No. 780,488. PATENTED JAN. 17, 1905.

F. N. YOUNG.

BOTTLE WASHING MACHINE.

APPLICATION FILED MAR. 9, 1903.

3 SHEETS—SHEET 1.

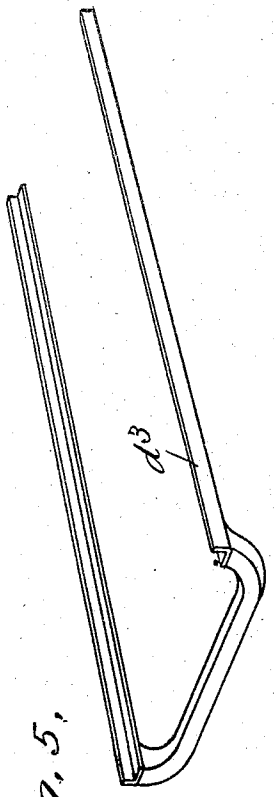


Fig. 5.

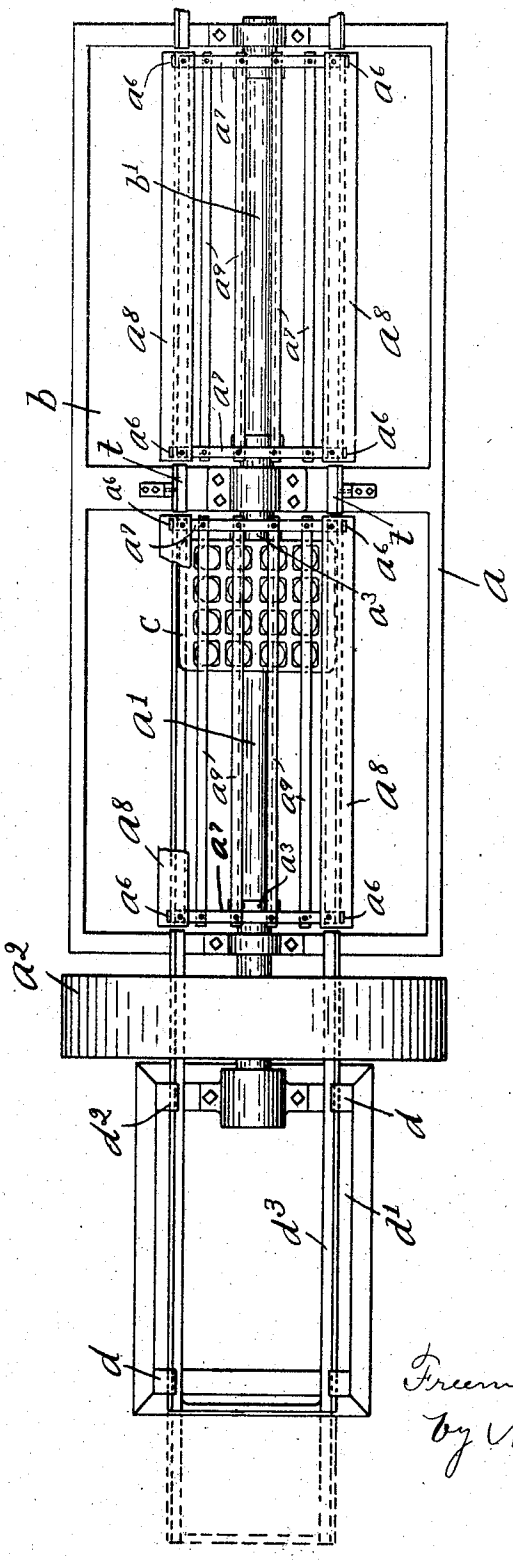


Fig. 1.

Witnesses:
H. B. Davis.
Maud M. Piper.

Inventor:
Freeman N. Young
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3 SHEETS—SHEET 2.

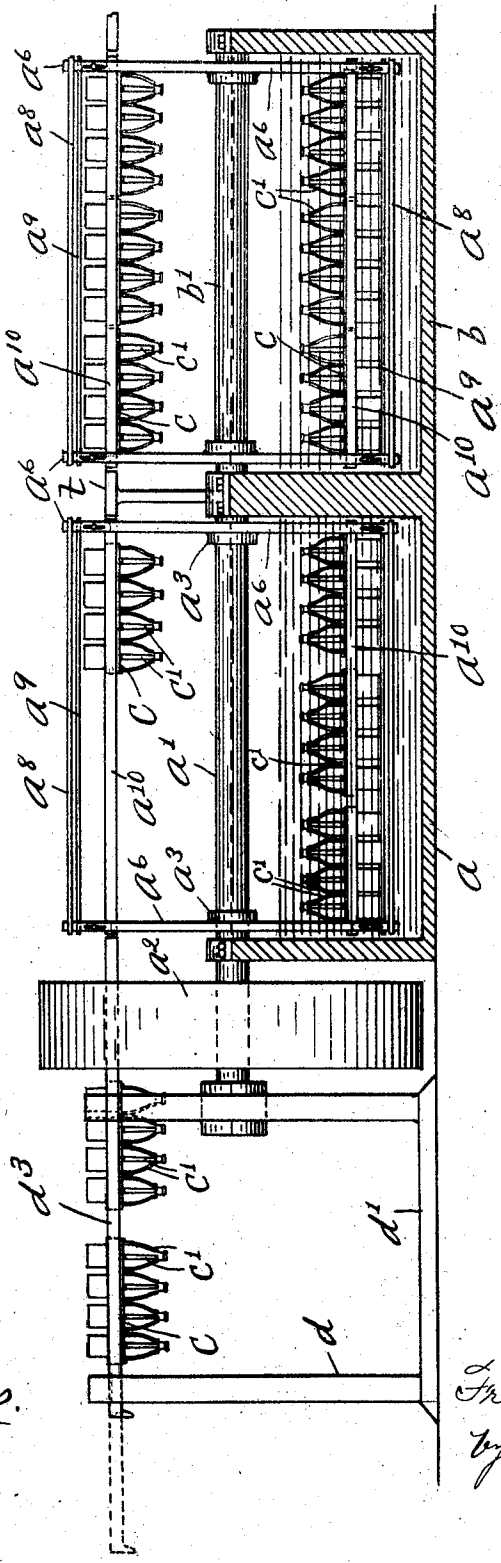


Fig. 2.

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3 SHEETS—SHEET 3.

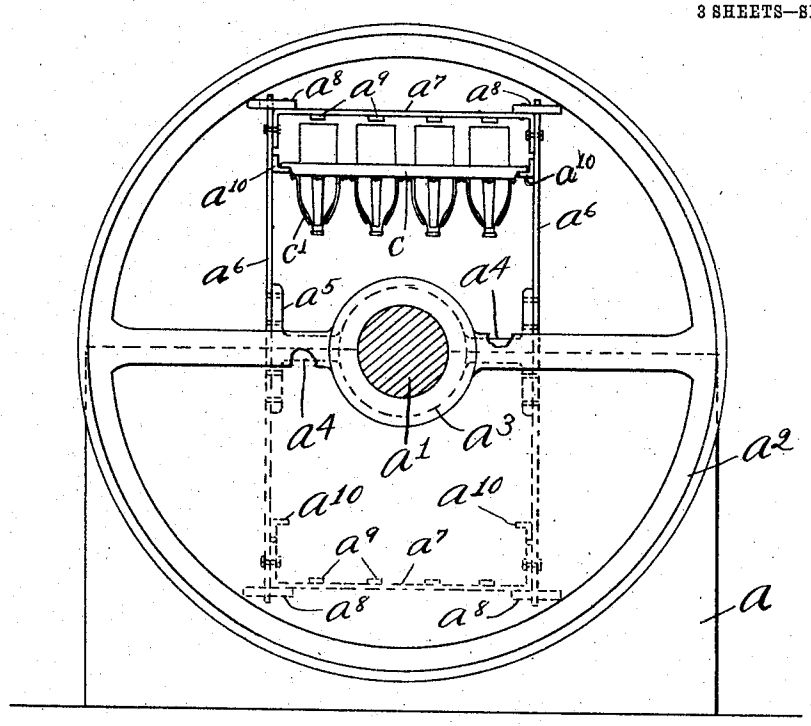


Fig. 3.

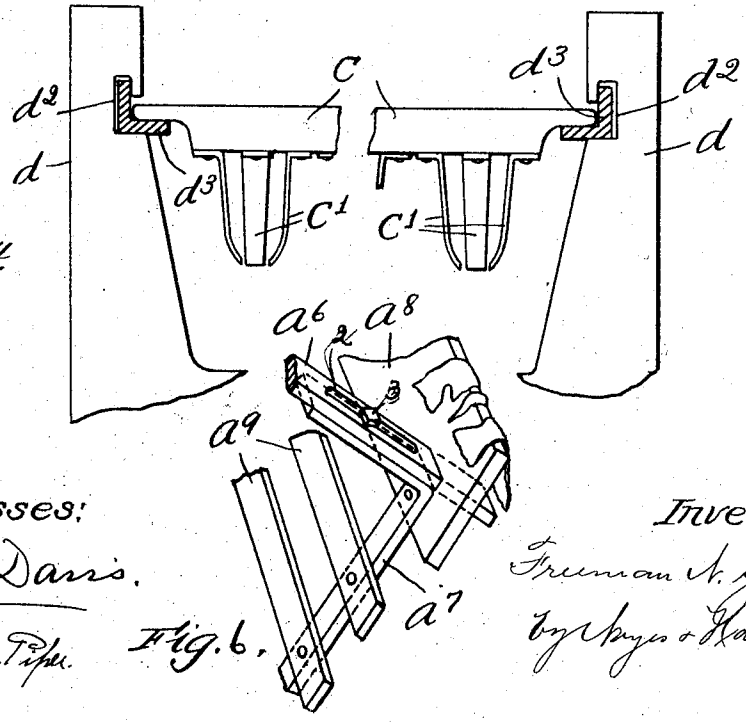


Fig. 4.

Fig. 6.

Witnesses:

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No. 780,488. Patented January 17, 1905.

UNITED STATES PATENT OFFICE.

FREEMAN N. YOUNG, OF ARLINGTON, MASSACHUSETTS.

BOTTLE-WASHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 780,488, dated January 17, 1905.

Application filed March 9, 1903. Serial No. 146,830.

To all whom it may concern:

Be it known that I, FREEMAN N. YOUNG, of Arlington, county of Middlesex, State of Massachusetts, have invented an Improvement in Bottle-Washing Machines, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to machines for washing bottles, and is especially adapted for washing previously-used or second-hand bottles, although also adapted for washing new bottles and other articles.

Second-hand bottles usually have labels pasted on them, and it is necessary to remove these labels by the washing process, and the machine embodying this invention has the capability of washing off the labels as well as thoroughly cleaning the bottles exteriorly and interiorly.

In accordance with this invention the bottles to be washed are placed in racks especially provided for the purpose, and an open-ended skeleton frame is provided adapted to be revolved on a horizontal axis in a suitable tank, the relative proportions of the frame and tank being such that approximately the lower half of the frame will be at all times submerged in the washing liquor contained in the tank, and said frame is constructed and arranged to receive and hold a plurality of bottle-holding racks at a distance suitably remote from its axis, so that during each revolution the racks and bottles carried by them will be bodily carried into and out of the washing liquor which is contained in the tank. The bottles are placed in the racks upside down, and the racks are drawn into the revoluble frame with the bottles upside down, and as the frame makes a complete revolution the bottles will pass into and through the washing liquor and will make a complete revolution in a circular path about the axis of said frame. While the bottles are passing through the washing liquor they become partially filled with said liquor, and while passing around preparatory to being again submerged more or less of the water escapes while the bottles are held in an inverted position. Therefore the washing liquor in the bottles, which, it will be understood, does not completely fill them, is shaken during each revolution of the frame, so that the bottles are washed interiorly as well as exteriorly. The bottles are also loosely supported, so that as the frame revolves they will move more or less independently to thereby accelerate the shaking action. The revoluble frame has an open-ended passage through it from end to end, and the bottle-racks are drawn into and slid along said passage and finally drawn out of said passage at the opposite end of the frame. The frame has tracks located at opposite sides of said passage on which said bottle-racks are adapted to slide and on which they rest while the frame revolves and also suitable means, preferably adjustable, for holding the bottles in the racks to thereby provide for holding them in place while the frame revolves. The revoluble frame is also provided with means for collecting the labels which become detached from the bottles and float in the washing liquor.

To assist the operator in feeding the racks to the machine, a suitable slide is provided adapted to hold several bottle-racks, and the bottles are placed in the racks either while the racks rest on said slide or previously, and the slide is supported on suitable tracks, into alinement with which the tracks carried by the frame may be brought. When the racks are filled with bottles, they are moved up to the open end of the revoluble frame and then slid along on the tracks into the passage in said frame.

The revoluble frame is constructed to hold two sets or rows of bottle-racks, which will be disposed at diametrically opposite points, although I do not desire to limit my invention to the number of racks or rows of racks that the frame shall carry.

My machine may be built in multiple, if desired—that is to say, I may employ two or, if desired, a greater number of open-ended revoluble frames arranged in alinement, each revolving in a separate tank, and the frames will be constructed in such manner that the bottle-racks can be slid along from one to the next frame and finally withdrawn.

Figure 1 shows in plan view a bottle-wash-

ing machine embodying this invention. Fig. 2 is a side elevation and a partial vertical section of the bottle-washing machine shown in Fig. 1. Fig. 3 is an end view of the revoluble frame and tank and driving-pulley. Fig. 4 is a detail showing in elevation one of the bottle-racks and in section the slide by which it is fed to the machine. Fig. 5 is a detail of the slide or sliding frame by which the bottle-racks are carried up to the open end of the revoluble frame. Fig. 6 is a detail of a portion of the revoluble frame.

a represents the tank, of any suitable size and shape adapted to contain the washing liquor, and *b* is another tank which is adapted to contain a suitable rinsing liquor. The horizontal shaft *a'*, to which the frame to be described is secured, has its end bearings in the end walls of the tank and has secured to it a driving-pulley a^2. The shaft *a'* may be extended so as to pass lengthwise of the other tank, as shown at *b'*, so that a second shaft and a second driving-pulley need not be employed. The driving-pulley a^2 is made quite large and has large openings through it which are sufficient for the passage of the bottle-racks to be described. The shaft *a'* has secured to it a frame which supports any desired number of bottle-racks, and, as herein shown, said frame consists of a skeleton or open-work structure composed, essentially, of strap-iron, the parts of which are riveted or bolted together. At each end of the shaft *a*, inside of the tank, a collar a^3 is secured, and each collar has projecting from it in opposite ways a pair of arms a^4, having at their extremities feet a^5, which are disposed at right angles to the arms. A long piece or strip of strap-iron a^6 or equivalent material is secured to each foot a^5, and said pieces or strips a^6 are disposed in parallelism, and the extremities of said pieces or strips at each end of the frame are connected together by similar pieces or strips a^7. A rectangular frame is thus produced at each end of the shaft *a'*, which forms one of the end frames of the bottle-rack-carrying frame. The strips a^7 are formed with downwardly-turned ends, and the extremities of the strips a^6 are slotted, as at 2, to receive bolts 3, which connect the strips a^7 adjustably with the strips a^6 for purposes to be described.

The ends of the strips a^7 at the opposite ends of the shaft *a'* are connected together by longitudinal strips or bars a^8, four such strips or bars being employed to thereby present a cubical skeleton structure.

The strips a^8 have holes through them through which the ends of the strips a^6 project to provide for adjustment of the strips a^7.

The strips a^7 of the two end frames are further connected together by horizontal strips or bars a^9, there being four such strips or bars connecting each pair of strips a^7, although so far as stiffening the structure is concerned any other number may be employed; but the main object of employing these strips or bars a^9 is to assist in supporting the bottles, as will be hereinafter described. The strips a^7 of each pair and the bars which connect them together form a flat open-work frame which is adjustable toward and from the axis of the revoluble frame and which serves as a bottle-retaining frame, as will be described. Angle-iron bars a^{10} are secured to the strips or bars a^6 near their outer ends, but inside of the adjustable open-work frame, which extend horizontally lengthwise the revoluble frame and serve as supports or tracks for the bottle-racks, being arranged in parallelism and in pairs. An open-ended passage is thus provided, which extends from end to end of the frame. Each pair of tracks a^{10} is adapted to receive upon it one or more bottle-racks, which will be drawn into the open-ended passage at one end of the revoluble frame and withdrawn therefrom at the other end of the frame.

The bottle-racks herein shown each consist of a flat plate *c*, having holes through it for the bottles, and having fingers *c'*, preferably yielding, attached to the under side of said plate adjacent said holes, which support the necks of the bottles. The bottles are placed in the racks in inverted position, the necks thereof resting on the fingers *c'*, and they are held in upright position by the perforated plate *c*. These racks will have as many holes as desired, four rows of holes being herein shown, each row containing four holes, so that each rack will carry sixteen bottles.

The racks are made of the proper width to freely enter the open end of the longitudinal passage through the main frame and have rests at opposite sides which rest on the tracks a^{10}, as shown in Fig 3, and when thus drawn into the revoluble rack the bottles carried by the frame will occupy positions beneath the bars a^9 of the bottle-retaining frame and will be held by said bars from leaving the racks as the frame is revolved. During each revolution of the frame the bottles are submerged in the washing liquor and withdrawn therefrom and caused to make a complete revolution in a circular path about the axis of the frame, and while submerged in the washing liquor they fill more or less, and afterward empty more or less, so that they will be partly filled with the washing liquor while carried by the revoluble frame, and the washing liquor which thus partly fills them is shaken in the bottles as the frame revolves, so that the bottles are washed interiorly as well as exteriorly.

The bottles are held loosely in the racks by the bottle-retaining frames and being thus loosely supported in the racks are free to move a little independently, and consequently as the frame revolves they are shaken bodily, and the result is same as if they were partly filled with washing liquor and bodily shaken.

The first time the bottles are submerged in the washing liquor rotation of the frame may be temporarily checked while the bottles fill to make sure that enough washing liquor has entered to thoroughly wash the bottles. The bottle-retaining frame is made adjustable to provide for bottles of different lengths.

The revoluble frame which is contained in the tank b is constructed the same as the frame in the tank a, having one or more open-ended passages through it from end to end and having tracks on which the bottle-racks are adapted to slide, and the longitudinal passage through the revoluble frame is located in alinement with the passage through the revoluble frame in the tank a, so that the bottle-racks may be slid from one frame to the other; but between the revoluble frames a pair of short tracks t are stationarily supported, into alinement with which the tracks a^{10}, carried by the frames, will be brought whenever it is desired to slide the bottle-racks from one frame to the other.

The liquor contained in the tank b may and preferably will be different from the liquor contained in the tank a and used to rinse the bottles.

To assist in feeding the bottle-racks through one of the openings in the driving-wheel a^2 to the open-ended revoluble frame which is contained in the tank a, an upright structure is provided at one end of said frame outside of the driving-wheel a^2, which, as herein shown, consists of several upright posts d, rising from a base d', the upper ends of which are provided with runways d^2, adapted to receive the angle-iron frame d^3 on which the bottle-racks are placed, said angle-iron frame being movable longitudinally in the runways provided for it, so that it can be projected through one of the openings in the driving-wheel and moved close up to the open end of the revoluble frame, and for the introduction of the bottle-racks the revoluble frame will be stopped with its tracks a^{10} in alinement with the runways d^2.

The side bars of the sliding frame d^3 are located the same distance apart as the tracks a^{10} which are borne by the revoluble frame, so that the bottle-racks may be slid from said frame d^3 into the open end of the revoluble frame. At the opposite ends of the revoluble frame a pair of stationary tracks are provided onto which the bottle-racks will be drawn when they are withdrawn from the revoluble frame.

The cross bars or strips a^8 are made wide enough to project a short distance from the revoluble frame and besides stiffening the cubical structure also serve to collect the washed-off labels which float in the washing liquor, as represented by Fig. 6.

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

1. In a bottle-washing machine, the combination of a tank, a revoluble open-ended skeleton frame therein, a horizontal shaft bearing said frame, a bottle-rack support carried by said frame consisting of a pair of horizontally-disposed tracks and an adjustable bottle-retaining frame, and a removable bottle-rack adapted to be slid along on said tracks, substantially as described.

2. In a bottle-washing machine, the combination of a tank, a pair of stationary tracks at one end thereof, a revoluble frame in said tank having an open-ended passage through it from end to end, a pair of horizontal tracks located one at each side of said passage adapted to be brought into alinement with said stationary tracks, a horizontal shaft bearing said frame and a removable bottle-rack adapted to be supported upon and to be slid along on said tracks, substantially as described.

3. In a bottle-washing machine, the combination of a tank, a revoluble frame therein having an open-ended passage through it from end to end, a pair of horizontal tracks located one at each side of said passage, a bottle-retaining frame opposite said tracks and a removable bottle-rack adapted to be supported upon and to be slid along on said tracks, substantially as described.

4. In a bottle-washing machine, the combination of a tank, a revoluble frame therein having an open-ended passage through it from end to end, a shaft bearing it, a bottle-rack support carried by said frame remote from its axis, a driving-wheel secured to said shaft having a large opening through it opposite said passage, a sliding frame carrying the bottle-rack adapted to be projected through the opening in said driving-wheel, a support for said sliding frame and a removable bottle-rack, substantially as described.

5. In a bottle-washing machine, the combination of a tank, a revoluble frame therein having an open-ended passage through it from end to end, a shaft bearing it, a bottle-rack support carried by said frame comprising a pair of tracks and a bottle-retaining frame, a driving-wheel secured to said shaft having a large opening through it, a sliding frame having a pair of tracks adapted to be projected through the opening in said driving-wheel into alinement with the tracks borne by said frame, a support for said sliding frame, and a removable bottle-rack, substantially as described.

6. In a bottle-washing machine, the combination of two tanks, two revoluble frames therein revoluble on horizontal axes, each having an open-ended passage through it from end to end, a bottle-rack support carried by each frame, an intermediate bottle-rack track between said frames, and a removable bottle-rack adapted to be carried by said revoluble frames, which is movable from one to the other, substantially as described.

7. In a bottle-washing machine, the combi-

nation of two tanks, two revoluble frames therein, each having a passage through it from end to end, a bottle-rack support carried by each frame, a shaft to which said frames are secured and by which the bottle-rack supports are held in alinement, a stationarily-disposed pair of tracks placed between said revoluble frames, and a removable bottle-rack adapted to be carried by said revoluble frames which is movable from one to the other, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FREEMAN N. YOUNG.

Witnesses:
B. J. NOYES,
H. B. DAVIS.