FIG. 1

FIG. 2

FIG. 3

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ABSTRACT OF THE DISCLOSURE

A toy comprising a handle, a threaded post on the upper end of the handle, a spool threaded upon the post and carrying a propeller releasably locked thereon for rotation therewith attendant to an operator pulling a string wound about the spool. Rotation of the spool winds up a return spring connected between the handle and spool and threads the spool down onto the post which causes the post to project through the top of the spool to release and eject the propeller from the spool. The handle has a guide for the string which cooperates with the rotation of the spool and its ascent along the post as effected by unwinding of the spring to evenly wind the string in a helical pattern onto the spool. The string is anchored to the upper end of the spool and the guide is adjacent to the lower end of the spool. An air chamber formed between the post and spool forming a dash-pot to reduce end shock loading on the toy and string and to force cooling air through the threads of the plastic toy to increase its longevity.

DESCRIPTION OF THE INVENTION

The novel flying toy, generally designated 1 comprises a handle 2 at its lower end including a scalloped hand grip 3 which has a centrally located bore 4 at the lower end of a bell-shaped socket portion 5 which is formed integral with and extends upwardly from the upper portion of handle 2.

The bore 4 snugly admits a complementally shaped reduced-diameter lower end portion 6 of a post 7 which has a transverse opening 8 through which extends a securing pin 9 which has an inner end 10 fitted into opening 11 in the handle and an outer end portion 12 extending through coaxial opening 13 in the handle through which the pin 9 may be driven externally of the handle.

The post 7 has an intermediate enlarged cylindrical portion 14 which provides a shoulder 15 seated upon the closed lower end surface 16 of the socket opening or bore 17. The upper portion 18 of the post is of reduced cross-section and is provided with a screw thread 19 which cooperates with a complementary thread 20 formed in a vertical bore 21 of a spool 22.

The spool 22 is essentially a cylindrical structure having an annular lower outturned peripheral flange 24 which fits into the enlarged upper portion 25 of the socket opening 17 and affords a seat 27 at its lower side for the upper end of a torsion spring 29 which at its upper end has an upwardly extending anchor end 30 projecting into an anchor notch or aperture 32 in the flange 24. The upper portion of the spring surrounds a cylindrical hollow air chamber cylinder 34 which has a lower open end 35. The chamber 36 has an internal diameter slightly larger than the external diameter of the intermediate portion 14 of the post 7 and telescopes thereover. The spring 26 is compressed against the seating surface 16. The lower portion of spring 29 is captured within a close confining smaller diameter lower portion 37 of the socket opening. The spring has a downturned anchor end 38 which fits into a notch 39 extending into handle 2 through surface 16. The spring winds up attendant to an operator pulling on the handle 40 on free end of the pull string 42 which is threaded through a guide 44 in the form of an eye formed integral with the upper portion 46 of the
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socket portion and spaced radially from the strive-receiving periphery 48 of the spool.

The string 42 is wound helically on the periphery 48 to the upper end of the spool whereat it extends through an anchoring aperture 50 in one of two diametrically opposed lugs 51, 54. The end 55 of the string is knotted above the upper surface of lug 51 thereby anchoring the inner end of the string.

The lugs 52, 54 provide upwardly facing coplanar seating surfaces 57, 58 upon which rests the root portions 60, 61 of a pair of blades 62, 63 of a propeller 62' which has a central hub portion generally indicated 64 comprising a depending rounded abutment 65a in axial alignment with a rounded upper head end 65b of the combination post-ejector 7. The upper part 65c of the hub is coned to provide a massive center structure and aerodynamic balance.

The propeller is provided with apertures 66, 67 through the root portions 60, 61 which receive pins 68, 69 secured to lugs 52, 54 and projecting upwardly therefrom. The pins 68, 69 with the apertures 66, 67 provide a releasable interlock, said pins 68, 69 being inclined upwardly toward each other and adapted to spring apart upon the spool being moved downwardly by pull on the string as seen in FIG. 3 whereupon the post which exits from the spool ejects the propeller by forcing it upwardly off the pins.

It is contemplated that the entire toy will be made of plastic which, of course, is subject to deterioration and distortion when heated. A feature of the present invention is the provision of the air chamber 36 which serves as a piston, forces the air upwardly through opening 72 in the upper end chamber 36 into the thread bore 21 of the spool which tends to cool the loose fitting threads of the post and bore this produces an air exhausting through the upper open end 74 of bore 21. Some of the air flowing past the threads may serve as a bearing to minimize the frictional heat developed during rotation of the parts. The air chamber serves an additional function of a dash pot to cushion and prevent abrupt bottoming of the upper surface 75 of the chamber adjacent to shoulder 70 and/or the lower edge 76 of the cylinder against surface 16 if the operator should pull the string beyond normal range to an extent to thread the spool down thus far. Although the length of string is proportioned to allow an excess to remain on the spool as seen in FIG. 1 to take care of normal pull.

OPERATION OF THE DEVICE

Assuming that the parts are as shown in FIG. 1, the operator grasps the handle 2 in one hand and the string handle 40 in the other hand. He rapidly accelerates the pull on the string 42. This causes the spool 22 and propeller 62' to rotate. This action concurrently unwinds the string and threads the spool proportionately downwardly which compresses the air in the chamber 36. At the same time the spring 29 winds up and the upper ejector portion 65b of the spool extends through the upper end opening of the spool and the nose of the ejector abuts against the hub bearing 65a on the bottom of the propeller. This action is momentary and continues until the propeller is freed from the pins 68, 69 and is thus launched into free flight.

Release of tension on the string by the operator causes the return spring 29 to unwind thus reversely rotating the spool and causing it to ascend. Because the guiding eye 40 is also inclined with the winding up on the spool in helical coils. Concurrently with the spool moving upwardly air is aspirated into the chamber under the lower edge 35 of the cylinder and between the male and female threads of the post and spool thus cooling the same.

After retrieving the flying propeller, it is again inserted onto the pins and seated preparatory to another launching.

It will be noted that the air exhausting and aspirating through the threads and the lower edge of the air chamber produces a whistling sound which adds to the enjoyment of the toy.

A preferred embodiment of the invention has been disclosed. However, it will be realized that various other forms will become apparent within the scope of this disclosure.

I claim:

1. A propeller toy and the like comprising a handle, a post projecting upwardly therefrom and terminating in an upper end, a spool skewed to the post, interthreaded thread means on the spool and post operative to traverse the spool up and down the post upon rotation respectively of the spool in reverse directions, propeller means mounted upon the spool, means releasably interlocking the propeller means to the spool, and means for acceleratingly rotating the spool with the propeller means thereon in a direction traversing the spool downwardly on the post, said post disposed in axial alignment with said propeller means and projecting at said upper end upwardly from said spool into engagement with the propeller means upon downward traverse of the spool of predetermined extent and operating to release said propeller means from said interlocking means by ejecting said propeller means from the spool while said propeller means is at substantially maximum rotational acceleration.

2. The invention according to claim 1 and a seating portion on the handle opposing the spool, return spring means skewed over the post between the spool and said opposed seating portion on the handle and anchored thereto, said spring means operative to wind up attendant to the spool being rotated to traverse downwardly on the post to launch said propeller means, and said spring unwinding to traverse the spool upwardly in the post to prelaunch position by unthreading the spool with respect to the post.

3. The invention according to claim 2 and said means for acceleratingly rotating the spool comprising a chord having one end anchored to the spool adjacent one end thereof and having a helical winding, thereon a guide on the handle offset radially from the spool adjacent to the opposite end thereof, and said chord having a free end portion extending through the guide for grasp and pull by an operator.

4. The invention according to claim 1 and said means for acceleratingly rotating the spool comprising a chord wound upon the spool and anchored thereto, and a dash pot air chamber between the post and said propeller means after predetermined descent of the spool to gradually resist rotation of the spool in an unwinding direction of the chord.

5. The invention according to claim 4 and said chamber having an upper end opening communicating with said thread means for discharging air therefrom for cooling the same.

6. The invention according to claim 1 and said interlocking means comprising a pair of upwardly convergingly resisting rotation of the spool toward the lower end and axially displaced openings receiving respective pins, said pins being spaced to generally parallel relation in consequence of said propeller means being urged upwardly by said post to dislocate said propeller means from said pins and thereby release said propeller means.

7. The invention according to claim 1 and means forming a dashpot between said post and spool for increasing ly resisting rotation of the spool toward the lower end the post beyond a predetermined point.

8. The invention according to claim 1 and means for cooling said post and said spool at said thread means concurrent with rotation of the spool on the post by passing pressurized air therethrough.

9. The invention according to claim 1 and said spool having an axial bore, and the thread means on the spool being within bore, a cylinder depending from said spool
having a lower open end, a piston on the post extending into said lower open end of the cylinder and defining a compression chamber therewith for pressurizing air therein during descent of the spool and aspirating air thereinto upon ascent of the spool.

10. The invention according to claim 1 and said spool having a pair of diametrically disposed lugs at its upper end flexible axially of the spool, said interlocking means comprising elements on said lugs and cooperating elements on said propeller means releasable in consequence of said post urging said propeller means upwardly.

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