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(54) Title: FLYING APPARATUS FOR A DOLL

(57) Abstract: A flying toy includes a doll support housing which receives and supports a doll. The housing further supports a plurality of flexible radially extending resiliently mounted wing struts having fabric segments coupled therebetween to form wings. A launcher includes a cup-like receptacle which receives the flying toy and which receives and confines the wing struts and wing structure in a folded configuration. A latchable release maintains the flying toy in its receptacle until the toy is rapidly moved and the latch is released. Thereafter, the toy leaves the receptacle and the wings flex outwardly to produce a glider toy.



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FLYING APPARATUS FOR A DOLL

SPECIFICATION

Cross-Reference to Related Applications

[0001] This application claims the benefit of and priority under 35 U.S.C. 119(e) of U.S. Provisional Patent Application No. 60/813,157 entitled FLYING APPARATUS FOR DOLL filed June 12, 2006 in the name of Connie Dale, the disclosure of which is hereby incorporated herein by reference.

Field of the Invention

[0002] Through the years dolls have proven to be an extremely long-lasting and popular type of toy product. From earliest times, children and adults fashion various dolls for use by children in virtually every society which is known. Not surprisingly, the long-term popularity and consumer desire for doll products have prompted practitioners in the art to create and market a virtually endless variety of dolls and doll products. Since most, if not all, dolls are fabricated for use by children, practitioners in the art make special efforts to make dolls and products used in association with dolls which are appealing to young children. Since a substantial age range and therefore manual skill range exists in children using doll products, practitioners target certain children within certain age ranges with different types of dolls from other children in other ranges. Thus, practitioners take care to provide dolls which have the size, weight and appearance characteristics appropriate for a particular group of targeted consumer.

[0003] One type of doll which has proven to be extremely popular among young children is provided by extremely small dolls having relatively little if any movement or articulation associated therewith. These dolls are fabricated to meet the needs and limited manual skills of extremely young children. Perhaps one of

the most popular types of such small dolls is found in the well-known "Polly Pocket" brand of dolls. Such dolls are generally colorful and simplified in appearance and are characterized by relatively small size and light-weight. For the most part, such dolls are not articulated to any great extent. However, certain limited articulation is provided in some lines of the dolls. The essential character however is preserved in that the dolls are intended to be relatively light-weight small in size and easy for children to manipulate. Over the years, such simplified dolls have expanded in their sophistication and now form a line of dolls intended to also appeal to slightly older children than originally intended.

[0004] The small size and limited articulation of such dolls necessitates that apparatus and accessories used in combination therewith such as clothing articles and the like are also preferably small in size and relatively simple in construction which leads to easier manipulation and handling by young children.

[0005] In attempting to enhance the consumer appeal of such small dolls and fashion dolls, practitioners in the toy arts have often attempted to provide dolls which are capable of some activity. One of the more interesting types of small doll activities which have been provided is found in attempts to provide flying or gliding versions of small dolls. For example, U.S. Patent 5,525,086 issued to Gentile, et al. sets forth a LAUNCHABLE FIGURINE DEVICE which includes a figurine having wings capable of providing aerodynamic lift upon rotation of the figure. The wings are constructed and supported in a manner which causes the wings to rise and extend outwardly when the figure is rotated. A rotation imparting mechanism is releasibly mated to the figurine to provide rotational velocity for launching the figure in the air.

[0006] Other types of flying devices generally relevant to the present invention are found in apparatus such as toy gliders or the like. U.S. Patent 6,102,765 issued to Forti, et al. and U.S. Patent 6,048,246 also issued to Forti, et al. both of which are entitled TOY GLIDER sets forth toy gliders having folding wings and a long ribbon-like tail. The wings are movable between a folded

configuration and a gliding configuration and are biased toward the gliding configuration. A resilient launcher is employed to impart launch energy to the glider. Once the glider is launched, the wings transition to the extended gliding configuration.

[0007] U.S. Patent 5,725,410 issued to Robinson, et al. sets forth a **PROJECTILE AND LAUNCHER TOY** having a projectile and a tube for launching the projectile into the air. The projectile supports a pair of wings which are movable between a folded configuration and an extended gliding configuration. The wings are spring-biased into the gliding configuration. The projectile is launched into the air by a tube which is hollow and open at one end.

[0008] U.S. Patent 5,423,706 issued to Chase sets forth a **TOY AIRCRAFT GLIDER WITH ROTATING AND FOLDING WINGS** which is configured for launching by a resilient sling shot. The wings are folded and rotated to the launch position and held by the user. The user then draws back the folded glider against the resilient force of the sling shot until sufficient energy is stored in the sling shot. Thereafter, the user releases the glider causing the glider to be launched into the air. Once launched, the glider wings rotate and extend to the gliding configuration supplying a lift which sustains the glider flight.

[0009] U.S. Patent 4,863,413 issued to Schwarz sets forth a **BIRD-SHAPED TOY GLIDER** having a glider body and foldable wings configured to generally resemble the body and wings of a bird. A sling shot resilient launcher is used to launch the glider. The glider is launched in its folded configuration and caused to extend to its gliding or flight configuration when released and thrust forward by the sling shot launcher.

[0010] U.S. Patents 3,654,729 issued to Imperato and 2,221,012 issued to Walker set forth early examples of folding wing gliders.

[0011] U.S. Patents 5,299,966 issued to Rose, III and 3,187,460 issued to Robertson set forth examples of gliders having configurable wings for changing flight characteristics.

[0012] In a related art, a plurality of toy airplane devices are provided which may be generally described as resilient launcher and glider combinations. For example, U.S. Patent 3,902,271 issued to Turoff, et al. sets forth a TOY AIRPLANE LAUNCHER in which a launcher includes an elongated guide rod having a launch spring supported thereon together with a trigger mechanism for release. A cooperating toy airplane includes a body having a passage therein which allows the toy airplane to be received upon the elongated rod. With the spring compressed and held by the trigger release, the airplane is positioned upon the guide rod against the captive spring. When the trigger is released, the energy stored in the spring is transferred to the toy airplane launching it from the launcher.

[0013] U.S. Patents 3,918,197 issued to Stanzel; 4,060,930 issued to Hirtle, et al. and 4,064,647 issued to Lemelson set forth similar resilient spring launcher and toy airplane glider combinations.

[0014] Additionally, U.S. Patents 3,031,797 issued to Gelfand; 3,068,612 issued to Simpson; 3,496,671 issued to Korona; 2,976,644 issued to Crisci; 1,541,579 issued to Kikta and 1,565,437 issued to Greife set forth examples of early devices provided by practitioners in the toy art which all may be generally characterized as providing spring energy launchers for gliding devices such as toy airplanes or the like.

[0015] A substantial number of additional toy devices which are launched by resilient energy launching devices are found in U.S. Patents 5,240,448 issued to Ishikawa; 5,330,198 issued to Dinhofer; 6,733,356 issued to Lee; 4,125,960 issued to Bacca and 3,691,674 issued to Thompson.

[0016] While the above-described prior art devices have to some extent improved the art and have in some instances enjoyed commercial success, there remains nonetheless a continuing need in the art for evermore improved interesting and amusing toys which provide flying apparatus.

Summary of the Invention

[0017] Accordingly, it is a general object of the present invention to provided an improved flying toy. It is a more particular object of the present invention to provide an improved flying toy which combines the play pattern of a doll or toy figure together with a novel launching and construction apparatus for the flying wings on the doll.

[0018] In accordance with the present invention, there is provided a flying apparatus for use in combination with a doll. The apparatus includes a receiver for attaching a small doll to the flying apparatus. The flying portion of the apparatus includes a plurality of flexible wing struts together with a cloth webbing extending between the flexible struts to form a wing surface. The apparatus further includes an elongated cruciform cross sectioned shaft secured to the doll receiver and extending downwardly therefrom. A launcher cooperating with the flying apparatus includes a generally conical wing shroud defining an upwardly open portion and a narrowed closed portion secured to a supporting base. The launcher further includes a spring loaded mechanism which receives the cruciform shaft and which includes a launching spring and trigger release. In operation, the child user places a small doll in the doll receiver and thereafter bends the flexible wing struts downwardly to collect in a confined bundle. Thereafter, the flying apparatus is inserted into the launcher such that the cruciform shaft is received within the spring loaded launch mechanism and the bundled wings and wing struts are captivated within the interior of the wing shroud. Thereafter, actuation of the trigger release releases the energy stored within the launcher spring producing a launching force against the cruciform

shaft. The apparatus comprised of the cruciform shaft, the doll receiver, the wing struts and the cloth fabric wings together with the doll supported within the doll receiver is launched into the air. Once the apparatus has been launched from the wing shroud of the launcher, the flexible wing struts immediately extend back to their normal wing forming positions. As a result, the flying apparatus together with its supported doll fly's and glides a substantial distance.

[0019] From another perspective, the present invention provides in a flying apparatus having a doll-carrying housing which supports a plurality of flexible wing struts having flexible fabric wing segments therebetween and a launcher having an interior receptacle into which the flying apparatus having its wing struts and fabric wing segments may be folded and may be placed in and launched therefrom to resiliently unfold and promote gliding, the improvement comprising: a slide movable within the housing between first and second positions; a spring coupled to the slide urging the slide toward the second position; first and second gear racks carried by the slide; first and second gears rotatably supported by the housing and engaging the first and second gear racks, the first and second gears having first and second key shafts; and first and second keyed ends supported on the interior ends of first and second ones of the struts engaging the first and second key shafts, whereby the force of the spring is coupled by the slide to the first and second gear racks, first and second gears and first and second key shafts to the first and second ones of the keyed ends to pivot the first and second struts to an open position for gliding.

Brief Description of the Drawings

[0020] The features of the present invention, which are believed to be novel, are set forth with particularity in the appended claims. The invention, together with further objects and advantages thereof, may best be understood by reference to the following description taken in conjunction with the accompanying drawings, in the several figures of which like reference numerals identify like elements and in which:

[0021] Figure 1 sets forth a front view of the present invention flying apparatus and cooperating launcher;

[0022] Figure 2 sets forth a front view of the present invention flying apparatus and launcher showing the details of the flexible strut structure;

[0023] Figure 3 sets forth a rear view of the present invention flying apparatus in the folded position within the launcher;

[0024] Figure 4 sets forth a partial section view of the spring launch and trigger mechanism utilized in the launcher portion of the present invention flying apparatus for a doll;

[0025] Figure 5 sets forth a partial front view of the present invention flying apparatus; and

[0026] Figure 6 sets forth a partial front view of the housing portion of the present invention flying apparatus having the housing cover removed.

Description of the Preferred Embodiment

[0027] By way of overview, the present invention includes a flying apparatus having a doll receiver together with a plurality of outwardly extending flexible wing struts. A cloth fabric sheet is secured to the flexible wing struts to form wing surfaces between the struts. The doll receiver further supports a cruciform shaft extending downwardly from the doll receiver. Also provided in the present invention, is a launcher for use in combination with the remainder of the flying apparatus which receives the flying apparatus in a wing folded configuration. The flying apparatus is inserted into the launcher such that the cruciform shaft is received within a spring loaded trigger mechanism utilized in imparting the launch energy to the flying apparatus. With the flying apparatus

and a supported doll within the doll receiver secured within the launcher and the wings thereof bundled into the shroud of the launcher, release of the trigger mechanism produces a spring force against the cruciform shaft launching the flying apparatus and the doll within the doll receiver. Immediately after launch, as the flying apparatus leaves the wing shroud, the resilient character of the flexible wing struts causes the wings to immediately snap to an open configuration. Once the wings have opened, the launched flying apparatus is able to fly and glide for a considerable distance.

[0028] More specifically, Figure 1 sets forth a front view of a flying apparatus constructed in accordance with the present invention and generally referenced by numeral 10. Apparatus 10 is utilized in combination with a launcher generally referenced by numeral 20 and supports a conventional doll generally referenced by numeral 30.

[0029] More specifically, apparatus 10 includes a doll receiver 11 which receives and secures a doll 30 in a snap-fit attachment using a snap clip 19. Doll receiver 11 further includes a flexible bumper 12 which is provided for safety considerations since the apparatus does fly. Apparatus 10 further includes a plurality of resilient flexible wing struts 13, 14, 15, 16, 17 and 18 which are supported by doll receiver 11 and which extend generally radially therefrom. Doll receiver 11 further supports a downwardly extending cruciform cross sectioned shaft 35. A tail 36 formed of a flexible ribbon material is also secured to flying apparatus 10 and operates much like the tail of a kite to maintain the appropriate attitude of the flying apparatus. A plurality of fabric wing sections 31, 32, 33 and 34 are secured to an supported by flexible struts 13 through 18.

[0030] The present invention apparatus further includes a cooperating launcher 20 having a generally frusto-conical wing shroud 21 defining a tapered interior 24. Shroud 21 is supported by a base 22. Launcher 22 further includes a spring loaded launch mechanism (seen in Figure 4) which is operative upon and

receives cruciform shaft 35. Shaft 35 is inserted into cruciform aperture 25 formed at the upper end of launcher 20.

[0031] In the configuration shown in Figure 1, flying apparatus 10 supporting doll 30 is shown in its flying position having flexible wing struts 13 through 18 in their extended positions. As can be seen, the extension of struts 13 through 18 in a generally radial pattern stretches fabric wing portions 31, 32, 33 and 34 to form a pair of wings extending outwardly from doll receiver 11. In this configuration, flying apparatus 10 will glide a substantial distance once launched.

[0032] Figure 2 sets forth a front view of flying apparatus 10 together with launcher 20 and doll 30. Figure 2 corresponds generally to Figure 1 with the difference being found in the solid line representations of flexible wing struts 13 through 18. It will be understood that wing struts 13 through 18 are received within fabric sheeds formed in wing portions 31 through 34. However, for purposes of understanding the invention, the drawing of Figure 2 showing the flexible wing struts in solid line representation is believed helpful.

[0033] More specifically, apparatus 10 includes a doll receiver 11 which receives and secures a doll 30 in a snap-fit attachment (not shown). Doll receiver 11 further includes a flexible bumper 12 which is provided for safety considerations since the apparatus does fly. Apparatus 10 further includes a plurality of resilient flexible wing struts 13, 14, 15, 16, 17 and 18 which are supported by doll receiver 11 and which extend generally radially therefrom. Doll receiver 11 further supports a downwardly extending cruciform cross sectioned shaft 35. A tail 36 formed of a flexible ribbon material is also secured to flying apparatus 10 and operates much like the tail of a kite to maintain the appropriate attitude of the flying apparatus. A plurality of fabric wing sections 31, 32, 33 and 34 are secured to and supported by flexible struts 13 through 18.

[0034] The present invention apparatus further includes a cooperating launcher 20 having a generally frusto-conical wing shroud 21 defining a tapered

interior 24. Shroud 21 is supported by a base 22. Launcher 22 further includes a spring loaded launch mechanism (seen in Figure 4) which is operative upon and receives cruciform shaft 35. Shaft 35 is inserted into cruciform aperture 25 formed at the upper end of launcher 20.

[0035] With flying apparatus 10 supporting doll 30 and with wing struts 13 through 18 in their extended configurations, the user prepares for launching of apparatus 10 by bundling wing struts 13 through 18 in the manner indicated by arrows 40 through 45. This bundling is carried forward by flexing strut 13 in the manner indicated by arrow 40 and thereafter strut 14 and 13 in the manner indicated by arrow 41 and finally flexing strut 15, 14 and 13 in the manner indicated by arrow 42. Concurrently, strut 16 is flexed in the manner indicated by arrow 43 while struts 16 and 17 are flexed in the manner indicated by arrow 44 and finally struts 18, 17 and 16 are flexed in the manner indicated by arrow 45. The resulting bundled configuration is illustrated in Figure 3. Suffice it to note that the flexible wing struts and fabric portions 31 through 34 are bundled to facilitate insertion thereof into the interior of wing shroud 21 of launcher 20.

[0036] Figure 3 sets forth the final insertion step for preparing flying apparatus 10 for launch. The above described wing bundling process having been carried forward, the combination of flexible struts and wing fabric is inserted into the interior of wing shroud 21 of launcher 20. Concurrently, cruciform shaft 35 is inserted into aperture 25 (seen in Figure 2) of launcher 20. With alignment complete, the user forces flying apparatus 10 downwardly in the direction indicated by arrow 50 inserting the bundled wing structure into wing shroud 21 and inserting cruciform shaft 35 downwardly to compress the launching spring (spring 46 seen in Figure 4).

[0037] More specifically, apparatus 10 includes a doll receiver 11 which receives and secures a doll 30 in a snap-fit attachment (not shown). Doll receiver 11 further includes a flexible bumper 12 which is provided for safety considerations since the apparatus does fly. Apparatus 10 further includes a

plurality of resilient flexible wing struts 13, 14, 15, 16, 17 and 18 which are supported by doll receiver 11 and which extend generally radially therefrom. Doll receiver 11 further supports a downwardly extending cruciform cross sectioned shaft 35. A tail 36 formed of a flexible ribbon material is also secured to flying apparatus 10 and operates much like the tail of a kite to maintain the appropriate attitude of the flying apparatus. A plurality of fabric wing sections 31, 32, 33 and 34 are secured to an supported by flexible struts 13 through 18.

[0038] The present invention apparatus further includes a cooperating launcher 20 having a generally frusto-conical wing shroud 21 defining a tapered interior 24. Shroud 21 is supported by a base 22. Launcher 22 further includes a spring loaded launch mechanism (seen in Figure 4) which is operative upon and receives cruciform shaft 35. Shaft 35 is inserted into cruciform aperture 25 formed at the upper end of launcher 20.

[0039] Once flying apparatus 10 has been fully inserted into launcher 20, the user simply presses trigger button 23 releasing the latch (seen in Figure 4) which has thus far restrained shaft 35. The stored energy within the launcher spring then launches flying apparatus 10 and doll 30 in the direction indicated by arrow 51. Immediately upon clearing launcher 20, the resilient character of the wing structure of flying apparatus 10 causes the wings to flex outwardly in the directions indicated by arrows 52 and 53 to again resume the flying configuration described above in Figure 1.

[0040] Figure 4 sets forth a partial section view of the launcher and trigger apparatus for the present invention. Launcher 20 includes a wing shroud 21 secured to a supporting base 22. Within launcher 20, a trigger arm 26 is supported by a pivot 27 and is coupled to a trigger spring 28. A trigger button 23 extends through an aperture formed in wing shroud 21 and is in contact with the lower end of trigger arm 26. The upper end of trigger arm 26 defines a tooth 29. Launcher 20 further includes a launching spring 46. In preparation for launch, the user inserts cruciform shaft 35 downwardly into launcher 20 in the direction

indicated by arrow 55. This downward movement of cruciform shaft 35 compresses spring 46 until notch 37 of shaft 35 is engaged by tooth 29. Spring 28 acts upon trigger arm 26 to maintain the engagement of tooth 29 within notch 27. At this point, the flying apparatus is ready for launch. Launching is initiated by the user simply pushing trigger 23 inwardly in the direction indicated by arrow 56 causing the upper end of trigger arm 26 to pivot outwardly in the direction indicated by arrow 57. The user pushes with enough force to overcome spring 28 and move tooth 29 away from engagement with notch 37. Once the engagement of tooth 29 and notch 37 is removed, the force of spring 46 acts upon cruciform shaft 35 launching the flying apparatus upwardly in the direction indicated by arrow 58.

[0041] Figure 5 sets forth a partial front view of the doll supporting housing and wing support structure of the present invention flying apparatus. As mentioned above, apparatus 10 includes a housing 11 which supports a resilient bumper 12 on its upper edge and a doll receiving snap clip 19. As is also described above, apparatus 10 includes a plurality of flexible struts 13, 14, 15, 16, 17 and 18 movably supported within housing 11. The support of struts 13 through 18 is described below in Figure 6 in greater detail. However, suffice it to note here that housing 11 supports a doll 30 and further supports flexible struts 13 through 18 in a manner whereby struts 13 through 18 may be folded downwardly to fit within launcher 20 as shown in Figure 3. Flexible bumper 12 provides a safety feature for the present invention flying apparatus in that individuals will not be injured by the flying apparatus striking them due to the resilience of bumper 12 and its cushioning effect.

[0042] Figure 6 sets forth the front view of Figure 5 with housing 11 having its front cover removed to reveal the interior structure which supports struts 13 through 18. As described above, struts 13 through 18 are pivotally supported within housing 11 and are joined together by a flexible fabric web having segments 31 through 34. Each web segment secures adjacent pairs of flexible struts. In this manner, the movement of struts 13 and 16 in the manner indicated

by arrows 85 and 86 produces a corresponding opening movement of struts 14, 15, 17 and 18.

[0043] As mentioned above, housing 11 further supports a resilient bumper 12 (seen in Figure 5). Housing 11 further supports a movable slide 80 having a spring 81 coupled thereto. Spring 81 is coupled between the interior end of slide 80 and the underside of housing 11. The force of spring 81 provides a resilient spring force which urges slide 80 downwardly in the direction indicated by arrow 84. A stop 87 limits the downward movement in the direction of arrow 84 which slide 80 may travel. In the position shown in Figure 6, spring 81 has forced slide 80 downwardly against stop 87 in the direction indicated by arrow 84. Slide 80 further includes a pair of gear rack segments 82 and 83.

[0044] Housing 11 further includes a plurality of supports posts 70, 71, 72 and 73. Correspondingly, struts 14, 15, 17 and 18 define ring ends 60, 61, 62 and 63 respectively. Ring ends 60 through 63 are received upon posts 70 through 73 to provide pivotal attachment of struts 14, 15, 17 and 18.

[0045] Housing 11 further includes a pair of key shafts 90 and 92 which are rotatably supported by a pair of gears 91 and 94. Gears 91 and 94 are rotatably supported within housing 11 in accordance with conventional fabrication techniques utilizing keyed shafts 90 and 92. Correspondingly, strut 13 defines a keyed end 95 which is configured to be received upon and engage key shaft 90. Similarly, strut 16 includes a keyed end 96 which is structured and configured to be received upon key shaft 92. The engagement of key shafts 90 and 92 with ends 95 and 98 of struts 13 and 16 provides direct coupling to gears 91 and 94 respectively. In addition, the gear coupling between gears 91 and 94 with gear rack portions 82 and 93 respectively produces rotational motion of struts 13 and 16 in response to movement of slide 80.

[0046] In the configuration shown in Figure 6 with slide 80 positioned against stop 87, gear racks 82 and 93 have pivoted gears 91 and 94 in the

direction indicated by arrows 85 and 86. Accordingly, the spring force of spring 82 against slider 80 which positions slider 80 against stop 87 also maintains the open configuration of struts 13 and 16 shown in Figure 6.

[0047] In operation, as the user forces struts 13 and 16 downwardly and together carrying struts 14, 15, 17 and 18 to provide the closed configuration shown in Figure 3, the force of spring 82 is overcome allowing slide 80 to be moved upwardly against the force of spring 82. Thus, with the struts and wing segments of apparatus 10 in the folded configuration shown in Figure 3, energy is stored within spring 82. Once apparatus 10 is launched, the restraining force upon struts 13 and 16 is removed allowing the force of spring 82 to move slide 80 in the direction indicated by arrow 84. The cooperation of gear racks 82 and 93 with gears 91 and 94 respectively produces rotation of struts 13 and 16 in the directions indicated by arrows 85 and 86. This rotation opens struts 13 and 16 which carry struts 14, 15, 17 and 18 due to the connection of fabric segments 31 through 34 therebetween.

[0048] While particular embodiments of the invention have been shown and described, it will be obvious to those skilled in the art that changes and modifications may be made without departing from the invention in its broader aspects. Therefore, the aim in the appended claims is to cover all such changes and modifications as fall within the true spirit and scope of the invention.

THAT WHICH IS CLAIMED IS:

1. In a flying apparatus having a doll-carrying housing which supports a plurality of flexible wing struts having flexible fabric wing segments therebetween and a launcher having an interior receptacle into which the flying apparatus having its wing struts and fabric wing segments may be folded and may be placed in and launched therefrom to resiliently unfold and promote gliding, the improvement comprising:

a slide movable within said housing between first and second positions;

a spring coupled to said slide urging said slide toward said second position;

first and second gear racks carried by said slide;

first and second gears rotatably supported by said housing and engaging said first and second gear racks, said first and second gears having first and second key shafts; and

first and second keyed ends supported on the interior ends of first and second ones of said struts engaging said first and second key shafts,

whereby said force of said spring is coupled by said slide to said first and second gear racks, first and second gears and first and second key shafts to said first and second ones of said keyed ends to pivot said first and second struts to an open position for gliding.

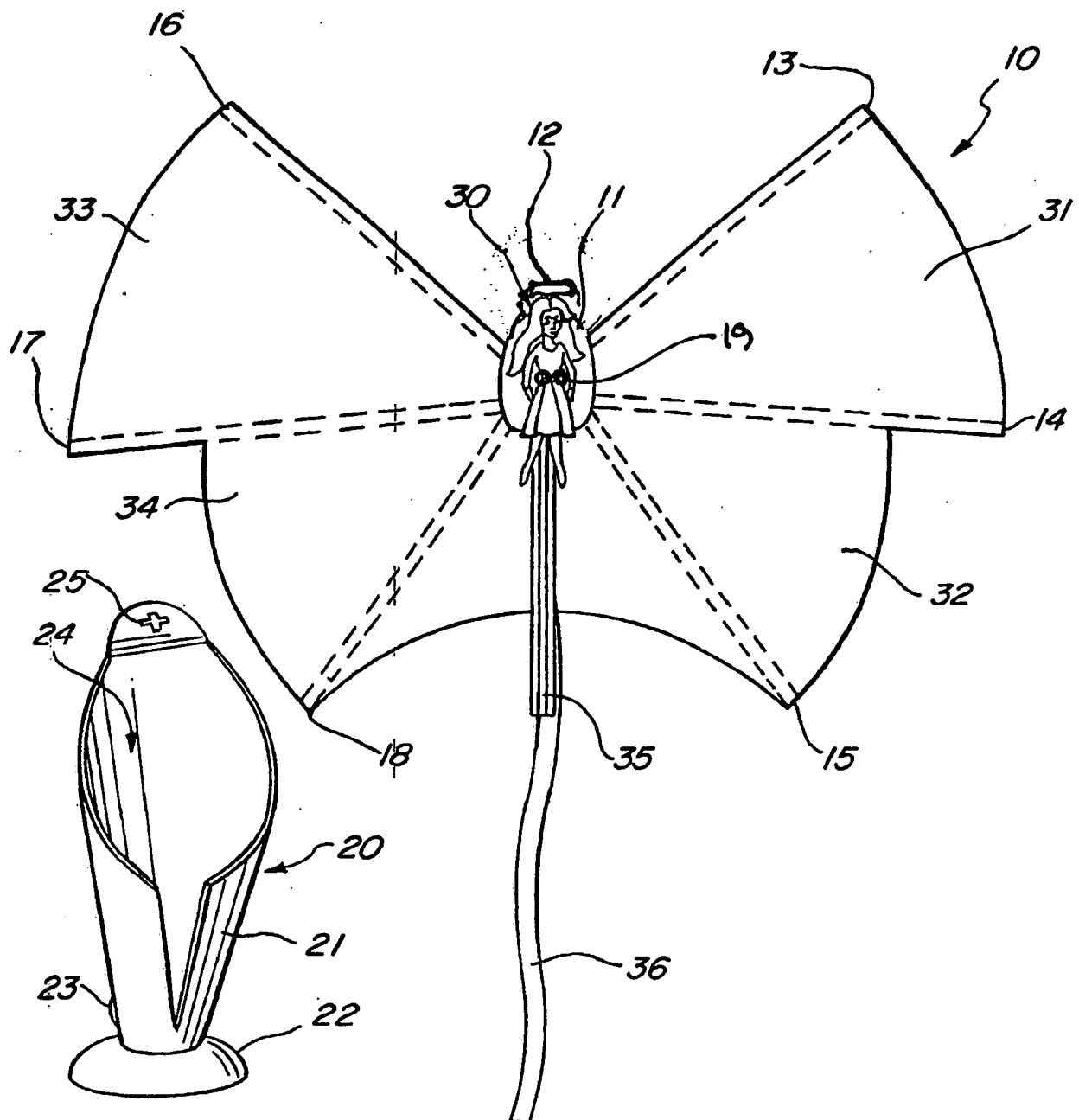


FIG. 1

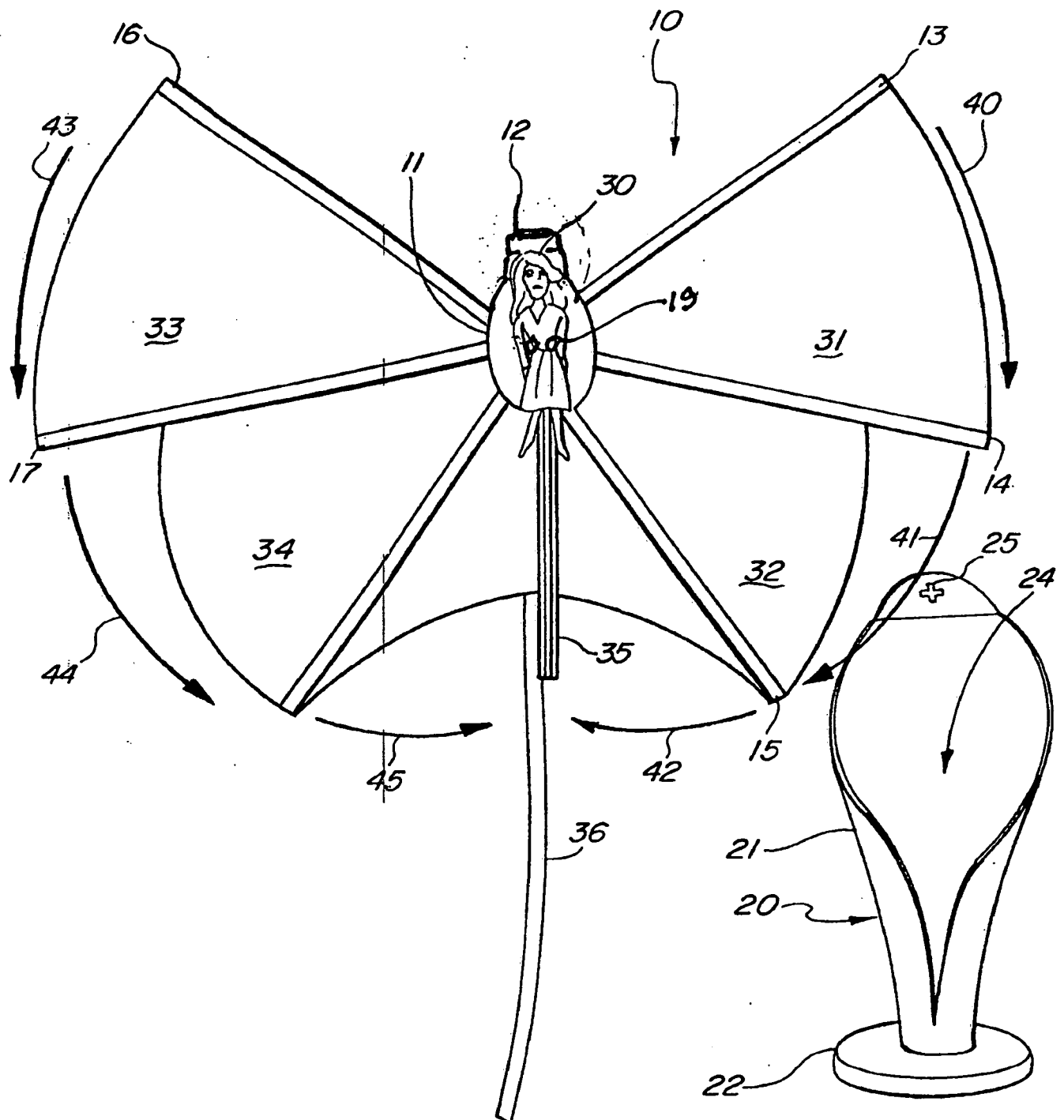
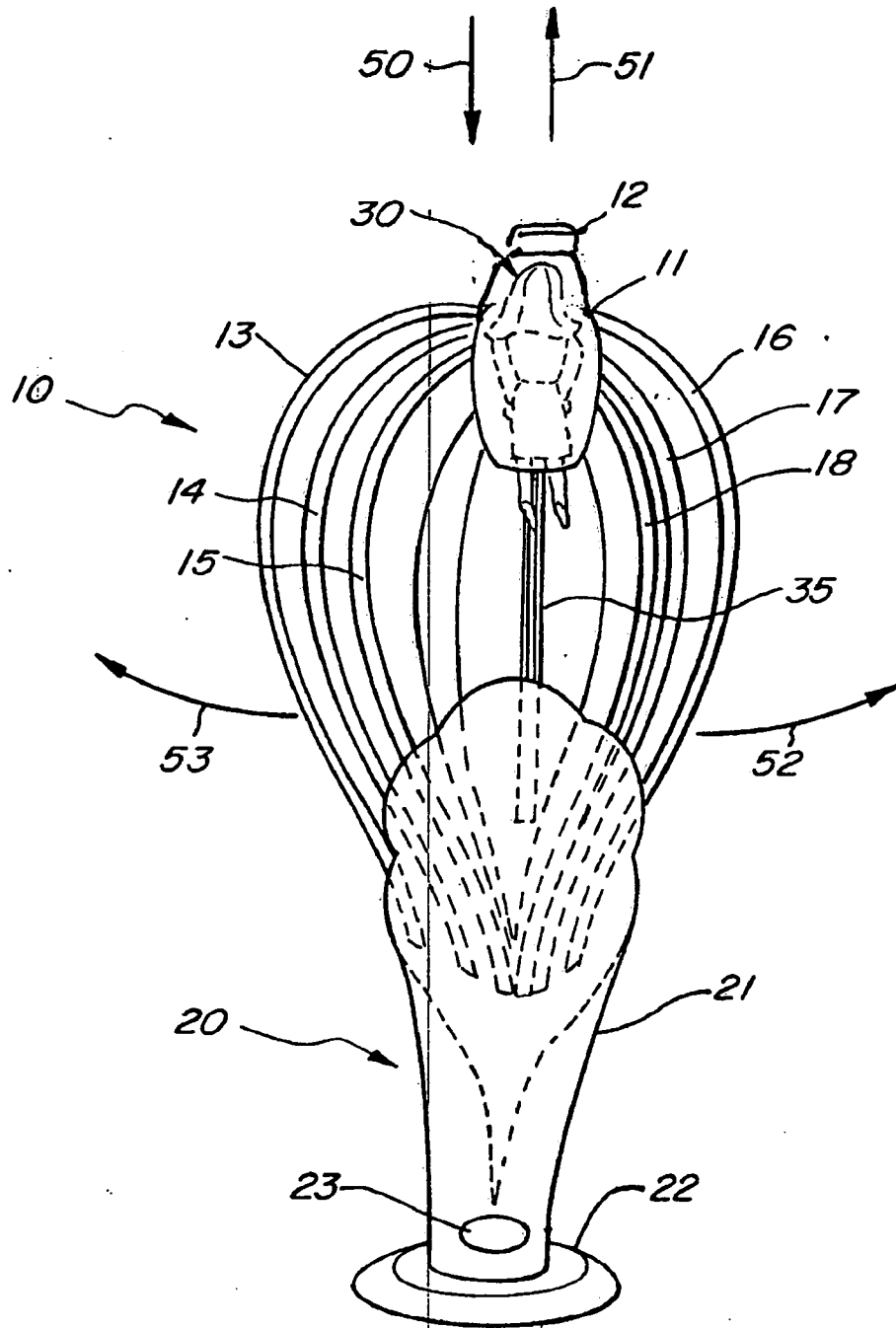


FIG. 2

**FIG. 3**

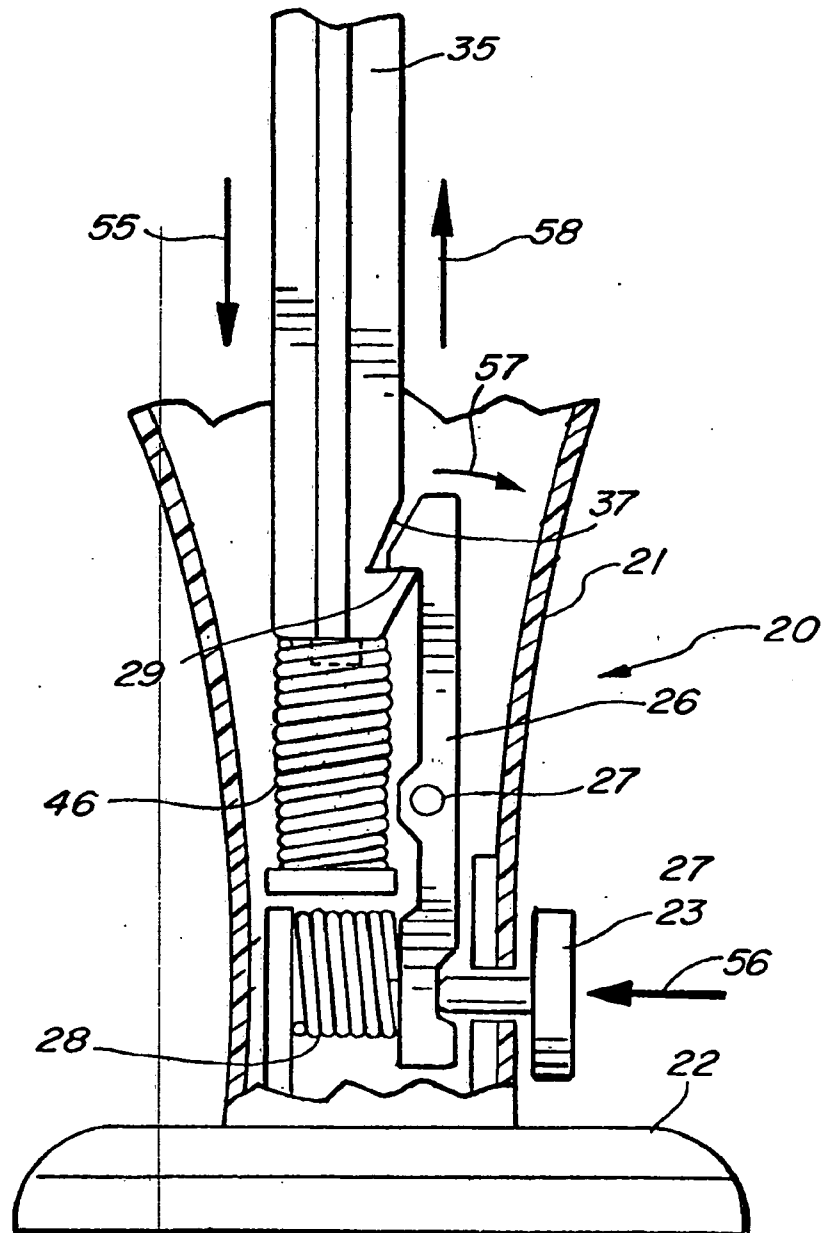


FIG. 4

