(No Model.) 2 Sheets—Sheet 1.

T. WENDLING.

BOTTLE WASHER.

No. 526,277. Patented Sept. 18, 1894.

Fig. 1.

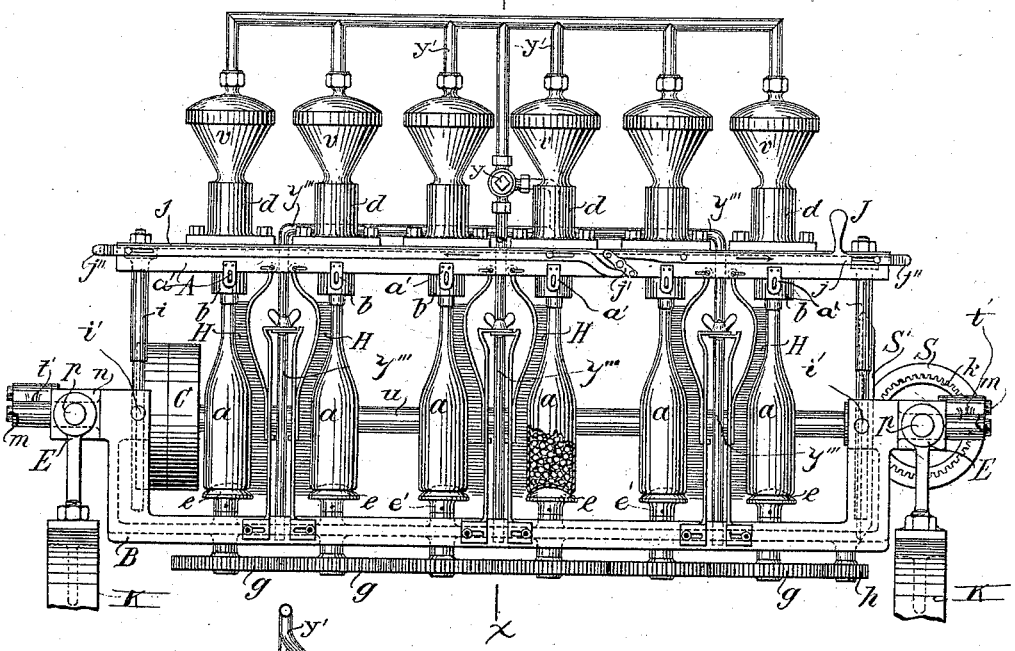


Fig. 3.

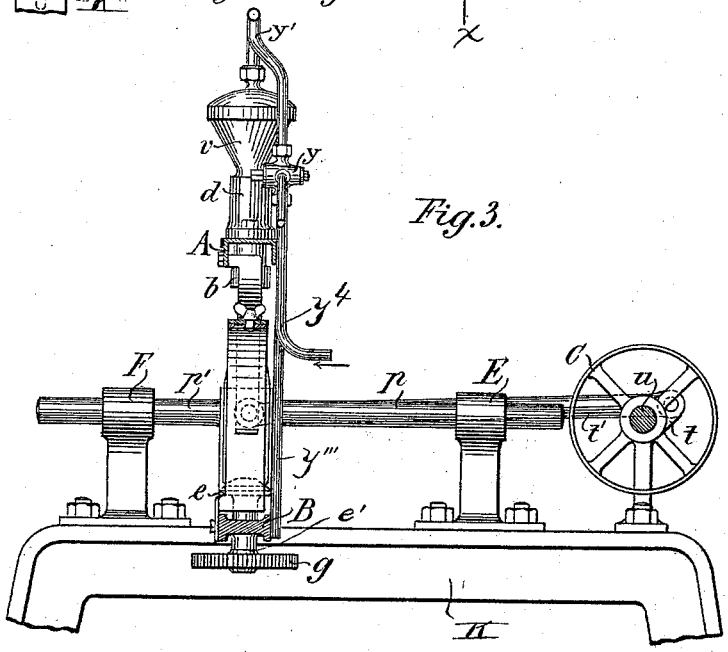
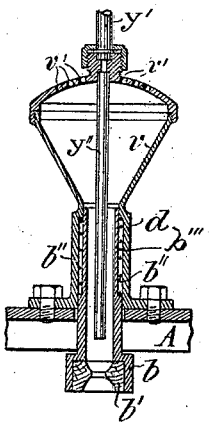


Fig. 5.



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Thos. A. Green

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By James L. Norris.
Atty.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

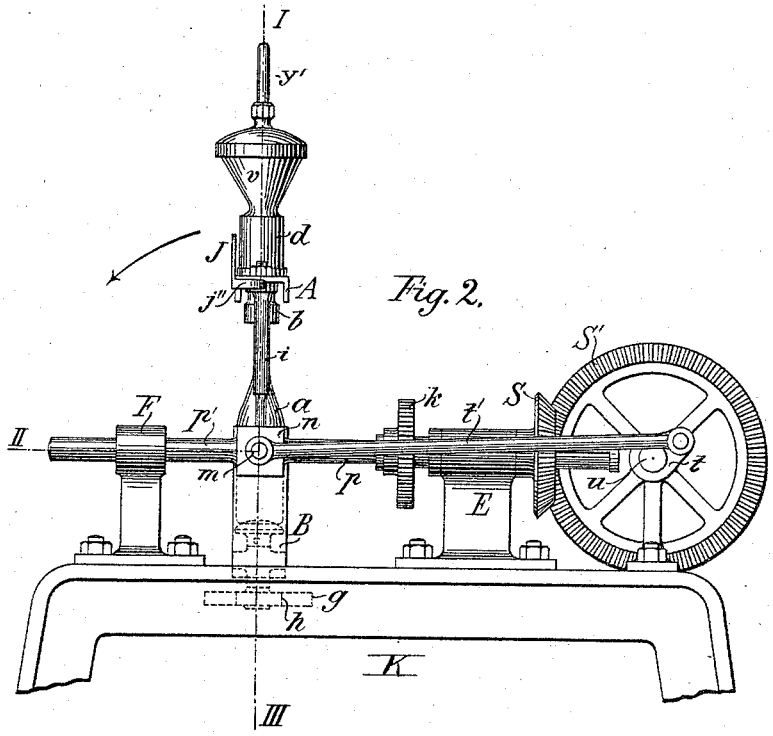
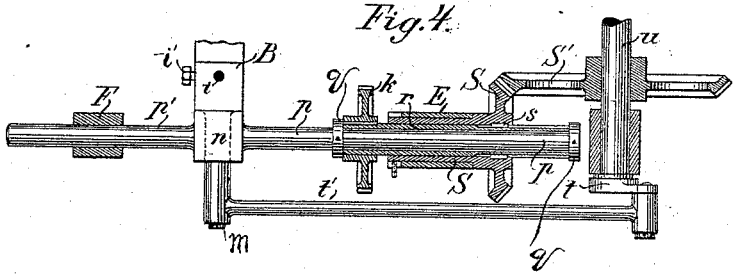


Fig. 4.



Witnesses:
G. W. Rea.
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Inventor:
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By James L. Norris.
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UNITED STATES PATENT OFFICE.

THEOBALD WENDLING, OF MANNHEIM, GERMANY, ASSIGNOR TO CARL CRON, OF SAME PLACE.

BOTTLE-WASHER.

SPECIFICATION forming part of Letters Patent No. 526,277, dated September 18, 1894.

Application filed March 20, 1894. Serial No. 504,449. (No model.)

To all whom it may concern:

Be it known that I, THEOBALD WENDLING, a subject of the German Emperor, residing at Mannheim, in the Grand Dukedom of Baden, German Empire, have invented certain new and useful Improvements in Machines for Cleaning Bottles; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to machines for cleaning bottles, and consists in the features of construction and novel combination of devices hereinafter described and claimed.

The improved machine constructed according to my said invention is designed for rinsing and cleaning a number of bottles of the same size simultaneously inside and outside. The interior cleaning is accomplished by agitating within the bottles a quantity of water and a number of small pieces or balls of porcelain, which balls after the cleaning of one set of bottles are conducted into peculiar funnels, and from these funnels, by turning over the frame which holds the bottles, into the bottles next to be cleaned; without any necessity for removing the porcelain pieces or balls from the funnels or otherwise transporting them by hand. The exterior cleaning is effected by means of brushes and water, a turning movement and at the same time a to-and-fro shaking movement in the horizontal direction being imparted to the bottles. After the interior and exterior cleaning the bottles are rinsed with fresh water.

In the accompanying drawings, I have shown the improved machine in its initial position prior to the cleaning of the bottles.

Figure 1 is a front view; and Fig. 2 a side view of the bottle cleaning machine. Fig. 3 is a vertical transverse section on the line *x*—*x* of Fig. 1. Fig. 4 is a sectional detail view of a portion of the operating mechanism for agitating and rotating the bottles to be cleaned. Fig. 5 is a section of a bottle holding chuck and connected funnel and pipe for introducing water into the bottle.

The bottles to be cleaned are supported in a frame A, B which is so mounted or arranged that it can be readily turned to either one of the three positions designated by dotted or broken lines I, II, III, in Fig. 2. This frame comprises a bar A having a number of chucks *b* mounted therein, and an angle bar B in which the shanks *e'* of a number of rotary disks *e* are mounted, at points opposite the said chucks. The mouth of each bottle is pressed on by the wooden mouth piece *b'*, Fig. 5, of a chuck *b*, while the bottom of the bottle bears upon a disk *e*, Fig. 1, covered with india rubber. A spiral spring *b''* is arranged to bear against the shouldered portion of the hollow chuck shaft *b'''*, Fig. 5, which is capable of longitudinal movement in the sleeve *d* forming the neck of a funnel *v* a series of which are secured to the bar A; each chuck being normally pressed outward by its spring *b''* so that the several bottles will be each clamped between a mouth piece *b'* and disk *e*, but in such manner as to be carried around when the disks *e* are rotated. On the bar A are slotted brackets *a'* to engage pins on the chucks *b*, and prevent them from falling out of place or becoming disconnected from the sleeves *d* when the bottles are removed.

In order to provide for an adjustment of the bottle supporting frame to receive smaller or larger bottles, the bar A is provided at its ends with rods *i* received in suitable guideways formed in the opposite ends of the angle-bar B and adjustably secured therein by bolts or set screws *i'*, Figs. 1 and 4. The transverse bar A may thus be caused to approach the angle-bar B when smaller bottles are to be cleaned, or it may be made to recede when larger bottles are to be inserted in the frame. The two bars A and B, firmly, but adjustably connected by the rods *i*, *i*, thus constitute the frame in which the bottles are to be clamped while subjected to the cleansing operation. This frame is provided at opposite ends of the bar B with journals or trunnions *m*, supported in the manner hereinafter described, and on which the frame A B may be readily turned to any one of the three positions hereinbefore mentioned.

The required rotary movement of the india rubber disks *e* is effected by spur wheels *g* on the disk shanks *e'* and through which the

disks are rotated by a toothed driving wheel *k*, Figs. 1, 2, and 4, when the bottles together with the frame A B holding them are in a horizontal position, that is to say, when the frame A B is turned from the position I shown in Fig. 2 through an angle of ninety degrees to the left into the position II. Then the toothed driving wheel *k*, will mesh with the intermediate wheel *h*, Figs. 1 and 2, and thus drive the spur wheels *g* through which the disks *e* are rotated. The intermediate wheel *h* is mounted on the bar B, and has somewhat large spaces between its teeth so that the engagement and disengagement of this wheel *h* and the toothed driving-wheel *k* may take place without difficulty during the changing of the position of the frame A B in which the bottles are supported.

The toothed driving wheel *k* is splined upon a sleeve *r*, Fig. 4, arranged to slide to and fro in the hollow journal of a bevel gear S, inasmuch as the said sleeve is provided in its lower half with two longitudinal grooves, with which engage two tongues or flat keys *s*, Fig. 4, arranged opposite each other in the bevel gear S.

The journals or trunnions *m*, *m* of the tilting frame A B are supported in bearing blocks *n*, *n* provided with guide rods *p*, *p'* arranged to slide in bearings E, F at opposite ends of a stationary base or frame K forming the pedestal of the machine. One of the bearings E serves also as a support for the bevel gear S and sleeve *r* through which one of the guide rods *p* is passed.

Upon the main shaft *u* of the machine I provide, besides the driving pulleys C, a bevel gear S' which engages with the before mentioned bevel gear S. On each end of the main shaft *u* is also arranged a crank *t*, to which is attached one end of a connecting rod *t'*, the other end of which connects with a journal *m* of the tilting and reciprocating frame A B. The journals or trunnions *m*, *m*, project through the sliding bearing blocks *n*, *n*, and serve at the same time for attachment of the connecting rods *t'*, *t'* and as pivots for the frame A B in which the bottles are supported.

When in the position II, (see Fig. 2) the frame and bottles are horizontal, and in this position the bottles are rinsed. If the main shaft *u* is now turned by the belt pulleys C, its toothed bevel wheel S', by means of the bevel-gear S turns first the sleeve *r* and together with this the toothed wheels *k* and *h*, and the spur gears *g* with which the disks *e* covered with india rubber are connected. These disks *e* carry round the bottles *a* by friction, so that the latter are also caused to turn; but during the turning movement of the bottles the blocks *n* and guide rods *p p* will be moved rapidly to and fro by the cranks *t* and connecting rods *t'*, and therefore a reciprocating movement will be imparted to the frame A B in which the bottles are supported. Under these circumstances the engagement of the wheels *k*, *h* is not interrupted, because the wheel *k*, by reason of its connection with the sleeve *r*, participates in the sliding movement of the guide-rod *p* on which the said sleeve is held by means of collars *q q*, Fig. 4, at each end, but in such manner that the sleeve may be rotated freely through the bevel gearing with which it is in sliding connection.

On the bar A of the tilting bottle-supporting frame are mounted two locking bars *j*, Fig. 1, connected by a link *j'* and having curved catch arms *j''* at their outer ends which project somewhat beyond the ends of the frame. One of these locking bars *j* is provided with a handle J through which a sliding movement can be imparted to the said bars to protrude or retract their catch arms. After the frame A B has been tilted to a horizontal position the bars *j*, *j* are moved outward to cause their catches *j''*, *j''* to loosely engage the guide rods *p'*, *p'* and thus prevent the frame from tilting vertically during the operation of cleaning the bottles.

For the interior rinsing and cleaning of the bottles, I use small porcelain pieces or balls placed in the bottles and which in the energetic to-and-fro movement of the frame A, B, while in the position II are shaken very effectively against the inner periphery of the bottles.

When, after the cleaning has taken place, the porcelain pieces or balls are to be removed from the bottles, the frame A, B, after the main driving shaft *u* has been stopped, is turned upon the journals *m*, *m* to the position III so that the bottle necks and heads with the funnels *v* will be below. The frame A, B can, however, be tilted vertically only after disengagement of the catches *j''* from the rods *p'*, *p'* by sliding the handle J inward. In this position the catches *j''* pass the rods *p'* so that the frame A B can be tilted to the position III. Then the small intermediate wheel *h* is automatically disengaged from the wheel *k*.

The frame A B is tilted so far, with the funnels *v* downward that the porcelain pieces or balls contained in the bottles will run back through the hollow shaft *b'''* of each chuck *b* into the funnels *v*. The rinsing water then flows off through small holes *v'* provided in the cover of the funnel, Fig. 5, and while the funnel is in an inverted position. After this has taken place, the three-way cock *y* in the water pipe is opened so that a powerful jet is introduced through the pipes *y'* and *y''*, Fig. 5, into the interior of each bottle. This completes the cleaning. The clean bottles are then removed, other bottles to be cleaned are placed between the chucks and the india rubber disks *e*, and the frame A B is now turned upward to the vertical position, that is to say, from the position III to the position I which is represented in Fig. 2. By these means the porcelain pieces or balls contained in the funnels *v* are caused to fall again

through the hollow shaft of each chuck b into the bottles. Then the before-mentioned three-way cock y is opened in the same position I, and the bottles are about half filled with water. When the frame A B is tilted again to the position II the handle J of the locking bars j, j, arranged on the transverse bar A must be displaced to the right, so that the catches j'' will engage the rods p', and the apparatus can then be set in operation again.

During the operation of the machine the three-way cock y is opened so that water will run into the funnels and bottles through the pipes y', y'' and through pipes y''' to a series of brushes H arranged between the bottles. By means of a flexible pipe y^4 water may be supplied to the cock y from any suitable source.

The exterior cleansing of the bottles is accomplished by means of brushes H that are adjustably attached to the frame A B, as shown in Fig. 1. These brushes are preferably made of rods or bars provided with bristles and adapted to the form or contour of the bottles. As shown in Fig. 1 they may be made in two parts adapted to slide on each other, one part being adjustably attached to the bar A and the other part to the bar B, or in lieu of such two part brushes any other suitable construction may be employed. Water is supplied to the brushes through the pipes y''' and during the rotation of the bottles in contact with such brushes their outer sides will be thoroughly cleaned.

What I claim as my invention is—

1. In a machine for cleaning and rinsing bottles, the combination of the tilting and reciprocating frame A B having journals or trunnions m, m, the bearing blocks n, n in which said trunnions are journaled, the guide rods p, p' attached to said bearing blocks, the bearings E F in which said guide rods are adapted to slide, the funnels v and communicating spring pressed chucks b carried by the bar A of said frame, the rotary disks e and their operating gears g and h mounted on the frame bar B, the shaft u having pulleys C bevel gear S' and cranks $t\ t$, the sleeve r mounted on a guide-rod p and carrying a gear k adapted to mesh with the gear h when the frame A B is in a horizontal position, the bevel gear S mounted in a bearing E and splined with the sleeve r to mesh with gear S', the rods $t'\ t'$ connecting the cranks t, t and journals m, m, and means for supplying water to the funnels and bottles carried by the tilting and reciprocating frame, substantially as described.

2. In a machine for cleaning and rinsing bottles, the combination of the tilting and reciprocating frame A B provided with means for supporting a number of bottles and gearing for rotating the bottle supports, the perforated funnels v communicating with the bottles and provided with pipes for admitting water, brushes H supported in said frame between and in contact with the bottles, sliding guide-rods p, p' for supporting the pivotal portions of the frame and with which said frame may be moved to and fro, a driving-shaft u having cranks and connecting rods for reciprocating the frame and its guide-rods, and gearing connected with the driving-shaft for actuating the gears mounted on said frame and through which the bottles are turned, substantially as described.

In witness whereof I have hereunto set my hand, at Mannheim, this 3d day of February, 1894.

THEOBALD WENDLING.

Witnesses:
A. B. BEYREEUTHER,
BENEDICT GOLDFINGER.