# United States Patent [19]

**Samuel**

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[54] **FLYING DISC HAVING IMPACT PROTECTED ELECTRIC SIGNALING DEVICE THEREIN**


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[21] Appl. No.: **343,558**

[52] **U.S. Cl.** ..... **46/228,** 46/74 D, 46/232

[51] **Int. Cl.** ..... **A63h 33/26,** A63h 27/00

[58] **Field of Search** ..... 46/226, 227, 228, 66, 65, 46/74 D, 75, 232



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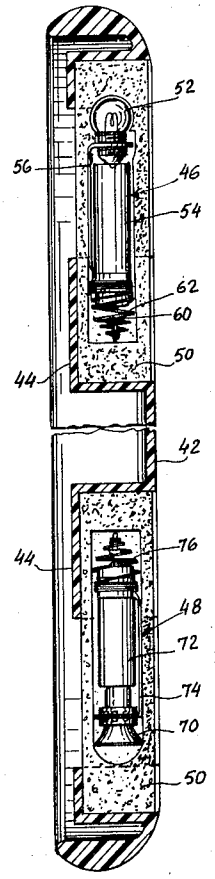
*Primary Examiner*—Barry F. Shay
*Attorney, Agent, or Firm*—Stoll and Stoll



[57] **ABSTRACT**

A disc-shaped directional-flight toy having a generally saucer-shaped body and at least one battery-powered audio or visual signaling device with a centrifugally actuated switch oriented to close and to energize said audio or visual signaling device when said disc-shaped directional-flight toy is hurled through the air and caused to rotate while in free flight. The visual device may be a battery-powered light bulb. The audio device may be a battery-powered buzzer or siren or the like. Removably mounted inpact cushioning means are provided which function to secure the signaling device, battery and switch to the body and also provide a cushion between the audio or visual signaling device and centrifugal switch, on the one hand, and the saucer-shaped body, on the other hand, in order to cushion the device and switch against the shock of the impact of said saucer-shaped body striking an obstruction.


**12 Claims, 11 Drawing Figures**



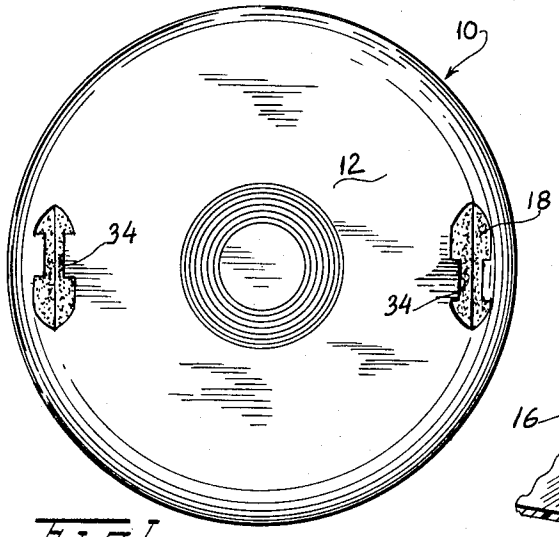



Fig. 1

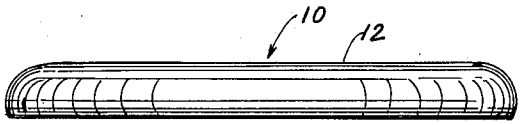



Fig. 2

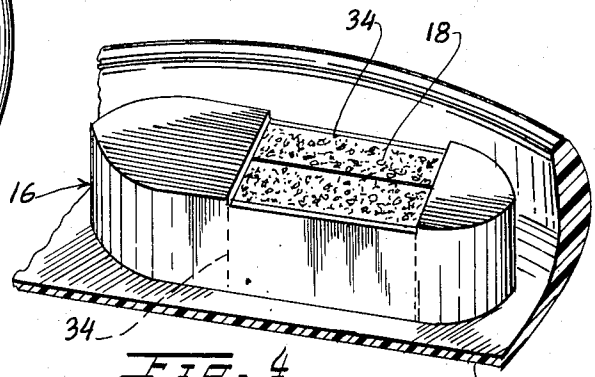
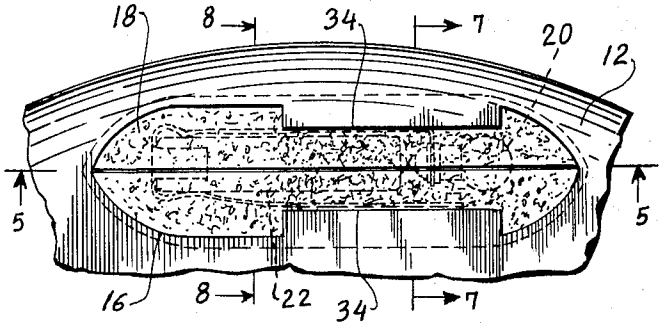



Fig. 4

Fig. 3



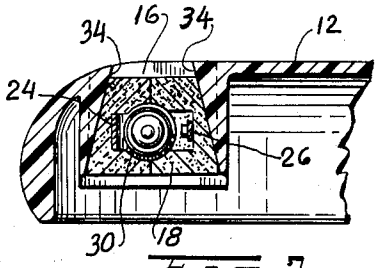




Fig. 7

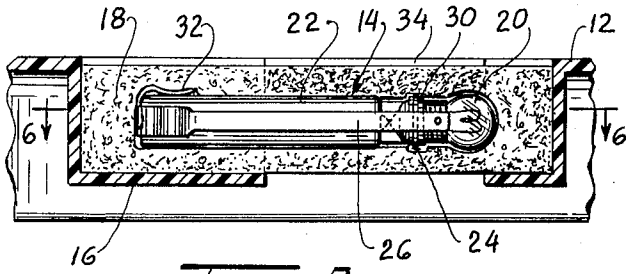



Fig. 5

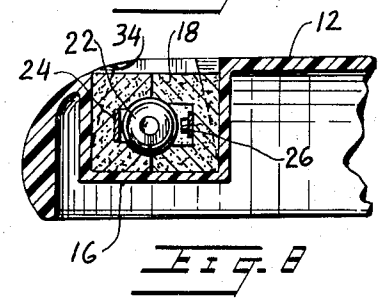



Fig. 8

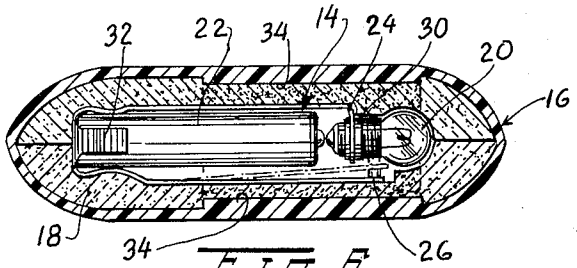



Fig. 6

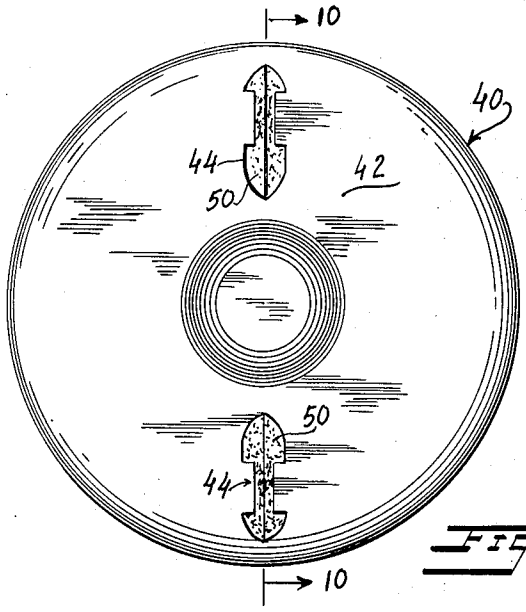



Fig. 9

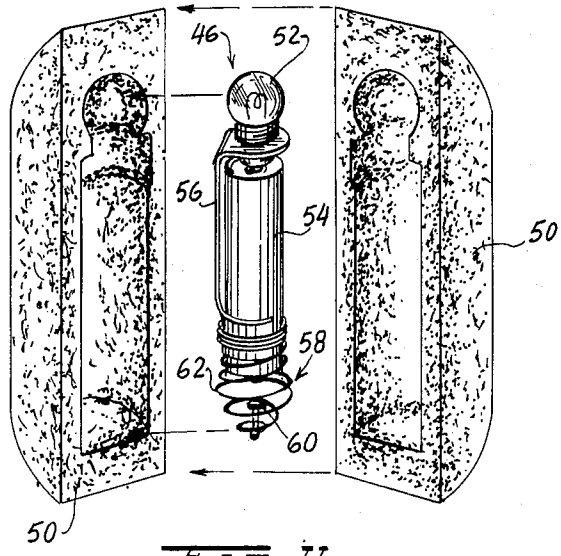



Fig. 11

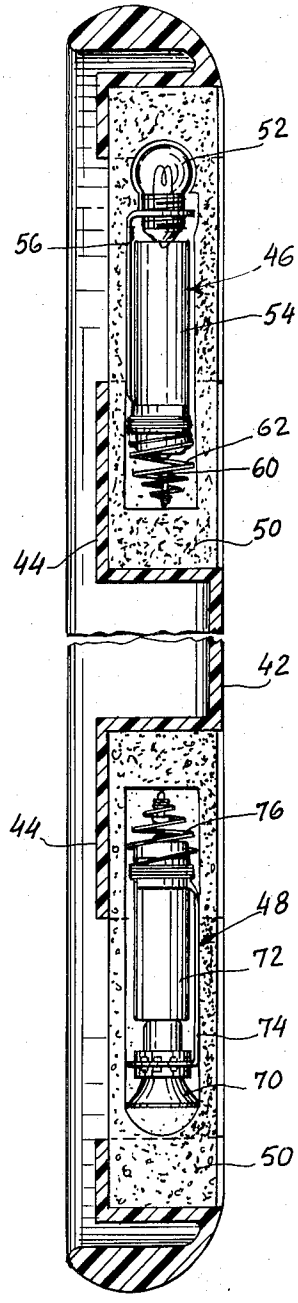



Fig. 10

# FLYING DISC HAVING IMPACT PROTECTED ELECTRIC SIGNALING DEVICE THEREIN

## BACKGROUND OF THE INVENTION

1. Field of the Invention.

This invention relates to the game, sport or art of throwing disc-shaped objects through the air. Such disc-shaped objects are sometimes sold under the trademark FRISBEE, and they are sometimes called "Frisbees." Frisbees are made by the Wham-O Mfg. Co., of San Gabriel, Calif.

2. Description of the Prior Art

The closest prior art patent is believed to be U.S. Pat. No. 3,359,678. This is the patent which protects the disc-shaped directional-flight toy which is sold by Wham-O Mfg. Co. under the FRISBEE trademark. However, this device does not have a battery-powered audio or visual signaling means, and its sole functional value resides in its use as a toy flying saucer for toss games and the like.

Other pertinent prior art patents are the following: U.S. Pat. No. 2,011,813 Heekin Aug. 20, 1935; U.S. Pat. No. 2,836,009 Wang May 27, 1958; U.S. Pat. No. 3,531,892 Pearce Oct. 6, 1970; U.S. Pat. No. 3,610,916 Meehan Oct. 5, 1971. Although these prior art patents disclose various forms of rotating or spinning toys and various means for illuminating them, including means controlled by centrifugally actuated switches, they do not show the invention of the present application, which comprises a disc-shaped directional-flight toy having the features and characteristics hereinafter described.

## SUMMARY OF THE INVENTION

The present invention comprises a disc-shaped directional-flight toy such as a toy flying saucer sold under the FRISBEE trademark, but unlike the latter it is provided with audio or visual or both audio and visual means for producing distinctive lighting or sound effects or both, in the course of free flight through the air. A centrifugally actuated switch is provided to close a battery circuit to such audio or visual means under the centrifugal force which is generated when said disc-shaped directional-flight toy is caused to rotate in flight.

The invention contemplates many variations. For example, a single audio or visual signal-emitting device, or a plurality of such devices in various combinations, may be used. When a single signaling device is used it should be counterbalanced in the saucer-shaped body, so that said saucer-shaped body may rotate freely and smoothly while in flight. When two such signaling devices are used, they may be placed diametrically opposite each other, equidistant from the axial and gravitational center of the saucer-shaped body. In such case each signaling device would counterbalance the other. Various combinations are possible. Thus, two audio signaling devices or two visual signaling devices or one audio and one visual signaling device are all equally feasible.

## BRIEF DESCRIPTION OF THE DRAWING

FIG. **1** is a plan view of a disc-shaped directional-flight toy made in accordance with one form of this invention.

FIG. **2** is a side edge view thereof.



FIG. **3** is an enlarged fragmentary view showing a light-emitting device mounted in a pod provided in the saucer-shaped body of said disc-shaped directional-flight toy.

FIG. **4** is a perspective view of said pod, showing the saucer-shaped body broken away and in section.

FIG. **5** is a section on the line **5—5** of FIG. **3.**

FIG. **6** is a section on the line **6—6** of FIG. **5.**

FIG. **7** is a section on the line **7—7** of FIG. **3.**

FIG. **8** is a section on the line **8—8** of FIG. **3.**

FIG. **9** is a plan view of a modified form of said disc-shaped directional-flight toy.

FIG. **10** is an enlarged sectional fragmentary view on the line **10—10** of FIG. **9.**

FIG. **11** is an exploded view showing one of the signaling devices illustrated in FIG. **10** and also showing the impact-insulating or absorbing means associated with said device.

## DESCRIPTION OF PREFERRED EMBODIMENTS OF THE INVENTION

Referring now to the first form of the present invention and to FIGS. **1–8,** inclusive, it will be seen that disc-shaped directional-flight toy **10** comprises a saucer-shaped body **12** and a pair of electrically actuated signaling devices **14** mounted in said saucer-shaped body. Each electrically actuated signaling device is mounted in a pod **16** formed in the saucer-shaped body and impact insulating or absorbing means **18** is provided between each said device and the walls and floor of the pod. This impact insulating means performs two functions: It secures the signaling device in the pod, and it absorbs the shock of impact of the saucer-shaped body striking an obstruction, thereby protecting the signaling device from damage.

More specifically, each signaling device **14** comprises four elements: a light bulb **20,** a power source for said light bulb in the form of a pencil battery **22,** a holder **24** for both the light bulb and the battery, and a switch element **26** which is mounted on said holder or on said battery and is engageable with one of the contact elements of the light bulb. Switch element **26** is simply a switch arm which is spring-biased away from the light bulb. The spring bias is relatively weak and may readily be overcome by centrifugal force generated when the saucer-shaped body is thrown into the air and caused to rotate about its central axis. When this occurs the switch element is forced outwardly and into engagement with the light bulb, thereby closing the circuit between said light bulb and its power source.

It will of course be understood that the material which surrounds the light bulb is light-transmitting material. This would apply to both the insulating material **18** and the material of which the saucer-shaped body and its pods **16** are made. As an illustration, the cushioning material **18** may be polyurethane foam, and the saucer-shaped body and its pods may be made of molded polyethylene. These are purely illustrative materials, which are not intended to limit the scope of the invention. Also contemplated within the scope of the invention is the use of materials which are not light-transmitting, provided that the light bulbs are exposed through a window or other opening in the structure. In such case light emitted by the light bulbs would simply pass through such window or other opening.

The electrical system is conventional. Thus, if holder **24** is made of electrically conductive material, electri-

cal insulation **30** should be provided between said holder and the shell (contact element) of the light bulb. If the holder is made of electrically non-conductive material, this of course would not be necessary. Alternatively, if the holder is held out of contact with either of the terminals of the battery, the material of which the holder is made would again be unimportant. In the illustrated form of the invention, the holder is itself a conductor and is in electrical contact with one of the terminals of the battery. The holder includes clip elements **32,** which are adapted to clip the battery and hold it in operative position. Also, in the illustrated form of the invention, switch arm **26** is integral with the holder, but obviously this is not an essential requirement of the invention. The switch arm is a spring element which is biased away from the light bulb, and it is located between the light bulb and the axial center of the saucer-shaped body. Thus, when the saucer-shaped body is caused to rotate, centrifugal force causes the switch arm **26** to flex radially outwardly until it makes contact with the light bulb.

Pod **16** is merely a receptacle for the electrical device above described and its impact insulating cushion. In the illustrated form of the invention each pod is molded integrally with the saucer-shaped body. Wall portions **34** are tapered, as shown in FIG. **7,** to hold the impact absorbing material in place.

Referring to the second embodiment of the invention, as illustrated in FIGS. **9–11,** disc-shaped directional-flight toy **40** comprises a saucer-shaped body **42,** a pair of pods **44,** and a pair of electrically actuated signaling devices **46** and **48,** respectively. In each pod there is impact insulating means in the form of a pair of cocoon elements **50.** As is clearly shown in FIGS. **10** and **11,** these cocoon elements confine the two electrical devices in their respective pods and protect said devices against damage from the shock of impacting against an obstruction.

Taking electrical signaling device **46** first, it will be observed that it comprises a light bulb **52,** a power source for said light bulb in the form of a pencil battery **54,** a holder **56** for said light bulb and battery, and a spring-mounted, centrifugally actuated switch **58.** The switch is in the form of a weighted contact element **60** supported by a coil **62** and movable into engagement with one of the terminals of the battery under centrifugal force generated when the saucer-shaped body is caused to rotate in flight.

It will be noted in FIGS. **9** and **10** that the electrical elements **46** and **48** are oriented along a diametric line extending through the saucer-shaped body. The centrifugal switch is mounted between the signaling device and the axial center of the saucer-shaped body.

Signaling device **48** is similar to signaling device **46,** except that a sound-emitting element **70** is provided in signaling device **48** in place of the light-emitting element **52** of signaling device **46.** As an illustration, sound-emitting device **70** may be an electrically powered siren (or whistle or buzzer or the like). The power source is a pencil battery **72.** Holder **74** is similar to holder **56.** Centrifugally actuated switch **76** is like centrifugally actuated switch **58.**

The foregoing is illustrative of preferred forms of the invention, and it will clearly be understood from the above description that variations and modifications may be incorporated therein within the broad scope of the appended claims.

I claim:

**1.** A disc-shaped, directional-flight toy comprising:

a. a generally saucer-shaped body having a central axis about which it is adapted to rotate in sustained flight, and

b. at least one battery-powered light bulb and centrifugally-actuated switch in circuit therewith,

c. means on said body for mounting each said bulb and switch thereon with said switch in radially offset relation to said axis whereby centrifugal force causes the switch to close and the light bulb to be energized when the saucer-shaped body is thrown into the air and caused to engage in free flight while rotating about its center axis,

d. means for securing said bulb and switch to said mounting means and for insulating them against impact, said securing and insulating means comprising a cushion provided between said battery-powered light bulb and associated centrifugally actuated switch, on the one hand, and said mounting means, on the other hand, to cushion said bulb and switch against the shock of impact of the flying saucer-shaped body against an obstruction.

**2.** A disc-shaped, directional-flight toy in accordance with claim **1,** wherein:

a. the saucer-shaped body is provided with two said battery-powered light bulbs, each having a centrifugally actuated switch in circuit therewith;

b. said mounting means being adapted to mount said battery-powered light bulbs in diametrically opposite positions on said saucer-shaped body.

**3.** A disc-shaped, directional-flight toy in accordance with claim **1,** wherein:

a. the saucer-shaped body is provided with a plurality of said battery-powered light bulbs each having a said centrifugally actuated switch in circuit therewith,

b. said mounting means being adapted to mount said battery-powered light bulbs and centrifugally actuated switches in spaced relation on said saucer-shaped body such that their respective weights are in aerodynamic balance.

**4.** A disc-shaped, directional-flight toy in accordance with claim **1,** wherein:

a. the saucer-shaped body is provided with a plurality of said battery-powered light bulbs, each having a centrifugally actuated switch in circuit therewith,

b. said mounting means being adapted to mount said battery-powered light bulbs such that they are spaced equally from each other on a common circular line which is concentric with the saucer-shaped body.

**5.** A disc-shaped, directional-flight toy in accordance with claim **1,** wherein:

a. the centrifugally actuated switch comprises fixed and movable contact elements which are in circuit with the battery-powered light bulb;

b. said movable contact element being situated radially inwardly from the fixed contact element and being spring-biased away from said fixed contact element,

c. said movable contact element being movable radially ouwardly into engagement with the fixed contact element responsive to centrifugal force generated when the saucer-shaped body is caused to rotate in flight through the air.

6. A disc-shaped, directional-flight toy in accordance with claim 5, wherein:

said axis is perpendicular to the flight trajectory.

7. A disc-shaped, directional-flight toy in accordance with claim 5, wherein:

the movable contact element is mounted on a leaf spring which is biased away from the fixed contact element and toward the center of the saucer-shaped body.

8. A disc-shaped, directional-flight toy in accordance with claim 5, wherein:

the movable contact element is mounted on a coil spring which is biased away from the fixed contact element and toward the center of the saucer-shaped body.

9. A disc-shaped, directional-flight toy in accordance with claim 1, wherein:

a. said mounting means comprises a pod formed in the saucer-shaped body to receive said battery-powered light bulb and associated centrifugally actuated switch,

b. said securing and insulating means comprises light-transmitting plastic foam provided in said pod as said cushion between said saucer-shaped body and said battery-powered light bulb and associated centrifugally actuated switch.

10. A disc-shaped, directional-flight toy comprising:

a. a generally saucer-shaped body,

b. at least one signal-emitting, electrically actuated device,

c. a power source for said signal-emitting device,

d. a normally open, centrifugally actuated switch in circuit with said signal-emitting device and said power source,

e. means on said body for mounting each said signal-emitting device, power source and centrifugal switch on said saucer-shaped body in radially offset relation to its center axis,

f. whereby centrifugal force causes the centrifugal switch to close and the signal-emitting device to be energized when the saucer-shaped body is thrown into the air and caused to engage in free flight while rotating about its center axis,

g. means for securing said signal-emitting device, power source and switch to said mounting means for absorbing impacts to them, said securing and absorbing means being provided between said signal-emitting device, power source and centrifugal switch, on the one hand, and said saucer-shaped body, on the other hand, to reduce the shock impacted to said signal-emitting device, power source and centrifugal switch, when the saucer-shaped body strikes an obstruction while in flight.

11. A disc-shaped directional-flight toy in accordance with claim 10, wherein:

a. the saucer-shaped body is provided with two said signal-emitting devices, power sources, and centrifugal switches, forming two separate assemblies,

b. each of said assemblies consisting of a battery-powered light bulb and a normally open, centrifugally actuated switch in circuit therewith,

c. said mounting means being adapted for mounting said two assemblies in diametrically opposite positions on said saucer-shaped body in radially balanced relation to its rotational center axis.

12. A disc-shaped directional-flight toy in accordance with claim 10, wherein:

a. the saucer-shaped body is provided with two said signal-emitting devices, power sources and centrifugal switches, forming two separate assemblies,

b. said signal-emitting device of one of said assemblies comprising a battery-powered light bulb,

c. said signal-emitting device of the second assembly comprising a battery-powered, sound-emitting device,

d. said mounting means being adapted for mounting said two assemblies in diametrically opposite positions on said saucer-shaped body in radially balanced relation to its rotational center axis.

* * * * *