

[54] **AERIAL TOY**
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 [52] **U.S. Cl. 244/155 R**
 [51] **Int. Cl. B64c 31/06**
 [58] **Field of Search 244/155 R, 153 R**

3,044,737 7/1962 Vavra..... 244/155 R

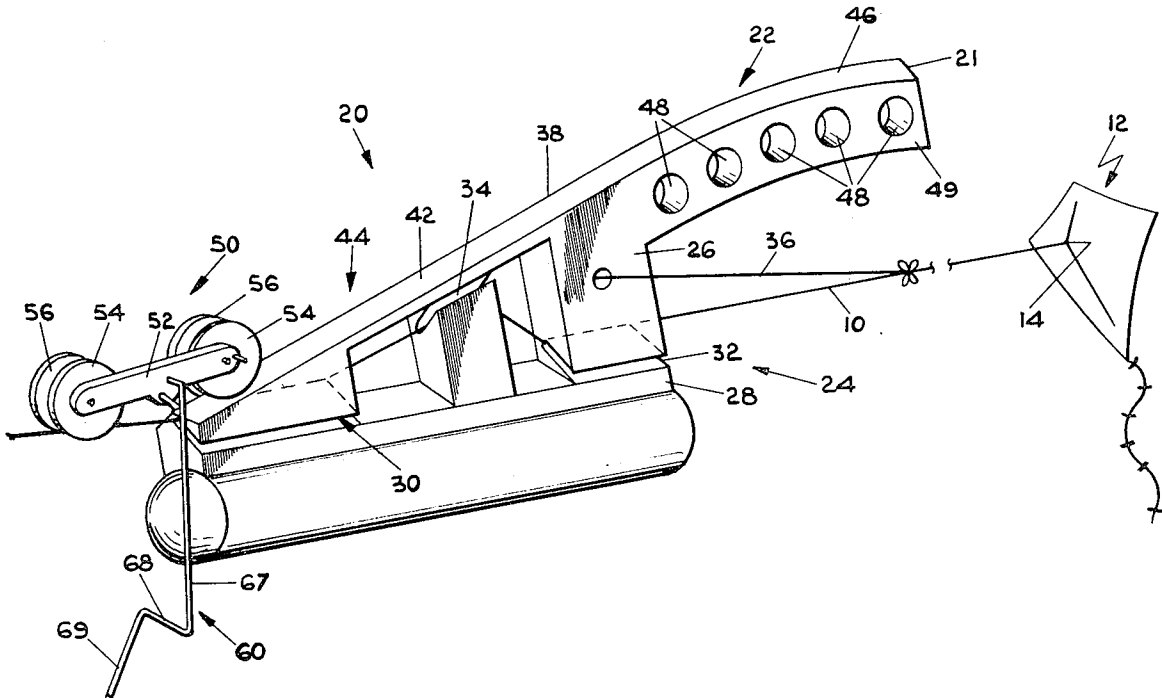
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Attorney—Price, Heneveld, Huizenga & Cooper

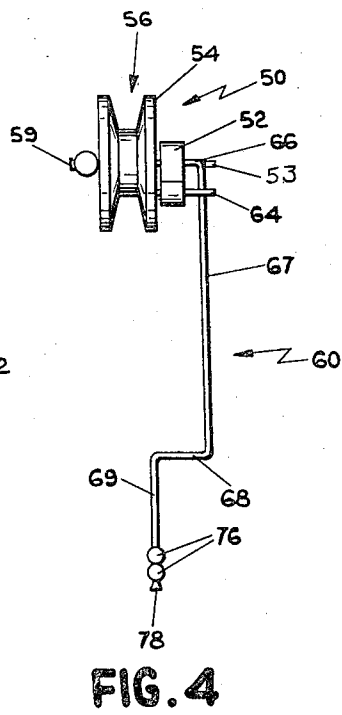
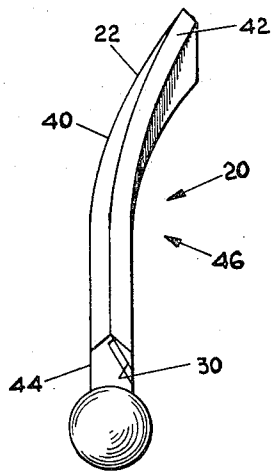
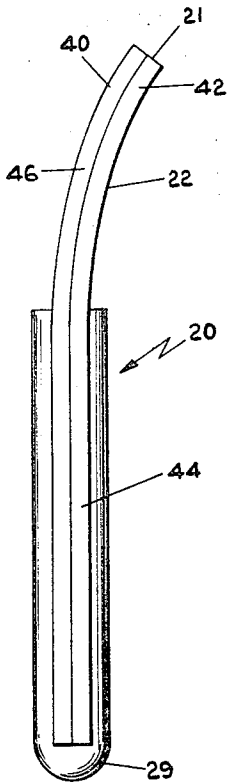
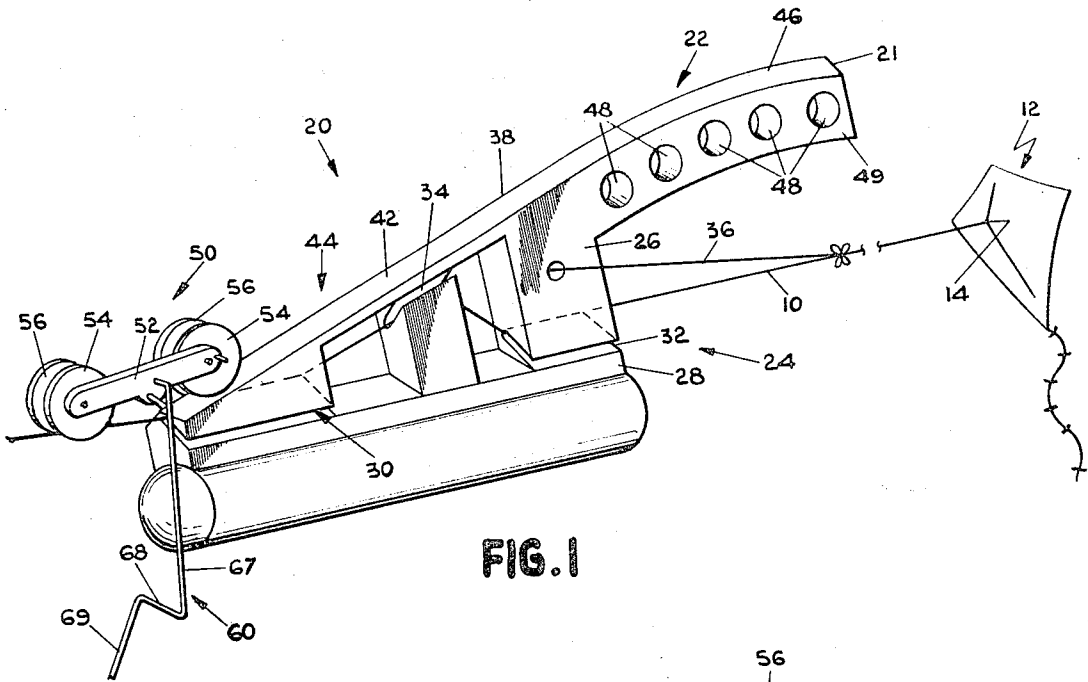
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[57] **ABSTRACT**
 A two-wheeled carrier is propelled up a kite string by a parachute mounted to a toy soldier. The toy is connected to the carrier by a wire shaped to permit free rotation of the toy relative to the carrier about both a vertical and horizontal axis when the carrier is mounted on the string. An ejector positionable arbitrarily along the string includes a ramp which separates the carrier both above and laterally to the windward side of the string prior to separation off the free end of the ramp.

13 Claims, 8 Drawing Figures





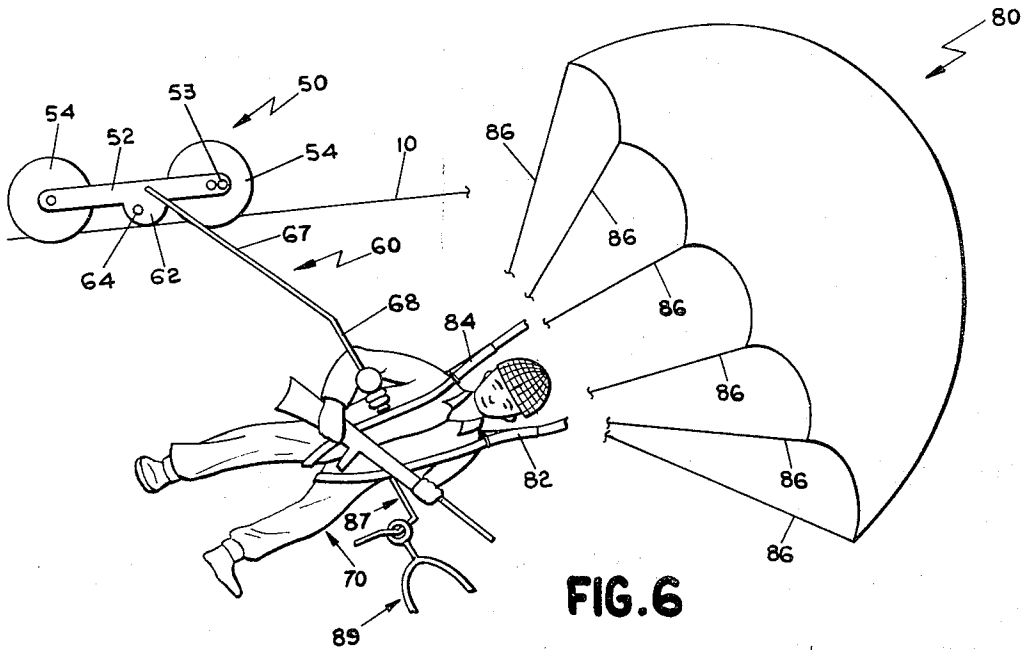


FIG. 6

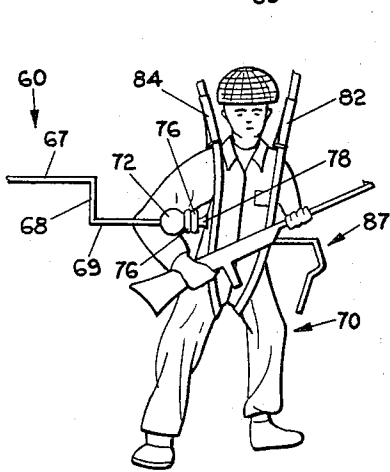


FIG. 7

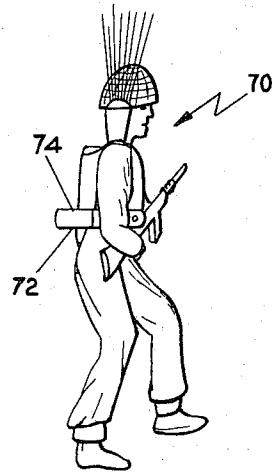


FIG. 8

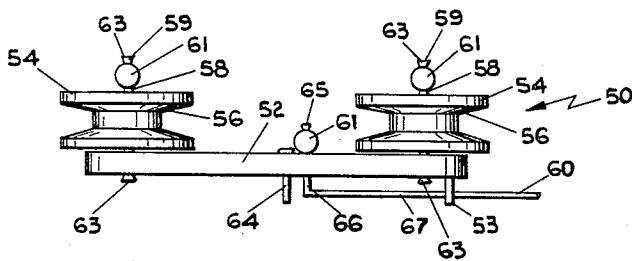


FIG. 5

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AERIAL TOY

BACKGROUND OF THE INVENTION

This invention relates to air-borne toys and more particularly to a novel parachute toy carrier and ejector for releasing the parachute at a selected point along a kite string suspended by a kite.

Aerial toys of the type described herein have provided both hours of fun and consternation to young and old alike. The fun is a product of proper functioning and the consternation is a product of improper functioning. Unfortunately, existing proposals have suffered from a tendency to cause the toy to foul with the kite string. This occurs in several ways and for several distinct reasons. First, none of the ejectors or release mechanisms known provide both vertical lift and lateral displacement of the carrier prior to release. Applicant has discovered that when a two-stick kite (the most conventional) is flown, the wind moves from left to right across the kite string at a 2°-3° angle. As a result of this discovery, it has been found that lateral displacement of the parachute and carrier to the windward side prior to separation greatly reduces any tendency of the parachute to foul with the line. Another typical fouling problem has been premature separation of the carrier from the string prior to reaching the ejector. A principal reason for this has been the weight and balance factors in existing proposals causing an unstable carrier. Applicant has discovered that a key to stability is the positioning of the center of gravity of both the carrier and attached parachute and toy relative to each other and the string. Yet a further fouling potential is caused by premature or accidental deflation of the parachute.

Other disadvantages to present proposals include the lack of simplicity in attaching the ejector and/or carrier to the kite string. On occasion, the ejector will become accidentally separated from the string and lost. On the other hand, those proposals insuring non-separation have proven difficult and time consuming to adjust longitudinally along the string. Yet another disadvantage of several known ejectors is their tendency to shift out of an upright position therefore causing unsuccessful separation when the carrier reaches the ramp since it is in non-alignment with the carrier. Still other disadvantages are the cost of present proposals, especially the more sophisticated ones and their lack of authentic looks or appearance. Authentic scales and appearances add an extra dimension of enjoyment not found in many present proposals.

Thus, there is a need in this art for a less expensive, more authentic parachute toy and ejector which is easy to manipulate and yet moves smoothly up the kite string and off the ejector without fouling.

SUMMARY OF THE INVENTION

In accordance with the invention, a carrier is movable along a string suspended in the air by a kite for release from the string by an ejector positioned up the string an arbitrary distance. The carrier is motivated by a parachute attached to a toy means which in turn is connected to the carrier. Upon release of the carrier from the string and ejector, the parachute causes the carrier and toy means to float to the ground. The ejector includes a novel ramp which both displaces the carrier above and laterally to the windward side of the string prior to separation to provide a clean non-fouling

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release. In another aspect of the invention, the connector member which connects the carrier to the toy means is rotatably connected to both the carrier and toy means to permit rotation of the toy means and parachute about generally vertical and horizontal axes when the carrier is mounted on the string. In a narrower aspect, the connector member is shaped to position the toy means beneath the carrier so that the center of gravity is directly beneath the kite string. This keeps the carrier wheels firmly positioned over the strings for stability.

In accordance with the preferred aspects of this invention, a novel aerial parachute toy is provided which effectively overcomes many of the disadvantages of the present art. The apparatus is particularly designed to provide a relatively inexpensive toy which functions easier and better than existing proposals and is easier to manipulate.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary perspective view illustrating the ejector and carrier provided by the invention mounted on a kite string suspended by a kite;

FIG. 2 is a plan view of the ejector;

FIG. 3 is an end view of the ejector;

FIG. 4 is an end view of the carrier and connector member provided by the invention;

FIG. 5 is a plan view of the carrier;

FIG. 6 is a fragmentary elevation view of the parachute and toy supported by the carrier on the kite string;

FIG. 7 illustrates the inter-connection of the connector member to the toy; and

FIG. 8 is a side view of the toy shown in FIG. 7 without the connector member.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring briefly to FIGS. 1 and 6, a string 10 is shown suspended by an air-borne kite 12 at one end 14 and anchored or held at the other end (not shown) in a conventional fashion. The aerial toy of the invention includes an ejector 20 positionable at a preselected point along the string and a carrier 50 movable along the string for separation therefrom by ejector 20. A connector wire 60 suspends a toy such as a toy soldier 70 from the carrier which in turn is connected to a parachute 80. With carrier 50 mounted on string 10, the soldier and carrier are moved up along the string 10 by the inflation and force of wind acting upon parachute 80. When the carrier and suspended toy reach ejector 20, they are deflected vertically upward off string 10 onto a ramp 22 for eventual release from the string and ejector off the free end 21 of the ejector ramp. Upon release, the carrier, toy and parachute float downwardly to the ground in a conventional fashion.

Referring now in detail to FIGS. 1-3, ejector 20 is shown having a body 24 comprising an upper portion 26 generally positioned above string 10 and a lower portion 28 generally suspended beneath string 10. Body 24 includes a pair of longitudinally spaced grooves 30 and 32. The grooves are aligned with each other and open downwardly at an angle for receipt of string 10. The grooves are relatively deep so that string 10 is recessed well within body 28. Preferably, the depth of groove 32 is slightly less than that of groove

30 in order to counteract the extra weight of ramp 22. This keeps the front of the ejector down tight on string 10 and reduces the tendency of the ejector to rock on the string. A third groove 34 opening generally upwardly at an angle is positioned intermediate grooves 30 and 32 substantially above the plane of grooves 30 and 32. Groove 34 is likewise relatively deep so that string 10 when inserted therein is positioned relatively deep within body 28. The mis-alignment in oppositely opening directions of grooves 30, 32 and 34 act to anchor string 10 to ejector 20 when the string is suspended by kite 12 to position ejector 20 arbitrarily along string 10. The tension in string 10 as a result of its connection to air-borne kite 12 causes that portion of string 10 resting in grooves 30, 32 to pull upwardly while that portion of string 10 secured in groove 34 pulls downwardly. The resultant pull is a binding between the grooves to anchor ejector 20 to string 10.

Referring to FIG. 1, the front end 29 of body portion 28 is rounded or hemispherically shaped in order to cam the connector wire 60 away from ejector 20 should a freakish wind carry the toy and parachute in towards the ejector just as it reaches the ejector. Normally this never occurs.

Although unlikely, it is possible under certain circumstances that tension is momentarily lost in string 10 even though kite 12 is air-borne such that string 10 is capable of accidental displacement from grooves 30, 32 and 34. Should this happen, it is possible to lose ejector 20 if it is a substantial distance away from the person manipulating the kite. To avoid accidental loss of ejector 20, an opening is formed through the upper portion 26 of body 24 to permit the anchoring of a safety string 36 which is tied to string 10. This provides a positive interlock between ejector 20 and string 10 such that if the ejector is displaced from string 10, it cannot become completely separated therefrom. The string 36 however does not inhibit longitudinal movement of the ejector along string 10.

The binding tension of string 10 in grooves 30, 32 and 34 acts to anchor ejector 20 to string 10 in an upright position wherein the upper and lower portions 26 and 28 of body 24 are in a generally vertical alignment. This tendency is further supplemented by the weight of lower portion 28 which preferably exceeds that of upper portion 26 to act as a ballast which tends to bias the ejector in an upright position in the event there is some angular movement or urgency on the ejector as a result of wind or string twisting.

The upper surface 38 of ramp 22 includes a pair of upwardly and converging sloped surfaces 40 and 42 forming a generally inverted V-shaped ramp configuration for guiding and supporting carrier 50, which will be described in more detail hereinafter. Ramp 22 is sloped upwardly away from string 10 in its entirety and includes a first generally linear portion 44 aligned with string 10 and a second portion 46 curved laterally to the right relative to the eye of a person facing and manipulating the kite. The purpose of ramp 22 is to lift carrier 50 above string 10 and displace it laterally to the windward side prior to its ejection off free end 21. As noted in the BACKGROUND, in a conventional two-stick kite, air moves laterally from left to right across string 10 approximately 2 to 3 degrees. By displacing the carrier above and to the windward side of the string 10 prior to ejection, any tendency of fouling

between string 10 or ejector 20 with carrier 50 and its attached toy is greatly reduced.

A plurality of openings 48 are shown through the nose section 49 of ramp 22. The openings are provided in order to reduce the overall weight of upper body portion 26 to enhance the ballast effect of lower body portion 28. Preferably the ejector is comprised of an inexpensive lightweight plastic which can be molded.

Referring specifically now to FIG. 6, the parachute toy is shown having a carrier 50, interconnected by a wire member 60 to a toy soldier 70 having a parachute 80 attached thereto. Referring in addition to FIGS. 4 and 5, carrier 50 is shown having a generally longitudinal extending body 52 with a roller 54 rotatably mounted on each end. Each roller 54 includes a circumferential groove 56 having an appreciable depth. Each roller also includes a central bore 58 (FIG. 5) through which is mounted a pin 59 which fits loosely in bore 58 to act as an axle to permit free rotation of rollers 54 thereabout. The length of pins 59 exceeds the width of rollers 54 so that the rollers are relatively friction free. Preferably, a bead 61 is disposed intermediate the outer end of pin 59 and rollers 54 to facilitate freedom of movement of the rollers. The opposite end 63 of each pin 59 is deformed to provide an enlarged portion which prevents removal of the pin from the bore and body. As shown clearly in FIG. 5, the pin extends completely through body 52 of the carrier. Body 52 is positioned to one side of rollers 54 to permit suspension of a connector wire 60 which connects the soldier 70 and parachute 80 to carrier 50. Preferably, body 52 is mounted on the right side of roller 54 when viewed from the eye of the operator of the kite so that it extends to the windward side. Body 52 is preferably comprised of plastic and includes a depending portion 62 (FIG. 6) positioned slightly off the longitudinal center to the front of carrier 50. A pair of stop pegs 53 and 64 in the form of wire projections are mounted in body 52 and project to the windward side to confine the rotation of connector wire 60 within the radius of rotation between pegs 53 and 64. This facilitates the handling of connector wire 60 and soldier 70 to position carrier 50 on string 10. Stop peg 64 is generally centered intermediate rollers 54, the significance of which will be appreciated after a more detailed description hereinafter.

Connector wire 60 is anchored at one end 65 through the main body portion 52 of carrier 50. A first portion 66 of wire 60 extends laterally through body 52 through an opening which permits free rotatable movement of first portion 66 relative to carrier 50. A bead 61 facilitates rotation of first portion 66 and the enlargement of end 65 captures the bead and connector member 60 relative to carrier 50. The rotation provided by portion 66 permits free rotation of connector 60 and toy 70 about a horizontal axis. A second portion 67 of substantial length extends generally at a right angle from first portion 66 to position toy soldier 70 well beneath string 10 as the carrier moves up string 10. Second portion 67 which extends generally vertically downward (FIG. 4) terminates at its lower end in a third portion 68 which extends horizontally inward approximately 90 degrees relative to second portion 67 (FIG. 4) to position the toy suspended by wire 60 directly beneath string 10 when the carrier is mounted and moving along string 10. This acts to pull rollers 54 securely over string 10 with the string securely disposed

in grooves 56. This reduces any tendency for premature separation of the carrier from string 10.

Referring now to FIGS. 6 and 7, horizontal portion 68 terminates in a fourth wire portion 69 which is connected to toy 70. Portion 69 is shaped at approximately a 90 degree angle relative to portion 68 so that portion 69 extends generally vertically downwards. However, as illustrated in FIG. 6, it is shaped out of alignment with portion 67 so that it is skewed relative to wire portion 67. The position of toy 70 during movement of carrier 50 up string 10 is shown clearly in FIG. 6 and the angle of skew is provided to orient toy 70 into a more horizontal position to eliminate the chance of fouling between parachute 80 and string 10. Since the forces acting on parachute 80 tend to pull toy 70 ahead of carrier 50, the skew angle as shown compensates for this tendency. As shown in FIG. 7, the free end of wire portion 69 is anchored to the mid portion of toy 70.

Referring to FIG. 8, a hollow tubular member 72 is shown extending beneath one arm of the toy soldier 70. A cap 74 is removable from tube 72 to permit the insertion of a carefully folded piece of paper or message. This increases the novelty of the use of the toy in that it provides a means for transferring a message from one place to another in the event more than one person is involved in utilizing the toy. The free end of wire connector member 69 is mounted through the front end of tube 72 for pivotal rotation relative to the toy similar to the opposite end 65 of connector 60. A pair of flat beads 76 are positioned intermediate the outer end 78 of wire 60 to facilitate free rotation. The outer end is flattened and enlarged to prevent removal of toy 70 from connector 60. Referring back to FIG. 6, it becomes evident that as a result of the particular shape of connector 60, the position of toy 70 is rotatable relative to carrier 50 about a generally horizontal and vertical axis when the carrier is mounted on and moving up string 10 as shown in FIG. 6. This movement about two different axes provides free movement of the toy in compensating for variations in the affect of wind etc. to prevent fouling. Thus the toy is free to follow the wind so to speak as it changes intermittently without exerting an immediate adverse force on carrier 50 which might cause its premature separation prior to ejection on ejector 20.

Referring now to FIGS. 6-8, parachute 80 is shown to be attached to the upper portion of toy 70 by a pair of straps 82 and 84. Preferably, the parachute itself is comprised of a durable cellophane which is extremely light in relation to its area to provide a positive pull on carrier 50 once it is inflated. A plurality of shrouds 86 are shown which connect the parachute to straps 82 and 84. In accordance with the invention, shrouds 86 are semi-rigid to reduce the tendency for premature deflation of parachute 80 and in addition facilitate the positioning of the parachute properly as the toy is mounted on string 10.

Referring now specifically to FIG. 6, the cooperation between stop peg 64 and connector wire 60 will be explained. When the toy is positioned on string 10, it is generally picked up by either wire 60 or toy 70. Since the toy rotates freely about two axes relative to carrier 50, it can flip around into a difficult position for placing the carrier on string 10. Preferably, the toy is picked up by connector wire 60 with portion 67 held generally vertical. As illustrated in FIG. 6, portion 67 of connector wire 60 is attached to body 52 slightly in front of its

overall center of gravity defined generally at the mid point between rollers 54. In this fashion, the gravitational affect on carrier 50 will tend to rotate it in a counterclockwise direction with the rear roller rotating downwardly relative to the front roller. However, as soon as it reaches a position generally aligned with the slope of string 10 or some point therebetween with respect to the horizontal, portion 67 comes into abutment with stop peg 64. This stabilizes and positions carrier 50 for proper placement on string 10 thereby facilitating the entire operation. Should the carrier for some reason rotate in a clockwise direction, peg 53 will prevent its full rotation into an inverted position. In addition, while carrier 50 is moving up string 10, should the wind cease suddenly, toy 70 and parachute 80 will tend to rotate in a clockwise direction causing carrier 50 to eventually separate from string 10. Stop peg 64 will prevent this momentary movement so that if the wind begins again shortly, parachute 80 is in the proper orientation. Likewise peg 53 will prevent rotation of the connector above string 10 if a severe wind gust occurs.

Referring to FIGS. 6 and 7, a hook 87 is shown projecting from toy soldier 70 and is adapted to receive a glider or other floatable toy (not shown) which is released shortly after toy 70 is ejected off ramp 22. A bracket 89 with an eye hook (FIG. 6) is sufficient to suspend the glider on hook 87 as the toy moves up string 10 as shown. Once toy 70 is ejected, it assumes the general position shown in FIG. 7 and the glider will become released from toy soldier 70 by its gravitational weight. This feature adds extra engagement to the operation of the toy.

Having described the various components of the novel toy proposed by the invention, its operation should be obvious. Prior to flying kite 12, ejector 20 is positioned on string 10 generally in the vicinity of the point wherein string 10 is attached to kite 12. This is so since the maximum entertainment in utilizing the toy is generally achieved by ejecting the parachute and toy as high in the air as possible. However, it should not be positioned so close to kite 12 that it may become fouled with the kite itself. The ejector is attached to string 10 by simply deflecting string 10 so that it will simultaneously slip into grooves 30, 32 and 34. Once tension is applied to string 10, ejector 20 becomes anchored securely to the string. Safety string 36 can be attached to string 10 by knotting it at its free end to the string. At this point, kite 12 is flown into the air in conventional fashion.

Upon playing out string 10 to a desired level so that kite 12 is flown in the air, the toy comprising an interconnected carrier 50, connector wire 60, toy soldier 70 and parachute 80 is picked up by connector wire 60 in such a position that connector wire 60 is generally held in a vertical orientation with the toy soldier facing the person manipulating the toy. In this fashion, carrier 50 will tend to rotate in a counterclockwise direction until wire portion 67 abuts against stop peg 64 stopping carrier 50 in a generally horizontal or slightly inclined fashion. The carrier is positioned over string 10 with the rollers positioned over the string and the string securely positioned in grooves 56. At this point, the parachute will generally be inflated if there is any significant wind and upon release of the carrier, the entire carrier, soldier and parachute will begin to move upwards along string 10 by the force of wind in parachute 80.

Upon reaching ejector 20, front roller 54 moves up on ramp 22 (FIG. 1) and as a result of the generally inverted V-shape of the upper surface of ramp 22, the peak of ramp 22 becomes disposed in groove 56 of the roller so that it will move stably up ramp 22. The trailing roller will likewise move up ramp 22 so that the entire carrier becomes vertically separated above string 10. When carrier 50 reaches curve portion 46 of ramp 22, it continues to be lifted vertically above string 10 but at the same time becomes deflected laterally to the windward side of the string. As soon as carrier 50 reaches the free end of ramp 22, it becomes separated from the ramp. At this point, parachute 80 supports the entire toy while permitting it to drift slowly downward in a conventional fashion.

Although but one embodiment has been shown and described in detail, it will be obvious to those having ordinary skill in this art that the details of construction of this particular embodiment may be modified in a great many ways without departing from the unique concepts presented. It is therefore intended that the invention is limited only by the scope of the appended claims rather than by particular details of construction shown, except as specifically stated in the claims.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows.

1. In a kite toy adapted for use with an air-borne kite connected to a string having toy means suspended from a parachute; a carrier interconnected to said toy means by a connector member and movable up said string by the wind acting on said parachute; and an ejector positionable on said string for ejecting said parachute, toy means, and carrier from said string when it reaches said ejector; the improvement comprising said ejector being detachably positioned along said kite string without threading and having first and second ramp portions, said first ramp portion extending longitudinally in alignment with said string and inclined upwardly to lift said carrier upward away from said string, said second portion extending laterally away from said first portion in non-alignment with said string to divert said carrier laterally away from said string, said second portion terminating in a free end to eject said carrier, interconnected toy means and parachute for free fall back to the ground.

2. The toy according to claim 1 wherein said ejector includes a body portion suspended below said string, said body portion being substantially heavier than said ramp portion above said string to ballast said ejector in a generally vertical alignment with respect to said string.

3. The toy according to claim 2 wherein said ejector includes first and second spaced string receiving grooves opening generally downwards and a third groove intermediate said first and second grooves opening generally upwards, said third groove being spaced upwardly from said other grooves to permit arbitrary positioning of said ejector along said string by inserting said string in said grooves, the tension of said string acting on said offset grooves preventing longitudinal displacement of said ejector along said string.

4. The toy according to claim 3 wherein said first string receiving groove is positioned intermediate said second groove and said kite, the depth of said first

string groove being slightly less than said second groove.

5. The toy according to claim 1 wherein said ejector is comprised of plastic.

6. The toy according to claim 1 wherein said carrier is comprised of a pair of pulley-like rollers each having a pair of spaced flanges defining a string-receiving groove, said rollers being interconnected by a linking member.

7. The toy according to claim 1 wherein said connector member is rotatably connected at one end to said carrier and at the other end to said toy means whereby said toy means is movable relative to said carrier about both a generally horizontal and vertical axis when said carrier is mounted on said string.

8. The toy according to claim 7 wherein said carrier is comprised of a front and rear roller interconnected by a linking member, said connector at one end to said linking member and connected at the other end to said toy means, said wire-like element having a first portion extending from one side of said linking member for rotation about a horizontal axis in a vertical plane when said carrier is mounted on said string; a second portion extending from said first portion inwardly towards said rollers; and a third portion extending generally downwardly from said second portion when said carrier is mounted on said string, said third portion being rotatably connected to said toy means so that said toy is free to rotate about a generally vertical axis in a horizontal plane when said carrier is mounted on said string.

9. The toy according to claim 7 wherein said connector member is comprised of a one-piece wire having a first portion with a free end bent at a right angle thereto, said free end rotatably mounted through said linking member and secured thereto so that said connector member and attached toy means are rotatable about a horizontal axis when said carrier is mounted on said string; a second portion bent inwardly from the lower end of said first portion in the same direction as said free end, said second portion lying in a horizontal plane when said carrier is mounted to said string; and a third portion extending downwardly from said second portion in a vertical plane when said carrier is mounted on said string, said third portion rotatably mounted at its lower free end to said toy means to permit rotation of said toy means about a vertical axis when said carrier is positioned on said string.

10. The toy according to claim 9 wherein said first and third portions are angularly related to each other and positioned in parallel planes to position said toy means beneath said carrier.

11. In a kite toy adapted for use with an air-borne kite connected to a string having toy means suspended from a parachute; a carrier interconnected to said toy means by a connector member and movable up said string by wind acting on said parachute; and an ejector positionable on said string for ejecting said parachute, toy means and carrier from said string when it reaches and traverses said ejector; the improvement comprising: said connector member comprising a wire-like element pivotally connected at one end to said carrier and rotatably connected at the other end to said toy means whereby said toy means is movable simultaneously relative said carrier about both a generally horizontal and vertical axis when said carrier is mounted on said string.

12. The toy according to claim 11 wherein said carrier includes stop means projecting laterally therefrom and engageable by said connector so that when said carrier is lifted for placing on said string, said stop means prevents said connector member from rotating out of a generally vertical orientation to facilitate hanging said carrier on said string.

13. The toy according to claim 12 wherein said carrier includes a front and rear roller interconnected by

a linking member, said connector member being mounted to said linking member at a point closer to the front roller than the rear roller, said stop means projecting from said linking member intermediate said rear roller and said connector member so that when said carrier is picked up for placement on said string, said connector member is urged toward said stop means.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,768,762 Dated October 30, 1973

Inventor(s) Robert J. George

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Col. 8, line 18, Claim 18

After "connector" insert ---member is comprised of a wire-like element pivotally connected---

Signed and sealed this 16th day of April 1974.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents