from the dirt and possible damagings. Obviously, all the objectives 11 can be turned toward the zones to be displayed also in different manners, thus without departing from the protection sphere of the invention. The present control system lends itself advantageously to be used also in combination with a traffic control system described and claimed with the Italian patent application n. TV2000A000063, filed on 1.6.2000 by the same Applicants.

**[0012]** Such control system is constituted substantially by a plurality of autonomous vehicle detecting units, disposed spaced away along the road and each comprising at least a control plant having an electric supply voltage included therein, which is co-operating with similar control plants of the other detecting units, and composed of sensor means of the presence of motor-vehicles, adapted to generate electromagnetic, luminous or sound signals etc.. in presence of motor-vehicles, and formed by an emitting unit and a receiving unit of such signals, timer means adapted to receive the signals coming from the sensor means and to let to pass only a signal of continuous type and longer than a pre-established time, on the condition of traffic jam, and central control means formed by a main central control unit, adapted to receive the signals from the timer means and to activate alarm means on the condition of traffic jam, as well as adapted to reset themselves when such sig-

nals are ceased, said control plant being also adapted to control the alarm means in the case of receiving signals from the corresponding control plants of other detecting units on the condition of traffic jam.

**[0013]** Such central control means, also, are connected to radio-transmitter units and radio-receiver units and, in the case of traffic jam detected by the sensor means, provide to generate a control signal which activates the radio-transmitter units, whose signal is transmitted to the radio-receiver units of detecting units adjacent thereto, which in turn transmit a corresponding impulse to the associated central control means for activating their own alarm means.

**[0014]** For a better understanding of the structural composition and operation of this control system, visible from the Fig. 2, reference is made to said patent application.

**[0015]** The control system described by the patent application n. TV2000A000063 can be adapted to the present control system, so as to be used and operated in combination therewith, by utilizing (see Fig. 2) the same above mentioned components of the preceding control system, namely the sensor means 22 of presence of motor-vehicles, timer means 23, central control means 24, alarm means 25, 26, an emitting unit 27, 28 (respectively with high and low range of diffusion), and a receiving unit 29, 30 (respectively with high and low range of reception). However, in this case the emitting units and the receiving units are arranged in a different manner with respect to the corresponding emitting units and receiving units of the preceding patent application, so as to be compatible with the emitting unit 15 and receiving unit 16 of the present traffic control system, in order to be able to transmit and to receive coded informations with respect to this latter, which are able to recognize and activate only the detectors 9 of interest. Then, in this case as soon as the presence sensor 22 has detected a traffic jam, it provides to transmit the relative information, through the timer means 23, to the central control unit 24 and this latter provides to activate the alarm means 25 (or 26), by signalling therefore the danger situation to the adjacent units through the emitting unit 27, and such signal is received through the relative receiver 30 of the same units adjacent thereto.

**[0016]** Besides, the emitting unit 28 provides in turn to transmit by cable or by ether, as described in advance, an alarm signal to the devoted operative room, which signal includes the recognizing code of the activated control system, and such signal is detected from the operative room which finds this control system and provides for transmitting, manually or automatically, a signal coded with such recognizing code to the different detectors 9. This coded signal is received and recognized only by the receiving unit 29 of the control system in accordance to the invention which corresponds to the transmitted code, which then will be detected and activated. In such a way, the relative central control unit 24 will operate, by means of the control means 20 of the

actuator, the displacement of the box-like element 12 from its retracted position to its extracted position, with consequent orientation of the relative television camera toward the area to be displayed and transmission through the emitting unit 15 of the control system of interest of the operative room and in this manner in this latter there can be displayed the images and localized the exact point of the road portion being displayed and thereby detected in a very short time the situation and there can be decided in a time as short as possible the interventions to be done in the area of interest.

**[0017]** By turning now to the Fig. 7, it is noted a road portion being watched through the detectors 9 in accordance to the invention, of which the detectors 911 are not provided with television cameras while the detectors 91 are provided with television cameras.

**[0018]** In this Figure, there are noted the shot ranges 31, 32 and 33 of the various television cameras, of which the range 31 lets it to reveal that in this case a single detector 9 and a single television camera are activated, for taking and displaying an accident occurred on a road, while the shot ranges 32 and 33 let it to reveal that a detector 9 provided with two television cameras has been activated, for performing the same traffic control function.

## Claims

1. Traffic control system for road and motorways, adapted to display the road traffic on particular road and motorway routes, by signalling timely the traffic situation to suitable checking boards such as for example one or more operative rooms, which can be used in combination with possible autonomous motor-vehicle detecting units, as described in the patent application for invention n. TV2000A000063, filed on 1.6.2000 by the same Applicants, each comprising sensor means of the presence of motor-vehicles adapted to generate electromagnetic, luminous, sound signals etc.. in presence of motor-vehicles, and formed by an emitting unit and a receiving unit of such signals, timer means adapted to receive the signals coming from the sensor means and to let to pass only a signal of continuous type and longer than a pre-established time, on the condition of traffic jam, and central control means formed by a main central control unit, adapted to receive the signals from said timer means and to activate alarm means on the condition of traffic jam, as well as adapted to reset themselves when such signals are ceased, said central control means being also adapted to control said alarm means in the case of receiving signals from other detecting units, on the condition of traffic jam, said central control means being connected to transmitter units and receiver units and, in the case of traffic jam detected by said sensor means, being adapted to generate

a control signal which activates the transmitter units, whose signal is transmitted to the receiver units of detecting units adjacent thereto, which in turn transmit a corresponding impulse to the associated central control means for activating their own alarm means, **characterized by** a plurality of detectors (9) adapted to display the traffic situation and which can be identified with an own code as well as supported by corresponding containers (13) shaped preferably in the form of road signalizations or kerbstones, said detectors (9) co-operating with each operative room in a manner that on each traffic situation respectively detected by said detectors (9) or said possible autonomous detecting units and signalled to the relative operative room, each detector (9) involved in the visual detection of such traffic situation is found, in order to display the images of the same situation by means of the relative operative room.

2. Control system according to claim 1, **characterized in that** each detector (9) is constituted by at least an electronic displaying unit, made preferably like a television camera (10) and by an electronic circuit connected to an outer or inner electric voltage supply (17, 18, 19) and said display unit (10) and formed by a central control unit (13), emitting units (15) and receiving units (16) of informations, which are co-operating with the operative room, as well as constituted by alarm means adapted to emit an alarm signal when each detector (9) is activated, said central control unit (13) being arranged to control all the circuital components of the control system, by processing the inputted and outputted coded informations, by recognizing also the inputted coded signals and checking if the interlocutor with whom the information exchange occurs is enabled or not enabled to be connected to the control system, and finally by signalling the presence of any possible operative fault or failure, said central control unit (13) being activated in presence of coded signals received from the operative room through said receiving units (16), in presence of a determinate traffic situation to be displayed, in order to control said electronic display unit (10) to display this traffic situation, and being also adapted to transmit the informations corresponding to such traffic situation to the operative room, through said emitting units (15).
3. Control system according to claim 2, **characterized in that** said emitting units (15) and said receiving units (16) are arranged to transmit and to receive the signals either directly by cable or by radio links, by Internet connection or by satellite etc.. with the operative room.
4. Control system according to claim 3, **characterized**

**in that** each container (13) is provided with at least an element (12) for supporting at least an objective (11) of the television cameras (10), and which can be operated by means of per se known means from an extracted position thereof so as to position said objective (11) toward the zones to be displayed, to a retracted position thereof in the interior of said container (13) when the display isn't requested. 5

5. Control system according to the preceding claims, **characterized in that** said emitting units (15 ; 27, 28) and said receiving units (16 ; 29, 30) of both the control systems are so arranged as to be compatible with each other, in order to transmit and to receive coded informations of the detected traffic situation. 10 15

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figure 1

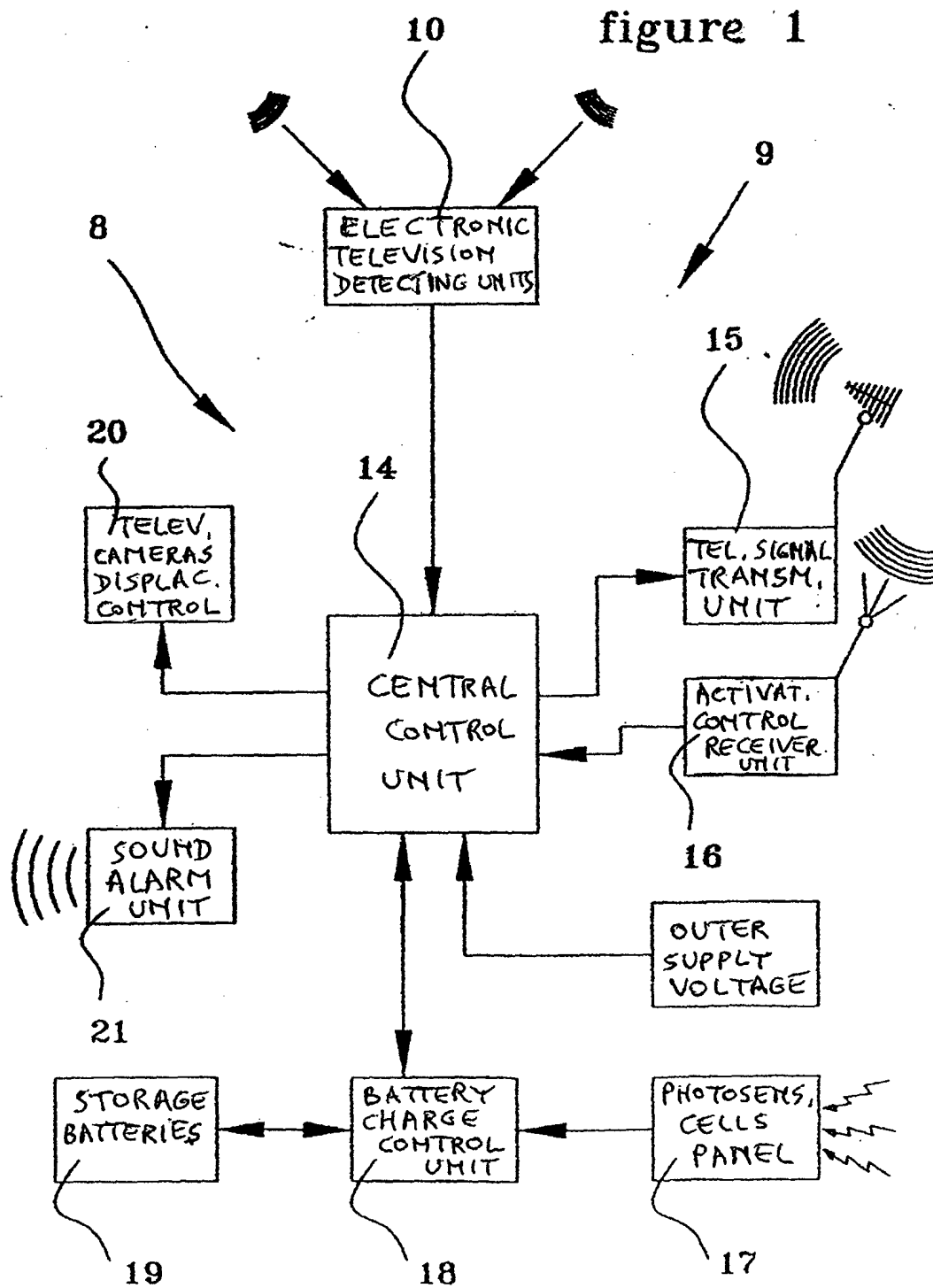


figure 2

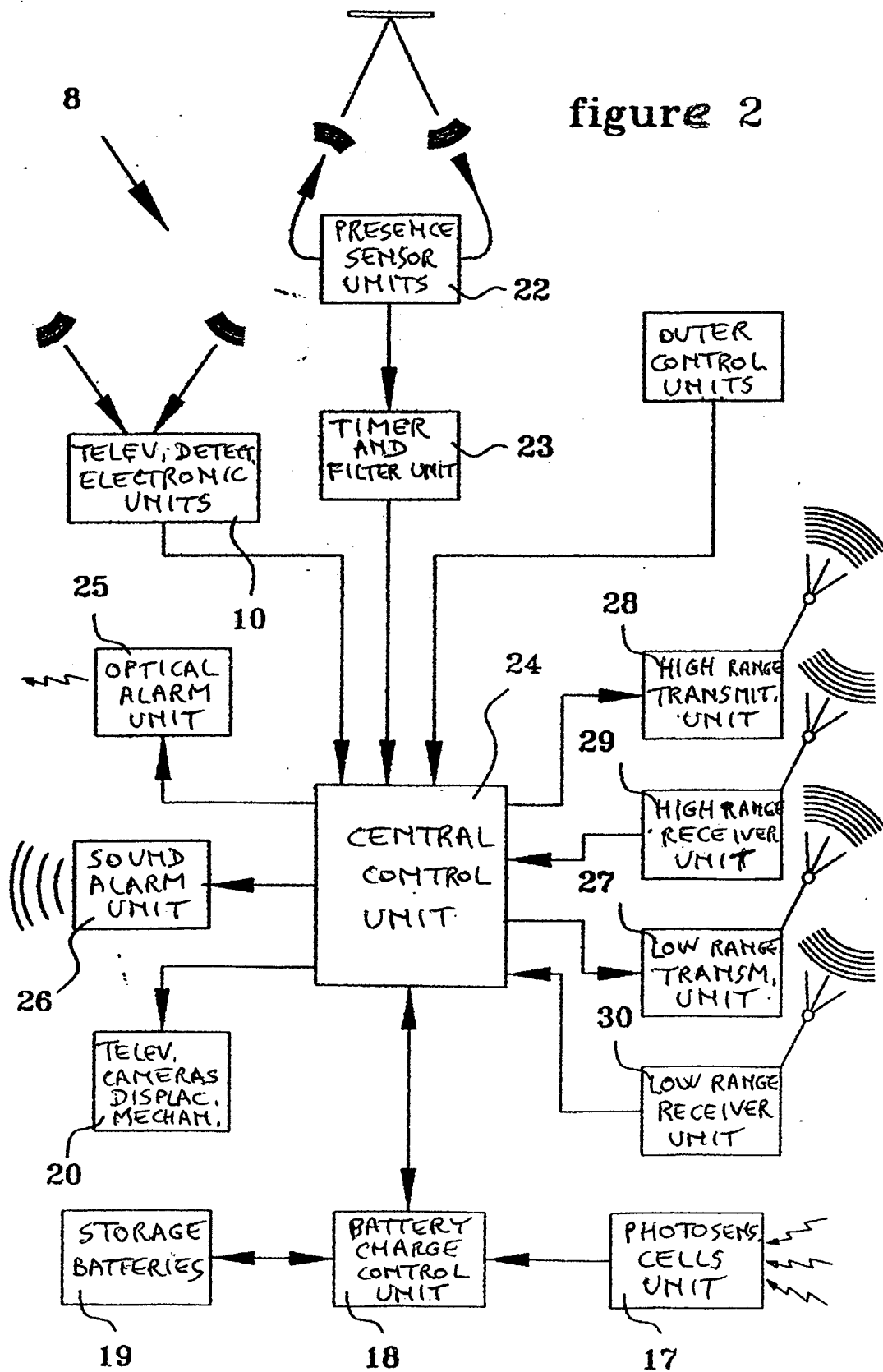


figure 3

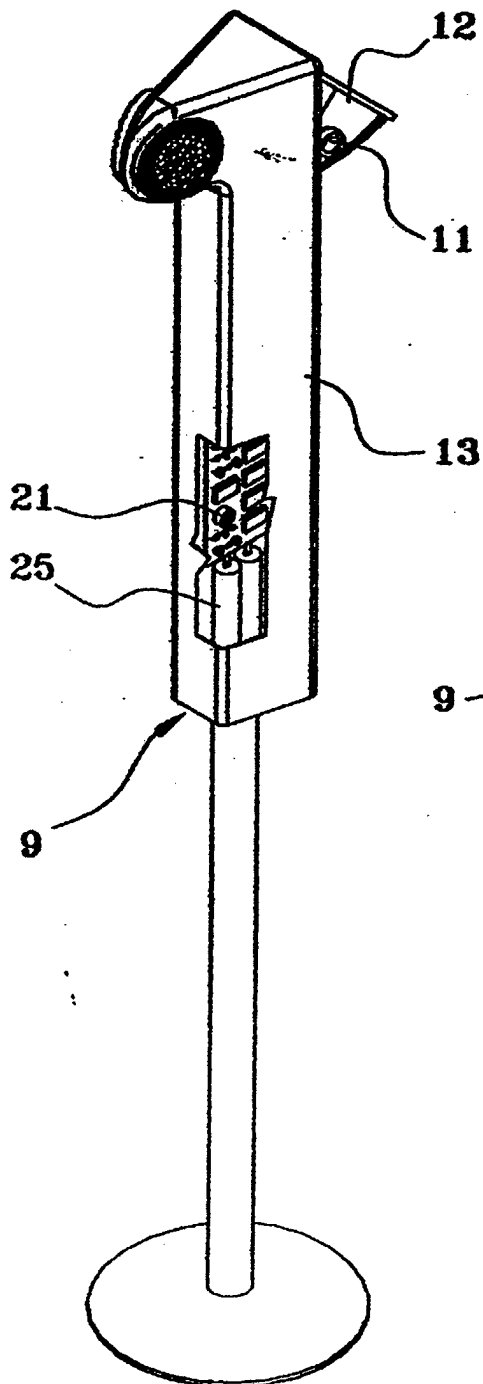


figure 4

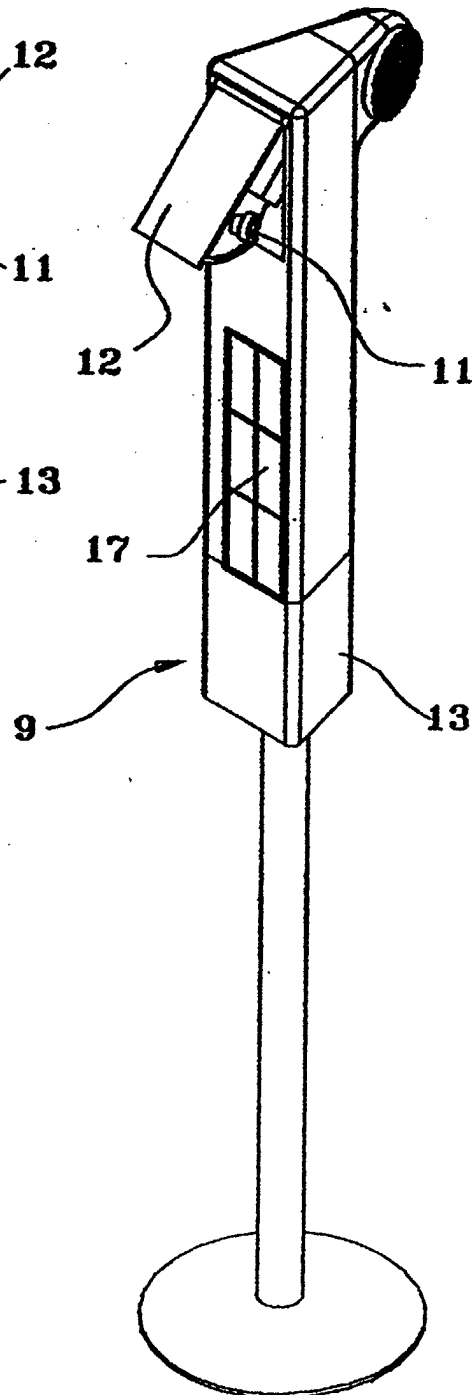
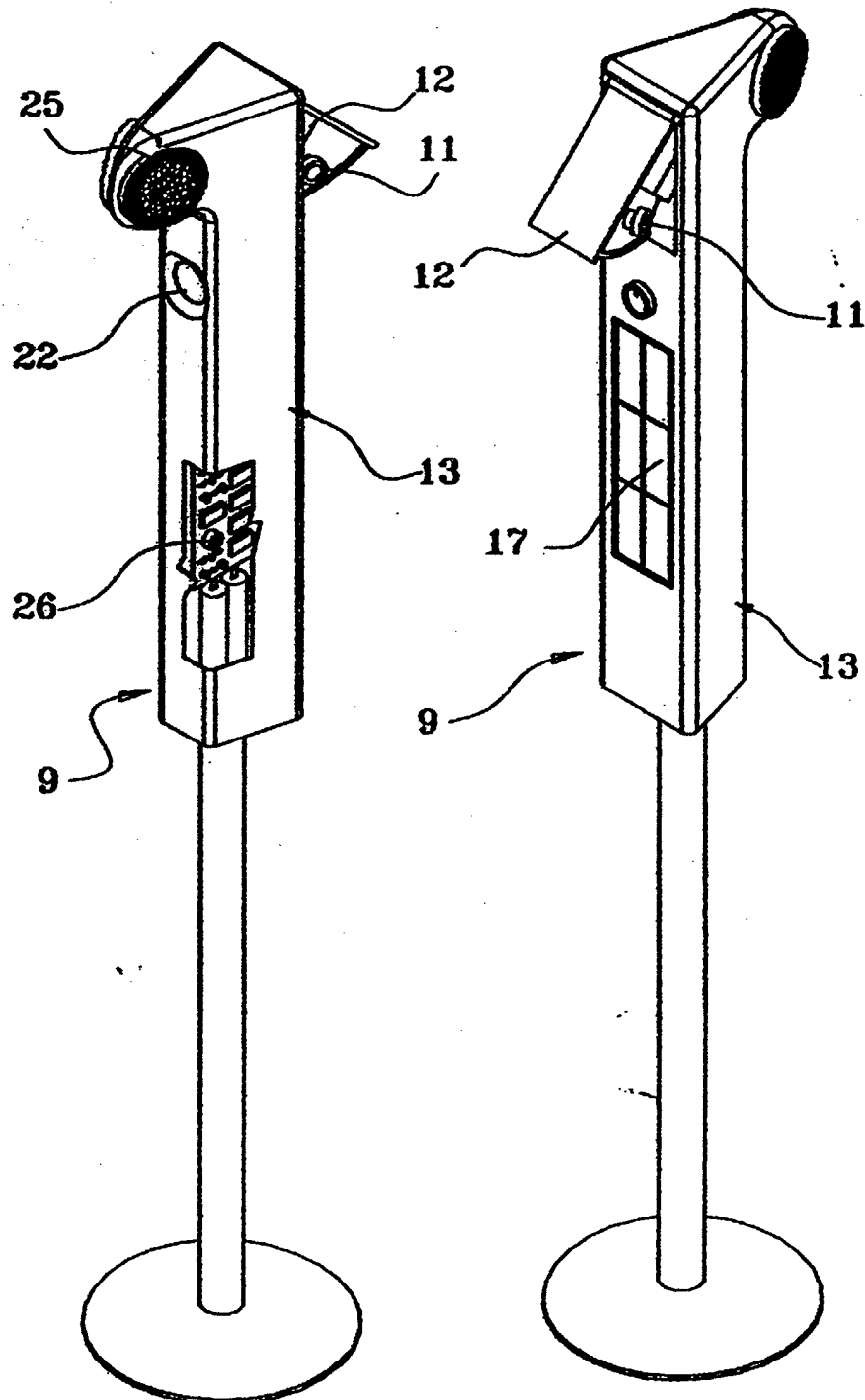
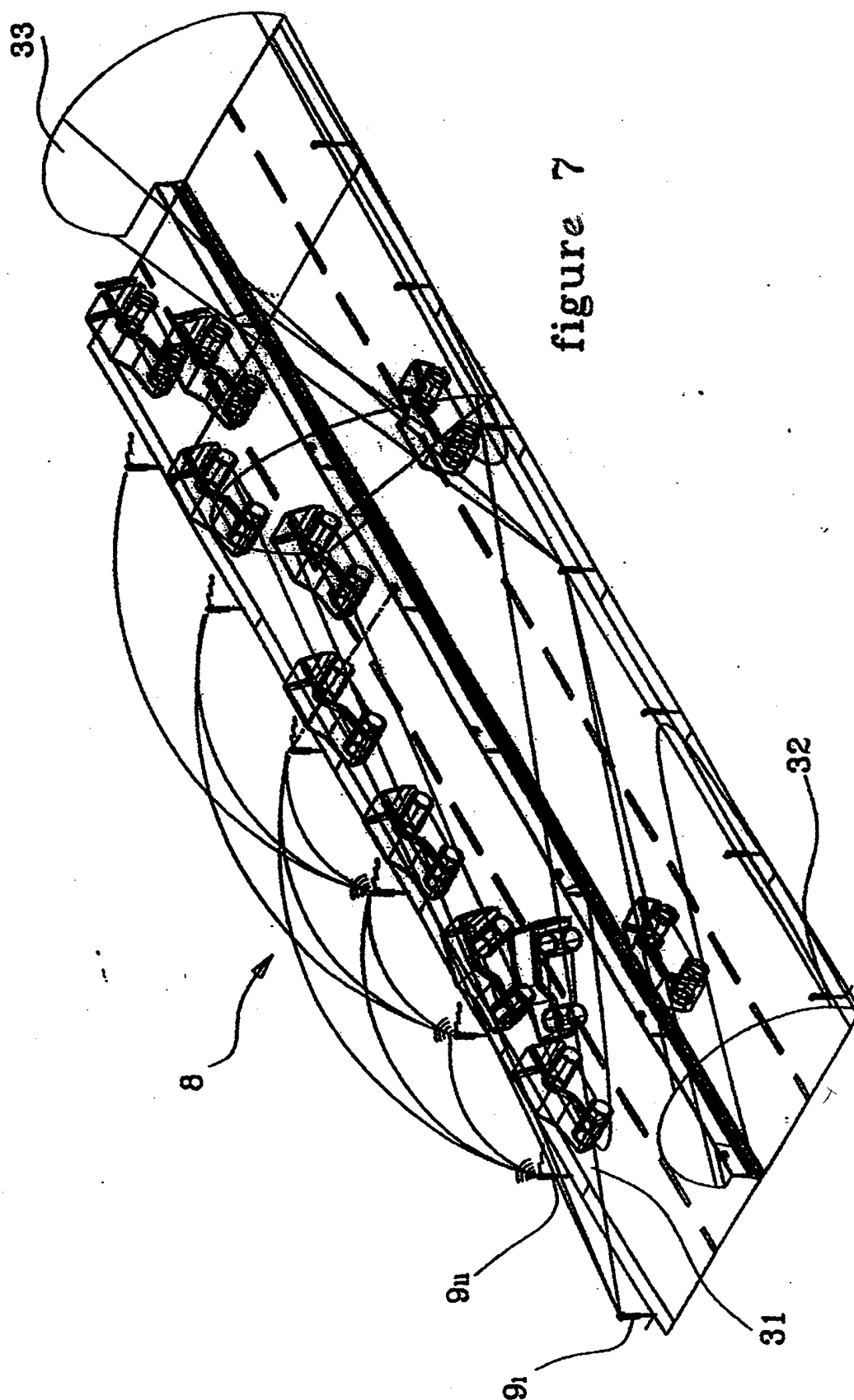




figure 5

figure 6







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Place of search <b>THE HAGUE</b>		Date of completion of the search <b>14 March 2003</b>	Examiner <b>Coffa, A</b>
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