

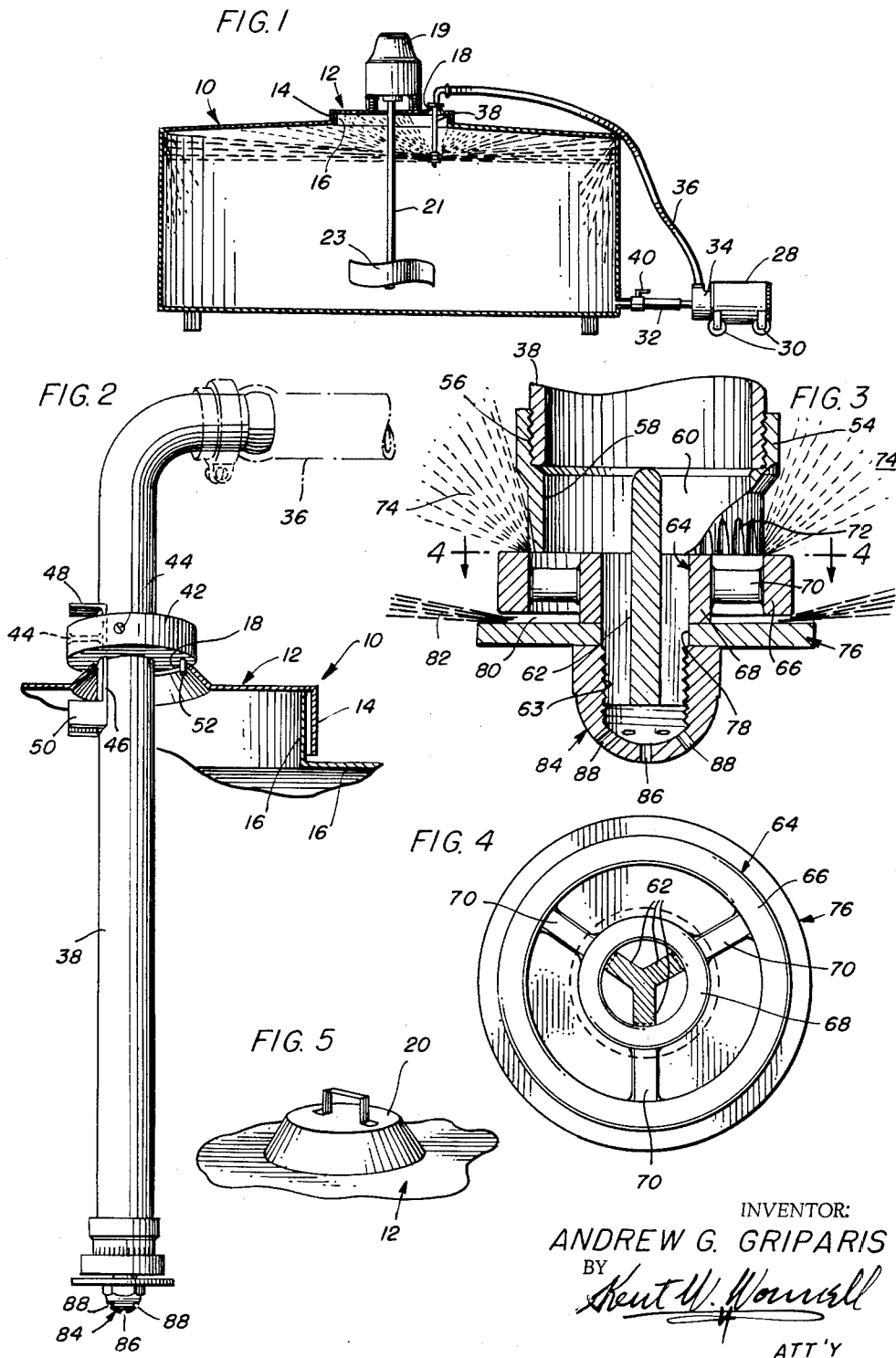
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TANK SPRAYER

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1

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TANK SPRAYER

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This invention relates in general to a tank with a sprayer head insertable through the top therein and connected to a pump for drawing liquid from the bottom of the tank to spray the under side of the top of the tank as well as the sides thereof. Tank sprayers are commonly provided with discharge heads which are adapted to wash down the sides of the tank and by moving or manipulating the head to spray the top or ceiling of the tank when inserted from the top thereof and moved accordingly.

The present invention relates to a high capacity pressure unit which features a high velocity mist for the ceiling of the tank and a heavy horizontal spray for the sides forming an efficient action spray head for cleaning the walls, ceiling and interior of the pump with a single setting of the head.

An important object of the invention is to provide a spray head insertable downwardly through the top of a tank to discharge in an upward direction to clean the top of the tank with minimum wastage at the top.

A further object of the invention is to provide a heavy spray which covers and cleans the rest of the tank, in addition to the top thereof, and does not blow hot water and detergent used for cleaning the tank out through the tank top or opening before cleaning it.

A still further object of the invention is to provide means for holding the insertable spray tube in the tank for spraying purposes.

Other objects of the invention will appear in the specification and will be more apparent from the accompanying drawings in which,

FIG. 1 is a sectional view somewhat diagrammatical illustrating a pump, a spray tube extending therefrom and a tank within which the spray tube is inserted for cleaning the ceiling, side walls and interior of the tank;

FIG. 2 is a perspective view of a curved spray tube and means thereon for releasably holding the tube tightly in the tank;

FIG. 3 is a sectional detail illustrating the construction of the spray head;

FIG. 4 is a cross sectional view of the spray head; and

FIG. 5 is a perspective of the tank cover closure.

In this construction, a heavy mist or light spray is directed upwardly and outwardly to saturate and clean the roof or ceiling of a milk tank, with a so-called shoebox cover with a minimum amount of leakage through the shoebox joint and the pipe connection. Heavy spray covers and cleans the remainder of the inside of the tank, which differs in operation from other spray heads, as they tend to blow out hot water and detergent which is used, through the tank cover itself and through the opening in the cover before actually cleaning the tank. By additionally retaining the spray stick in a fixed place as it projects through the cover of the tank, the interior of the tank including the ceiling or inside top of the cover are effectively sprayed and cleaned in one operation without moving the spray tube.

Referring now more particularly to the drawings, a tank 10 may be of a rectangular or cylindrical construction, but preferably has a removable cover 12 of the shoebox type in which a peripheral flange 14 extends downwardly over and closely engages an upwardly extending flange 16 at the upper side of the tank and engaged and closely covered by the cover 12.

The tank is ordinarily filled by a pipe (not shown) or at the top by removing the cover 12 or through a rela-

2

tively off-center opening 18 with an ordinary filling device applied thereto which forms no part of the present invention. The opening 18 has a removable lid 20 for closing it, which may be made of rubber or other plastic. An agitating device, comprising a motor 19 mounted on top of the cover 12 has a stem 21 extending through it and into the tank 10, for rotating a blade 23 at its lower end, but forming no part of the invention.

A pump 28 is mounted upon wheels 30 for readily moving it from one tank to another. The pump has an inlet hose 32 attached at one end to the center of a fitting 34 and with an outlet hose 36 connected to the periphery of the fitting 34 for attachment to a tank inlet pipe 38.

The tank is provided with a valve 40 connected through the pump inlet hose 32 for admitting cleaning fluid to the pump and to the hose connections therefor, which remove milk from the tank to a suitable containing receptacle. The cleaning fluid is thus drawn from the bottom of the tank and the pump discharges through the hose 36 and the pipe 38 through the opening 18 in the top 12 when the plate lid 20 is pushed to one side.

Intermediate the ends of the spray pipe 38 is a close fitting collar 42 which may have an adjustable fastening screw 44 extending through it and engaging the pipe 38. A preferable arrangement is to provide this screw 44 at a location to engage a slide 46 fitting against the pipe 38 and having a stop projection 48 and bottom projections 50 extending in the same direction spaced apart a distance greater than the thickness of the collar and projecting sufficiently to engage the edge of opening 18. This slide is arranged opposite a pin 52 extending through the collar, the lower end of which projects at a distance below the collar, such that when the slide is moved and may be adjustable for lips of different heights to engage within the opening at one side, the pin 52 engages the opening at the other side and prevents the pipe 38 from being drawn or forced outwardly from the opening 18 in a straight direction, but it must be tilted to disengage the pin 52 from the edge of the opening before the projections 50 of the slide 46 are moved with the pipe 38 to free it from engagement with the under side of the cover surrounding the opening 18. This collar 42 is preferably a plastic or flexible washer substantially sealing the opening 18 around the pipe 46, prevents the normal raising of the pipe 38 without first tilting it and thereby forms a substantial seal surrounding the pipe for any spraying liquid which is discharged in the tank, and the weight of the pipe 38 holds the spray head in place.

The spray head comprises a sleeve member 54 having one portion 56 threaded, or otherwise secured to the pipe 38, and another portion 58 is offset inwardly and is reduced to the inside diameter of the pipe to make it flush and smooth, and has a spider 60 extending from the center thereof. A central stem 62 also threaded at the ends extends from the center of the spider, extending from the end of the pipe 38, and the end of the sleeve 54 for the attachment of the sprayer head. The spiders 62 permit passage of water downwardly to the nut 85 which may have a central bottom opening 86 and surrounding spray slots 88 for spraying any agitator blades directly through the nut 84 if desired.

The outer end of the spider 60 is flush with the outer end of the sleeve 54 and the stem extends outwardly beyond it and is provided at the end with a threaded head 63; upon the extending portion of the stem, a nozzle collar 64 is mounted which has an outer rim 66 about the same diameter as the outside of the sleeve portion 58 and connected to a slightly longer inner rim portion 68 by short spacing arms 70 also forming a spider connection in effect. The inside diameter of the inner rim portion 68 is sufficient to make a close sliding fit with the unthreaded portion of the stem 62 of the sleeve member

and to locate the outer rim 66 with its inner diameter closely adjacent the outer edge of the reduced portion 58 of the sleeve member 54.

At the outer edge of the sleeve member 54, it is formed around its entire periphery with short indentations or longitudinal grooves 72 which extend inwardly along the outside of the reduced portion 58 of the sleeve member, and likewise inwardly of the outer rim 66 of this nozzle collar 64 which provides a discharge of a light film or spray 74 which extends angularly upward and outward entirely around the sleeve member and the nozzle collar for the purpose of washing, cleaning and spraying the inside of the top of the tank and the cover therefor.

Also mounted on the unthreaded portion of the stem 62 in engagement with a protruding edge of the inner rim 68 is a plate 76 which has a central perforation 78 to fit closely upon the stem leaving a limited discharge slot all around the nozzle collar between the outer rim 66 and the adjacent inner face of the plate 76 freely communicating through the space in the collar between the spider arms 70 and in the sleeve member between the spider 60 for the discharge of a cleaning fluid from the interior of the spray pipe outwardly and entirely around the spray pipe between the upper surface of the plate 76 and the adjacent edge of the outer rim 66 of the collar 64.

This plate 76 and the collar 64 are held tightly in engagement with the reduced portion of the sleeve member 54 forming the double spray head by the engagement of a threaded portion or a rounded nut 84 with a correspondingly threaded end or head 63. The inside of the nut engages the outer side surface of the plate 76 pressing it firmly against the projecting edge 68, and thereby holding both the plate and the collar 64 tightly in engagement with the sleeve member 54, and thus completing the assembly of the double spray head. The outer periphery of the plate 76 does not extend materially beyond the outer periphery of the collar 64 and acts with the outer spaced edge of the rim to confine the discharge of liquid from the pipe through the peripheral slot 80 in a substantially horizontal direction.

With this construction, it will be seen that the spray head may be inserted through the hole 18 provided for it in the removable top 12, by removing the lid 20, adjusted for the extent of insertion therein by the collar 42 and slide 46, and any substantial loss of spray may be prevented by the collar. When the spray head is inserted and the pump is activated, it will draw detergent or liquid from some other source, or from the bottom of the tank itself and discharges it into the tank near the top thereof. The spray head discharges a light spray upwardly in sufficient quantity to clean the removable top 12 of the shoe-box type by the heavy mist or light spray 74 which shoots angularly upward from the groove 72, and also to direct horizontal spray 82 from the duct 80 of the same inserted spray tube or head from completely around the spray head or for 360°. Thus the light spray is sufficient to cover and clean the inside of the top of the tank and the heavy horizontal spray covers and cleans the rest of the tank, the pump withdrawing the liquid as desired from the bottom of the tank.

When the cleaning operation is completed, the spray pipe 38 is removed from the spray opening 18 by first disengaging the slide 46, the cover 20 is replaced to close the opening 18, the pump inlet hose 32 is disconnected from the tank valve 40 while the pump with the inlet and discharge hose connections is moved away or is attached to another tank for similar action, allowing cleaning solution to drain out through valve 40.

While I have thus described a preferred form of the invention in some detail, it should be regarded by way

of illustration and example rather than as a restriction or limitation thereof, as many changes in the construction, combination and arrangement of the parts may be made without departing from the spirit and scope of the invention.

I claim:

1. In a tank sprayer for a tank having inner top and side surfaces and a removable cover with an opening therethrough with a removable closure for the opening, and for a cleaning pump having an inlet and a pipe outlet, the sprayer comprising said pipe formed with an enlarged head at the end insertable through the opening in the cover for directing some of the spray upwardly and entirely around the head to the inside of the top and cover and the other openings to direct cleaning spray from the head in a horizontal direction at right angles to the spray head for cleaning the inner walls of a tank, and means to secure the pipe to the tank being cleaned at the opening in the tank.

2. In a tank sprayer adapted to be inserted in a top opening in a tank, a spray head comprising a spray pipe, a sleeve member secured to the end of the pipe having a central spider and a stem extending outwardly therefrom, a collar fitting on the stem having spaced rings of two diameters connected by radial arms, the first ring fitting upon the stem and the second ring extending outwardly beyond the periphery of the sleeve member, means connected to the outer end of the stem for directing spray at right angles to the stem at one side of the collar, and a grooved edge at the periphery of the outer edge of the sleeve member adjacent the inner periphery of the outer rim of the collar to direct circumferential spray at an angle upwardly and reversely to the other spray and to the direction of flow of liquid through the spray pipe.

3. A spray tube in accordance with claim 2, in which the inner ring of the nozzle collar extends more in one direction than the other ring, a plate abutting the inner ring providing a peripheral space between the outer ring and the plate and the arms connecting the inner and outer plates forming a free passage for liquid from the interior of the spray pipe between the plate and the adjacent side of the outer ring to provide a 360° spray passage at right angles outwardly from the collar.

4. A tank sprayer in accordance with claim 2, having a plate with a central opening abutting the inner projecting ring of the collar on the stem projecting from the sleeve member, and threaded means engaging the outer end of the stem for pressing the plate against the inner ring of the collar and pressing the collar against the outer end of the sleeve member to complete the head and the collar having spaced arms for retaining a free space for spray at both sides of the collar, the spray at one side of the collar extending throughout a whole circumference at right angles to the stem, and a light spray at the other side of the collar extending reversely and at an angle to the collar and to the spray at the other side of the collar.

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