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Silverglate et al.(10) **Pub. No.: US 2006/0128253 A1**(43) **Pub. Date: Jun. 15, 2006**(54) **FLYING TOY SYSTEM**(76) Inventors: **Steven A. Silverglate**, Santa Cruz, CA
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PORTLAND, OR 97205-3335 (US)(21) Appl. No.: **11/341,072**(22) Filed: **Jan. 27, 2006****Related U.S. Application Data**(63) Continuation-in-part of application No. 10/777,507,
filed on Feb. 11, 2004, now Pat. No. 7,037,164.(60) Provisional application No. 60/447,055, filed on Feb.
12, 2003.**Publication Classification**(51) **Int. Cl.**
A63H 27/14 (2006.01)(52) **U.S. Cl.** **446/63**(57) **ABSTRACT**

A flying toy system is provided. The flying toy system typically includes a flying toy apparatus having a body, and a deployable accessory releasably coupled to the body of the flying toy apparatus by a coupling mechanism. The coupling mechanism is typically configured to hold the deployable accessory for an initial period of flight of the flying toy apparatus, and to release the accessory during a latter period of flight of the flying toy apparatus. The deployable accessory may be configured to travel independently of the flying toy apparatus following release.

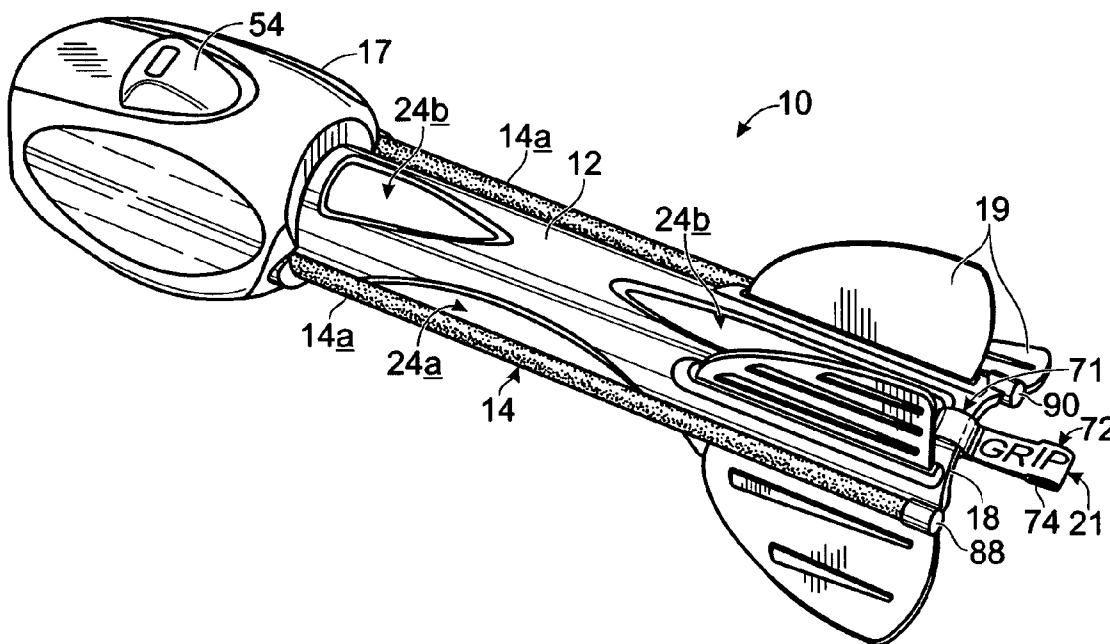


Fig. 1

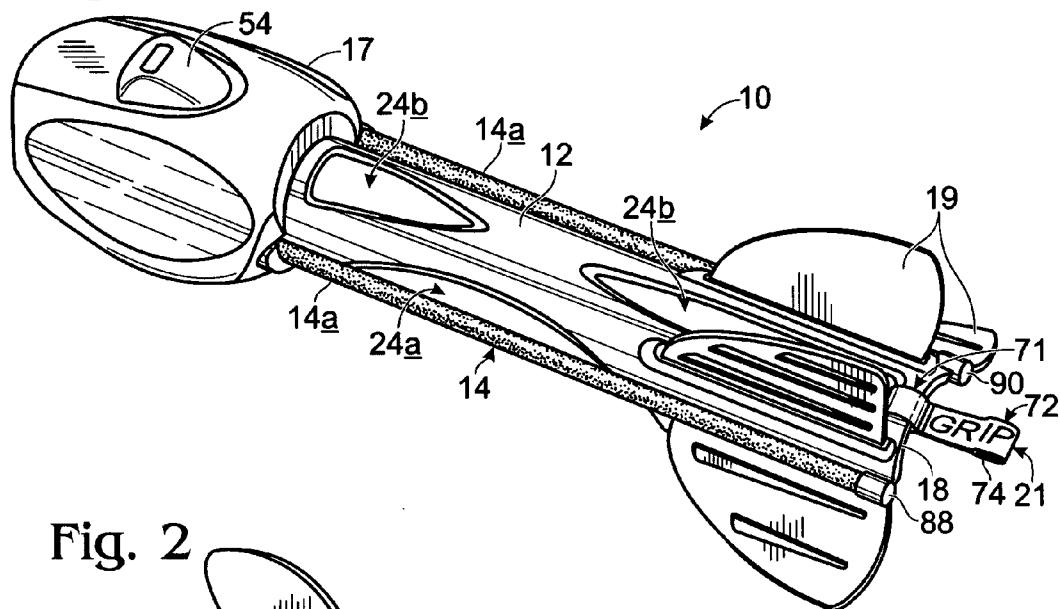


Fig. 2

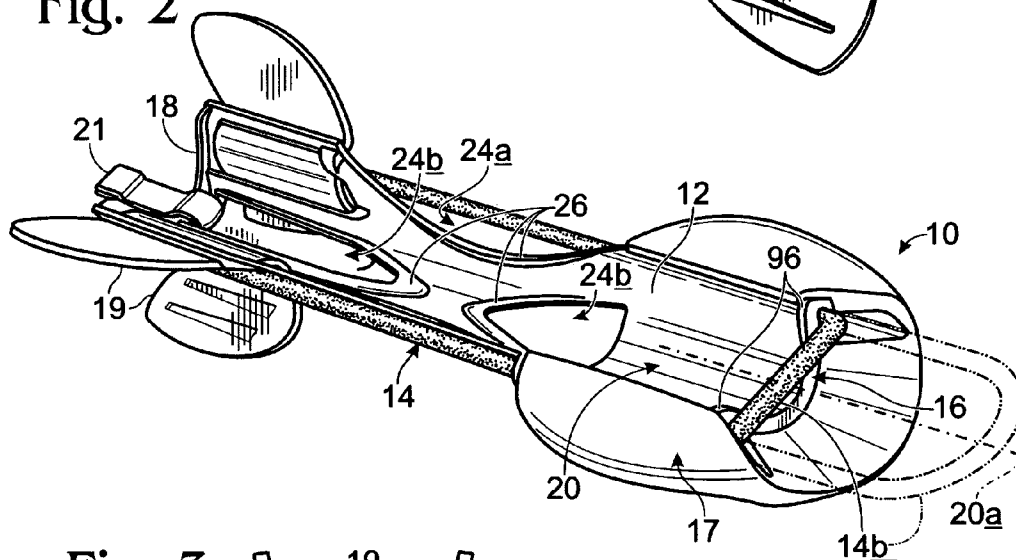
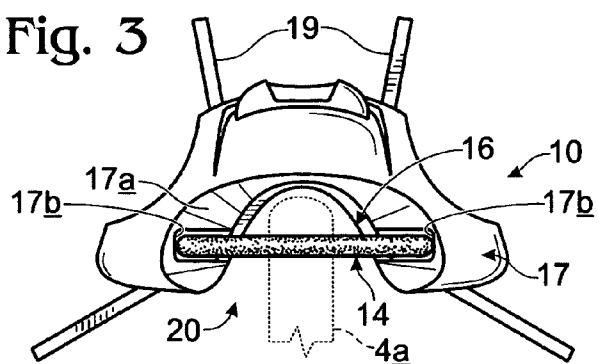
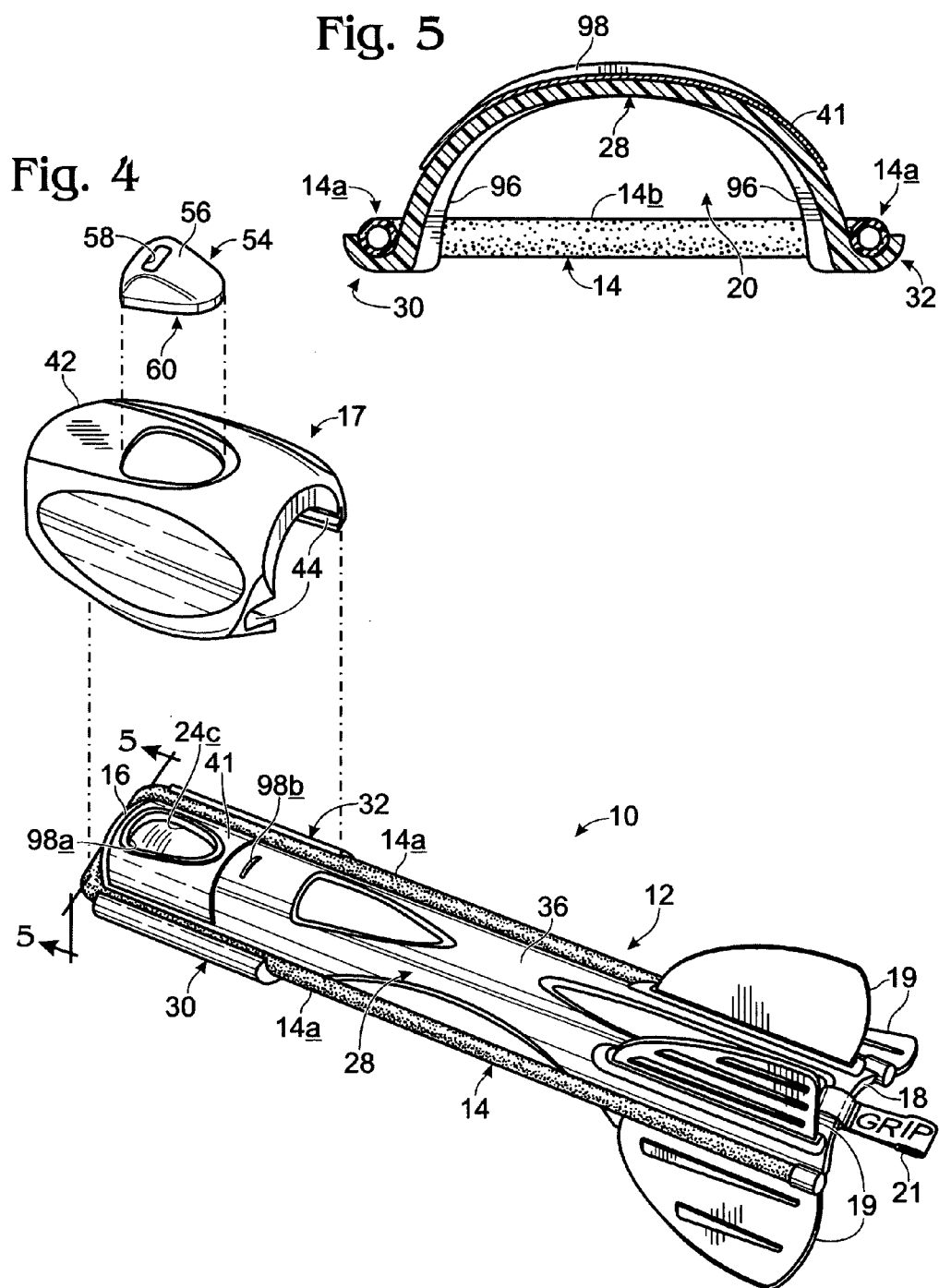
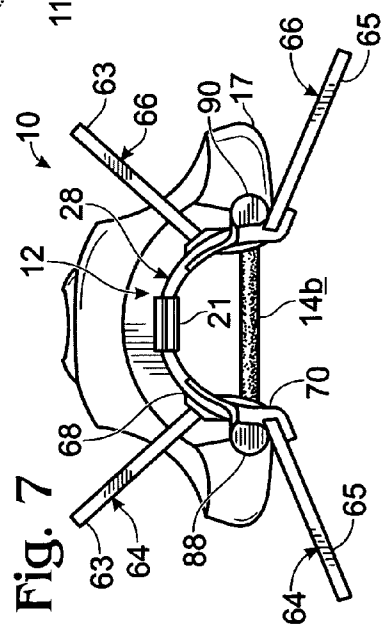
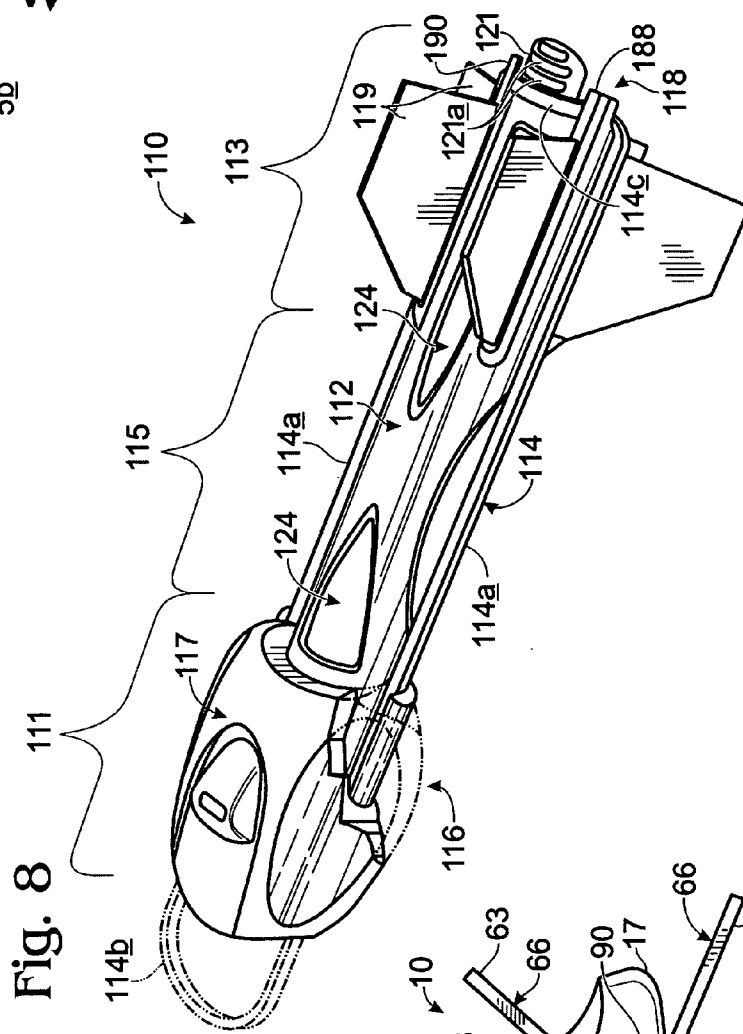
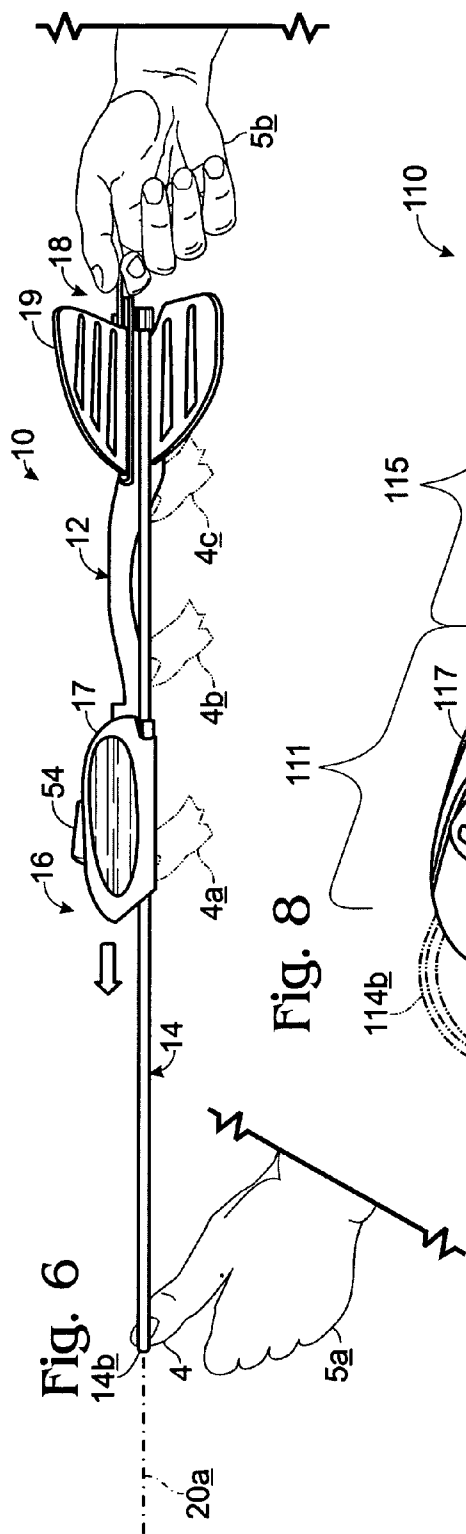


Fig. 3







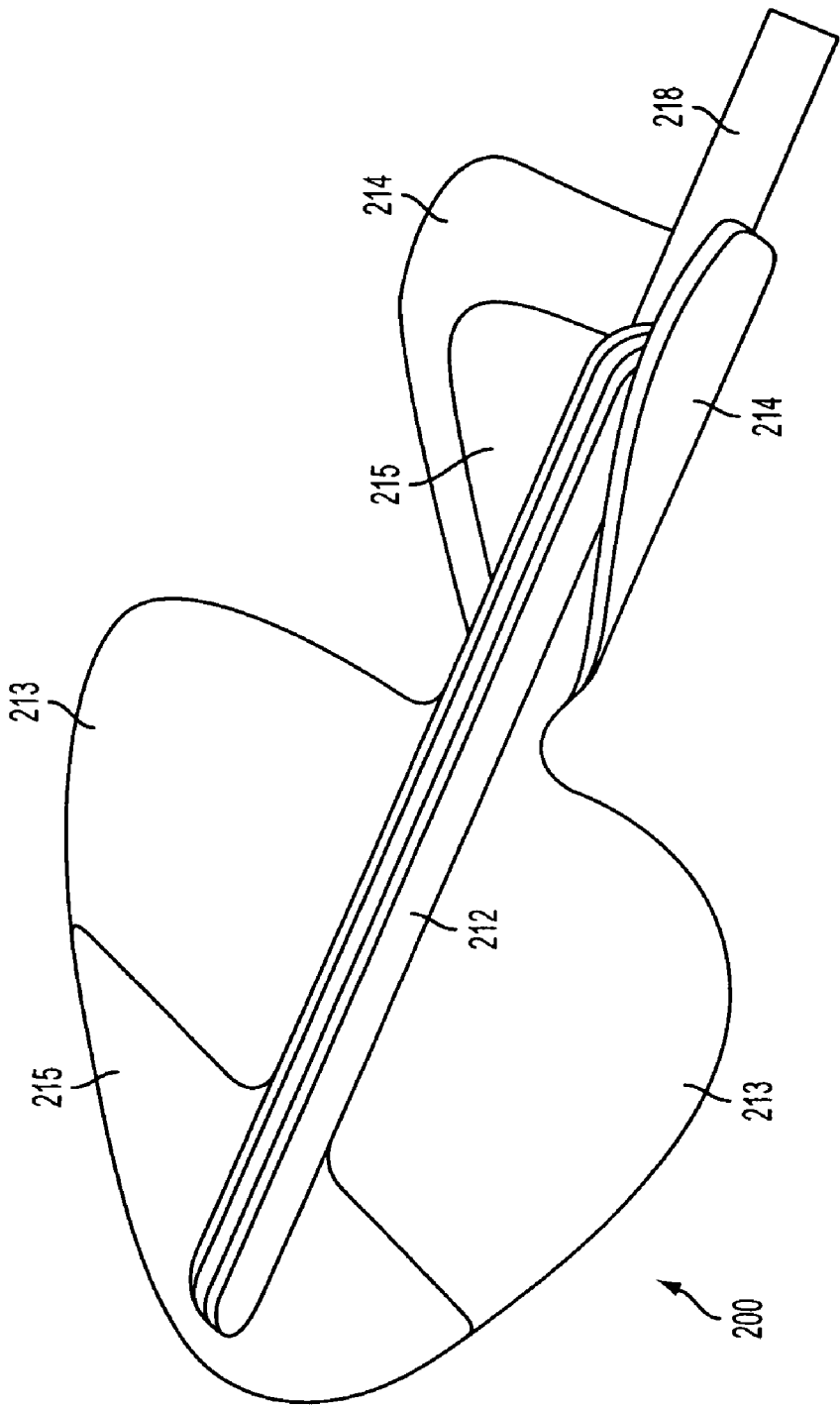


Fig. 9

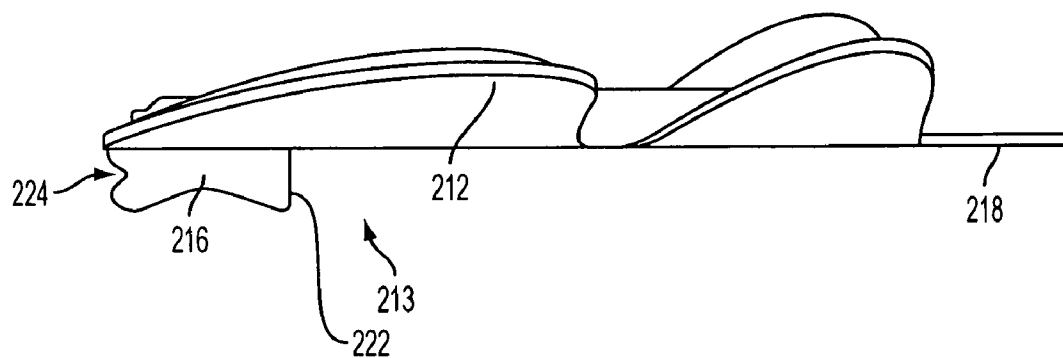


Fig. 10

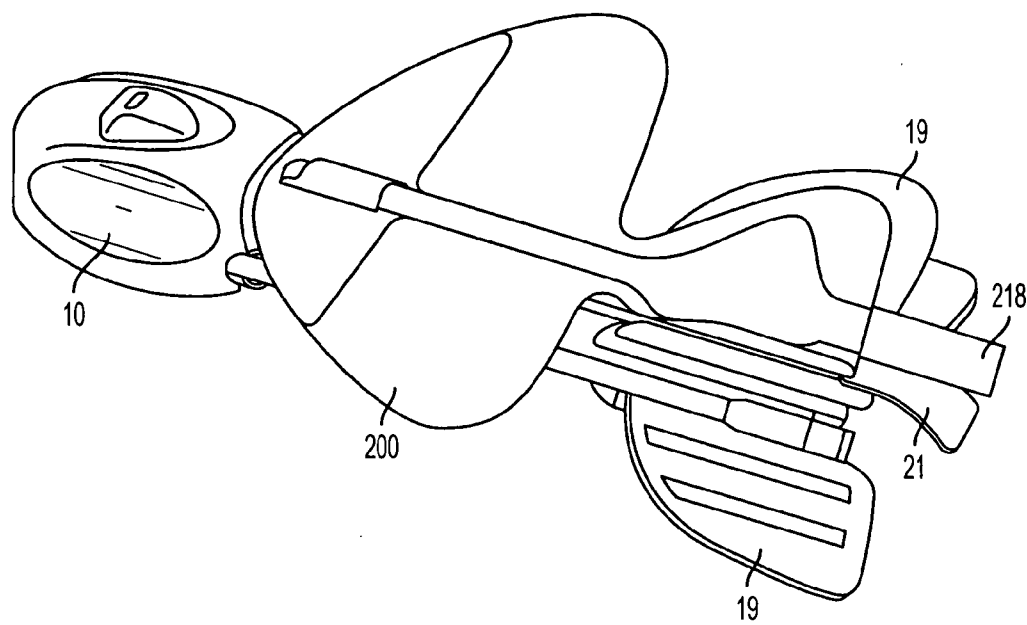


Fig. 11

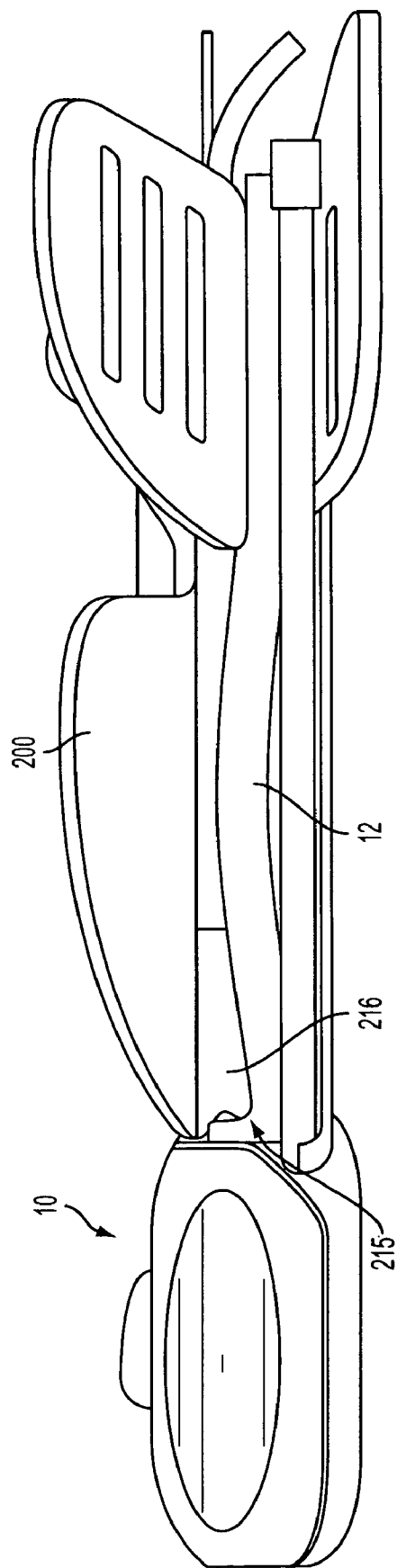


Fig. 12

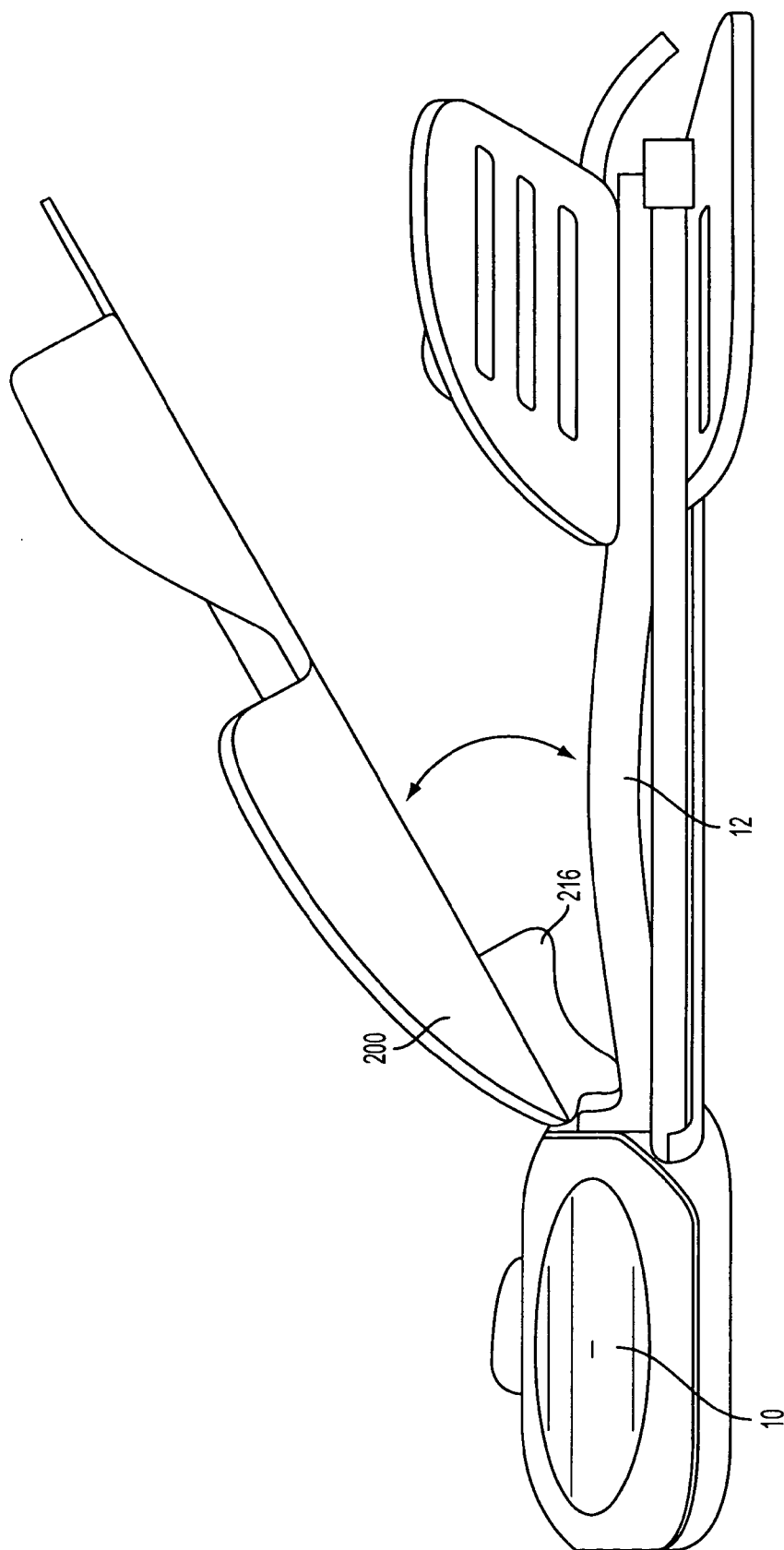


Fig. 13

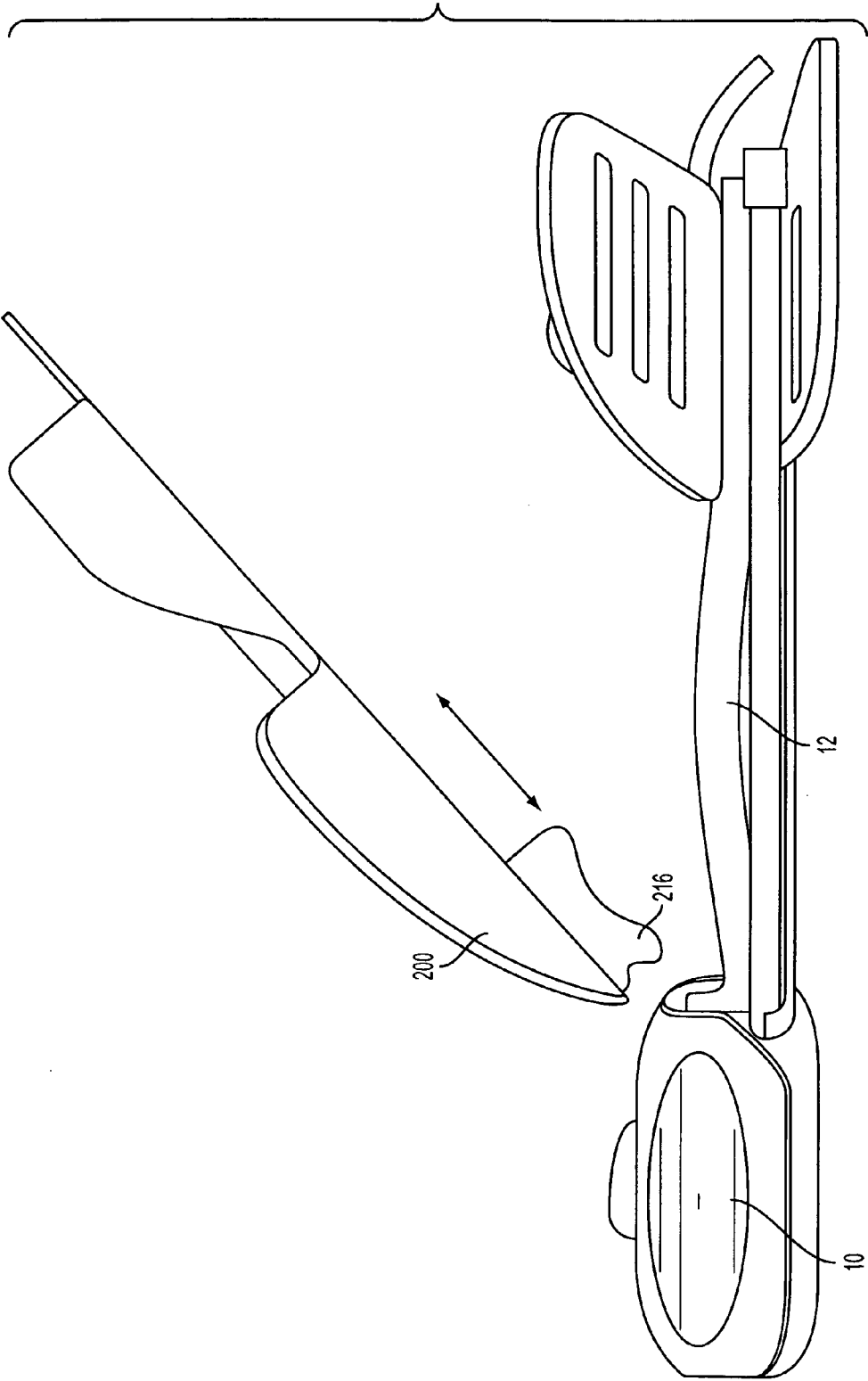


Fig. 14

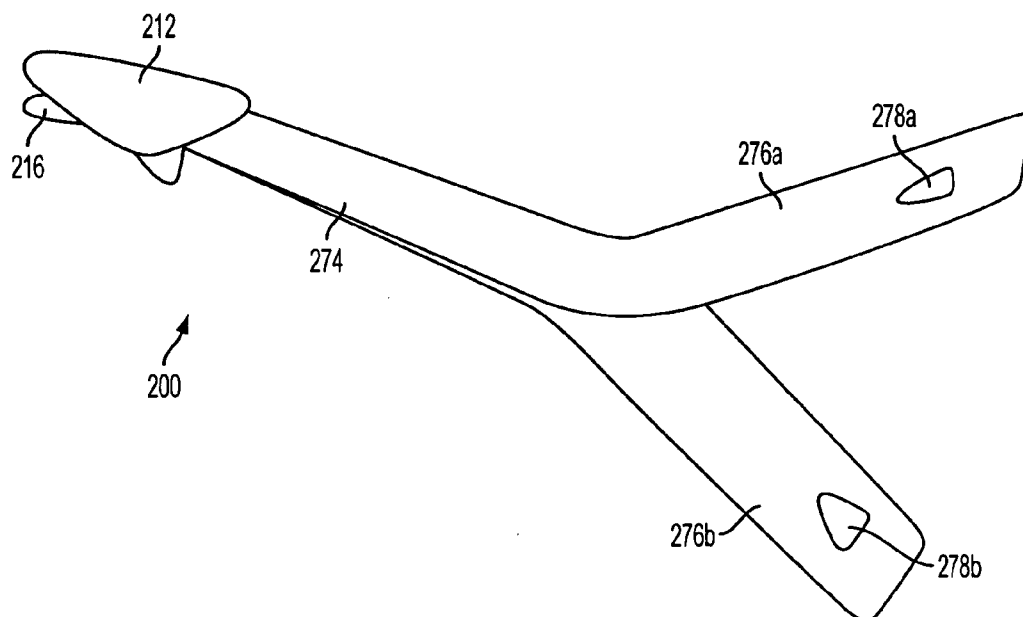


Fig. 15

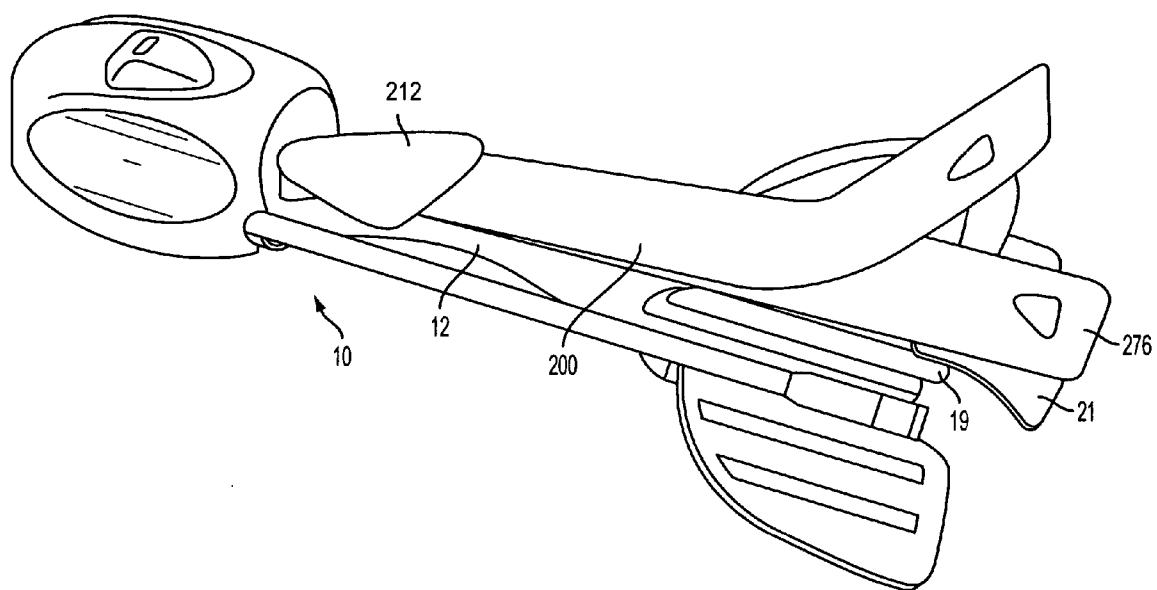


Fig. 16

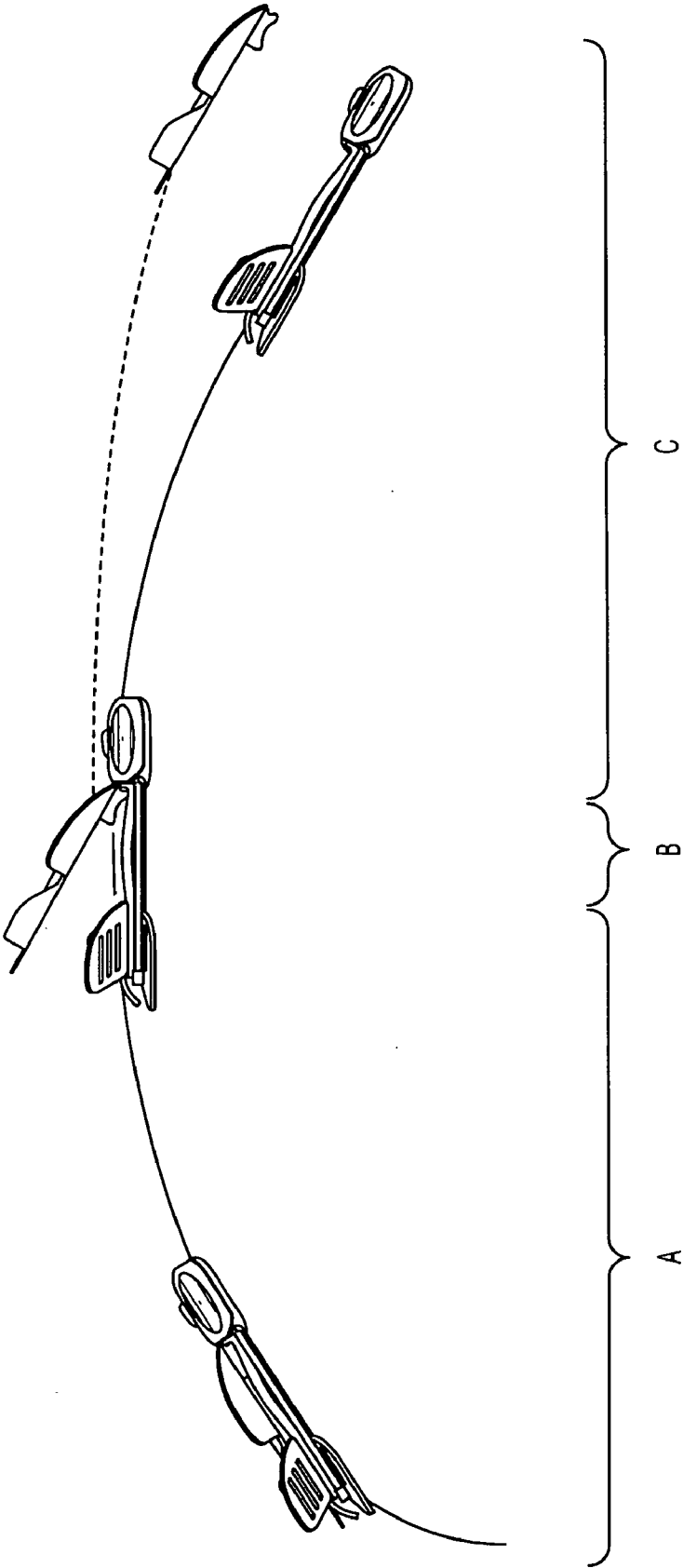


Fig. 17

FLYING TOY SYSTEM

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation-in-part of and claims priority to U.S. application Ser. No. 10/777,507, filed Feb. 11, 2004 and entitled "Flying Toy Apparatus," which in turn claims priority to U.S. Provisional Application Ser. No. 60/447,055, entitled "Flying Toy Apparatus," which was filed on Feb. 12, 2003. The entire disclosures of each of these applications is hereby incorporated by reference.

BACKGROUND

[0002] Both children and adults alike have enjoyed playing with a variety of hand-launched flying objects over the years. Perhaps the simplest of these objects, rubber bands, provide for a quick launch, but do not glide well and often painfully smack into a finger or thumb during launch. Toy gliders, such as paper airplanes, and their more sturdy balsa wood and plastic cousins, are typically configured to be thrown by a user and gently glide back to the ground.

[0003] To take advantage of the quick acceleration provided by rubber bands, certain prior art toy gliders have included a separate catapult launch unit formed by an elastic band secured to a stick. To launch the glider with the catapult launch unit, the user temporarily attaches a free end of the elastic band to a single attachment point on the glider, holds the stick in one hand via an outstretched arm, and pulls the glider back with the other hand until the elastic band is taut. The user next releases the glider, sending it catapulting toward the stick. With luck, the glider will miss the stick and be successfully launched. Unfortunately, luck does not always prevail, and the glider often crashes into the stick or hand of the user. This experience can be frustrating, and tends to decrease the enjoyment of these devices by users.

SUMMARY

[0004] A flying toy system is provided. The flying toy system typically includes a flying toy apparatus having a body, and a deployable accessory releasably coupled to the body of the flying toy apparatus by a coupling mechanism. The coupling mechanism is typically configured to hold the deployable accessory for an initial period of flight of the flying toy apparatus, and to release the accessory during a latter period of flight of the flying toy apparatus. The deployable accessory may be configured to travel independently of the flying toy apparatus following release.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] **FIG. 1** is a perspective view of a flying toy apparatus according to one embodiment of the present invention, showing a top side of the flying toy apparatus.

[0006] **FIG. 2** is a perspective view of the flying toy apparatus of **FIG. 1**, showing a bottom side of the flying toy apparatus.

[0007] **FIG. 3** is a front view of the flying toy apparatus of **FIG. 1**.

[0008] **FIG. 4** is an exploded perspective view of the flying toy apparatus of **FIG. 1**.

[0009] **FIG. 5** is a cross-sectional view of the flying toy apparatus of **FIG. 1**, taken along line 5-5 in **FIG. 4**.

[0010] **FIG. 6** is a side view of the toy apparatus of **FIG. 1**, showing the flying toy apparatus held by a user prior to launch.

[0011] **FIG. 7** is a rear view of the flying toy apparatus of **FIG. 1**.

[0012] **FIG. 8** is a perspective view of a flying toy apparatus according to another embodiment of the present invention.

[0013] **FIG. 9** is a perspective view of a deployable accessory for a flying toy apparatus according to another embodiment of the present invention, showing a top side of the deployable accessory.

[0014] **FIG. 10** is a side view of the deployable accessory of **FIG. 9**.

[0015] **FIG. 11** is a perspective view of a flying toy system including the deployable accessory of **FIG. 9** coupled to the flying toy apparatus of **FIG. 1**, showing a top side of the deployable accessory.

[0016] **FIG. 12** is a side view of the flying toy system of **FIG. 11**.

[0017] **FIG. 13** is a side view of the flying toy system, in a partially uncoupled state.

[0018] **FIG. 14** is a side view of the flying toy system in a fully uncoupled state.

[0019] **FIG. 15** is a perspective view of another embodiment of a deployable accessory for a flying toy apparatus, showing a top side of the deployable accessory.

[0020] **FIG. 16** is a perspective view of a flying toy system including the deployable accessory of **FIG. 9** coupled to the flying toy apparatus of **FIG. 9**, showing a top side of the deployable accessory.

[0021] **FIG. 17** is a schematic view of an example flight path of the flying toy apparatus and corresponding deployable accessory.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0022] Referring first to **FIGS. 1-3**, a flying toy apparatus **10** is shown according to one embodiment of the present invention. Flying toy apparatus **10** typically includes a body **12** with an elastic launch member **14** coupled thereto. The body typically includes a leading portion **16**, a trailing portion **18**, and an elongate channel **20** formed intermediate the leading and trailing portions, along a longitudinal axis **20a** of the channel. A nose member **17** may be provided adjacent the leading portion, and fins **19** and a grip **21** may be provided at suitable locations on the body, such as adjacent the trailing portion. As shown in **FIG. 6**, elastic launch member **14** is typically configured to be stretched forward along longitudinal axis **20a** by a digit **4** of a first hand **5a** of a user, while a second hand **5b** holds grip **21**. The user may release the grip to launch the toy apparatus forward, along longitudinal axis **20a**, over the first hand of the user. Channel **20** is typically formed on the bottom surface of the body, in a downwardly facing orientation, and

is generally U-shaped and sized to accommodate passage of digit 4, as the hand of the user passes under the body during launch.

[0023] As shown in FIG. 5, body 12 typically includes an elongate arched portion 28, which defines channel 20. The arched portion, like the rest of body 12, is typically made of a rigid material, such as plastic, suitable to resist the forces of the elastic member and of impact. Typically, the arched portion is formed on a bottom of body 12, and oriented such that the channel opens downwardly. A curved wall of substantially uniform cross-sectional thickness typically forms elongate arched portion 28. Alternatively, it will be appreciated that the arched portion may be formed by a wall or other body of varying thickness, bordered by a curved bottom surface. Typically, the arched portion 28 and channel 20 extend substantially the entire length of a lower surface of the body. Alternatively, it will be appreciated that they may only extend a shorter distance, only partially along the lower surface of the body.

[0024] Body 12 also typically includes a plurality of openings 24a, 24b. Typically the openings are thru-holes that extend entirely through body 12. The position and size of the openings is typically selected to optimize strength, rigidity and weight distribution within toy apparatus 10. The openings also serve to decrease wind resistance, and improve the appearance of toy apparatus 10. Perimeter openings 24a are typically positioned on opposite sides of the body, and are formed so as to intersect the edge or perimeter of the body. Internal openings 24b are typically positioned on the top or at other locations within body 12. Openings 24a, 24b are typically provided with reinforced edges 26, to prevent buckling of the body on impact. Reinforced edges 26 are typically of uniform cross-sectional thickness, being formed by an inwardly sloping bevel on the outer surface of the body, and by a corresponding lip on the inner surface, which slopes into channel 20.

[0025] As shown in FIG. 4, body 12 also typically includes guides 30, 32 positioned on left and right sides of the body, respectively, adjacent the leading portion 16. Typically, guides 30, 32 are formed of upwardly facing curved portions, which curve in the opposite direction as arched portion 28. Guides 30, 32 are configured to guide elastic member 14 as it is stretched and released, while permitting free longitudinal stretching and sliding of the elongate member therein. Guides 30, 32 are typically configured to extend rearward to a location beyond the rearmost edge of nose member 17 as shown in the figures. While shown as attached to the sides of body 12, it will be appreciated that the guides may be attached to the bottom side of body 12, or may be formed in another location. While the guides are typically formed as open notches, it will be appreciated that they may be hollow tubes that completely encircle elastic member 14.

[0026] Elastic member 14 typically is formed of a predetermined length of flexible, elastic material, such as latex tubing. It will be appreciated that a variety of other elastic materials may be used. The portions of elastic member 14 positioned within guides 30, 32 and along the sides of the body are referred to as side portions 14a. A portion of the elastic member that spans the channel 20, as viewed from the front of the toy apparatus in FIG. 3, is typically referred

to as a spanning portion 14b. The ends of the elastic member 14 are typically secured on opposite sides of the channel, via anchors 88, 90.

[0027] Anchors 88, 90 are typically positioned on the body adjacent the trailing portion 18 such that the elastic member travels substantially the entire length of the body. It will be appreciated that the longer the elastic member, the greater its ability to store energy for launch. Typically, one anchor is provided on each side of channel 20. The anchors 88, 90 and guides 30, 32 are typically mounted lower than an apex of arched portion 28 of the channel, and above a bottom opening of the channel. The anchors 88, 90 and guides 30, 32 are typically positioned at substantially the same height relative to channel 20, such that the side portions 14a of elastic member 14 are substantially parallel with channel 20 when at rest. The height of anchors 88, 90 and guides 30, 32 are typically identical to the height of longitudinal axis 20a, as viewed from a side of the toy apparatus.

[0028] Nose member 17 is typically mounted to the body adjacent a leading portion 16 of the body, and adjacent a front opening of channel 20. The nose member is typically made of resilient, impact absorbing material, such as foam. Typically, a closed-cell or self-skinning foam is used, although a variety of other foams, as well as non-foam materials, may be used. Nose member 17 is configured to have a wide, rounded front face 42, which is soft and resilient to the touch. These features enable the nose member to absorb and distribute over a large area impact forces caused by the landing or collision of apparatus 10.

[0029] As shown in FIG. 3, the nose member may include a guide surface 17a extending forward of the front opening of the channel. The guide surface is typically configured to guide the passing digit of a user into the channel as the digit approaches the body during launch. The guide surface is generally funnel-shaped, having a forward opening that is somewhat wider than the front opening of the channel. The guide surface tapers from the wide forward opening, to the narrower opening into channel 16.

[0030] As shown in FIG. 4, nose member 17 may further include mounting sleeves 44. Sleeves 44 are configured to mount to the first and second lateral edges 30, 32, during assembly of the apparatus. Nose member 17 and body 12 are typically assembled by aligning the front edges of the guides 30, 32 with the rear openings of the sleeves 44. Nose member 17 is subsequently pulled over body 12, causing the guides to slide into the sleeves. Sleeves 44 of nose member 17 may act to retain side portions 14a of elastic member 14 in their respective guides 30, 32. Alternatively, it will be appreciated that nose member 17 may not include sleeves 44. Rather, nose member 17 may rest on a top surface 36 of arched portion 28 and be secured by an adhesive or other means. It will be appreciated that nose member 17 and body 12 may include mating grooves and flanges, such as 98, 98a, and 98b, which assist in properly aligning and assembling flying toy apparatus 10. Adhesives may also be used to join nose member 17 to body 12.

[0031] Holes 17b are typically provided in guide surface 17a, on respective sides of channel 20, as viewed from the front of the apparatus. Elastic member 14 is configured to extend through each of the holes into guides 30, 32. Spanning portion 14b is configured to span the distance between

the holes when the elastic member is at rest in a retracted state. The longitudinal axis **20a** is typically centered at the midpoint of spanning portion **14b**. As shown in **FIG. 2**, spanning portion **14b** is configured to rest against a resting flange **96** on the leading portion of body **12**, when in the retracted state. As shown at digit position **4a** in **FIGS. 3 and 6**, a user's digit **4** may be positioned within the channel, behind the spanning portion, in the retracted state. The inside surface of the channel is configured to accommodate the digit in position **4a**. From this position, the user may stretch the elastic member forward to an extended configuration parallel to the longitudinal axis **20a**, shown in dashed lines in **FIG. 2** and in **FIG. 6**, to begin the launch process.

[0032] Nose member **17** may also include a whistle **54**, as shown in **FIG. 4**. Whistle **54** is typically positioned adjacent a mounting structure **24c** on a top surface **36** of the arched portion **28**, adjacent leading portion **16**. The mounting structure typically includes a lip surrounded by a well. Alternatively, whistle **54** may be disposed on the upper surface of nose member **17**, or at another suitable location on apparatus **10**. Typically whistle **54** is positioned at a highest point of nose member **17**, as viewed from the front, for optimal air flow past the whistle. Whistle **54** may extend downward through nose member **17** to mount to arched portion **28** of body **12**, surrounding mounting structure **24c**. Whistle **54** typically includes a whistle body **56**, a whistle slot **58**, and a whistle cavity **60** formed by whistle body **56** and the well of the mounting structure on the top surface **36** of arched portion **28**, when the whistle is installed. The mounting structure **24c** and whistle body **56** are typically glued together to adequately seal acoustic whistle cavity **60**. The location of the whistle on the apparatus, as well as the shape of the whistle body and cavity may be varied to adjust the sound of the whistle during flight.

[0033] To improve flight performance, the body may include a weight **41** coupled thereto. The weight is typically mounted adjacent leading portion **16** of the body, but alternatively may be positioned at another location on the body. The weight is typically sized such that after installation the center of gravity of the apparatus is located approximately one third of the distance from the leading portion to the trailing portion such that the center of gravity is well forward of the center-of-effort (center-of-pressure), as discussed in detail with references to **FIG. 8**, below. Of course, the center of gravity may be positioned in other positions, in order to achieve desired flight characteristics.

[0034] Flying toy apparatus **10** may further include a plurality of flexible fins **19** disposed adjacent the trailing portion **18** of the body **12**. In the depicted embodiment, four fins are provided that are made of two pieces of foam that lock into the body **12** without the need for adhesive, forming the horizontal and vertical stabilizers of the flying toy apparatus. Typically, the fins are formed of soft and/or flexible materials, such as foam or plastic. The fins may be manufactured of a material that temporarily holds a bent shape, such that the fins can be temporarily bent by the user to change the flight pattern of flying toy apparatus **10**. For example, if all of the fins **19** are bent in a similar manner in the same direction, flying toy apparatus **10** may spin in flight.

[0035] One or more of the plurality of fins **19** may further include a plurality of elongate grooves **62** extending sub-

stantially parallel to elongate passage **20**, for styling and/or functionality. In addition to giving the toy apparatus a more streamlined appearance, elongate grooves **62** further stabilize the fins **19** even after storage or rough play by preferentially causing the fins to bend along the longitudinal axis such that the fins still provide for flight stability.

[0036] Fins **19** are typically provided in pairs **64**, **66**, formed in respective unitary structures. As shown in **FIG. 7**, first pair of fins **64** is typically a single element that begins as a top left fin **63** above the top surface **36** of body **12**, and passes through a slot **68** formed on an upper left rear portion of body **12**, before turning sharply to pass back through a second slot **70** formed on a lower left rear portion of body **12**, and extending to form a bottom left fin **65** of the pair **64**. It will be appreciated that second pair of fins **66**, including a top right fin and bottom right fin, is formed of a similar structure on the right side of toy apparatus **10**. Slots **68**, **70** are typically sized and oriented to cause a sharp bend in the fins, thereby securing fins in place. Similar slots are provided in corresponding locations on the right side of the structure.

[0037] Grip **21** is typically a flexible fabric grip and is coupled to trailing portion **18** of body **12**. Alternatively, it will be appreciated that grip **21** may be made of other flexible or inflexible materials, such rubber or plastic, and may be positioned at other locations on toy apparatus **10**. Grip **21** is typically formed of a single length of material **72** folded back on itself and joined to form a first loop **71** encircling a bar formed in trailing portion **18**, and a second loop **74** configured to be gripped by a user.

[0038] As discussed above, flying toy apparatus **10** may be launched by pulling on and releasing grip **21**. Second loop **74** may facilitate gripping by providing a section of material that may be gripped between, for example, a thumb and a forefinger. The distal end of the grip is typically enlarged. This enlargement may be accomplished, for example, by forming the loop **74** with a segment of fabric, and tucking the ends of the fabric under prior to joining at the distal end, so that there are four layers of fabric joined together to form the enlarged portion, rather than just two layers as in the remaining portions of grip **21**. Grip **21** is typically provided on the body in a location adjacent channel **20**, such that the user may pull rearward on the grip in a direction substantially in-line with longitudinal axis **20a**. Other forms of grip may be provided, as shown in **FIG. 8**, or alternatively, a grip may be omitted and the user may directly grip the trailing portion of body **12**, fins **19**, etc.

[0039] The operation of flying toy apparatus **10** will now be described with reference to **FIG. 6**. Initially, the user inserts a digit **4** of first hand **5a** into elongate passage **20** at the position shown at **4a**, and grasps grip **21**. The user stretches the elongate member from the retracted state, to the extended state shown in **FIG. 6**. The user next aims the flying toy apparatus **10** in the desired direction and releases the grip to launch the flying toy apparatus **10**. The potential energy stored in the extended elastic member **14** propels body **12** in the direction of the elongated elastic member.

[0040] The flying toy is launched forward and travels along the longitudinal axis **20a**. As the flying toy apparatus **10** is being launched over the digit **4** of the user, the digit is allowed to pass through channel **120**, as shown at positions **4b** and **4c**, thereby avoiding a full frontal collision between

the digit and the body **12**. Typically, the digit passes through the channel without impacting nose member **17** at all. Under certain launch conditions, however, the digit may be arrive at the entrance to the channel slightly off the longitudinal axis **20a**. Under these conditions, guiding surface **17a** of the soft and funnel-shaped nose member **17**, is configured to guide the digit safely into the channel. In this manner, the apparatus protects the user from painful impacts associated with prior devices.

[0041] After launch, the elastic member returns to the retracted, streamlined state. To distribute and absorb the impact of the elastic member after it is released and returns to the retracted position, body **12** is provided with resting flanges **96** along a front surface of the body, as shown in **FIGS. 2 and 5**. Resting flanges **96** broaden the area of impact between spanning portion **14b** and leading portion **16**, and help to prevent damage to the elastic member.

[0042] Upon landing, the impact of nose member **17** with the landing area may press nose member **17** against leading portion **16** of body **12**. As shown in **FIG. 5**, to distribute and absorb forces associated with the impact of nose member **17** with the landing surface, a nose flange **98** may be provided on top surface **36** of arched portion **28**. Nose flange **98** may be configured to project upward away from top surface **36** at leading portion **16** of arched portion **28**. Like resting flanges **96**, nose flange may be configured to broaden the area of impact between nose member **17** and leading portion **16**. Additionally, nose flange **98** may be configured to assist in securing weight **41** and nose member **17** in their proper positions. Other flanges, shown at **98a** and **98b**, may also be provided for gripping into the nose member from the body and preventing slipping therebetween.

[0043] Referring to **FIG. 8**, a flying toy apparatus according to another embodiment of the present invention is shown generally at **110**. Flying toy apparatus **110** is similar to flying toy apparatus **10**, except as described differently below. Like numbered parts are numbered similarly. For the sake of brevity, similarities will not be re-described in detail.

[0044] Flying toy apparatus **110** typically includes a body **112**, elastic member **114**, nose member **117**, and fins **119**. Elastic member **114** is typically a continuous loop elastic member, such as a rubber band. Alternatively, looped elastic members of other materials may be used. Elastic member **114** is configured to loop around both a leading portion **116** and a trailing portion **118** of body **112**. Elastic member **114** typically includes a spanning portion **14b**, and side portions **14a**, which may be positioned in guides, as described above.

[0045] Elastic member **114** further includes a rear bridging portion **14c**, which is configured to travel under extensions **188**, **190**, and over grip **121**, to thereby travel up and over the channel. In this orientation the elastic member **114** does not interfere with the passage of a digit through the channel. The elastic member is tightly but not fixedly coupled to the body, to allow for stretching of the elastic member though the guides and around extensions **188**, **190** and grip **121**. While typically the entirety of elastic members **114**, **14** are made from elastic material; it will be appreciated that the elastic member may include both elastic portions and inelastic portions.

[0046] Flying toy apparatus **112** also typically includes a grip **121**. Grip **121** is typically a plastic tab extending from

the trailing portion **118** of the body **112**. The grip includes several regions of enlargement, namely, ribs **121a**, which facilitate a sure grip by the user. While typically positioned adjacent the trailing portion **116** above the channel in body **112**, it will be appreciated that grip **121** alternatively may be positioned at other locations on body **112**.

[0047] Flying toy apparatus **110** has a center of gravity and a center of effort. Flying toy apparatus **110** may be configured with the center of gravity disposed substantially forward of the center of effort, at least prior to launch of the flying toy apparatus **110**. Flying toy apparatus **110** may be configured to have a leading segment **111**, a trailing segment **113**, and an intermediate segment **115** therebetween. According to one embodiment of the present invention, the mass of the leading segment **111** may be configured to be substantially equal to the mass of trailing segment **113** and intermediate segment **115** combined. This weight distribution may also be applied in apparatus **10**. Of course, a wide variety of other weight distributions are also possible.

[0048] Furthermore, in addition to the rocket-shaped embodiments shown in **FIGS. 1-8**, flying toy apparatus **110** may be configured to resemble other spacecraft and flying machines, such as airplanes, gliders, helicopters, missiles, space shuttles, satellites, flying saucers, etc., and may include wings for a more glider-like flight path. Alternatively, flying toy apparatus **110** may be configured to resemble fictional characters, or flying creatures such as birds, bats, and flying squirrels. Further, while the nose member, body, and fins of the present invention are shown as discrete parts that are assembled together to form the flying toy apparatus, it will be appreciated that these parts may be formed in a unitary structure, for example, by molding a common material for all parts, or co-molding of different materials for each part. The present invention has industrial applicability to the toy industry. The above-described embodiments provide a flying toy apparatus that reduces undesirable launch impacts associated with prior devices, and provides the convenience of an integrated launch system. Because no separate launch system is required, the toy apparatus of the present invention may be used in games of catch between two or more persons, without each person having to carry a separate launcher. Also, there are no separate pieces that might be lost and thus cause the flying toy apparatus to be inoperable.

[0049] As shown in **FIGS. 9-17**, the flying toy apparatus described above may be configured to receive a deployable accessory. As described below, the deployable accessory is configured to be launched coupled together with the flying toy apparatus, and to travel independently of the flying toy apparatus following release.

[0050] **FIGS. 9 and 10** show an example deployable accessory according to one embodiment of the present invention. Deployable accessory **200** may be formed as a glider, and may include a body **212** that is constructed from a suitable material such as resilient foam, plastic, or balsa wood. Body **212** typically includes one or more wings **213**, and tail fins **214**. The wings typically extend laterally outward from a central region of the body, and the fins typically extend outward and upward, at an angle. Other angles and orientations are also possible for the wings and fins. It should be appreciated that the body shown in **FIG. 9** including the associated wings, fins and tail portions can be

formed from a single piece of material. Alternatively, these parts may be formed separately and joined together.

[0051] Further, deployable accessory 200 may also include a reinforcing structure 215. The reinforcing structure shown in FIG. 9 may be configured as a thin layer used to add additional support and/or mass to various portions of body 212. For example, a forward reinforcing structure 215 of FIG. 9 is configured to add reinforcing support to a nose and to the leading edge of wings 213, and rear reinforcing structures 215 are configured to reinforce a portion of tail fins 214. Furthermore, the reinforcing structure may also serve as a central supporting member as shown in FIG. 9 disposed along the length of body 212.

[0052] Deployable accessory 200 may include a grip 218 coupled to a trailing portion of body 200. As shown in FIG. 9, grip 218 can be formed from an extension of reinforcing structure 215, thereby reducing the total number of separate pieces used to form deployable accessory 200. Alternatively, the grip may be formed of a separate piece of material attached to the body. Grip 218 can be constructed in a similar manner and of a similar material as described above with reference to grip 21 of flying toy apparatus 10. Alternatively, grip 218 may be constructed from a clear plastic material, thereby enabling a user to view and align grip 21 when aligned with grip 218 as will be described below with reference to FIG. 11.

[0053] Deployable accessory 200 may be coupled to a body portion of flying toy apparatus 10 by a coupling mechanism 213, as discussed below. The coupling mechanism 213 can include a protrusion 216 and an opening configured for releasable engagement. Typically, protrusion 216 may be disposed on a bottom surface of the accessory body and the opening can be disposed on an upper surface of the flying toy accessory. However, it will be appreciated that protrusion 216 may be disposed on the flying toy accessory and the corresponding opening may be disposed on the deployable apparatus. As shown in FIG. 10, protrusion 216 may further include a rear edge 222 and a notch 224 located along the front edge of the protrusion. As will be described below in greater detail, protrusion 216 may be inserted into a corresponding opening in flying toy apparatus 10, thereby engaging coupling mechanism 215.

[0054] FIG. 11 shows a perspective view of a flying toy system, including the deployable accessory 200 coupled to the flying toy apparatus 10. As described above, deployable accessory 200 may be coupled to flying toy apparatus 10 by the coupling mechanism 215, described above. Further, fins 19 of flying toy apparatus 10 can be configured as a guide structure used to further align deployable accessory 200 along the center of the flying toy apparatus when coupled. For example, as shown in FIG. 11, the rear tail portion of the deployable accessory can be adapted to reside between fins 19 when coupled. During engagement of the coupling mechanism, grip 21 and grip 218 may be configured to be positioned adjacent each other and aligned, thereby enabling a user to easily grasp both grips during the launch operation described above.

[0055] Referring now to FIGS. 12-14, deployable accessory 200 is shown in varying states of engagement with flying toy apparatus 10. FIG. 12 shows protrusion 216 inserted into opening 24b (see FIG. 1) in body 12 of flying toy apparatus 10. For example, notch 224 of protrusion 216

can be adapted to accept a front lip of the opening, while rear edge 222 is held against a rear edge of the opening in body 12, thereby engaging the coupling mechanism. It will be appreciated that longitudinal movement of the deployable accessory 100 relative to the flying toy apparatus 10 is inhibited in this engaged configuration.

[0056] FIGS. 13 and 14 show one example of how deployable accessory 200 may be uncoupled during flight. For example, during an initial period of flight, rear edge 222 may be adapted to be held against the rear edge of the opening by a rearward force due to the flow of air against the deployable accessory and/or acceleration due to launch. During this initial period of flight, the deployable accessory is held in the configuration shown in FIG. 12. During a latter period of flight, the rear edge of the protrusion can be released from the rear edge of the opening, thereby enabling the protrusion to partially disengage from the opening while the notched portion of the protrusion can then rotate relative to the front edge or lip of the opening, as shown in FIG. 13. The release of the rear edge 222 from the rear edge of the opening may occur, for example, when forward acceleration forces are reduced, lowering the frictional forces between rear edge 222 and the rear edge of the opening. Next, the force of air acting against the deployable accessory can cause the flying toy apparatus and the deployable accessory to completely separate to a fully disengaged configuration, as shown in FIG. 14. It should be appreciated that the disengagement process as described above can be facilitated by a variety of forces during flight. For example, the wings may be configured to receive lift which can cause deployable accessory 200 to rotate relative to flying toy apparatus 10. Drag can cause additional translation, thereby causing the coupling mechanism formed by protrusion 216 and opening 24b to become disengaged.

[0057] Likewise, the deployable accessory can be coupled to the flying toy apparatus by reversing the order used for uncoupling the accessory. For example, a user may first insert the notched portion of the protrusion into the opening such that the lip of the opening is received by the notch as shown in FIG. 13. Next, the rear edge of the protrusion may be lowered into the opening, thereby engaging the coupling mechanism. Fins 219 of the flying toy apparatus can be configured to guide the deployable accessory into place for engagement of the coupling mechanism. Additionally, the deployable accessory can be further held in place during launch by the user holding together grips 218 and 21.

[0058] Deployable accessory 200 can be formed in a variety of shapes configured to perform a variety of functions. For example, FIG. 15 shows a second embodiment of deployable accessory 200 having a body portion 212, protrusion 216, and a tail 274. Protrusion 216 formed is formed similarly to the above described embodiment. Further, tail 274 can be divided into two or more tail portions 276a and 276b each having one or more openings 278a and 278b, respectively. Tail portions 278a and 278b and their respective openings can form blades that are scored and angled relative to each other to provide auto-rotation of deployable accessory 200 after being released from the flying toy apparatus, thereby simulating a helicopter, for example. Such auto-rotation of deployable accessory 200 can result in a decelerated decent, thereby providing a flying action that is different from flying toy apparatus 10.

[0059] FIG. 16 shows the deployable accessory of FIG. 15 coupled to flying toy apparatus 10 in a similar manner as described above with reference to FIGS. 11-12. Likewise, the deployable accessory of FIG. 15 can also be coupled and uncoupled from flying toy apparatus 10 as described above with reference to FIGS. 12-14.

[0060] FIG. 17 shows an example flight path of the flying toy apparatus and corresponding deployable accessory. It will be appreciated that FIG. 17 is a schematic view and is not drawn to scale. It has been observed, for example, that launch angles of close to vertical often provide superior performance of the deployable accessory. During an initial period of flight (period A) the deployable accessory can be coupled to the flying toy apparatus as described above with reference to FIGS. 11 and 12. The coupling mechanism may be configured to remain engaged during the initial period of flight following launch. At a latter period of flight (period B), such as at the apogee of the flight path, for example, the coupling mechanism can become disengaged as described above with reference to FIGS. 13 and 14. As the deployable accessory is uncoupled from the flying toy apparatus, they may each achieve independent flight during a final period of flight (period C). While the example presented above with reference to FIG. 17 shows deployment of deployable accessory at a specific period or location during flight, the coupling mechanism can also be configured to become disengaged before or after the apogee of the flight path. In some examples, the period or location of release may be dependant at least partially upon the manner in which the user launches the flying toy apparatus and coupled deployable accessory.

[0061] The above embodiments are merely exemplary, and it should be appreciated that numerous variations in form and structure are possible. For example, the elastic launch member 14 may be included in a launch system that is removably coupled to the flying toy apparatus.

[0062] Although the invention has been disclosed in its preferred forms, the specific embodiments thereof as disclosed and illustrated herein are not to be considered in a limiting sense, because numerous variations are possible. The subject matter of the invention includes all novel and non-obvious combinations and sub-combinations of the various elements, features, functions, and/or properties disclosed herein. The following claims define certain combinations and sub-combinations of features, functions, elements, and/or properties that are regarded as novel and non-obvious. Other combinations and sub-combinations may be claimed through amendment of the present claims or presentation of new claims in this or a related application. Such claims, whether they are broader, narrower, equal, or different in scope to any earlier claims, also are regarded as included within the subject matter of the invention.

What is claimed is:

1. A flying toy system, comprising:

a flying toy apparatus having a body; and

a deployable accessory releasably coupled to the body of the flying toy apparatus by a coupling mechanism that is configured to hold the deployable accessory for an initial period of flight of the flying toy apparatus, and to release the accessory during a latter period of flight of the flying toy apparatus;

wherein the deployable accessory is configured to travel independently of the flying toy apparatus following release.

2. The flying toy system of claim 1, wherein the coupling mechanism is configured to be released by action of air upon the deployable accessory during flight.

3. The flying toy system of claim 2, wherein the release occurs substantially at the apogee of flight of the flying toy apparatus.

4. The flying toy system of claim 1, wherein the coupling mechanism includes a protrusion and an opening configured for releasable engagement.

5. The flying toy system of claim 4, wherein the protrusion of the coupling mechanism includes a rear edge configured to be held against a rear edge of the opening by rearward force on the accessory during the initial period of flight, thereby preventing disengagement of the coupling mechanism during the initial period of flight.

6. The flying toy system of claim 5, wherein the rear edge of the protrusion and the rear edge of the opening are configured to disengage during the latter period of flight, thereby enabling the protrusion to partially disengage from the opening.

7. The flying toy system of claim 5, wherein the protrusion further includes a notch configured to engage a front lip of the opening, and wherein partial disengagement is caused by rotational movement of the notch relative to the lip.

8. The flying toy system of claim 7, wherein the protrusion is configured to release from the lip following partial disengagement, under action of air on the deployable accessory.

9. The flying toy system of claim 1, further comprising an elastic launch member coupled to the body of the flying toy apparatus and configured to be stretched forward in the longitudinal direction by a user.

10. The flying toy system of claim 9, further comprising a grip attached to at least one of the flying toy apparatus and the deployable accessory.

11. The flying toy system of claim 10, wherein the grip is a first grip attached to the flying toy accessory and wherein the flying toy system further comprises a second grip attached to the deployable accessory.

12. The flying toy system of claim 9, wherein the coupling mechanism is configured to be engaged by a user prior to launch via the elastic launch member.

13. The flying toy system of claim 12, wherein the flying toy apparatus includes at least two tail fins, and wherein the tail fins form a guiding structure for mounting the deployable accessory.

14. The flying toy system of claim 1, wherein the deployable accessory is configured to glide after said release from the flying toy apparatus.

15. The flying toy system of claim 1, wherein the deployable accessory is configured to auto-rotate after said separation from the flying toy apparatus.

16. The flying toy system of claim 1, wherein the deployable accessory includes at least a body and a protrusion disposed on the body and configured to releasably engage an opening on the body of the flying toy apparatus, and wherein the body further includes a wing structure.

17. The flying toy system of claim 1, wherein the flying toy apparatus further includes a launch system configured to launch the body.

18. The flying toy system of claim 17, wherein the launch system includes an elastic member.

19. A deployable accessory for use with a flying toy apparatus, comprising:

an accessory body; and

a coupling mechanism disposed at least partially on the accessory body and configured to releasably couple the accessory body to the flying toy apparatus;

wherein the coupling mechanism is configured to release the deployable accessory from the flying toy apparatus during flight.

20. The deployable accessory of claim 19, further comprising a grip coupled to a rear portion of the accessory body.

21. The deployable accessory of claim 19, wherein the accessory body includes a wing structure that is configured to glide after being released during flight.

22. The deployable accessory of claim 19, wherein the accessory body is configured to auto-rotate after being released during flight.

23. The deployable accessory of claim 19, wherein the coupling mechanism includes a protrusion projecting down-

ward from the bottom of the accessory body, wherein the protrusion has a notched front edge and a flat rear edge.

24. A toy flying toy system, comprising:

a flying toy apparatus including a body;

an elastic launch member coupled to the body and configured to be stretched forward in a longitudinal direction along the body; and

a deployable accessory releasably coupled to the body of the flying toy apparatus, wherein the deployable accessory is configured to be released from the body during flight.

25. The flying toy system of claim 24, wherein the body includes an elongate channel formed therein, the channel extending in a longitudinal direction along the body, wherein the channel is substantially barrier free along an entire length of the channel to accommodate passage of the digit therein during launch of the body over the digit.

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