

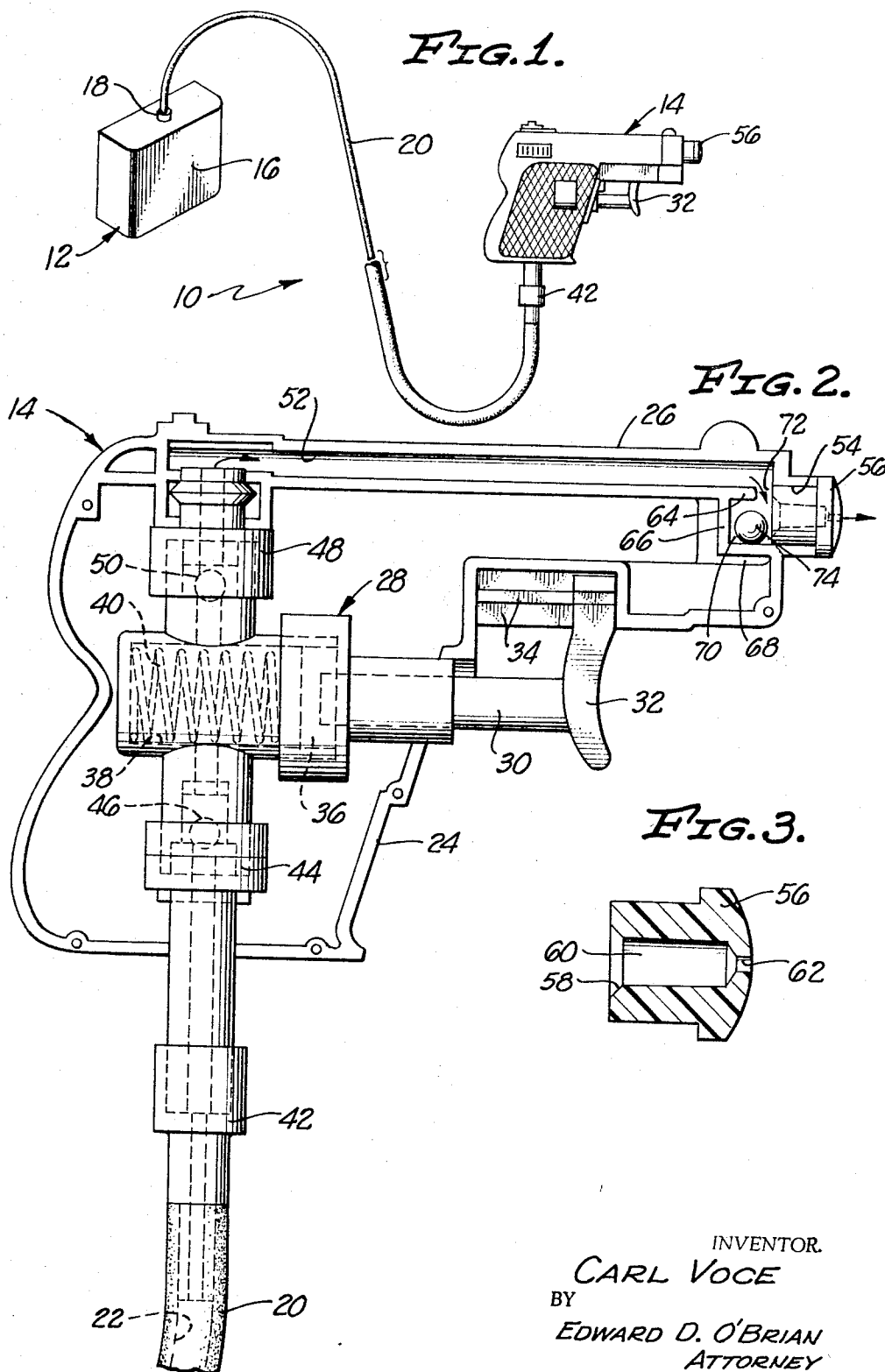
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C. VOCE

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WATER GUN

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INVENTOR
CARL VOCE
 BY
EDWARD D. O'BRIAN
 ATTORNEY

1

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WATER GUN

Carl Voce, Gardena, Calif., assignor to Eldon Industries, Inc., Hawthorne, Calif., a corporation of California
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This invention is directed to a water gun and particularly to a water gun which is equipped with a separate reservoir connected by means of a flexible hose to a gun and equipped with means to prevent siphoning of water from the gun nozzle.

Past water guns have been burdened by the limited storage quantity of water within the gun body itself. This burden has been especially critical in water guns of small dimension. In the past such water guns have been limited in the amount of ejectable water by the volume of the gun itself and, therefore, it becomes desirable to connect a separate reservoir by means of a flexible connection to a water gun. This brings forth the further problem of siphoning water from the reservoir, through the gun into the pocket of the person carrying the water gun. Means is provided in this invention to prevent such siphoning.

Accordingly, it is an object of this invention to provide a water gun of relatively small dimension with a water supply of considerably greater capacity than the limits imposed by the size of the water gun body.

It is a further object of this invention to provide an enhanced water capacity for a water gun by providing a separate reservoir connected to the gun by means of a flexible connector.

It is another object of this invention to provide a water gun, and especially a water gun connected to a separate reservoir, with an anti-siphon valve which prevents siphoning of the water out of the nozzle of the water gun.

It is a further object of this invention to provide an anti-siphoning valve within a water gun body and especially a water gun connected to a separate reservoir which anti-siphon valve closes when the water gun is pointed downwards to prevent discharge of water through the nozzle of the water gun when the nozzle is directed downward.

Other objects and advantages of this invention will become apparent from a study of the following portion of this specification, the claims and the attached drawings:

FIG. 1 is an isometric view of the water gun and reservoir of this invention showing the reservoir in isometric view and the water gun in enlarged side elevation;

FIG. 2 is an enlarged side elevational view of the water gun with parts broken away; and

FIG. 3 is a further enlarged elevational section of the water gun nozzle.

As an aid to understanding this invention it can be stated in essentially summary form that it is directed to a water gun having a separate reservoir and a flexible connection between the reservoir and the water gun, and to an anti-siphoning structure within the water gun. The reservoir is of sufficient size to carry a suitable supply of water for the water gun and is adapted to be carried upon the person of the water gun user. A supply tube extends into the bottom of the reservoir and it is of flexible character so that it may be connected to the gun so that the gun may be moved in accordance with desires of the user. The flexible hose connects directly to a section of the pump within the water gun itself so there is no need for a reservoir of water within the gun. The pump is operated by the conventional water gun trigger and discharges water into the discharge passage which terminates at the water gun nozzle. Anti-siphon action is provided by means of a valve seat formed on the nozzle structure and a ball valve which is positioned adjacent the

2

seat. The orientation of the structure is such that when the water gun nozzle is pointed generally downward, the ball valve moves into the seat to prevent flow of water out of the nozzle. Thus, siphoning is prevented when the nozzle is pointed downward. This prevents the siphoning of water into the pocket of the water gun user when the gun is placed in the person's pocket, or other similar locations.

This invention will be understood in greater detail by reference to the following portion of the specification wherein the drawings are described in detail. Referring now to FIG. 1 the water gun of this invention is generally indicated at 10. The water gun 10 comprises reservoir 12 and the pumping portion and water jet directing portion 14. For convenience of designation the portion 14 will be referred to as the gun. The reservoir 12 is of conventional construction and includes an enclosed receptacle 16 which is suitably equipped with a filler opening and filler opening closure and is preferably equipped with means for positioning the reservoir. The positioning means can include belt loops or the like so that the water gun user can attach the reservoir to his belt. Furthermore, the reservoir is equipped with a dip tube 18 which extends substantially to the bottom of receptacle 16. Attached to the upper portion of the dip tube 18 is a flexible tube 20 which is of rubber or other polymer composition material of such nature as to make it suitably flexible, and yet maintain the interior opening 22 thereof.

The gun 14 is externally shaped in the form of a small hand gun to provide conventional appearance in the art. The gun 14 thus has a hand grip 24 and a barrel structure 26. Within the hand grip 24 is water pump 28, which is of conventional construction. Water pump 28 has a piston rod 30 which is actuatable by trigger 32. Trigger 32 is controlled by guides 34 in the lower part of the barrel. Piston 36 is urged leftward within cylinder 38 by piston rod 30 and rightward by spring 40.

Tube 20 is connected to cylinder 38 by means of adapter 42 and check valve housing 44. Check valve housing 44 contains ball check valve 46 which acts as a suction check valve. Discharge check valve housing 48 carries discharge check valve ball 50 and connects cylinder 38 to discharge water passage 52. By this structure water pump 28 draws water from the interior of tube 20 through cylinder 38 and discharges it under pressure into discharge water passage 52.

Discharge water passage 52 is conventionally formed as recesses in the two halves which are secured together to form gun 14. Discharge water passage 52 extends from its connection with discharge check valve housing 48 to the forward end or muzzle of gun 14. At the muzzle of the gun a circular opening 54 is positioned to accept nozzle 56 in fluid tight relationship. Nozzle 56 has a valve seat 58 connected by bore 60 to nozzle orifice 62. Walls 64, 66 and 68 form chamber 70 adjacent valve seat 58. Chamber 70 is opened to discharge water passage 52 by means of the opening 72 formed by the termination of wall 64. Ball 74 is positioned within chamber 70. The chamber is of such dimension and of such configuration with respect to nozzle 56 that when gun 14 is held in the horizontal position, as shown in FIG. 2, the ball 74 rests in the bottom of chamber 70 away from closure of valve seat 58. The configuration is also such that when gun 14 is pointed substantially downward, ball 74 rests upon valve seat 58 to close communication from discharge water passage 52 to bore 60.

In operation, reservoir 12 is filled with water and secured upon the person using the water gun 10. When the person desires to discharge water from nozzle orifice 62 he depresses trigger 32 against the action of spring 40 to force the piston 36 leftward within cylinder 38. This motion discharges water in the cylinder

through discharge check valve 50, discharge water passage 52, opening 72, bore 60 and nozzle orifice 62 toward his target. In such use the gun 14 is held in the relatively horizontal position. When the trigger 32 is released spring 40 moves piston 36 to the right to draw water from reservoir 12 through tube 20 and past suction valve 46 to refill cylinder 38. Thus, the cylinder is ready for the discharge of another charge of water upon actuation of trigger 32. When such firing ceases the user of the water gun 14 would normally put it in his pocket. At that time the nozzle 56 is generally pointed downward and ball 74 moves on to valve seat 58 to prevent the siphoning of water from reservoir 12 out of nozzle orifice 62. Thus, leakage is prevented, water is conserved, and the pocket remains dry.

This invention having been described in this preferred embodiment, it is clear that it is susceptible to numerous modifications and changes within the ability of the person skilled in the art and without the exercise of invention. Accordingly, the scope of this invention is defined by the scope of the following claims.

I claim:

1. A water gun, said water gun comprising:
 - a reservoir comprising an enclosed receptacle adapted to contain water and means to withdraw water from said receptacle from adjacent the bottom thereof;
 - a gun comprising a gun shaped structure having a handle and having a barrel, a pump located in said handle, said pump being adapted to be manually operated, said pump having an intake connection and a discharge connection, said intake connection being connected to said means to withdraw water from said receptacle, a discharge nozzle adapted to direct the flow of water outwardly therefrom in accordance with the orientation of said barrel, a closed discharge water passage connected between said discharge connection of said pump and said discharge nozzle, and gravity operated valve structure within said discharge water passage adjacent said nozzle, said gravity operated valve structure preventing water flow out of said reservoir when said nozzle is directed generally downwardly.
2. The structure of claim 1 wherein said gravity operated valve comprises a valve ball and a valve seat, said valve seat forming a portion of said discharge nozzle.
3. A water gun, said water gun comprising a reservoir, a gun and a flexible inter-connection between said reservoir and said gun;
 - said reservoir comprising a generally rectangular receptacle having a bottom and a top, a dip tube extending through said top and terminating adjacent said bottom of said reservoir, said reservoir being adapted to be closed so as to prevent the spillage of water therefrom;
 - said flexible conduit comprising a flexible, hollow, cylindrical tube of polymer composition material, said tube being connected to said dip tube;
 - said gun comprising a gun-like structure having a manually engageable handle and a barrel, said barrel being adapted to be manually directed toward a target, guide means on said barrel, a trigger reciprocally mounted on said guide means, a piston rod connected to said trigger, a piston engaged by said piston rod and adapted to be operated by reciprocation of said piston rod, a cylinder mounted within said handle of said gun, said cylinder having a substantially cylindrical interior wall, said

piston being mounted within said cylinder, a spring within said cylinder engaging said piston and urging said piston rod away from said cylinder, a suction valve housing having an interior opening therethrough mounted on said cylinder, said opening being in communication with said cylinder, a ball and a seat within said suction valve housing, said ball and said seat inter-engaging to prevent flow of water from said cylinder through said opening, an adapter having an opening therethrough mounted on said suction valve housing, said opening being in communication with said opening through said suction valve, said tube being connected to said adapter and having its interior opening connected to said opening in said adapter, a discharge valve housing mounted upon said cylinder, said discharge valve housing having an interior opening therethrough, a discharge valve seat in said opening and a discharge valve ball mounted adjacent said valve seat and arranged so as to prevent flow of water through said discharge opening into said cylinder, a discharge water passage in said barrel of said gun, said discharge valve passage having its opening in communication with said discharge water passage and sealed with respect thereto, said discharge water passage being formed by exterior and interior imperforate walls of said gun barrel, said gun barrel having a front end and a rear end and being arranged so that said front end is directed in the direction of discharge of water from said gun, a chamber adjacent said front end of said gun, said chamber being formed of interior imperforate walls within said gun, said chamber being in fluid communication with said discharge water passage, a ball within said chamber, an opening in the front end of said gun, a nozzle positioned within said opening, said nozzle having a valve seat and having a nozzle orifice, said nozzle orifice being adapted to discharge water generally in the direction toward the target, said valve ball being gravitationally positioned way from said seat in said nozzle when said gun is pointed generally horizontally and being positioned against said seat when said gun is oriented with its barrel pointing generally downwardly, said pump being adapted to withdraw water from said reservoir and discharge it only out of said nozzle orifice when said gun is positioned generally horizontally and upon manual actuation of said trigger and said valve ball and said valve seat in said nozzle closing exterior communication of said water passage to prevent discharge of water out of said reservoir when said nozzle is oriented generally downwardly.

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ROBERT B. REEVES, *Primary Examiner*.
HADD S. LANE, *Examiner*.