

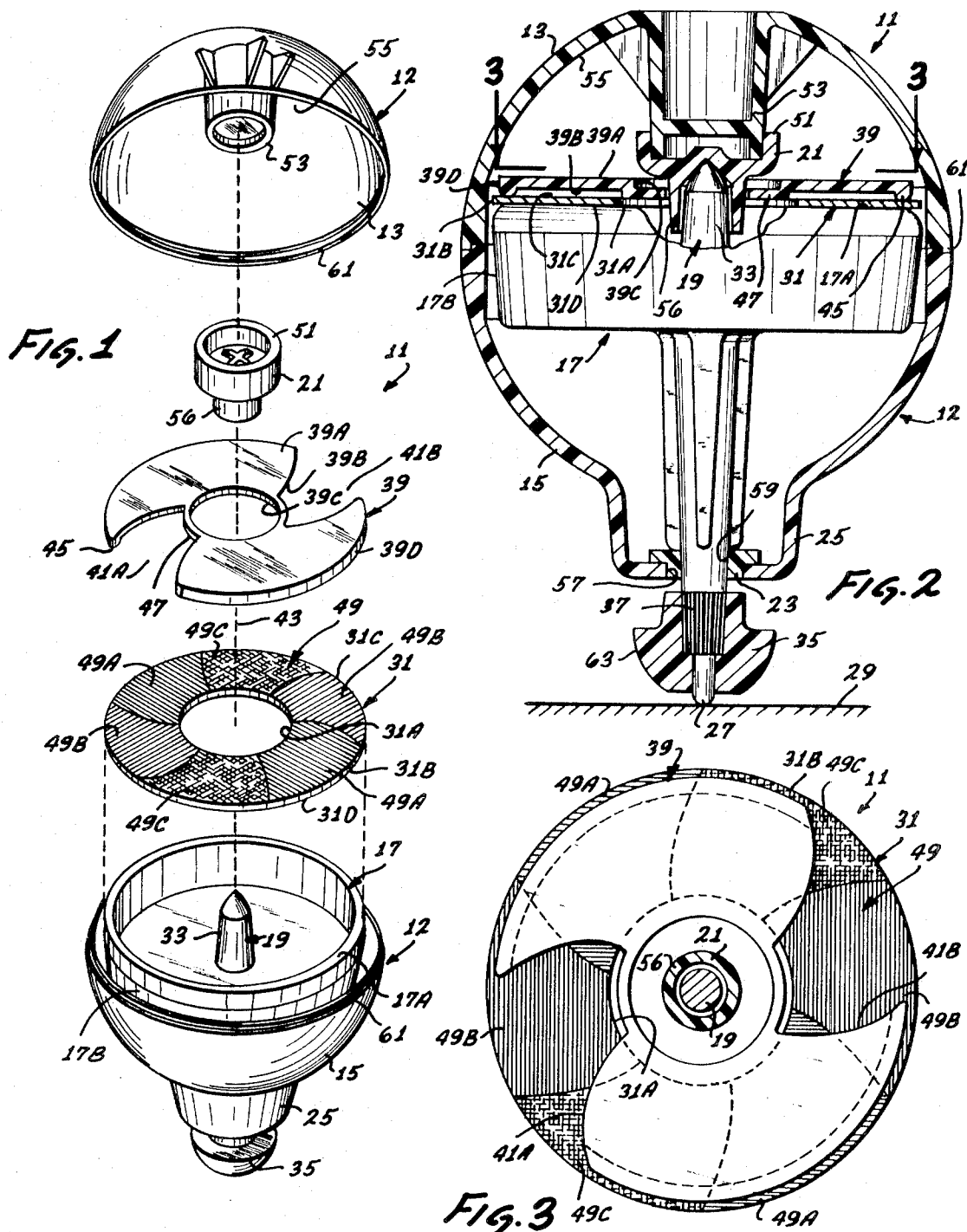
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COLOR CHANGING TOY TOP

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COLOR CHANGING TOY TOP
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ABSTRACT OF THE DISCLOSURE

A toy top having a housing with a gyroscopic-type rotor mounted on a freely rotatable shaft that extends below the housing and terminates at a spinning tip which supports the top in spinning engagement with a playing surface, the top includes a color disc rotating with the top's rotor and a substantially freely rotatable coaxially disposed apertured opaque disc positioned between the color disc and a transparent portion of the top's housing so that the apertured disc may rotate at a speed different from that of the color disc to provide the illusion, that the color disc is changing colors.

BACKGROUND OF THE INVENTION

The background of the invention will be set forth in two parts.

Field of the invention

The present invention pertains generally to the field of toy tops and more particularly to spinning toy tops providing unusual and amusing colors and patterns.

Description of the prior art

The use of the gyroscopic effect of spinning bodies for scientific and amusement purposes has long been known. Generally, in the amusement or toy field, these devices are known as tops or spinning tops. Such tops may take any of many different forms, some being very simple in construction comprising only a disc transversely mounted along a shaft which is rotated merely by twisting between the user's fingers. Others are more elaborate and require that a cord be wound about a portion of the top, which cord when pulled briskly by its user, imparts to the top a desired rotation.

As the toy top art has developed, over the years, the tendency has been to develop tops having less classical appearance and which utilize more sophisticated configuration, such as tops having housings which conceal and protect the rotating annular tip of a rotatable hub member so that it will not accidentally come into contact with obstructions or the user's hand and cause it to lose momentum.

In more recent time, the toy industry has moved away from top configurations having fixed pivot arms which support the top and has developed spinning tops which have a housing enclosing an elongated, rotor-carrying shaft freely rotatably supported in and extending from the housing, and with a spinning tip in spinning engagement with a playing surface for supporting the housing, but being independently rotatable with respect to the housing. Such a toy is fully described in U.S. Pat. No. 3,523,386 which is assigned to the assignee of the present invention.

Even with the above-described attributes, these spinning tops all have the disadvantage of easily becoming boring to watch. Although separate accessories may be obtained to increase interest in these toys, it should be evident that a technique which would cause such added interest and amusement without requiring additional accessories constitutes a significant advancement of the art.

SUMMARY OF THE INVENTION

In view of the foregoing factors and conditions characteristic of the prior art, it is a primary object of the

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present invention to provide a new and improved color changing toy top not subject to the disadvantages enumerated above and which includes a completely self-contained color changing arrangement.

It is another object of the present invention to provide a color changing toy top which changes its color with changes in the relative rotational speed of the top's rotor and a substantially freely rotatably disposed apertured disc mounted within its housing.

It is a further object of the present invention to provide an economical to fabricate and a relatively simple structured color changing toy top.

It is still another object of the present invention to provide a technique which allows the manufacturer to utilize an appreciable number of components of conventional toy tops as described in the aforementioned U.S. Pat. No. 3,523,386, and produce, with few additional components, a significantly different and amusing toy.

According to the present invention, a color changing toy top is provided basically of the type having a housing with a gyroscopic-type rotor mounted on a freely rotatable shaft that extends below the housing and which terminates at a spinning tip that supports the top in spinning engagement with a playing surface. The improvement includes an annular color disc associated and rotatable with the rotor and having colors in a predetermined pattern on an upper surface thereof, and a viewing means in the housing for allowing at least a portion of the color pattern to be viewed from outside the housing. Also, there is provided an annular apertured disc disposed in the housing between the color disc and the viewing means and independently rotatable with respect to the rotor and the housing, whereby only portions of the color pattern adjacent the apertured portion of the apertured disc may be viewed through the viewing means. The apertured disc may preferably include a pair of oppositely disposed apertures extending between a portion of the disc adjacent an inner circular opening thereof and the outer periphery of the disc. Also, in the preferred embodiment, the color disc includes contiguously colored portions, where adjacent ones of these portions are colored differently and opposite ones of these portions are of the same color.

The features of the present invention which are believed to be novel are set forth with particularity in the appended claims. The present invention, both as to its organization and manner of operation, together with further objects and advantages thereof, may best be understood with reference to the following description, taken in conjunction with the accompanying drawing in which like reference characters refer to like components in the several views.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded view, in perspective, of a color changing toy top having a spinning tip in accordance with the present invention;

FIG. 2 is a vertical section of the assembled toy top shown in FIG. 1; and

FIG. 3 is a horizontal view taken immediately above the top's apertured disc along lines 3—3 of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring again to the drawings, and more particularly to FIGS. 1 and 2, there is shown a color changing toy top 11 of the type having a housing 12 with an upper section 13 and a lower section 15, and with a gyroscopic type rotor 17 mounted on a freely rotatable shaft 19 supported at an upper bearing 21 and a lower bearing 23, the shaft 19 extending below a neck portion 25 of a lower housing section 15 and terminating at a spinning tip 27 which

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supports the top 11 in spinning engagement with a playing surface 29.

An annular color disc 31 with a central aperture 31A and an outer periphery 31B is mounted over a tapered upper portion 33 of the shaft 19. The disc 31 also has an upper broad surface 31C and a lower broad surface 31D and is attached by any conventional means, such as an adhesive, for example, to an upper rim edge 17A of the rotor 17.

Except for a few specific parts of the color changing top 11, the various elements such as the housing sections and the discs and the upper bearing, may be molded using any conventional technique such as injection and/or vacuum processes for example, from any conventional materials such as high impact styrene and other synthetic materials. In order to provide more mass for a better and longer lasting gyroscopic effect, the rotor 17 and the shaft 19 may be integrally molded from any suitable metal such as, for example, an aluminum alloy or steel, etc. Such synthetic materials as acetal may be most advantageously used in fabricating the lower bearing 23 and a relatively resilient or soft material such as urethane may be utilized for starting tip 35 mounted on a splined lower shaft 37 extending below the housing neck portion 25.

Above the color disc 31 is mounted an annular apertured disc 39 having upper and lower broad surfaces 39A and 39B, respectively, a central opening 39C and an outer peripheral edge 39D. The disc 39 also is divided with a pair of apertures 41A and 41B extending in spiral fashion from the area adjacent the opening 39C to the peripheral edge 39D on opposite sides of the axis of rotation 43 of the rotor 19.

In order to reduce the surface contact area between the adjacent discs 31 and 39, the lower broad surface 39B includes a circular downwardly extending lip portion 45 and a centrally located lower bearing surface 47. These depending portions of the aperture disc 39 ride on the upper surface 31C of the color disc 31 and allow the aperture disc to be only slightly frictionally coupled to the rotating lower disc 31. In this manner, the aperture disc 39 will generally rotate at a different speed than the color disc 31 to thereby expose different portions of the upper broad surface 31C of the color disc 31 which includes thereon a predetermined color pattern.

This pattern is made up of contiguously colored portions 49, adjacent ones of which are the same color. Thus, oppositely disposed portions 49A, 49B and 49C may be red, blue or yellow, respectively. Preferably, these portions may take the form of spiral sections similar in size to the apertures 41 in the apertured disc 39 but taking the opposite spiral direction.

The upper bearing 21 is shown in this embodiment as molded independently of the upper housing section 13 and includes an upper tubular body portion 51 into which extends an accessory accepting cup portion 53 depending from an inner surface 55 of the upper housing section 13. The cup 53 is coaxial with the axis of shaft rotation 43 so that the bearing 21 will hold the rotor shaft in permanent alignment whereby the rotor's outer periphery 17B will not contact the housing 12. The bearing 21 also includes a lower extending tubular bearing portion 55 into which is rotatably held the tapered upper portion 33 of the shaft 19.

The top 11 may be assembled by first inserting and either crimping and/or bonding the lower bearing 23 in an aperture 57 at the bottom of the neck portion 25, with the upper section 13 not yet in place, and then inserting the lower shaft portion 37 through the central bearing opening 59 in the lower bearing 23. The starting tip 35 is then pressed on the splines of the lower shaft, over the spinning tip 27. As noted previously, the color disc 31 is mounted by a conventional adhesive to the upper ridge 17A of the rotor 17, and the aperture disc 41 is placed over the upper surface 31C of the color disc 31

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before the tubular bearing portion 55 is inserted through the apertures 39C and 31A of the discs and over the tapered shaft end 33. The upper housing section 13 is then mounted on the lower section 15 and joined by heat treating or bonding at the housing seam 61, so that the cup portion 53 fits into the upper tubular body portion 51 of the upper bearing 21 to hold the shaft 19 in alignment.

In operation, the top 11 is activated by gripping the housing and moving the top in a generally lateral or curved direction with an outer surface 63 of the starting tip 35 in contact with the playing surface 29, the rotor and shaft 17 and 19, and the color disc 31 to rotate relative to the housing 12. Because of the loose frictional coupling between the aperture disc 39 and the color disc 31, the position of the apertures 41A and 41B will continually be changing to expose different color patterns 49 on the upper surface 31C of the color disc as illustrated in FIG. 3. This variation in disc speeds produces a very unique and attractive illusion of the colored disc changing colors and patterns.

From the foregoing, it should be evident that a very entertaining and simple-to-fabricate color changing toy has been described in the form of a toy top having a housing and a gyroscopic rotor mounted on a freely rotatable shaft that extends below the housing and terminates at a spinning tip in spinning engagement with a playing surface.

It is to be pointed out that the materials and processes used in fabricating the various parts and elements shown are not critical and any material and forming process generally recognized as suitable for similar applications may be utilized.

It should be further clear from the foregoing that the invention is susceptible to numerous modifications and embodiments not shown, all within the attainment of one skilled in the art. For example, the upper bearing 21 may be made an integral part of the upper housing section 13, and the apertures and corresponding color patterns may have different shapes than those shown so as to provide a variety of color changing schemes.

What is claimed is:

1. In a toy top of the type having a housing with a gyroscopic-type rotor mounted on a freely rotatable shaft that extends below said housing and terminating at a spinning tip which supports said top in spinning engagement with a playing surface, the improvement comprising:

an annular colored disc associated with and rotatable with said rotor and having colors in a predetermined pattern on an upper surface thereof;

viewing means in said housing for allowing at least a portion of said color pattern to be viewed from outside said housing; and

an annular apertured disc disposed in said housing between said color disc and said viewing means and substantially independently rotatable with respect to said rotor and said housing whereby only portions of said color pattern adjacent the apertured portions of said apertured disc may be viewed through said viewing means.

2. In a toy top according to claim 1, wherein said apertured disc includes two oppositely disposed apertures.

3. In a toy top according to claim 2, wherein said apertured disc includes a centrally disposed inner circular opening and an outer circular periphery coaxial therewith, said apertures extending from adjacent said inner opening to said outer periphery and having identical configuration.

4. In a toy top according to claim 3, wherein said apertures extend spirally outwardly from adjacent said inner opening.

5. In a toy top according to claim 1, wherein said apertured disc is opaque.

6. In a toy top according to claim 5, wherein said apertured disc is colored black.

7. In a toy top according to claim 1, wherein said colored disc includes contiguously colored portions, adja-

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cent ones of said portions being colored differently, and opposite ones of said portions being of the same color.

8. In a toy top according to claim 7, wherein said colored portions extend between the inner opening and the outer circumference of said colored disc.

9. In a toy top according to claim 8, wherein said colored portions extend spirally outward from said inner opening.

10. In a toy top according to claim 1, wherein said colored disc is attached to the upper portion of said rotor.

11. In a toy top according to claim 1, wherein said housing includes an upper bearing structure having a circular outer periphery and a circular inner bearing aperture, wherein said freely rotatable shaft includes an upper portion extending above said rotor, the end of which is disposed in said bearing aperture, and wherein said color and apertured discs include centrally disposed inner cir-

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cular openings having diameters larger than the diameter of said upper bearing structure, said upper bearing structure extending through the openings in said discs but not binding thereon.

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