Feb. 3, 1948. J. KEREZI 2,435,445

FLYING TOP

Filed April 26, 1946 2 Sheets-Sheet 1

Fig. 2.

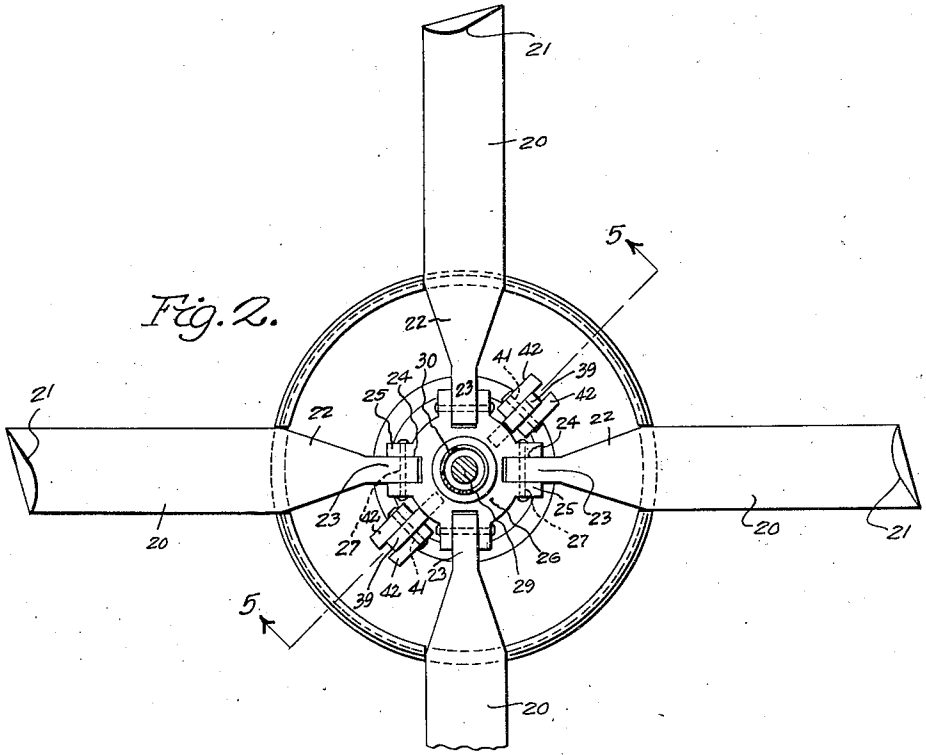
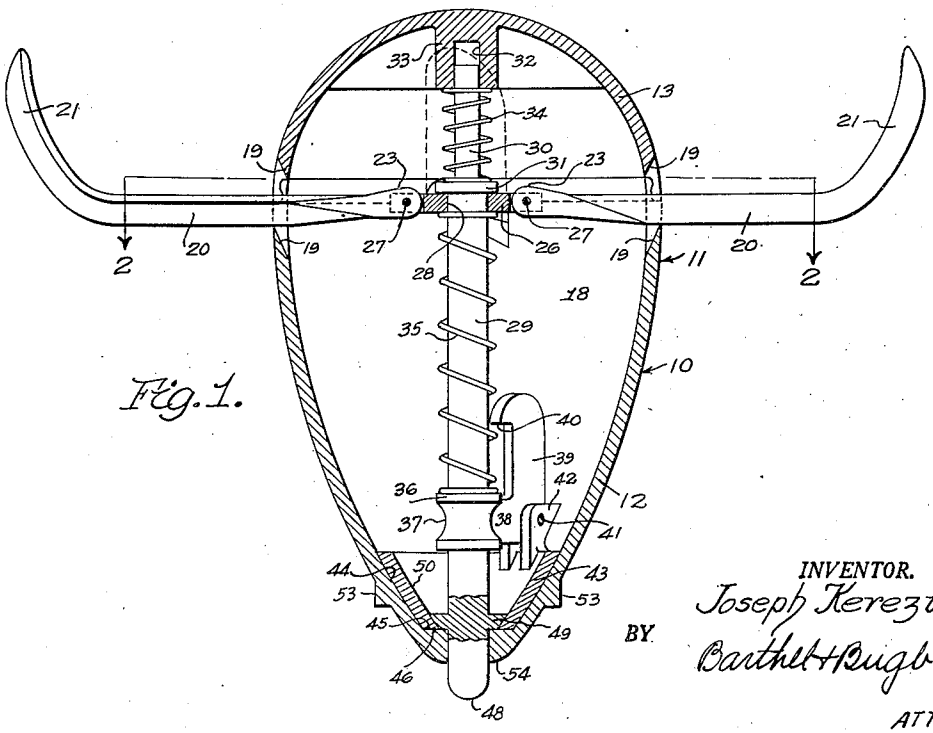


Fig. 1.



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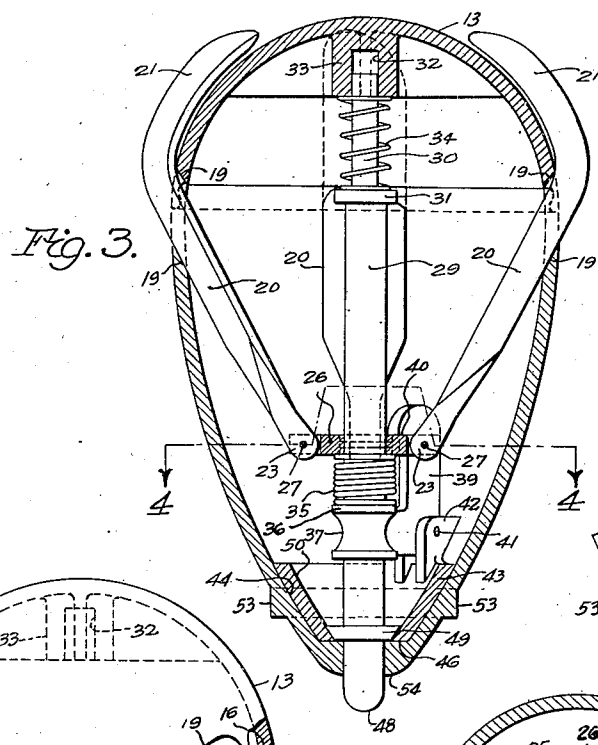


Fig. 3.

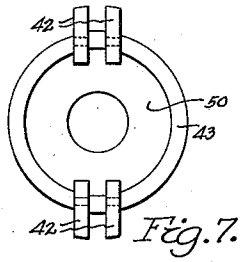


Fig. 7.

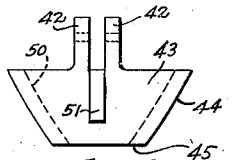


Fig. 8.

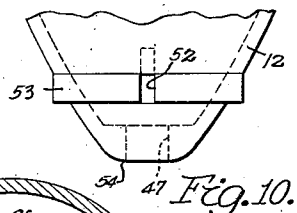


Fig. 10.

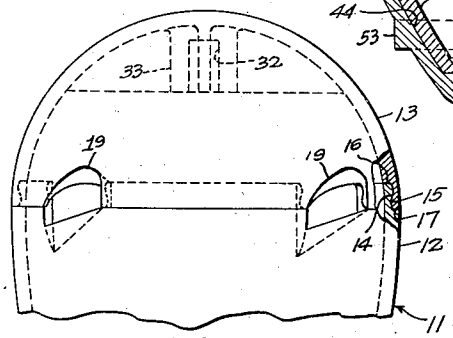


Fig. 9.

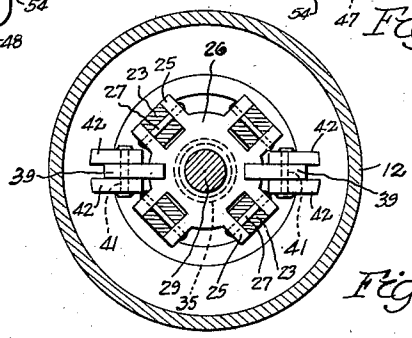


Fig. 4.

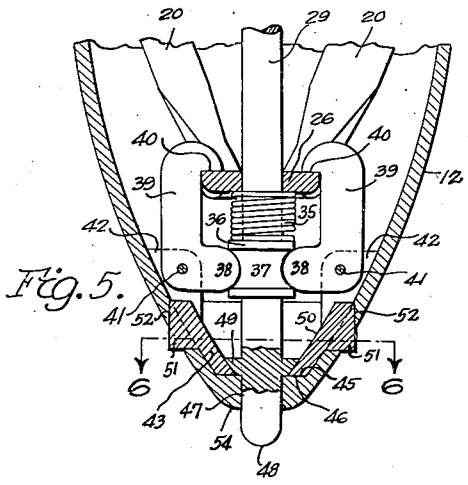


Fig. 5.

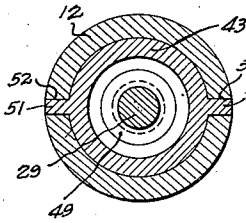


Fig. 6.

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UNITED STATES PATENT OFFICE

2,435,445

FLYING TOP

Joseph Kerezi, Dearborn, Mich.

Application April 26, 1946, Serial No. 665,063

13 Claims. (Cl. 46—75)

1

This invention relates to tops, and in particular to flying tops.

One object of this invention is to provide a flying top having retractible rotor blades which are automatically extended when the top hits the ground or other surface on which it is intended to spin.

Another object is to provide a flying top having a hollow body with rotor blades retracted therein and held by a latching mechanism which is released when the "peg" of the top hits the pavement or other surface on which it is intended to spin.

Another object is to provide a flying top as set forth in the preceding objects wherein the rotor blades are curved near their outer end so as to be faired along the top body, so that a part of the blade is outside the top and a part inside when the rotor is in its latched or retracted position, these upturned blade portions giving greater stability and preventing sliding off of the top sidewise during its descent.

Another object is to provide a flying top as set forth in the preceding objects wherein the rotor blades, on being released by the latching mechanism, are projected upwardly and outwardly into flying position.

Another object is to provide a flying top as set forth in the preceding objects wherein the top is spun either by a cord wound thereon or by a conventional spring winder, the contact of the peg with the pavement or other spinning surface causing the blades to be unlatched and to be projected upwardly and outwardly whereupon their engagement with the air causes the top to rise to a height above the operator's head and then to descend slowly and gently.

Other objects and advantages of the invention will become apparent during the course of the following description of the accompanying drawings, wherein:

Figure 1 is a central vertical section through a flying top according to a preferred form of the invention, with the rotor blades unlatched and extended into flying position;

Figure 2 is a cross-section taken along the line 2—2 in Figure 1;

Figure 3 is a central vertical section similar to

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Figure 1 but with the rotor blades in their retracted and latched position;

Figure 4 is a cross-section along the broken line 4—4 in Figure 3;

Figure 5 is an enlarged fragmentary central vertical section of the lower portion of the top, taken along the line 5—5 in Figure 2, but with the rotor blades retracted and latched as in Figure 3;

Figure 6 is a cross-section near the lower end of the top taken along the line 6—6 in Figure 5;

Figure 7 is a top plan view of the latch support shown in Figures 1, 3, 5 and 6;

Figure 8 is a side elevation of the latch support shown in Figure 7;

Figure 9 is a side elevation of the upper portion of the top casing with the rotor blades and other mechanism removed; and

Figure 10 is a fragmentary side elevation of the lower portion of the top, looking from the left-hand side in Figure 5 with the internal mechanism removed.

Referring to the drawings in detail, Figure 1 shows a preferred embodiment of the flying top, generally designated 10, as housed in a roughly egg-shaped hollow casting 11 having a lower half 12 and a cover or cap 13 separably attached thereto by means of interengaging undercut edges 14 and 15 (Figure 9) along spaced internal and external contact edges 16 and 17 respectively. The casing 11 is preferably made of light material such as molded plastic, and has relatively thin walls enclosing a chamber 18 with upwardly inclined openings 19 therein for the passage of rotor blades 20. The openings 19 are distributed so that their upper portions lie in the cap 13 and their lower portions in the lower half 12.

The outer ends of the rotor blades 20 are upwardly turned as at 21 with a configuration approximating the contour of the cap 13 so that when the blades 20 are retracted (Figure 3), the blade portions 21 lie snugly along the cap 13 and are approximately faired into the latter so as to offer a minimum of wind resistance to the rotation of the top 10 prior to the release of the blades 20. The blades 20 are of course provided with a pitch or inclined arrangement (Figures 1 and 2) so that when they are extended and in rapid rotation, they cause the top 10 to rise. The blades 20 are preferably also of approximately

airfoil cross-section (Figure 2) so as to possess efficient aerodynamic performance characteristics.

The inner ends of the blades 20 are tapered as at 22 into tongues 23 (Figure 2) which enter radial slots 24 between radially projecting arms 25 in a partially circular cruciform spider 26 and are pivotally secured therein by pivot pins 27 extending transversely therethrough. The spider 26 is provided with an internal bore 28 (Figure 1) through which passes a plunger 29 having a reduced diameter portion 30 upon which is mounted a washer 31, the latter abutting the annular shoulder therebetween and also engaging the upper surface of the spider 26. The upper end of the reduced diameter portion 30 is reciprocably mounted in a bore 32 within a downwardly projecting boss 33 formed on the lower side of the cover 13. A compression spring 34 extends between the boss 33 and the washer 31 and urges the plunger 29 downwardly.

Likewise wound around the plunger 29 with its upper end engaging the lower surface of the spider 26 is a compression spring 35 having its lower end engaging the upper surface of a spool-shaped enlargement 36 of the plunger 29. The spring 34 is more powerful than the spring 35 and overpowers the latter except when the top hits the ground at the start of its spinning motion, as explained in the description of the operation. The plunger 29 is provided with an annular groove 37 of arcuate longitudinal section and is engaged by the correspondingly arcuate ends 38 of the bellcrank latching levers 39 having hook portions 40 at their upper ends (Figures 1 and 5). The latching levers 39 are thus approximately L-shaped and are pivotally mounted on pivot pins 41 extending between upstanding spaced ears 42 projecting upwardly from the upper edge of an approximately conical latch support 43 (Figures 7 and 8). The latch support 43 has an outer surface 44 nesting with the inner surface of the lower casing half 12 (Figures 1 and 5) and its lower edge 45 abuts an annular internal shoulder 46 near the lower end of the top 10 and surrounding a longitudinal bore 47 through which the lower end of the plunger 29 passes outwardly and is rounded as at 48 to form the "peg" of the top. Intermediate the rounded portion 48 and the spool-shaped enlargement 36, the plunger 29 is provided with an annular approximately conical enlargement 49, the tapered outer surface of which engages and nests with the inner surface 50 of the latch support 43, urging the latter downwardly. In order to prevent rotation of the latch support 43, it is provided with outwardly extending wings 51 (Figures 5 and 6) which extend outwardly and downwardly through rectangular apertures 52 formed in the side walls of the lower casing half 12 and in an annular rib 53 extending therearound (Figures 1 and 10).

In the operation of the flying top of this invention, let it be assumed that the rotor blades 20 are retracted (Figure 3) with the spider 26 locked in its downward position by the latching levers 39 (Figure 5), thereby compressing the coil spring 35. In this position, the coil spring 34 urges the plunger 29 downwardly so that its rounded lower end 48 projects a considerable distance outwardly from the lower end 54 of the bore 47. The operator winds a cord around the outer surface of the lower casing half 12 in the usual manner, looping the free end around his finger or hand in the usual way. To spin the top, he throws it downwardly and outwardly, the unwinding of the cord causing the top to rotate rapidly before it hits the pavement or other surface upon which it is intended to spin.

When the top 10 hits the pavement, its kinetic energy pushes the lower end 48 of the plunger 29 sharply upward, temporarily overcoming the thrust of the coil spring 34. As a result of the upward motion of the plunger 29, the spool-shaped enlargement 36 thereof likewise moves upward, swinging the bell-crank latching levers 39 about their pivot pins 41 sharply, and withdrawing their hook portions 40 from engagement with the upper surface of the spider 26 (Figure 5). The coil spring 35 thrusts the thus-released spider 26 upwardly, pushing the rotor blades 20 upwardly and outwardly through the openings 19 in the casing 11, so that they shift from the positions of Figure 3 to those of Figure 1. The more powerful coil spring 34 then pushes the plunger 29 downwardly again into the position shown in Figures 1 and 5.

The rapid rotation of the top 10 then causes the rotating extended blades 20 to engage the air and the latter cause the top to rise bodily into the air in the manner of a helicopter. The top actually constructed and tested rose to heights well above the adult operator's head. When the rotation of the top slows down a sufficient amount so that the blades 20 no longer lift it upward, it reaches the top of its flight and then descends slowly and gently, with the blades 20 rotating in the opposite direction in the manner of a descending maple seed or helicopter, setting the top down gently upon the ground and preventing damage thereto. As the top descends, the upwardly-bent blade portions 21 impart stability to the top and prevent it from sliding off laterally during the descent.

To prepare the top for another ascent, the operator grasps the casing 11 in one hand and with the fingers of the other hand forces the blades 20 inwardly and downwardly through the opening 19 from the position of Figure 1 to the position of Figure 3, until the hook portions 40 of the latching levers 39 snap over the upper surface of the spider 26 and latch the latter in position, meanwhile compressing the coil spring 35 (Figure 5). The top is now ready for rewinding of the cord thereon, the bent upper ends 21 of the blades 20 lying snugly adjacent the outer surface of the cap 13 and the parts now occupy the position shown in Figure 3. To spin the top, the operator repeats the operations described above.

While I have shown and described my invention in detail, it is to be understood that the same is to be limited only by the appended claims, for many changes may be made without departing from the spirit and scope of my invention.

What I claim is:

1. A flying top comprising a hollow casing having openings therethrough, retracting mechanism mounted within said casing, a plurality of rotor blades connected to said retracting mechanism and retractible at least partially into said casing, and mechanism responsive to the impact of said top with an external surface for extending said blades upwardly and outwardly through said openings.

2. A flying top comprising a hollow casing having openings therethrough, retracting mechanism mounted within said casing and having a portion projecting outwardly therethrough, a plurality of rotor blades connected to said retracting mechanism and retractible at least partially into said casing, and mechanism responsive to the spinning

of said top and to the impact of said projecting portion with an external surface for extending said blades upwardly and outwardly through said openings.

3. A flying top comprising a hollow casing having openings therethrough, retracting mechanism mounted within said casing, a plurality of rotor blades connected to said retracting mechanism and retractible at least partially into said casing, and mechanism responsive to the impact of said top with an external surface for extending said blades upwardly and outwardly through said openings, the outer portions of said blades being bent upwardly into positions approximately co-extensive with said casing in the retracted positions of said blades.

4. A flying top comprising a hollow casing having openings therethrough, retracting mechanism mounted within said casing, a plurality of rotor blades connected to said retracting mechanism and retractible at least partially into said casing, and mechanism responsive to the impact of said top with an external surface for extending said blades upwardly and outwardly through said openings, said openings being spaced around the periphery of said casing and inclined upwardly therethrough.

5. A flying top comprising a hollow casing having openings therethrough, retracting mechanism mounted within said casing, a plurality of rotor blades connected to said retracting mechanism and retractible at least partially into said casing, a latching device releasably engageable with said retracting mechanism in the retracted positions of said blades, and mechanism responsive to the impact of said top with an external surface for releasing said latching device and extending said blades upwardly and outwardly through said openings.

6. A flying top comprising a hollow casing having openings therethrough, retracting mechanism mounted within said casing and having a portion projecting outwardly therethrough, a plurality of rotor blades connected to said retracting mechanism and retractible at least partially into said casing, a latching device releasably engageable with said retracting mechanism in the retracted positions of said blades, and mechanism responsive to the spinning of said top and to the impact of said projecting portion with an external surface for releasing said latching device and extending said blades upwardly and outwardly through said openings.

7. A flying top comprising a hollow casing having openings therethrough, retracting mechanism mounted within said casing, a plurality of rotor blades connected to said retracting mechanism and retractible at least partially into said casing, a latching device releasably engageable with said retracting mechanism in the retracting positions of said blades, and mechanism responsive to the impact of said top with an external surface for releasing said latching device and extending said blades upwardly and outwardly through said openings, the outer portions of said blades being bent upwardly into positions approximately co-extensive with said casing in the retracted positions of said blades.

8. A flying top comprising a hollow casing having openings therethrough, retracting mechanism mounted within said casing, a plurality of rotor blades connected to said retracting mechanism and retractible at least partially into said casing, a latching device releasably engageable with said retracting mechanism in the retracting positions

of said blades, and mechanism responsive to the impact of said top with an external surface for releasing said latching device and extending said blades upwardly and outwardly through said openings, the outer portions of said blades being bent upwardly into positions approximately co-extensive with said casing in the retracted positions of said blades, said openings being spaced around the periphery of said casing and inclined upwardly therethrough.

9. A flying top comprising a hollow casing having openings therethrough, a plunger reciprocably mounted in said casing and having a portion projecting through the lower end thereof, a plurality of rotor blades connected to said plunger and retractible at least partially into said casing, and mechanism responsive to the impact of said plunger with an external surface for extending said blades upwardly and outwardly through said openings.

10. A flying top comprising a hollow casing having openings therethrough, a plunger reciprocably mounted in said casing and having a portion projecting through the lower end thereof, a plurality of rotor blades connected to said plunger and retractible at least partially into said casing, a yielding element for urging said blades upwardly and outwardly through said opening into extended positions relatively to said casing, a latching device releasably holding said blades in their retracted positions, and mechanism responsive to the impact of said plunger with an external surface for releasing said latching device whereby to release said yielding element to move said blades upwardly and outwardly into their extended positions.

11. A flying top comprising a hollow casing having openings therethrough, a plunger reciprocably mounted in said casing and having a portion projecting through the lower end thereof, a plurality of rotor blades connected to said plunger and retractible at least partially into said casing, and mechanism responsive to the impact of said plunger with an external surface for extending said blades upwardly and outwardly through said openings, the outer portions of said blades being bent upwardly into positions approximately co-extensive with said casing in the retracted positions of said blades.

12. A flying top comprising a hollow casing having openings therethrough, a plunger reciprocably mounted in said casing and having a portion projecting through the lower end thereof, a plurality of rotor blades connected to said plunger and retractible at least partially into said casing, a yielding element for urging said blades upwardly and outwardly through said opening into extended positions relatively to said casing, a latching device releasably holding said blades in their retracted positions, and mechanism responsive to the impact of said plunger with an external surface for releasing said latching device whereby to release said yielding element to move said blades upwardly and outwardly into their extended positions, the outer portions of said blades being bent upwardly into positions approximately co-extensive with said casing in the retracted positions of said blades.

13. A flying top comprising a hollow casing having openings therethrough, a plunger reciprocably mounted in said casing and having a portion projecting through the lower end thereof, a plurality of rotor blades connected to said plunger and retractible at least partially into said casing, a yielding element for urging said

blades upwardly and outwardly through said opening into extended positions relatively to said casing, a blade support connected to said blades within said casing, a latching device releasably engageable with said blade support, and mechanism responsive to the impact of said plunger with an external surface for releasing said latching device whereby to release said yielding element to move said blades upwardly and outwardly into their extended positions.

JOSEPH KEREZI.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,122,189	Benson	Dec. 22, 1914