

European Patent Application 0114569.

A method of supplying a soap solution metering device,
and a device for working the method

Description

The invention relates to a method of supplying a reservoir of a soap solution metering device comprising a downstream withdrawal device, and a soap solution metering device for working the method, comprising a soap solution supply system and a cover.

Methods and devices of the aforementioned kind are well-known per se.

US-A-3 531 021 describes and illustrates a similar soap solution metering device. The device comprises two containers holding soap solution, and after the contents of one container has been used up, the contents of the second container is used. This device, however, has a fairly complicated control system.

The complexity of the known solutions results in breakdowns and frequent servicing. In some cases the means for indicating the amount of soap solution remaining in the device are inadequate or non-existent. There is therefore a risk that the device will not be in working order, because the container has not been replaced on time.

The object of the invention is to produce a method and soap solution metering device of the initially-mentioned kind, in which the efficiency is not affected by refilling.

To this end, according to the invention, by actuating the withdrawal device the reservoir is supplied with soap solution stepwise in succession from at least two outlet openings disposed at different levels, each outlet opening is supplied with soap solution by a separate container, each higher level of soap solution keeps at least one lower outlet opening closed until the level of soap solution reaches the next lower outlet opening, and when the level of the soap solution continues to fall, environmental air is allowed into the next-lower outlet opening, thus causing an outflow, and the steps of this process are repeated until the level of soap solution, as a result of actuating the withdrawal device, has dropped below the lowest outlet opening.

The advantage of this method is that two or more containers of soap solution can be used. When a container is empty it can be replaced, an adequate amount of soap solution being available in at least one additional container. There is therefore no risk, given proper servicing, that the soap solution will fail completely or that a not completely empty container will have to be removed.

Advantageously when the withdrawal device is actuated a float is guided downwards with the level of the soap solution, and the position of the float controls an indicator lug. The advantage of this additional feature

is that without dismantling the soap solution metering device it is possible to detect from the exterior whether one or more containers are already empty or almost empty.

The soap solution metering device according to the invention comprises a soap solution supply system and a cover. It is constructed so that it has at least two vertically spaced outflow openings, discharging into the reservoir, for the soap solution supply. This construction enables the device to operate reliably in very simple manner.

Advantageously, in the case of the soap solution metering device according to the invention, an indicator device is associated with at least one outlet opening. Advantageously the indicator device is associated with the higher outlet opening, thus showing that the soap solution supply system has been emptied through this opening and refilling is accordingly necessary. There is sufficient time for refilling, however, since the soap solution supply system continues to be emptied through the lower outlet opening and the time for refilling is not limited by the time for emptying the reservoir.

In an advantageous embodiment, the soap solution supply system is mounted on a support in the upper region of the reservoir. At least one container is vertically disposed on the support, and the soap solution supply system extends through the support into the interior of the reservoir. The supply system can therefore easily

and reliably be disposed on and secured to the reservoir.

According to another advantageous feature of the soap solution metering device, the soap solution supply system comprises at least two separate containers each having a neck, the support has a neck for each container and the heights of the outlet openings are determined by the mouth of the necks of the containers or of the support. The containers can thus be held in particularly simple manner in the soap solution metering device. The replacement of the conventional single container by two containers does not result in any special structural alterations in the soap solution metering device or any appreciable losses of volume, so that existing soap solution metering devices can be converted.

Advantageously the containers have necks of equal length and the support has portions associated with the containers, each pair of portions being vertically offset from one another by a distance equal to the vertical distance between the outlet openings. This enables the containers to be replaced when necessary.

Advantageously, in the soap solution metering device according to the invention, the indicator device comprises a float mounted in the reservoir and connected to at least one indicator lug, which travels along a path extending at least partly along an inspection window in the cover. The indicator thus in very simple manner contains a float which is connected to an indicator lug

and moves with the level of soap solution in the reservoir. The indicator of course is simple; since the lug, which is clearly visible, appears in the inspection window of the cover, the reading is clear and reliable and independent of the number of refillings. The lug does not come into contact with the soap solution and therefore the reading cannot become unclear or be tampered with. The lug is also visible independently of the transparency of the containers or the soap solution.

Advantageously, in the case of the indicator for the soap solution metering device according to the invention, two indicator lugs and two inspection windows are disposed on different sides of the cover.

As a result, the reading is recognisable even in cases where one side of the cover is inaccessible, e.g. for constructional reasons.

According to another feature, the indicator lug has two differently-coloured areas, so that the reading in the inspection window is particularly clear. Also, the coloured area indicating emptiness moves gradually into the inspection window as the reservoir is emptied, so that the transition to the final empty state can be followed.

In another advantageous embodiment of the invention, an indicator lug is disposed at each end face of the float and is made integral with the associated lever, the float being secured to a bent part between the lug and lever. The result is a space-saving system which does not require

any special constructional alterations to the soap solution metering device for incorporating the indicator, and readings are available on two sides of the device.

The invention will be explained in detail with reference to the drawings, in which:

Figure 1 is a longitudinal central section along line 1-1 in Fig. 2 through a soap solution metering device according to the invention in a first operating state in which emptying occurs through the higher outlet opening;

Figure 1a is a corresponding section through the soap solution metering device in Fig. 1 in an operating state in which emptying occurs through the lower outlet opening;

Figure 2 is a section II-II through Fig. 1, showing the indicator;

Figure 2a is a view of the indicator lug in the soap solution metering device in Fig. 2, showing how it is aligned relative to the inspection window in the cover in the two different operating states in Figs. 1 and 1a.

Figure 3 is a plan view of the float system for the indicator in Fig. 2 and Fig. 2a and

Figure 4 is a plan view of the support and reservoir in the soap solution metering device in Fig. 1.

In the drawings, like parts are denoted by like references.

Figure 1 is a section showing a retaining means, e.g. a rear surface 1 secured to a wall. A soap solution

supply system 2 comprises a first container 3 and a second container 3' disposed vertically side by side with downward openings. At the open end, containers 3, 3' have recesses 4, 4' for a purpose described hereinafter. Recesses 4, 4' are adjacent a neck 5, 5' having a mouth which defines an outlet opening 6, 6'. The soap solution metering device also comprises a reservoir 7 into which the openings 6, 6' discharge. Containers 3, 3' are mounted on a retaining device 8. Device 8 comprises bearing ribs 9 formed on reservoir 7 and a support 10 resting on ribs 9. Support 10 has two portions 11, 11' each having a neck 12, 12'. Necks 5, 5' of containers 3, 3' extend through necks 12, 12' respectively of support 10, and the outlet openings 6, 6' discharge at a given vertical distance from one another into reservoir 7. Portions 11, 11' of support 10 are offset from one another by the vertical distance between openings 6, 6' and containers 3, 3' rest on support 10.

Reservoir 7 has a base 13. The outlet openings 6 and 6' of containers 3, 3' are in the interior 14 of reservoir 7. A pump chamber 15 is disposed under base 13.

In the operating position as shown in Fig. 1, containers 3, 3' are both filled with soap solution. When containers 3, 3' are in use, soap solution rises in reservoir 7 to the level of the higher outlet opening 6 of container 3, as shown by the upper liquid level 18. Fig. 1a shows the operating state of the soap solution

metering device after container 3 has been emptied, but before container 3' has been emptied. The level of soap solution in the intermediate container 7 has then fallen to the lower liquid level 18'.

As also shown in Figs. 1 and 1a, the entire system is surrounded by a cover 20. Near the recesses 4, 4' in containers 3 and 3', cover 20 cooperates with recesses 4, 4' to form a chamber 23 for a purpose described hereinafter, where an inspection window 28 is formed in cover 20.

In Fig. 2, parts already shown in Fig. 1 have the same reference numbers. Fig. 2 also shows a cylinder 16 inserted in a vertical part of base 13. The cylinder receives a piston (not shown) of the metering device, the other end of the piston being connected to a push-button 17. An outlet 17' for soap solution is disposed under button 17.

Figure 2 also shows a lower retaining plate 19, which is formed integrally with the back surface 1 and on which the reservoir 7 is disposed. A part 19' for securing the reservoir 7 is also disposed on the back surface 1.

Figure 2 also shows an indicator. The indicator substantially comprises a cylindrical float 21, from which an indicator lug 22 extends upwards and a lever 25 extends sideways. Lever 25 is pivoted to reservoir 7 at a bearing 26. Lug 22 projects into the space 23

bounded by the cover 20 and the recess 4 on container 3. Cover 20 has an inspection window 28 (see Fig. 1) through which the lug 22 is visible.

In Fig. 2a, lug 22 is shown in two positions. A continuous line shows the position of lug 22 when the interior 24 of reservoir 7 is full (see Fig. 1). A broken line shows that the reservoir is almost empty. Lug 22 has a first coloured area 17 which is e.g. green, and a coloured area 29 which is e.g. red. Reference 30 denotes a region of the coloured areas 27, 29 visible in the inspection window.

The plan view in Fig. 3 shows the reservoir 7 with the securing part 19' and the float system comprising the float 21, from both sides of which levers 25, 25' extend and are pivoted to reservoir 7 at bearings 26. Bearings 26 are shown as projections formed near the ends of levers 25, 25' and received in corresponding recesses in the associated wall of reservoir 7. In the embodiment shown in Fig. 3, only lever 25' has an indicator lug 22.

The plan view in Fig. 4 also shows reservoir 7 with the securing part 19' and the retaining device 18 and support portions 11, 11' for receiving containers 3, 3' and necks 12, 12' for receiving the necks 5, 5' of containers 3, 3'.

The operation of the soap solution metering device will now be described in conjunction with Figs. 1, 1a, 2 and 2a. When the soap solution metering device is in

the normal operating state, which continues as long as the first container 3 contains soap solution, the liquid in reservoir 7 is at a level 18 determined by the outlet opening 6 of container 3. Float 21 then occupies a top position as shown in Figs. 2 and 2a. As shown in detail in Fig. 2a, lug 22, at its end remote from float 21, has two areas 27 and 29. These areas are coloured; in the embodiment area 27 is green and area 29 is red. The region of area 27 visible through window 28 in cover 20 when lug 22 is in the aforementioned position is shown by a dotted line in Fig. 2a and marked 30. Accordingly, the green area 27 shows that the soap solution metering device is ready for operation.

After container 3 has emptied, the level of liquid in reservoir 7 sinks. The second container 3', which is still filled with soap solution, now cooperates with reservoir 7 in the same manner as container 3 did.

Accordingly, the level of liquid soap solution in reservoir 7 falls to the level 18' of the outlet opening 6' of container 3'. Float 21 and consequently lug 22 follow this movement along an arcuate trajectory. The end position of float 21 and lug 22 corresponding to the liquid level 18' in Fig. 1a is shown by chain lines in Fig. 2a. As can be seen, when lug 22 is in this position, the top, red area 29 is in line with window 28 of cover 20 and region 30 of area 29 is visible through window 28.

Between the two end positions shown in Fig. 2a, a region 30 including parts of both areas 27 and 19 is

visible in inspection window 28. The overall result, therefore, is that the user is informed in good time that container 3 has emptied.

The cylinder 16 in base 13 receives the piston (not shown) of the withdrawal device, which is known per se.

In the embodiment shown, the indicator on the higher outlet opening is associated with the first container 3. This means that the red area 29 of the indicator shows that the first container 3 has emptied and needs to be replaced by a full container. If the replacement is not made immediately, this does not initially matter, since the soap solution metering device can continue to operate with the remaining contents of the second container 3'. When the replacement is made, however, the container 3', which now may be only partly filled, should be put in the place of the empty container 3 and a new, full container put in the place of container 3'. In this manner, a reserve can always be kept in the soap solution metering device.

Note that when the level of liquid is sinking to the height of opening 6' of container 3', both areas 27 and 29 of lug 22 are visible in window 28. This gives early notice that container 3 is empty.

The embodiment of the soap solution metering device shown in the drawings can be varied in numerous ways. If required, more than two containers can be provided, but at least two of them must be disposed so that the outlet openings are vertically spaced apart when they end in the reservoir. The containers in the soap solution metering device need not be exchangeable, but can be permanently

mounted and refillable.

The retaining device 8 can also be varied in numerous ways. For example, it can be attached to the back surface 1 instead of to reservoir 7, in which case the support 10 may be omitted or be replaced by a bearing means on surface 1.

In the embodiment shown, necks 5, 5' of containers 3, 3' extend through support 10. If the necks 12, 12' in the portions 11, 11' of support 10 are suitably constructed, the outlet openings can also be defined by the mouths of necks 12, 12'. Alternatively, containers disposed e.g. on the back surface 1 can be connected in suitable manner to the interior 14 of reservoir 7 by suitable intermediate members which extend into the containers.

Other embodiments of the indicator are also possible. For example, float 21 can have an indicator lug 22 at each end and cover 20 can correspondingly have an inspection window 28 on each side. This solution enables readings to be recognisable even when the soap solution device, for technical reasons, has to be secured to the wall in a corner.

In another variant, lug 22 can have only one coloured area, which can be seen in window 28 after container 3 has emptied.

The area or areas need not be coloured, but can alternatively be e.g. reflecting, luminous, luminescent, or otherwise conspicuously marked. The lugs can also be disposed at a greater distance from the back surface 1.

The float can be guided by other means on reservoir 7. Also, the lug can extend in a different direction or the area or areas can be formed on other parts of the float system, in which case the inspection window or windows 28 in cover 20 will be correspondingly disposed.

In another optional variant of the indicator, the level to which container 3, 3' are filled can be shown separately by the indicator. To this end, indicator lugs are disposed at both ends of float 21 and inspection windows are formed on both sides of cover 20, so that the lugs are in line with the windows. For example, the lugs can be of different lengths and the windows at different heights on the cover. Both lugs can have differently-coloured areas in the manner previously described, so as to indicate whether each container 3, 3' is full or empty. Alternatively, lugs 22 can be of equal length and the windows in the cover can be at the same height. In that case the coloured areas must be made asymmetrical so as to ensure that the fact that one container has been emptied continues to be indicated while the other container is being emptied.

The result is an extremely simple, cost-saving indicator which punctually, before reservoir 7 has emptied, gives a clear, reliable and unambiguously recognisable indication of the operating state of the soap solution metering device, irrespective of the number of refillings.



ICH/11

CLAIMS

1. A method of supplying a reservoir (7) of a soap solution metering device comprising a downstream withdrawal device (16, 17, 17'), characterised in that by actuating the withdrawal device (16, 17, 17') the reservoir (7) is supplied with soap solution stepwise in succession from at least two outlet openings (6, 6') disposed at different levels, each outlet opening (6, 6') is supplied with soap solution by a separate container (3, 3'), each higher level of soap solution keeps at least one lower outlet opening (6') closed until the level of soap solution reaches the next lower outlet opening (6'), and when the level of the soap solution continues to fall, environmental air is allowed into the next-lower outlet opening (6'), thus causing an outflow, and the steps of this process are repeated until the level of soap solution, as a result of actuating the withdrawal device (16, 17 17') has dropped below the lowest outlet opening (6').

2. A method according to claim 1, characterised in that when the withdrawal device (16, 17, 17') is actuated a float (21) is guided downwards with the level of the soap solution and the position of the float controls an indicator lug (22).



3. A soap solution metering device for working the method according to claim 1, comprising a soap solution supply system (2) and a cover (20), characterised in that the soap solution supply system (2) has at least two vertically spaced outlet openings (6, 6') discharging into the reservoir (7).

4. A soap solution metering device according to claim 3, characterised in that an indicator device is associated with at least one of the outlet openings (6, 6').

5. A soap solution metering device according to claim 3, characterised in that the soap solution supply system is mounted on a support (10) in the upper region of the reservoir (7).

6. A soap solution metering device according to claim 5, characterised in that the soap solution supply system (2) comprises at least two separate containers (3, 3') each having a neck (5, 5'), the support (10) has a neck (12, 12') for each container (3, 3') and the heights of the outlet openings (6, 6') are determined by the mouth of the necks (5, 5') of the containers (3, 3') or of the support (10).

7. A soap solution metering device according to claim 6, characterised in that the containers (3, 3') have necks (5, 5') of equal length and the support (10) has portions (11, 11') associated with the containers



(3, 3'), each pair of portions being vertically offset from one another by a distance equal to the vertical distance between the outlet openings (6, 6').

8. A soap solution metering device according to at least one of claims 3 to 7, characterised in that the indicator device comprises a float (21) mounted in the reservoir (7) and connected to at least one indicator lug (22), which travels along a path extending at least partly along an inspection window (28) in the cover (20).

9. A soap solution metering device according to claim 8, characterised in that the two indicator lugs (22) and two inspection windows (28) are disposed on different sides of the cover (20).

10. A soap solution metering device according to claim 8 or 9, characterised in that the indicator lugs (22) are provided with two differently-coloured areas (27, 29).

11. A soap solution metering device according to claim 3, characterised in that an indicator lug (22) is disposed at each end face of the float (21) and is made integral with the associated lever (25), the float (21) being secured to a bent part between the lug (22) and lever (25).