

May 31, 1955

R. A. SORENSON

2,709,433

FLUID INOCULATING SYRINGE OR INJECTOR

Filed March 29, 1954

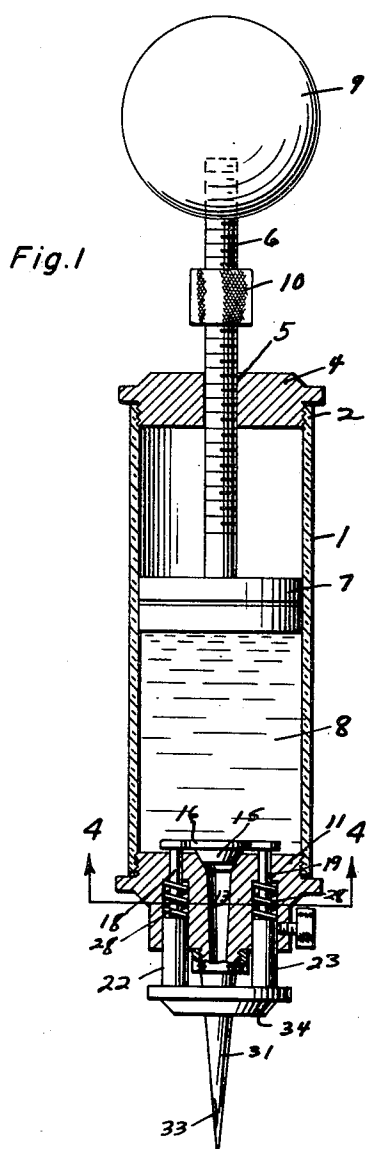


Fig.4

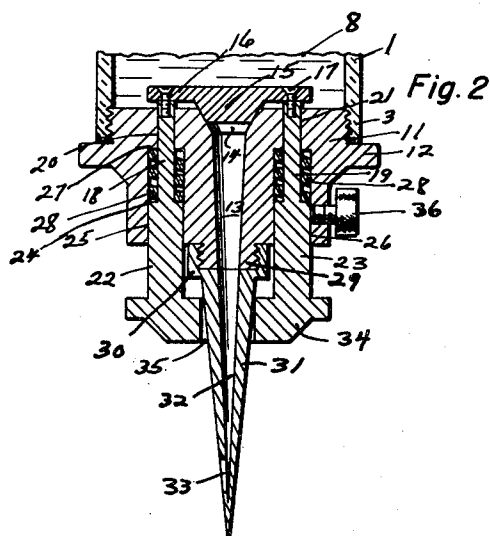
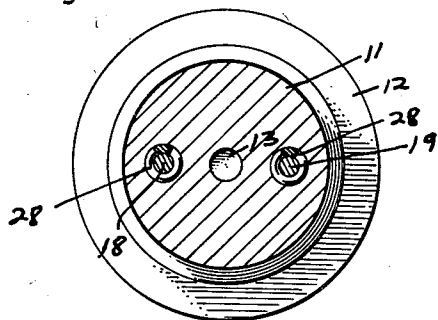


Fig. 2

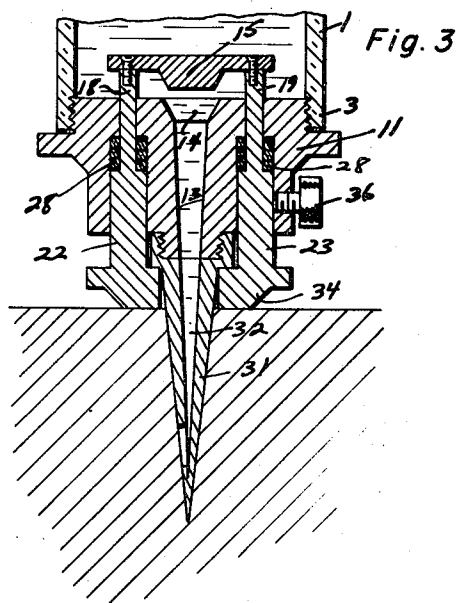


Fig. 3

INVENTOR

Roger A. Laranson

1

2,709,433

FLUID INOCULATING SYRINGE OR INJECTOR

Roger A. Sorenson, Provo, Utah

Application March 29, 1954, Serial No. 419,460

5 Claims. (Cl. 128—218)

This invention appertains to new and novel improvements in syringes or injectors for vaccinating, inoculating or otherwise treating live stock.

The primary object of this invention is to provide a syringe or fluid injector which will enable the operator to inject the desired fluid into an animal in one thrust.

A further object of this invention is to provide a trigger mechanism which surrounds the needle and is adapted to be thrust against the hide of the animal, as the needle is being forced into the animal's body, and which controls the passage of the fluid from a tube or casing to the needle. The trigger mechanism is so positioned in relation to the needle that when it abuts the hide of the animal, the needle is in its proper position in the body of the animal, that is, the needle has penetrated the body a sufficient distance. The trigger mechanism operates, upon abutting the animal's body, to open a passage from the tube or casing to the needle and allow the fluid to flow into and through the needle.

A further object of this invention is to provide a stopper for the outlet of the container or casing and to provide a releasing trigger mechanism for opening the stopper when the needle has penetrated to the proper depth in the animal.

Another object of this invention is to provide a plunger means for initially thrusting the needle into the animal's body and forcing the trigger mechanism against the animal's body to unseat the stopper and then, under the same movement, for forcing the fluid into and through the needle. Ancillary to this is the object of providing an adjustable stop means for controlling and limiting the movement of the plunger means whereby the amount of fluid injected can be positively controlled.

In the drawing, wherein the preferred form of the invention is illustrated,

Figure 1 is a longitudinal sectional view of the injector;

Figure 2 is a detailed longitudinal sectional view of the stopper and trigger mechanism, showing the stopper closed;

Figure 3 is a view similar to Figure 2 but showing the stopper open, and,

Figure 4 is a cross-sectional view taken on line 4—4 of Figure 1.

Referring to the drawing by way of similar reference numerals for similar parts, the fluid injector or syringe includes a cylindrical, transparent casing or tube 1 which has internally threaded open ends 2 and 3. A closure 4 is threaded in the inlet end 2 and has a center opening 5 to slidably receive a rod 6. The rod carries a piston 7 transversely on its inner end, the piston being of a diameter to slide against the inside of the casing and having any suitable rings or the like to prevent seepage of fluid from one side to the other. The fluid 8 is forced by the piston toward the outlet end 3 of the casing.

The rod 6 is externally threaded and has a large knob 9 threaded on its outer end. A sleeve 10 is threaded on the rod and is adapted to abut the outside closure 4

2

to limit the throw or axial movement of the rod and thereby control the amount of fluid injected by the piston.

A closure block 11 is threaded into the outlet end 3 of the tube 1 and has a shoulder 12 tightly abutting the end. The closure block has a tapering, centrally disposed passage 13 which terminates at its major, inner end in a frusto-conical seat 14. A frusto-conical stopper 15 is adapted to seat in the seat 14 and close off the passage and block the flow of fluid therethrough.

The stopper 15 is carried by a plate 16 which is attached by screws 17 to the inner ends of rods 18 and 19. The rods 18 and 19 slide in bores 20 and 21 in the block 11 and have the ends of the plate 16 transversely fastened to their inner ends. The rods have diametrically enlarged outer sections 22 and 23, which define shoulders 24 and which slide in enlarged bores or passages 25 and 26 in the block. The bores or passages 25 and 26 are aligned with and form diametrically enlarged prolongations of the bores 20 and 21 and define shoulders 27 with the bores 20 and 21. Springs 28 are coiled on the rods 18 and 19 and bear against the shoulders 24 and 27 to urge the rods outwardly and yieldingly retain the stopper seated in the seat 14.

The outer end of the block 11, at the center thereof, has an axial extension 29, which is externally threaded and receives the internally threaded collar 30 on the inner base end of the needle 31. The passage 32 in the needle is aligned with the passage 13 in the closure and the needle, inwardly of its flared end, has a lateral outlet 33.

The ends of the rod sections 22 and 23 are connected by an annular abutment member 34, which has a center opening 35 for receiving the needle, the member 34 being concentric to the needle.

A set screw 36 is threaded radially through the closure block and bears against the rod section 23 to lock the stopper in a closed position and prevent accidental opening thereof, caused by an accidental pressure on the member 34.

In use, the closure 4 is removed to remove the rod 6 and piston 7 and to fill the tube with the desired fluid. The piston and closure are then replaced, the closure being threaded into the end 2. The sleeve 10 is adjusted axially of the rod to the desired position, dependent upon the amount of fluid that is desired to be ejected.

Considering Fig. 1, it is obvious that with the stopper 15 in a seated position, the piston will produce a pressure head on the fluid 8 so that a push on the knob 9 will force the needle into the body of an animal. Thus, the fluid will transmit the force exerted on the piston by a push on the knob 9 to the needle. When the needle has penetrated the body of the animal to a point where the member 34 abuts the hide of the animal, the member 34 will be forced rearwardly. Such rearward motion of the member 34 will slide the rods 18 and 19 rearwardly, against the urging of the springs and compressing the springs. The stopper will thus be unseated and force on the piston will move it forward to eject the fluid, the forward motion of the piston being arrested by the sleeve 10, which acts as a stop.

As the needle is withdrawn, the member 34 will be moved away from the animal and the springs 28 will immediately slide the rods outwardly and seat the stopper 15. The set screw 36 can then be tightened against the rod section 23 to lock the stopper in its seated position whereby no accidental flow of fluid will be possible.

The illustrated form of the invention is merely exemplary, the scope of the invention being defined in the following claims.

What is claimed is:

1. A fluid injector comprising a fluid container, a

3

piston disposed in said container, means for moving the piston to eject the fluid from the container, means limiting the ejecting movement of the piston, said container having an outlet passage through which the fluid is ejected by the piston, a needle carried by the container and having a passage aligned with the outlet passage, a stopper seated in said outlet passage and closing off the flow of fluid to the passage and to the needle, an abutment member surrounding the needle and movable along the axis thereof when the needle is forced into a body, the abutment member abutting the body and being forced rearwardly of the needle as the needle is forced further into the body, and means connected between the abutment member and the stopper for unseating the stopper upon the continued rearward movement of the abutment member.

2. The device of claim 1, wherein said last means includes rods slidable axially in the container alongside the outlet passage and connecting the abutment member and the stopper.

3. A fluid injector comprising a casing, means in the

4

casing for ejecting a fluid therefrom, said casing having an end formed with a passage for the fluid ejected therefrom, said passage having a seat, a stopper in said seat closing off the passage, a needle connected to said end and having a passage aligned with the passage in the end, a pair of axially sliding members slidably disposed through said end, means connecting said sliding members to the stopper and an abutment member surrounding the needle and connected to the sliding members for unseating the stopper when the abutment member abuts an object into which the needle has been forced.

4. A fluid injector as claimed in claim 3, wherein spring means is connected to said sliding members for normally urging said stopper to a closed position in the seat.

5. A fluid injector as claimed in claim 4, wherein means is provided for locking the sliding members against sliding movement to lock the stopper in the seat.

No references cited.