The peristaltic pump streaming/spraying pistol comprises a shroud with a battery, a motor, and a hose. The hose is connected with a sinking weighted ball at one end and a streaming/spraying nozzle at another end. A wall and a rotating disc, which is at least partially surrounded by the wall, are inside the shroud. Equidistant rollers for pressing the hose are mounted on the rotating disc. Between the rollers and the wall, there is a pressurizing channel for the hose. When in use, the battery starts the motor to drive the rotating disc. At the same time, the rollers on the rotating disc continuously press the hose and rapidly extrude the air out of it, so that a negative pressure is created in the hose. Due to the atmospheric pressure, the liquid will enter the hose from sinking weighted ball and will stream/spray out from the discharge nozzle.
PERISTALTIC PUMP PISTOL

FIELD OF THE INVENTION

[0001] The invention relates to spraying apparatuses, and particularly to a peristaltic pump streaming/spraying pistol.

BACKGROUND OF THE INVENTION

[0002] As is well known, spraying agricultural chemicals plays an important role in agricultural production because it assists with the harvesting of farm crops. However, agricultural chemicals are highly poisonous, and thus, people generally use spraying apparatuses to spray agricultural chemicals over the farm crops.

[0003] In daily life, spraying apparatuses are also used to spray chemical liquids for home cleaning, sterilization, removing mildew, etc. Traditional spraying apparatuses are hand-operated and not convenient to use. Moreover, users can easily become tired after a long period of operation.

[0004] At present, commonly-used spraying apparatuses are mainly gear-pump pistol or piston-pump pistol devices. These two pistols have the following disadvantages:

[0005] (1) If the gear-pump pistol is used to pump the chemical liquid, its service life will be very short because of the strong corrosive properties of the chemical liquid. When strong corrosive chemical liquids are sucked into the gear pump, the chemical liquid may easily flush away the grease which is inside the gear pump for sealing and lubrication, resulting in the gear pump not working.

[0006] (2) If the single-directional piston-pump pistol is used to pump the chemical liquid, it operates with low efficiency and high energy consumption, it is difficult to produce and assemble, and it is expensive.

BRIEF SUMMARY OF THE INVENTION

[0007] A peristaltic pump streaming/spraying pistol, which is of high efficiency and protects itself well from strong corrosive chemical liquids, is provided.

[0008] The invention may comprise a peristaltic pump streaming/spraying pistol having a shroud in which there is a battery, a motor, and a hose. One end of the hose is connected with a sinking weighted ball while the other end is equipped with a streaming/spraying nozzle. Inside the shroud, there is a wall and also a rotating disc which is driven by the motor. The rotating disc is at least partially surrounded by the wall. A plurality of equidistant rollers for pressing the hose are mounted on the rotating disc. Between the rollers and the wall, there is a pressuring channel in which the hose is placed.

[0009] When in use, the battery starts the motor to rotate the rotating disc at a high speed. At the same time, the rollers on the rotating disc continuously press the hose and rapidly extrude the air out of it so that a negative pressure is created in the hose. Due to the atmospheric pressure, the liquid will be sucked into the hose from the sinking weighted ball and is streamed/sprayed out from the nozzle, thus realizing the aim of the peristaltic-pump pistol being used for pumping and streaming/spraying liquid. When the rotating disc stops, the rollers can function similar to a check valve by pressing the hose tightly to prevent the liquid from flowing back. Thus, unlike existing technology, there is no need to mount a check valve on the hose.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] FIG. 1 is an exploded perspective view of a peristaltic pump streaming/spraying pistol;

[0011] FIG. 2 is a schematic drawing of gear box connection between the motor and the rotating disc for the peristaltic pump streaming/spraying pistol shown in FIG. 1;

[0012] FIG. 3 is a schematic drawing of the connection between the motor, the rotating disc, and the hose for the peristaltic pump streaming/spraying pistol shown in FIG. 1;

[0013] FIG. 4 is a schematic drawing similar to FIG. 3 with the hose removed;

[0014] FIG. 5 is a schematic drawing similar to FIG. 3 with the top cover removed from the motor; and

[0015] FIG. 6 is a schematic drawing of the cover plate for the rotating disc shown in FIG. 3.

DETAILED DESCRIPTION OF THE INVENTION

[0016] In order to explain the aim and technical design and advantage of the invention, a detailed description referencing the attached drawings as examples is provided herein. The following representative examples are used for describing the invention, but the invention should not be limited to these specific examples.

[0017] As shown in FIGS. 1 to 6, the invention provides a peristaltic pump streaming/spraying pistol comprising a shroud 1 with a battery 2, a motor 3, and a hose 4, all at least partially disposed therein. One end of hose 4 is connected to a sinking weighted ball 5 while the other end is equipped with streaming/spraying nozzle 6. Inside the shroud 1, there is a wall 7 and a rotating disc 8, which is driven by the motor 3. The rotating disc 8 is at least partially surrounded by the wall 7. Equidistant rollers 81, which can press the hose 4, are mounted on the rotating disc 8. Between the rollers 81 and the wall 7, there is a pressuring channel 71 in which hose 4 is placed. To use the pistol, the trigger 9, which is connected with battery 2, is pressed. The battery 2 will start the motor 3, which drives the rotating disc 8 to rotate at a high speed. At the same time, the rollers 81 on the rotating disc 8 continuously press the hose 4 and rapidly extrude the air out of it, so that a negative pressure is created in the hose 4. Due to the atmospheric pressure, the liquid will be sucked into the hose 4 from the sinking weighted ball 5 and will stream/spray out from the nozzle 6, thus realizing the aim that the peristaltic-pump pistol is used for pumping liquid and streaming/spraying it. When the rotating disc 8 stops, the rollers 81 can function similar to a check valve by pressing the hose 4 tightly to prevent the liquid from flowing back. Thus, unlike the existing technology, there is no need to mount a check valve on the hose 4.

[0018] Detailed descriptions for certain component parts of the invention follow below.

[0019] As shown in FIG. 1, the shroud 1 comprises an upper shroud 11 and a lower shroud 12. The battery 2, motor 3, hose 4, streaming/spraying nozzle 6, wall 7, rotating disc 8, and trigger 9 are all mounted inside the lower shroud 12, which combines with the upper shroud 11 to form a peristaltic pump streaming/spraying pistol.

[0020] As shown in FIG. 2, the motor 3 drives the rotating disc 8 through a gear box 10 which is connected as follows:
the shaft of the motor 3 is equipped with small gear 101 which matches with large gear 102 and drives it. Large gear 102 and small gear 103 are mounted on the same shaft. Small gear 103 drives large gear 104 which is mounted on the same shaft with rotating disc 8. Thus, rotating disc 8 will turn with large gear 104. By means of the gear box 10, the motor 3 can drive rotating disc 8 with a steady torque, and the rotary speed of the rotating disc 8 can be easily controlled.

[0021] As shown in FIGS. 3 to 6, the rotating disc 8 is mounted on a horizontal base 82, which is installed on lower cover 12. In this example, there are three rollers 81 on the rotating disc 8. In addition, a plurality of equidistant flange bulges 83 are mounted on the rotating disc 8. The rotating disc 8 connects to the cover plate 84, which has a lower surface equipped with several equidistant flange bulges 841, which oppose the flange bulges 83 on rotating disc 8. When the rotating disc 8 is operating, both flange bulges 841 and 83 can open and prepare the hose 4 for contact with the roller 81, so as to prevent that portion of the hose 4 from remaining stuck together by the roller 81. If the peristaltic-pump pistol is operated after not being in use for a long time, the hose 4 may be stuck together because there is liquid left in hose 4. Both flange bulges 841 and 83 can work together to open and prepare the hose 4 for the roller 81, so as to prevent the hose 4 from being substantially stuck together and thus, blocked.

[0022] The peristaltic-pump streaming/spraying pistol is mainly used for pumping and dispensing a chemical liquid with corrosive properties. In order to prevent the hose 4 from being damaged due to corrosion caused by a chemical liquid, the hose 4 can be made of silicon.

[0023] As shown in FIG. 1, the nozzle 6 can rotate in the shroud 1, so that the chemical liquid can be streamed or sprayed out to reach a large area of coverage.

[0024] Referring to FIG. 1 again, the sinking weighted ball 5 may comprise a plastic outer casing and a ceramic ball inside. One end of the plastic outer casing is equipped with a liquid intake 51 while the other end is connected with the hose 4. The ceramic ball inside the plastic outer casing can ensure that the sinking weighted ball 5 immerses itself in the liquid completely with the help of gravity so that the peristaltic pump pistol can reliably pump the liquid.

[0025] The above-mentioned description is only a representative example of the invention without exerting any limit on the invention. Any modification, equivalent change and improvement, etc. made according to the spirit and principle of the invention shall be encompassed by the invention.

[0026] The use of the terms “a” and “an” and “the” and similar referents in the context of describing the invention (especially in the context of the following claims) are to be construed to cover both the singular and the plural, unless otherwise indicated herein or clearly contradicted by context. The terms “comprising,” “having,” “including,” and “containing” are to be construed as open-ended terms (i.e., meaning “including, but not limited to,”) unless otherwise noted. Recitation of ranges of values herein are merely intended to serve as a shorthand method of referring individually to each separate value falling within the range, unless otherwise indicated herein, and each separate value is incorporated into the specification as if it were individually recited herein. All methods described herein can be performed in any suitable order unless otherwise indicated herein or otherwise clearly contradicted by context. The use of any and all examples, or exemplary language (e.g., “such as”) provided herein, is intended merely to better illuminate the invention and does not pose a limitation on the scope of the invention unless otherwise claimed. No language in the specification should be construed as indicating any non-claimed element as essential to the practice of the invention.

[0027] Preferred embodiments of this invention are described herein, including the best mode known to the inventors for carrying out the invention. Variations of those preferred embodiments may become apparent to those of ordinary skill in the art upon reading the foregoing description. The inventors expect skilled artisans to employ such variations as appropriate, and the inventors intend for the invention to be practiced otherwise than as specifically described herein. Accordingly, this invention includes all modifications and equivalents of the subject matter recited in the claims appended hereto as permitted by applicable law. Moreover, any combination of the above-described elements in all possible variations thereof is encompassed by the invention unless otherwise indicated herein or otherwise clearly contradicted by context.

What is claimed is:

1. A peristaltic pump pistol comprising: a shroud at least partially enclosing a battery, a motor, and a hose; a first end of the hose is connected to a weighted ball while a second end of the hose is connected to a nozzle; a wall and a rotating disc are disposed inside the shroud, the rotating disc is at least partially surrounded by the wall and is driven by the motor; a plurality of equidistant rollers for compressing the hose are mounted on the rotating disc; a pressing channel is disposed between the rollers and the wall, and the hose is disposed within the pressing channel.

2. The peristaltic pump pistol of claim 1 wherein the motor is mounted outside the wall.

3. The peristaltic pump pistol of claim 2 wherein the motor drives the rotating disc with a gear box.

4. The peristaltic pump pistol of claim 1 further comprising a plurality of equidistant rotating disc flange bulges mounted on the rotating disc.

5. The peristaltic pump pistol of claim 4 wherein the rotating disc is coupled to a cover plate, the cover plate including a plurality of equidistant cover plate flange bulges opposing the rotating disc flange bulges.

6. The peristaltic pump pistol of claim 1 wherein the hose is a silicon tube.

7. The peristaltic pump pistol of claim 1 wherein the nozzle is rotatable with respect to the shroud to switch between a streaming and a spraying position.

8. The peristaltic pump pistol of claim 1 wherein the weighted ball includes a plastic outer casing and a ceramic ball disposed within the plastic outer casing, the plastic outer casing includes a water intake and is connected to the hose.