March 17, 1953 N. K. MASTEN 2,631,405

TOY TOP

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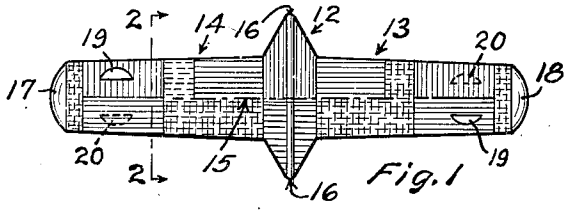


Fig. 1

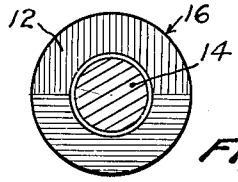


Fig. 2

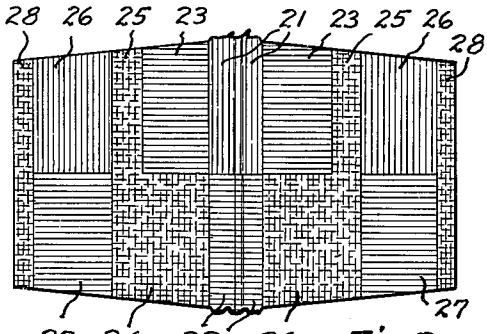


Fig. 3

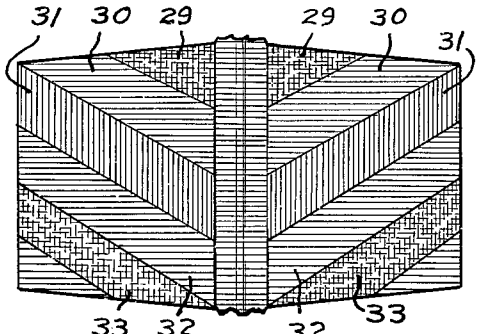


Fig. 4

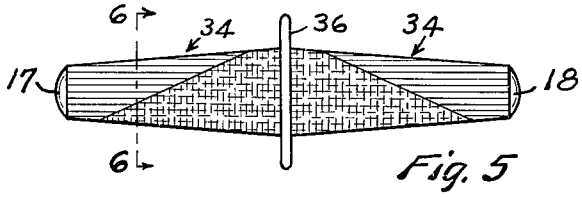


Fig. 5

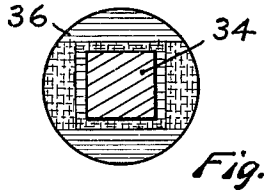


Fig. 6

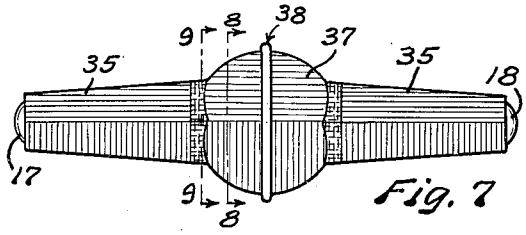


Fig. 7

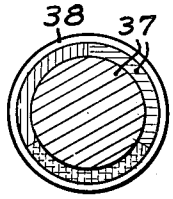


Fig. 8

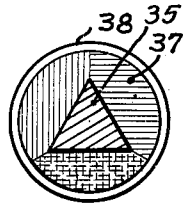


Fig. 9



Fig. 11

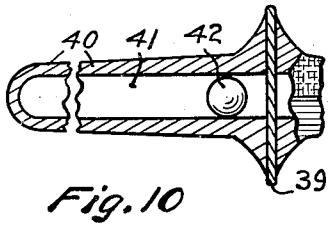


Fig. 10

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TOY TOP

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4 Claims. (Cl. 46—49)

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This invention relates to a toy top. More particularly this invention relates to a toy top that spins on a fulcrum disposed at right angles to its longitudinal axis rather than spinning on its longitudinal axis as is conventional.

An object of the present invention is to provide a top which spins on a rotatable disc-like member or, in other words, on a movable axis and at the same time at right angles to the longitudinal axis of the top.

More particularly it is an object of the present invention to provide a disc-like member with shaft means extending in opposite directions from said disc-like member so that during spinning the shafts will rotate about the disc as a center and at the same time the disc will angularly move.

It is another object of my invention to provide color effects on the surface of the top so that during spinning the color effects on opposite sides of the disc-like center will complement each other to provide desired color effects.

It is a further object of my invention to provide color effects on different portions of the top of my invention so that color changes result during spinning to provide a myriad of color effects.

It is another object of my invention to provide a top of the character described wherein the mass at one end portion if unlike that at the other to augment the tendency of the top to rotate about its longitudinal axis as it is being spun on an axis at right angles to its longitudinal axis.

It is another object of my invention to provide a disc-like member with shafts extending at right angles thereto and at opposite sides thereof wherein the shafts provide a moment of inertia, when the top is spinning, to support the top for spinning movement on an axis which is a diameter of said disc-like member.

The above mentioned general objects of my invention, together with others inherent in the same, are attained by the devices illustrated in the accompanying drawings, throughout which drawings like reference numerals indicate like parts:

Figure 1 is a view in elevation of a top embodying my invention;

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

Fig. 3 is a planar development view showing fragmentarily the external surface of the device of Fig. 1 and to illustrate one form of color design which may be employed;

Fig. 4 is a view similar to Fig. 3 showing another color design which may be employed;

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Fig. 5 is a view in elevation of a modified form of my invention having an alternate sectional view and an alternate form of supporting disc;

Fig. 6 is a sectional view taken substantially on broken line 6—6 of Fig. 5;

Fig. 7 is a view similar to Fig. 5 of a further modified form of my invention having an alternate sectional view and an alternate form of supporting disc;

Fig. 8 is a sectional view taken substantially on broken line 8—8 of Fig. 7;

Fig. 9 is a sectional view taken substantially on broken line 9—9 of Fig. 7;

Fig. 10 is a fragmentary sectional view showing a further modified form of my invention; and

Fig. 11 is a fragmentary view indicating a preferred form of top supporting edge employed in the preceding figures.

In the drawings a disc-like portion 12 has shaft portions 13 and 14 extending in opposite directions therefrom. The shaft portions 13 and 14 are each longer than the diameter of band 16 and provide a moment of inertia, when the top is spinning, to support the top on an axis which is a diameter of the band 16. The longitudinal axis of my top is indicated by the dot and dash line numbered 15. The top during spinning spins at right angles to said longitudinal axis 15 and about an axis in the plane passing through the band 16 of the disc-like portion 12. In the form of the invention shown in Fig. 1, the shaft portions 13 and 14 may be a circle in section as is indicated by Fig. 2. Also, said shaft portions 13 and 14 may have other shapes in section, some of which are hereinafter illustrated and described.

The shaft portions 13 and 14 preferably have different masses to augment the top to rotate about an axis in the plane of band 16. In spinning the top, the top spins about an axis in the plane of band 16. At the same time, the end portions of the shafts 13 and 14 have different masses or moments of inertia as respects the axis about which the top is spinning which augments the tendency of the top to rotate about its longitudinal axis 15 to thus present different axes on which the top spins. This difference in mass of the shafts 13 and 14 may be provided by having the shafts 13 and 14 of different lengths away from the plane of band 16. Also, this difference in mass may be accomplished by providing the portions 13 and 14 of the same length and by employing weights 17 and 18 which are unalike.

During rotation of the top about an axis lying in the plane of band 16, a difference in mass of the shaft portions 13 and 14 tends to cause

the top to revolve about a given point or "walk" and thus turn about its longitudinal axis 15. Preferably the difference in mass between the shaft portions 13 and 14 is accomplished by adding weights disposed toward the ends portions as is indicated by weights 17 and 18 having either unequal weights or unequal distances from the plane of band 16. However, the difference in mass can be accomplished anywhere throughout the lengths of the portions 13 and 14, either locally or over the full distance thereof, but I have found that better results obtain by localizing the weights as has been above indicated.

If desired a whistling sound may be obtained by providing intake ports 19 and exhaust ports 20 at the end portions of the shafts 13 and 14 and with any suitable orifices therebetween so that a whistling sound results from air passing through intake ports 19 and out through exhaust ports 20. Preferably the intake ports 19 on the shafts 13 and 14 are diametrically opposed to provide for a continuous whistling sound. Thus as the top rotates during spinning about its longitudinal axis 15, one of the intake ports 19 will always be in a position so that air will pass therethrough and out an exhaust port 20.

The action of my top during spinning may be described by stating that the top spins about an axis in the plane of band 16 and at the same time the top "walks" or tends to turn about its longitudinal axis 15 and thus various portions of the surface of the disc-like portion 12 and the shafts 13 and 14 are visible when looking down on the top. The surfaces which are visible when looking down on the top tend to change because of the "walking" action of the top or its movement about its longitudinal axis 15. The "walking" action of the top is augmented because the top is out of balance so far as its end portions are concerned when the band 16 is considered as the fulcrum. When my top is spun on a flat surface, preferably black or contrasting with the colors on the top, its path of travel may be erratic. If spun on a concave surface it will "walk" up and then down the inclined surfaces.

The "walking" action of my top tends to bring out desired color effects during spinning. For example, in Figs. 4 and 5 I have illustrated by planar development views two of the many color designs which may be employed. In Figs. 3 and 4 the disc-like portion 12 is provided with two bands 21 and 22 which may be colored red and blue respectively as indicated by the shading symbols employed. In the specific illustration employed the band 21 extends halfway around and the band 22 extends the other halfway around the disc-like portion 12. On each of the shaft portions 13 and 14, a band 23 indicated as blue and a band 24 indicated as yellow may be employed. These bands 23 and 24 are preferably mated on each of the shaft portions 13 and 14. Again they may extend halfway around each of the shafts 13 and 14. Next, I have indicated a band 25 which is shown as being yellow and which extends entirely about each of the shafts 13 and 14. Next, and outwardly from the center defined by the band 16 I have shown a red band 26 and a blue band 27 each of which extends halfway around each of the shafts 13 and 14. Next, there is indicated a yellow band 28 which extends entirely around each of the shafts 13 and 14.

Upon spinning of a top of my invention, having the color design illustrated in Fig. 3 of the drawings, different color effects obtain during spinning. When looking directly down on the bands 21 and 23, a continuous circular color effect obtains and the center will appear red which will be followed by circular bands which will be from the center extending outwardly as follows: A blue band (produced by spinning of band 23), a yellow band (produced by spinning of band 25), a red band (produced by spinning of band 26), and a yellow band (produced by spinning of band 28). As the top turns about its longitudinal axis the spinning effect of bands 22, 24, and 27 gradually comes into view and replaces the spinning effect of bands 21, 23, and 26. When said bands 22, 24 and 27 are directly upward then the color combinations will be from the center outwardly, a blue band (by reason of band 22), a yellow band (by reason of band 24), a yellow band (by reason of band 25), a blue band (by reason of band 27), and a yellow band (by reason of band 28). By having the bands 23, 24, 26, and 27 paired on each side of the center which passes through ring 16, the colors tend to complement each other in the color effects obtained. Also, by having bands such as 25 and 28 continuous and paired on each side of the center of rotation of the top, a continuous color band is provided during spinning which tends to contrast with and augment the changing color effects obtained by employing different colors around the periphery of the shaft portions 13 and 14.

Another illustrative color combination is illustrated in the planar development view of Fig. 4 where angular bands 29 to 33 inclusive are employed and wherein such bands are colored respectively yellow, blue, red, blue, and yellow. During spinning a top having the color design illustrated in Fig. 4, the color effects which obtain (assuming the top is turning clockwise about its longitudinal axis 15 as viewed from the right in Fig. 3, and at the same time is spinning about an axis in the plane passing in the plane of band 16) may start with a yellow center (provided by band 29) surrounded by a blue band (provided by band 30). Next, a red band (provided by band 31) will start to move inwardly and supplant the outer portions of the blue band (provided by band 30) and also the yellow band (provided by band 29). Blue and yellow bands (provided respectively by bands 32 and 33) will in turn move inwardly and supplant the previous bands by a blue band and then by a yellow band. This action will continue so long as the top spins and at the same time rotates about its longitudinal axis.

By describing the planar development views in Figs. 3 and 4, I have illustrated two of many color effects which can be obtained. As there are so many color effects which can be obtained I have only attempted to illustrate two designs. To obtain the desired color effects I may employ designs painted on the top or I may employ colored pieces adhered to the top. Also, the top may have a base color and variations therefrom can be obtained by spacing painting effects or adhering glued pieces on the top and permitting the base color to show through the spacings.

In my top, the same can be made from suitable metals, plastics or woods. Plastics have an advantage in that they may be readily molded and can be provided with a suitable base color included in the plastics when molded.

In Fig. 2 I have shown a sectional view illustrating that the shaft portions of my top may be

circular in section. It is to be understood that I am not limited to any such configuration and the section may be a polygon of any shape, such as the square shown in Fig. 6 or the triangle shown in Fig. 9. Thus, by way of illustration, in Figs. 5 and 6 I have shown shaft portions 34 which are square in section as indicated in Fig. 6 and shaft portions 35 which are triangular in section as is indicated in Fig. 9.

Also, the band 16, defining the axes of rotation of the shaft portions, may take other forms than that illustrated in Fig. 1. For example, I may provide a disc member 36 (Fig. 5) whose edge will support my top for spininng thereabout. Also, I have shown in Figs. 7 and 8 a center sphere-like portion 37 which supports a centrally located band 38 and the top spins about axes lying in the plane of band 38. One advantage of the ball 37 is to provide increased surface area which can be suitably colored to provide desired color effects.

If desired, the fixed weight portions 17 and 18 shown in the previous figures may be supplanted by movable weight means. This is illustrated in Fig. 10 of the drawings wherein the supporting band about which the top spins is indicated by 39. The shaft portions 40 are each provided with a longitudinal recess 41 in which a ball 42 may travel outwardly by reason of centrifugal force away from the center of rotation defined by the band 39. In this form of my invention I may employ different masses to the balls 42, may provide different lengths of the recesses 41, or may provide different masses to the shaft portions 40. I have found that some personalities enjoy the feature of the movable weights brought about by reason of the balls 42.

In order to provide for maximum turning moment of the tops of my invention, preferably the band 16, the outer portions of the disc 36, the outer portions of the band 38, and the outer portions of the band 39 terminate in a surface 43, semi-circular in cross section, as is best illustrated in Fig. 11 of the drawings. This curved shape should present a minimum contacting surface to the floor or to the supporting surface on which the top is spun to minimize friction and provide for maximum spinning life. Thus the diameter of the surface 43 should be relatively small. I have found that surfaces other than curved surfaces are useful but a curved surface tends to provide only tangential contact and at the same time provides for minimum frictional resistance to spinning of the top. As different portions of the curved surface 43 are presented to the floor or supporting surface as the top turns about its longitudinal axis 15, preferably the surface 43 should be rather accurately made to provide for uniform action. As the surface 43 is in effect a bearing surface it should be made of a material such as metal or plastic for uniform results.

Obviously, changes may be made in the forms, dimensions and arrangement of the parts of my invention, without departing from the principle thereof, the above setting forth only preferred forms of embodiment.

I claim:

1. A top comprising a central portion; a circular band rigidly connected with and forming the outside of said central portion and on which said top may be supported while rotating on a supporting surface, the plane of which band includes the axes of rotation of the top, and the periphery of said band, cross-sectionally considered, being a relatively narrow convex arcuate portion; shaft portions rigidly connected with said central portion and extending in diametrically opposite directions and at right angles to the plane of said band, the overall length between the outer end portions of said shaft portions being substantially greater than the diameter of said band; and two weight means of unequal mass, as respects the plane of said circular band as a center, one carried by each of said shaft portions, whereby upon spinning of the top on one of its axes of rotation, the shaft portions having unequal mass as respects each other will cause the top to turn about said shafts as a center while the said top is rotating about an axis of its said axes.

2. A top comprising a central portion; a circular band rigidly connected with and forming the outside of said central portion and on which said top may be supported while rotating on a supporting surface, the plane of which band includes the axes of rotation of the top, and the periphery of said band, cross-sectionally considered, being a relatively narrow convex arcuate portion; shaft portions rigidly connected with said central portion and extending in diametrically opposite directions and at right angles to the plane of said band, the overall length between the outer end portions of said shaft portions being substantially greater than the diameter of said band; and two weight means of unequal mass, as respects the plane of said circular band as a center, one carried by each of said shaft portions, whereby upon spinning of the top on one of its axes of rotation, the shaft portions having unequal mass as respects each other will cause the top to turn about said shafts as a center while the said top is rotating about an axis of its said axes; and colored media carried by the surfaces of said shaft portions, whereby color effects from different surface portions of said shaft portions appear from a given view point during spinning of the top.

3. A top comprising a central portion; a circular band rigidly connected with and forming the outside of said central portion and on which said top may be supported while rotating on a supporting surface, the plane of which band includes the axes of rotation of the top, and the periphery of said band, cross-sectionally considered, being a relatively narrow convex arcuate portion: shaft portions rigidly connected with said central portion and extending in diametrically opposite directions and at right angles to the plane of said band, the overall length between the outer end portions of said shaft portions being substantially greater than the diameter of said band; and two weight means of unequal mass, as respects the plane of said circular band as a center, one carried by each of said shaft portions, whereby upon spinning of the top on one of its axes of rotation, the shaft portions having unequal mass as respects each other will cause the top to turn about said shafts as a center while the said top is rotating about an axis of its said axes; and complementary colored media carried by the surfaces of said shaft portions, whereby color effects from different surface portions of said shaft portions appear from a given view point during spinning of the top.

4. A top comprising a central portion; a circular band rigidly connected with and forming the outside of said central portion and on which said top may be supported while rotating on a supporting surface, the plane of which band in-

cludes the axes of rotation of the top, and the periphery of said band, cross-sectionally considered, being a relatively narrow convex arcuate portion; shaft portions rigidly connected with said central portion and extending in diametrically opposite directions and at right angles to the plane of said band, the overall length between the outer end portions of said shaft portions being substantially greater than the diameter of said band; and two weight means of unequal mass, as respects the plane of said circular band as a center, one carried by each of said shaft portions, said two weight means comprising a recess in each of said shafts and a movable weight in each recess, whereby upon spinning of the top on one of its axes of rotation, the shaft portions having unequal mass as respects

each other will cause the top to turn about said shafts as a center while the said top is rotating about an axis of its said axes.

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