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Attorney Docket No. 84587
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DISTRIBUTION STATEMENT A
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Attorney Docket No. 84587

DISPOSABLE VISUAL SENSOR

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN that CHARLES PHILIP AMIDON, citizen of the United States of America, employee of the United States Government, and resident of Portsmouth, County of Newport, State of Rhode Island, has invented certain new and useful improvements entitled as set forth above, of which the following is a specification.

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DISPOSABLE VISUAL SENSOR

STATEMENT OF GOVERNMENT INTEREST

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefore.

BACKGROUND OF THE INVENTION

(1) Field of the Invention:

The invention relates to visual sensors and is directed more particularly to a disposable sensor that may be dropped into building rubble or other such areas, not readily accessible by rescue personnel, to make visual inspection for survivors.

(2) Description of the Prior Art:

There have been experiments with disposable microphones which may be dropped into the rubble of collapsed buildings, and the like, to aid search and rescue teams to hear survivors over the surface noise levels caused by heavy lift cranes, air hammers, bull dozers, and large numbers of rescue workers.

It has become apparent that there is a need for disposable devices of similar nature, but which are adapted to send

photographic images of structures and any survivors surrounding the device to a surface unit.

SUMMARY OF INVENTION

An object of the invention is, therefore, to provide a disposable visual sensor which may be dropped into a rubble and survivors pile and which, by its weight and shape, will tend to drop down well into the rubble before coming to rest.

A further object of the invention is to provide such a sensor capable of producing images of the rubble all around the sensor, and which is adapted to tilt to provide images all around in different planes.

With the above and other objects in view, a feature of the invention is the provision of a disposable visual sensor including a body defining an enclosed chamber, a power source mounted in the chamber, an on-off switch mounted on the body and accessible from outside the body, and a processor mounted in the chamber and powered by the power source; a transceiver is mounted in the chamber and is in communication with the processor. A rotationally moveable mounting is fixed on the body and extends from there, the rotationally moveable body having a clear window therein. A light source is disposed in the mounting and is adapted to cast a light beam outwardly from the sensor, and a camera is disposed in the mounting and adapted

to provide images of surrounding structures illuminated by the light source. The processor is adapted to control information flow to and from the transceiver and to operate the camera and light source, and movement of the mounting.

The above and other features of the invention, including various novel details of construction and combinations of parts, will now be more particularly described with reference to the accompanying drawings and pointed out in the claims. It will be understood that the particular assembly embodying the invention is shown by way of illustration only and not as a limitation of the invention. The principles and features of this invention may be employed in various and numerous embodiments without departing from the scope of the invention.

BRIEF DESCRIPTION OF THE DRAWING

Reference is made to the accompanying drawing in which is shown an illustrative embodiment of the invention from which its novel features and advantages will be apparent, and wherein:

FIG. 1 is a diagrammatic side elevational and broken-away view of a disposable visual sensor illustrative of an embodiment of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. 1, there is illustrated a disposable visual sensor illustrative of an embodiment of the invention includes a body 10 preferably of a spherical configuration designed to be rugged enough to sustain impacts and crushing forces, defining an enclosed chamber 12.

A power source 14 is mounted in the chamber 12 and may comprise one or more dry cell batteries.

A processor on-off switch 16 is mounted on the body 10 and is accessible from outside of the body to turn on a processor 18 which, when turned on, is powered by the power source 14.

A transceiver 20 is in communication with the processor 18 and is provided with an antenna 22 for communications between the transceiver 20 and a remote unit (not shown).

A rotationally moveable mounting 24 is mounted on the body 10 and extends from the body 10 forming a turret 26 upstanding from the body and rotatable in the body around a central axis of the turret. A camera and light assembly 28 is disposed in the turret 26.

The turret 26 is provided with a clear window 30 through which a light beam may be projected and through which the camera may obtain images. Thus, the camera is adapted to provide images of surrounding structure illuminated by the light source.

The turret 26 is rotatable in the body 10 through a complete circle of 360°. In addition, the turret 26 is tiltable about 40° relative to the central axis of the turret, such that images may be observed and recorded by the camera in planes different from the plane of the turret in equilibrium. An orientation sensor 32 is disposed in the chamber 12 and is in communication with the processor 18 for providing to a viewer of the images an indication as to the perspective being observed.

In operation, the switch 16 is moved by an operator to the "on" position which starts operation of the processor 18 which draws power from the power source 14. The processor instructs operation of the turret 26 and the camera and light assembly 28.

The sensor is dropped into a void in a rubble area. Because of the shape and weight of the sensor, it tends to roll and bounce through openings in the rubble until coming to a stop.

The camera begins taking pictures of the surrounding rubble lighted by the light source. After a complete turn or so, the turret tilts to provide a new 360° plane in which to provide images, and is operative until the camera has investigated a number of planes.

The camera's images are sent to the processor 18, which, in turn, sends them to the transceiver 20, and thence onto the

remote unit where the images are scanned for evidence of survivors.

The processor 18 continues operation of the turret 26 and the camera and light source 28 as long as there is power provided by the power source 14.

In practice, a number of the sensors are tossed into a rubble pile, all in communication with the remote unit.

There is thus provided a disposable visual sensor which may be dropped into a rubble pile and which tends to drop deep into the pile, and which sends images of the area surrounding the sensor to a remote station for viewing.

It will be understood that many additional changes in the details, materials, and arrangements of parts, which have been herein described and illustrated in order to explain the nature of the invention, may be made by those skilled in the art within the principles and scope of the invention as expressed in the appended claims.

Attorney Docket No. 84587

DISPOSABLE VISUAL SENSOR

ABSTRACT OF THE DISCLOSURE

A disposable visual sensor includes a body defining an enclosed chamber, a power source mounted in the camber, an on-off switch mounted on the body and accessible from outside the body, a processor mounted in the chamber and powered by the power source, a transceiver mounted in the chamber and in communication with the processor, and a rotationally moveable turret mounted on the body and extending therefrom, the rotationally moveable turret having a clear window therein. A light source and camera assembly is disposed in the turret and adapted to cast a light beam outwardly from the sensor, and to provide images of surrounding structures illuminated by the light source. The processor is adapted to control information flow to and from the transceiver and a remote unit to operate the light source and camera functions, and movement of the turret.

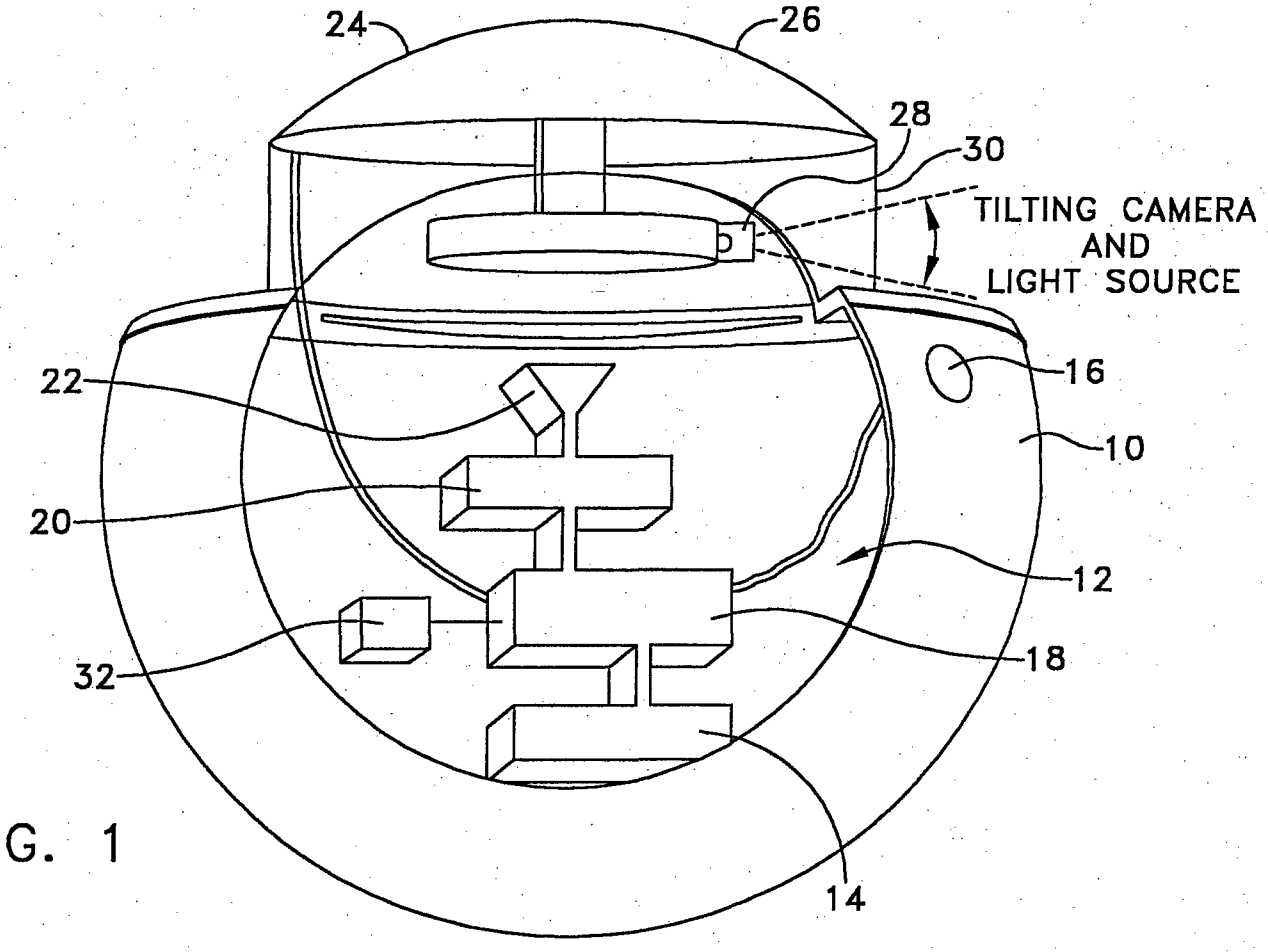
24
26
28
30
TILTING CAMERA
AND
LIGHT SOURCE
22
16
10
20
12
32
18
14

FIG. 1