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**1100 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005 (US)**

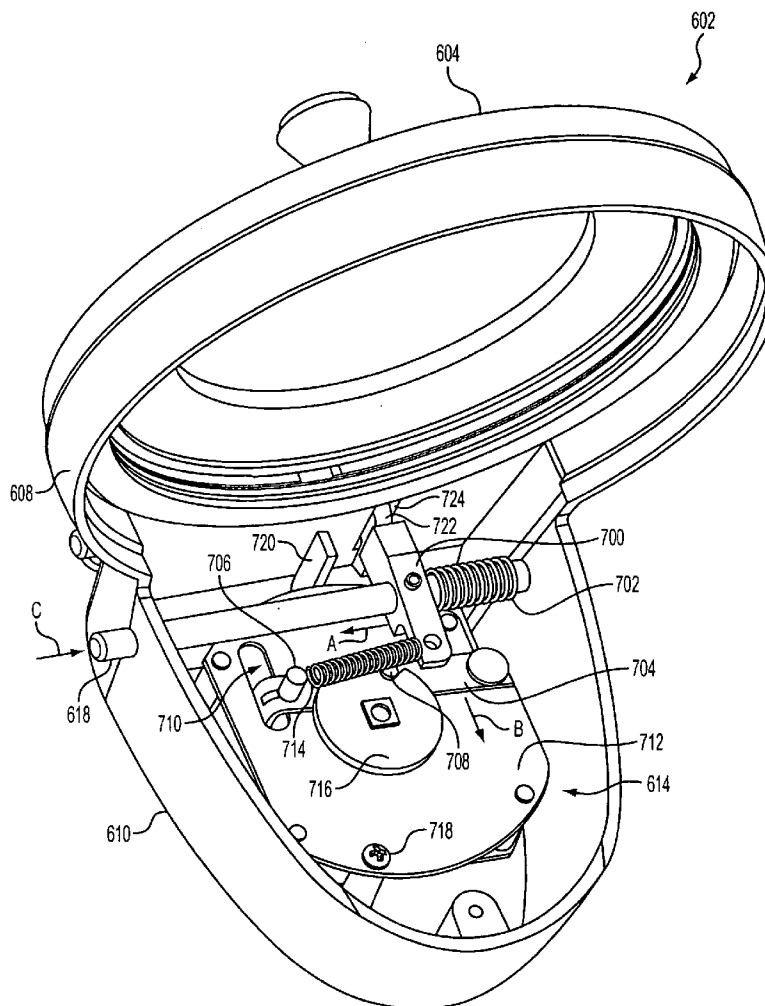
(57) **ABSTRACT**

A safety device, for example for candles, is disclosed. The safety device includes a cover, a support structure, a support device, a controller, an electrical timing device, an input device, an output device, and a closing device. The support structure is hingedly coupled to the cover, and configured to be supported by a container. The support device is coupled to the support structure. The controller is coupled to the support device. The electrical timing device is coupled to the support device and the controller. The input device is coupled to the support device and the controller. The output device is coupled to the support device and the controller. The closing device coupled to the support device and the controller.

(22) Filed: **Dec. 6, 2006**

Related U.S. Application Data

(60) Provisional application No. 60/742,876, filed on Dec. 7, 2005.



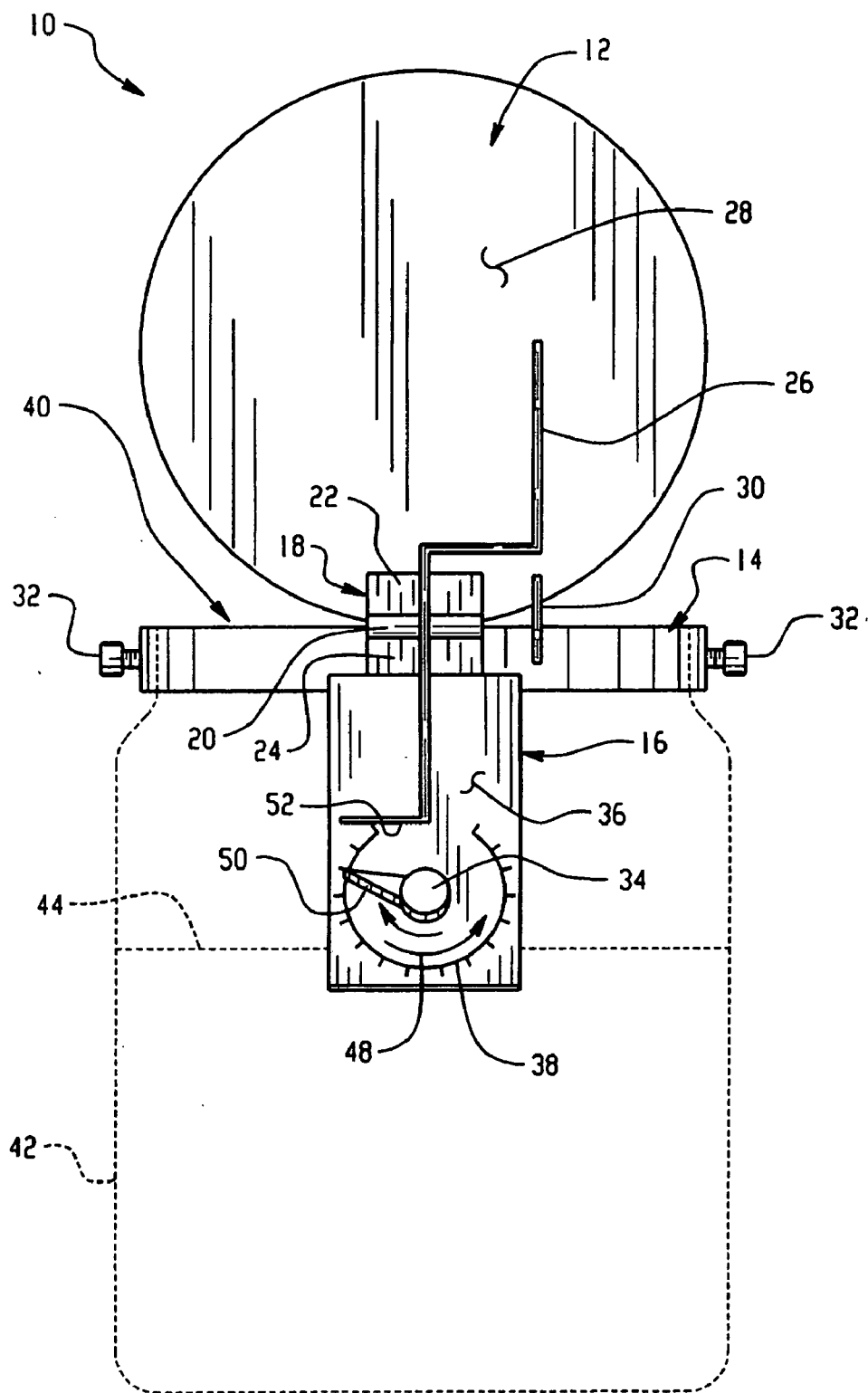
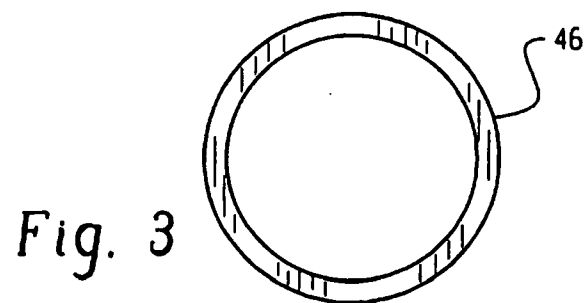
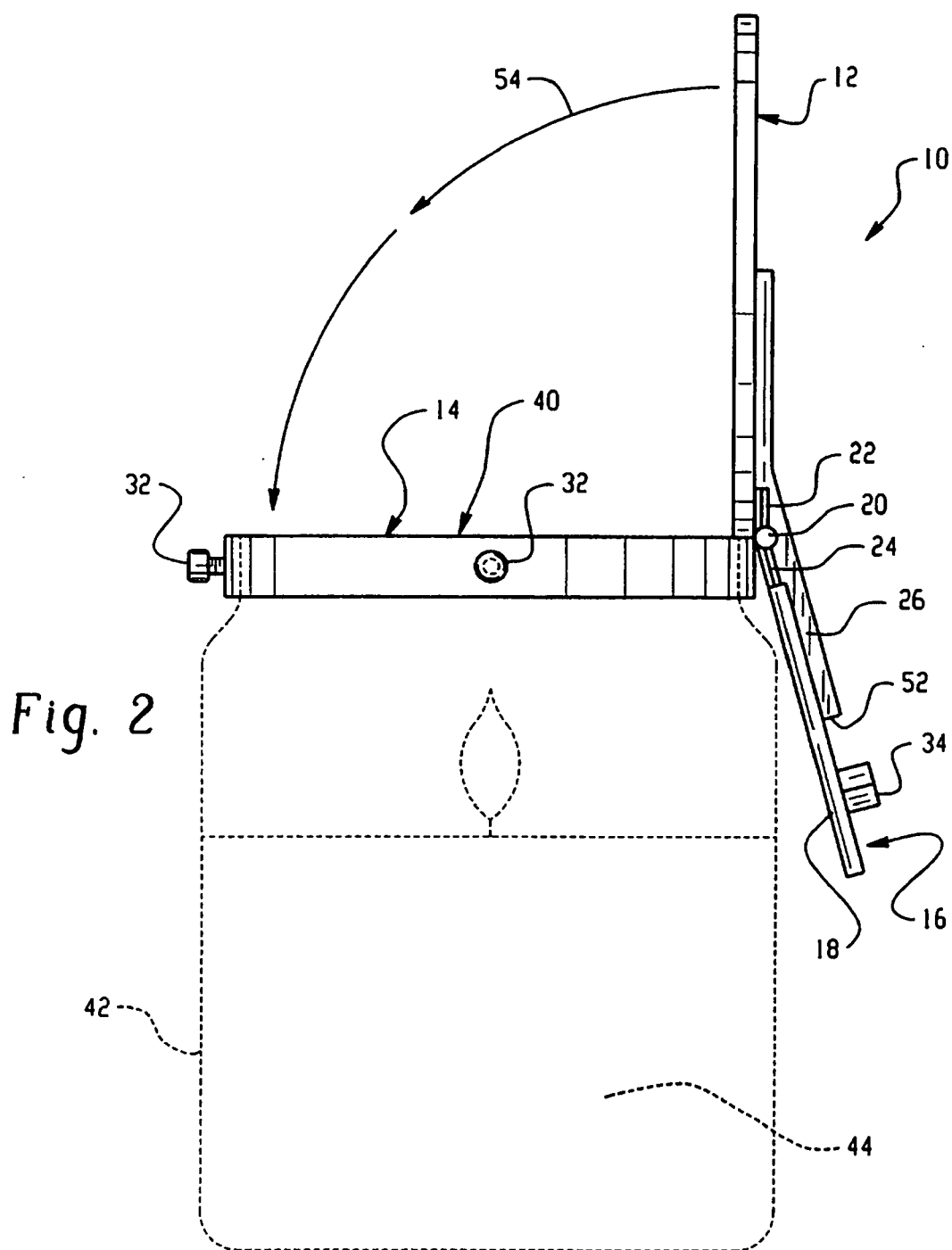


Fig. 1



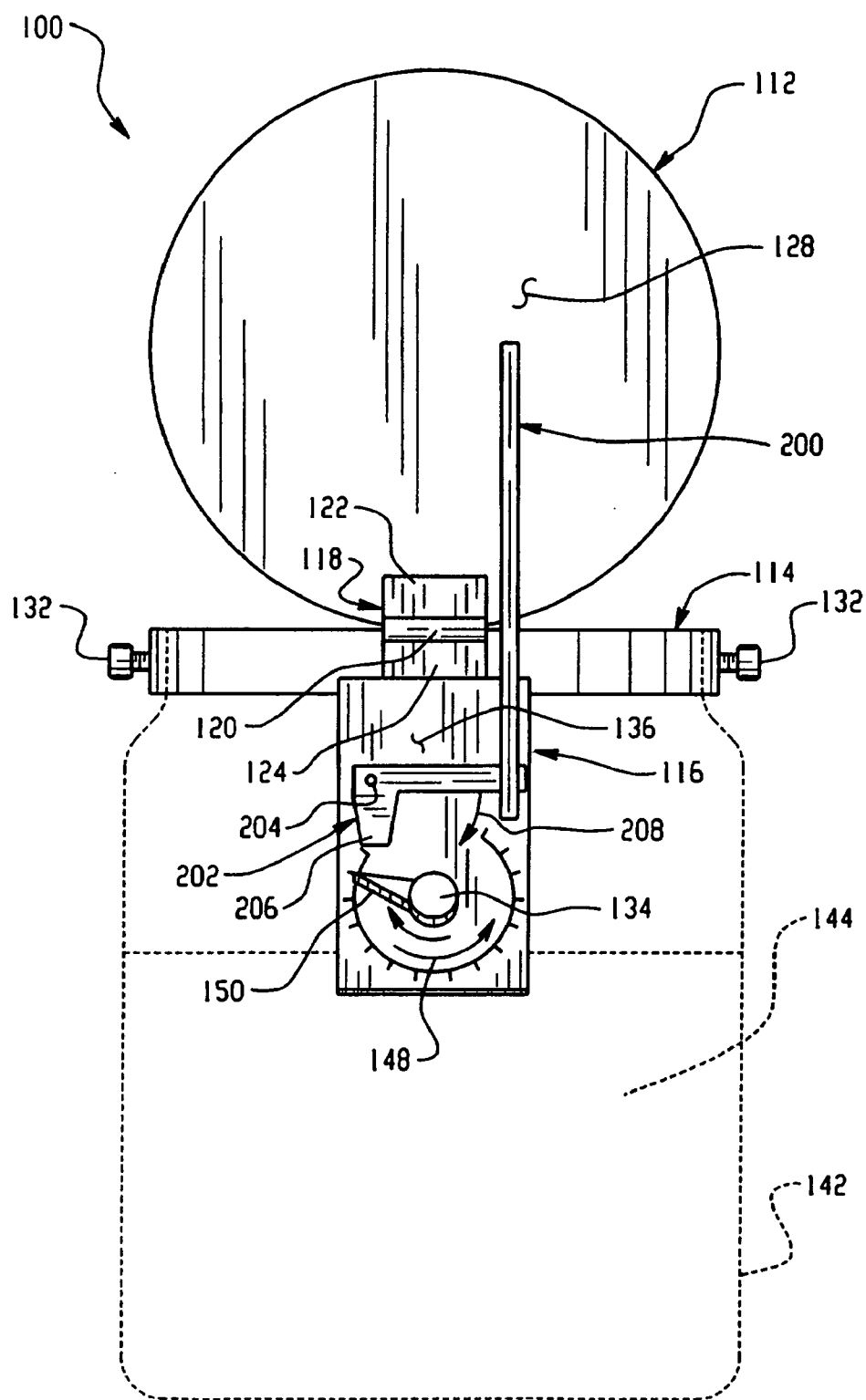


Fig. 4

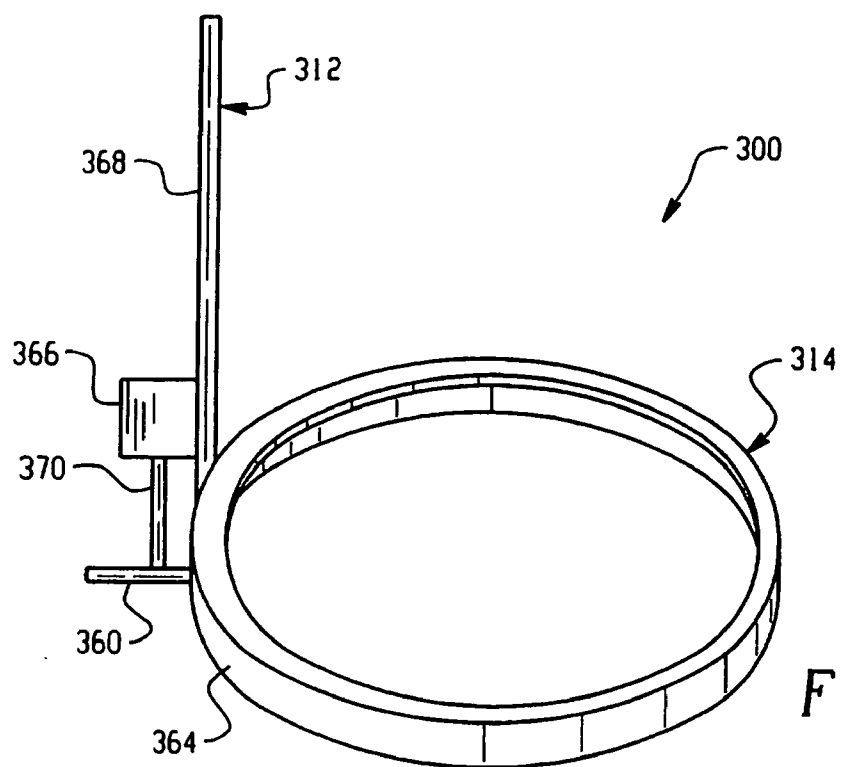


Fig. 5A

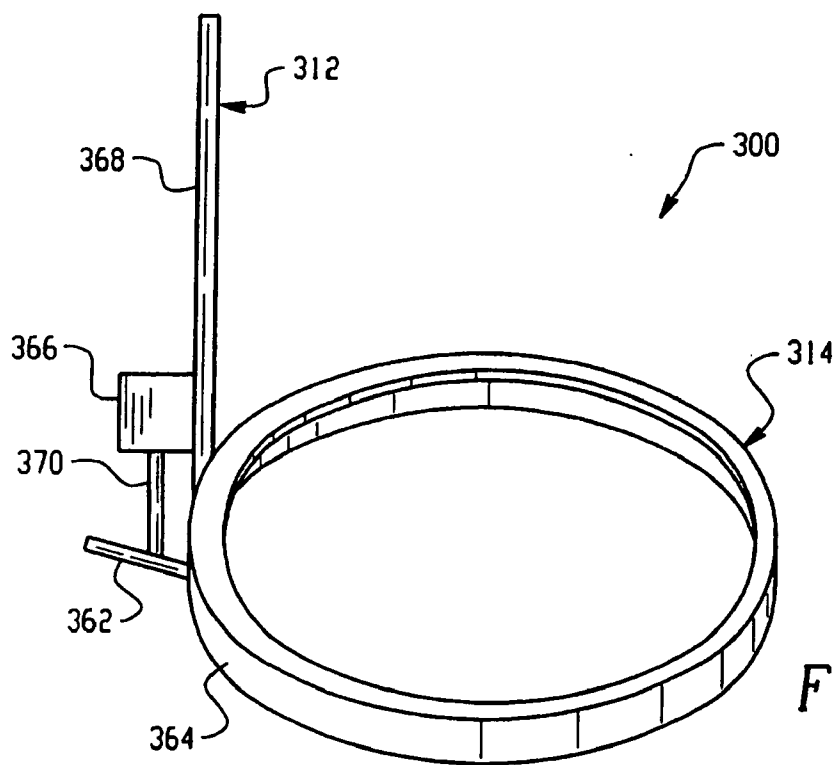


Fig. 5B

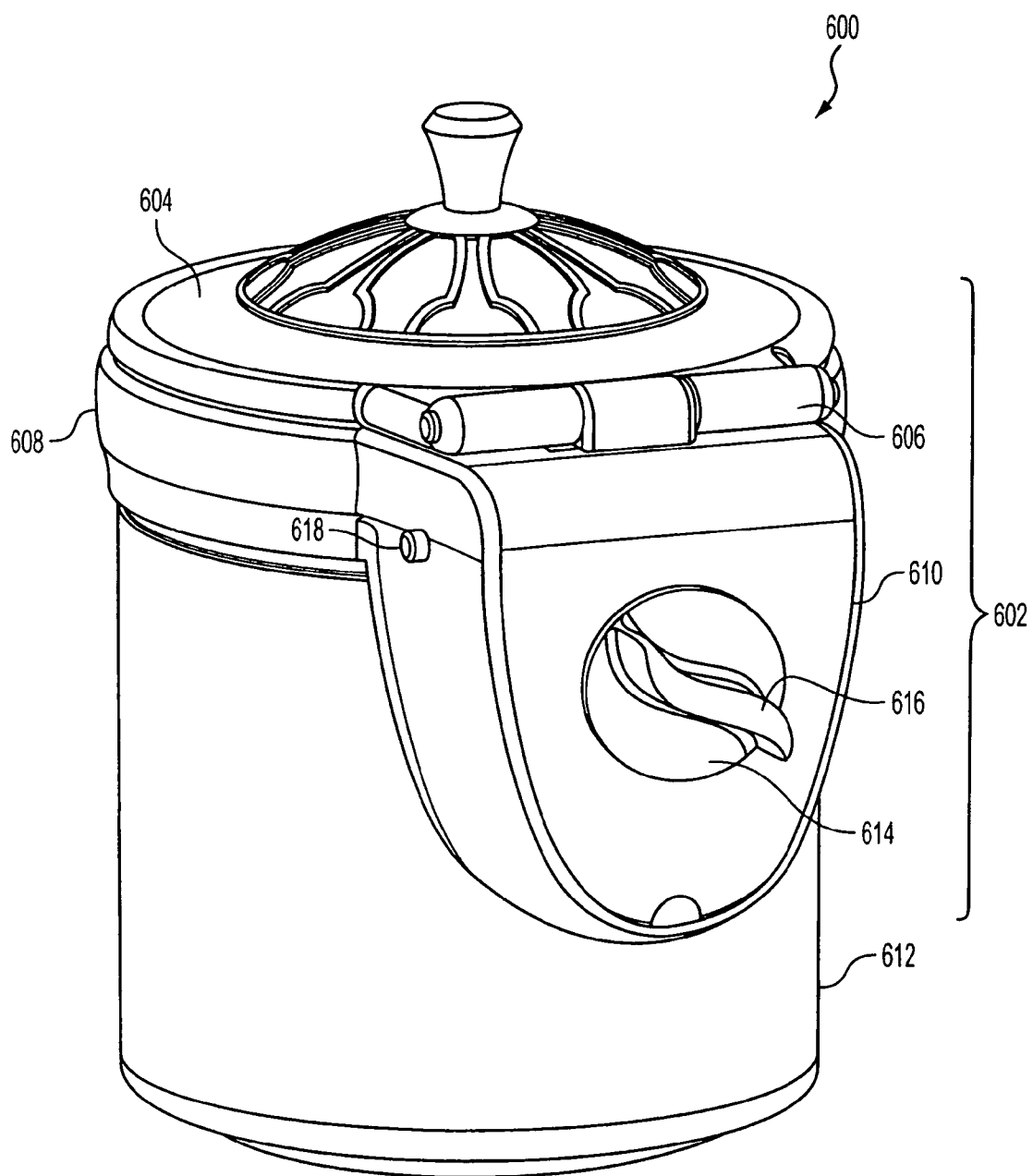


FIG. 6

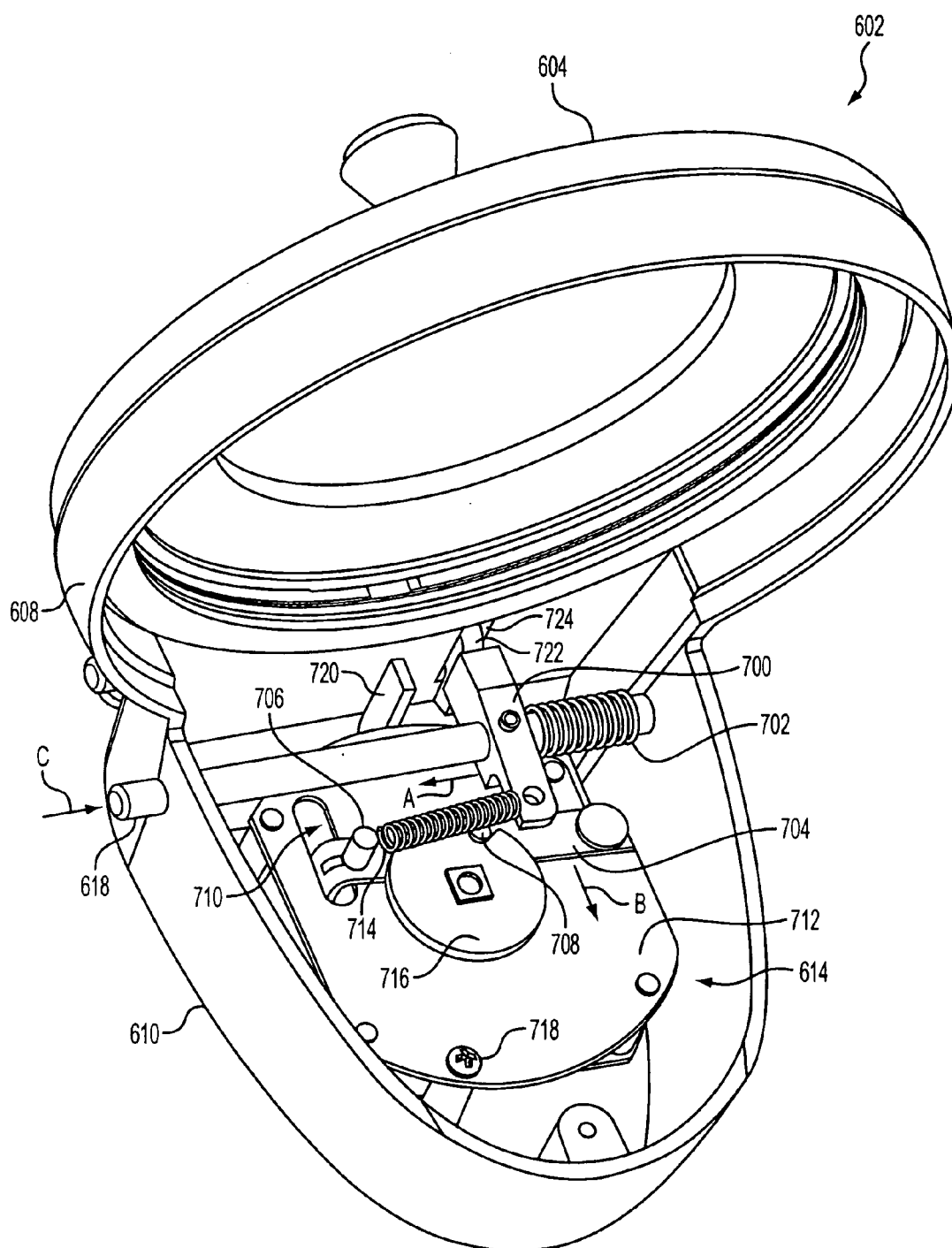


FIG. 7

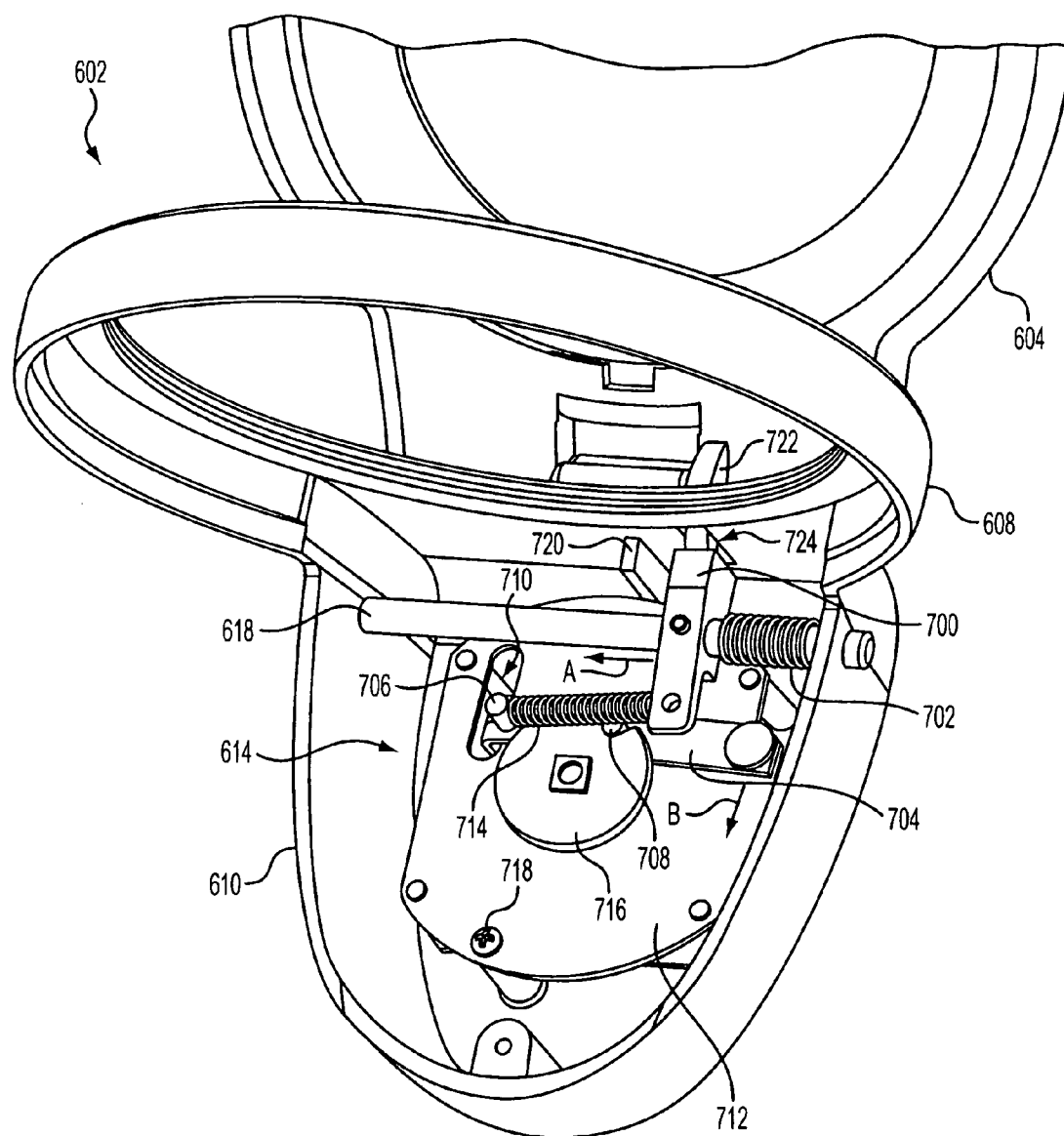


FIG. 8

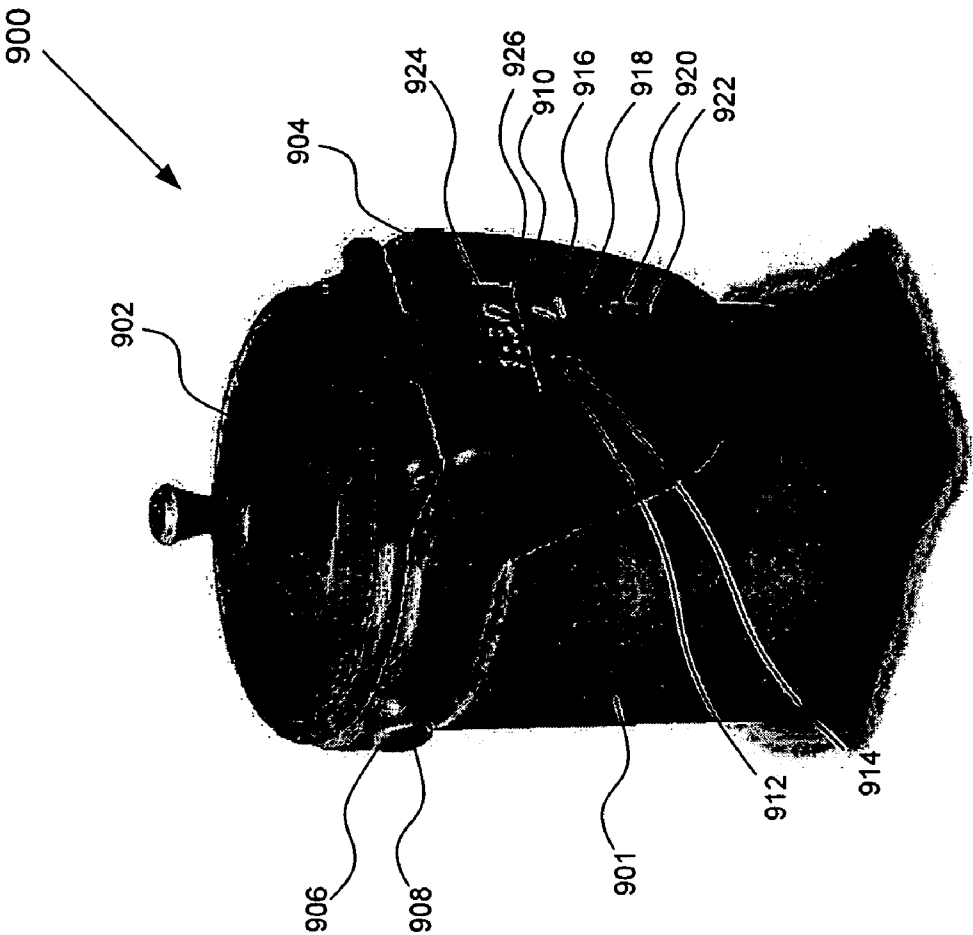


FIG. 9

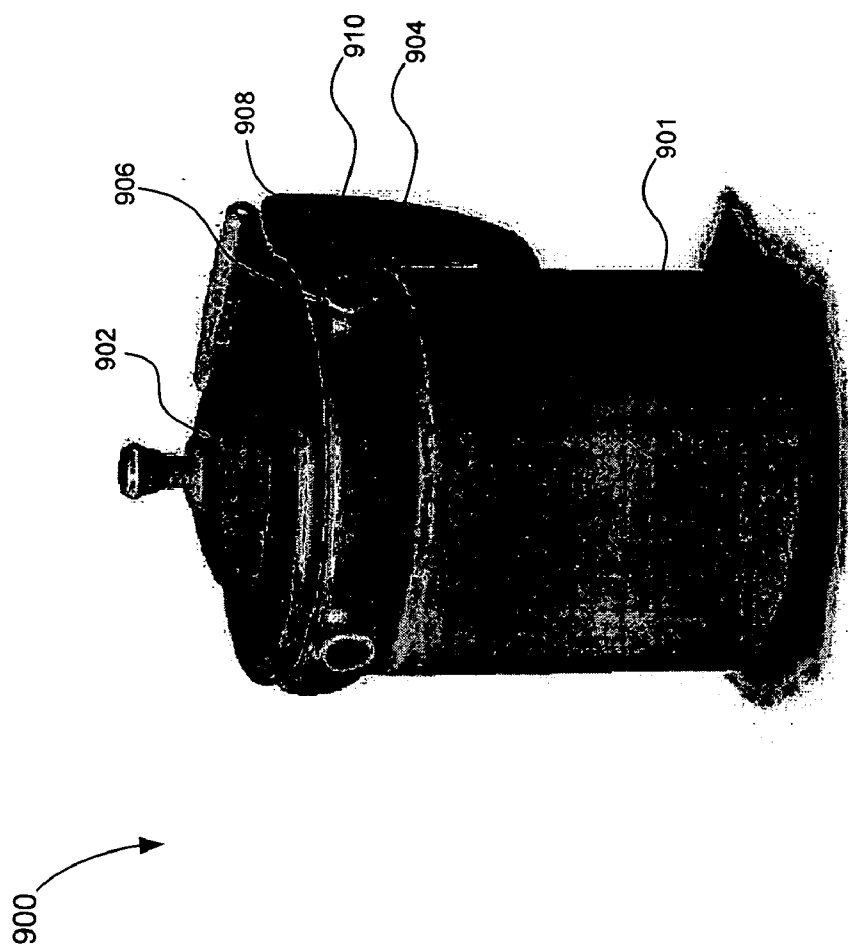


FIG. 10

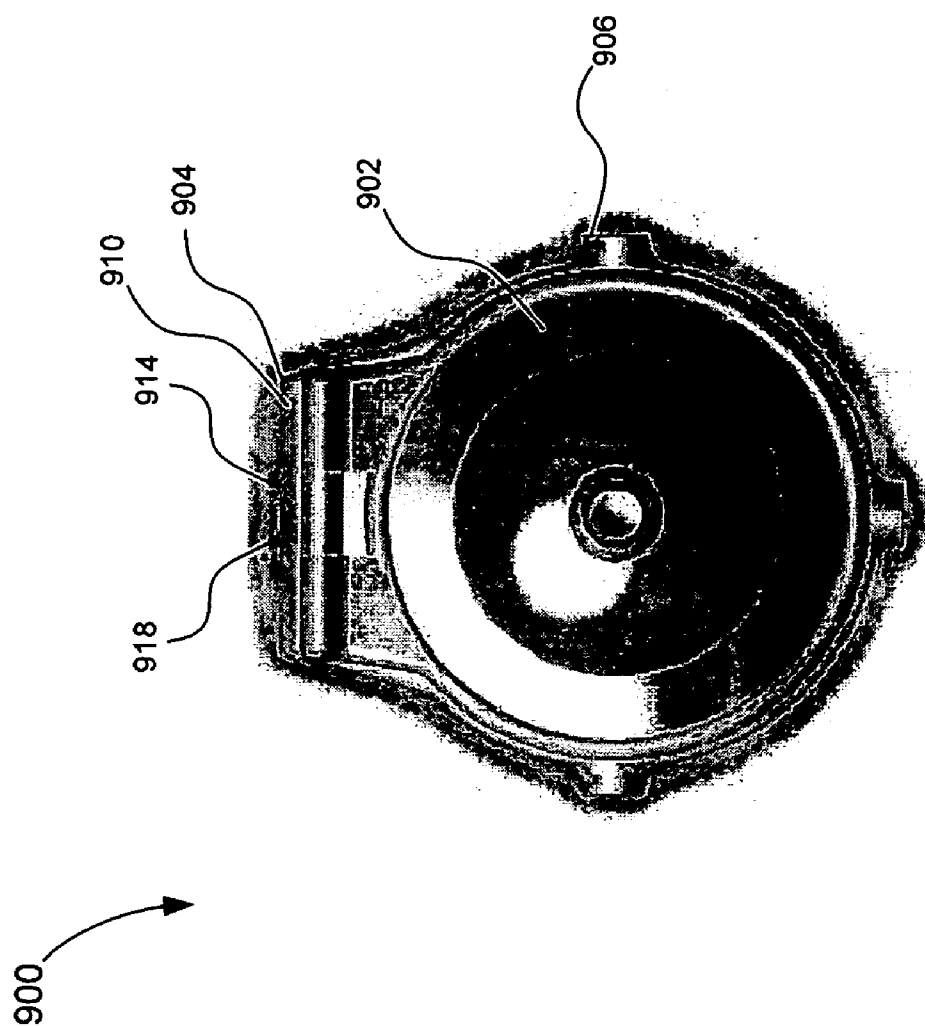


FIG. 11

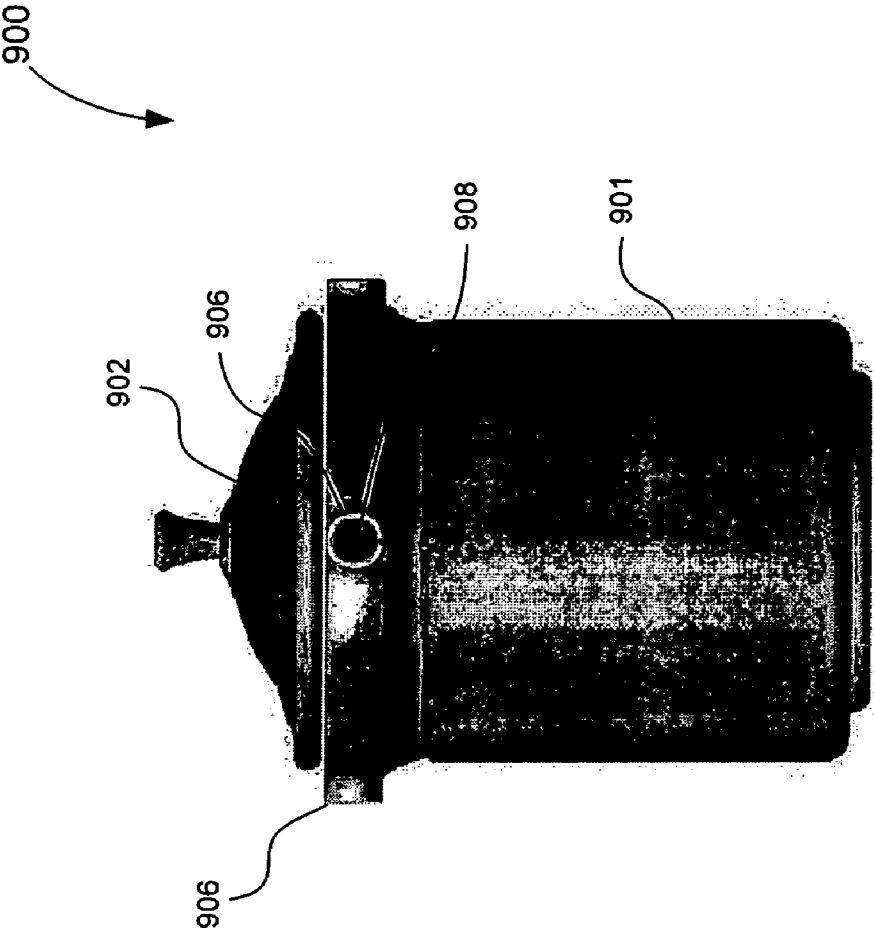


FIG. 12

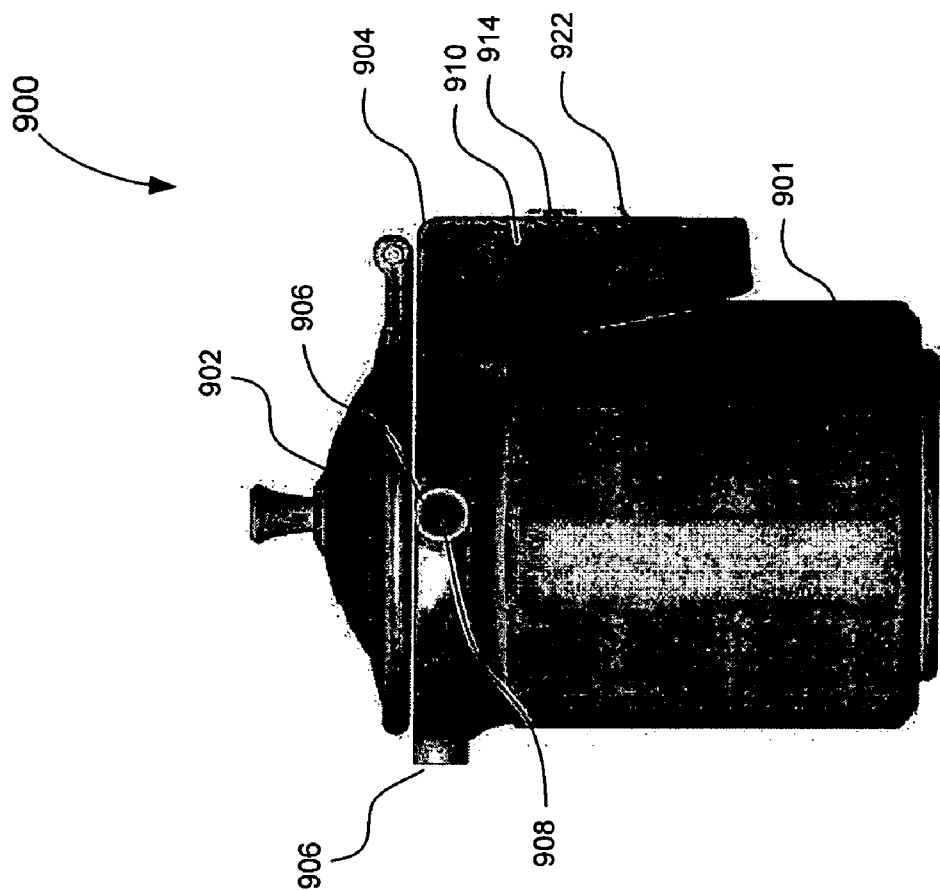


FIG. 13

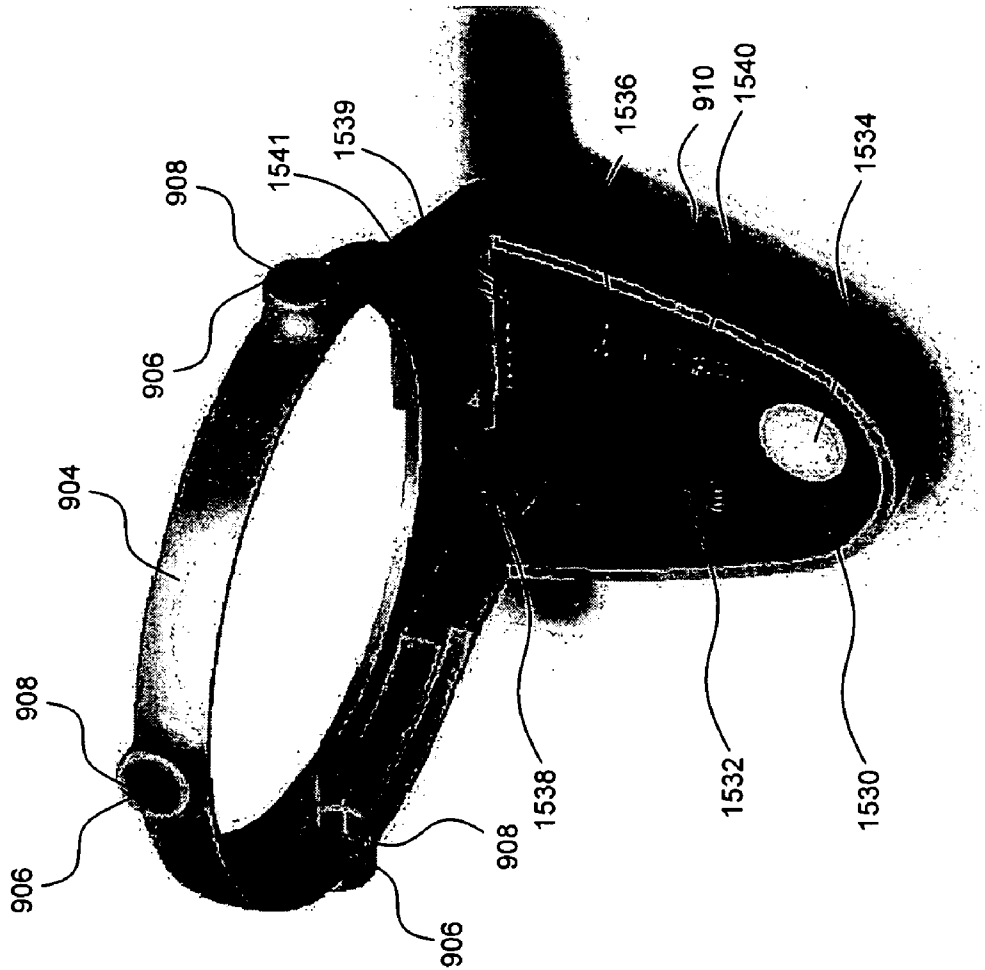


FIG. 15

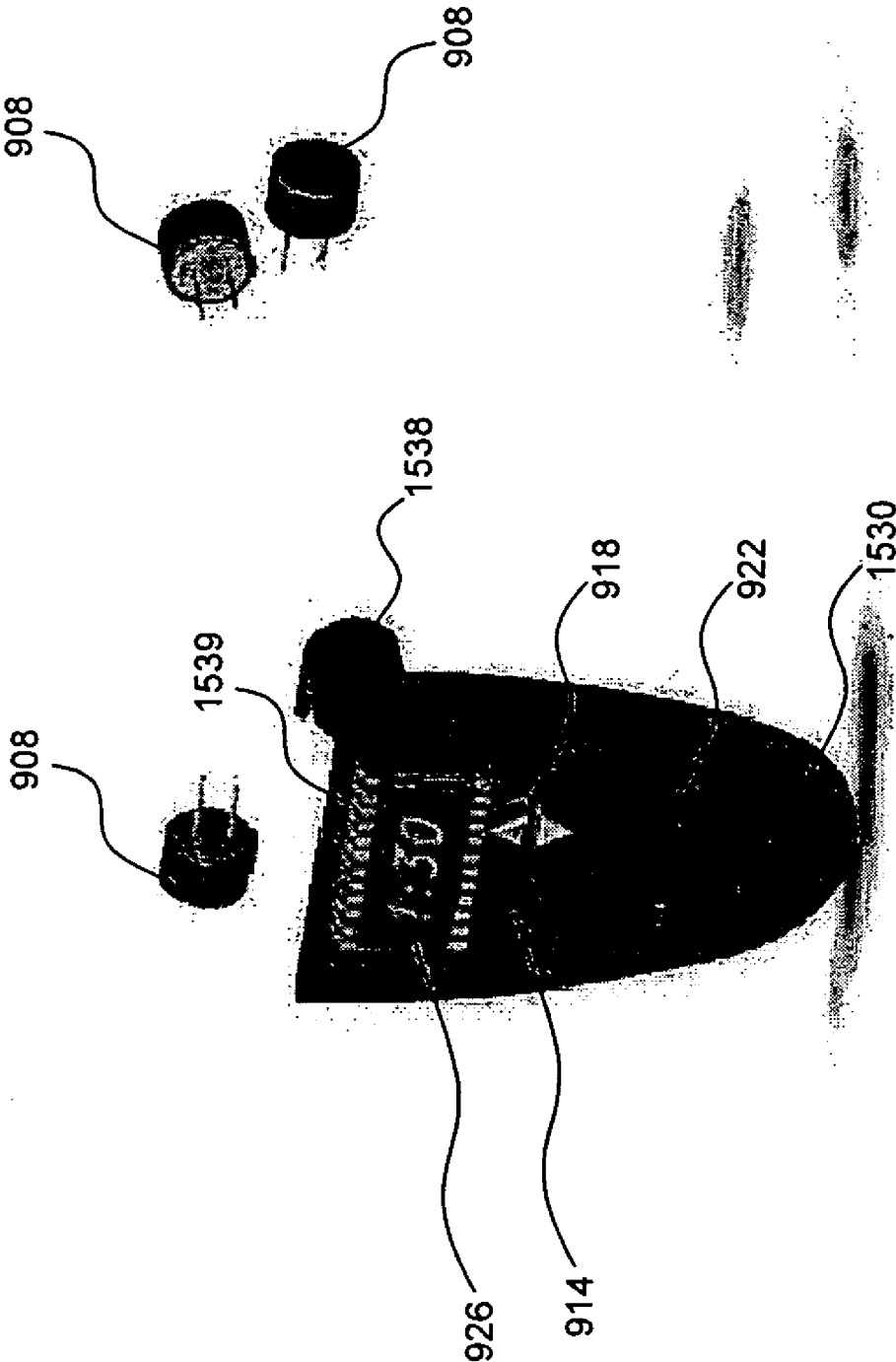


FIG. 16

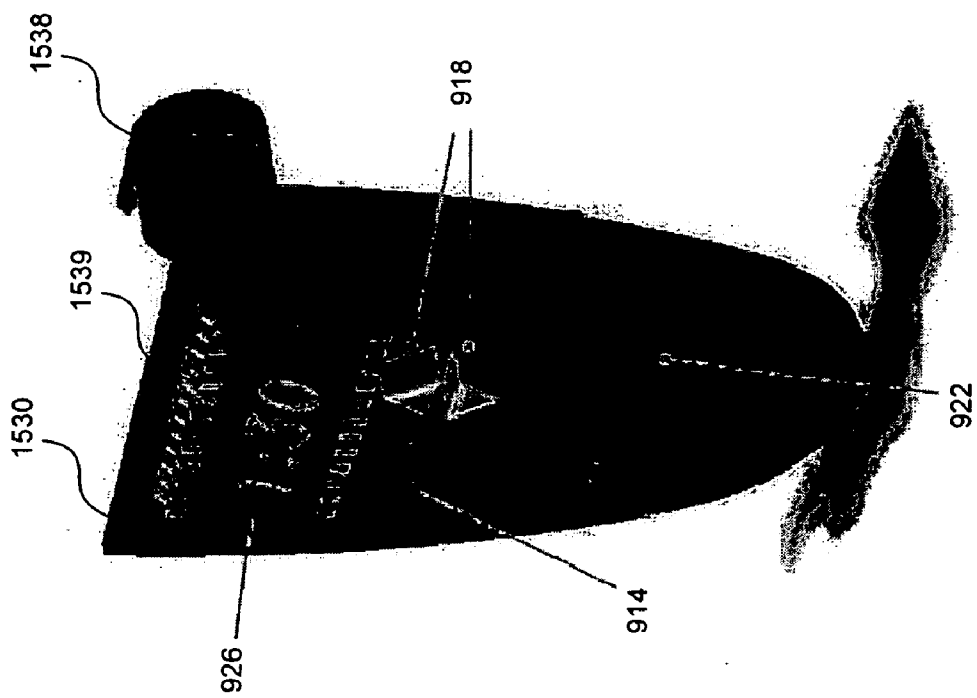


FIG. 17

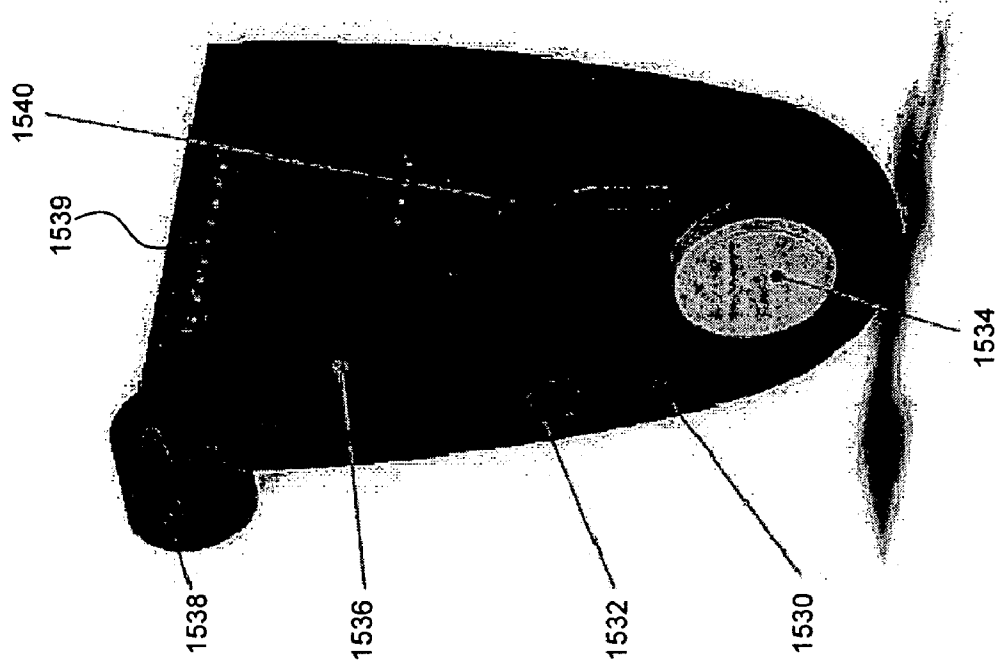


FIG. 18

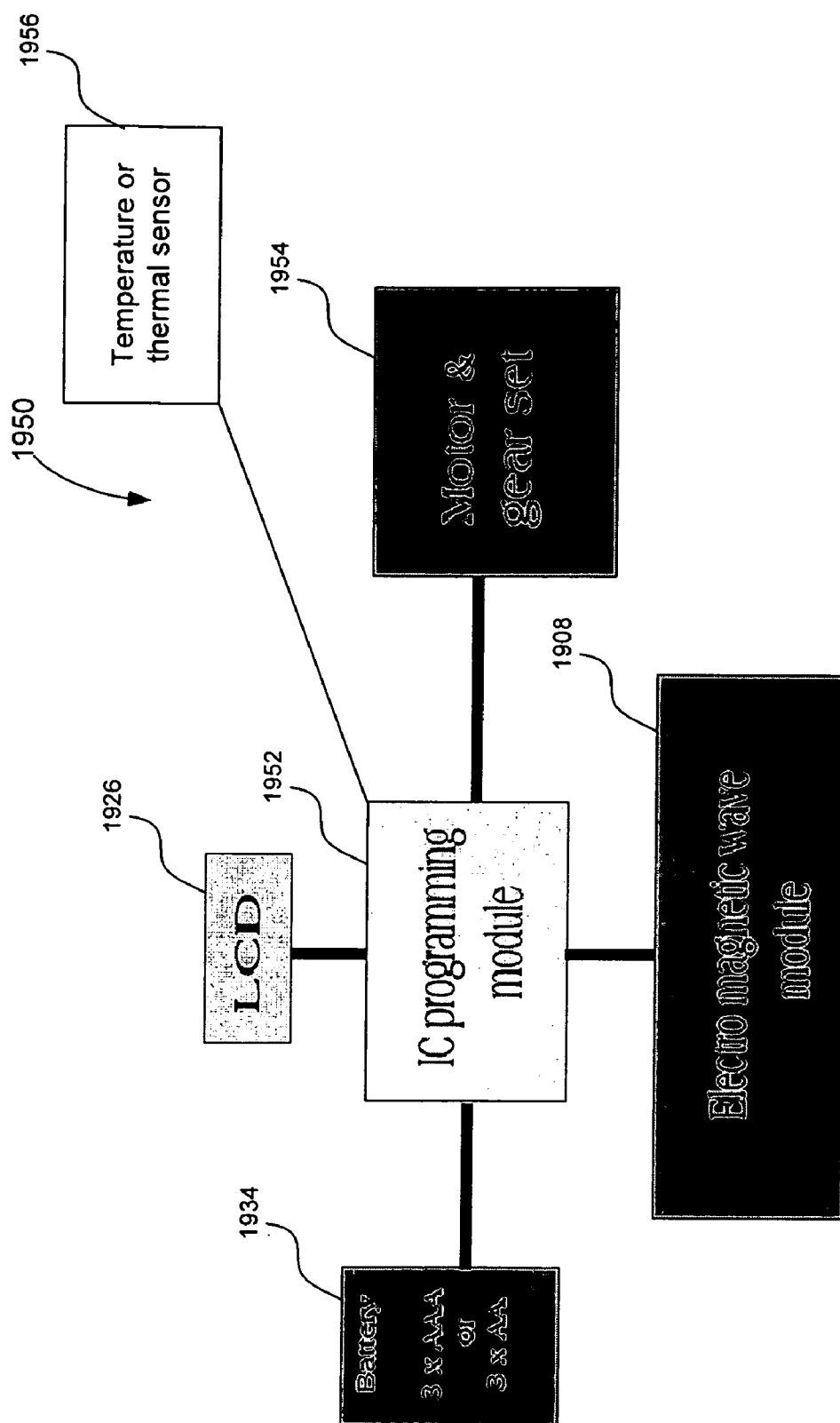


FIG. 19

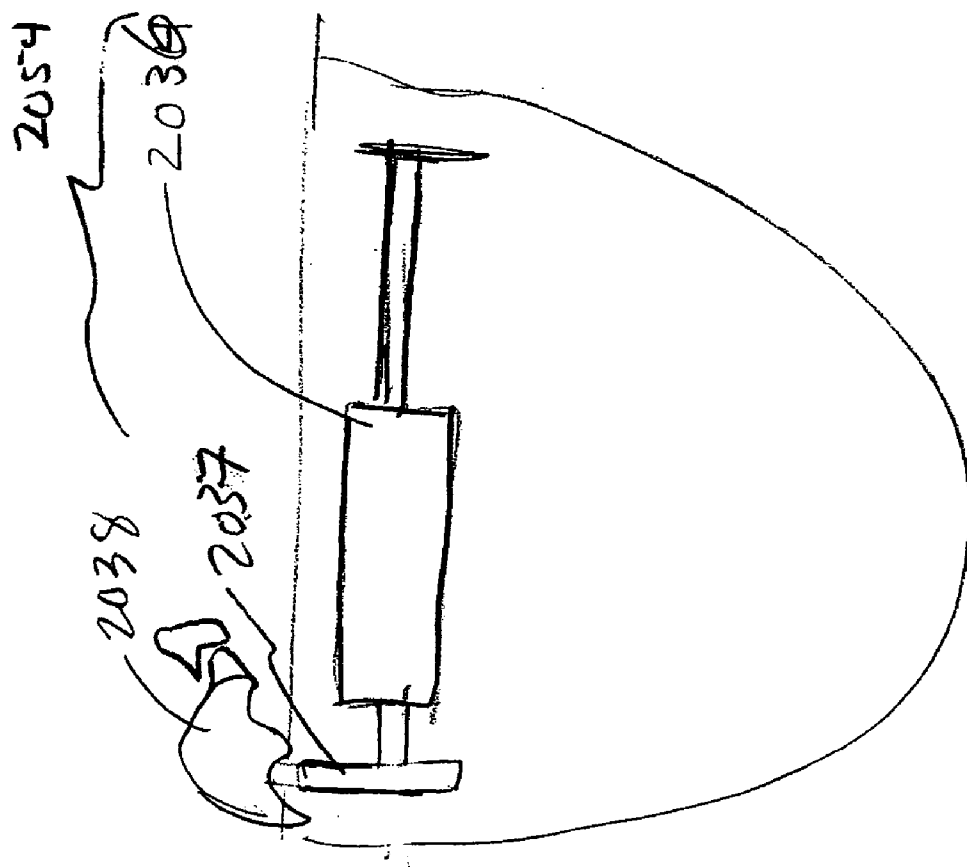


FIG. 20

SYSTEM AND METHOD TO AUTOMATICALLY EXTINGUISH A CANDLE

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims benefit under 35 U.S.C. 119(e) to U.S. Provisional Application No. 60/742,876, filed Dec. 7, 2005, which is incorporated by reference herein in its entirety.

[0002] This application is related to co-owned U.S. Pat. No. 6,494,708 and co-pending, co-owned U.S. application Ser. No. 10/317,202, filed Dec. 2, 2002, which are incorporated by reference herein in their entireties.

BACKGROUND

[0003] 1. Field

[0004] This invention is directed towards safety devices for candles. More particularly, the invention relates to a method and apparatus for automatically actuating candle snuffers and extinguishers.

[0005] 2. Related Art

[0006] One of the hottest selling products in today's market are candles. These candles come in all shapes, sizes, colors, scents, and containers. Increasingly, candles are being used to set atmosphere, light rooms, change the smell of a room with fragrances, or the like. Unfortunately, one common feature of all candles is that when left unattended for too long a period of time or disturbed they can cause fires. Recently, there has been a real increase in the frequency, severity, and reporting of fires. The worst cases are when these fires are in apartment houses or social houses since there is an even larger potential for damage to property, and even worse, an increased potential for death.

[0007] Manufacturers have recognized this problem and are trying to combat the increasing occurrence of fires caused by candles by producing candles in containers, such as jars or the like. Although this solution has been moderately successful in some ways, there are still fires starting because of unattended or forgotten candles being in these containers or when these candles are disturbed in some fashion. One reason for this is users falsely assumed the candles in containers are safer because of their configuration.

[0008] Therefore, a need exists for a safety device for candles in containers that automatically extinguishes a candle in a container after a user selected predetermined duration of time has passed. Further, there is a need for a safety device for candles in containers that can automatically extinguish the candle if the container is disturbed.

BRIEF DESCRIPTION OF THE DRAWINGS/FIGURES

[0009] The accompanying drawings, which are incorporated herein and form a part of the specification, illustrate embodiments of the present invention and, together with the description, further serve to explain the principles of the invention and to enable a person skilled in the pertinent art to make and use the invention.

[0010] FIG. 1 illustrates a safety device for candles, according to a one embodiment of the present invention.

[0011] FIG. 2 illustrate a side view of the safety device for candles in FIG. 1.

[0012] FIG. 3 illustrates a portion of a height adjusting device section of the safety device for candles in FIG. 1.

[0013] FIG. 4 illustrates a safety device for candles, according to one embodiment of the present invention.

[0014] FIGS. 5A and 5B illustrating a safety device for candles, according to various embodiments, of the present invention.

[0015] FIG. 6 is a perspective view of a safety device for candles, according to one embodiment of the present invention.

[0016] FIG. 7 shows a section of the safety device for candles of FIG. 6 when a closing device is in a closed position.

[0017] FIG. 8 shows a section of the safety device for candles of FIG. 6 when a closing device is in an open position.

[0018] FIGS. 9 and 10 show front and side prospective views, respectively, of a safety device coupled to or supported by a container, according to one embodiment of the present invention.

[0019] FIGS. 11, 12, 13, and 14 show top, front, right side, and rear views, respectively, of the safety device in FIG. 9.

[0020] FIGS. 15, 16, 17 and 18 show various views of a support device coupled to a support structure with a portion of a housing removed, according to one embodiment of the present invention.

[0021] FIG. 19 shows a safety device system, according to one embodiment of the present invention.

[0022] FIG. 20 shows a portion of the device.

[0023] In the drawings, like reference numbers may indicate identical or functionally similar elements. Additionally, the left-most digit(s) of a reference number may identify the drawing in which the reference number first appears.

DETAILED DESCRIPTION

[0024] While specific configurations and arrangements are discussed, it should be understood that this is done for illustrative purposes only. A person skilled in the pertinent art will recognize that other configurations and arrangements can be used without departing from the spirit and scope of the present invention. It will be apparent to a person skilled in the pertinent art that this invention can also be employed in a variety of other applications.

[0025] This specification discloses one or more embodiments that incorporate the features of this invention. The disclosed embodiment(s) merely exemplify the invention. The scope of the invention is not limited to the disclosed embodiment(s). The invention is defined by the claims appended hereto.

[0026] The embodiment(s) described, and references in the specification to "one embodiment", "an embodiment", "an example embodiment", etc., indicate that the embodi-

ment(s) described may include a particular feature, structure, or characteristic, but every embodiment may not necessarily include the particular feature, structure, or characteristic. Moreover, such phrases are not necessarily referring to the same embodiment. Further, when a particular feature, structure, or characteristic is described in connection with an embodiment, it is understood that it is within the knowledge of one skilled in the art to effect such feature, structure, or characteristic in connection with other embodiments whether or not explicitly described.

Exemplary Mechanical Timer System and Operation

[0027] As seen in FIG. 1, an apparatus 10, according to one embodiment of the present invention is shown. In one example, the apparatus 10 is a safety device for candles. The apparatus includes a first section 12, a second section 14, and a third section 16. In one example, the first section 12 is a closing device, e.g., a lid, the second section 14 is an attachment device, e.g., a rim device or ring device, and the third section 16 is a holding device. The apparatus 10 further comprises a coupler 18 that is configured to operatively couple the first through third sections 12-16, respectively, so that the first through third sections 12-16, respectively, move relative to one another. In one example, the coupler 18 is a hinge or flexible type device. In one exemplary configuration, the center portion 20 of the coupler 18 is coupled to the second section 14, a first end portion 22 of the coupler 18 is coupled to the first section 12, and a second end portion 24 of the coupler 18 is coupled to the third section 16.

[0028] It is to be appreciated that the first and second sections 12 and 14, respectively, could be made of similar non-flammable material, such as metal, aluminum, alloy, molded plastic, or the like. Also, the third section 16 can be made of any non-flammable material, such as metal, aluminum, alloy, molded plastic, or the like. Further, the coupler 18 can be coupled to the first through third sections 12-16, respectively, with any known material, such as adhesive material or small screws, bolts, or the like.

[0029] With continuing reference to FIG. 1, the first section 12 comprises an extension 26 coupled to and extending from a surface 28 and an optional second extension 30 coupled to and extending from the surface 28. The second extension 30 is in one example a stopping device that stops the movement of the closing device 12 as it moves from a first position, e.g., closed, to a second position, e.g., opened a predetermined amount. The second section 14 includes a securing system 32. The securing system 32 is, in one example, a set of threaded devices that interact with threaded openings (not shown) in the second section 14. It is to be appreciated, alternative embodiments comprise similar functioning securing systems, such as a clasp or spring loaded securing device or a malleable device, e.g., a soft rubber like material, which allows the second section 14 to be secured through form fitting and friction. The third section 16 comprises a timing device 34 coupled to and protruding from a surface 36 and a scale 38 on the surface 36. In one example, the timing device 34 is a mechanical timer, e.g., a kitchen timer or the like.

[0030] With further reference to FIG. 1, and reference to FIG. 2, in one example the apparatus 10 is secured adjacent an opening 40 of a container 42. Also, the container 42 comprises a lighted device 44, e.g., a candle or the like. The container 42 and candle 44 are represented as dashed lines

in FIG. 1. As seen in FIG. 3, a position adjusting device 46, or a plurality of position adjusting devices 46, may be positioned between an inside surface of the second section 14 and the opening 40 of the container 42 to fine adjust a position of the second device 14 until an optimal secured position is found. In one example, the position adjusting device 46 is utilized when the opening 40 is much smaller than the second section 14. At that time a user can secure the apparatus 10 onto the container 42 with the securing system 32.

[0031] In one example, an operation of the apparatus 10 with reference to FIGS. 1-2 will now be described after the apparatus 10 has been secured to container 42. A user will lift the first section 12 from the first position, e.g., closed, to the second position, e.g., opened a predetermined amount. In one example, the second position cannot be attained unless the timing device 34 has been moved in the direction of arrow 48, e.g., counterclockwise, to an ON position that starts the timing device 34 on a user selected predetermined duration of time.

[0032] Once the first section 12 is placed in the second position, the user can ignite the candle 44. During the duration of time on the timing device 34, determined by the scale 38, air can flow into the container 42 through the opening 40 based on the first section 12 being in the second position. Once the duration of time ends, the timing device 34 will return to an OFF position and a tip portion 50 of the timing device 34 interacts with an end portion 52 of the extension 26 forcing the extension 26 upward. This force causes the first section 12 to move in the direction of arrow 54 returning the first section 12 to the first position. Once the first section 12 is in the first position, the lack of air entering the container 42 will extinguish the lighted device 44 in a predetermined amount of time. In one example, the predetermined amount of time is around 5 seconds.

[0033] In an alternative embodiment, if during the duration of time a user or someone else disturbs the container or a structure holding the container, e.g., a table or the like, a predetermined amount, the first section 12 will automatically close, which extinguishes the lighted device 44 in the predetermined amount of time.

[0034] Therefore, through an exemplary arrangement of the apparatus 10, the candle 44 is automatically extinguished after a user selected predetermined duration of time. Thus, a user or a parent, friend, or relative of the user, can gain increased peace of mind when the user wants to light a candle. Further, the arrangement of apparatus 10 will also automatically extinguish the candle 44 when a predetermined amount of disturbance occurs around the candle 44 as an added measure of safety.

[0035] Turning now to FIG. 4, an apparatus 100, according to one embodiment of the present invention is shown. Throughout the description of FIG. 4, all elements similar to the apparatus 10 in FIGS. 1-2 will have similar elements numbers with a 100 prefix. For example, apparatus 100 in FIG. 4 for apparatus 10 in FIGS. 1-2, first section 112 in FIG. 4 for first section 12 in FIGS. 1-2. These similar elements function similarly to the elements in the previous description, so the description will not be repeated for convenience.

[0036] A main difference in the embodiment shown in FIG. 4 compared to that shown in FIGS. 1-2 is the shape and

interaction of an extension 200 coupled to and extending from a surface 128 of a first section 112. Another difference is the addition of a holding device 202 that holds the extension 200 when the first section 112 is in the second position. In this embodiment, the holding device 202 pivots around pivot securing device 204. Thus, in operation an end portion 150 of a timing device 134 will interact with an end portion 206 of the holding device 202 when the duration of time has elapsed and the timing device 134 is in an OFF position. Next, the holding device 202 will pivot in the direction of an arrow 208 to release the extension 200 allowing the first section 112 to return to the first position. Finally, once the first section 112 returns to the first position, the candle 144 is extinguished in a predetermined amount of time since no air can enter the container 142.

[0037] It is to be appreciated the container 42 might contain reflective surfaces, or in other alternative embodiments the first section 12 can include reflective surfaces. These reflective surfaces would be utilized to enhance the light produced by the candle 44.

[0038] Now with reference to FIGS. 5A and 5B, again similar elements will have similar numbers with a 300 prefix. These FIGS. show an apparatus 300 according to various embodiments of the present invention. The apparatus 300 comprises a first section 312 and a second section 314.

[0039] A main difference between the above embodiments shown in FIGS. 1-4 and the embodiments shown in FIGS. 4 and 5 is that an extension 360 in FIG. 5A and extension 362 in FIG. 5B extends from an outside edge surface 364 of the second section 314. The extension 360 or 362 in alternative embodiments can be either stationary or moveable. Also, the extension 360 is substantially horizontal, while the extension 362 is at a predetermined angle.

[0040] Another difference between the embodiments in FIGS. 1-4 and FIGS. 5A and 5B is that a timing device 366, e.g., an electronic timing device, is coupled to and protrudes from an outside surface 368 of the first section 312. The timing device 366 comprises an extension 370 that extends to a first position, e.g., a contacting position, and retracts to a second position, e.g., a non-contacting position. The timing device 366 is configured to automatically extend the extension 370 when a user selected predetermined time duration has expired and retract the extension 370 either automatically or through manual manipulation after the first section 312 is in the first position, e.g., closed.

[0041] In operation, a user will set a predetermined duration of time on the timing device 366 after moving the first section 412 from the first position, e.g., closed, to the second position, e.g., opened a predetermined amount. Once the selected predetermined duration of time has elapsed, the timing device 366 is configured to automatically extend the extension 370 until contact is made with the extension 362. The force caused by the contact is enough to initiate movement of the first section 312 to return the first section 312 to the first position. By having the extension 362 extending at a predetermined angle, less force is needed to return the first section 312 to the first position. The other functions as described above for embodiments one and two also are performed by the apparatus 300 in embodiments three and four.

[0042] FIG. 6 is a perspective view of a system 600, according to one embodiment of the present invention.

System 600 includes an apparatus 602. Apparatus 602 includes a closing portion 604 hingedly coupled via coupling device 606 to an attachment portion 608 and a system 610. Attachment portion 608 is releasably secured, via any one of the securing systems discussed above or otherwise known in the art, to container 612. For example, attachment portion 608 can be frictionally or interference fit coupled to container 612. System 610 can be used to automatically extinguish a candle, and can include a support rod 618 (e.g., that can act as a manual closing button) and a timing device 614 having a gripping device 616. Further details of system 610 according to one embodiment of the present invention are described below with reference to FIGS. 7-8. It is to be appreciated, other configurations can be used for system 610.

[0043] FIG. 7 shows apparatus 602 with a section removed so that details of apparatus 602, when closing portion 604 is in a closed state, can be seen. FIG. 8 shows system 610 with a section removed so that details of apparatus 602, when closing portion 604 is in an open position, can be seen.

[0044] In one embodiment, system 610 can further include a support device 700 and a resilient device 702 coupled to support rod 618. The coupling can be based on support rod 618 passing through an opening in support device 700 and an open area of resilient device 702. It is to be appreciated that other coupling methods and/or devices can also be used. Although coupled, support device 700 and/or resilient device 702 may slide along support rod 618.

[0045] In an embodiment, timing device 614 can further include an arm 704 having extensions 706 and 708. Arm 704 passes through an opening 710 in a body 712. A resilient device 714 is coupled between extension 706 and support device 700. A rotating device 716 interacts with extension 708 to move arm 704 in a direction of arrow B when an OFF state of timing device 614 is reached, as described in detail below. Timing device 614 can be secured to apparatus 602 using any known securing devices, such as a screw 718, bolts, adhesive material, or the like. Both resilient devices 702 and 714 are biased to push or pull, respectively, support rod 618 and support device 700 in a direction of arrow A. In the perspective of FIGS. 7 and 8, this is the leftward direction. A stopping device 720 can be used to limit movement of supporting rod 618 and support device 700.

[0046] In one embodiment, closing portion 604 includes an extension 722 that extends through an opening 724 in attachment device 608. Extension 722 interacts with support device 700, as will be described in detail below.

[0047] When a user wishes to light a candle (not shown) in container 612, timing device 614 should be turned ON. After turning ON timing device 614, support rod 618 is pushed by the user to move support rod 618 and support device 700 in a direction of arrow C. In the perspective of FIGS. 7 and 8, this direction is rightward. Then, closing portion 604 is opened so that extension 722 can be supported by support device 700. This support can be enhanced based on friction between extension 722 and support device 700. Once extension 722 is supported by support device 700, several types of events can automatically cause resilient device 714 and/or resilient device 702 to pull or push, respectively, support rod 618 and support device 700 in the direction of arrow A, which causes automatic extinguishing of the candle, as will be described in more detail below.

[0048] In one example, an event can be when timing device 614 reaches an OFF state. This moves arm 704 in the direction of arrow B causing resilient device 714 to pull support rod 618 and support device 700 in the direction of arrow A. When support device 700 moves in the direction of arrow A, extension 722 becomes unsupported by support device 700. This causes closing portion 604 to move to a closed state, which extinguishes the candle.

[0049] In another example, an event can be when any aspect of system 600 is disturbed, as described above. The disturbance causes resilient device 702 to move support rod 618 and support device 700 in the direction of arrow A. Resilient device 714 may also assist resilient device 702 in the movement of support rod 618 and support device 700. Again, when support device 700 moves in the direction of arrow A extension 722 is unsupported by support device 700. This causes closing portion 604 to move to a closed state, which extinguishes the candle.

[0050] In another example, a person can manually extinguish the candle by pushing on rod 618 in the direction of arrow C.

Exemplary Electrical Timer System and Operation

[0051] FIGS. 9 and 10 show front and side prospective views, respectively, of a safety device 900 coupled to or supported by a container 901, according to one embodiment of the present invention. FIGS. 11, 12, 13, and 14 show top, front, right side, and rear views, respectively, of safety device 900.

[0052] Safety device 900 includes a cover 902 hingedly coupled to a support structure 904. Support structure 904 includes openings 906, which receive proximity sensors 908, and a housing 910.

[0053] It is to be appreciated that proximity sensors 908 may not be used in all embodiments, based on a desired application of safety device 900, and thus are optional. It is also appreciated that more or less proximity sensors 908 can be used than are shown, based on a desired application of safety device 900. In various examples, proximity sensors 908 can be either acoustic or optical sensors that detect movement proximate the safety device 900. For example, the movement can be from a person or a animal, or other types of moving objects, such as curtains or debris. This movement can trigger closing of cover 902, as discussed in more detail below.

[0054] In one example, housing 910 includes an opening 912 for an on/off switch 914, an opening 916 for an up/down switch 918, and an opening 920 for an on/off proximity sensing switch 922 (only needed if proximity sensors 908 are being used in a particular application), and an opening 924 for an output device 926. In various examples, output device 926 can be a liquid crystal display (LCD), a light emitting diode (LED) display device, or the like, which can show a time set/remaining on an associated electrical timing device (not shown) (see timing device 1532 in FIG. 15). Up/down switch 918 is used to set the time stored in the timing device, which is discussed in more detail below.

[0055] In one example, an input device is considered one or more of switches 914, 918, and/or 922.

[0056] FIGS. 15, 16, 17 and 18 show various views of a support device 1530 (e.g., a printed circuit board) coupled to

support structure 904 with a portion of housing 910 removed, according to one embodiment of the present invention. FIGS. 15 and 18 show a back-side view of support structure 1530, while FIGS. 16 and 17 show a front-side view of support structure 1530.

[0057] In the example shown in FIGS. 15, 16, 17, and 18, an electrical timing device 1532, a power source 1534, a release arm 1536, an actuator 1538, and a non-mercury motion switch 1540 are coupled to support structure 1530. Prongs 1539 extending from display 926 are shown extending through openings 1541 in support device 1530.

[0058] In various examples, electrical timer 1532 can be either an analog or digital timer.

[0059] In one example, release arm 1536 and actuator 1538 form a closing device.

[0060] In one example, a controller (not shown, but see controller 1952 in FIG. 19) can be coupled to one or more of electrical timing device 1532, switches 914, 918, and 922, output device 926, proximity sensors 908, power source 1534, and actuator 1538 in order to control one or more of these elements through receipt and transmission of signals therefrom, as discussed in more detail below. The controller can be coupled to one or more of these elements via signal transmission lines, e.g., printed wires, or the like, that are formed on or coupled to support structure 1530, as would be known to a skilled artisan in the relevant arts.

[0061] FIG. 20 shows a portion of the device 900. In this embodiment, an actuator 2054 is shown, including a solenoid 2056 coupled to an arm 2057, which interact with actuator 2038 to close a lid (not shown).

[0062] FIG. 19 shows a safety device system 1950, according to one embodiment of the present invention. System 1950 comprises a controller 1952 (e.g., an IC programming module, or the like), a power source 1934 (e.g., one or more AA or AAA batteries, or the like), an output device 1926 (e.g., an LCD display, or the like), a sensor 1908 (e.g., an electro magnetic wave module), and an actuation device 1954 (e.g., a motor and gear set, for example actuator 1538 and release arm 1536, or a system comprising with a solenoid type design which plunger action moves and releases the lid thus closing it, for example actuator 2054).

[0063] In one example, additionally or alternatively, a temperature or thermal sensor 1956 can be coupled to controller 1952. Temperature sensor 1956 can be coupled to or attached to either cover 902, e.g., inside cover 902 facing into container 901, or support structure 904, or in another location. Temperature sensor 1956 is used to measure an ambient temperature inside container 901 or adjacent a flame, which can indicate a flame has grown to a large size or that the flame is conducting a large amount of heat. Either situation can indicate that the flame has become dangerous, and should be extinguished.

[0064] An exemplary operation of safety device 900, with reference to FIGS. 9-19, will now be described. Initially, device 900 is turned on when a user moves on/off switch 914 into an "on" position to power the device 900 with power source 1534/1934. To set a time on electrical timing device 1532, the user interacts with up/down switch 918 while observing display 926. Time is set by pressing the up arrow

of switch **918** to increase the time or the down arrow of switch **918** to decrease the time. When either the up or down arrow are depressed, or otherwise interacted with, signals from up/down switch **918** are transmitted to electrical timing device **1532**, possibly via a controller, e.g., controller **1952**. Electrical timing device **1532** then transmits corresponding signals to display **926**, possibly via the controller **1952**. Using this methodology, the user watches display **926** and interacts with up/down switch **918** until a time is shown that the user desires to set in electrical timing device **1532**. This time will correlate to how long the user wants cover **902** to remain open before extinguishing a candle (not shown) located inside the container **901**. Once a time selected by the user is set in electrical timing device **1532**, release arm **1536** and actuator **1538/2038** are allowed to rotate (release arm **1556**) or activate (solenoid **2036**) or, which allows cover **902** to be held open through an interaction of cover **902** and release arm **1536**. Activation or rotation of these elements, and thus holding open of cover **902**, is not possible before a time is set on electrical timing device **1532**. Once the cover **902** is locked into a open position, the user can light the candle held within container **901**.

[0065] In one example, once the time runs out in electrical timing device **1532**, a signal is sent from electrical timing device **1532** to actuator **1538/2038**, possibly via controller **1952**. When the actuator **1538/2038** receives this signal, the actuator **1538/2038** causes release arm **1536** to rotate or arm **2037** and solenoid **2036** to activate to a position in which it no longer supports cover **902**. This causes cover **902** to close. Once cover **902** closes, the candle is automatically and quickly extinguished, as is discussed above.

[0066] In another example, a motion sensor **1540** is used. If movement of the container **901** or the safety device **900** is detected by motion sensor **1540**, a signal is sent to actuator **1538/2038**, possibly via controller **1952**, to initiate the closing of cover **902**, as described above. Thus, cover **902** can be closed regardless of how much time is remaining when movement of container **901** or safety device **900** is detected. The closing of the lid may be automatic if the system detects low battery signal and the lid will not stay open if the same is detected.

[0067] In a further example, proximity sensors **908** are used. When proximity sensors **908** are turned on via switch **922**, they detect if a person or animal, or the like, is within a certain distance (e.g., up to about 20") of proximity sensors **908**. When this is detected, a signal is sent from proximity sensors **908** to actuator **1538/2038**, possibly via controller **1952**, to initiate the closing of cover **902**, as described above. Thus, cover **902** can be closed regardless of how much time is remaining when something is detected as being too close to the container **901** or safety device **902**. When using the motion detectors, the user will have a set time, approx 1 minute from the point when this option is chosen, to light the candle and move out of the range of motion.

[0068] In a further example, temperature sensor **1956** is used. Temperature sensor **1956** is used to detect an amount of heat being generated by a flame of a candle in the container **901** and generate a temperature value signal corresponding thereto. The temperature value signal generated by temperature sensor **1956** is received at either controller **1952** or a comparing device (not shown) coupled to controller **1952**. The temperature value signal is compared to a threshold value (e.g., a stored threshold value). If the

temperature is above the threshold value, a signal is sent to actuator **1538/2038**, possibly via controller **1952**, to initiate the closing of cover **902**, as described above. Thus, cover **902** can be closed regardless of how much time is remaining when the temperature exceeds the threshold value.

CONCLUSION

[0069] While various embodiments of the present invention have been described above, it should be understood that they have been presented by way of example only, and not limitation. It will be apparent to persons skilled in the relevant art that various changes in form and detail can be made therein without departing from the spirit and scope of the invention. Thus, the breadth and scope of the present invention should not be limited by any of the above-described exemplary embodiments, but should be defined only in accordance with the following claims and their equivalents.

[0070] It is to be appreciated that only the Detailed Description section is meant to be used in interpreting claim limitations, and the Summary and Abstract sections are not to be used when interpreting the claim limitations. The Summary and Abstract sections are merely one or more exemplary embodiments or examples of the present invention, while the Detailed Description provides additional/alternative embodiments and/or examples.

What is claimed is:

1. A safety device, comprising:

a cover;

a support structure hingedly coupled to the cover, and configured to be supported by a container;

a support device coupled to the support structure;

a controller coupled to the support device;

an electrical timing device coupled to the support device and the controller;

an input device coupled to the support device and the controller;

an output device coupled to the support device and the controller; and

a closing device coupled to the support device and the controller.

2. The safety device of claim 1, wherein the input device comprises a switching device.

3. The safety device of claim 2, wherein the switching device comprises at least an on/off switch and an up/down switch used to control the electrical timing device.

4. The safety device of claim 1, wherein the output device comprises a display.

5. The safety device of claim 4, wherein the display displays a time associated with the electrical timing device.

6. The safety device of claim 1, further comprising:

a proximity sensing system coupled to the support structure and the controller.

7. The safety device of claim 6, wherein the input device comprises at least one of an on/off switch, an up/down switch that controls the digital timing device, and a slide switch that controls the proximity sensing system.

8. The safety device of claim 6, wherein the proximity sensing system comprises ultrasonic sensors.

9. The safety device of claim 6, wherein the proximity sensing system comprises optical sensors.

10. The safety device of claim 1, wherein the closing device comprises an actuator and a release arm.

11. The safety device of claim 1, further comprising:

a motion detector coupled to the support device and the controller.

12. The safety device of claim 11, wherein the motion detector comprises a non-mercury motion switch.

13. The safety device of claim 1, wherein the output device comprises one of a liquid crystal display or a light emitting diode display.

14. The safety device of claim 1, further comprising:

a proximity sensing system coupled to the support structure and the controller; and

a motion detector coupled to the support device and the controller.

15. The safety device of claim 1, further comprising:

a temperature or thermal sensor that detects the temperature associated with the container.

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