BULLET-PROOF VEST WITH DISTRESS SIGNALING SYSTEM

This application claims Provisional of 60/075,902, filed Feb. 25, 1998.

FIELD OF THE INVENTION

The present invention relates to bullet-proof vests and more particularly to such vests having the capability of selectively providing distress and warning signals to remote locations.

BACKGROUND OF THE INVENTION

This invention is related to the field of personal security devices. In particular, the invention is directed to a protective garment, such as a vest, which will not only provide protection against traumas and impacts delivered to the wearer, but will provide a distress signal to a police station or other such authority when the trauma or impact is received.

It is common for police officers and other peace keeping officials to wear protective vests. These vests are made of a bullet proof material and additional shock absorbing material. Kevlar® or other tightly woven, tear resistant material can be employed as the bullet proof material. Rigid plates can also be employed but due to their added weight and discomfort, they are less common. Padding, including inflatable chambers or compressible fill, can be used within the bullet proof liner to distribute the force of stopping the bullet over a larger area on the wearer's body.

Although these vest are often successful at preventing or reducing the wearer's injuries, they are not perfectly effective. Some bullets can pass through a protective vest, entering the body of the wearer. Other weapons deliver a spray of pellets (such as a shotgun) which may not be completely blocked by the vest. Further, even when the bullet does not pass completely through, the impact from stopping the bullet can be substantial, causing severe, even deadly injury to the wearer.

Once the wearer has been injured, he may be unable to request aid. This is of particular concern for police officers who may be on a deserted road at night during a traffic stop, or who may be called off their regular beat in an emergency situation. Once so severely injured, the locations of these officers may be unknown. Consequently, although the vest may reduce injury, the officer is still at great risk and not easily located to receive aid even if it is known that the officer is injured. While such officers typically carry radios, if the officer is unconscious or delirious, he may not be able to instruct anyone as to his location.

The problems arising in these situations are not even recognized in the prior art, let alone resolved. U.S. Pat. No. 5,636,378 is directed to an impact sensing vest and issued on Jul. 10, 1997 from a patent filed Jun. 8, 1995. This patent discloses a vest including woven tubing incorporated throughout the vest. An electrically conductive fluid passes through the tubing. An electrical signal is passed through the tubes at all times. Should the vest be subjected to a substantial impact, the tubing would break, thereby short circuiting the current passing through the tubes. When the electrical contact is broken, the transmitter is activated and sends a recorded message, such as an identification number of the wearer, to a central dispatcher. The transmitter can also be activated when a position sensor detects that the vest is in a vertical position for a predetermined period of time. A rip-cord can be provided which allows the wearer to instantly activate the transmitter in times of distress. There is no suggestion to employ this system with a bullet proof vest.

U.S. Pat. No. 5,319,355 is directed to an alarm for patient monitor and life support equipment system. This patent issued on Jun. 7, 1994 from a patent application originally filed on Mar. 6, 1991. In the disclosed system, medical and hospital personal are notified that a patient's life support equipment require an immediate response. As preferred this system generates an alarm signal indicating the patient and the particular equipment which needs attention. This signal is sent to a master control unit which then transmits the signal to pagers held by the doctors and other personnel. Preferably, the pager has a vibrational announcer and a visual display which can describe the patient location and the equipment which needs attention. In this way, the medical personnel can be notified without alarming the patient. Again, there is no teaching to use this system with a bullet proof vest or with an impact sensing device.

U.S. Pat. No. 5,274,359 is directed to a portable water activated alert system with directional indicator. This patent issued on Dec. 28, 1993 from an application filed Mar. 9, 1992. In this system, a device is provided which incorporates a signal transmitter activated by water. Such a device could be warn by a child playing near a pool. Should the device become wet, the transmitter sends a signal to a receiver. The receiver is operably engaged to an alarm. The receiver also is attached to a directional and proximity indicator which lights up LEDs indicating the distance and location of the transmitter.

U.S. Pat. No. 4,740,792 is directed to a vehicle location system. This patent discloses generally the use of one type of global positioning system.

None of these patents address the problems resolved by the instant invention.

SUMMARY OF INVENTION

It is an object of the present invention to provide a bullet proof vest which will signal a central station when the wearer is subjected to a substantial impact, such as from a bullet.

It is another object of an aspect of the invention to provide a bullet proof vest which will perceive the location of the wearer and will forward the location to the central station when the wearer has received a substantial impact.

It is another object of the invention to provide a vest which will distribute the impact of a trauma over a large portion of the wearer's body, will signal a central station that the impact has been delivered, and will identify the wearer and his location.

It is another object of an aspect of this invention to provide a vest which can reduce the effect of an impact on the wearer while monitoring the wearer's bodily functions. Should the wearer be subjected to an impact or should the bodily functions move beyond a predetermined range, a transmitter will send a distress signal to a central station identifying the wearer and his location.

It is another object of the invention to provide a garment which is bullet proof that includes a sensor for determining when a substantial impact has been delivered to the garment and a transmitter for sending a signal that the substantial impact has been received.

In accord with one aspect of the invention, an apparatus for protecting a user from severe impact and warning of the severe impact is provided. A vest has an outer sensing layer,