

Description

The present invention relates to a device for the portional formation of soap lather, comprising a storage container for an aqueous soap solution, in each case with a soap solution metering pump and a compressed air diaphragm pump which are actuatable by a single lever, with a diaphragm piston and a return spring as well as with a mixing chamber for the formation of lather.

Soap dispensers are well-known in use in many embodiments in public and private washing installations. The known embodiments include lather-forming soap dispensers, which use a propellant gas of dichlorofluoromethane (Freon 12) and which for environmental reasons should be distributed only with the greatest restraint.

In addition, a device for the metering and formation of soap lather according to the preamble of Patent Claim 1 is known (European Application A1-0 019 582), which comprises a single lever for simultaneously driving a piston of a soap solution metering pump and a diaphragm pump for producing compressed air. The compressed air is blown by way of a perforated wall of a line into the metered quantity of soap solution present in a mixing chamber, thereby producing a soap lather with large bubbles which is subsequently blown through a

porous body, homogenized and compressed.

In practice this solution has proved to be very economical with respect to soap consumption. It has been found, on the other hand, that the soap lather, in particular when the device has not been used for prolonged periods, can dry up in the region of its discharge opening, which has an adverse effect upon its functioning.

The object of the invention is therefore to provide a device for the portional formation of soap lather which is immediately ready for use even after prolonged periods out of use.

This object is attained by the feature characterized in Patent Claim 1.

The following dependent claims represent advantageous modifications of this solution.

The device according to Claim 2 produces a pulse-like ejection of the soap lather portion and thus presents blocking and/or dripping after actuation of the device.

A valve arrangement according to Claim 3 has proved to be particularly advantageous.

The operating reliability of the device and thus its degree of readiness can be further increased by valves according to Claim 4.

The design of the double-acting piston in the compressed-air diaphragm pump according to Claim 5 has the advantage of an elevated air capacity despite low installation dimensions and a considerable degree of operating convenience.

One embodiment of the invention subject matter is illustrated below with reference to a drawing.

The Figure is a sectional view of a preferred embodiment of a soap dispenser further developed with respect to the one already mentioned.

In the Figure, G designates the casing of a soap dispenser. An actuating lever 1 with a handle 1' projects from the casing G. A storage container V filled with aqueous soap solution — and indicated by an arrow — is disposed above the casing G. A nozzle 67 extends into the casing G and is connected to a cylinder space 4 of a soap-solution metering pump 3 by way of a lateral supply line 6. A piston 2 with a cylindrical blind-end bore and a piston outlet opening 7' is disposed in the soap-solution metering pump 3. This piston 2 is constructed in the manner of a slide and is sealed off at one end by means of an O-ring 52.

A bearing journal (not shown) which is non-positively inserted on its two end faces in a driving yoke 1a, is introduced through the end portion of the piston 2 projecting out of the cylinder space 4. The cylinder space 4 is connected to a mixing chamber 8 by way of a connexion opening 7. The nose-like end of a line 18, through which compressed air D flows in by way of a compressed-air line 5 and can escape by way of apertures 19, projects into the lower part of the mixing chamber 8.

The compressed air D is produced by actuating the lever 1 by means of an actuating force F in a diaphragm pump 9. The cylinder 13 of this diaphragm pump 9 comprises a rubber diaphragm 14a which is guided by concave members 14c and 14d which form a double-acting diaphragm piston 14. This diaphragm holding means is screwed by 59. A return spring 12 is arranged around a piston rod 14b and pushes both the diaphragm piston 14 and the actuating members connected thereto into the upper position shown.

The diaphragm piston 14 can undergo a stroke H (downwards) and draws air into the cylinder 13 by way of an air inlet 56 and a flap valve 55.

The flap valve 55 is made of rubber and is fixed at one end in the cover of the cylinder 13 by a holding means 57.

At the same time, a valve 70 disposed on the left at the foot of the diaphragm pump 9 closes; the air D present below the diaphragm 14a is compressed and flows into the compressed-air line 5 by way of a further valve 70 disposed to the right of the piston rod 14b.

If pressure is no longer applied to the lever 1, i.e. the actuating force F ceases to be effective, the diaphragm piston 14 moves relatively rapidly under the action of its return spring 12 into the upper position shown. During this the flap valve 55 is closed and there is produced in the cylinder head the compressed air D which acts by way of the compressed-air line 5a upon a further valve 70 disposed in the connecting ducts, opens the said valve and flows into the upper part of the outlet opening A by way of the line 5a and blows out the soap lather present here almost completely.

In the rest position illustrated the cylinder space 4 is filled with soap solution except for a small defined dead space 15 which is essentially predefined by an enclosed space 16 with a connecting bore 16'.

If, however, the actuating lever 1 is pressed, the slide-like piston 2 moves to the end of the cylinder space 4 and forms an air cushion 17 by means of the air present in the dead space 15 and the enclosed space 16, as a result of which the soap solution is now under pressure and in the end position of the piston 2 the

said soap solution is forced into the mixing chamber 8 by way of the piston outlet opening 7', the connecting opening 7 and a flap valve 54 which has been opened.

The compressed air D now flows in the manner described through the compressed-air line 5, the line 18, through the apertures 19 into the mixing chamber 8 and there produces a foam with large bubbles which is pressed through a porous body 20, a so-called frit, and homogenized and is finally expelled through an outlet opening A by way of a subsequent expansion chamber 21 in a foam deflexion body 22. A [quantity of] fine soap lather the size of a walnut is ready for cleaning purposes.

In this apparatus the axes 10 and 11 of the pistons 2 and 14 are arranged at right angles to one another. Force is transmitted from the lever 1, which is designed with two arms, by way of bearing journals to a driving yoke 1a or to the piston rod 14a respectively. The flap valve 54 is made of synthetic rubber and is centred at its edges by a partially surrounding retaining ring 58.

The compressed-air line 5a is, as shown in broken lines in the Figure, provided in a manner curving around a threaded pin 68. This threaded pin 68 fixes the foam deflexion body 22 disposed centrally in the casing G, porous bodies 20 and mixing chamber 8.

It has proved successful to construct the valves 70 with a cylindrical valve member 71 of commercially available brass, having a valve bush 73 and a valve seat 72 of a likewise commercially available high-molecular formaldehyde polymerizate (Delrin).

The subject matter of the invention can be very widely applied and on account of its constant readiness for use and its simple reproducible manipulation in particular it represents an advance in washroom hygiene.