Oct. 14, 1941. H. G. VOLCKENING 2,259,144

BOTTLE CLEANING DEVICE

Filed Aug. 5, 1937

FIG. 1

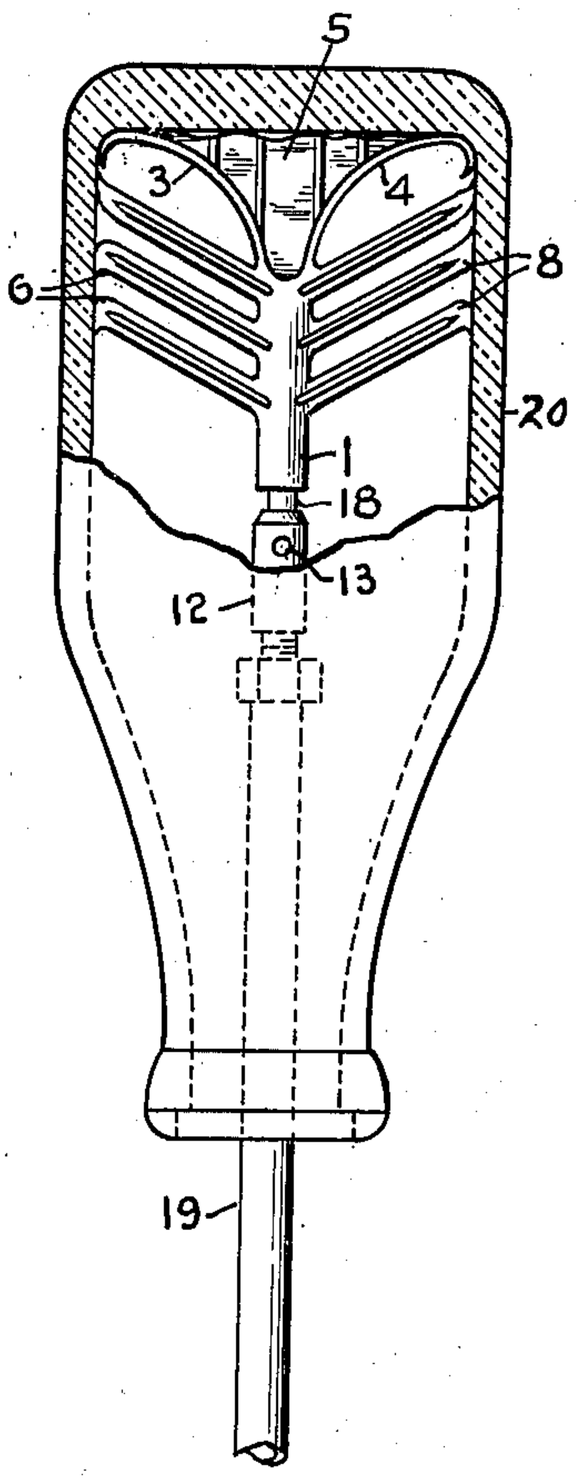


FIG. 2

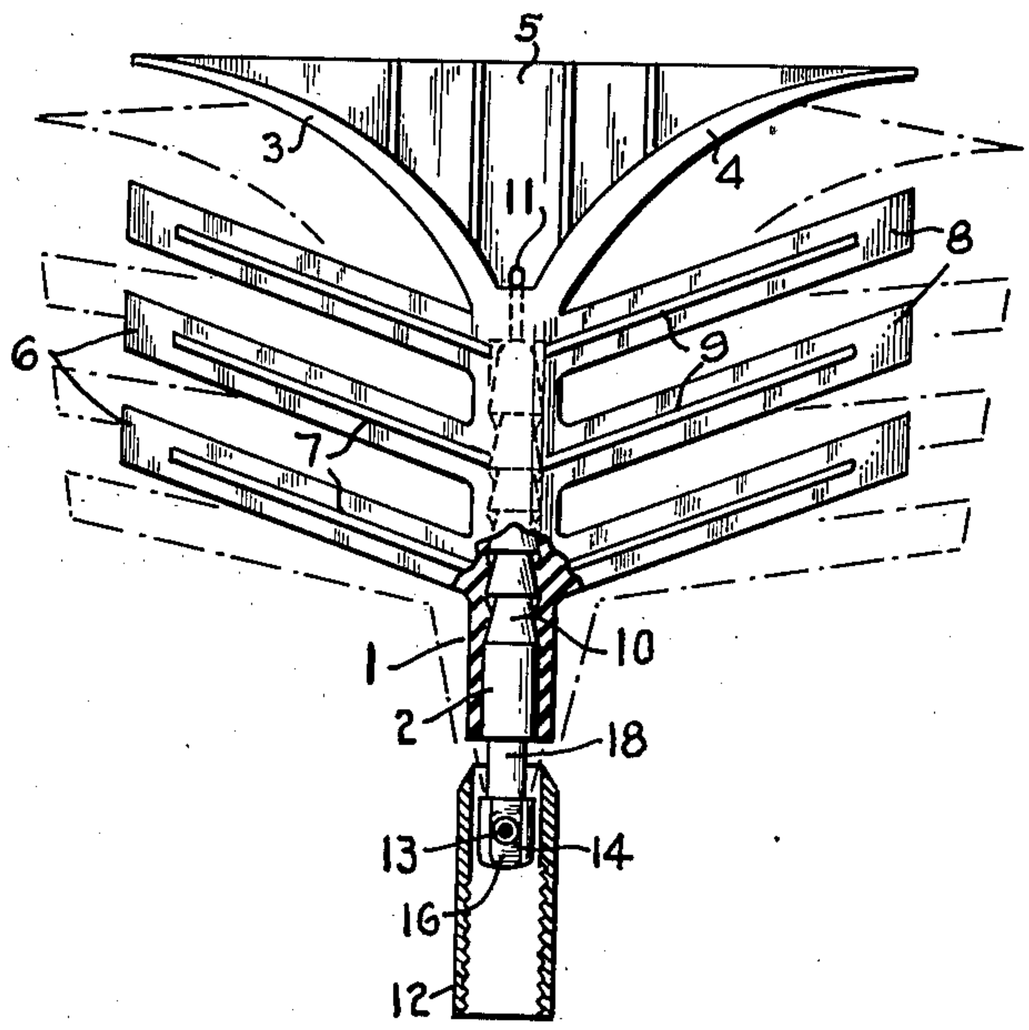


FIG. 3

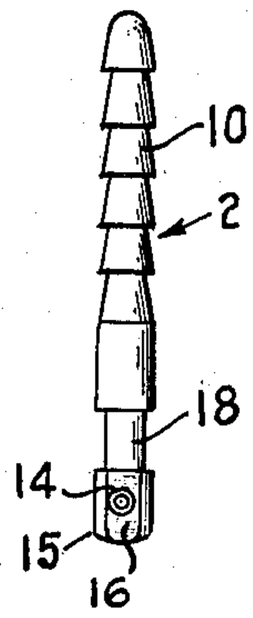
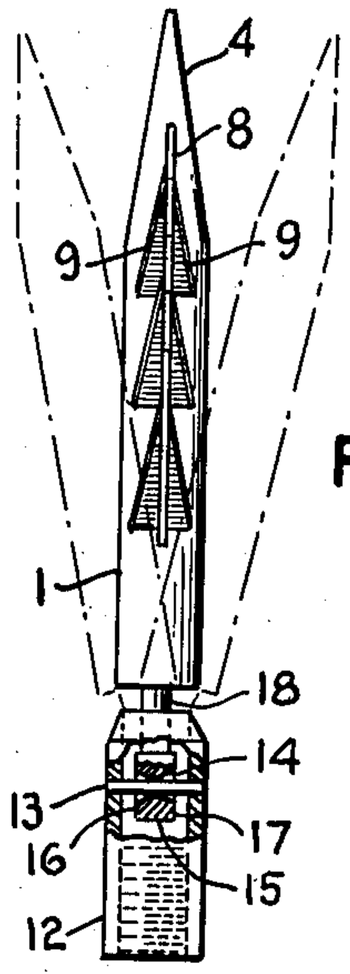


FIG. 4



H. G. Volckening INVENTOR.

BY Thomas Howe

ATTORNEY.

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2,259,144

BOTTLE CLEANING DEVICE

Henry G. Volckening, Brooklyn, N. Y., assignor to Volckening Inc., a corporation of New York

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3 Claims. (Cl. 15—127)

This invention relates to devices for insertion in bottles or other receptacles for the purpose of cleaning the same, which devices are commonly referred to as brushes.

The main object of the invention is to provide a device of the character described which shall be simple in construction and efficient in operation.

A further object of the invention is to provide a brush mounting especially adapted for use in combination with a rubber brush.

A further object of the invention is to provide a brush and mounting such that the brush may readily adjust itself to the surfaces to be cleaned.

A further object of the invention is to provide a brush and mounting such that the brush may readily adjust itself to the interior surfaces of the receptacle and yet permit of the proper supply of water for the cleaning operation.

Other and ancillary objects of the invention will appear hereinafter.

In the accompanying drawing which llustrates the invention:

Fig. 1 is a side elevation of a bottle partly broken away showing a cross section, with a cleaning device embodying the invention inserted therein;

Fig. 2 is a side elevation, on an enlarged scale, and partly in section, of the brush and its mounting as shown in Fig. 1;

Fig. 3 is a side elevation of a part on which the brush proper is mounted; and

Fig. 4 is an elevation of the edge (viewed 90° removed from that of Fig. 2) of the apparatus of Fig. 2, with certain parts in cross section for clarity.

Referring to the drawing, the brush proper, of rubber, comprises the elongated central body portion 1 of substantially circular cross section, having a central longitudinal opening into which is telescoped the solid, one-piece, stiff, rod-like support 2 of circular cross section. From the body 1 extend, at the top, the curved arms 3 and 4 tapering outwardly whereby they become gradually more flexible toward their outer ends. Between the arms 3 and 4 extends the very thin flexible sheet or web 5. On one side of the body 1 extend the very thin flexible wings 6 each supported and reenforced by an arm 7 tapered outwardly so that it is most flexible at its outer end, and on the other side of the body extend the similar thin wings 8 each having an outwardly tapering supporting rib or arm 9, like the ribs 7, which increase in flexibility outwardly. A portion of the support 2 which is within the body 1 has circumferential serrations 10 as shown.

The rubber body 1 fits so tightly about the support that the rubber enters in between the serrations and the inner end of each of the serrations presents an abrupt shoulder whereby movement of the brush outwardly along the support is retarded, and the other side of each serration is tapered so that the brush body is readily telescoped over the support in placing it in position thereon. Also a vent hole 11 is provided at the inner end of the recess on the interior of the rubber brush body 1, whereby the air is allowed to escape which otherwise would be imprisoned within the cavity when the support was inserted therein and the placing of the brush in position on the support would thereby be impeded and rendered more difficult. The brush is thus readily placed in position on the support but is securely held thereon against accidental displacement.

The lower end of the support 2 enters within the sleeve 12 of circular cross section which is screw-threaded so as to engage with screw threads on a rotary tubular spindle 19, so as to be secured thereto, through which spindle water is supplied under suitable pressure, such structure and arrangement of spindle being well known in bottle washing machines.

The brush support 2 is supported and secured in the sleeve 12, so as to have universal movement with relation thereto, by means of a pin 13 secured in the sleeve. The support 2 fits loosely in the sleeve 12 so that the desired amount of water may find exit. The universal movement of the support 2 is provided by the support being rotatable about the pin 13 and also tiltable longitudinally of the pin, the hole 14 in the brush support through which the pin passes being chamfered or beveled at its ends to permit the brush support 2 to rock longitudinally on the pin 13. The movement of the support 2 on the pin is limited entirely about the circumference of the sleeve 12 by coming against the upper edge of the sleeve, and the amplitude of the movement is increased by reducing the diameter of the support 2 at 18, the upper portion being of larger diameter sufficient to produce the desired stiffness, strength and other qualities. The reduction in diameter referred to also provides greater clearance within the sleeve for the passage of water or other cleaning fluid. The lower end 15 of the brush support 2 is substantially the same diameter transversely of the pin as the portion above the reduced portion 18 but is flat-

tened at 16 and 17 on opposite sides along the pin. This flattening permits desired longitudinal rocking of the brush support on the pin and also increases the clearance for the passage of the cleaning water.

It will now be seen that the brush may be readily inserted into a bottle 20 as shown for instance in Fig. 1, the flexing of the rubber brush permitting its ready passage through the narrow neck of the bottle. The elasticity of the brush will then cause it to expand outwardly against the sides of the bottle after it has been released from the restriction of the neck and the rotation of the brush in contact with the sides of the bottle, cleaning fluid being meanwhile supplied through the spindle, will clean the sides of the bottle as the brush is entered therein until it finally comes against the bottom of the bottle, as shown in Fig. 1, which is thoroughly cleaned including the corners where the bottom joins the sides of the bottle.

During the operation of entering and cleaning the bottle, the pivotal and universal mounting of the brush permits it to adjust itself to the position of the bottle and the surfaces to be cleaned so that an efficient and thorough job of cleaning is accomplished under all circumstances.

The inner end of the cavity in the body 1, that is the end opposite the opening through which the support 2 is inserted, is substantially closed so that the end of the support 2 abuts against it and positively limits the downward movement of the brush on the support, and this is limited so that the lower end of the brush is spaced at a distance from the top of the sleeve 12. The wabbling or turning of the support and brush upon the mounting of the support may thus freely take place without interference by the bottom end of the brush coming against the top of the sleeve 12. If the downward movement of the rubber brush toward the mounting of the support were not limited by abutting against the support, the brush would, in practice, during the operation of inserting within the bottle and the cleaning operation, work down on the support and eventually come against the top of the sleeve 12 and interfere with the tilting of the brush on the support mounting. This tilting or wabbling of the brush is of importance especially with bottles having small necks with relatively wide bodies, because in such bottles the size of the rubber brush must be limited in order to permit it to be of such mass when pressed together that it will pass through the neck of the bottle, and under such circumstances the brush may not be of sufficient width to reach remote surfaces of the interior of the bottle. The provision for wabbling of the brush, however, causes it, during the cleaning operation, to tilt or wabble so as to reach such remote surfaces.

The arrangement of rubber brush and support as shown is of advantage in that when the rubber brush requires replacement, due to wear or other cause of unfitness, it may be slit and removed from the support without disturbing the pivotal mounting of the support. If it were necessary to remove the support with the brush, the disassembly at the pivotal mounting of the support, particularly by unskilled persons, would result in damaging of the mounting so that new mountings would have to be supplied in a relatively short time. By leaving the mounting intact and removing the brush by slitting it off the support (the new brush being then telescoped over the support), the brush support and mounting will endure for an extremely long time.

As has been noted above, the imprisoned air within the cavity of the body 1 of the brush when the support 2 is inserted therein, would cause difficulty of assembly of the brush with the support if the vent 11 were not provided to permit the escape of imprisoned air. In the drawing this vent 11 has been shown exaggerated so as to be clearly seen, but in actual practice this vent would consist of simply a puncture in the rubber, which would be practically self-closing and invisible normally, and only opening sufficiently to permit the passage of air under pressure.

While the invention has been illustrated in what is considered its best application, it may have other embodiments without departing from its spirit and is not, therefore, limited to the structure shown in the drawing.

What I claim is:

1. A bottle cleaning device comprising a brush of flexible, elastic material having a central body and brush members laterally projecting therefrom, a cavity in said body and a support adapted for entering said cavity and having on its outer surface cone-shaped serrations, the inner end of each serration presenting an abrupt shoulder whereby to retard a movement of said brush away from said support, the exposed end part of said support having a head provided with a transverse opening increasing in magnitude from its middle outwardly in both directions, for the purpose of longitudinally tilting said support on a pivot pin passing through said opening.

2. A bottle cleaning device comprising a brush of flexible, elastic material having a central body and brush members laterally projecting therefrom, a cavity in said body and a support adapted for entering said cavity and having on its outer surface cone-shaped serrations, the inner end of each serration presenting an abrupt shoulder whereby to retard a movement of said brush away from said support, the exposed end part of said support having a head provided with guiding means adapted for tilting in a longitudinal direction and for partly rotating at right angles to the tilting motion of said support on a pivot pin passing through said head.

3. A bottle cleaning device comprising a brush of flexible, elastic material having a central body and brush members laterally projecting therefrom, a cavity in said body and a support adapted for entering said cavity and having at its exposed end part a head provided with a transverse opening adapted for longitudinally tilting said support on a pivot pin passing through said opening, the diameter of said support above said head being in part reduced for increasing the amplitude of movement of said support and said brush.

HENRY G. VOLCKENING.