V. LAPP,
BOTTLE WASHING MACHINE.
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Witnesses:
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Inventor:
Valentin Jaff
by Max Tingui
his attorney

6 SHEETS—SHEET 1.
To all whom it may concern:

Be it known that I, VALENTIN LAPP, a subject of the King of Saxony, residing at Leipzig, in the Kingdom of Saxony, in the German Empire, have invented certain new and useful Improvements in Bottle-Washing Machines, of which the following is a specification.

The object of this invention is to wash a large number of bottles in a short time and to obtain a thorough exterior as well as interior cleansing without any particular attention of the workmen occupies the machine. The services to be rendered by the workmen consist merely in putting the dirty bottles into the machine and taking the cleaned ones off from the same. It is impossible that an attention on the side of one or the other workman can impair the proper action of the machine. The manner of cleansing and the duration of the several operations carried out during the cleansing is or are invariably the same.

In order to make my invention more clear, I refer to the accompanying drawings, in which similar figures denote similar parts throughout the several views, and in which—

Figure 1 is a vertical section through one-half of my improved machine on the line x x of Fig. 2. Fig. 2 is a plan of one-half of the machine, partly in horizontal section, on the line y y of Fig. 1. Fig. 3 is a horizontal section in line 6 7 of Fig. 1. Fig. 4 is a vertical section through one of the devices, of which each receives one bottle, the figure being drawn on a greatly-enlarged scale. Fig. 5 is a plan of two such devices in combination with some neighboring parts.

My improved machine is of circular shape. The bottles are carried around in a horizontal circle and are held in a vertical position during that time, the mouths of the bottles being directed downward. The greatest portion of the upper part of the machine is in closed in a casing 37, there being one large opening or aperture where a workman takes the washed bottles off from the machine, while immediately thereafter another workman puts dirty bottles into the same—that is to say, each bottle is put upon and into such a device as is shown in Figs. 4 and 5. These devices are in constant rotation as well as in constant revolution. Each of them has a rotary spindle 1, the upper end of which is furnished in known manner with a brush. The reversed bottle is put upon said spindle, and the head of the bottle is made to between and rest upon fingers 2, whereas the other end of the bottle is embraced by curved wires 3, held by the upper ends of bars 4, arranged each between two of the spindles 1. The spindles 1 extend upward from casings 5, which are screwed into radially-extending projections 6 of a circular pipe 7. During work the circular pipe 7 carries bottles on its whole circumference, and the soiled bottles are put upon the pipe as the clean bottles are taken off. The circular pipe 7 represents the rim of a wheel, the pipes 8 constituting the spokes, which connect the pipe 7 with a rotary 70 annular casing 9. The two ends of the pipe 7 are provided with an interposed washer 74. This casing may be regarded as the casing of a kind of cock of which the plug is formed by a stationary casing 10, having partition-walls 11, by which several compartments (four in the example shown) are formed. The casing 10 is supported by a frame 12, and into the casing terminate from below pipes 53, which serve for introducing and leading off the washing fluids employed for cleansing the bottles. Corresponding to the four compartments formed in the casing 10 the bottom of this latter has four openings 13, 14, 15, and 16, the opening 13 serving for introducing a solution of soda, the opening 14 serving for introducing steam or hot water, and the opening 15 serving for introducing cold water, whereas the opening 16 serves for leading off the residue of the unused washing fluids present in the pipes 7 and 8.

The rotary casing 9 is connected with a worm-wheel 17, which is in gear with a worm 19, keyed to a shaft 18. The outer end of this shaft is provided with a pulley 20, which is driven from an upper pulley 21, fixed to a shaft 22, extending horizontally over the machine. This shaft is driven by any suitable motor, and the rotation is transmitted by the means aforementioned to the rotary casing 10, so that consequently also the radial pipes 8 and the circular pipes 7 are rotated. As a further consequence also, the casings 5, with the bottles, are revolved, and, furthermore,
the inner ends of the pipes 8 are connected successively with the four compartments of the stationary casing 10. Therefore each of the pipes 8 and the neighboring portion of the pipes 7 is provided first with the soda solution, then with the hot water or steam, and after this with the cold water, when the residue of the various fluids escapes finally through the fourth compartment. The washing fluids are forced, of course, not only into the pipes 7, but into the casings 5, too, and from these casings the fluids enter the bottles, so as to cleanse or wash the same.

Each of the casings 5 contains a central part 24, into the upper end of which is inserted a tube 25. These parts 24 and 25 surround the vertical spindle 1 already mentioned. The lower end of this spindle is provided with a pulley 26. Into the upper part of the casing 5 is screwed a body 27, the upper end of which is provided with a tube 29, embracing the tube 26, a small annular space being left between these parts in such a manner that the liquid forced into the chamber 30 of the casing 5 may escape through the space left between the pipes 25 and 29. Owing to the pressure under which the liquids are forced into the chambers 30 of the casings 5 the liquids are forced in an upward direction to and against the brushes 38, carried by the upper ends of the spindles 1. These brushes do not only revolve around the machine, but each of them is also rotated around its own axis, as each of the spindles 1 is rotated by its pulley 26. The liquid escaping from the lower ends of the bottles flows upon and into a shallow annular ring 31, from which it is led away through tubes 32 into a bottom pipe 33, by which it is conducted to a basin or the like. While the bottles are thus treated, each of them is rotated around its own axis. The aforementioned fingers 2, which take over the head of the bottle, are secured to a cog-wheel 34, which gears with a circular rack 35, fixed to the stationary main casing of the machine. Therefore the revolution of the cog-wheels 34 around the central axis of the machine causes also a rotation of each of those wheels on its own axis, so that consequently, also, the fingers 2 are rotated. The bottles are cleansed not only upon their inner surfaces, but upon their outer surfaces also. Standards 36 are connected at their upper ends by flat bars 37, which support curved brushes 38, having their bristles directed downward. These brushes operate upon the bottom surfaces of the bottles. Besides the brushes 38 there are curved brushes 39, having their bristles directed outward in a radial position. There are two sets of these brushes, the brushes of one set operating upon the body-surfaces of the bottles and the brushes of the other set operating upon the necks of the bottles, so that the three brushes or sets of brushes together (38 39 39) effect the cleansing of the whole of the outer surface of the bottles. The brushes 39 may be radially adjusted according to the diameter of the bottles to be washed. The brushes are held in proper working position by radial bolts 40 passing through the tire 41 of a horizontal wheel 42, in which each bolt may be adjusted by means of a pair of nuts, one nut being located upon the outer surface of the tire, the other upon the inner surface. The wheel 42 is keyed to a vertical shaft 43, extending centrally through the machine. The shaft 43 is connected with the shaft 22 by bevel-wheels 44. The upper bearing of the shaft 43 is furnished with a stationary cog-wheel 45, around which moves a cog-wheel 46, the shaft 47 of which has its bearing in one of the spokes of the wheel 42. The lower end of the shaft 47 is provided with a cog-wheel 48, which is in gear with a cog-wheel 49, fixed to a sleeve 50, having at its other end a pulley 51. The rotation of this pulley is transmitted by a suitable cord or rope to all the pulleys 26 of the spindles 1, the transmitting cord or rope being so led over the rolls that the alternate spindles rotate in opposite directions. In order to maintain the proper tension of the cord or rope, a tension-pulley 52 is provided.

In order to furnish an additional safeguard to insure the rotation of the bottles with the fingers 2, supplementing their frictional engagement, I preferably provide uprights 53, which are intended to be embraced by the wire loop of bottles provided with such closure-securing means, as indicated in dotted lines in Fig. 4. The line 53 54 in Fig. 2 indicates that portion of the circumference of the machine where the bottles to be washed are introduced into the machine and where the washed bottles are taken off from the same.

Having now described my invention, what I desire to secure by Letters Patent of the United States is—

1. In a bottle-washing machine, the combination with a suitable support, of a container for different washing fluids, and means operating automatically to supply the different washing fluids in succession to the bottles to be cleansed.

2. In a bottle-washing machine, the combination with a suitable support, of a container for different washing fluids, and means operating automatically to supply the different washing fluids in succession to the bottles to be cleansed.

3. In a bottle-washing machine, the combination with a horizontal circle of bottle-carriers, and means for moving said carriers around the circle, of a distributing device for washing fluids located centrally with respect to said circle and divided into compartments, pipes connecting said bottle-carriers successively with said compartments, and adapted to supply the washing fluids to the bottles while they are moved around.

4. In a bottle-washing machine, the combination with a horizontal circular pipe, and
bottle-holders carried by said pipe, of a stationary casing located concentrically with respect to the circular pipe, a movable casing embracing the stationary one, radially-arranged pipes connecting the circular pipe with said movable casing, and means for rotating
the latter; the said stationary casing being divided into chambers, and these chambers as well as the rotary casing having ap-

eratures adapted to coincide successively, the radially-arranged pipes communicating with the apertures of the rotary casing.
5. In a bottle-washing machine, the combination with a rotary horizontal circular pipe, and rotary bottle-holders carried by said pipe, of means for rotating said pipe, and means for rotating the bottle-holders at the same time; a distributing device for washing fluids consisting of a plurality of chambers, means for feeding said device and means for feeding the bottles from the distributing device while they are being revolved and rotated.
6. In a bottle-washing machine, the combination with a rotary horizontal circular pipe, and bottle-holders carried by said pipe, of a stationary casing arranged concentrically with respect to the rotary pipe, partition-walls dividing said casing into compartments, pipes adapted to lead washing fluids into said com-

cpartments, a rotary casing embracing said stationary one, apertures provided in the two casings and adapted to coincide successively, pipes connecting the apertures of the rotary casing with the rotary circular pipe; means for introducing the washing fluids from the circular pipe into the interior of the bottles, and means for collecting and leading away the dirty fluids.
7. In a bottle-washing machine, the combination with a rotary horizontal circular pipe, bottle-holders carried by said pipe, and means for introducing different washing fluids successively into said pipe during one rotation, of brushes adapted to act upon the exterior surfaces of the bottles while they are carried around by and upon the said rotary pipe.
8. In a bottle-washing machine, the combination with a rotary horizontal circular pipe, bottle-holders carried by said pipe, and means for introducing different washing fluids successively into said pipe during one rotation, of stationary brushes adapted to act upon the bottom surfaces of the bottles, rotary brushes adapted to act upon the outer surface and the necks of the same, and means for rotating said brushes.
9. In a bottle-washing machine, the combination with a rotary horizontal circular pipe, bottle-holders carried by said pipe, and means for introducing different washing fluids successively into said pipe during one rotation, of stationary brushes adapted to act upon the bottom surfaces of the bottles, a rotary horizontal brush arranged coaxially with respect to the circular pipe and adapted to act upon the outer surfaces and the necks of the bottles, and means for rotating said brush at another speed than that of the said circular pipe.
10. In a bottle-washing machine, the combination with a rotary horizontal circular pipe, bottle-holders carried by said pipe, and means for introducing different washing fluids successively into said pipe during one rotation, of brushes adapted to act upon the exterior surfaces of the bottles while they are carried around by and upon the said rotary pipe; pipes extending from the latter into the bottles, a circular shallow vessel located below these pipes, a collecting-channel located below this vessel, and waste-pipes leading from this vessel into said channel.
In witness whereof I have hereunto set my hand in presence of two witnesses.

VALENTIN LAPP.

Witnesses:

OTTO KRAHMER,

RUDOLPH PHICKEL.