Sept. 14, 1948. J. R. MORDAN 2,449,405

AIR PROPELLED TOP

Filed Aug. 24, 1946 2 Sheets-Sheet 1

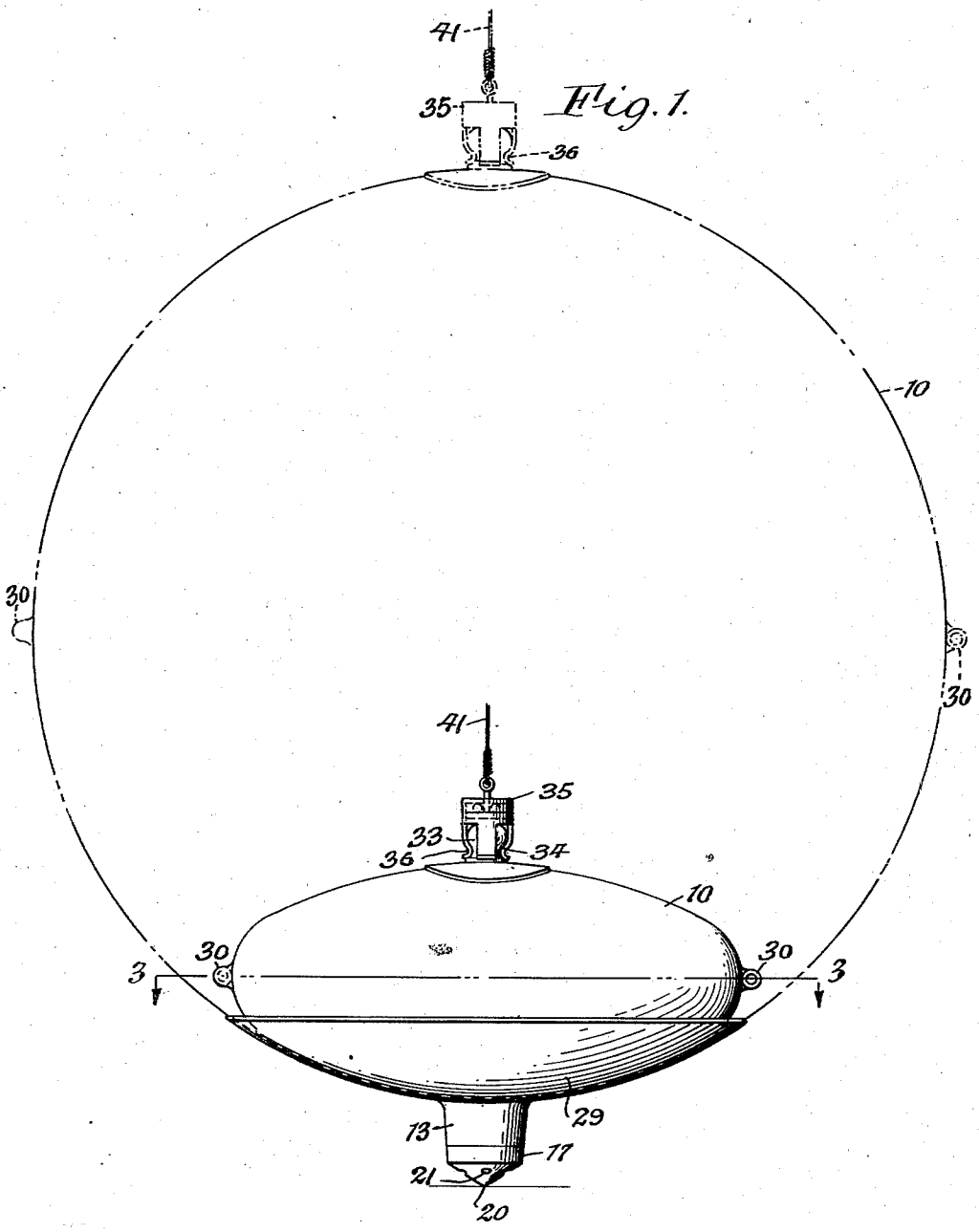


Fig. 1.

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Fig. 2.

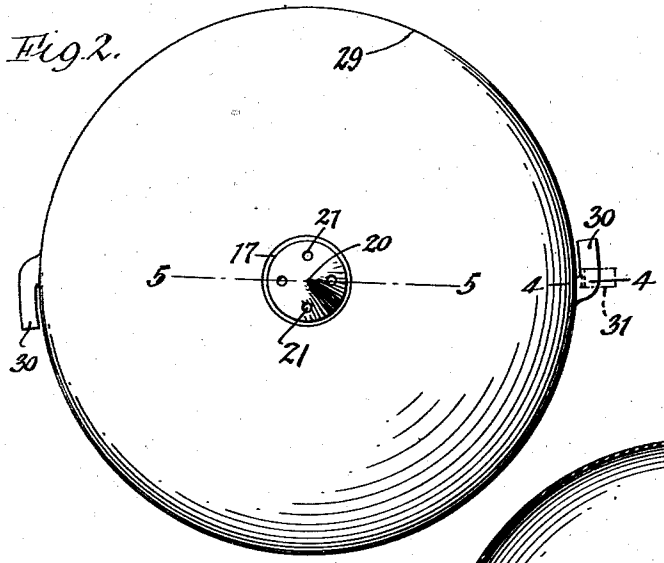


Fig. 4.

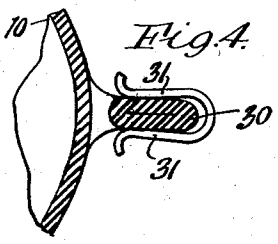


Fig. 3.

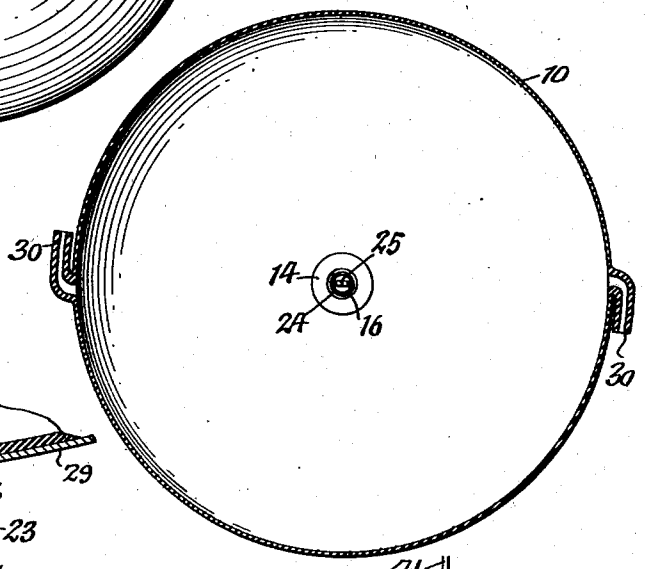


Fig. 5.

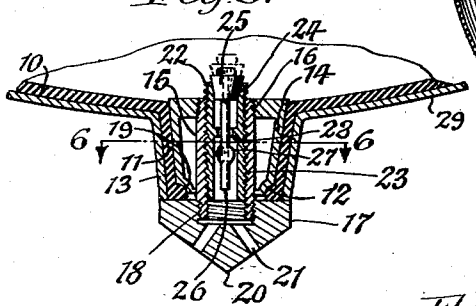


Fig. 6.

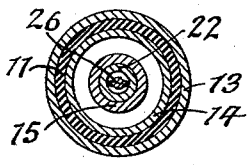


Fig. 8.

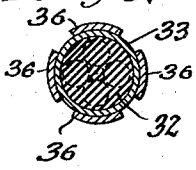
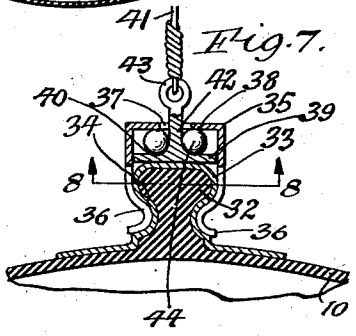


Fig. 7.



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2,449,405

AIR PROPELLED TOP

Joseph R. Mordan, Alden, N. Y.

Application August 24, 1946, Serial No. 692,831

9 Claims. (Cl. 46—67)

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This invention relates to an air-jet propelled top which is adapted to be spun or turned about its axis either when resting on a surface or when suspended in mid-air.

One of the objects of this invention is to provide a top of this character in which the air for driving the top is stored in an inflatable elastic bag or container which is adapted to be expanded by forcing air into the same, which air is subsequently discharged from the bag by contraction of the latter in the form of jets which react on the outer atmosphere and cause the top to revolve.

Another object of this invention is to provide a top of this type which can be readily inflated either by blowing air into the same with the mouth or by connecting the same with a source of compressed air.

A further object of this invention is to so construct the top that the same can be readily repaired if its bag should burst or any of its parts should be broken.

A still further object of this invention is to simplify the construction of the top so that the same can be produced at low cost and also enable the same to be easily repaired.

In the accompanying drawings:

Fig. 1 is a side elevation of the top embodying this invention and showing the elastic air storage bag in a deflated condition by full lines and in an inflated condition by dotted lines.

Fig. 2 is a bottom plan view of the top with the air bag deflated.

Fig. 3 is a horizontal section taken on line 3—3, Fig. 1.

Fig. 4 is a fragmentary vertical section, on an enlarged scale, taken on line 4—4, Fig. 2.

Fig. 5 is a fragmentary vertical section, on an enlarged scale, taken on line 5—5, Fig. 2.

Fig. 6 is a horizontal section taken on line 6—6, Fig. 5.

Fig. 7 is a fragmentary vertical section, on an enlarged scale, showing the means for suspending the top in the air.

Fig. 8 is a horizontal section taken on line 8—8, Fig. 7.

In the following description like parts are indicated by the same reference characters in the several figures of the drawings.

In general this air-jet propelled top comprises an inflatable bag or balloon, means whereby the same may be pivotally supported on a surface upon which the top can spin or turn, air inlet means through which the bag may be inflated, air outlet means through which the air is discharged from the bag for the purpose of rotating or spinning the top, and suspension means whereby the top may be lifted from the support and permitted to rotate while suspended in mid-air.

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The inflatable bag 10 of the top is preferably constructed of elastic rubber which in its deflated condition has the general shape of a double-convex lens, as represented by full lines in Fig. 1, but when the same is more or less inflated the same has the general shape of a sphere, as shown by dotted lines in the same figure.

Centrally on its underside this bag is provided with means whereby the same may rotate or spin on a support and also with check valve means through which air may be supplied under pressure to the interior of the bag but return flow from the interior of the bag to the outer atmosphere is prevented, these means being constructed as follows:

The numeral 11 represents a tubular neck of downwardly tapering conical form which projects from the central part of the underside of the inflatable bag, which neck is made of elastic rubber and is integral with the inflatable bag. At its lower end this neck is provided internally with an annular bead which forms an upwardly facing shoulder 12 in the bore of this neck.

On its outer side this neck is engaged by a downwardly tapering outer clamping sleeve 13 of hard material such as metal or plastic, and on its inner side the neck is engaged by a downwardly tapering inner clamping sleeve 14 which is also made of hard material such as metal or plastic. The outer clamping sleeve is pressed upwardly and the inner clamping sleeve is pressed downwardly for the purpose of clamping the tubular neck between them and form an air tight joint between these members, this being preferably accomplished by means of a coupling tube 15 of metal or the like arranged axially within the inner clamping sleeve and connected at its upper end by means of a screw joint 16 or otherwise with the upper part of the inner clamping sleeve while its lower part slides in the lower part of this sleeve, and a screw nut 17 having its central part connected by a screw joint 18 with the lower end of the coupling tube while the marginal part bears against the lower end of the outer clamping sleeve 13, as shown in Figs. 1 and 5. Upon tightening this screw nut the upwardly facing shoulder 12 on the neck of the bag is engaged by a downwardly facing annular shoulder 19 on the lower end of the inner clamping sleeve, thereby connecting these clamping

sleeves and the coupling sleeve with the rubber neck and also forming an air tight joint between these members.

The underside of the screw nut 17 is made of downwardly tapering form so that the same terminates in a point 20 so that this nut forms a peg or pivot upon which the top may be supported upon a surface for spinning the same thereon.

The air for inflating the elastic bag is introduced into the same through one or more ports or passages 21 extending from the outer side of the nut 17 to the lower end of the coupling tube 15, thence upward through a valve tube 22 arranged within the coupling tube and thence into the interior of the inflatable bag. This valve tube forms part of a check valve which permits air to enter the bag from the external atmosphere but prevents return flow of the same. This valve tube is preferably connected with the coupling tube by means of a screw joint 23 between these members and at its inner or upper end this valve tube is provided with an upwardly facing conical valve seat 24 which is adapted to be engaged by a downwardly tapering valve closure 25 which is movable toward and from this valve seat. This closure is guided on the valve tube by means of a valve stem 26 which projects downwardly into the valve tube and is provided with an upwardly facing shoulder 27 which is adapted to engage with a downwardly facing shoulder 28 within the bore of the valve tube so as to limit the upward movement of the valve closure.

This check valve device is similar to those now commonly employed in the filling nipples of pneumatic tires and air under pressure for filling the bag may be supplied either by blowing with the mouth inwardly through the passages 21 of the nut 17 or by detaching this nut from the lower end of the coupling tube and temporarily connecting the latter with an air pump or any other means for supplying air under pressure. After the bag has been inflated the desired extent the nut 17 is again restored to the lower end of the coupling tube.

At its upper end the outer clamping sleeve is provided with a supporting disk 29 which is preferably of downwardly dished form and engages with the underside of the inflatable bag, thereby providing a bearing surface of substantial area whereby the inflatable bag is supported both in its deflated and also in its inflated condition and thus maintains the parts in their proper relative position.

This supporting disk is preferably formed integrally with the outer clamping sleeve 13.

The compressed air within the bag is discharged therefrom through outlets so that the reaction of the escaping air will cause the top to rotate about a vertical axis. This is preferably accomplished by means of two outlet nozzles 30 which are constructed of elastic rubber and preferably integrally with the inflatable bag. These nozzles are arranged tangentially on diametrically opposite outer sides of the periphery or largest diameter of this bag, as shown in Figs. 1, 2 and 3. Each of these nozzles has its front end opening into the interior of the bag while its rear end opens to the atmosphere so that when the compressed air escapes from these nozzles the reaction of the same will cause the top to rotate.

While inflating the elastic bag, the nozzles 30 are preferably closed so as to confine the compressed air in the bag and for this purpose the nozzles may be held shut either by squeezing them between the fingers of the operator or employing mechanical means for this purpose such as U-shaped clips each of which is made of spring metal and provided with arms 31 adapted to engage with opposite sides of the respective nozzle so that the opposite parts of each nozzle will engage each other, as shown in Fig. 4 and thus close the passage through this nozzle and thereby prevent the escape of air therethrough.

These clips may be retained on these nozzles after the bag has been inflated until such time as it is desired to spin the top and then the removal of these clips from these nozzles will permit the latter to again expand due to their resilience and automatically open so that the air is free to escape and cause the top to rotate about its axis by the contraction of the resilient bag.

Means are provided whereby this top may rotate or spin about its axis while its peg is lifted from a support into mid-air, these means being so constructed that they may be attached to and removed from the bag and also permit the top to rotate independently of the suspension device. Although these suspension means may be variously constructed the preferred form of the same, as shown in Figs. 1, 7 and 8 are constructed as follows:

The numeral 32 represents an upwardly enlarged button or knob formed integrally on the upper side of the inflatable bag so as to form attaching means thereon. This button is enclosed by a cap 33 of metal or similar hard material so as to form an annular downwardly facing shoulder 34 which corresponds to the shape of said button.

The numeral 35 represents a hollow coupling head which is detachably mounted on the button and is provided at its lower end with a plurality of elastic jaws or spring arms 36 which are adapted to be sprung over the cap 33 and into engagement with the downwardly facing shoulder 34. At its upper end this head is provided with a central opening 37 and an annular downwardly facing bearing or ball-race 38 around said opening.

The numeral 39 represents a bearing disk arranged within the central part of the coupling head and provided on its upper side with an upwardly facing bearing face or ball-race 40. This bearing disk is adapted to be suspended by means of a cord or line 41 which may either be held in the hand of the operator or attached to a support, the connection between this cord and the disk 39 being preferably accomplished by means of a stem or rod 42 projecting upwardly from the central part of the bearing disk through the opening in the bearing head and provided at its upper end with an eye 43 which is attached to the lower end of the suspension line or cord 41, as shown in Figs. 1 and 7. Between the upper and lower ball-races or bearing surfaces 38, 40 an annular row of bearing balls 44 is arranged thereby forming a rotatable joint or support between the suspension line 41 and the inflatable bag of the top whereby the top may be supported in mid-air and rotate without twisting this line. If it is desired to spin the top on a surface without being connected to the suspension line 41 this may be done by first pulling the bearing head and the parts associated therewith from the coupling button or knob 32, this being readily accomplished due to the resilience of the jaws or arms 36.

As a whole this top provides an interesting toy

which is highly entertaining. It can be very readily inflated by the pressure of air from the mouth of the user and provides an amusing toy for children. Owing to the simplicity of its construction the same can be manufactured at comparatively low cost and its organization is such that its several parts can be readily replaced particularly the bag which is liable to bust when inflated excessively.

I claim as my invention:

1. An air-jet propelled top, comprising an elastic inflatable bag provided on its underside with a tubular neck, a peg which is connected with said neck and upon which the bag is adapted to turn, an air inlet valve device mounted on said peg and neck, and means for discharging air tangentially from said bag.

2. An air-jet propelled top, comprising an elastic inflatable bag provided on its underside with a tubular neck, a peg upon which said bag turns arranged below said neck, means for connecting said peg with said neck including an inner sleeve arranged within said neck, and connected with said peg, air inlet valve means arranged within said sleeve, and air outlet means for discharging air tangentially from said bag.

3. An air-jet propelled top, comprising an elastic inflatable bag provided on its underside with a tubular neck, a peg upon which said bag turns arranged below said neck, means for connecting said peg with said neck including an inner sleeve arranged within said neck, a coupling tube arranged within said sleeve and connecting the same with said peg, air inlet valve means arranged within said coupling tube and air outlet means for discharging air tangentially from said bag.

4. An air-jet propelled top comprising an elastic inflatable bag provided on its underside with a downwardly projecting conical tubular neck, a peg arranged below said neck and upon which the top is adapted to spin, means for connecting said peg with said neck including an inner conical sleeve engaging with the inner side of said neck, an outer conical sleeve engaging the outer side of said neck, a coupling tube arranged within said inner sleeve and connected with the same and with said peg, air inlet valve means arranged within said coupling tube, and air outlet means arranged tangentially on said bag.

5. An air-jet propelled top, comprising an elastic inflatable bag provided on its underside with a downwardly projecting conical tubular neck, a peg arranged below said neck and upon which the top is adapted to spin, means for connecting said peg with said neck including an inner conical sleeve engaging with the inner side of said neck, an outer conical sleeve engaging the outer side of said neck, a coupling tube arranged within said inner sleeve and connecting the same with said peg and communicating with the outer atmosphere through a passage in said peg, air inlet valve means arranged within said coupling tube, and air outlet means for discharging air tangentially from said bag.

6. An air-jet propelled top, comprising an inflatable bag, air inlet means through which air is introduced into said bag including a neck formed on the underside of said bag, a tube mounted on said neck and a check valve device arranged within said tube, a peg connected with the lower end of said tube and provided with an air passage leading to said tube, and air outlet means arranged on the periphery of said bag for rotating the top.

7. An air-jet propelled top, comprising an elastic inflatable bag provided on its underside with a downwardly projecting tubular neck the inner side of which has an annular shoulder, an inner clamping sleeve arranged within said neck and provided with an annular shoulder engaging the shoulder of said neck, an outer clamping sleeve engaging the outer side of said neck, a peg connected with said inner clamping sleeve, air inlet valve means arranged within said inner clamping sleeve, and air outlet means for discharging air tangentially from said bag.

8. An air-jet propelled top, comprising an elastic inflatable bag provided on its underside with a downwardly projecting tubular neck, a peg upon which said bag is adapted to spin and which is connected with said neck, air inlet valve means arranged within said neck, a supporting disk mounted on said neck and engaging the underside of said bag, and air outlet means for discharging air tangentially from said bag.

9. An air-jet propelled top, comprising an elastic inflatable bag provided on its underside with a downwardly projecting tubular neck, a peg upon which said bag is adapted to spin and which is connected with said neck, air inlet valve means arranged within said neck, an outer sleeve engaging with the outer side of said neck, a downwardly dished disk engaging with the underside of said bag and connected with said outer sleeve, and air outlet means for discharging air tangentially from said bag.

JOSEPH R. MORDAN.

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