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TOY

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Fig. 1

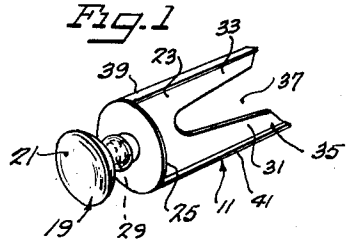
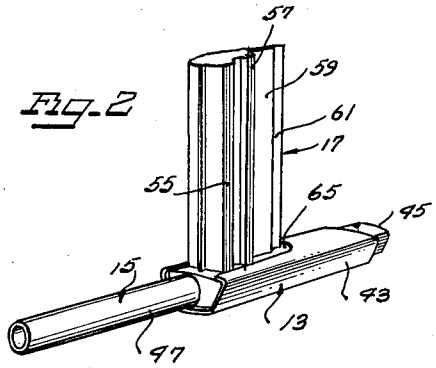


Fig. 2



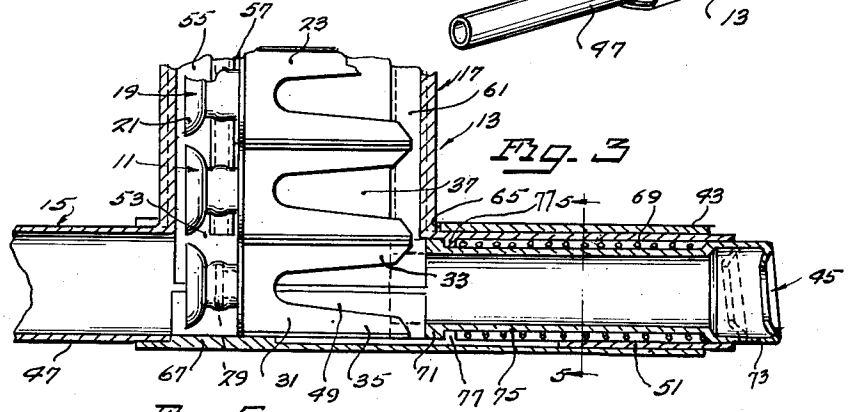


Fig. 3

Fig. 6

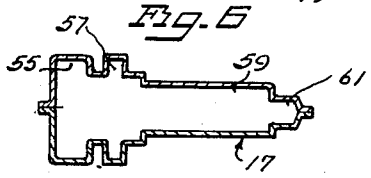


Fig. 4

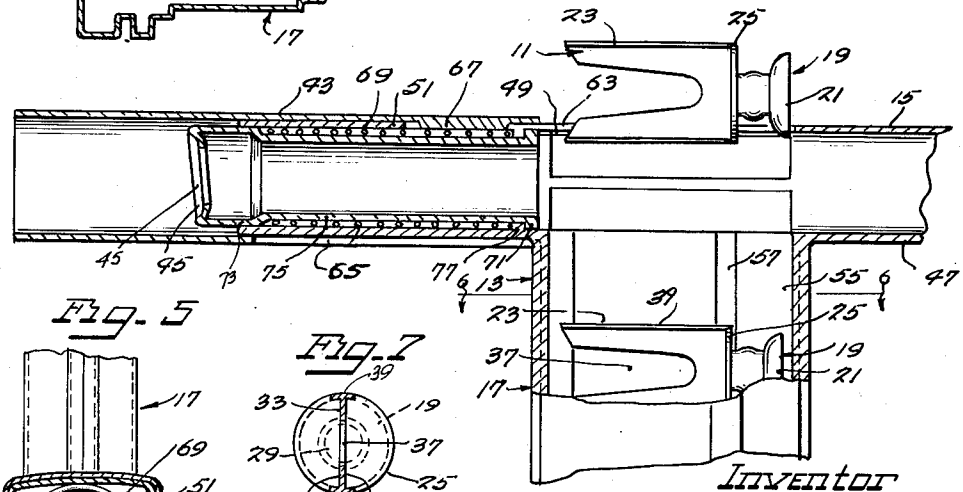


Fig. 5

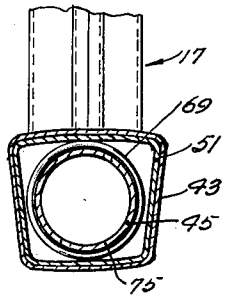


Fig. 7

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The present invention relates generally to darts and means for accurately delivering such darts. More particularly, this invention is directed to the combination of a novel suction cup-tipped dart, and an improved blow gun for firing these darts.

Accordingly, the main object of the present invention is the provision of a novel dart which includes a forwardly disposed suction cup and which is intended for use in combination with an improved blow gun designed for effective and accurate delivery of the darts. Further objects of this invention are the provision of a suction cup-tipped dart having guidance means for delivering the dart free of interfering engagement between the suction cup and the blow gun, the provision of a blow gun having means for delivering several of such darts from a magazine in single fashion or in continuous succession, and the provision of a blow gun and darts of the type characterized above which are of exceedingly inexpensive construction. Other objects and advantages of the present invention will be understood by reference to the following description and the accompanying drawings, wherein there is illustrated and described a dart and blow gun constructed in accordance with the present invention.

In the drawings:

FIGURE 1 is a perspective view of the novel dart construction which incorporates various of the features of the present invention;

FIGURE 2 is a perspective view of a blow gun embodying various features of this invention;

FIGURE 3 is an enlarged, broken away and partially sectioned view of the blow gun in firing position;

FIGURE 4 is a view similar to FIGURE 3, illustrating the mode of loading the blow gun;

FIGURE 5 is a sectional view taken along line 5—5 of FIGURE 3;

FIGURE 6 is a sectional view taken along line 6—6 of FIGURE 4; and

FIGURE 7 is a sectional view of the dart shown in FIGURE 1.

Illustrated generally in FIGURES 1 and 2 are a suction cup-tipped dart 11 and a blow gun 13 which embody the features of the present invention, and which are intended for use in cooperation with one another to provide an improved and inexpensive dart throwing combination. As shown, the blow gun 13 includes generally a tube or barrel 15 through which the darts are discharged from the gun, and a magazine 17 which is designed for storing several darts. The construction of the darts and blow gun cooperate to permit selective discharge of the darts, either one at a time or in a rapid succession in a machine gun-like fashion and also to provide for reliable relatively frictionless discharge of the suction cup-tipped darts incident to the passage of a rapidly traveling stream of air through the barrel. This latter feature is accomplished, in part, by forming the darts to avoid any contact or interference between the suction cup head and the interior wall of the barrel. Smooth transit of the dart through the

barrel nad highly reliable flight characteristics are also achieved by locating the center of gravity of the dart in close proximity to the point of application of the propelling stream of air to thereby impart motion to the dart with little or no tendency toward cocking during travel.

Considering now the construction of the dart 11 in greater detail, the dart, as shown in FIGURES 1, 3 and 4, comprises a forwardly disposed suction cup 19 which is formed of rubber-like material with a head 21 having a diameter less than that of the barrel 15 to provide clearance therebetween and to preclude interfering contact of the suction cup with the barrel during discharge. Rearwardly extending from the suction cup in axial alignment therewith is an after section 23 formed of a light plastic material and comprising a thin, circular disc or piston 25 against which the propelling stream of air acts, and a rearwardly projecting guidance portion designed to steady the travel of the dart through the barrel as well as in flight. The piston 25 is formed with a diameter affording smooth, sliding engagement with the inner wall of the barrel, and with a centrally located and forwardly projecting hub 29 upon which the suction cup 19 is seated. The guidance portion in this embodiment comprises a thin, unitary fin 31 which does not significantly disturb or affect the flow of air directed against the piston 25, and which is formed with upper and lower wings 33 and 35, formed as a result of a forwardly directed and centrally located, generally wedge shaped cut-out indicated by the reference numeral 37. In order to insure alignment of the dart with the barrel during discharge, each of the wings 33 and 35 is formed with an outer diametrically opposed and rearwardly extending edge surface 39 and 41 respectively, which constitute a continuation of opposed segments of the outer peripheral surface of the piston 25 and which are, therefore, spaced one from the other at a distance corresponding to the diameter of the piston. These surfaces 39 and 41 act in sliding cooperation with the inner wall of the barrel to prevent any misalignment of the dart during travel through the barrel and resultant, possible interference by engagement of the suction cup head with the interior wall of the barrel.

As shown particularly in FIGURE 7, the wings 33 and 35 are preferably formed so that the rearwardly extending outer edge surfaces 39 and 41 extend laterally to either side of the central web of the fin 31 to thereby produce a formation of T-shaped cross section extending transversely of each of the outer edge surfaces 39 and 41. This construction provides increased fin rigidity, and also acts to afford an increased measure of flight stability.

A further important feature provided by the disclosed construction is the location of the center of gravity of the dart in close proximity to, and preferably just forwardly of the area of impact by the propelling stream of air. The location of the center of gravity will, of course, be determined by the shape and weight of the materials employed. As disclosed, the use of a light weight plastic to form the after section 23 permits a relatively long after section providing the desired guidance without substantially increasing the weight of the dart and still affording location of the center of gravity within the thin piston 25 just rearwardly of the relatively heavy suction cup and in very close proximity to the rear face of the piston against which the propelling air stream acts. Moreover, by the simple expedient of enlarging or de-

creasing the form of the cut-out 37 between the fin wings, it is possible to quite accurately locate the center of gravity within the confines of the thin plastic wall.

As noted before, the illustrated blow gun is especially designed for use in cooperation with a plurality of the above described darts, and includes the previously-mentioned barrel 15 and magazine 17, and in addition, a slide or housing 43, which is movable lengthwise relative to the barrel to enable loading of the darts in the gun, and a mouthpiece 45 which has a length greater than the distance between opening 53 and the rear end of the barrel 51 and is also operably movable relative to the barrel to permit discharge of the darts either singly, or in machinegunlike series incident to forceful oral exhalation into the mouthpiece.

The barrel 15 is inexpensively fabricated of plastic, and as shown in the drawings, includes a forwardly extending discharge portion 47 of circular cross section, an intermediate breech 49 from which the magazine 17 extends, and a rearwardly disposed portion 51 of generally boxlike formation which receives the mouthpiece 45.

The magazine 17 is formed integrally with the barrel in radially extending relation to the breech 49 and is also formed to accommodate storage within the blow gun of a plurality of darts in aligned relationship with one another and with the barrel for proper entry into the breech prior to firing. As illustrated, the magazine 17 is closed at its outer or free end and communicates at its other end with the breech 49 through an opening 53 in the tubular wall of the barrel.

In order to position the darts in proper orientation for entry into the breech, the magazine is formed, as shown in FIGURE 6, with a hollow, irregular cross section corresponding roughly to the outline of the dart when seen with the fin in parallel relation to the line of sight. In this connection, there is provided a forwardly located channel 55 adapted for general enclosure of the suction cup, a slot 57 adapted to engage the outer margins of the piston, and a rearwardly directed recess 59 having a portion 61 designed for sliding engagement with the side surfaces of the rearward wing tips to position the darts in alignment with their fins lying in a plane extending radially from the breech.

Loading of the magazine is afforded by forming the breech 49 with an aperture 63 in opposed relation to the magazine by which, when the slide 43 is rearwardly disposed, the darts may be passed through the breech and into the magazine.

In this regard, the slide 43 is also fabricated of plastic and is molded in a generally tubular formation with a box-like cross section for telescopic engagement with the outer wall of the rearward barrel portion 51 for movement between a forwardly disposed firing position, as seen in FIGURE 3, and a rearwardly located loading position, as seen in FIGURE 4. To enable movement of the forward portion of the slide into the firing position in surrounding relation to the breech, the upper wall of the slide is formed with a rearwardly extending notch 65 affording passage of the slide past the magazine. When in the firing position, the lower wall of the slide 43 covers the loading aperture 63 in the breech to prevent dropping of the darts out of the gun and acts to align the darts in the breech with the barrel, despite the interruption of the barrel wall resulting from the aperture 63, by the formation on the inner surface of the lower slide of a longitudinally disposed ledge 67 having an upper surface in alignment with the wall of the barrel. Thus, when in the breech, the dart is properly aligned by engagement of the piston along three surfaces, that is, along the ledge 67, and along the curved portions on each side of the barrel formed at the intersection of the magazine 17 and the breech 49. Of course, the rearward barrel portion 51 is suitably slit to provide for entry of the ledge 67 when the slide is rearwardly located to permit loading of the magazine.

In connection with the initial dart movement, the location of the dart center of gravity assists materially in achieving smooth exit of the dart out of the breech and into the forwardly extending discharge portion of the barrel. During this transition, the travel of the dart is guided by the blow gun principally by the engagement of the piston along the three lines of support, as just explained, and the guiding effect of the fin is reduced due to the absence of a complete tubular wall formation. Thus, the stability resulting from the close proximity of the dart center of gravity to the rear piston face, against which the propelling air stream acts, materially reduces the possibility of misalignment and substantially contributes, in cooperation with the three point guidance afforded the piston, to achieve smooth entrance into the forward portion of the barrel and prevention of initial interfering contact of the suction cup with the interior barrel wall.

Discharge of the darts through the barrel, either singly or in rapid succession is accomplished by directing a stream of air through the mouthpiece 45 which comprises a generally cylindrical unit telescopically engaged with the inner walls of the rearward barrel portion 51. In this regard, the mouthpiece is urged rearwardly by means of a spring 69 to a position clear of the breech opening 53 to afford rapid, successive delivery of a series of darts from the barrel. However, the barrel and mouthpiece are movable toward one another against the action of the spring 69, so as to move the forward end of the mouthpiece into the breech for engagement with the wing tip of the dart in the breech to position this dart somewhat forwardly and to engage the under surface of the lower wing of the next successive dart to prevent its movement into the breech thereby enabling single discharge of the darts from the blow gun.

More particularly, the mouthpiece is formed with a forward and rearward flange 71 and 73 which, as shown in FIGURE 5, are in four-point linear engagement with the inner wall of the rearward barrel portion 51, and which define therebetween a central section 75 having an outer surface of somewhat reduced diameter to provide room for locating the spring 69. Formed on the inside of the rearward barrel portion 51 is an inwardly directed series of lugs 77 against one side of which the forward flange 71 of the mouthpiece 45 is engageable to limit its rearward movement. The other side of the lugs 77 acts as a seat against which the forward end of the spring 69 is engaged, while the other end of the spring is in engagement with the side wall of the rearwardly disposed mouthpiece flange 73.

In operation, the blow gun may be loaded by inverting the gun so that the magazine 17 is in downward depending relation to the barrel 15, by positioning the slide 43 rearwardly to expose the breech aperture 63, and then dropping a succession of darts in alignment through the breech and into the magazine. After filling the magazine with darts, the slide 43 is then repositioned forwardly to cover the dart loading aperture 63, and the gun is again held with the magazine 17 extending upwardly to afford discharge of the darts from the magazine into the breech by means of gravity. The darts may be expelled in rapid succession from the breech by a long, forceful stream of air directed through the mouthpiece when the mouthpiece is in the rearward position shown in solid line in FIGURE 3. In this instance, as each dart clears the breech and enters the discharge portion of the barrel under the influence of a stream of air, the next succeeding dart will automatically fall into place in the breech and will be expelled by the action of the air stream.

When desiring to expel the darts one at a time, the barrel may be moved rearwardly toward the mouthpiece by grasping either the barrel or the magazine, and moving it against the action of the spring 69 toward the operator. In this condition, shown in dotted outline in FIGURE 3, the forward end of the mouthpiece is extended into the

breech 49, moving the loaded dart somewhat forwardly and engaging the undersurface of the next dart to prevent its dropping into the breech after firing of the previously loaded dart. After the loaded dart is expelled, the barrel may be allowed to return to its normal position relative to the mouthpiece to permit the next dart or the next succeeding darts, as desired, to enter the breech for single or series discharge.

The dart and blow gun construction described above provides a novel and inexpensive combination for use in connection with various target games or the like, as well as in many other circumstances. Although the constructions of the dart and blow gun disclosed have been designed for particular use in conjunction with one another, it is evident that the features of each may also be respectively incorporated in connection with other types of darts and with blow guns for delivery of other forms of missiles. In addition, the disclosed dart may also be effectively used with other forms of blow guns.

Numerous changes and modifications may be made in the present disclosure to achieve certain of the features mentioned herein without departing from the principles of the present invention. Various features of the invention are set forth in the appended claims.

I claim:

1. A blow gun comprising an elongated cylindrical barrel having an opening therein spaced from the rear end thereof, a dart magazine on said barrel communicating with said opening for affording passage of darts from said magazine to said barrel, and a tubular elongated mouthpiece having one end telescopically engaged with said rear end of said barrel and having the other end thereof extending outwardly from the rear of said barrel for engagement by the mouth of the user to direct a stream of air through said barrel, said mouthpiece having a length greater than the distance between said opening in said barrel and the rear end of said barrel, said mouthpiece being movable axially of said barrel between a first position wherein said one end of said mouthpiece is spaced from said opening and a second position wherein said one end of said mouthpiece blocks said opening to prevent passage of darts therethrough.

2. A blow gun comprising an elongated cylindrical barrel having an opening spaced from the rear end thereof, a dart magazine on said barrel communicating with said opening for affording passage of darts from said magazine to said barrel, a tubular elongated mouthpiece having one end telescopically engaged with said rear end of said barrel and having the other end thereof extending outwardly from the rear of said barrel for engagement by the mouth of the user to direct a stream of air through said barrel, said mouthpiece having a length greater than the distance between said barrel opening and the rear end of said barrel, said mouthpiece being movable axially of said barrel between a first position wherein said one end of said mouthpiece is spaced from said opening and a second position wherein said one end of said mouthpiece blocks said opening to prevent passage of darts therethrough, and means urging said mouthpiece toward one of said positions, whereby said mouthpiece may be engaged by the mouth of the user and caused to move relative to said barrel to provide a controlled succession of darts for individual firing from the blow gun.

3. A dart blow gun comprising an elongated hollow barrel having an opening therein spaced from the rear end thereof, a plurality of darts, a dart magazine on said barrel in communication with said opening for affording individual passage of said darts from said magazine to said barrel, a tubular elongated mouthpiece having one end telescopically engaged with said rear end of said barrel and having the other end thereof extending outwardly from the rear of said barrel for engagement by the mouth of the user to direct a stream of air through said barrel, said mouthpiece having a length greater than the distance between said barrel opening and the rear end of said barrel, said mouthpiece being movable axially of said barrel between a first position and a second position, means urging said mouthpiece toward said first position, and means operated by the movement of said mouthpiece for controlling the passage of darts through said opening, said controlling means permitting passage of said darts through said opening when said mouthpiece is in said first position and blocking said opening to prevent passage of said darts when said mouthpiece is in said second position.

4. A dart blow gun set comprising an elongated hollow barrel having an opening therein spaced a predetermined distance from the rear end thereof, a plurality of darts, each of said darts comprising a suction cup, and an after section attached in axial alignment to said suction cup, said after section being proportioned so as to slidably move within said barrel and to maintain said dart in axial alignment with said barrel during said movement, said after section including a thin, solid plate proportioned to fit within the barrel for receiving the impact of a propelling jet of air and rearwardly extending means for affording guidance to the travel of said dart, said suction cup being sufficiently small to move within said barrel without touching the walls thereof, said suction cup and said after section being proportioned to position the center of gravity of said dart in close proximity to said solid plate, a dart magazine on said barrel communicating with said opening for affording passage of darts from said magazine to said barrel, means in said magazine engaging said darts and maintaining them so that said darts will pass into said barrel axially aligned therewith, and locate therein without said suction cup contacting the walls of said barrel, and a tubular elongated mouthpiece having one end telescopically engaged with the rear end of said barrel and having the other end thereof extending outwardly from the rear of said barrel for engagement by the mouth of the user to direct a stream of air through said barrel, said mouthpiece being of a length greater than said predetermined distance and being movable axially of said barrel between a first position wherein said one end of said mouthpiece is spaced from said opening and a second position wherein said one end of said mouthpiece blocks said opening to prevent passage of darts therethrough.

5. The combination of a plurality of darts and a blow gun for delivering said darts, said blow gun comprising an elongated cylindrical barrel having an opening therein spaced from the rear end thereof, a dart magazine on said barrel communicating with said opening for affording passage of darts from said magazine to said barrel, and a tubular elongated mouthpiece having one end telescopically engaged with said rear end of said barrel and having the other end thereof extending outwardly from the rear of said barrel for engagement by the mouth of the user to direct a stream of air through said barrel, said mouthpiece having a length greater than the distance between said opening in said barrel and the rear end of said barrel, said mouthpiece being movable axially of said barrel between a first position wherein said one end of said mouthpiece is spaced from said opening and a second position wherein said one end of said mouthpiece blocks said opening to prevent passage of darts therethrough, and said darts each comprising a suction cup and an after section attached to said suction cup and an axial alignment therewith, each of said suction cups having a diameter less than the diameter of said tube to provide clearance between the interior wall of said barrel and said suction cups, and each of said after sections including a transversely disposed wall having a diameter affording slidable engagement with the interior wall of said barrel and rearwardly directed fin means affording positive alignment of said darts in said barrel to prevent interfering contact between said suction cups and said barrel during discharge of said darts, said suction cups and said after sections being proportioned to position the center

of gravity of each dart in close proximity to its transversely disposed wall.

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