Jan. 31, 1961 B. P. KOWALSKI 2,969,609

AERIAL TOY

Filed Jan. 14, 1959

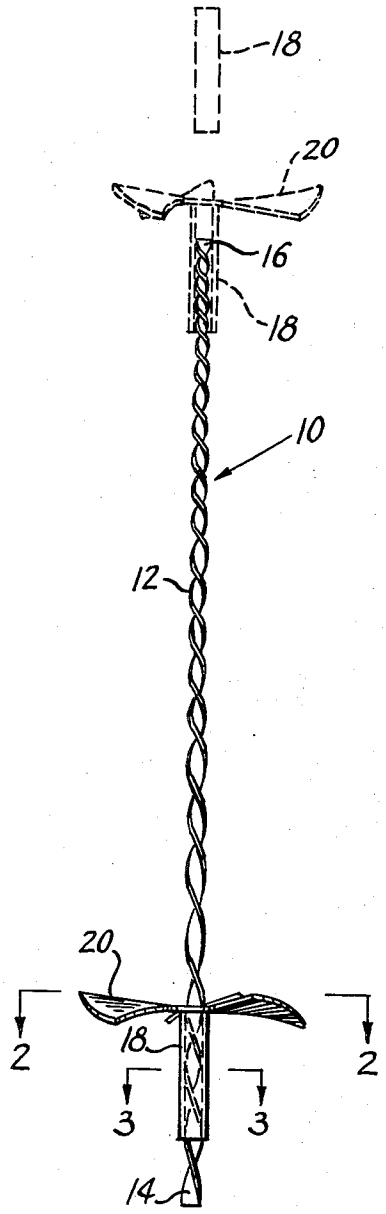

FIG. 1

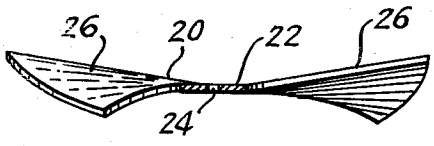

FIG. 4

FIG. 3

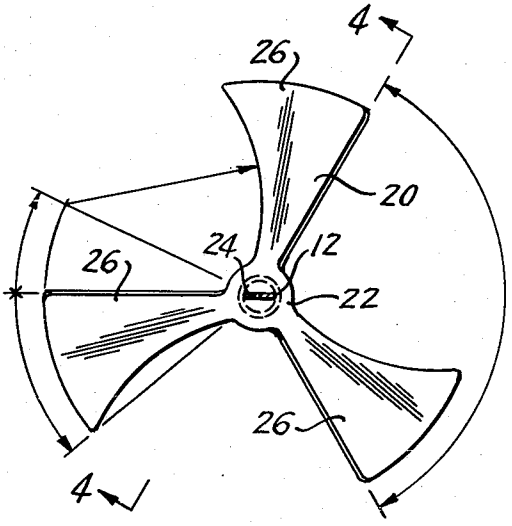

FIG. 2

INVENTOR.
BRONISLAW P. KOWALSKI
BY
Gustave Miller
ATTORNEY

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AERIAL TOY

Bronislaw P. Kowalski, 358 Chapin St., Ludlow, Mass.

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1 Claim. (Cl. 46—85)

This invention relates to a flying toy, and it particularly relates to a mechanical toy having a member adapted to be propelled into aerial flight.

There have heretofore been various types of flying toys propelled into flight by means of movement along a spiral rod. However, these prior devices never were capable of attaining any substantial heights or speeds and, as a mater of fact, were designed more for indoors than for outdoor use. With today's emphasis on height and speed, these prior devices have lost their attraction to children and even grown-up who are now used to thinking in terms of great heights and even space flight.

It is one object of the present invention to overcome the above difficulties and disadvantages by providing a toy device adapted to be helically propelled into greater heights and at greater speeds than previously attainable with such types of mechanisms.

Another object of the present invention is to provide a toy device of the above type which is simple in construction and easy to manipulate.

Another object of the present invention is to provide a toy which is highly instructive relative to the aerodynamic problems of lift, thrust, drag, stressing, etc.

Other objects of the present invention are to provide an improved toy, of the character described, that is easily and economically produced, which is sturdy in construction, and which is highly efficient in operation.

With the above and related objects in view, this invention consists in the details of construction and combination of parts, as will be more fully understood from the following description, when read in conjunction with the accompanying drawing, in which:

Fig. 1 is a side elevational view of a device embodying the present invention.

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a sectional view taken on line 3—3 of Fig. 1.

Fig. 4 is a sectional view taken on line 4—4 of Fig. 2.

Referring in greater detail to the drawing, wherein similar reference characters refer to similar parts, there is shown a toy, generally designated **10**, comprising a spiral rod **12** having a series of spiral turns along the length thereof. These spiral turns are constructed to grow progressively smaller from the lower end **14** of the rod to the upper end **16**. As illustrated, the rod here used is one wherein the lead progresses from one turn in two inches at the lower end to two turns in one inch at the upper end of the rod **12**, which measures approximately 14 inches from one end to the other.

Slidably and telescopically movable over the rod **12** is an actuating sleeve **18** above which is adapted to be positioned a flyer **20**. This flyer **20** comprises a hub portion **22** provided at its center with an elongated slit **24** through which the rod **12** is adapted to extend. Extending out from the hub **22** are three equally-spaced blades **26** bent at approximately a 20° angle from the plane of the hub **22** and measuring about 40° from tip

to tip of their respective curved outer peripheral edges. The leading edges of the blades **26** are straight while the trailing edges are concavely curved. They are also, when constructed according to the aforementioned dimensions, preferably about .020 inch thick. These various dimensions are, of course, given for illustrative purposes and can be varied where desired and feasible.

In the operation of the device, the sleeve **18** is slid down to the lower end of the rod **12** and the flyer **20** is then slid down on the rod to a position overlying the top of the sleeve **18** (as shown in Fig. 1). The sleeve **18** is then given a sudden upward thrust carrying the flyer **20** along with it. As the flyer **20** moves along the rod **12**, it rotates along the spiral track formed on the rod **12** and this rotation progressively increases in speed as the spiral track becomes increasingly of smaller turns. Finally, when the flyer **20** leaves the upper end **16** of the rod **12** it is propelled at relatively great speed in a vertical direction. This vertical free flight may reach about 200 feet or more. It may then sail horizontally with the wind for about 400 feet or more.

The progressive spiral feature of this invention acts to increase the revolutions of the flyer while it moves along the rod at least five-fold over the prior types of toys where the spiral was constant, thereby creating that much more dynamic lift. Furthermore, the three-bladed flyer is designed to soar into the atmosphere with a flywheel effect, thereby creating the least permissible amount of drag and the greatest amount of lift.

The above described toy can be packaged along with instructions pertaining to the various aspects of aerodynamic mechanics such as lift, thrust, drag, gravity, stress, etc. and would therefore be a most educational and inspiring toy.

The device may be constructed of any desirable material such as metal, wood or plastic.

Although this invention has been described in considerable detail, such description is intended as being illustrative rather than limiting, since the invention may be variously embodied, and the scope of the invention is to be determined as claimed.

Having thus set forth and disclosed the nature of this invention, what is claimed is:

An aerial toy flyer formed from sheet material in a single plane, said flyer comprising a central disc-shaped hub portion having an elongated rectangular diametrical slit of a length less than the hub diameter, the slit being adapted to fit about a helical rod rectangular in cross section, the flyer being adapted to be rotated by and projected upwardly from the helical rod by pressure applied against the bottom side of said hub portion, three identical equi-angular blades integrally extending radially from and secured only to said hub, a straight radial leading edge on each blade on a radius from said hub and extending at an angle of approximately 20° up from the plane of said hub, a concavely curved trailing edge on each blade extending at an angle below the plane of the hub substantially equal to the leading edge angle, the peripheral edges of said blades being circumferential and measuring approximately 40° between the tips of their leading and trailing edges.

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