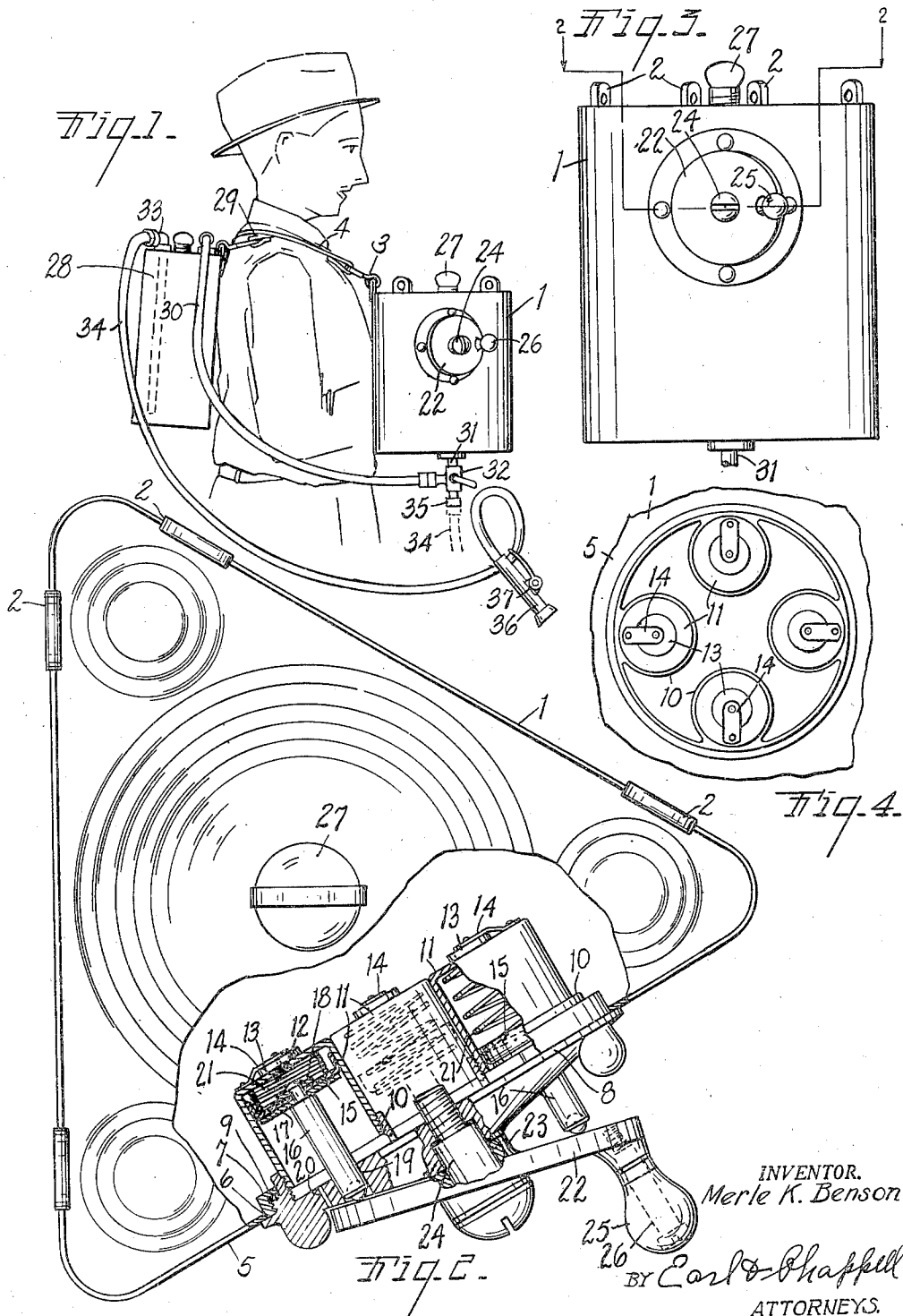


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SPRAYING APPARATUS
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SPRAYING APPARATUS

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The main objects of this invention are:

First, to provide a portable spraying or dusting apparatus or the like which is very convenient to use and can be easily operated to maintain a substantially constant pressure.

Second, to provide an apparatus of the class described which includes two tanks or receptacles, one to be supported at the front of the user and the other as a knapsack or at the back of the user, the one acting as a counterbalance for the load of the other as well as providing additional capacity.

Third, to provide a portable apparatus which may be adjusted so that the pump may be operated by either hand of the user.

Fourth, to provide a structure embodying these advantages which is economical in its parts and very durable in use.

Objects relating to details and economies of the invention will appear from the description to follow. The invention is defined in the claims.

A preferred embodiment of the invention is illustrated in the accompanying drawing, in which:

Fig. 1 is a side elevation of a spraying apparatus embodying my invention, illustrating the arrangement of the tanks on an operator or user, certain of the parts being shown conventionally.

Fig. 2 is an enlarged fragmentary plan view of a structure embodying my invention partially in section on line 2—2 of Fig. 3.

Fig. 3 is a side elevation of the pump side of the structure illustrated in Fig. 2.

Fig. 4 is a fragmentary view showing the inner end of the pump assembly in elevation.

In the embodiment of my invention illustrated, I provide a portable pressure tank 1 of triangular cross section and having supporting ears 2 on two sides thereof, these supporting ears being adapted to be engaged by the hooks 3 of the shoulder strap or carrying strap 4, the hooks being selectively engageable with either pair of ears for purposes which will appear as the description proceeds. The third side 5 of the tank is provided with an opening 6 having a flanged internally threaded ring 7 secured therein. This ring is adapted to receive the pump assembly base 8 which is externally threaded to thread into the supporting ring against the gasket 9.

The base has a plurality of annular flanges 10 on its inner side, uniformly spaced or grouped on the base and adapted to receive the cylinders 11. These cylinders are, in the embodiment illustrated, sheet metal stampings externally threaded to engage the flanges 10 and provided

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with discharge ports 12 at their inner ends. The valves 13 are urged to closing position by their spring supporting arms 14.

Each cylinder is provided with a plunger 15 of the flexible cupped type, the plungers being carried by the plunger rods 16 having plunger supporting disks 17 and retaining disks 18, the parts being assembled by reducing the ends of the plungers and riveting the ends thereof as shown in Fig. 2.

The plungers are supported by suitable bearings 19 on the base, the base having air inlet openings 20 permitting a free entrance of air to the cylinder at the outer sides of the plungers.

The coiled springs 21 preferably of the cylindrical type urge or bias the plungers outwardly to urge their plunger rods 16 into engagement with the swash or cam plate 22 which has a hub portion 23 rotatably mounted on the stub shaft 24 threaded into the base plate. The swash plate is provided with a handle 25 rotatably mounted on the spindle 26 projecting from the swash plate.

With this arrangement, the pump is conveniently operated while the tank is supported at the front of the user and it may be, as stated, adjusted to be operated by either hand, some operators preferring right-hand operation for which it is adjusted in Fig. 1 and others left-hand operation. The tank is provided with a filling opening at the top provided with a closure 27.

In the embodiment illustrated, I provide a second tank 28, this being conventionally shown and being adapted to be supported at the back of the user by means of shoulder straps 29. This tank 28 is connected to the pressure tank 1 by means of the flexible hose connection 30, the tank 1 of the embodiment illustrated having a branched discharge 31 provided with a valve 32. This connection 30 delivers to the top of the tank 28. The tank 28 has a discharge connection 33 opening thereto at the bottom of the tank.

The spray hose 34 may be connected to this discharge connection 33 as shown in Fig. 1, or the hose 34 may be connected to the branch 35 of the discharge connection 31 and the valve 32 may be adjusted to cut out the tank 28 and deliver liquid from the tank 1 to the hose 34. The spray hose 34 has a spray head 36 having a valve 37 of a type known to the art—that is, of a type in which the valve is held open by the user but is closed automatically. I have not detailed this as it will be readily understood by those skilled in the art to which my invention relates.

The apparatus is very convenient to use and a constant pressure may be easily maintained. I have not illustrated the filling opening of the second tank as that will be readily understood. It will be understood that both tanks are airtight and adapted to contain spraying liquid and air under pressure although if desired the liquid may be placed in the second tank only, the pressure tank being used purely as a pressure tank.

It will be appreciated that the apparatus has a wide range of adaptation. When both tanks are filled with liquid they are substantially balanced which is a desirable feature when the load is at its maximum.

I have illustrated and described my invention as embodied in a liquid spraying apparatus. I have not attempted to illustrate or describe these other embodiments or adaptations as it is believed that this disclosure will enable those skilled in the art to embody or adapt my invention as may be desired.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a spraying apparatus, the combination of a portable pressure tank of triangular cross section having supporting ears at two sides thereof and an opening on its third side adapted to receive a pump assembly, said pressure tank being provided with a branched outlet having a discharge valve controlling the branches thereof, an air pump assembly comprising a base removably mounted in said opening, a plurality of cylinders mounted on said base to project into said tank and having discharge valves at their inner ends, flexible cupped plungers disposed to face inwardly within said cylinders and provided with plunger rods projecting through said base, springs arranged within said cylinders to bias said plungers outwardly, a swash plate rotatably mounted on the outer side of said base in coacting relation to all of said plunger rods and provided with a handle, means for supporting said pressure tank at the front of the user selectively engageable with supporting ears whereby the pump may be presented for manipulation by either hand of the user, a second portable tank adapted to be carried by the user as a knapsack, a flexible hose connection for the one branch of the discharge of said pressure tank to said second tank, the second tank being provided with a discharge connection communicating therewith adjacent the bottom thereof, and a spray hose provided with a discharge valve and a spray head, said spray hose being adapted to be selectively connected to the discharge of the second tank or to the second branch of the discharge of said pressure tank.

2. In a spraying apparatus, the combination of a portable pressure tank of triangular cross section having supporting ears at two sides thereof, and an opening on its third side adapted to receive a pump assembly, said pressure tank being provided with a branched outlet having a discharge valve controlling the branches thereof, an air pump assembly comprising a base removably mounted in said opening, a plurality of cylinders mounted on said base to project into said tank and having discharge valves at their inner ends, flexible cupped plungers disposed to face inwardly within said cylinders and provided with plunger rods projecting through said base, springs arranged within said cylinders to bias said plungers outwardly, a swash plate rotatably mounted on the outer side of said base in coacting relation to all of said plunger rods and provided

with a handle, means for supporting said pressure tank at the front of the user selectively engageable with supporting ears whereby the pump may be presented for manipulation by either hand of the user, and a spray hose connected to said tank and provided with a discharge valve and a spray head.

3. In a spraying apparatus, the combination of a portable pressure tank of triangular cross section having an opening in one side adapted to receive a pump assembly, said pressure tank being provided with an outlet, an air pump assembly comprising a base mounted in said opening, a plurality of cylinders mounted on said base and having discharge valves delivering to said tank, plungers coacting with said cylinders and provided with plunger rods projecting through said base, springs acting to bias said plungers outwardly, a swash plate rotatably mounted on the outer side of said base to coact with said plunger rods and provided with a handle, means for supporting said pressure tank at the front of the user to selectively present the pump for manipulation by either hand of the user, a second portable tank adapted to be carried by the user as a knapsack, a flexible delivery connection for said pressure tank to said second tank, the second tank being provided with a spraying hose discharge connection, and a spraying hose selectively connectable to either tank.

4. In a spraying apparatus, the combination of a portable pressure tank adapted to be carried at the front of the user and having an opening in the side thereof, said pressure tank being provided with an outlet, an air pump assembly comprising a base mounted in said opening, a plurality of cylinders mounted on said base to project into said tank and having discharge valves at their inner ends, plungers coacting with said cylinders and provided with plunger rods projecting through said base, springs acting to bias said plungers outwardly, a swash plate rotatably mounted on the under side of said base to coact with said plungers and provided with a handle, a second portable tank adapted to be carried at the back of the user, a flexible delivery connection for said pressure tank to said second tank, an outlet for said second tank, and a spraying hose provided with a spray head, said spraying hose being adapted to be selectively connected to either tank outlet.

5. In a spraying apparatus, the combination of a portable pressure tank adapted to be carried at the front of the user and having an opening in the side thereof, an air pump assembly comprising a base mounted in said opening, a plurality of cylinders mounted on said base to project into said tank and having discharge valves at their inner ends, plungers coacting with said cylinders and provided with plunger rods projecting through said base, springs acting to bias said plungers outwardly, a swash plate rotatably mounted on the outer side of said base to coact with said plungers and provided with a handle, a second portable tank adapted to be carried at the back of the user, a flexible delivery connection for said pressure tank to said second tank, a spraying hose provided with a spray head, and means for connecting said hose to either tank.

6. In a spraying apparatus, the combination of a portable pressure tank adapted to be carried at the front of the user and having an opening in the side thereof, an air pump assembly comprising a base mounted in said opening, a plurality of cylinders mounted on said base to project

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into said tank and having discharge valves at their inner ends, plungers coacting with said cylinders and provided with plunger rods projecting through said base, springs acting to bias said plungers outwardly, and a swash plate rotatably mounted on the outer side of said base to coact with said plungers and provided with a handle.

7. The combination of a portable pressure tank having a pump assembly on the side thereof, said pressure tank being provided with an outlet, said assembly comprising a plurality of cylinders discharging to said tank, plungers coacting with said cylinders, springs acting to bias said plungers outwardly, a rotatably mounted swash plate coacting with said plungers, means for supporting said pressure tank at the front of the user, a second portable tank adapted to be carried at the back of the user, a flexible delivery connection for said pressure tank to said second tank, and a discharge hose selectively connectable to either tank.

8. The combination of a portable pressure tank having a pump assembly on the side thereof, said pressure tank being provided with an outlet, said assembly comprising a plurality of cylinders discharging to said tank, plungers coacting with said cylinders, springs acting to bias said plungers outwardly, a rotatably mounted swash plate coacting with said plungers, a manually engageable handle rotatable in a plane adjacent the enclosure wall of the tank and operatively connected to said swash plate for turning the same, and means for supporting said pressure tank at the front of the user.

9. The combination of a portable pressure tank adapted to be carried at the front of the user, an air pump mounted on the side of said tank and comprising a plurality of cylinders discharging to said tank, plungers coacting with said cylinders, springs acting to bias said plungers outwardly, a driven swash plate coacting with said plungers, a second portable tank adapted to be carried at the back of the user, a flexible delivery connection for said pressure tank to said second tank, and a manually controlled delivery means to said second tank.

10. The combination of a portable pressure tank adapted to be carried at the front of the user, an air pump mounted on the side of said tank and comprising a plurality of cylinders discharging to said tank, plungers coacting with said cylinders, springs acting to bias said plungers outwardly, a swash plate rotatably mounted to coact with said plungers, and a manually engageable handle rotatable in a plane adjacent

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the enclosure wall of the tank and operatively connected to said swash plate for turning the same.

11. The combination of a portable pressure tank of triangular cross section having a pump assembly on one side thereof, said pump assembly comprising a plurality of cylinders delivering to said tank and provided with plungers, a rotatably mounted swash plate coacting with said plungers, and means for supporting said pressure tank at the front of the user to selectively present the pump for manipulation by either hand of the user.

12. The combination of a pressure tank and a pump assembly on the side thereof, said pump assembly comprising a plurality of cylinders delivering to said tank and provided with plungers, a rotatably mounted swash plate for actuating said plungers, and a manually engageable handle rotatable in a plane adjacent the enclosure wall of the tank and operatively connected to said swash plate for turning the same.

13. In a pump, the combination with a base plate adapted for mounting on the wall of a pressure tank, of a plurality of cylinders mounted on said base plate and having discharge valves at their inner ends, flexible cupped plungers disposed to face inwardly within said cylinders and provided with plunger rods projecting through said base plate, springs arranged within said cylinders to bias the plungers outwardly, and a swash plate rotatably mounted on the outer side of said base plate in coacting relation to all of said plunger rods and provided with means for actuating the same.

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