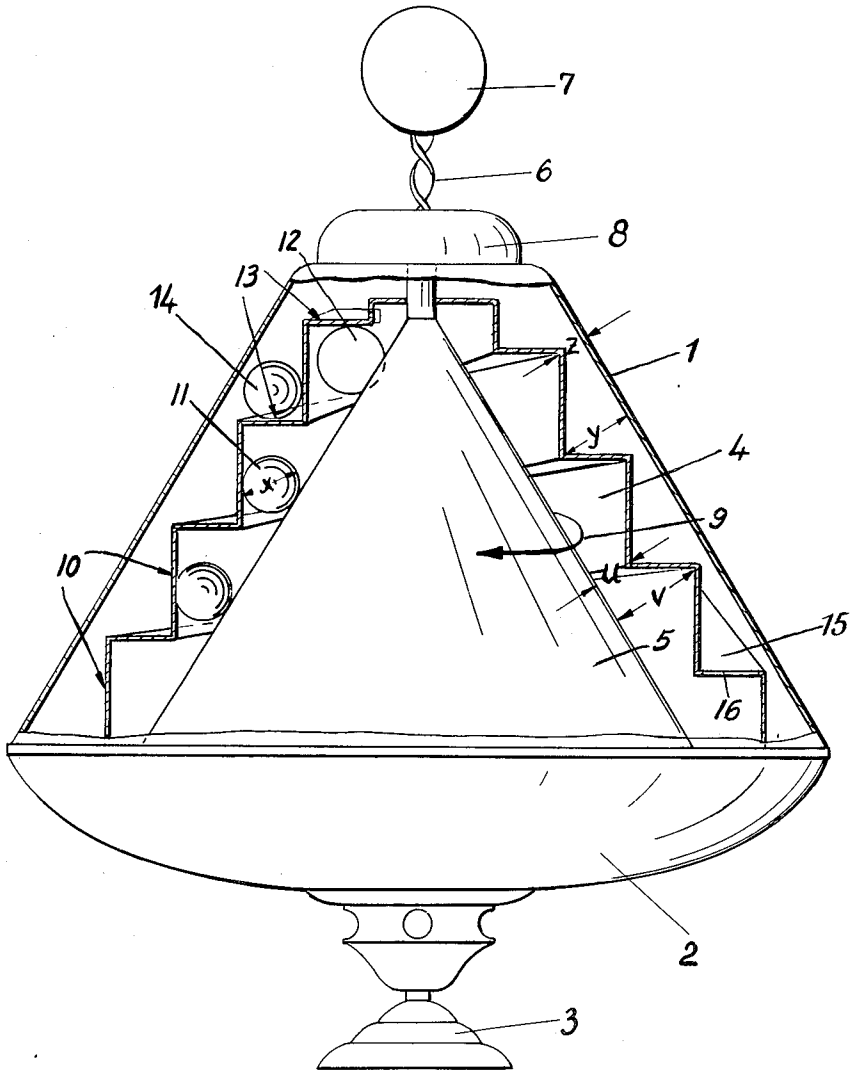
Jan. 25, 1966 F. FUCHS 3,230,662

TOP SPINNING TOP HAVING MARBLE RUNWAY

Filed July 8, 1963 2 Sheets-Sheet 1

Fig. 1



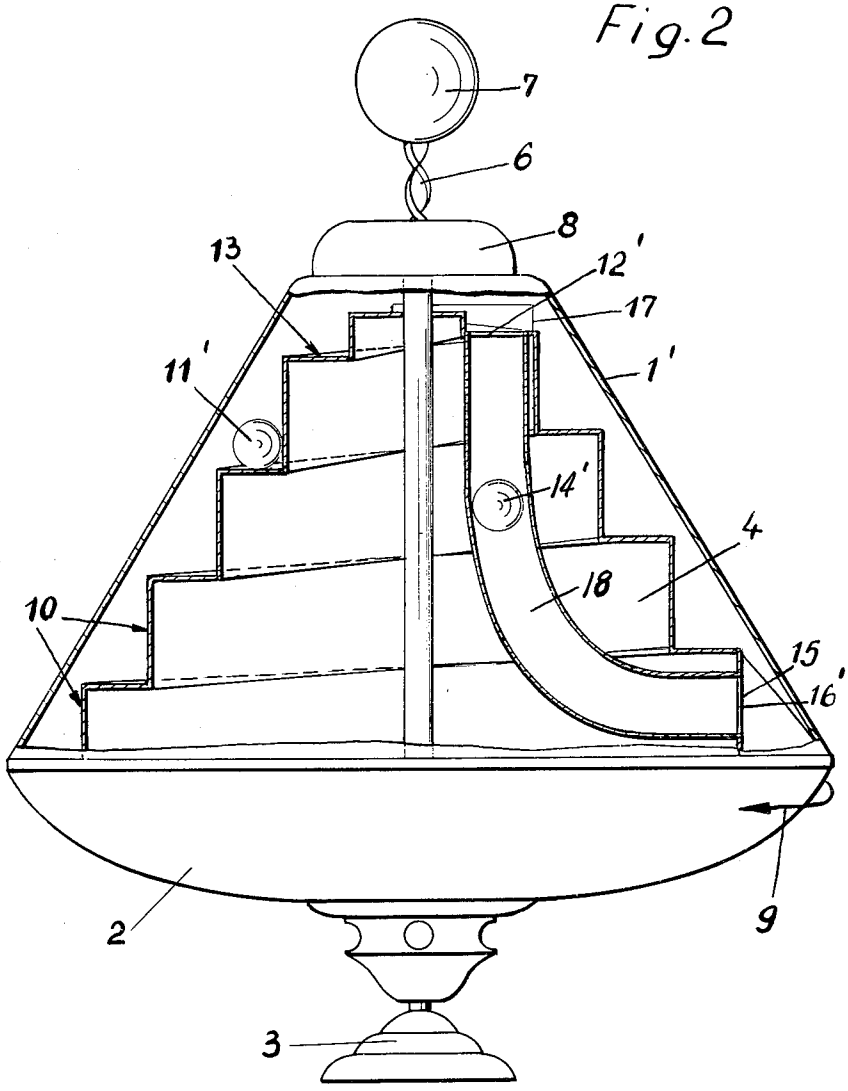
Inventor:
Friedrich Fuchs
By Kenyon, Palmer, Stewart & Estabrook,
Attorneys

Jan. 25, 1966 F. FUCHS 3,230,662

TOP SPINNING TOP HAVING MARBLE RUNWAY

Filed July 8, 1963 2 Sheets-Sheet 2

Fig. 2



Inventor:
Friedrich Fuchs
By Kenyon, Palmer, Stewart
& Eastbrook,
Attorneys

United States Patent Office 3,230,662 Patented Jan. 25, 1966

3,230,662

TOY SPINNING TOP HAVING MARBLE RUNWAY

Friedrich Fuchs, Heimgartenstrasse 16, Zirndorf, near Nurnberg, Bavaria, Germany

Filed July 8, 1963, Ser. No. 293,306
Claims priority, application Germany, July 10, 1962, F 37,276
11 Claims. (Cl. 46—43)

The invention relates to a spinning top with a dish-shaped bottom part and a conical upper part.

Spinning tops are very popular with children, especially those who are attracted mainly by visual impressions. Consequently the attractive features of many tops and their manner of operation are directed chiefly to the optical receptional readiness of the child.

Tops hitherto known employ, as effect-producing features, movable figures, colored insertions, balls and rings or attract the interest of the child solely by rotating movement of the top itself. At increased expense, the known tops have also been equipped with musical works.

The object of the present invention is to further develop or improve tops of this type in an advantageous manner and to produce in combination therewith additional particularly attractive movement effects in order to impart new interest to the child playing with the top.

Further objects details, features and advantages of the invention will become apparent from the following description of two preferred embodiments with reference to the accompanying drawings, in which:

FIG. 1 is a longitudinal section through a first embodiment with the cone rotating within the spiral, and

FIG. 2 is a longitudinal section through a second embodiment with the cone rotating around the spiral.

In general, the objects of the present invention are achieved by incorporating in a top a stepped conical spiral and a plurality of rolling bodies such as balls preferably of different colours and arranging for spinning of the top to effect rolling of the balls up the stepped conical spiral from the bottom to the top and then down to the original starting point.

The top body according to FIG. 1 consists of a transparent conical upper part 1 and a dish-shaped lower part 2 rigidly connected with 1 and standing on a base 3.

The rotary cone 5 is located within a stationary transparent spiral 4. This cone is driven with the aid of a thrust spindle attached to a spindle head 7. The conversion of the thrust movement into a rotary movement takes place under a cap 8. This type of drive is known so that it is unnecessary to describe it in detail here.

Balls of different colors, already inserted when assembling the top, collect in the lowermost windings of the spiral when the top is at a standstill.

If the cone 5 is rotated in the direction of the arrow 9, the balls will participate in the movement and are thereby subjected to centrifugal force. The substantially vertical walls 10 of the spiral 4 exert a centripetal force on the balls and, in conjunction with the frictional forces occurring, these are compelled to roll upwards along the path determined by the spiral. Such a ball is designated by 11. In order that a rolling movement be imparted to the balls, the diameter x must be smaller than the distance y and larger than the distance z.

In the example illustrated it is also advisable to make the diameter x smaller than the distance v and larger than the distance u.

At the apex of the spiral, a passage opening 12 is arranged radially to the axis of the top. When a ball reaches this point, it drops, owing to lack of centripetal force, through the passage opening 12 on to a substantially horizontal track 13 of the spiral 4. This track 13 can be constructed in the form of a curve.

The rotary movement of the cone 5 now no longer acts on the ball. This ball, designated by 14, therefore rolls downwards on the spiral under its own weight and strikes against an abutment 15 which guides it through an axial passage opening 16 into its initial position in the interior of the spiral.

The interest in the toy is further increased if the order and therefore the sequence of colors of the different balls changes. The upper passage opening 12 is therefore arranged at a distance from the end of the track 13 equal to about twice the diameter of the balls. In other words, that portion of the outer spiral path beyond the opening is of sufficient length to permit the second ball which goes through the opening to be positioned ahead of the first ball before these balls begin to descend on the outer spiral path.

Balls passing through the passage opening 12 still tend to roll upwards a short distance along the track on account of their accumulated kinetic energy. Balls directly following up find their path blocked or occupied and roll directly downwards. Only then do the first balls follow.

The embodiment illustrated in FIG. 2 differs fundamentally from that shown in FIG. 1 in that here the transparent conical upper part 1' is set in rotation by the spindle 6.

In the top illustrated in FIG. 2 the balls roll upwards along the outer surface of the spiral 4 and pass through a tube 18 from the upper axial passage opening 12' into their initial position through the lower passage opening 16'.

In this embodiment, the path 13 of the spiral is blocked by the abutment 17 at a distance equal to two ball diameters behind the passage opening 12' in order to enable the displacement of the balls.

From the foregoing it will be apparent to those skilled in this art that when the top is in operation, a counter movement is imparted to the rolling bodies such movement being in the form of a conical spiral. The openings provided in the spiral permit the rolling bodies to pass from one side to the other of the spiral member thus reversing their directions of movement.

What I claim is:

1. A top comprising:
a stationary spirally stepped conical member;
a rotary cone arranged concentrically with said member and spaced radially therefrom;
a plurality of rolling bodies positionable between said member and said cone and adapted to be driven upward along said member whenever said cone is rotated with respect to said member;
and communicating passageways through said member adjacent the apex and base thereof to permit passage of said rolling bodies from one side of said member to the other.

2. Top according to claim 1, wherein said rotary cone is arranged within said member.

3. Top according to claim 2, wherein a second stationary at least translucent outer cone surrounds said member.

4. Top according to claim 3, wherein the spacing between said outer cone and said member is smaller at the narrowest point and larger at the widest point than the diameter of said rolling bodies.

5. Top according to claim 1, wherein said rotary cone surrounds said member.

6. Top according to claim 3, wherein said outer cone surrounding said spiral and said spiral itself are at least translucent.

7. Top according to claim 1, wherein said passageways at the apex of said member are arranged at a distance

from the upper end of the spiral path of at least twice the diameter of said rolling bodies.

8. Top according to claim 7, wherein said passageways are arranged axially to said member.

9. Top according to claim 7, wherein said passageways are arranged radially to said member.

10. Top according to claim 9, wherein abutments are arranged adjacent said passageways to facilitate the passage of the rolling bodies.

11. Top according to claim 10, wherein a guide for said rolling bodies is arranged within said member and connects the upper and lower passageways.

References Cited by the Examiner

UNITED STATES PATENTS

3,084,478 4/1963 Burger ---------- 46—68 X

OTHER REFERENCES

German printed application, 1,113,403, August 1961.

RICHARD C. PINKHAM, *Primary Examiner.*

L. J. BOVASSO, *Assistant Examiner.*