April 8, 1952 P. H. JACOBS 2,592,286

SPINNING TOY OR DISPLAY APPARATUS

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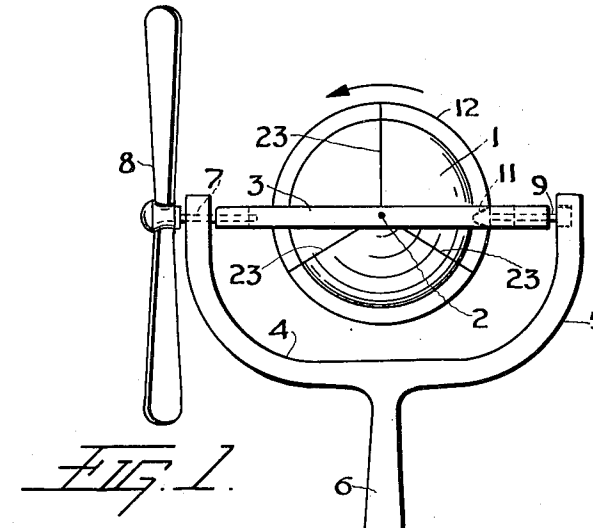


FIG. 1.

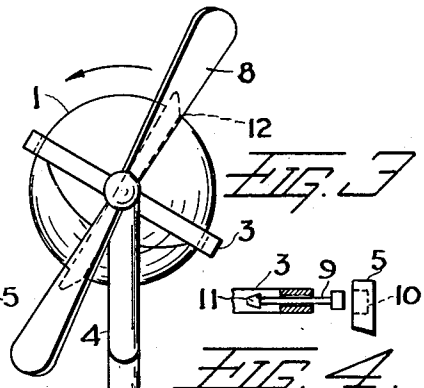


FIG. 3

FIG. 4.

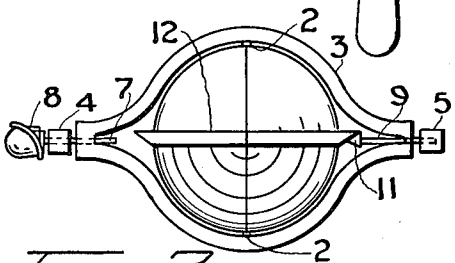


FIG. 2

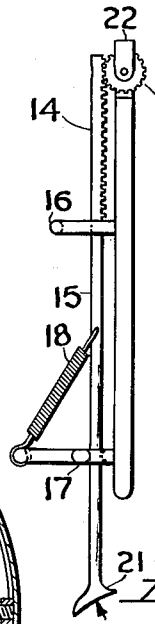


FIG. 6.

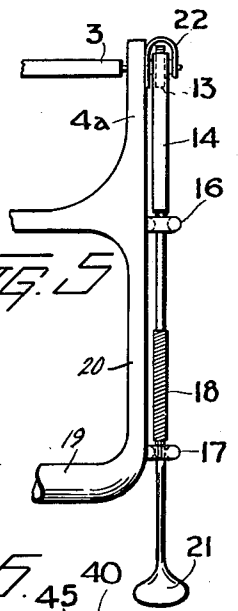


FIG. 5

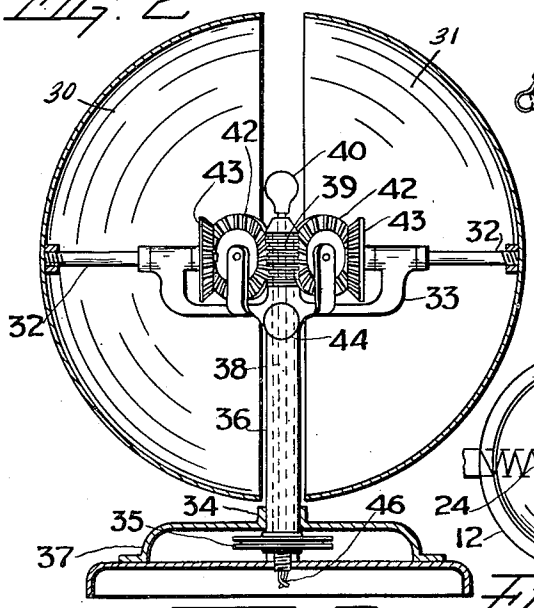


FIG. 7

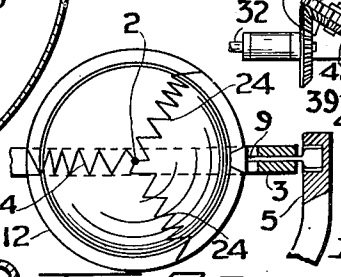


FIG. 9

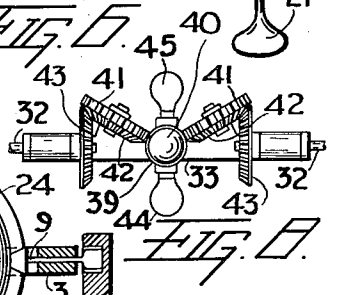


FIG. 8.

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SPINNING TOY OR DISPLAY APPARATUS

Pieter Hendrik Jacobs, Cape Town, Cape Province, Union of South Africa

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3 Claims. (Cl. 46—49)

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This invention relates to an improved toy or display apparatus which is capable of being used for purposes of amusement, or as means to attract the attention of the public for advertising and other purposes.

According to the invention, the device consists of a varicoloured rotating element in the form of a sphere or disc mounted for simultaneous rotation about primary and secondary axes arranged at right angles to one another, the arrangement being such that, on rotation, the varicoloured portions of said rotating element, will give the appearance of several differently coloured bands of colour which are continually changing. Preferably, what will be called the primary motion about the primary axis is rapid, while the corresponding rotational movement about the secondary axis, called the secondary motion, is relatively slow.

According to one form of construction of the invention, the varicoloured rotating element is mounted for rotation about its secondary axis within a ring frame, which frame is itself mounted for rotation on trunnion shafts, spindles or pins about an axis at right angles to said secondary axis, which ring frame axis constitutes the primary axis of rotation of the element. Rotational motion is imparted to the ring frame in any suitable manner, such as by an airscrew adapted to be driven by arranging for a current of air to impinge thereagainst. To impart rotational motion to the varicoloured element about its secondary axis, a preferred method is to provide a friction or gear member, extending inwardly, axially in line with the primary axis, which member is arranged to make frictional or meshing contact with a friction or gear ring as the case may be, attached to the element so that the axis of said friction or gear ring coincides with the aforesaid secondary axis of the element. More particularly the said friction or gear ring is bevelled for co-acting engagement with the said friction or gear member as the case may be, which member is likewise bevelled to engage therewith, and keyed to a stationary shaft which extends through one end bearing of the ring frame which may be arranged to rotate thereon. In this case the stationary shaft constitutes a trunnion.

From this arrangement it will be understood that as the ring frame carrying the varicoloured element is rotated about the primary axis, the said friction or gear ring rotates in contact with the friction or gear member and thereby the element is caused to rotate simultaneously about its secondary axis.

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In the preferred construction, the said varicoloured element in the form of a sphere is marked with differently coloured sections or bands. By arranging suitable colours for the sections a variety of pleasing and effective coloured effects can be secured. By suitable arrangement of primary colours, the rotation of the element will blend these to give the secondary colours. It will be understood that the rotating element may be a disc instead of a sphere, although the disc does not give such effective results as the sphere. To enhance the effect, the sphere may be hollow and a light may be arranged therein to show up the colours through the wall of the sphere which may be of translucent material. By this arrangement the device becomes a very effective means for attracting attention to window displays, since as the sphere rotates various coloured beams of light will be thrown on to the articles displayed in the window.

Arrangements may, of course, be made to cause rotation of the ring frame carrying the varicoloured element about what has been termed the primary axis, by the use of an electric motor or other convenient power transmitting means.

When the device is used as a toy, rotational movement about the primary axis is conveniently effected by means of an airscrew or propeller, whereby the device will operate when it is held with the airscrew facing in the direction from which the wind is blowing. In this construction the ring frame is mounted between the arms of a forked supporting or carrying member by which the device is carried or erected.

The airscrew is preferably of very light construction and provided with slightly flexible blades so that the blades can bend backwards to expose a smaller area to the current driving the airscrew, should the current become too strong. The ratio of flexibility to lightness of the blades should be such that said blades will bend under the force of the current against the centrifugal force of the rotating blades. By means of this provision the speed of rotation of the varicoloured spherical element is controlled to be relatively stable, which is desirable to produce the desired appearance.

To enable the invention to be more clearly understood and carried into practice, reference is now made to the accompanying drawings, in which like reference numerals denote like parts throughout the several views.

In the drawings—

Fig. 1 is a side elevation of a device constructed according to the invention;

Fig. 2 is a plan view taken on Fig. 1;

Fig. 3 is a shortened front view taken on Fig. 1;

Fig. 4 is a fragmentary side sectional view of the rear bearing of the ring frame;

Fig. 5 is a side fragmentary view of a ratchet mechanism for imparting rotary motion to the ring frame;

Fig. 6 is an end view taken on Fig. 5;

Fig. 7 is a vertical sectional view through a modified form of device constructed according to the invention, which is suitable for use as an illuminated display apparatus;

Fig. 8 is a fragmentary plan view of the driving gear of the modification shown in Fig. 7; and

Fig. 9 is a fragmentary sectional side elevation showing the rear bearing mounting of the device of Figs. 1 to 3, as well as a modified method of marking the rotating element.

Referring to the drawings, reference 1 denotes a varicoloured spherical element mounted on bearing pins 2 within the ring frame 3 for rotation about its aforementioned secondary axis, which passes through the pins 2. The ring frame 3 is mounted for rotation between the arms 4 and 5 of a supporting or carrying member provided with a handle 6. The front end of the ring frame 3 has fixed to it the trunnion spindle 7 which, after projecting through a bearing in the arm 4, has keyed to its outwardly projecting end, the airscrew or propeller 8. The rear end of said ring frame 3 is rotatably mounted on the trunnion pin 9, the rear end of which is fixed to the arm 5, such as by being flattened as shown in Fig. 4, and being inserted in a slot 10 therein. The front end of the trunnion pin 9 has a small bevelled friction member 11 keyed to it, which member co-acts frictionally with the bevelled friction ring 12 fixed to and encircling the spherical element 1. It will be understood that the pressure of the air current driving the airscrew 8, will tend to press the friction ring 12 into contact with the friction member 11, whereby slow rotary motion will be imparted to the element 1 to cause it to revolve about its bearing pins 2 simultaneously with its rotation about its primary axis passing through the trunnion spindle 7 and trunnion pin 9.

According to a modified method of operating the device (see Figs. 5 and 6), a ratchet pinion 13 is substituted for the airscrew 8, which ratchet pinion 13 is adapted to be rotated by the co-acting toothed rack 14 formed on the top end portion of a ratchet rod 15 located slidably in guide lugs 16 and 17, and normally held in its inoperative position by the light tension spring 18. To accommodate the bottom guide lug 17, the arm 4a is extended downwardly by the member 20, and is joined to the handle 6 by a cross member 19. The hole in the lug 16 through which the ratchet rod 15 passes, is slotted so that normally the spring 18 tends to hold the upper end of rod 15 away from arm 4a so that the rack 14 is just out of contact with the ratchet pinion 13. When, however, the said rod 15 is operated by thumb pressure on the cup-shaped end 21 in an upward and outward direction, the rack 14 engages with the ratchet pinion 13 to cause rotation thereof, while on release of such pressure, the spring 18 acts to pull the upper end of the rod 15 outwardly and downwardly whereby during its downward stroke the rack 14 is disengaged from the ratchet pinion 13, which together with the ring frame 3, is free to rotate under the influence of the previously applied impulse. It will accordingly be understood that the device is operated by a series of strokes. The rod 15 is loosely slidable in the lower lug 17, so that it is capable of being canted to a sufficient extent to disengage the rack 14 as described above. To keep the friction ring 12 in frictional contact with the pinion 11, an inverted U-shaped flat spring 22 is secured to the top of the arm 4a, so that its outer limb presses resiliently against the outer or front end of the trunnion spindle 7.

As shown in Figs. 1, 2 and 3, the element 1 in the form of a sphere of celluloid or the like, is divided into three equal differently coloured segments by the lines 23. In Fig. 9 the three coloured segments are divided by the zig-zag lines 24.

Figs. 7 and 8 illustrate a further modification of the invention suitable for use as a display apparatus for shop windows and the like. In this case the rotating element is in the form of a hollow sphere having its walls made of thin translucent material and arranged in two substantially hemispherical-shaped sectors 30 and 31, each fixed to an internal shaft 32, the axes of which shafts are in line diametrically and constitute the secondary axis of the rotating element. The shafts 32 are journalled in bearings provided in the carrier frame 33, which is provided with a downwardly extending hollow vertical extension 36 journalled in the bearing 34 in a base 37, and adapted to be rotated by the grooved pulley 35 from any convenient source of power, such as a small electric motor. It will be understood that the axis of the extension 36 constitutes the aforementioned primary axis of the rotating element. Located concentrically within the extension 36 is a stationary hollow shaft 38, the bottom end of which is screwed into the base 37. The top end of the shaft 38 has a worm pinion 39 keyed to it and carries an electric light globe 40. Meshing with the worm pinion 39 are the two worm wheels 41 which have the bevel wheels 42 formed integrally therewith, or fixed thereto. These bevel wheels 42 mesh with the bevel wheels 43, which are keyed to the ends of the shafts 32. Additional globes 44 and 45 are attached to the carrier frame 33. The current conductors 46 supplying current to the globes 40, 44 and 45 are arranged to pass up the bore of the stationary shaft 38.

As illustrated, the two hemispherical sectors 30 and 31 are arranged to rotate at equal speeds, although they may be arranged to rotate at different speeds by varying the numbers of teeth of the bevel wheels 42 and 43. Alternatively, only one of said hemispherical sectors may be driven.

What I claim is:

1. In a display device, the combination of a base having a journal and a socket therein; a trunnion mounted in said socket; a frame rotatably mounted in said journal and on said trunnion; means for rotating said frame; a body rotatably mounted in said frame, the axis of rotation of said body being normal to the axis of rotation of said frame; a friction ring on said body; and a friction member fixed on said trunnion and frictionally engaging said ring.

2. In a display device, the combination of a base having a journal and a socket therein; a shaft rotatable in said journal; means for rotating said shaft; a trunnion non-rotatably mounted in said socket, said shaft and said trunnion being co-axial; a frame fixed on said shaft and journaled on said trunnion, and having a pair of co-axial trunnions normal to said co-axial shaft

and trunnion; a body rotatably mounted on said frame trunnions; a friction ring on said body; and a friction member fixed on said trunnion in said socket, and frictionally engaging said ring.

3. In a display device, the combination of a bifurcated support having a socket and a journal in its legs, respectively, said socket and said journal being co-axial; a shaft rotatable in said journal; means for rotating said shaft; a trunnion fixedly mounted in said socket; a frame fixed on said shaft and journaled on said trunnion, and having a pair of co-axial trunnions normal to said co-axial socket and support journal; a spherical body rotatably mounted on said frame trunnions; a peripheral friction ring on said body; and a friction member fixed on said trunnion in said socket, and frictionally engaging said ring.

PIETER HENDRIK JACOBS.

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