

- [54] ILLUMINATED FLYING SAUCER
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- [58] Field of Search ..... **240/6.4 R; 46/74 D, 46/228**

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**UNITED STATES PATENTS**

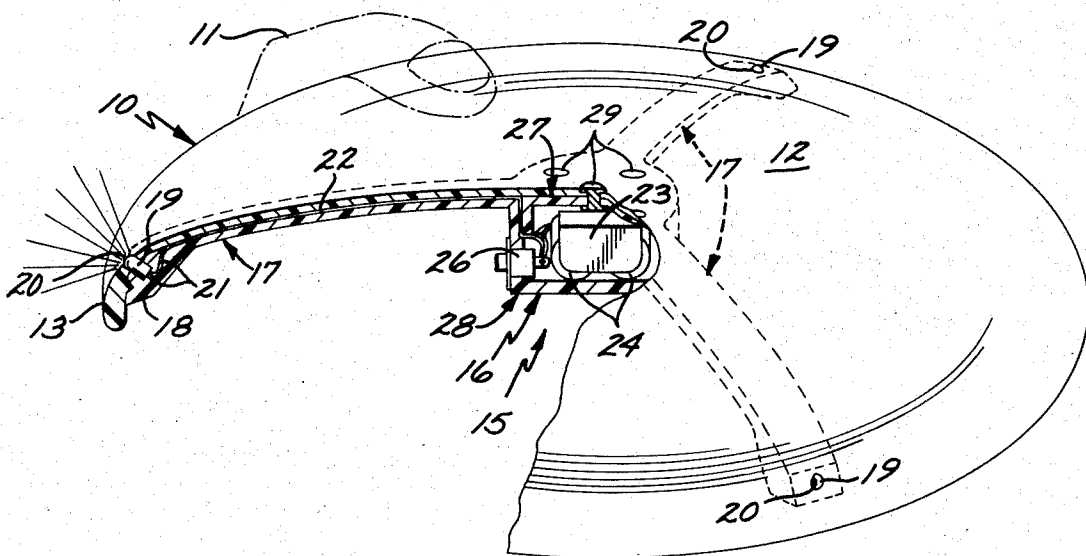
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[57] **ABSTRACT**  
 A "Frisbee" type flying saucer toy which has a gener-

ally disc-shaped body terminating at its periphery in a downwardly pointing rim so that the body and rim define a generally convex upper surface and a generally concave lower surface. Lighting means, preferably in the form of a plurality of regularly spaced lamps, is generally fixedly disposed proximate the rim so as to be visible when energized from the outside of the rim. A battery holder is generally centrally located on the body, preferably on the underside thereof, and electrical conductors extend generally radially outwardly along the body from the battery holder to the lights. The battery holder, lights, and electrical conductor means are all embodied in a unitary structure having a central hub in which the battery holder is located, with a plurality of regularly spaced arms extending radially outwardly from the hub, with the lights located at the ends of the arms, and the electrical conductor extending along the arms. This unitary structure is adapted to be engaged in the concave underside of the flying saucer. The centrally located battery holder and the peripherally located lights present a minimum interference with the aerodynamic characteristics of the saucer, so that good flight characteristics are retained.

**16 Claims, 3 Drawing Figures**



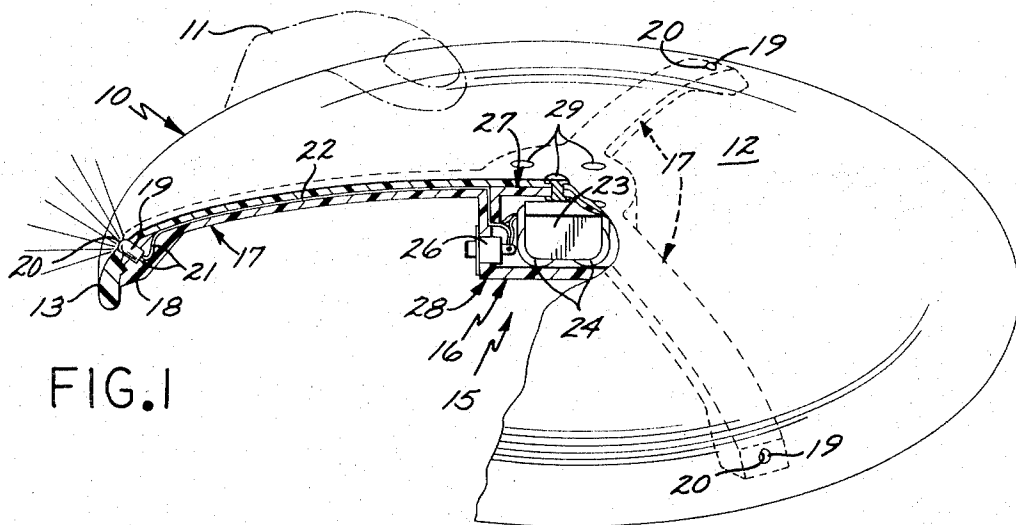


FIG. 1

FIG. 2

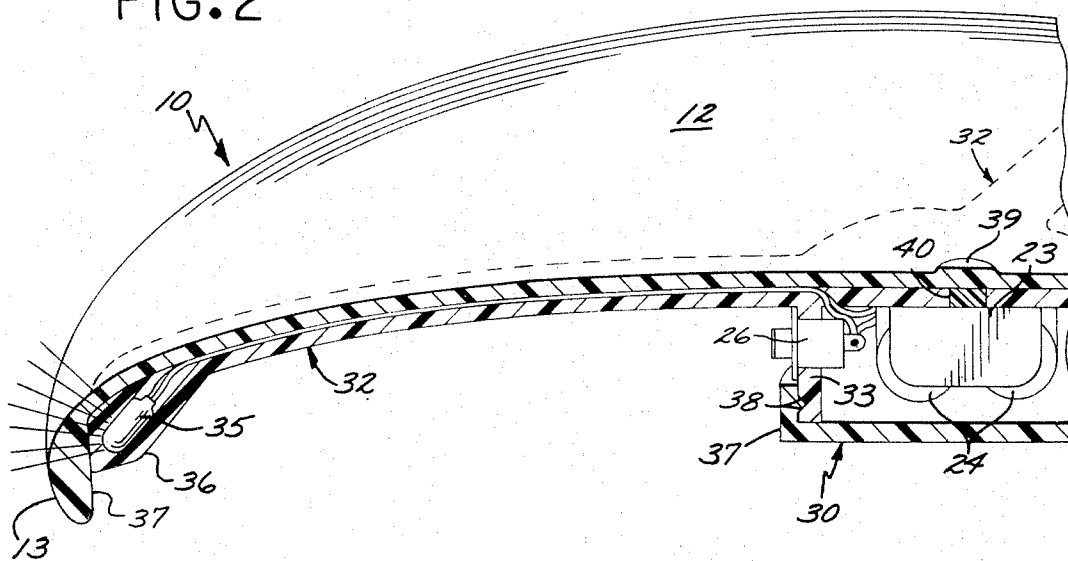
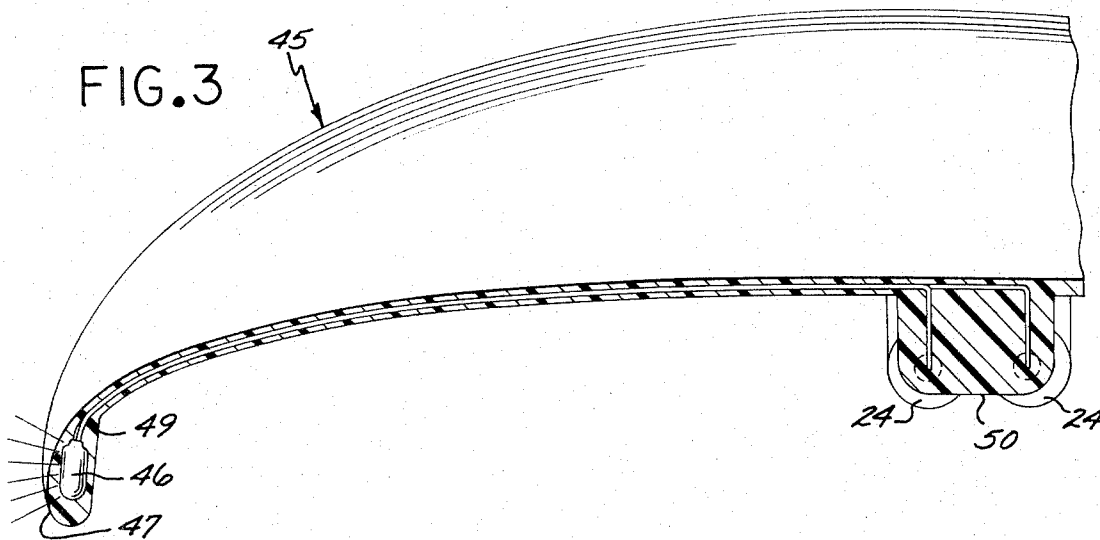


FIG. 3



## ILLUMINATED FLYING SAUCER

## BACKGROUND OF THE INVENTION

Among the most popular of the present day outdoor toys and games is the one known as the "flying saucer" wherein a "thrower" flings the flying saucer in the direction of a "receiver." The flying saucer being a lightweight plastic dished saucer that is typically about 9 inches in diameter and about 1½ inches deep.

In use, the thrower holds the flying saucer with its continuous surface upwards, and uses a thumb-uppermost grip on the saucer rim. The thrower's arm is first stretched across his chest, so that the saucer points away from the receiver. The thrower's arm is then swung in a vigorous arc, so that the flying saucer now points toward the receiver, and as the thrower's grip is released, his wrist imparts a pivoting gyroscopic-type motion to the flying saucer.

The flying saucer is quite cleverly aerodynamically designed, having a substantially flat but arched continuous surface, and having a sturdy peripheral rim that permits the operator to acquire a firm handgrip. The projected, pivoting flying saucer acts in the manner of an airplane wing, thus providing aerodynamic lift so that the saucer is capable of sailing a long distance, as much as several hundred feet at times.

Apparently, the instantaneous angle of the flying saucer at the time of its release is very important to its resultant trajectory, certain angles producing straight flight, whereas other angles produce trajectories that curve to the right or to the left. Thus, a skilled thrower can cause the flying saucer to go directly to a receiver, can cause the flying saucer to overshoot the receiver, or can cause the saucer to veer just enough to extend the receiver into a hard run to catch the flying saucer.

It is apparent that many of the beaches, parks and other open spaces are ideal for this game and the game has acquired a wide popularity. However, as will be realized by anyone who has ever engaged in outdoor activities, the arrival of darkness generally ends the game at a time when the game seems to be becoming the most interesting, and this is true of the flying saucer game.

While the most widely used flying saucer of the above type is known as a "Frisbee," others are known, some of the other flying saucers being of different sizes, others having suitably placed apertures for producing a sound as the saucer whirls through the air, etc. For ease of explanation, however, all such aerial trajector devices will be grouped under the heading of "flying saucers," and this latter term will be used in the following presentation.

## OBJECTIVES AND DRAWINGS

It is therefore the principal object of the present invention to provide an improved flying saucer.

It is another object of the present invention to provide an improved flying saucer that is adapted for use after dark.

It is still another object of the present invention to provide an improved flying saucer that has its instantaneous position lighted, so that it may be seen as it traverses its aerial trajectory in darkness.

It is a further object of the present invention to provide an improved position-lighted flying saucer that

produces an aesthetically pleasing lighted pattern as the flying saucer whirls through the air.

It is a still further object of the present invention to provide an accessory that may be added to a flying saucer to cause the flying saucer to be position-lighted for use after darkness falls.

It is a still further object of the present invention to provide an improved integral flying saucer for permitting such a flying saucer to be used in either daylight or darkness.

The attainment of these objectives and others will be realized from a study of the following description taken in conjunction with the drawings, of which:

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a cutaway pictorial view of a flying saucer containing a retrofitted lighting accessory;

FIG. 2 shows a cutaway pictorial view of a flying saucer containing a self-contained lighting accessory;

FIG. 3 shows a cutaway pictorial view of an integral flying saucer containing position-lighting means.

## SYNOPSIS

Broadly speaking, the present invention teaches various ways by which a prior art flying saucer may be fitted with lights in such a manner that its instantaneous position and trajectory may be indicated by the lights and by the light pattern produced by the flying saucer. The present invention discloses apparatus that may be retrofitted onto an existent flying saucer with minimal difficulty, and also discloses a flying saucer with the lighting apparatus integral with the flying saucer structure.

## DESCRIPTION

## The Basic Concept

FIG. 1 shows a cutaway pictorial view of a flying saucer 10 in an orientation preparatory to being projected by a hand 11. As indicated, flying saucer 10 has a slightly domed upper surface 12, and has an open concave area at its other "surface." The cutaway view of FIG. 1 shows that the flying saucer 10 has an aerodynamically rounded peripheral rim 13 that provides additional strength to the flying saucer 10.

The cutaway of flying saucer 10 shows it to have a lightweight (preferably plastic) accessory 15 that comprises a centrally located container 16, and a plurality (two or more, but typically three) arms 17 that extend radially outwardly from container 16 toward the rim 13 of the flying saucer. The outer or distal end 18 of each arm 17 is shown to incorporate a minute electric lamp 19 that is positioned at a peripheral location of the flying saucer, a so-called "grain of wheat" lamp being quite satisfactory since it is about ¼ inch in diameter, about ¼ inch long, operates on about 3 volts, and has an insignificant weight.

It has been found convenient to produce a small aperture or window 20 in the rim 13 of the flying saucer. This window permits the direct emanation of light from the lamp 19, and this indicates the instantaneous position of the flying saucer. Such holes or windows may be readily formed at a selected location of the flying saucer rim 13 by drilling, by burning as by the insertion of a heated sharp tool, by the twisting of a sharp pointed knife, etc.

FIG. 1 also shows that a pair of minute wires 21 extends from the lamp 19 to the container 16, along the

arm 17, and in this connection it has been found advantageous to use a narrow slot 22 along the upper surface of arm 17 to receive the electric wires 21.

As indicated in the cutaway view of FIG. 1, container 16 has a retainer 23 for retaining and interconnecting one or more dry cell batteries so that the batteries 24 may act as a power source that operates through the wires 21 to power the lamp 19. A miniaturized switch 26 is included in the accessory 15 for completing the electrical circuit between the lamp 19 and the battery 24.

Container 16 is illustrated as having two portions 27 and 28, one of the container portions, say the primary center portion 27, being shown as affixed to the undercenter of the flying saucer 10 in any suitable manner as by rivets 29, adhesives, etc. The secondary container portion 28 is adjoined to the affixed container portion 27 in any suitable manner, as by a snap-in configuration, a friction fit, detents, interlocking configuration, etc.

It has been found desirable in the accessory 15 shown in FIG. 1, to have the arms 17 slightly longer than the straight line distance from the container 16 to the rim 13, or stated in another way, the arms 17 should have substantially the same length as the radial undersurface of the saucer. When the arms 17 have this particular length, they "snap" onto the rim and conform with the underside of the saucer top as indicated. This "over-center" action causes the distal end 18 of the arms to assume a close pressured proximity with the inner surface of the rim 13, and to hold the lamp in such a manner that it projects into its respective window 20.

This over-center arrangement also causes the arm 17 to hug the undersurface of the flying saucer, thus providing minimal distortion of the aerodynamic characteristics of the flying saucer.

When the switch 26 is set to its "closed" position, the batteries 24 power lamps 19 to illumination, and as the flying saucer 10 whirls through the darkness, the illuminated windows produce a pattern of moving light that is quite attractive, and permits the receiver to judge the instantaneous position and the flight trajectory of the flying saucer.

In the illustration of FIG. 1, the entire accessory 15, except the affixed primary container portion 27, is removable as a single unit when this is desired. The advantage of this removable unit is twofold. First of all, the accessory 15 may be retrofitted onto an existent flying saucer with minimal modification of the flying saucer. Second, when the unitary portion of the accessory 15 is removed, the flying saucer 10 may now be used in its designed manner, the only modification being the three small windows 20, and the affixed primary container portion 27. Therefore, the flying saucer will perform in its usual manner, and the slight modification will have practically no adverse effect on its aerodynamic characteristics.

It should be noted that the accessory 15, being made of a lightweight plastic or metal, adds a minimum of additional weight to the flying saucer 10. Moreover, since practically all of the actual weight of the accessory 15 is in the centrally located batteries 24, this weight does not introduce any unbalancing effect and does not change the center of gravity, or adversely affect the weight distribution or the inertial characteristics of the flying saucer. Therefore, the flying saucer behaves in practically the same manner whether the accessory 15

is present or is absent, since accessory 15 is lightweight, is centered, and is in the nonlift producing portion of the flying saucer.

#### A SELF-CONTAINED LIGHTING ACCESSORY

FIG. 2 shows a partial cutaway view of a flying saucer 10 with a self-contained accessory 30. In FIG. 2, the arms 32 and the affixed primary container portion 33 form a single unit which may be snapped and retained in operative position by the over-center action described above. The inner annular surface 37 of the rim is normally somewhat undercut, to securely lodge the distal ends 36 of the arms 32 against downward slippage. Alternatively, the accessory unit 30 may be affixed to the flying saucer 10 by other suitable means, as for example by a pressure sensitive tape or other adhesive. The secondary container portion 38 may be connected to primary portion 33 by a snap-on arrangement such as that illustrated, or be attached in any other desired manner, or may be omitted.

Each lamp 35 in the arrangement of FIG. 2 is held being entirely enclosed in the distal end 36 of respective arm 32. Since the flying saucer 10 is desirably lightweight, it is usually made of a thin lightweight plastic which is generally translucent. As a result of this translucency, it has been found that the previously discussed lamp windows may be omitted, and that lamps 35 mounted as indicated in FIG. 2 illuminate adjacent areas of the saucer rim 13, and provide the desired position-lighting.

It will be recalled from the previous discussion that it is desirable for the weight of the accessory — particularly the weight of the batteries 24 in the accessory container — to be centrally located. For an accessory 30 having three arms 32, such centering is automatically caused by having the arms of equal length and angular spacing. Otherwise, this relation may be facilitated in FIG. 2 as follows. In general, the flying saucer 10 has an exterior surface design that is either symmetrical or concentric, so that the center 39 of the flying saucer 10 is easily found. It will be noted from FIG. 2 that the accessory 30 has a center index 40 that may be aligned with the center 39 of the flying saucer 10. This alignment may be visual, or alternatively, one or more holes may be formed in the saucer for riveting or centering.

The advantage of the self-contained accessory 30 of FIG. 2 is that it requires no modification of the flying saucer and may be provided as a complete ready-to-install unit, the batteries being installed only when desired for nighttime use. If desired, the switch may be omitted for simplicity, and switching accomplished by the simple expedient of inserting and removing the batteries.

#### THE INTEGRAL POSITION-LIGHTED FLYING SAUCER

FIG. 3 shows a flying saucer 45 that is integrally formed to incorporate apparatus for achieving the disclosed position-lighting concept of the present invention. In FIG. 3, the flying saucer 45 has a plurality of lamps 46 incorporated directly into its rim 47 as part of the saucer-forming operation. Suitable electric conductors 49 may also be incorporated into the flying saucer, or alternatively, may take the form of suitable strips of electrically conductive material, electrically conductive paint, electrically conductive ink, etc., that are on or in the surface of the flying saucer. The proxi-

mal ends of the electrical conductors 49 terminate at a battery retainer 50 that may also be incorporated into the structure of the flying saucer 45. A switch (not shown) may also be incorporated if so desired, or alternatively, the switching may be accomplished by insertion and removal of the batteries.

The advantage of the integral arrangement shown in FIG. 3 is that no assembly of parts is required after the initial forming, the only addition necessary being the batteries.

#### SUMMARY

The present invention has numerous advantages over prior art flying saucers, and the various disclosed arrangements each has its own distinctive individual advantage. First, the present invention permits the flying saucer game to be played at night. Second, one disclosed apparatus may be easily retro-fitted onto an existing flying saucer, with minimal modification of the flying saucer. Third, this particular apparatus may be practically completely removed in order to return the flying saucer to substantially its original condition. Fourth, another disclosed apparatus may be easily retrofitted onto an existing flying saucer without any modification of the flying saucer. Fifth, this particular embodiment need only to have its batteries removed in order to return the flying saucer to substantially its original condition. Sixth, another disclosed arrangement permits the flying saucer to integrally incorporate the position-lighting apparatus. Seventh, the disclosed invention is such that it has minimal degrading effect on the aerodynamic characteristics of the original flying saucer. Eighth, the disclosed apparatus has no detrimental effect on the holding or on the throwing of the flying saucer, the thrower using his original handgrip. Ninth, a minimum of additional weight has been added, with no effect on the flying saucer's center of gravity, and minimal effect on the inertial characteristics, range, control, etc. Finally, the disclosed apparatus is economical to produce, is easy to install, and increases the desirability of owning and using a flying saucer.

While the instant invention has been shown and described herein in what are conceived to be the most practical and preferred embodiments, it is recognized that departures may be made therefrom within the scope of the invention.

We claim:

1. A flying saucer toy which comprises a generally disc-shaped body terminating at its periphery in a downwardly pointing rim, said body and rim defining a generally convex upper surface and a generally concave lower surface; power source retaining means generally centrally located on the underside of said body; lighting means generally fixedly operatively positioned proximate said rim and visible when energized from the outside of said rim; means for holding said lighting means in its said operative position; said lighting means holding means comprising at least one arm extending generally radially from said power source retaining means to said operative position of said lighting means; and electrical circuit means extending from said power source retaining means to said lighting means for con-

ducting electricity from said power source retaining means to said lighting means so as to energize said lighting means.

2. The apparatus of claim 1 wherein said lighting means, said lighting means holding means, said power source retaining means, and said electrical circuit means, comprise a unitary structure.

3. The apparatus of claim 2 wherein said unitary structure comprises a centrally located power source retaining means, and a plurality of regularly spaced, radially extending arms of substantially equal length having said lighting means at their distal ends.

4. The apparatus of claim 3 wherein said unitary structure is mounted and retained in the flying saucer by an over-center action.

5. The apparatus of claim 3 which includes three of said arms.

6. The apparatus of claim 2 including means for centering said unitary structure on the undersurface of said flying saucer.

7. The apparatus of claim 1 wherein said arm is held to said flying saucer toy by adhesive means.

8. The apparatus of claim 1 wherein said electrical circuit means comprises a pair of wires positioned along said arm.

9. The apparatus of claim 1 wherein said arm is held to said flying saucer toy by an over-center action.

10. A flying saucer toy which comprises a generally disc-shaped body terminating at its periphery in a downwardly pointing rim, said body and rim defining a generally convex upper surface and a generally concave lower surface; lighting means generally fixedly disposed proximate said rim and visible when energized from the outside of said rim; power source retaining means generally centrally located on said body; and electrical circuit means extending from said power source retaining means to said lighting means for conducting electricity from said power source retaining means to said lighting means so as to energize said lighting means.

11. A flying saucer toy as defined in claim 10, which includes manually operable on-off switch means operatively connected with said electrical circuit means for controlling the flow of electricity through said electrical circuit means.

12. A flying saucer toy as defined in claim 10, which includes window means in said rim optically associated with said lighting means.

13. A flying saucer toy as defined in claim 10, wherein said power source retaining means is located on the underside of said body.

14. A flying saucer toy as defined in claim 13, wherein said electrical circuit means comprises electrical conductor means located proximate the underside of said body.

15. A flying saucer toy as defined in claim 10, wherein said lighting means comprises a plurality of discrete lamps regularly spaced about said rim.

16. A flying saucer toy as defined in claim 15, wherein three of said lamps are regularly spaced about said rim.

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