

June 2, 1959

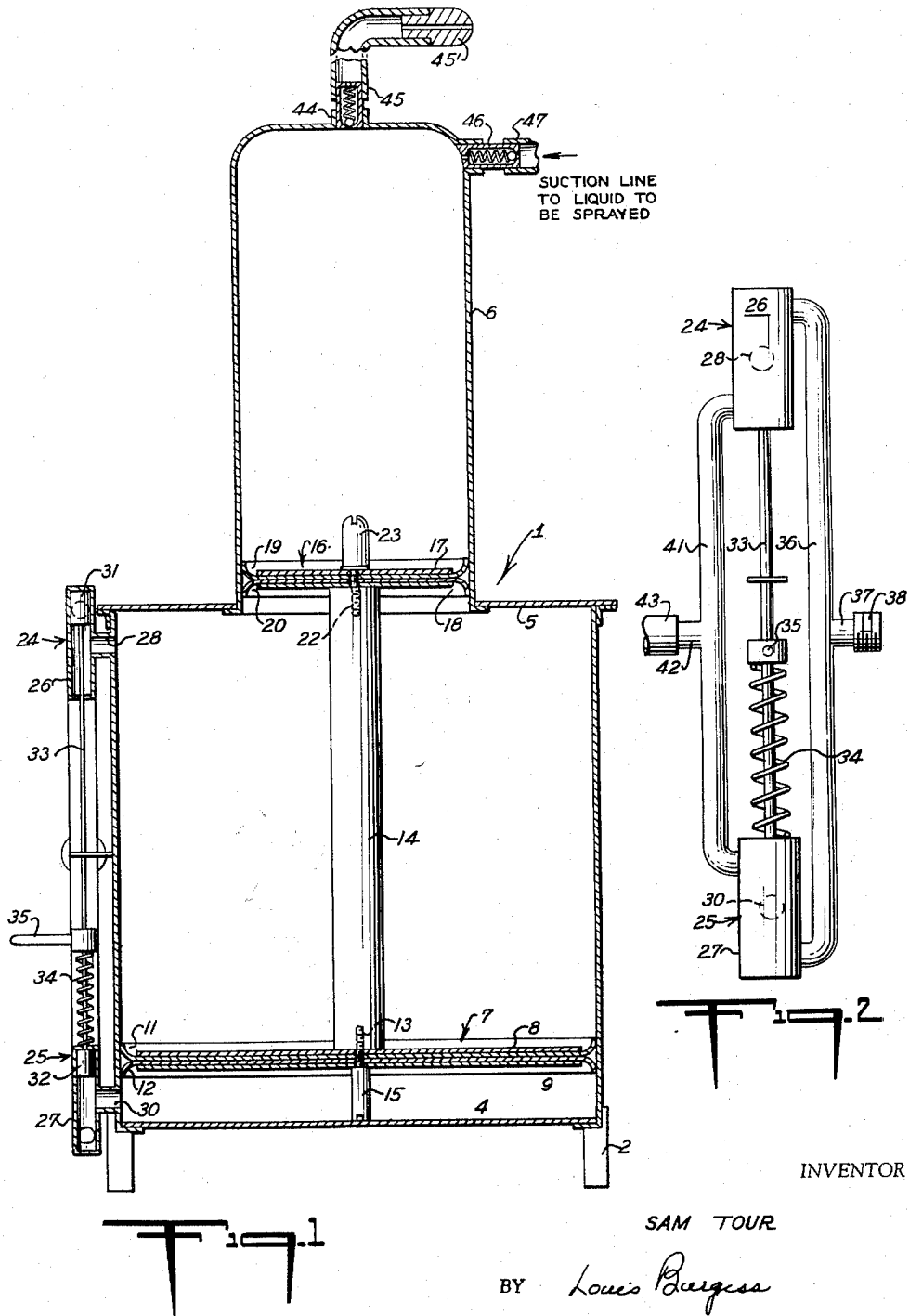
S. TOUR

2,889,084

AGRICULTURAL SPRAYER

Filed March 16, 1956

2 Sheets-Sheet 1



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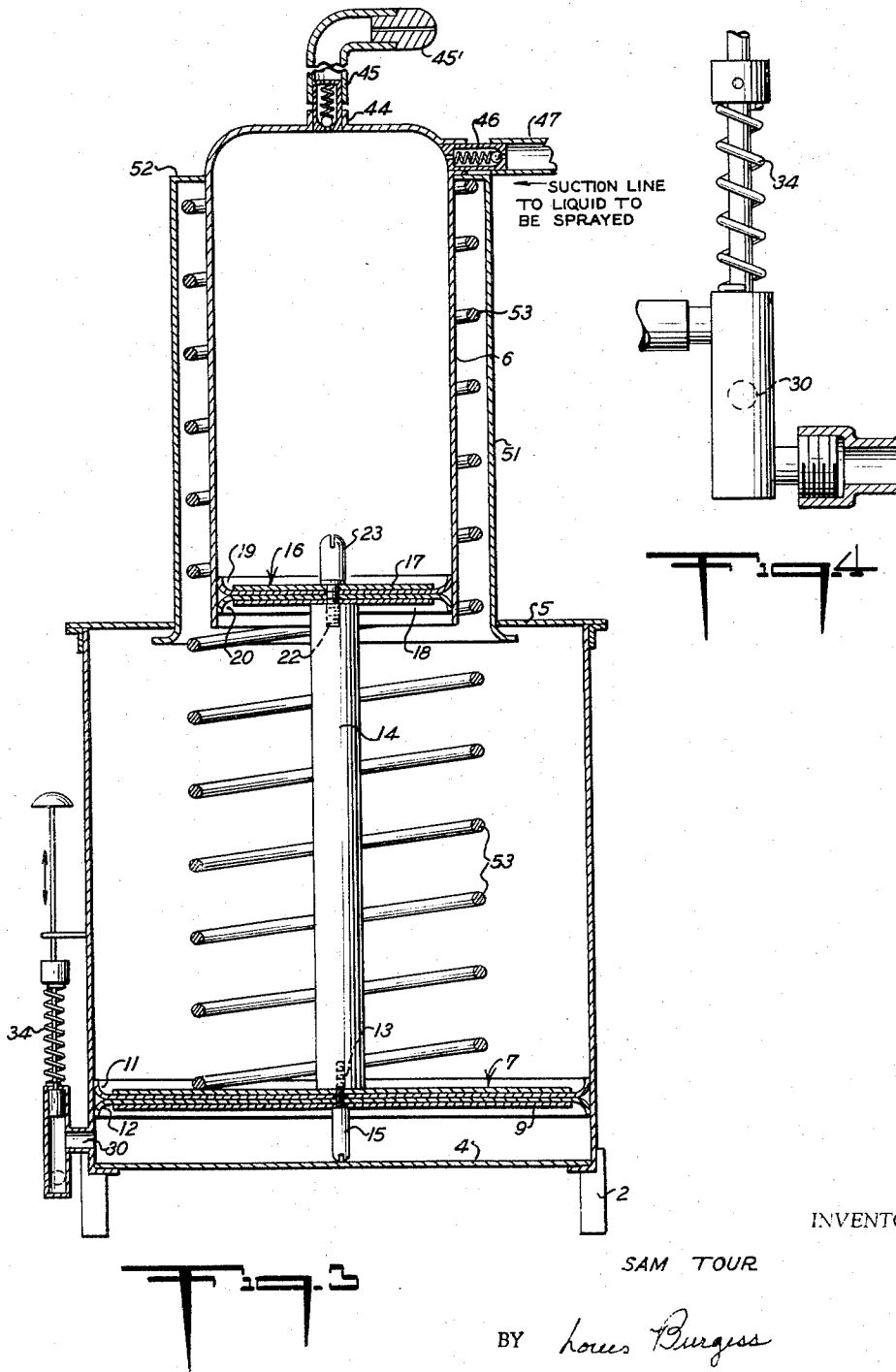
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2 Sheets-Sheet 2



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AGRICULTURAL SPRAYER

Sam Tour, New York, N.Y.

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3 Claims. (Cl. 222—334)

This invention is a new and useful agricultural sprayer of the manually portable type especially adapted for use in the maintenance of lawns, gardens, small farms and small orchards. Up to the present this type of spraying has been principally accomplished by means of a metal tank provided with a dip pipe connected through a hose to the sprayer nozzle. The liquid to be sprayed is charged into the tank, which is then sealed, and pressure on the liquid is then built up by pumping air into the tank. These devices are inconvenient to use, the spray is easily plugged by stray dirt, and have at times been ruptured by the air pressure, with serious results.

The sprayer of my invention is small, easily portable, semi-automatic in operation, and can be easily made to clean itself of any residual spray liquid at the end of each operation. It is moreover entirely safe in use.

The invention will be fully understood from the following description read in conjunction with the drawing in which:

Fig. 1 is a vertical section through one embodiment of the invention;

Fig. 2 is a side view of a part of Fig. 1;

Fig. 3 is a vertical section through an alternative embodiment of the invention; and

Fig. 4 is a side view of part of Fig. 3.

Referring to Figs. 1 and 2, the sprayer 1 includes ring stand 2 supporting cylinder 3 provided with bottom closure 4. The top of cylinder 3 is sealed by cover 5 carrying the upper cylinder 6 of smaller diameter. Piston 7 in cylinder 3 is formed of circular metal plates 8 and 9, which embrace the flexible, cup-shaped washers 11 and 12, of rubber, neoprene or similar material. Parts 8-12 inclusive are held together by screw 13 threaded into rod 14 and integral with pin 15, which maintains a minimum space between the lower surface of the piston 7 and bottom 4.

Piston 16 in cylinder 6 is formed of circular metal plates 17 and 18 which embrace the flexible cup-shaped washers 19 and 20 of rubber, neoprene or similar material. Parts 17-20 are held in position by screw 22 threaded into the upper end of rod 14, integral with pin 23. As is evident from this construction, when piston 7 reciprocates in cylinder 3, piston 16 correspondingly reciprocates in cylinder 6.

The reciprocation of piston 7 is controlled by valves 24 and 25, which in the embodiment shown are of the slide type including cylinders 26 and 27. Cylinder 26 is connected at its mid-point through pipe 28 into the upper end of cylinder 3. Cylinder 27 is connected at its mid-point through pipe 30 into the lower end of cylinder 3. Flow is controlled by piston 31 in cylinder 26 and piston 32 in cylinder 27. The pistons are connected together through rod 33 normally urged into the up-position by compression spring 34, but which may be returned to the down-position by pressure exerted downwardly on treadle 35. Manifold 36 (Fig. 2) is connected into the upper end of cylinder 26 and into the lower end of cylinder 27. This manifold carries side arm 37 provided with male fitting

2

38 adapted to receive the conventional threaded female fitting in which the usual garden hose terminates, thereby receiving liquid under pressure from this source. Manifold 41 (Fig. 2) is connected into the lower end of cylinder 26 and into the upper end of cylinder 27. It carries side arm 42 to which a hose 43 may be fitted to carry low pressure water to waste.

In the position of pistons 31 and 32 indicated in Fig. 1, water under pressure flows from manifold 36 into the lower end of cylinder 27, and thence through pipe 30 into the lower end of cylinder 3 to raise piston 7. Simultaneously the upper end of cylinder 3 discharges through pipe 28 into manifold 41, from which it runs to waste through pipe 42 and hose 43. In the upward movement any liquid in cylinder 6 is expelled under pressure through outlet check-valve 44 connected to the hose 45, which carries the spray nozzle 45'. Whenever the spraying stops the foot treadle 35 is depressed for a few seconds, whereupon flow is reversed and pistons 7 and 16 return to the position indicated in Fig. 1. Simultaneously the liquid to be sprayed is drawn into cylinder 6 through inlet check-valve 46. For this purpose the hose 47 which connects with check-valve 46 dips into a pail or other receptacle which contains the liquid to be sprayed.

Referring to Figs. 3 and 4, corresponding numbers identify corresponding parts. In this case, however, cylinder 6 is surrounded by an outer cylinder 51 secured at its lower end to cover 5, and through annulus 52 at its upper end to cylinder 6, by which it supports cylinder 6. In this case, however, the propulsive liquid is admitted to, and exhausted from, the lower end only of cylinder 3. When the foot treadle 35 is depressed, the pistons 7 and 16 are returned to the position indicated in Fig. 3 by operation of the compression spring 53.

I claim:

1. An agricultural sprayer consisting of a unitary, manually portable device, including a first cylinder, a first piston positioned in said first cylinder and axially movable to reciprocate therein, a second cylinder of lesser diameter than said first cylinder positioned adjacent to, coaxial with said first cylinder, a second piston positioned in said second cylinder and axially movable to reciprocate therein, a shaft connecting said first and second pistons for movement together, a suction inlet connection at an end of said second cylinder, an outlet connection at the same end of said second cylinder, a check valve associated with said suction inlet connection allowing flow into said second cylinder through said suction inlet connection and automatically preventing flow out of said second cylinder through said suction inlet connection, a check valve associated with said outlet connection allowing flow out of said second cylinder through said outlet connection and automatically preventing back-flow through said outlet connection, a conduit connected to said outlet connection, an agricultural spray head at the end of said conduit, a suction line connected to said suction inlet connection for the suction withdrawal of liquid to be sprayed from a reservoir and a valve controlling flow into and out of one end of said first cylinder.

2. Agricultural sprayer according to claim 1 including a second valve controlling flow into and out of the other end of said first cylinder.

3. An agricultural sprayer consisting of a unitary, manually portable device, including a first cylinder, a first piston positioned in said first cylinder and axially movable to reciprocate therein, a second cylinder of lesser diameter than said first cylinder positioned adjacent to, coaxial with said first cylinder, a second piston positioned in said second cylinder and axially movable to reciprocate therein, a shaft connecting said first and second pistons for movement together, a suction inlet connection at an end of said second cylinder, an outlet connection at the

3

same end of said second cylinder, a check valve associated with said suction inlet connection allowing flow into said second cylinder through said suction inlet connection and automatically preventing flow out of said second cylinder through said suction inlet connection, a check valve associated with said outlet connection allowing flow out of said second cylinder through said outlet connection and automatically preventing back-flow through said outlet connection, a conduit connected to said outlet connection, an agricultural spray head at the end of said conduit, a suction line connected to said suction inlet connection for the suction withdrawal of liquid to be sprayed from a reservoir, a valve controlling flow into and out of one end of said first cylinder, and a spring biasing said

4

first piston to return to the end of said cylinder, into which and out of which said valve controls flow.

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