



(51) International Patent Classification:

G07C 1/22 (2006.01) A63B 26/00 (2006.01)
G07C 1/02 (2006.01)

(21) International Application Number:

PCT/US2017/012779

(22) International Filing Date:

9 January 2017 (09.01.2017)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

62/278,082 13 January 2016 (13.01.2016) US
15/401,810 9 January 2017 (09.01.2017) US

(71) Applicant: TULLINGTON, LLC [US/US]; 6616 32nd Place NW, Washington, DC 20015 (US).

(72) Inventors: MALONEY, Brian, B.; 6616 32nd Place NW, Washington, DC 20015 (US). MALONEY, Elizabeth, S.; 6616 32nd Place NW, Washington, DC 20015 (US). ARENA, Richard, V.; 5928 School Avenue, Henrico, VA 23228 (US). FERRIS, Bruce, Seymour; 117 N. Lombardy Street, Richmond, VA 23220 (US).

(74) Agent: TEAGUE, Brian, J.; Patent Law Of Virginia, PLLC, PO Box 9319, Richmond, VA 23227 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(54) Title: TIMING DEVICE WITH SHOCK SENSOR AND CORRESPONDING ACTIVITY SYSTEM AND METHOD

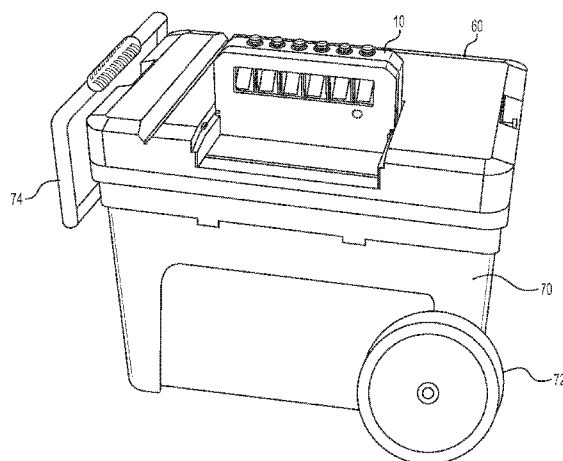


FIG. 5

(57) Abstract: A timing device comprising a housing, a controller within the housing, and a shock sensor connected to the controller and within the housing. The controller receives a first signal from the shock sensor when the shock sensor detects a first shock or vibration. The controller receives a second signal from the shock sensor when the shock sensor detects a second shock or vibration. The controller starts a timer in response to receipt of the first signal. The controller stops the timer in response to receipt of the second signal.



TIMING DEVICE WITH SHOCK SENSOR AND CORRESPONDING ACTIVITY SYSTEM AND METHOD

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to U.S. Provisional Application Serial No. 62/278,082, filed January 13, 2016, the contents of which are incorporated herein by reference in its entirety.

FIELD OF THE INVENTION

[0002] The present invention relates generally to timing devices for use with games and activity sets.

BACKGROUND

[0003] According to the US Centers for Disease Control and Prevention, childhood obesity has more than doubled in children and quadrupled in adolescents in the past 30 years. Healthy lifestyle habits, including healthy eating and physical activity, can lower the risk of becoming obese and developing related diseases.

[0004] Games and activities that encourage physical activity and are fun for kids can help provide a healthy lifestyle and lower the risk of childhood obesity.

BRIEF SUMMARY OF THE DISCLOSURE

[0005] In one embodiment of the invention, timing device comprises a housing, a controller within the housing, and a shock sensor connected to the controller and within the housing. The controller receives a first signal from the shock sensor when the shock sensor detects a first shock or vibration. The controller receives a second signal from the shock sensor when the shock sensor detects a second shock or vibration. The controller starts a timer in response to receipt of the first signal. The controller stops the timer in response to receipt of the second signal.

[0006] The timer may be selectively operable in a count-up mode or a countdown mode. The timing device may further comprise a timer mode selector connected to the controller for selecting whether the timer operates in the count-up mode or the countdown mode.

[0007] The timing device may further comprise a display connected to the controller for displaying a time output from the timer.

[0008] The timing device may be adapted to be selectively affixable to a lid of a storage tote. The housing may comprise a plurality of mating surfaces adapted to be mated with cooperatively-shaped mating surface of the lid.

[0009] In alternative embodiments of the invention, an activity system comprises a storage tote and a timing device. The storage tote comprises a main body having an open top end and defining a storage chamber and a lid selectively mountable to the open top end of the main body. The timing device is selectively affixable to the lid and comprises a housing, a controller within the housing, and a shock sensor connected to the controller and within the housing. The controller receives a first signal from the shock sensor when the shock sensor detects a first shock or vibration. The controller receives a second signal from the shock sensor when the shock sensor detects a second shock or vibration. The controller starts a timer in response to receipt of the first signal. The controller stops the timer in response to receipt of the second signal.

[0010] The timer may be selectively operable in a count-up mode or a countdown mode. The timing device may further comprise a timer mode selector connected to the controller for selecting whether the timer operates in the count-up mode or the countdown mode.

[0011] The timing device may further comprise a display connected to the controller for displaying a time output from the timer.

[0012] The timing device may be selectively affixable to the lid via cooperatively-shaped mating surfaces of the housing and of the lid.

[0013] The activity system may further comprise a plurality of obstacles selectively stored in the storage tote and selectively configurable in a plurality of different obstacle course arrangements when removed from the storage tote.

[0014] In alternative embodiments of the invention, a method of timing an activity comprises affixing a timing device to a lid of a storage tote, hitting the lid of the storage tote to start the timer, performing an activity to be timed, and hitting the lid of the storage tote to stop the timer after completing the activity. The timing device comprises a housing, a controller within the housing, and a shock sensor connected to the controller and within the housing. The controller receives a first signal from the shock sensor when the shock sensor detects a first shock or vibration. The controller receives a second signal from the shock sensor when the shock sensor detects a second shock or vibration. The controller starts a timer in response to receipt of the first signal. The controller stops the timer in response to receipt of the second signal.

[0015] The timer may be selectively operable in a count-up mode or a countdown mode. The timing device may further comprise a timer mode selector connected to the controller for selecting

whether the timer operates in the count-up mode or the countdown mode. The method may further comprise selecting the count-up mode or the countdown mode prior to hitting the lid of the storage tote to start the timer.

[0016] The activity may comprise running an obstacle course, and the method may further comprise arranging a plurality of selectively configurable obstacles into a desired obstacle course arrangement.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0017] Reference will now be made to the accompanying drawings, which are not necessarily drawn to scale. The following detailed description of the disclosure will be better understood when read in conjunction with the appended drawings. It should be understood, however, that the disclosure is not limited to the precise arrangements and instrumentalities shown. In the drawings:

[0018] FIGS. 1-4 are, respectively, front perspective, front, top, and rear perspective views of a timing device with a shock sensor, in accordance with embodiments of the present invention.

[0019] FIG. 5 is a perspective view of the timing device of FIGS. 1-4 selectively mounted to a lid of a game tote, in accordance with embodiments of the present invention.

[0020] FIG. 6 is a perspective view of the lid of FIG. 5 without the timing device.

[0021] FIG. 7 is a block diagram of a control system of the timing device of FIGS. 1-4.

[0022] FIG. 8 illustrates a sample obstacle course with which the timing device of FIGS. 1-4 may be used.

DETAILED DESCRIPTION OF THE DISCLOSURE

[0023] Certain terminology is used in the following description for convenience only and is not limiting. The words “lower,” “bottom,” “upper,” and “top” designate directions in the drawings to which reference is made. The words “inwardly,” “outwardly,” “upwardly” and “downwardly” refer to directions toward and away from, respectively, the geometric center of the device, and designated parts thereof, in accordance with the present disclosure. Unless specifically set forth herein, the terms “a,” “an” and “the” are not limited to one element, but instead should be read as meaning “at least one.” The terminology includes the words noted above, derivatives thereof and words of similar import.

[0024] Embodiments of the invention are directed to a game, obstacle course, or activity/exercise system, a timing device for use while playing a game, running an obstacle course,

exercising, or performing some other activity, and method of playing a game, running an obstacle course, exercising or performing some other activity, or timing any of those. Generally, the system comprises a tote or container for holding components of the activity/game/obstacle course and a timing device that is selectively mountable to the lid of the tote. Advantageously, the timing device incorporates a shock sensor so that, when the timing device is selectively mounted to the tote lid, the timing device may be started and/or stopped by hitting, slapping, or otherwise jolting the lid. The timing device may function in a count up (i.e., stopwatch) mode or a countdown mode. In the count up mode, a user may time how long it takes for him/her to, for example, complete an activity such as running an obstacle course. In the countdown mode, a user may attempt to complete an activity such as running an obstacle course in a specified amount of time (i.e., before the timing device counts down from a set time to zero).

[0025] In one embodiment of the invention, the game or activity system comprises various components that may be used to lay out an obstacle course, exercise course, or the like. Such components may be stored in the tote when not in use. Such obstacle course components may comprise, for example, (a) course markers, such as cones, flags, and/or the like, (b) game components to facilitate the performance of desired activities at locations along the course (e.g., a ball to be bounced a specified number of times at a location), (c) placards or other indicia to indicate desired activities to be performed at locations along the course (e.g., a sign indicating that a specified number of pushups should be performed at a location), or any other suitable, desired components that may be used to set up and run an obstacle/exercise course or play a game (e.g., poles and connectors which can be used to make hurdles and weaving obstacles, and rings or rubber tubing and connectors (which can be used to make rings) which can be used to mark areas for jumping or hopping (similar to an agility ladder or hopscotch)). One example of such an obstacle course is illustrated in FIG. 8, discussed below.

[0026] The tote is generally similar to conventional storage totes. However, the lid of the storage tote of embodiments of the invention is designed to enable a timing device to be selectively mounted thereto, as described further below. The tote and lid may be constructed of any suitable material, preferably durable and waterproof, such as any suitable plastic (typically, but not necessarily, polypropylene or polyethylene).

[0027] Referring now to the figures wherein like numerals indicate like elements throughout, embodiments of the invention comprise a timing device 10 that is selectively mountable to a lid 60 of a tote. The timing device 10 comprises a durable housing 12, a display 14, a plurality of buttons 16 to control the operation of the timing device, one or more indicator lights 18 (or other indicia) to

indicate a mode of the timing device, and a speaker or buzzer 20. In alternative embodiments of the invention, some of these components may be omitted, or substitutes may be used (some examples of such omissions and substitutes are described below, but these examples are not exhaustive or limiting).

[0028] The housing 12 may be constructed of any suitable material, such as metal or any suitable plastic. The housing may be water resistant or waterproof.

[0029] The display 14 may comprise a six digit LCD or LED numeric display, or any other suitable display for displaying a count up and/or countdown timer. For example, the display may display two digit minutes, two digit seconds, and two digit fractions of a second (MM:SS.FF) up to 99 minutes, 59.99 seconds. Alternatively, the display may display two digit hours, two digit minutes and two digit seconds (HH:MM:SS) up to 99 hours, 59 minutes, 59 seconds. Alternatively, more or fewer than six digits may be used.

[0030] The buttons 16 may be momentary pushbuttons. Some or all of the buttons may be lighted if desired. Six buttons are illustrated, but more or fewer buttons may be used depending on the features and options of the timing device. If desired, some of the buttons may be replaced with other input devices, such as switches or the like. For example, the on/off button may be replaced with a rocker or slide switch. The buttons 16 are illustrated on the top surface of the timing device, but some of the buttons (or other input devices) may be located on one or more other surfaces (for example, an on/off slide switch may be located on the back surface of the timing device).

[0031] The mode indicator lights 18 may comprise individual LEDs or any other suitable indicator. For example, the mode indicator lights may be omitted and the mode may be indicated on the display 14. The mode indicator lights 18 may be omitted if the timing device does not have more than one mode (the illustrated and described embodiment of the timing device has count up and countdown modes). The mode indicator lights 18 are illustrated on the front surface of the timing device, but the indicator lights may be located on a different surface or surfaces.

[0032] The speaker or buzzer 20 may comprise a piezoelectric speaker, or any other suitable sound producing device. The speaker 20 may be capable of producing a single sound or a plurality of different sounds. The timing device 10 may be configured such that the speaker 20 produces sound to indicate the occurrence of a defined event or events. For example, the timing device 10 may be configured such that the speaker 20 produces sound when a countdown timer reaches zero. As another example, the timing device may be configured such that the speaker 20 produces sound when the timing device is started and/or stopped.

[0033] The rear of the timing device 10 is seen in FIG. 4, in which an access panel is removed. Visible through the opening is a circuit board 32 upon which some components are mounted and to which some components are electrically connected. Also visible through the opening is a battery compartment 34. The timing device 10 is typically battery powered.

[0034] FIG. 7 illustrates a block diagram of a control system of the timing device 10. A controller 40 controls the operation of the timing device 10. The controller 40 may comprise a microprocessor, dedicated or general purpose circuitry (such as an application-specific integrated circuit or a field-programmable gate array), a suitably programmed computing device, or any other suitable means for controlling the operation of the timing device 10. The controller may include a timer module or algorithm 44, as illustrated, or may interface with a separate timer chip, circuit, or the like. As indicated in FIG. 7, the controller 40 receives user input via the buttons 16 and controls the output to the display 14, the lights 18, and the speaker 20. Advantageously, the timing device 10 incorporates a shock sensor 42. The controller 42 receives input from the shock sensor 42 to, for example, start and/or stop the timer 44. The shock sensor 42 may be any suitable sensor that can detect a shock to or vibration of the timing device, typically above a desired threshold to avoid inadvertent activation. While the sensor is referred to herein as a shock sensor, a vibration sensor (sometimes called a shake sensor) may also be used, and is within the scope of this invention. In this regard, since noise is a kind of vibration, a noise sensor may also be used. In one specific embodiment of the invention, the SW 200 D tilt / shake switch from Mantech Electronics may be used.

[0035] In the illustrated embodiment of the invention, as seen in FIG. 3, the six buttons are: POWER, MODE, + (INCREASE COUNTDOWN TIME), - (DECREASE COUNTDOWN TIME), START/STOP, and RESET.

[0036] In operation of the timing device of an embodiment of the invention, the user begins by powering on the timing device by pressing the POWER button once. If the user wants to use the timing device in the stopwatch (count up) mode, the user presses the MODE button until the LED next to the word “STOPWATCH” illuminates (the figures show the word “TIMER” displayed instead; the timing device may also display the words “COUNT UP” instead). The MODE button may toggle between the two modes. The timing device may not be in either mode up powering up. As such, it may be necessary to press the MODE button more than once to access the stopwatch function. Alternatively, the timing device may default to one of the modes upon powering up, or the timing device may power up in the same mode the timing device was in when it was last powered

down. In this regard, it may not be necessary to press the MODE button at all if the mode upon powering up is the desired mode.

[0037] To start the count up timer, the user may press the START/STOP button or may hit the lid of the tote or hit the timing device to activate the shock sensor. The controller treats the activation of the shock sensor the same as pressing of the START/STOP button. The timer will begin counting up, and the increasing time will be displayed on the display 14. The user then completes the obstacle course (or game or exercise). When the user has completed the obstacle course (or game or exercise), the user stops the count up timer by pressing the START/STOP button again or by again hitting the lid of the tote or the timing device itself to activate the sensor. The time is displayed on display 14. The user may then press the RESET button to reset the timer to 00:00.00 or the user may again press the START/STOP button or again hit the lid of the tote or hit the timing device itself to begin again counting up from the prior stop time.

[0038] If the user wants to use the timing device in the countdown mode, the user presses the MODE button until the LED next to the word “COUNTDOWN” illuminates. As discussed above, it may be necessary to press the MODE button more than once to access the countdown function, or it may not be necessary to press the MODE button at all if the mode upon powering up is the desired mode. The user then presses the “+” or “-” button to increase or decrease the time to the desired starting time for the countdown. (Other methods and types of buttons may be used to set the desired starting time.) In one embodiment (in which the display displays two digit minutes, two digit seconds, and two digit fractions of a second), pressing the “+” button increases the time in whole minutes from 00:00.00 up until 99:00.00, and pressing the “-” button decreases the time in whole minutes from 00:00.00 backwards to 99:00.00 and then down until 00:00.00.

[0039] To start the countdown timer, the user may press the START/STOP button or may hit the lid of the tote or hit the timing device to activate the shock sensor. The controller treats the activation of the shock sensor the same as pressing of the START/STOP button. The timer will begin counting down, and the decreasing time will be displayed on the display 14. The user then completes the obstacle course (or game or exercise). When the user has completed the obstacle course (or game or exercise), the user stops the countdown timer by pressing the START/STOP button again or by again hitting the lid of the tote or the timing device itself to activate the sensor. The time remaining in the countdown is displayed on display 14. The user may then press the RESET button to reset the timer to 00:00.00 or the user may again press the START/STOP button or again hit the lid of the tote or hit the timing device itself to begin again counting down from the prior stop time.

[0040] If the countdown timer reaches 00:00.00 before the user has completed the obstacle course (or game or exercise) and stops the countdown timer, then the controller will typically cause the speaker 20 to beep or otherwise provide an indication that the countdown time has elapsed.

[0041] When the user is done using the timing device, the user can power off the timing device by pressing the POWER button once. The timing device may include an auto-off feature that powers the timing device off when the timing device has not been used (e.g., no buttons have been pressed) for a predetermined amount of time.

[0042] The timing device 10 is selectively mountable to the lid 60 of a tote, as seen in FIG. 5. The lid 60 sits on the main body 70 of the tote, which forms the cavity in which the game components may be stored. The main body may include wheels 72 and a handle 74 for improved mobility. The timing device may be removed from the lid (if so mounted) and placed in the tote for storage. When the timing device is to be used, the timing device may be removed from the tote and mounted to the lid. When everything else to be used has been removed from the tote, the lid and mounted timing device may be placed on the tote body (alternatively, the timing device may be mounted on the lid after the lid has been placed on the tote body). Having the timing device mounted on the lid with the lid on the tote body provides a steady base for the timing device and places the timing device and lid at a good height for setting/activating the timing device.

[0043] The structure and/or mechanism for mounting the timing device to the lid should be such that the timing device may be readily mounted to and readily removed from the lid, but also such that the timing device is securely coupled to the lid when mounted thereto. Also, the structure and/or mechanism for mounting the timing device to the lid should be such that the force of hitting, slapping, or otherwise jolting the lid is readily transmitted to the timing device to activate the shock sensor when the lid is hit, slapped, or otherwise jolted.

[0044] FIGS. 1-6 illustrate one possible structure of the lid 60 and complementary structure of the timing device 10 that provides the desired ready mounting and removal, secure coupling, and force transmission. Many other structures and mechanisms are possible, and are within the scope of this invention. The timing device 10 has a narrowed lower portion 22 of opposing sides of the housing 12 and a rib 24 protruding from opposing sides of the lower portion 22. The rib 24 defines a channel 26 between the rib 24 and the wider upper portion of opposing sides of the housing.

[0045] A recess 62 is defined in the front edge and top of the lid 60 for slidably receiving the timing device when the timing device is in an upright orientation. Ledges 64 jut from opposing side walls of the recess 62. The distance between the opposing ledges 64 is selected such that the narrowed lower portion 22 of the timing device housing 12 fits relatively snugly between the ledges

64. The distance between the side walls of the recess 62 above the ledges 64 is similarly selected such that the upper portion 22 of the timing device housing 12 fits relatively snugly between the side walls. Ribs 66 protrude from the opposing side walls of the recess 62. The ribs 66 engage the channels 26 of the timing device to guide the timing device into the recess 62 and secure the timing device to the lid (the front ribs guide the timing device as it is being slid into the recess, and the rear ribs secure the timing device when in the mounted position). Two protrusions 68 on the back wall of the recess 62 engage the two indentations 28 on the back side of the timing device (seen in FIG. 4) when the timing device is fully slid into the recess 62. The engagement of the two protrusions 68 and the two indentations 28 help secure the timing device to the lid and help transfer the force of hitting, slapping, or otherwise jolting the lid to the timing device to activate the shock sensor.

[0046] As mentioned above, a game or activity system of embodiments of the invention may comprise various components that may be used to lay out an obstacle course, exercise course, or the like. Such components may be stored in the tote when not in use. FIG. 8 illustrates an example of such an obstacle course that may be set up using components that may be stored in the tote. The timing device 10 of embodiments of the invention may be used to time a person as he/she completes such an obstacle course. Such obstacle course components may include (but are not limited to) rings 80 to step through, vertical poles 82 to weave around, and high and low hurdles 84, 86 to jump over. Such obstacle course components may be laid out in an almost limitless number of configurations. Such obstacle course components may be modular and comprise a number of sub-components that are assembled for use and disassembled to fit into the storage tote.

[0047] The terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting of the invention. As used herein, the singular forms "a", "an" and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will be further understood that the terms "comprises" and/or "comprising," when used in this specification, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof.

[0048] The corresponding structures, materials, acts, and equivalents of all means or step plus function elements in the claims below are intended to include any structure, material, or act for performing the function in combination with other claimed elements as specifically claimed. The description of the present invention has been presented for purposes of illustration and description, but is not intended to be exhaustive or limited to the invention in the form disclosed. Many modifications and variations will be apparent to those of ordinary skill in the art without departing

from the scope and spirit of the invention. The embodiment was chosen and described in order to best explain the principles of the invention and the practical application, and to enable others of ordinary skill in the art to understand the invention for various embodiments with various modifications as are suited to the particular use contemplated.

THAT WHICH IS CLAIMED:

1. A timing device comprising:
a housing;
a controller within the housing; and
a shock sensor connected to the controller and within the housing;
wherein the controller receives a first signal from the shock sensor when the shock sensor detects a first shock or vibration;
wherein the controller receives a second signal from the shock sensor when the shock sensor detects a second shock or vibration;
wherein the controller starts a timer in response to receipt of the first signal; and
wherein the controller stops the timer in response to receipt of the second signal.
2. The timing device of claim 1, wherein the timer is selectively operable in a count-up mode or a count-down mode.
3. The timing device of claim 2, further comprising a timer mode selector connected to the controller for selecting whether the timer operates in the count-up mode or the countdown mode.
4. The timing device of claim 1, further comprising a display connected to the controller for displaying a time output from the timer.
5. The timing device of claim 1, wherein the timing device is adapted to be selectively affixable to a lid of a storage tote.
6. The timing device of claim 5, wherein the housing comprises a plurality of mating surfaces adapted to be mated with cooperatively-shaped mating surface of the lid.
7. An activity system comprising:
a storage tote comprising:
a main body having an open top end and defining a storage chamber; and
a lid selectively mountable to the open top end of the main body; and
a timing device selectively affixable to the lid, the timing device comprising:

a housing;
a controller within the housing; and
a shock sensor connected to the controller and within the housing;

wherein the controller receives a first signal from the shock sensor when the shock sensor detects a first shock or vibration; wherein the controller receives a second signal from the shock sensor when the shock sensor detects a second shock or vibration; wherein the controller starts a timer in response to receipt of the first signal; and wherein the controller stops the timer in response to receipt of the second signal.

8. The activity system of claim 7, wherein the timer is selectively operable in a count-up mode or a count-down mode.

9. The activity system of claim 8, wherein the timing device further comprises a timer mode selector connected to the controller for selecting whether the timer operates in the count-up mode or the countdown mode.

10. The activity system of claim 7, wherein the timing device further comprises a display connected to the controller for displaying a time output from the timer.

11. The activity system of claim 7, wherein the timing device is selectively affixable to the lid via cooperatively-shaped mating surfaces of the housing and of the lid.

12. The activity system of claim 7, further comprising:
a plurality of obstacles selectively stored in the storage tote and selectively configurable in a plurality of different obstacle course arrangements when removed from the storage tote.

13. A method of timing an activity comprising:

(a) affixing a timing device to a lid of a storage tote, the timing device comprising:

a housing;
a controller within the housing; and
a shock sensor connected to the controller and within the housing;

wherein the controller receives a first signal from the shock sensor when the shock sensor detects a first shock or vibration; wherein the controller receives a second signal from

the shock sensor when the shock sensor detects a second shock or vibration; wherein the controller starts a timer in response to receipt of the first signal; and wherein the controller stops the timer in response to receipt of the second signal;

- (b) hitting the lid of the storage tote to start the timer;
- (c) performing an activity to be timed; and
- (d) hitting the lid of the storage tote to stop the timer after completing the activity.

14. The method of claim 13, wherein the timer is selectively operable in a count-up mode or a count-down mode; wherein the timing device further comprises a timer mode selector connected to the controller for selecting whether the timer operates in the count-up mode or the count-down mode; and wherein the method further comprises selecting the count-up mode or the count-down mode prior to hitting the lid of the storage tote to start the timer.

15. The method of claim 13, wherein the activity comprises running an obstacle course; and wherein the method further comprises arranging a plurality of selectively configurable obstacles into a desired obstacle course arrangement.

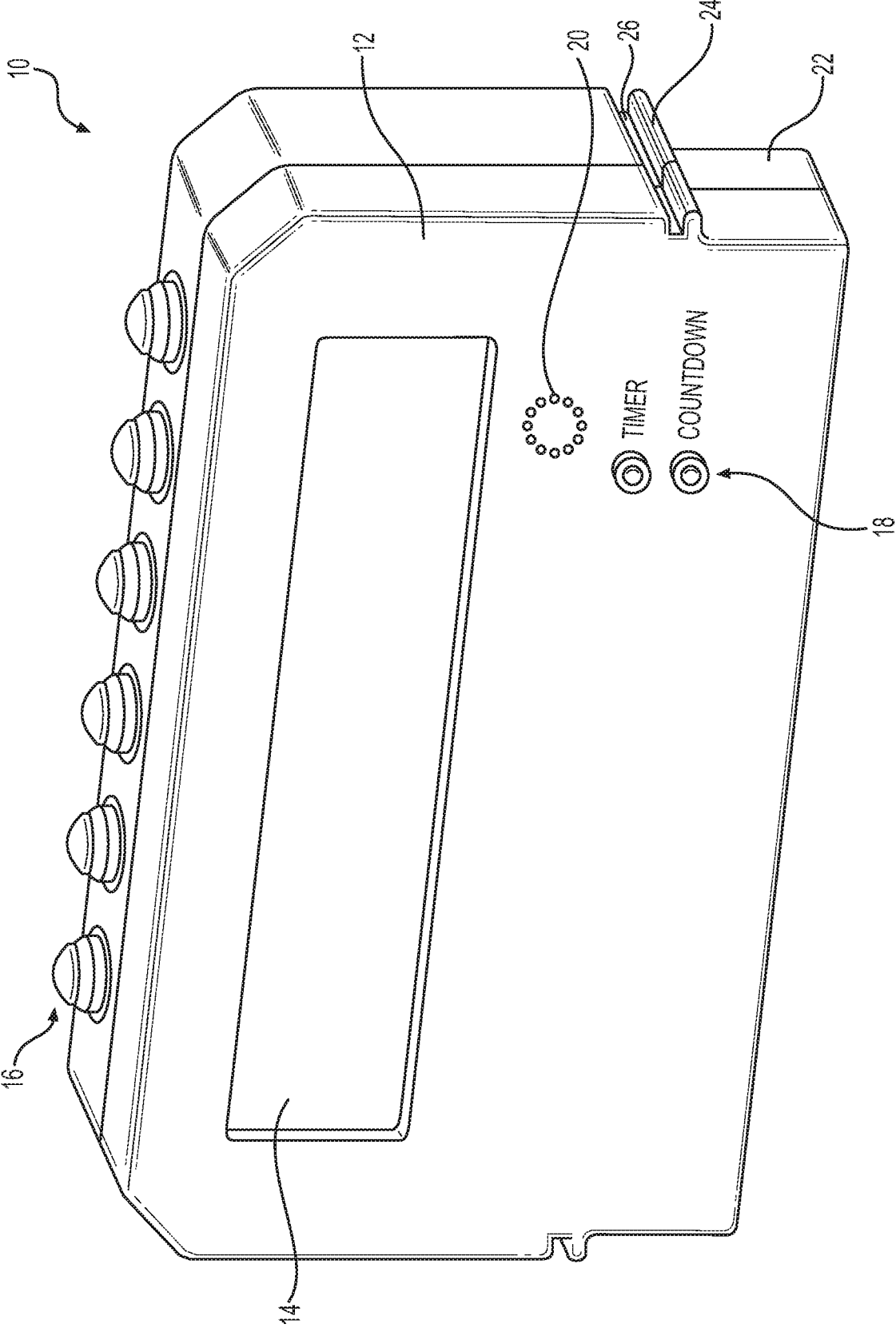


FIG. 1

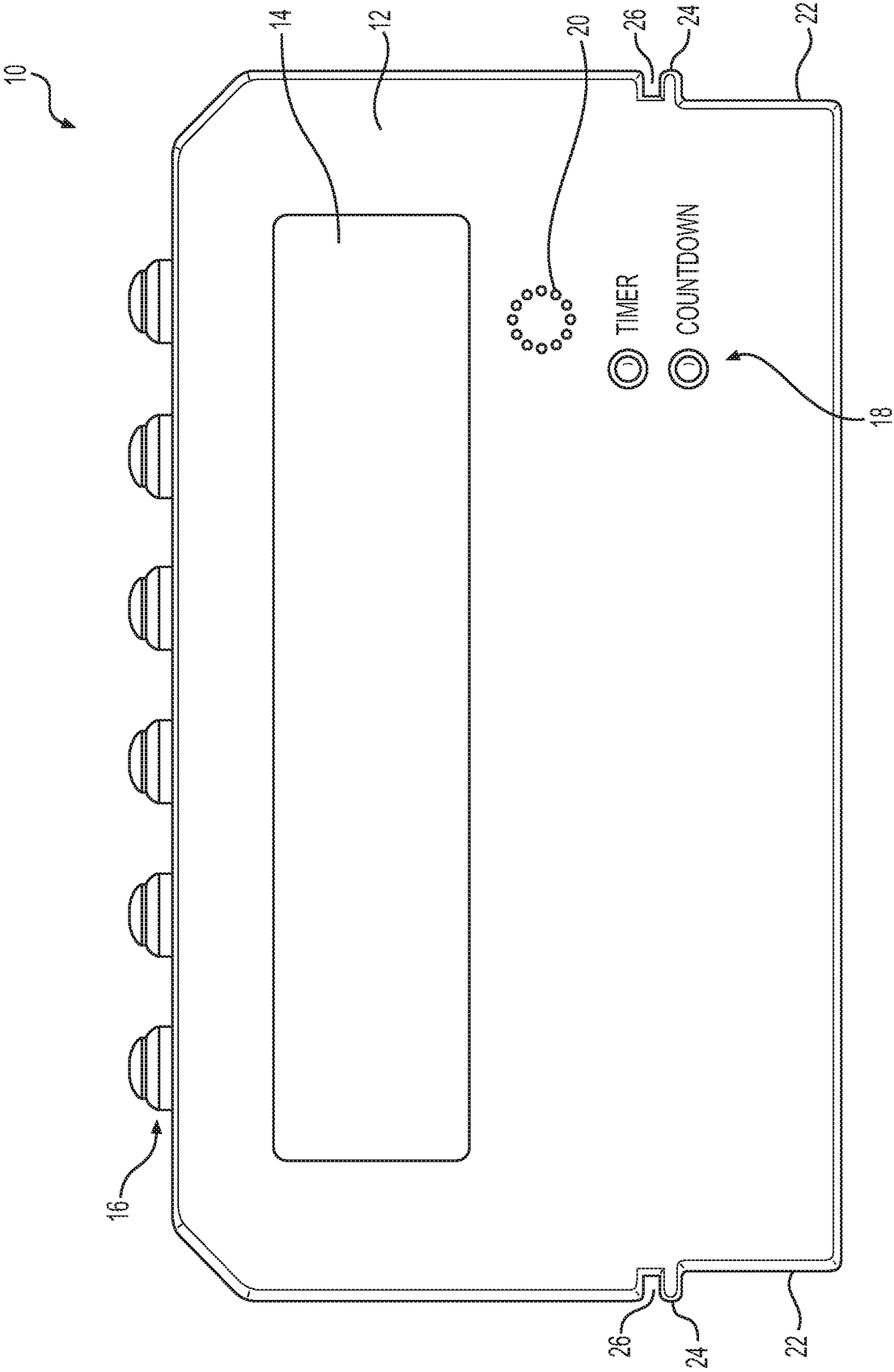


FIG. 2

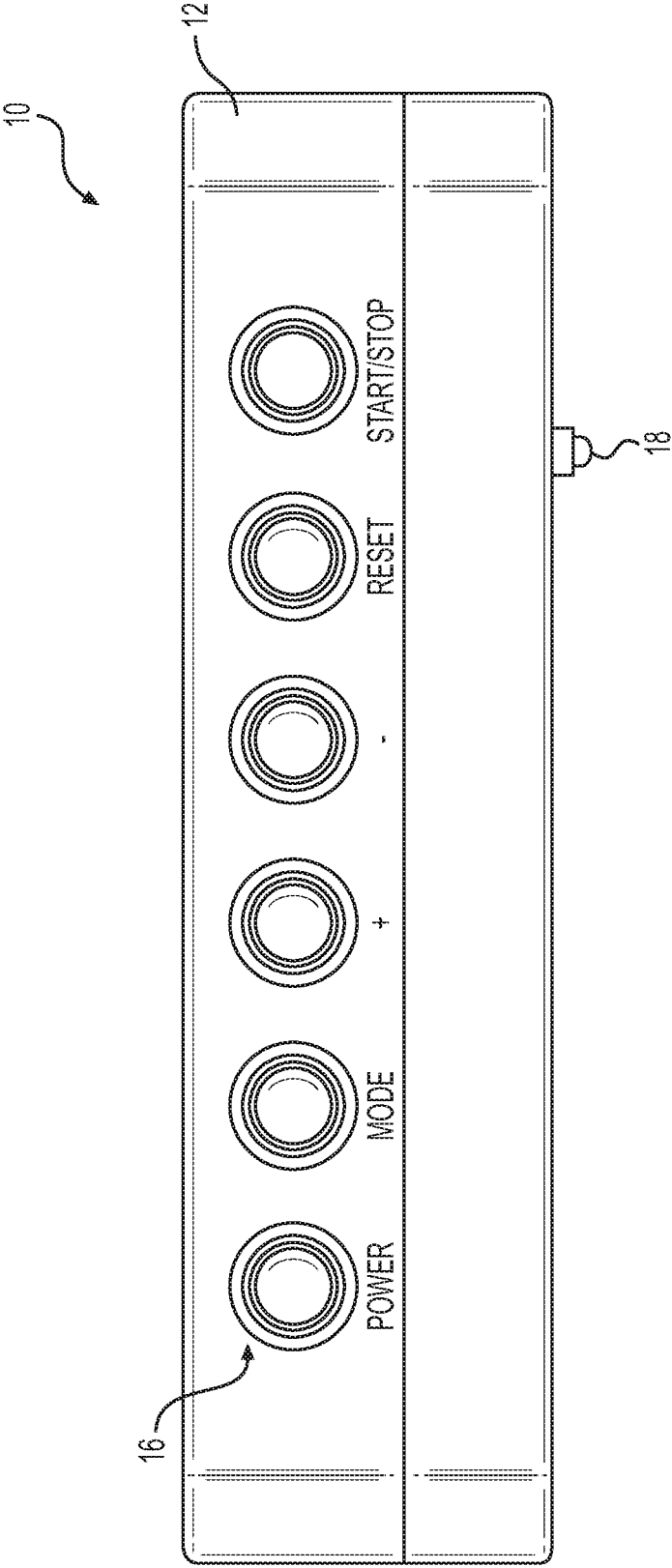


FIG. 3

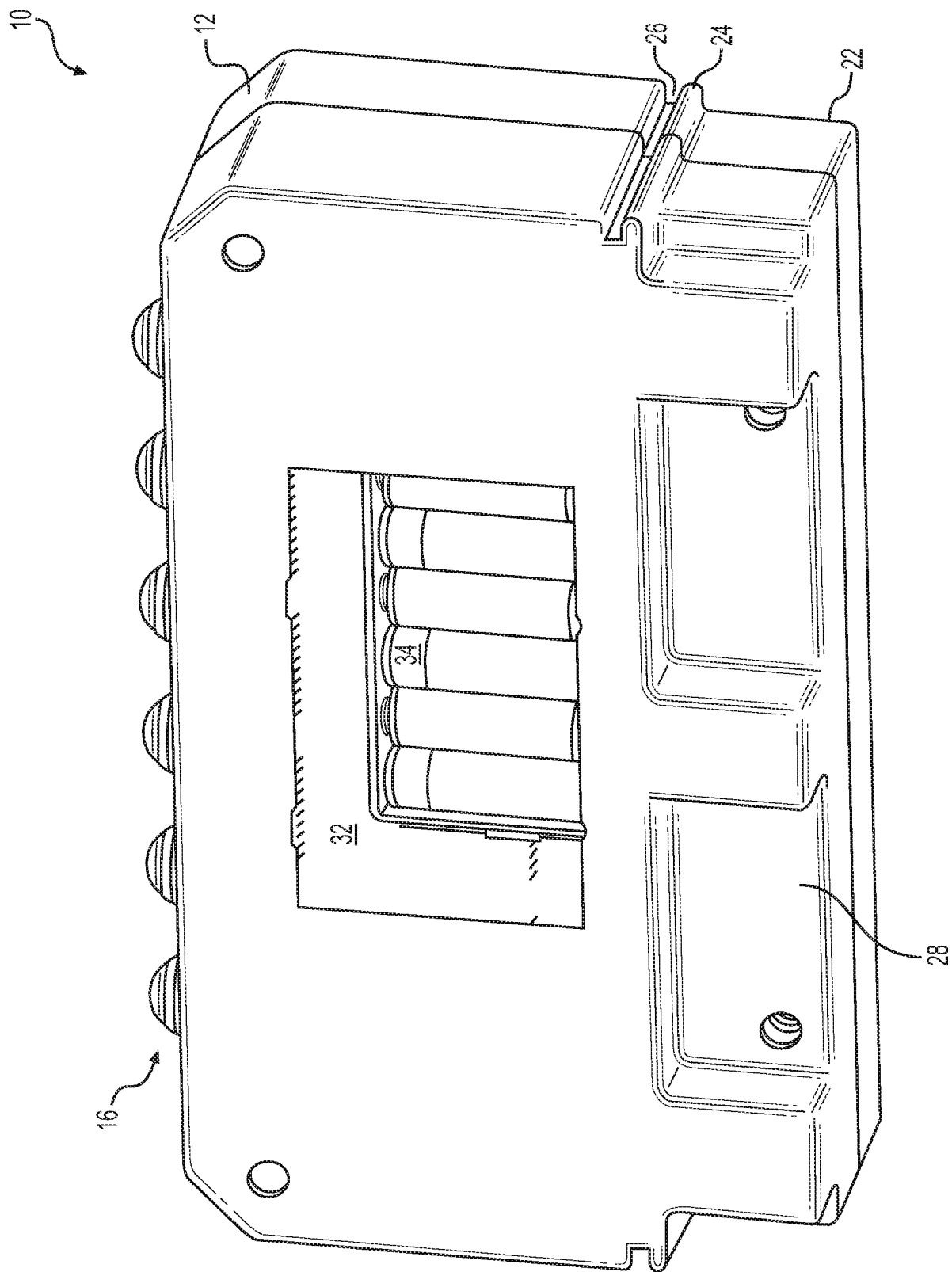


FIG. 4

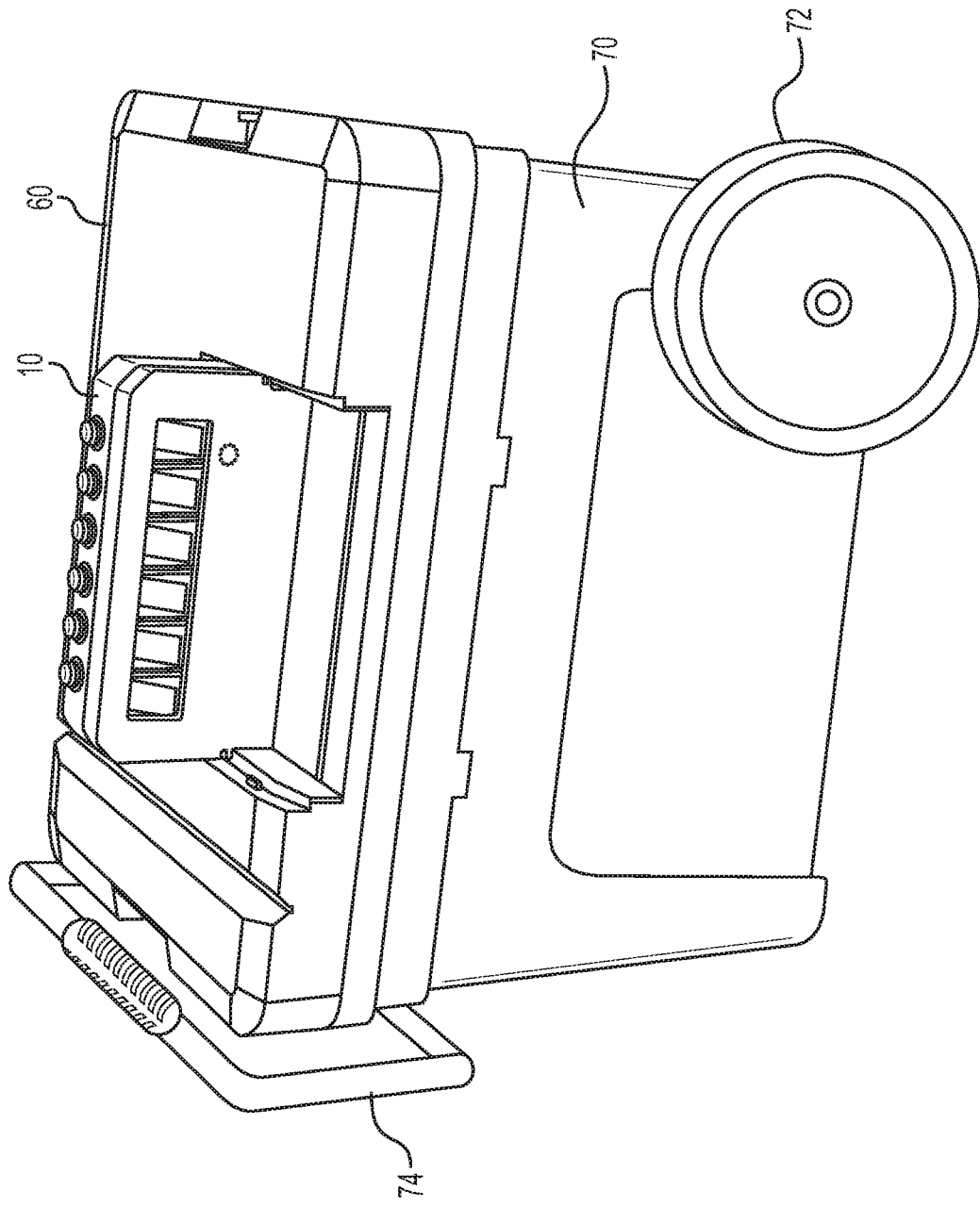


FIG. 5

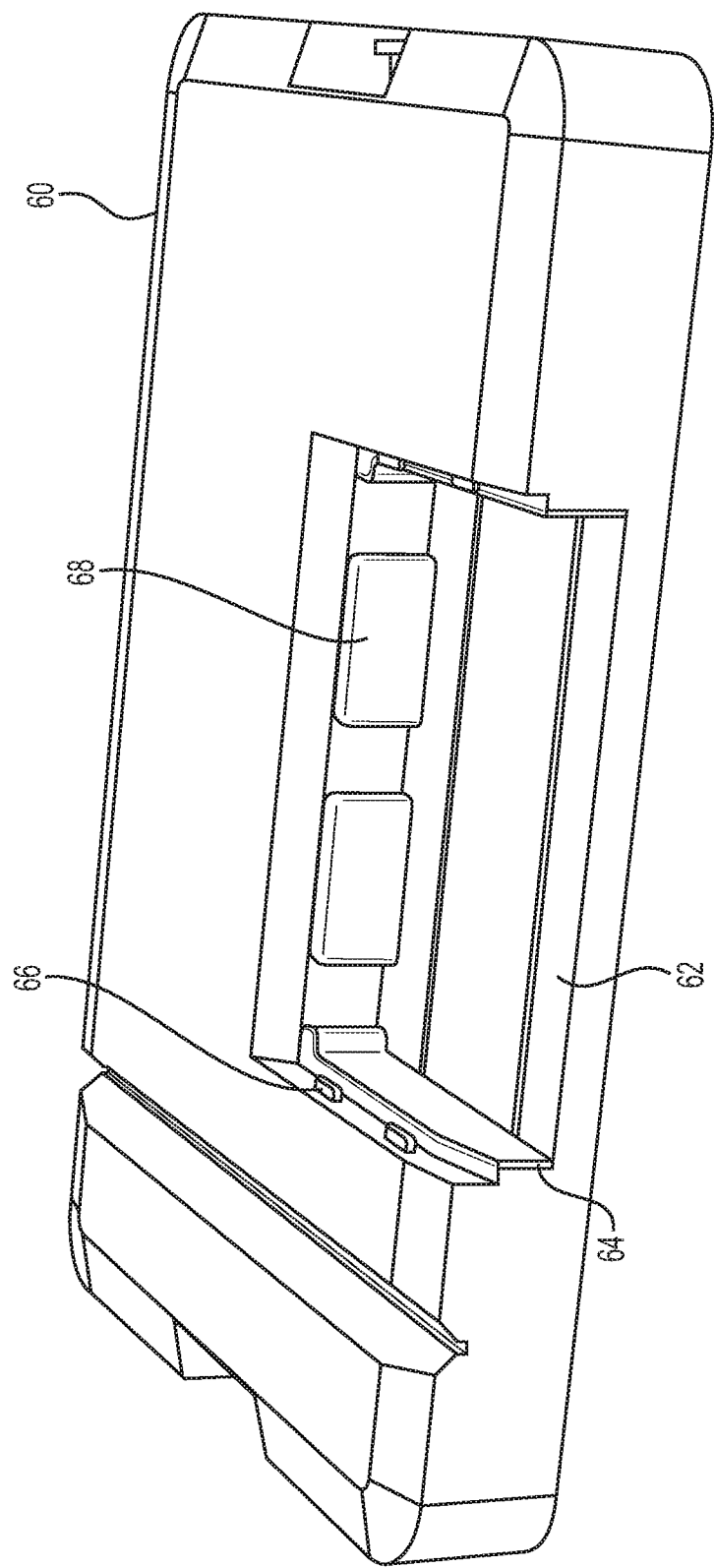


FIG. 6

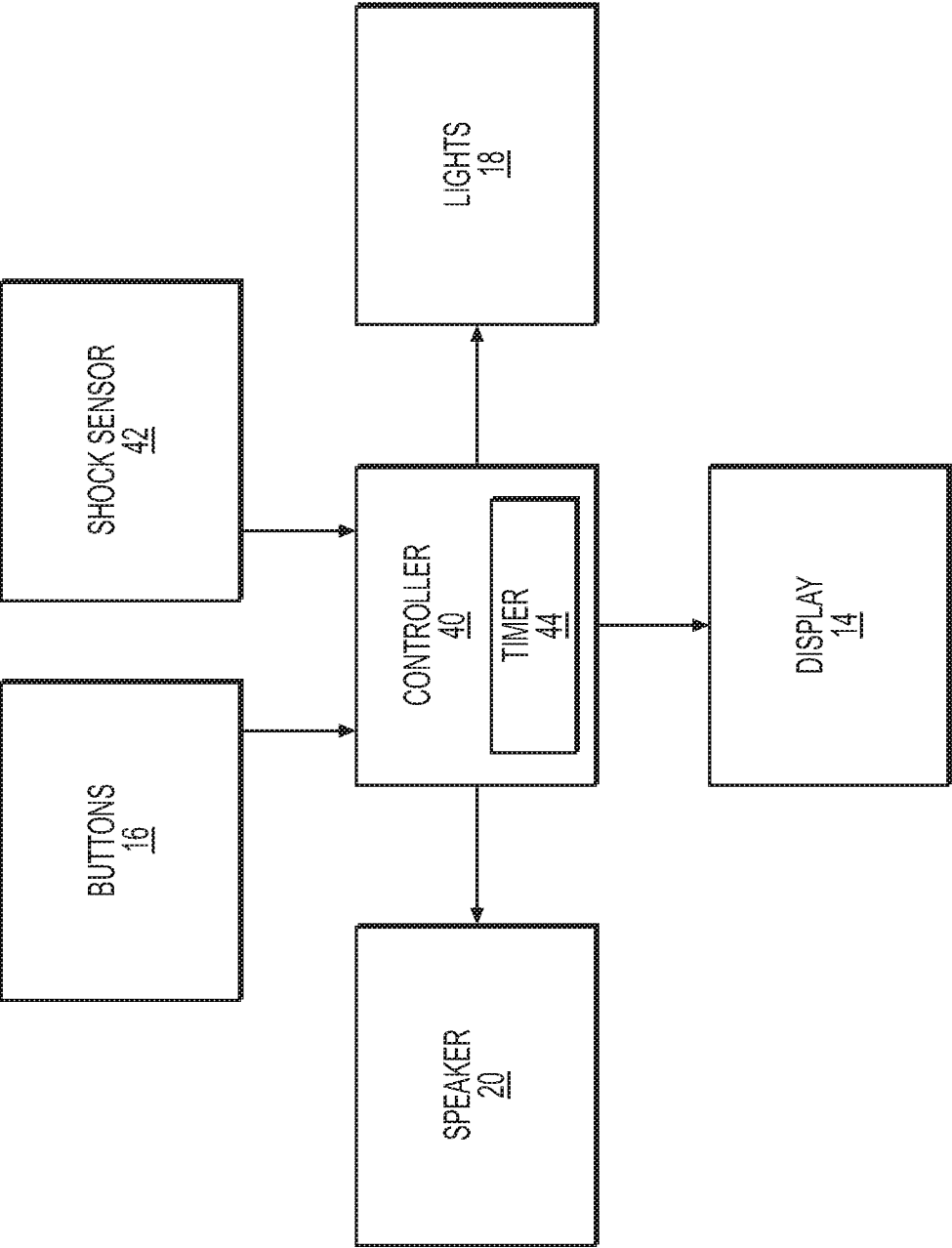


FIG. 7

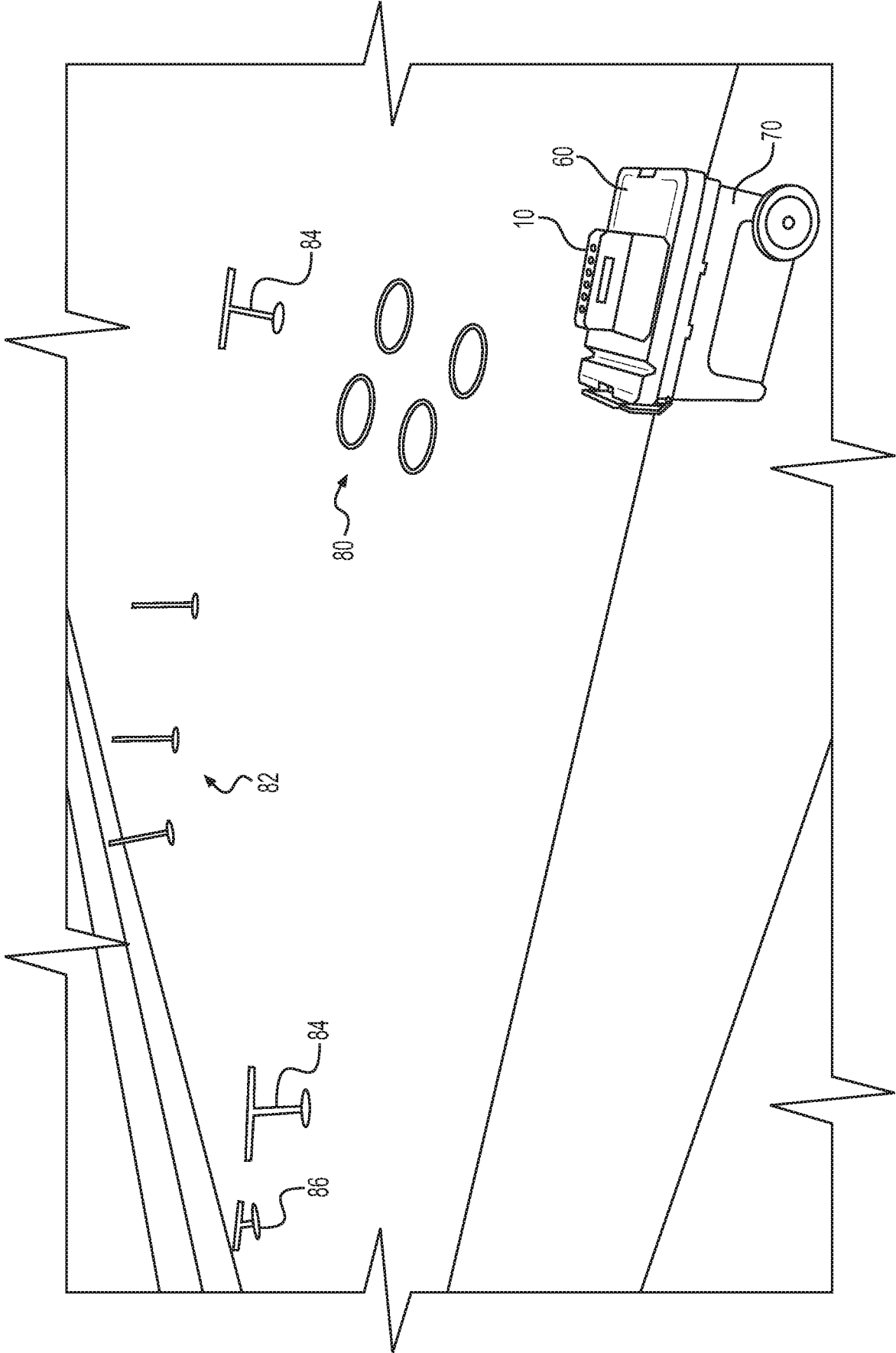


FIG. 8

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US17/12779

A. CLASSIFICATION OF SUBJECT MATTER

IPC - G07C1/22; G07C1/02; A63B26/00 (2017.01)

CPC - G07C1/22; G07C1/02; A63B26/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

See Search History document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

See Search History document

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y -- A	US 2009/0227293 A1 (YULO, A) 10 September 2009, paragraphs [0017], [0039], [0041], claim 21	1-4 ----- 5-15
Y -- A	US 5,897,457 A to (MACKOVJAK, P) 27 April 1999, column 3 lines 45-55	1-4 ----- 7-15
Y -- A	US 2005/0094786 A1 (OSSA, C) 05 May 2005, abstract, paragraphs [0007], [0011]-[0013]	2, 3 ----- 1-15
A	US 2008/0117719 A1 (HILDERBRANDT, W) 22 May 2008, paragraph [0014]	1-15
A	US 8,950,223 B1 (JOYCE, S) 10 February 2015, column 3 lines 57-58, column 4 lines 10-20	1-15

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

08 March 2017 (08.03.2017)

Date of mailing of the international search report

07 APR 2017

Name and mailing address of the ISA/

Mail Stop PCT, Attn: ISA/US, Commissioner for Patents
P.O. Box 1450, Alexandria, Virginia 22313-1450

Facsimile No. 571-273-8300

Authorized officer

Shane Thomas

PCT Helpdesk: 571-272-4300
PCT OSP: 571-272-7774