Aug. 8, 1933. J. A. KOPNICKY 1,921,680

BOTTLE CLEANING DEVICE

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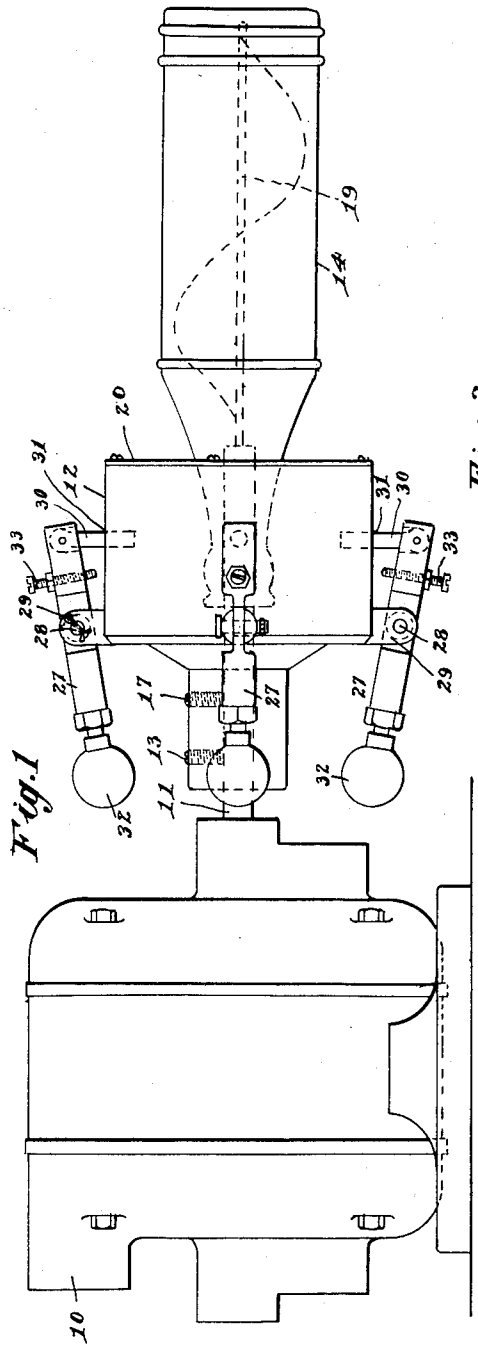


Fig. 1

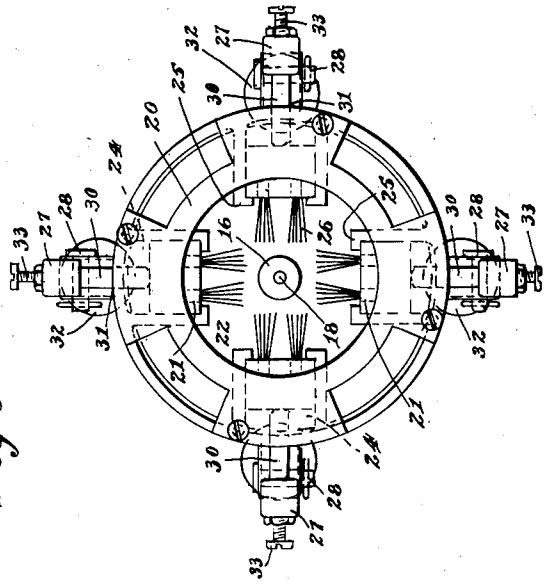


Fig. 3

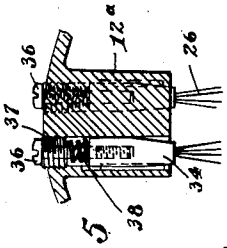


Fig. 5

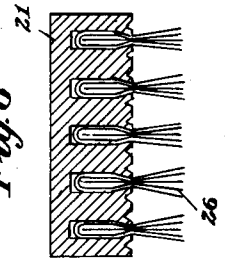


Fig 6

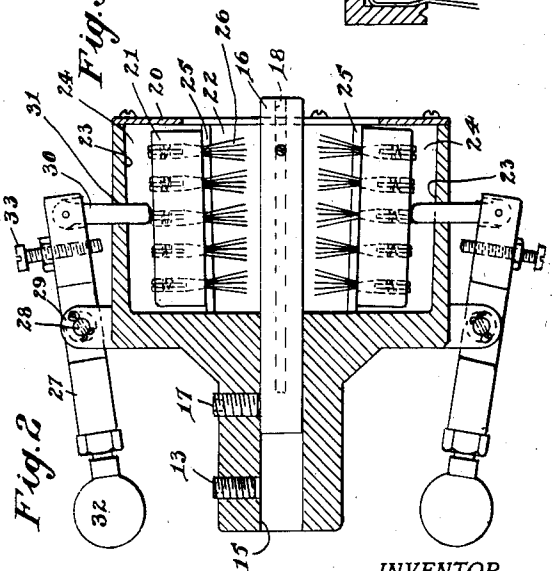


Fig. 2

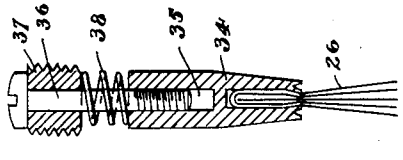


Fig. 4

INVENTOR.
Joseph A. Kopnicky
BY
Christian M. Newman
ATTORNEY

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BOTTLE CLEANING DEVICE

Joseph A. Kopnicky, Stratford, Conn.

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4 Claims. (Cl. 15—179)

This invention relates to new and useful improvements in means for cleaning bottles and more particularly for removing labels and other foreign matter from the outer surface of the neck of bottles and especially the depressions or corrugations surrounding the mouth of such bottles.

An object of the invention is to provide a bottle cleaning means having yieldable brushes, preferably formed of wire, arranged to yieldably engage the periphery of the neck of a bottle and to mount the same for rotary movement around the neck of the bottle.

A further object of the invention is to provide means whereby the foreign matter removed from the bottles will be thrown away from the bottle and out of the brush carrying head, by centrifugal force due to the rapid rotary movement imparted thereto. A still further object of the invention is to provide a rotatable brush carrying head for cleansing the outer surface of the neck of bottles, and to provide means whereby an additional brush may be inserted in the head for cleaning the inside of the bottle.

Another feature of the invention is to provide brushes for the above purpose, the bristles of which may be mounted in individual clusters so as to permit the removal and replacement of the clusters of bristles located in any particular portion of the holder and the substitution of new clusters.

With these and other objects in view, the invention resides and consists in the construction and novel combination and arrangement of parts hereinafter more fully described, illustrated in the accompanying drawing, and pointed out in the claims hereto appended, it being understood that various changes in the form, proportion, size, and minor details of construction within the scope of the claims may be resorted to without departure from the spirit, or sacrificing any of the advantages of the invention.

Similar characters of reference denote like or corresponding parts throughout the several figures of the accompanying drawing forming a part of this specification and upon which

Fig. 1 shows a side elevation of my bottle cleaning device, including a motor for rotating the same, and a bottle in position to be cleaned;

Fig. 2 is a central vertical longitudinal section of the bottle cleaning device, shown in Fig. 1, but upon a relatively larger scale;

Fig. 3 shows a front end view of the cleaning device;

Fig. 4 shows an enlarged view of one of the removable brush units, as contained in the previously described figures;

Fig. 5 shows a cross section illustrating a modified form of head construction in which the brushes are supported; and

Fig. 6 shows a modified form of brush unit.

Referring in detail to the characters of reference marked upon the drawing, 10 represents an electric motor having a driven shaft 11 to which the bottle cleaning head 12 is attached, as by means of screws 13. A bottle 14, which may be of any of the beverage type, is shown positioned in the cleaning head, with its neck in position to be cleaned. In practice the bottle is supported in this position by the hand of the operator.

The construction of the head 12, shown in Fig. 1, is more clearly illustrated in the larger views, Figs. 2 and 3, and discloses a cylindrical hollow body having a hub portion that is provided with a longitudinal bore 15 to fit the driving shaft 11, and to which it is secured by means of the before mentioned set screw 13. This bore extends through the axis of the head and serves to receive a guide pin 16 that is secured therein by a set screw 17. This guide pin is also provided with a central longitudinal hole 18 to receive the shank of an attachable brush 19 which may be used for cleaning the inside of the bottle, if desired, simultaneously with the cleaning of the neck of the bottle.

The cylindrical head is open at its forward end, except for a perforated cap 20 which serves to prevent the brush blocks 21 from sliding out. The brushes are thus contained in a cylindrical chamber 22, which is of a larger diameter across its outer end portion than its rear portion by reason of the inner cylindrical wall of the head being tapered, as at 23, Figs. 2 and 3, better to insure the discharge of the foreign matter, removed from the neck of the bottles by the brushes. The brush blocks are each seated in pockets 24, of the chamber, the elongated edges of the side walls of the pocket being provided with inclined flanges 25 to limit the inward movement of the brush blocks and to normally position one end portion of the brush in further than the other end, better to conform to the shape of the neck of a bottle.

I preferably employ four brush blocks that are suitably supported in the cylindrical holder so that their bristles 26 will project inward toward the axis of the holder in spaced relation so as to provide room to insert the bottle neck therebetween for the purpose of cleaning the same.

The brushes preferably comprise an elongated holder of suitable size and proportion to loosely fit into the brush pockets 24 within the cylinder, said brushes being positioned in the pockets from the outer end and retained therein by the cap 20 before referred to.

These brushes are adapted for slight yieldable radial movement better to accommodate them to the peripheral surface of the bottles, and are held against excess radial movement, due to centrifugal force when the head is rapidly rotated, by means of equalizing devices, one for each brush holder, as is shown in Figs. 1, 2, and 3. These equalizing devices each comprise a lever 27 that is hingedly supported as at 28 to ears 29 formed on the outer surface of the head. A pin 30 is carried by the forward end of these levers and slidably extends through a hole 31 in the shell of the head in line with the brush so as to loosely support the same. The other end of the lever 27 is provided with a weight 32, the tendency of which is to move outward with the rapid rotation of the head, causing a resultant inward movement of the other end of the lever and its pin 30.

An adjusting screw 33 is mounted in the inner end of the lever so as to form a stop that limits the inward movement of the pin 30 and its lever 27. By this arrangement, it will be seen that the brushes are loosely mounted and are therefore more or less flexible, better to permit the insertion and removal of the bottles. At the same time, the brushes are sufficiently supported to insure the necessary cleansing operation.

The bristles 26 of the brush are preferably mounted in central holes formed in one end of cylindrical holders 34 by setting up or swedging in the stock of the holder immediately adjacent to and surrounding the said bunch of bristles. This holder is provided with a central tapped hole 35 to receive an adjusting screw 36 loosely mounted in an externally threaded sleeve 37 that is adapted to threadably engage the brush blocks 21. A spring 38 is mounted on this screw between the end of the holder 34 and the sleeve 37, which permits longitudinal movement of the screw in the sleeve against the action of the spring, and whereby individual radial movement is made possible independent of the radial movement of the brush blocks. This independent movement serves to afford slight flexible action as between the different bunches of bristles.

In the modification shown in Fig. 5, the brush members, as shown in Fig. 4, are shown mounted in an integral part 12^a of the head, in which case the equalizing device 27 would not be employed. The modification shown in Fig. 6, illustrates a simple and inexpensive form of brush wherein the bristles are shown positioned in the blocks 21 and the surface of the holder surrounding the bristles swedged down to secure them in place.

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

1. A bottle cleaning device comprising a head adapted for attachment to a rotatable shaft and including a hollow cylindrical portion, inwardly disposed brush blocks having a series of threaded pockets therein, a removable brush holder within each pocket, an externally threaded sleeve mounted in the pocket, a screw mounted in the sleeve and engaging the holder, and a spring mounted on the screw between the sleeve and holder to press the latter inward, for yieldable engagement with a bottle.

2. A bottle cleaning device comprising a head adapted for attachment to a rotatable shaft and including a hollow cylindrical portion open at one end, elongated pockets formed on said hollow cylindrical portion and having stop flanges inclined outwardly in the direction of said open end, a removable brush block mounted in each of said pockets and adapted to be supported at an incline against said stop flanges, a series of movable brush holders mounted in each block, and means for independently pressing the individual brush holders inward for engagement with a bottle, when positioned between the brush blocks.

3. A bottle cleaning device comprising a head adapted for attachment to a rotatable shaft and including a hollow cylindrical portion open at one end and whose inner surface flares outwardly toward said open end thereof, elongated pockets formed on said hollow cylindrical inclined portion and having stop flanges inclined outwardly in the direction of said open end, a removable brush block mounted in each of said pockets and adapted to be supported at an incline against said stop flanges, a series of movable brush holders mounted in each block, means for independently pressing the individual brush holders inward for engagement with a bottle when positioned between the brush blocks.

4. A bottle cleaning device comprising a head adapted for attachment to a rotatable shaft and including a hollow cylindrical portion open at one end and whose inner surface flares outwardly toward said open end thereof, elongated pockets formed on said hollow cylindrical inclined portion and having stop flanges inclined outwardly in the direction of its open end, a movable brush block mounted in each of said pockets and adapted to be supported at an incline against said stop flanges, a series of spring actuated brush holders mounted in each block, spring means for independently pressing the individual brush holders inward for engagement with a bottle when positioned between the movable brush blocks, and an equalizing device adapted to provide additional inward pressure upon the blocks with increased speed of rotation of the head.

JOSEPH A. KOPNICKY.