PERSONAL DEFENSE DEVICE WITH COMMUNICATION CAPABILITIES

Applicant: Virgil C Breeden, Hattiesburg, MS (US)
Inventor: Virgil C Breeden, Hattiesburg, MS (US)
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ABSTRACT

A personal defense device and method incorporating Bluetooth technology into a container with an irritant agent, such as pepper spray. The container is provided with Bluetooth-enabled wireless communication circuit that allows generation of an alarm signal every time pepper spray is dispensed. The alarm signal is capable of being received by a cellular telephone and capable of generating a predetermined responsive action by the cellular telephone, such as activation of a speakerphone, dialing of an emergency number, and activation of a global positioning system locator. A panic actuator is optionally provided on the container; the panic actuator is independently connected to the wireless communication circuit to generate the alarm signal even if the pepper spray is not dispensed.
PERSONAL DEFENSE DEVICE WITH COMMUNICATION CAPABILITIES

BACKGROUND OF THE INVENTION

[0001] The present invention relates to personal defense devices, and, more particularly, to an apparatus for providing law enforcement and private citizens with a single device that integrates law enforcement tools and mechanisms for the application of capsaicinoids.

[0002] Capsaicinoids are a group of natural inflammatory products that are isolated from the dried fruits of chili peppers (e.g., Capsicum frutescens) via extraction such as with an organic solvent. Capsaicinoids are irritant agents (chemical compounds that can irritate the eyes to cause tears, pain, and even temporary blindness). The crude extract of peppers is called Oleoresin Capsicum ("OC") and contains a variety of chemicals including significant quantities of the capsaicinoids.

[0003] OC and capsaicinoids are used as active components for the production of self-defense articles known as non-lethal pepper spray products used by law enforcement and civilians. The capsaicin-containing products are used by law enforcement agencies worldwide to assist in the apprehension of non-compliant suspects and in crowd control. The temporary blindness allows officers to more easily restrain subjects. Members of the general public also carry these products to help protect themselves against aggressive attack by animals and other individuals, while giving an opportunity to persons using pepper spray for self-defense an opportunity to escape. Pepper spray causes immediate closing of the eyes, difficulty breathing, runny nose, and coughing. The duration of its effects depends on the strength of the spray but the average full effect lasts around thirty to forty-five minutes, with diminished effects lasting for hours.

[0004] However, it is possible that the pepper spray will not produce the desired result. For instance, the user may press the activation button when being at a too far distance from the assailant or the direction of the spray is off-target. In such a case it is entirely possible that the assailant will continue his/her aggressive acts. The victim's cries for help may not be heard or even if recognized by the public—not acted upon. As a result, no assistance will be rendered to the victim.

[0005] The most effective way of handling a dangerous assault situation is to promptly alert law enforcement authorities of an attack. Such information can be delivered to the authorities using a cellular telephone. However, it may be impractical to attempt to call authorities during or after an assault. An assailant may snatch the cell phone from the victim, thus depriving the victim of the only opportunity to send an alarm signal to the police. Another method is to include a “panic button” on a necklace or key ring in radio communication with a transceiver that is connected to a telephone or similar network. These devices are compact, but have a very limited range.

[0006] The present invention contemplates provision of a device and method of activating an alarm signal that will be transmitted to a monitoring station and from there— to a law enforcement agency even when the victim is attempting to prevent or stop the attack.

SUMMARY OF THE INVENTION

[0007] It is therefore, an object of the present invention to provide a personal defense device that is equipped with a signal transmitting capability and incorporated in a conventional self-defense device, such as pepper spray canister.

[0008] It is another object of the invention to provide a personal defense device with wireless communication capabilities compatible with conventional cell phone technology.

[0009] These and other objects of the invention are achieved through a provision of a personal defense device that is provided with a Bluetooth-enabled wireless communication circuit. The personal defense device is constructed as a rigid portable container retaining a predetermined quantity of a repellant agent, such as pepper spray. A manually activated button causes dispensing of the repellant agent through a spray nozzle. The wireless communication circuit associated with the container is capable of generating an alarm signal capable of being received by a Bluetooth-enabled paired cellular telephone.

[0010] The wireless communication circuit is capable of generating a predetermined responsive action by the cellular telephone, such as activation of a speakerphone, dialing of an emergency number, and activation of a global positioning system locator.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] Reference will now be made to the drawings, wherein like parts are designated by like numerals, and wherein

[0012] FIG. 1 is a perspective view of the personal defense device of the present invention with a detail view of the activation switch.

[0013] FIG. 2 is a perspective, partially cutaway view of the device of the present invention and a schematic illustration of the wireless distress call transmitted from the personal defense device to a cellular telephone, and to a police station.

[0014] FIG. 3 is a plan view of the personal defense device showing the electronic circuitry embodied in the housing.

[0015] FIG. 4 is a detail view of an optional activation switch for use in the personal defense device.

[0016] FIG. 5 is a schematic view illustrating a micro switch, which activates transmission of a distress signal to a cellular phone for speed dialing of an emergency number.

[0017] FIG. 6 is a schematic view illustrating a micro switch, which activates transmission of a distress signal to a cellular phone for speed dialing of an emergency number, activation of a speakerphone function and activation of a global positioning system (GPS) function.

[0018] FIG. 7 is a schematic view illustrating a micro switch ("Panic button"), which activates transmission of a distress signal to a cellular phone.

DETAIL DESCRIPTION OF THE INVENTION

[0019] Turning now to the drawings in more detail, numeral 10 designates a portable container or canister for retaining a predetermined quantity of the capsaicin-containing agent according to this invention. In one aspect of the invention, the canister 10 is a spray-dispensing device capable of emitting a fine mist of capsaicin-containing product admixed with a marking agent, for instance glitter powder. The canister 10 can be a pump or an aerosol-spraying device.

[0020] The canister 10 comprises a rigid hollow cylindrical body 12 with a closed bottom 14 and an open top end 16. A depressible pump head 18 is fitted in the top open end 16. The pump head 18 is in fluid communication with the interior of the canister body 12, where a quantity of the irritant agent is
stored. A dip tube (not shown) extends inside the container body 12. The liquid irritant-containing agent is drawn up through the dip tube for dispensing from the container 10.

[0021] An upper part 20 of the canister 10 is provided with an elongated cutout 22. The pump head 18 extends into the upper part 20 below the cutout 22, while frictionally sliding moving within the canister body 12. The pump head 18 sealingly engages the inner wall of the canister body 20 and prevents the liquid irritant agent from escaping the canister body 12.

[0022] A nozzle opening 24 is formed in the pump head 18. The nozzle opening 24 is oriented toward the cutout 22. The nozzle opening 24 is in fluid communication with the interior of the canister body 12. When depressed by a finger, the pump head 18 bears against the inner wall of the canister 10 and is displaced in a co-axial orientation with the central axis of the canister body 12. The pumping action causes pressure differential inside the canister body 12 and ejection of a small quantity of pressurized irritant-containing liquid or repellant agent from the nozzle opening 24 toward a remote target. In one aspect of the invention, the spray emitted from the nozzle opening 24 contains a capsaicinoid material.

[0023] Mounted in the pump head 18 is a depressible button 30 which is in contact with a top surface 26 of the pump head 18. The depressible button 30 moves downwardly when the user presses on the top surface 26. The button 30 is operationally connected to a wireless communication assembly 32 secured in the pump head 18. The wireless communication assembly operates on a short-wave frequency radio band using Bluetooth technology or similar protocol. The Bluetooth technology is widely used by Apple products, Microsoft platforms, Android phones, etc. A schematic example of a Bluetooth-enabled cellular phone is shown in FIG. 1 and designated by numeral 34.

[0024] Depressing the button 30 (when pressing on the pump head 18 to release a pepper spray) causes an alarm signal to be created by the wireless communication assembly 32. The generated alarm signal is transmitted to the cellular phone 34. A suitable application downloaded into the cellular phone 34 enables the phone 34 to perform a variety of functions. The phone 34 can turn on a speakerphone in a step 36, dial an emergency number (911) in a step 37, and initiate, in a step 38, the GPS application to point the location of the attack in progress. The victim of the attack can talk with a police station operator located in a remote police station 39 using the speakerphone of the cellular phone 34.

[0025] When the user buys the personal defense device 10, the user first pairs the device 10 with a Bluetooth-enabled phone 34. Optionally, the user can download a third party application to extend the functionality of the device 10, as will be described in more detail hereinafter.

[0026] FIG. 3 illustrates an alternative embodiment of the invention using a tactile (bump) switch 40 located below a pepper spray dispenser button 42. In this embodiment, the personal defense device 46 is a container housing a discreet quantity of an irritant, such as a pepper spray. The device 46 has a wireless communication circuit 48 built into a sidewall of the container 46. The communication circuit can be a Bluetooth-enabled circuit capable of communicating with Bluetooth enabled cellular phone 58 of the user.

[0027] The wireless communication circuit 48 is connected by suitable wiring to the tactile switch 40. A rechargeable battery 50 is operationally connected to the wireless communication circuit 48. A recharging port 52 is provided on the closed bottom wall 54 of the canister 46.

[0028] A dispensing opening 56 is formed in an upper part of the canister 46. When the user presses the irritant dispensing button 42 it presses on the tactile switch 40 and closes the circuit of the tactile switch 40 with the communication circuit 48. As a result, the alarm signal generated by the act of pepper spray activation will cause a response in the cellular phone 58. The phone 58 can then perform any of the functions discussed above, such as activation of the speakerphone, dialing of 911, and GPS locating.

[0029] If desired, the device 46 can be provided with a suspension ring 60 allowing the device 46 to be suspended from a belt, a purse strap, etc. of the user.

[0030] FIG. 4 illustrates an alternative activation switch for the personal defense device. In this embodiment, the device is equipped with an optional safety switch 62. In this embodiment, the device 46 is powered on by first moving the safety switch 62 into an “on” position in the direction of arrow 64. In this embodiment, the safety switch 62 prevents accidental generation of an alarm signal through depressing of the pepper spray dispensing button and the activation switch.

[0031] After the user moves the safety switch 62, the user can then dispense the irritant from the container 46 by pressing the switch 42 and also activating the tactile switch 40. The wireless communication functionality is then activated and the communication is established with the phone 58. The alarm signal generated by the wireless communication circuit 48 sends instructions to the phone 58 to dial the local emergency number, allowing the user to inform the authorities of the emergency.

[0032] FIG. 6 illustrates optional steps that can be performed in the method of the present invention. Some Bluetooth-enabled devices cannot natively control the phone functions of turning on the GPS or speakerphone. To accomplish this step, a third party application 68 needs to be installed on the paired cell phone 58. This application runs in the background, and upon receiving a signal generated by the communication circuit 48 activates the speakerphone 70 and the GPS unit 72. It is envisioned that an application be available for each target phone running on Apple operating system, Android, Blackberry, etc.

[0033] Turning now to FIG. 7, still another optional element of the personal defense device is illustrated. In this embodiment a panic actuator in the form of a panic button 76 is provided on a container 78. The panic button is spaced apart from the trigger switches 80, 82. This embodiment may be preferred when the irritant in the container 78 does not necessarily have to be dispensed. For instance, if a user notices suspected activity but is too far away from the reach of the repellant agent, the user may activate the panic button 76 by moving it upwardly in the direction of arrow 84.

[0034] Moving the panic button 76 activates the same functionality as activation of the tactile switch 82 since both the panic button and the tactile switch 82 are operationally connected to the wireless communication circuit 86. In this embodiment, the paired phone 88 will turn on the speakerphone 90 and start dialing the emergency number, which will connect the user to the police.

[0035] Similar to the embodiment of FIG. 3, the container 78 can be provided with a key ring 92 for suspending the container 78 from a key chain, belt, purse strap, and the like.

[0036] Many other changes and modifications can be made in the device and method of the present invention without
departing from the spirit thereof. I therefore pray that my rights to the present invention be limited only by the scope of the appended claims.

1. A personal defense device, comprising:
   a rigid portable container retaining a pre-determined quantity of a repellant agent;
   a manually activated means for dispensing the repellant agent mounted on the container, said dispensing means comprising a spray nozzle;
   a wireless communication circuit associated with the container, said wireless communication circuit generating an alarm signal capable of being received by a cellular telephone and capable of generating a predetermined responsive action by the cellular telephone, wherein the predetermined responsive action is at least one of activation of a speakerphone, dialing of an emergency number, and activation of a global positioning system locator.

2. The device of claim 1, comprising an activation switch operationally connected to the means for dispensing the repellant agent.

3. The device of claim 2, wherein the dispensing means comprises a depressible member movable in relation to a rigid wall of the container, the depressible member carrying the spray nozzle, and the activation switch is operationally connected to the depressible member such movement of the depressible member causes activation of the wireless communication circuit through associated movement of the activation switch.

4. The device of claim 2, said activation switch is a tactile switch.

5. The device of claim 1, wherein the alarm signal is communicated to the cellular telephone through a Bluetooth connection on the cellular telephone and the wireless communication circuit.

6. The device of claim 1, wherein the repellant agent is pepper spray.

7. The device of claim 1, said wireless communication circuit comprising a battery.

8. The device of claim 7, said container being provided with a recharging port connected to the battery.

9. The device of claim 1, comprising a safety switch operationally connected to the dispensing means.

10. The device of claim 1, said container carrying a panic actuator a distance from the dispensing means, said panic actuator being operationally connected to the wireless communication circuit.

11. The device of claim 10, wherein the panic actuator is capable of generating an alarm signal through the wireless communication circuit independently from the dispensing means.

12. A method of self-defending against an assailant, comprising the steps:
   providing a rigid portable container;
   depositing a pre-determined quantity of a repellant agent into the container;
   providing a manually activated means for dispensing the repellant agent mounted on the container, wherein the repellant agent contains a capsicum-containing substance;
   providing a manually activated means for dispensing the repellant agent mounted on the container, said dispensing means comprising a spray nozzle;
   providing a wireless communication circuit mounted on the container, said wireless communication circuit generating an alarm signal capable of being received by a cellular telephone and capable of generating a predetermined responsive action by the cellular telephone, wherein the predetermined responsive action is at least one of activation of a speakerphone, dialing of an emergency number, and activation of a global positioning system locator;
   providing a wireless communication circuit activation switch on said container and operationally connecting the wireless communication circuit activation switch to the dispensing means such that dispensing of the repellant agent causes an alarm signal to be generated and transmitted to the cellular telephone.

13. The method of claim 12, said activation switch is a tactile switch.

14. The method of claim 12, wherein the alarm signal is communicated to the cellular telephone through a Bluetooth connection on the cellular telephone and the wireless communication circuit.

15. The method of claim 12, comprising a step of providing a battery incorporated into the wireless communication circuit.

16. The method of claim 15, comprising a step of providing said container with a recharging port connected to the battery.

17. The method of claim 12, comprising a step of providing a safety switch operationally connected to the dispensing means which, upon being moved into position, allows communication between the activation switch and the wireless communication circuit.

18. The method of claim 12, comprising a step of providing the container with a panic actuator a distance from the dispensing means, said panic actuator being operationally connected to the wireless communication circuit.

19. The method of claim 18, wherein the panic actuator is capable of generating an alarm signal through the wireless communication circuit independently from the dispensing means.