Nov. 5, 1963 J. M. DEAN 3,109,256

FLYING TOY

Filed June 5, 1961 2 Sheets-Sheet 1

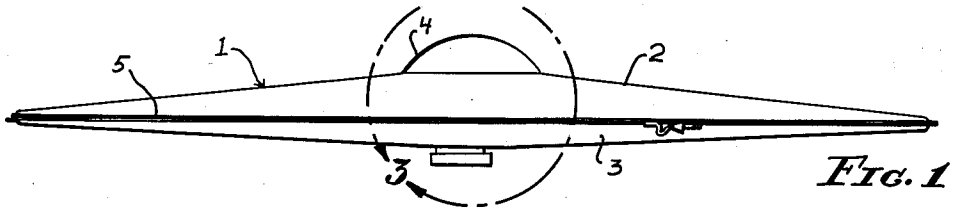


FIG. 1

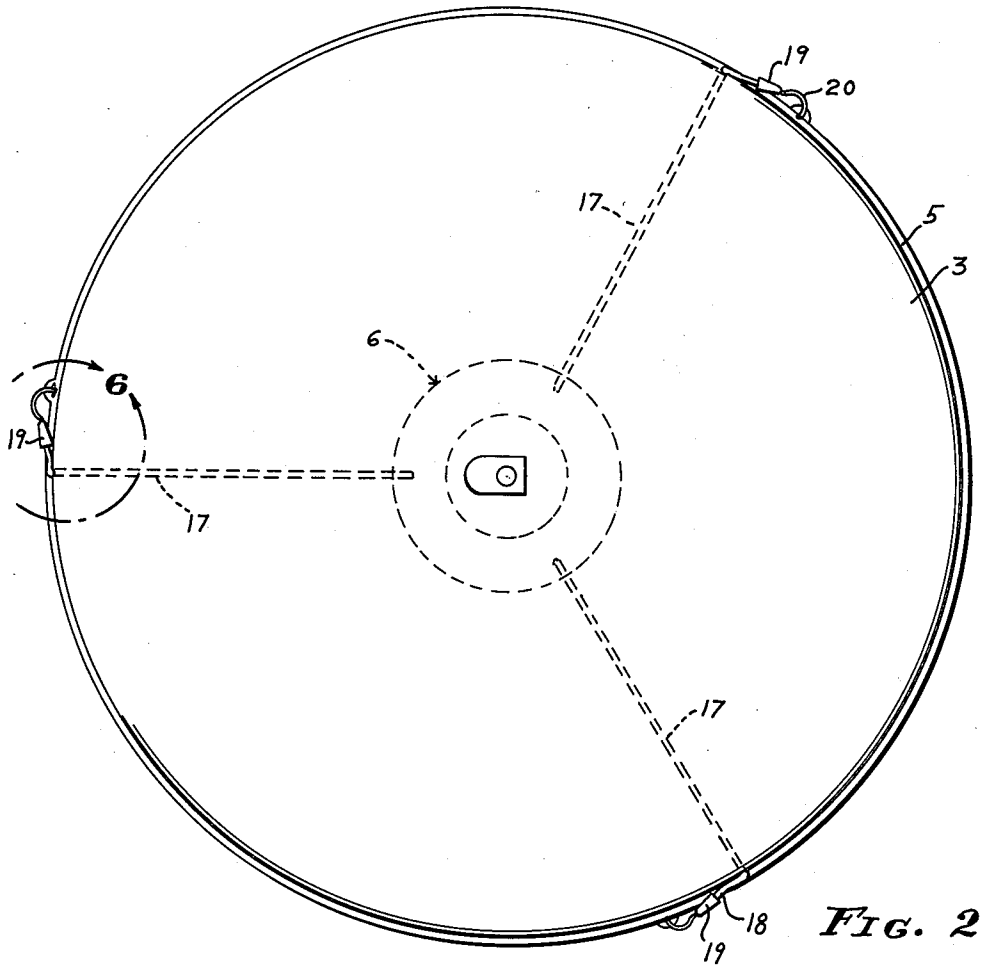


FIG. 2

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FLYING TOY

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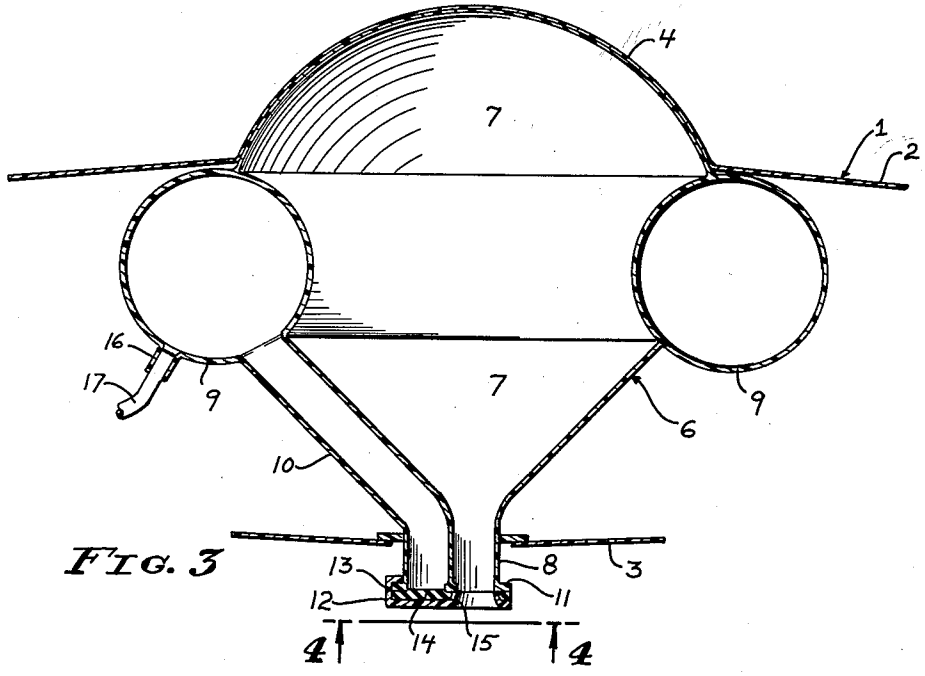


FIG. 3

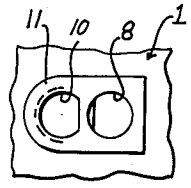


FIG. 5

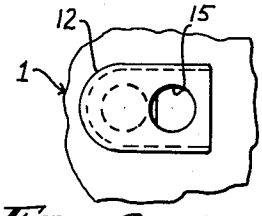


FIG. 4

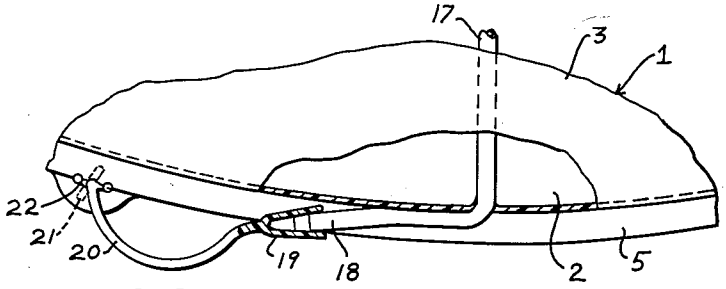


FIG. 6

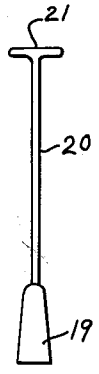


FIG. 7

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3,109,256

FLYING TOY

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This invention relates to flying toys and included in the objects of this invention are:

First, to provide a flying toy in the form of a flying saucer or disk in which the disk is jet propelled in an axial direction and also rotated by jets discharging tangentially at the periphery of the disk.

Second, to provide a disk-shaped flying toy which incorporates novelly arranged means including two gas-generating chambers adapted to receive gas-producing ingredients, such as citric acid, sodium bicarbonate and water, the discharge from one chamber effecting axial movement of the disk and discharge from the other chamber effecting rotation of the flying toy.

Third, to provide a flying toy which is particularly easy as well as safe to operate even by small children.

With the above and other objects in view as may appear hereinafter reference is directed to the accompanying drawings in which:

FIGURE 1 is a side or edge view of the flying toy.

FIGURE 2 is a bottom view thereof.

FIGURE 3 is an enlarged fragmentary sectional view thereof taken within circle 3 of FIGURE 1.

FIGURE 4 is a fragmentary bottom view taken from 4—4 of the FIGURE 3 showing the cap member in place to seal one of the gas generating chambers.

FIGURE 5 is a similar fragmentary bottom view with the cover removed.

FIGURE 6 is an enlarged fragmentary sectional view taken within circle 6 of FIGURE 2.

FIGURE 7 is an elevational view of one of the cap members employed in conjunction with the tangential jet nozzles.

The flying toy includes a body structure 1 which comprises a top shell 2 and a bottom shell 3. The top and bottom shells are preferably formed of a sheet plastic and are dished slightly. The upper shell is dished more than the bottom shell and is provided with a central dome 4. The peripheries of the two shells are joined together to form a marginal rim 5.

Mounted within the central portion of the body structure is a pressure-generating means 6. The pressure-generating means includes a central or primary jet chamber 7, the upper half of which is semispherical and the lower half of which is conical. Formed at the apex of the conical portion of the primary jet chamber is a jet nozzle 8 which is tubular and extends through the bottom shell 3.

The central portion of the primary jet chamber 7 is surrounded by a toroidal or secondary jet chamber 9 which is isolated from the primary jet chamber and is provided with a filler tube 10 which extends along a wall of the primary jet chamber and alongside the jet nozzle 8, that is, the filler tube 10 protrudes with the jet nozzle 8 from the bottom shell 3. The protruding ends of the jet nozzle 8 and filler tube 10 are provided with a peripheral flange 11. The common ends of the filler tube and flange are adapted to receive a slide cap 12 having an interned skirt 13 extending part way therearound so as to slide laterally over the ends of the filler tube and jet nozzle and be held thereon by the flange 11. The slide cap is provided with a gasket 14 which, when the slide cap is in place, seals the filler tube 10. The slide cap is also provided with an orifice 15 which, when the slide cap is in place, registers with the jet nozzle 8.

The toroidal or secondary jet chamber 9 is provided

with three equally spaced nipples 16 to which are attached flow tubes 17. The flow tubes 17 extend radially to the marginal rim of the body structure, then extend through the bottom shell 3, adjacent the marginal rim, and are then bent so as to extend tangentially and form secondary jet nozzles 18. A portion of the protruding end of each flow tube is cemented to the body structure, as shown in FIGURE 6, so that the jet nozzles 18 are held in tangential position. Each tangential or secondary jet nozzle is adapted to receive initially a conical cap 19. These caps are quite inexpensive and therefore may be used once with each operation of the flying toy. Alternatively each cap may be attached to a small strap 20 having an enlarged end 21 adapted to be secured to the marginal rim 5 by insertion through a slit 22.

Operation of the flying toy is as follows: Initially the flying toy is inverted. The caps 19 are placed on the secondary jet nozzles 18 and the slide cap 12 is removed. A predetermined quantity of gas-producing substances is introduced into each of the jet chambers 7 and 9. The slide cap 12 is placed so as to close the filler tube 10. A stopper, not shown, is inserted into the orifice 15, whereupon the toy is turned upright and the stopper is forced out by the pressure generated in the primary chamber. The jet discharge from the nozzle 8 drives the flying toy axially. During this initial flight the pressure in the secondary jet chamber 9 raises to a point sufficient to drive the caps 19 from the secondary jet nozzles 18, whereupon the toy rotates as well as moves axially until the gas is no longer generated in the jet chambers, whereupon the flying toy glides back to earth.

A number of reacting substances may be used to produce a pressure gas within the jet chambers, for example, a mixture of citric acid, sodium bicarbonate and water may be introduced into the chambers. This may be conveniently done if the citric acid or the sodium bicarbonate or both are prepared in pellet form. The pellets may be dropped into the chambers and the prescribed amount of water added.

Having fully described our invention, it is to be understood we do not wish to be limited to the details set forth herein, but our invention is of the full scope of the appended claims.

I claim:

1. A flying toy comprising a dish-shaped body structure having a relatively narrow rim, the walls of the body structure diverging from each other toward the center of said body structure; walls forming a primary jet chamber disposed in central relation to the axis of said body structure, and an axially directed primary jet nozzle for propelling said body structure axially; walls forming a toroidal secondary jet chamber surrounding said primary chamber; said primary and secondary jet chambers adapted to receive pressure generating substances; secondary jet nozzles tangentially disposed at the periphery of said body structure; and conduits connecting said secondary jet nozzles with said secondary jet chamber.

2. A flying toy, comprising: a dish-shaped body structure having a relatively narrow rim, the walls of the body structure diverging from each other toward the center of said body structure; walls forming a primary jet chamber disposed in central relation to the axis of said body structure, and an axially directed combination filler opening and primary jetting orifice for the introduction of propulsion constituents into said jet chamber for later discharge therefrom; walls forming a toroidal secondary jet chamber surrounding said primary jet chamber; a filler tube contiguous to said primary jetting orifice for the introduction of propulsion constituents into said secondary jet chamber; secondary jet nozzles tangentially disposed at the periphery of said body structure; and con-

ducts connecting said secondary jet nozzles with said secondary jet chamber.

3. A flying toy comprising: a dish-shaped body structure having a relatively narrow rim, the walls of the body structure diverging from each other toward the center of said body structure; walls forming a primary jet chamber disposed in central relation to the axis of said body structure, and an axially directed combination filler opening and primary jetting orifice for the introduction of propulsion constituents into said jet chamber for later discharge therefrom; walls forming a toroidal secondary jet chamber surrounding said primary jet chamber; a filler tube contiguous to said primary jetting orifice for the introduction of propulsion constituents into said secondary jet chamber; a removable cap embracing both said primary jetting orifice and the contiguous end of said filler tube for sealing said filler tube, said cap having an opening exposing said primary jetting orifice; secondary jet nozzles tangentially disposed at the periphery of said body structure; and conduits connecting said secondary jet nozzles with said secondary jet chamber.

4. A flying toy comprising a dish-shaped body structure having a relatively narrow rim, the walls of the body structure diverging from each other toward the center of said body structure; walls forming a primary jet chamber disposed in central relation to the axis of said body structure, and an axially directed primary jet nozzle for propelling said body structure axially; walls forming a toroidal secondary jet chamber surrounding said primary chamber; said primary and secondary jet

chambers adapted to receive pressure generating substances; secondary jet nozzles tangentially disposed at the periphery of said body structure; conduits connecting said secondary jet nozzles with said secondary jet chamber; and caps initially covering said secondary jet nozzles, said caps adapted to be forced from said secondary jet nozzles by pressure generated in said secondary jet chamber.

5. A flying toy comprising: a dish-shaped body structure having a relatively narrow rim, the walls of the body structure diverging from each other toward the center of said body structure forming an axially enlarged central portion; a propulsion unit fitted within said central portion and including a jet chamber adapted to be charged with a propelling fluid and an axially directed jet nozzle penetrating one of the walls of said body structure; a rotation unit including a jet chamber and a plurality of jet nozzles in the rim of said body structure; and means for initially capping said rotation jet nozzles to permit axial travel of said body structure before rotation thereof.

6. A flying toy as set forth in claim 5, wherein: said propulsion unit jet nozzle also forms a filler tube and said rotation unit has a filler tube adjacent thereto.

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