TOY AIR GUN

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ABSTRACT

A toy air gun featuring a magazine detachably mounted to the gun for sequentially urging pellets into a chamber contained therein, a hollow cylinder provided at the forward end thereof with a nozzle and being operatively mounted for sliding movement within the gun between a first position wherein the nozzle is positioned rearwardly of that part of the chamber into which the pellets are fed and a second position wherein the nozzle extends within the barrel of the gun, the cylinder normally being urged to its second position by a spring, a piston mounted within the cylinder, the inoperative position of a trigger mechanism formed as a part of the gun holding the piston in its rearward position, the piston normally being urged to move forwardly within the cylinder and a slide mechanism operatively mounted to the gun such that as the child moves same rearwardly, the cylinder is caused to move rearwardly eventually contacting and forcing the piston rearwardly to its cocked position, after which the cylinder returns to its forward position moving a pellet introduced from the magazine into the chamber of the gun, after which actuation of the trigger mechanism releases the piston to move forwardly within the cylinder forcing air normally contained therein outwardly through the nozzle causing the pellet to be propelled out of the barrel of the gun.

5 Claims, 5 Drawing Figures
TOY AIR GUN

BACKGROUND OF THE INVENTION

The present invention relates generally to toy guns wherein air is used to propel a harmless pellet. The present invention is characterized by its simplicity in construction, reliability of use and safety standards.

SUMMARY OF THE INVENTION

The toy air gun of the present invention is designed to stimulate the amusement of the child by permitting harmless pellets contained within a detachably mounted magazine to be automatically and sequentially raised into the chamber of the gun by pumping a slide action mechanism. Air, forced from a cylinder and accelerated through a nozzle, is used to propel the harmless pellets. More specifically, a hollow cylinder provided at its forward end with a nozzle is mounted for sliding movement within the gun casing. A hollow piston, in turn, is slidably mounted within the cylinder. The hollow piston is mounted on an elongated guide located within the gun casing and a spring is positioned between the guide and the piston for the purpose of normally urging the piston forwardly within the cylinder. As the slide mechanism of the gun is pulled rearwardly by the child, the cylinder is forced backwardly into engagement with the piston which, in turn, is forced rearwardly until fixedly secured by the action of a latch mechanism formed as an integral part of the trigger mechanism. As the slide lever is released, the cylinder is urged forwardly by a spring until the nozzle thereof contacts the uppermost pellet, which has automatically been delivered to the chamber, thereafter forcing same into the barrel of the gun. As the trigger is pulled, the piston lurches forward expelling the air within the cylinder through the reduced nozzle, at which time the resulting jet of air contacts the pellet propelling same forwardly through the barrel. Not only does the present invention simplify construction and operation of the gun, but, moreover, insures that only a predetermined amount of air can be expelled from the cylinder thus insuring that the length of flight of the pellet which is, of course, of the utmost importance when considered from a safety standpoint, is uniform. The pellets are soft plastic and are provided rearwardly with hollow portions into which the jet of air is directed.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevational view of the toy air gun illustrating the casing, barrel, trigger group, stock, slide mechanism and magazine;

FIG. 2 is a side elevational view of a portion of the toy air gun with part of its casing removed so as to expose the position of the component parts after a pellet has been propelled;

FIG. 3 is a side elevational view of a portion of the toy air gun with part of its casing removed illustrating the position of the component parts as the slide mechanism is moved rearwardly causing the cylinder to engage and eventually move the piston rearwardly until the latter is locked by the latching mechanism of the trigger;

FIG. 4 is a side elevational view of a portion of the toy air gun with part of its casing removed illustrating the position of the component parts after the piston has been cocked and the hollow cylinder and discharge nozzle have moved forwardly under the force of a restoring spring, it being apparent that the nozzle is thus caused to move the uppermost pellet into position within the barrel, it further being understood that actuation of the trigger mechanism causes the piston to move forwardly eventually assuming the position illustrated in FIG. 2 at which time air within the cylinder is expelled through the discharge nozzle propelling the pellet through the barrel; and

FIG. 5 is an exploded perspective view illustrating the uppermost portion of the magazine which is detachably mounted within a receiving section mounted within the gun casing.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The toy air gun is designated generally by the reference numeral 10 in FIG. 1 and comprises a casing 12 within which a barrel 14 is mounted. The stock 16 is appropriately secured to the casing 12. The reference numeral 18 designates generally the trigger mechanism. Detachably mounted to the casing 12 is a magazine 20 containing a plurality of harmless pellets 72 normally urged upwardly by the force of a spring. Mounted forwardly of the casing for pumping action is the slide mechanism 26. Movement of the slide mechanism 26 rearwardly automatically cocks the gun while introducing the uppermost of the pellets 22 into the chamber, as explained in detail hereinafter.

Turning now to FIG. 2, the reference numeral 28 designates a hollow, plastic cylinder provided forwardly with a discharge nozzle 30 of reduced dimension. When the gun is inoperative, the forward end of the nozzle 30 protrudes within the rearward end of the barrel 14. The cylinder 28 is provided with a downwardly extending flange 32 having a support 34 around which one end of a spring 36 is secured. The other end of the spring 36 is secured to a support 38 formed as an integral part of the magazine receiving section 39 of the casing 12. As will be apparent, the spring 36 normally urges the cylinder 28 forwardly to the position illustrated in FIG. 2.

Operatively connected to the flange 32 of the cylinder 28 is a rod 40 terminating at its forward end in a block 42 suitably secured within the walls of the slide mechanism 26. As will be apparent, the slide mechanism 26 is provided with arms 44 extending within the slots 46 formed within the casing 12. Thus, as the slide mechanism 26 is pulled rearwardly by the child, the rod 40 moves rearwardly forcing the cylinder 28 to move rearwardly against the force of the spring 36.

A hollow, plastic piston 48 is slidably mounted within the interior of the cylinder 28 and terminates forwardly in a flat wall 50. The hollow piston 48 is mounted around a guide member 52 formed as an integral part of the casing 12. Interposed between the forward end of the guide 52 and the wall 50 of the piston 48 is a spring 54 which normally urges the piston 48 forward. The piston 48 is also provided with a depending flange 56 provided with an opening 58, the purpose of which will be described hereinafter.

The trigger mechanism or group 18 comprises a one-piece lever 60 mounted to rotate about an integrally formed shaft 62 appropriately journaled within the casing 12. Opposite the trigger finger configuration in the lever 60 is a latching element 64. The spring 66 is
secured at one end to a support 68 formed as a part of the lever 60 and at the other end thereof to a shaft 70 secured to the casing 12. In this manner, the lever 60 is urged to move counterclockwise about the shaft 62 so that the trigger configuration is moved forwardly within its associated housing.

As will now be apparent, and as illustrated in FIG. 3, as the slide lever 26 is moved rearwardly, the cylinder 28 moves rearwardly engaging the piston 48 moving same rearwardly until the latching element 64 is forced through the opening 58 at which time the piston 48 is fixedly secured in its cocked position. Note that the discharge nozzle 30 has been withdrawn from the barrel 14.

Thereafter, and as illustrated in FIG. 4, the slide lever 26 is released at which time the force of the spring 36 causes the cylinder 28 to return to its original position. During the return movement of the discharge nozzle 30, the uppermost positioned pellet 72 is moved forwardly into the rearward section of the barrel 14, the operation of the magazine 20 and its receiving section 39 to be explained hereinafter.

Thereafter, the trigger mechanism 18 is actuated in the usual manner, rotating the latching element 64 clockwise so as to release the cocked piston 48. The piston 48 lurches forward under the influence of the spring 54. Thus, air normally within the cylinder 28 is expelled therefrom through the discharge nozzle 30. As will be apparent, the restricted area of the nozzle converges the air causing same to jet outwardly.

Each of the pellets 72, which are made of any soft material, is provided rearwardly with a generally hollow cone-shaped portion 74 into which the jetting air is directed, thus providing maximum and uniform impact.

Turning now to FIG. 5, it is noted that the magazine receiving section 39 is integrally fitted within the casing 12. In the top of the section 39 is formed a generally cylindrical opening into which the rearward end of the barrel 14 extends, as seen for example in FIG. 4. The discharge nozzle 30 of the cylinder 28 is free to slide within the cylindrical opening of the receiving section 39.

A slot 76 is provided within the side wall of the section 39 while the magazine 20 is formed with complementary guides 78, thus permitting the magazine 20 to be pushed upwardly within the receiving section 39. Eventually, the intermediate side wall 80 flexes upwardly as the top portion 82 thereof abuts and is pushed outwardly from the downwardly extending flange 84 of the receiving section 39, thus resiliently locking the magazine 20 within the receiving section 39. The pellets 72 are loaded on top of the surface 86 below and against which the spring 71 presses. As a pellet 72 is loaded and pushed downwardly, the top portion 82 normally restrains the pellet from moving upwardly. As the magazine is inserted within the receiving section, the top portion 82 is flexed outwardly, as previously explained, thus permitting the pellets 72 to move upwardly under the influence of the spring 71 as soon as the discharge nozzle 30 is withdrawn to the position illustrated in FIG. 3. The resilient flap 90 forming the top of the section 39 bears gently against the pellet 72 until it is moved forwardly into the rearward section of the barrel 14, as illustrated in FIG. 4.

We claim:

1. A toy air gun, comprising:

a casing;

a chamber provided within said casing;

a trigger mechanism mounted to said casing and provided with a latching mechanism;

a slide mechanism operatively mounted to said casing;

a barrel having one end thereof extending within said casing adjacent said chamber;

a magazine detachably mounted to said casing, a plurality of pellets located within said magazine, and means feeding said pellets from said magazine to said chamber of said casing;

a hollow cylinder having a forward end thereof provided with a discharge nozzle, said nozzle being in communication with the interior of said cylinder, means mounting said cylinder for sliding movement within said casing between a first position wherein the forward end of said nozzle is positioned rearwardly of the position wherein said pellets are fed into said chamber and a second position where the forward end of said nozzle extends within said chamber, and a spring operatively connected at one end thereof to said cylinder and at the other end thereof to said casing for normally urging said cylinder and discharge nozzle forwardly to said second position;

a piston terminating forwardly in a wall, said piston being positioned within said cylinder, means mounting said piston for sliding movement between a first position wherein said latching mechanism of said trigger mechanism grips said piston holding same and a second position wherein said wall of said piston is in the general vicinity of the forward end of said cylinder adjacent said nozzle, and means normally urging said piston forwardly to said second position; and

means operatively connecting said slide mechanism and said cylinder such that as said slide mechanism is pulled rearwardly said cylinder is moved to its said first position during which time said cylinder engages said piston forcing said piston to its said first position after which said cylinder returns to its said second position, the operation of said trigger mechanism thereafter releasing said latching mechanism and said piston permitting said piston to move forward within said cylinder forcing the air normally contained therein through said discharge nozzle propelling said pellet through said barrel.

2. A toy air gun as in claim 1, wherein said piston is hollow, said means providing said piston for sliding movement comprises a guide located within said casing and extending within said piston, and wherein said means normally urging said piston forward to said second position comprises a spring positioned within said piston and interposed between the end of said guide and said forward wall of said piston.

3. A toy air gun as in claim 1, wherein said magazine terminates upwardly in guide members, a receiving section mounted within said casing, said receiving section being provided with a slot generally complementary in configuration with respect to said guide members of said magazine permitting said magazine to be inserted within said receiving section, said receiving section defining said chamber of said casing.

4. In a toy air gun provided with a casing within which is located a chamber, a barrel extending within said casing to said chamber, and a trigger mechanism
and slide mechanism operatively connected to said casing, a propulsion unit for propelling pellets positioned within said chamber, comprising a hollow cylinder having a forward end thereof provided with a discharge nozzle, means mounting said cylinder for sliding movement within said casing, a spring operatively connected at one end thereof to said cylinder and at the other end thereof to said casing for normally urging said cylinder forwardly within said casing to a position wherein the forward end of said nozzle extends within said chamber, a piston positioned within said cylinder and provided with a hollow portion, a guide located within said casing and extending within said hollow portion of said piston, and a spring located within the hollow portion of said piston and interposed between the end of said guide and said forward wall of said piston for normally urging said piston forwardly within said cylinder, means operatively connecting said slide mechanism to said cylinder such that as said slide mechanism is moved rearwardly said cylinder is moved rearwardly thereafter engaging said piston forcing said piston to move rearwardly eventually locking said piston by said trigger mechanism, after which said cylinder moves forwardly such that said nozzle thereof extends into said chamber engaging one of said pellets and moving said pellet into said barrel, the subsequent actuation of said trigger mechanism releasing said piston to move forwardly within said cylinder forcing the air normally contained therein through said discharge nozzle propelling said pellet through said barrel.

5. A toy air gun as in claim 1, wherein each of said pellets includes a cone-shaped rear portion adjacent said discharge nozzle of said hollow cylinder when said hollow cylinder is in said second position such that after the operation of said trigger mechanism the air passing through said discharge nozzle is directed towards said cone-shaped portion of said pellet.