No. 764,456. PATENTED JULY 5, 1904.

T. GREBE.

BOTTLE WASHING MACHINE.

APPLICATION FILED OCT. 15, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

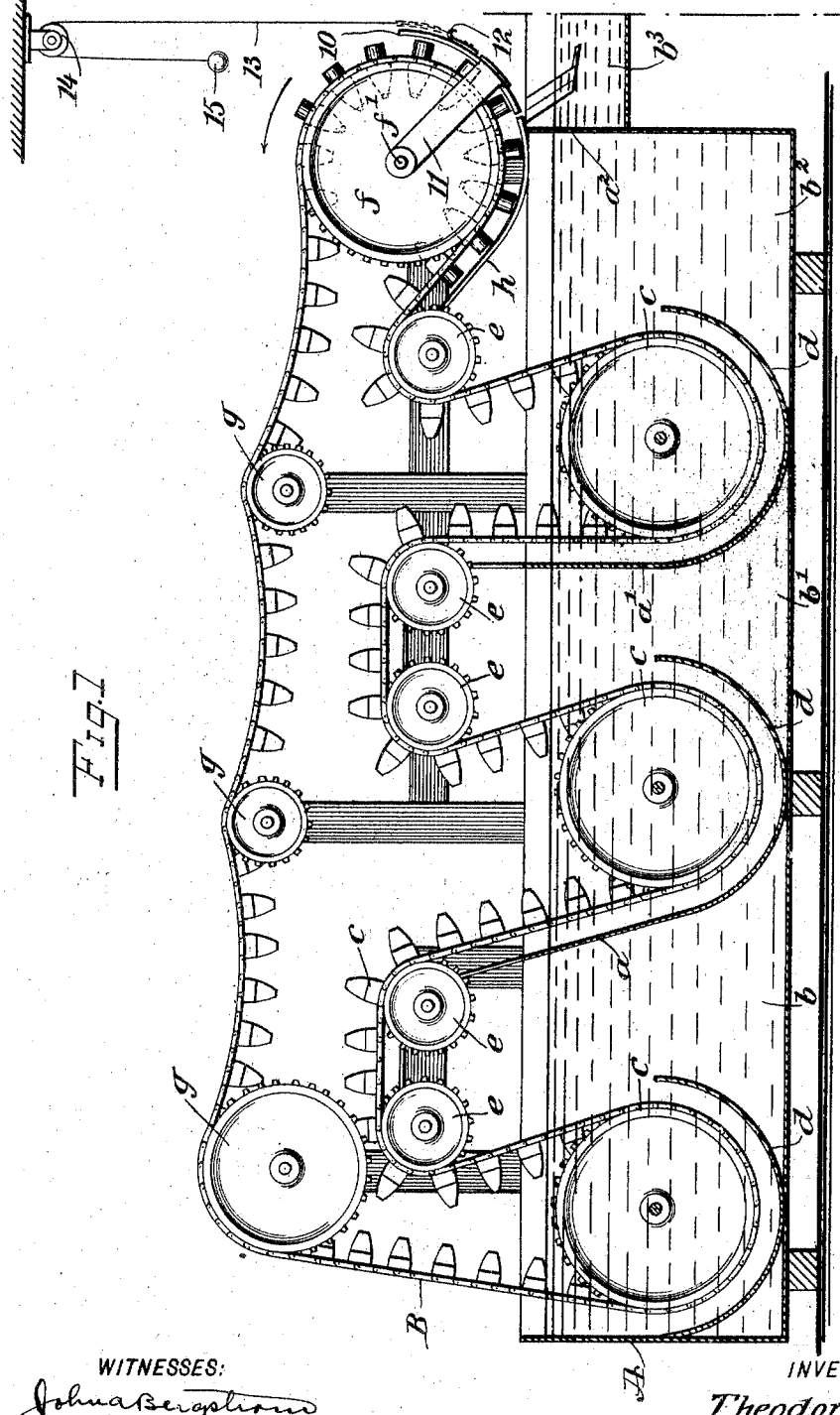


Fig. 1

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NO MODEL. 2 SHEETS—SHEET 2.

Fig 4

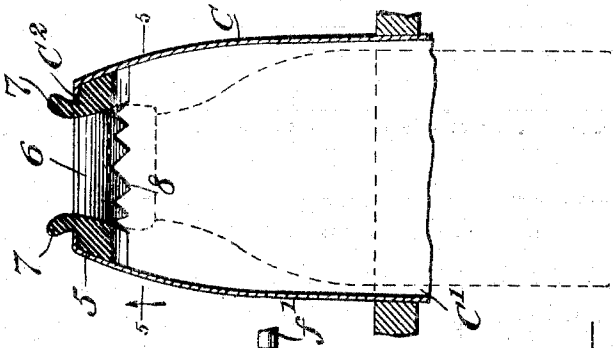



Fig 5

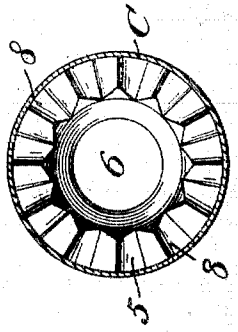



Fig 3

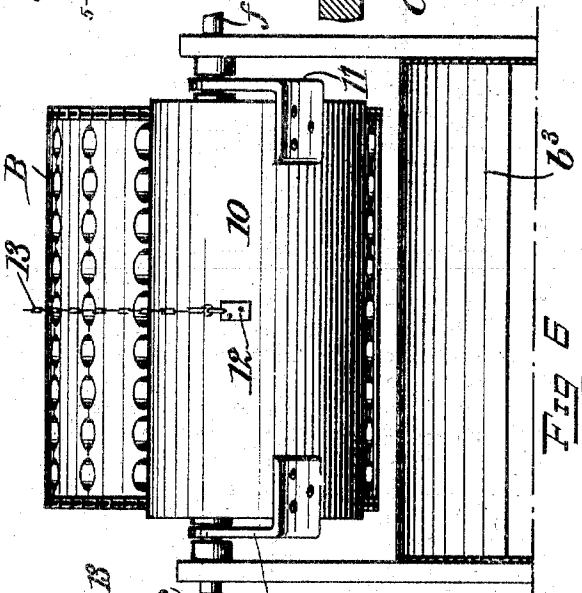



Fig 6

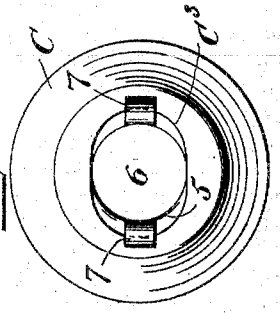
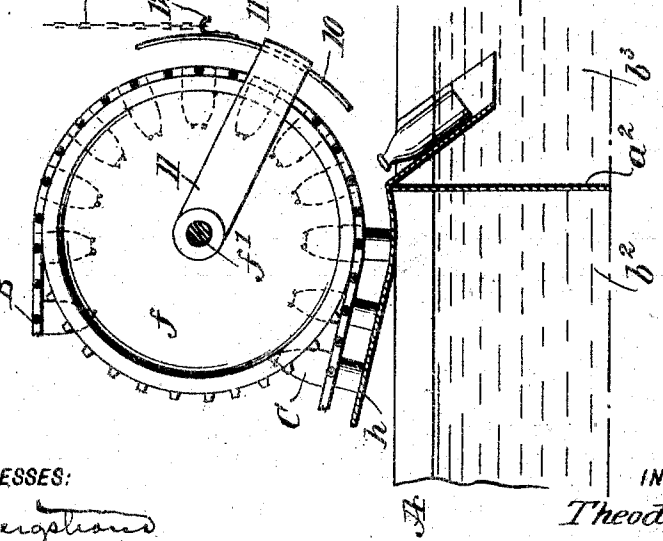



Fig. 2




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No. 764,456. Patented July 5, 1904.

# UNITED STATES PATENT OFFICE.

THEODORE GREBE, OF NEW YORK, N. Y.

## BOTTLE-WASHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 764,456, dated July 5, 1904.

Application filed October 15, 1903. Serial No. 177,147. (No model.)

*To all whom it may concern:*

Be it known that I, THEODORE GREBE, a subject of the Emperor of Germany, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Bottle-Washing Machine, of which the following is a full, clear, and exact description.

My invention relates to improvements in machines for soaking and washing bottles of that class wherein an endless conveyer is guided to travel through a succession of baths.

In the practical service of ordinary machines of this character it is found that bottles are sometimes broken by forcibly thrusting them into the metallic holders on the conveyer, and it is also found that the washed bottles accumulate in the final tank so rapidly that they cannot be removed fast enough by the services of a number of attendants. I seek to overcome the first objection by the provision of a peculiar construction of a yieldable liquid-proof cushion in each bottle-holder of the conveyer, said cushion serving to minimize the shock due to the thrust of the bottle in the holder and to effectually prevent breakage.

Another improvement resides in the employment of a hood adjacent to the delivery end of the conveyer and adapted to occupy an abnormal raised position with relation thereto, permitting the rapid discharge of the washed bottles, said hood being shiftable to a lowered position opposite to the delivery end of the conveyer and being effective in retaining bottles in the conveyer, so that they will be carried back and through the tanks for a second washing.

Further objects and advantages of the invention will appear in the course of the subjoined description, and the actual scope thereof will be defined by the annexed claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional elevation of a bottle-washing machine, showing my improvements adapted for use in connection with one of the existing types of machines. Fig. 2 is a sectional elevation at the delivery end of the conveyer, showing the adjustable hood in a position which will allow the discharge of the bottles from said conveyer into the final washing-tank. Fig. 3 is an end elevation of the devices shown by Fig. 2. Fig. 4 is an enlarged detail sectional view of one of the bottle-holders, illustrating my improved cushion applied thereto. Fig. 5 is a transverse section on the line 5 5 of Fig. 4 looking in the direction of the arrow, and Fig. 6 is an end elevation of the bottle-holder shown by Fig. 4.

A designates a tank which is divided by a series of partitions $a$ $a'$ $a^2$ into a series of compartments $b$ $b'$ $b^2$ $b^3$, the same adapted to hold solutions and baths through which the bottles are to be carried for immersion successively in said baths. The compartments $b$ $b'$ $b^2$ contain a series of rotary wheels $c$, which are partly enveloped by guards $d$. The apparatus is equipped with a framework which supports a plurality of elevated rotary wheels $e$, which are disposed in pairs over the compartments of the tank, and this framework is provided with a delivery-wheel $f$ and with another series of wheels, $g$, the latter being disposed above the rotary wheels $e$, as shown by Fig. 1.

An endless bottle-conveyer B is fitted operatively to the rotary wheels $c$ $e$ and to the wheels $f$ $g$, so as to travel lengthwise of the machine and to dip into the baths contained in the compartments $b$ $b'$ $b^2$. Between the final wheels $e$ of the series and the delivery-wheel $f$ is arranged a chute $h$, which serves the same function as the hoods $d$, said chute being arranged to allow the escape of the bottles from the conveyer B into the final washing-tank $b^3$ of the apparatus. The endless conveyer B is equipped with a large number of bottle-holders C, each of which has a large opening C′ at one end for the ready introduction of the bottle into the holder. This holder, however, tapers somewhat toward its other end, and this end is provided with an inwardly-extending flange $C^2$, which provides a smaller opening $C^3$ at the opposite end from the opening C′, substantially as shown by Figs. 4 and 6.

One of the improvements which I have made consists in the provision of a cushion which

is fitted within the open flanged end $C^2$ of the bottle-holder, so as to afford a seat for the bottle when the neck portion thereof is thrust into the holder C. This cushion is made of rubber or other material which will afford a soft seat and be impervious to the solutions or baths through which the bottle-holder must travel when moved by the conveyer lengthwise of the machine. The cushion 5 is provided with an opening 6, which is coincident with the opening $C^3$ at the contracted portion of the bottle-holder, and said cushion is arranged within the holder so as to engage with the flange $C^2$ thereof. Any suitable means may be employed for holding the cushion in place within the holder; but, as shown by Figs. 4 and 6 of the drawings, the cushion is provided with lugs 7, which are integral with the body portion of the cushion and are arranged to fit around the flanged open end portion $C^2$ of the holder. The lugs 7 are adapted to be pressed toward one another when the cushion is introduced in the holder, so that they will pass through the opening $C^3$; but these lugs spring apart and have engagement with the flange $C^2$, so as to confine the cushion within the holder and against said flange when said cushion is properly fitted in the contracted end portion of the holder. The inner surface of the cushion is provided with a series of ribs 8, which are in the form of corrugations or scallops, so as to provide intermediate spaces through which the liquid or solution is free to pass when the holder is immersed in the bath.

The bottles are designed to be placed in the conveyer at the left-hand end of the machine, and the operator is able to rapidly and easily thrust the bottles into the holders when the conveyer passes from the elevated wheel *g* to the first wheel, *c*, of the series. In some types of existing machines the bottles are broken by thrusting them rapidly into the holders; but when the cushion 5 of my invention is placed in each holder the bottle impinges or abuts against this cushion, and it is held thereby from having forcible contact with the solid metallic bottle-holder, thereby minimizing the liability of breaking bottles when thrusting them into the holders of the conveyer.

Another improvement which I have made resides in the employment of an adjustable hood 10, which is disposed at the delivery end of the conveyer and occupies an operative relation to the delivery-wheel *f*. This hood is curved to conform to the arc of the delivery-wheel, and it is provided with radial arms 11, which are mounted loosely on the shaft *f'* of said delivery-wheel. This hood is equipped with a hook 12 or any other suitable means, to which may be attached a suspending rope or chain 13, the latter being arranged over an elevated guide or sheave 14 and provided with a suitable counterpoise 15, as shown by Fig. 1. In Fig. 2 of the drawings I have shown the hood in a raised position with respect to the delivery-chute *h*, thus allowing the bottles to pass from the conveyer and the chute into the final washing-tank $b^3$ of the apparatus. It frequently happens, however, that the bottles are delivered so rapidly as to fill this washing-tank $b^3$, because the workmen cannot remove the bottles from the tank fast enough to prevent the filling thereof, and at other times it is desirable to subject the bottles to a second washing operation by conveying them through one bath or a series of baths in the tank. The hood 10 may be lowered so that it will lie quite close to the chute *h*, substantially as shown by Fig. 2, and this hood serves to close the delivery-opening, so that the bottles will ride from the chute *h* directly to and upon the hood, whereby the bottles will be retained in the holders, and they will be carried along with the returning lead of the conveyer back to the final wheel *g* of the series, so as to be again carried through the several baths in the apparatus. It will be understood that the hood may be easily raised when it it is desired to discharge the bottles from the conveyer into the tank; but by lowering the hood the bottles are caused to remain in the holders, so as to be again carried through the series of baths.

Although I have shown my cushion as applied to a bottle-holder in a particular type of machine, it will be understood that I do not desire to confine myself to this specific construction of bottle-holder nor to the application of the cushion to any special type of bottle-washing machine.

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

1. In a bottle-washing machine, a cushion provided with a ribbed inner face and with an opening for the passage of liquid.

2. In a bottle-washing machine, a bottle-holder having a seat around a contracted opening, and a cushion occupying said seat and provided with an opening which registers with said opening of the bottle-holder, said cushion having a corrugated face forming a bottle-seat.

3. In a bottle-washing machine, the combination with a delivery-wheel, and an endless bottle-conveyer adapted to said wheel, of a chute adjacent to the wheel, a hood pivotally suspended on an axis coincident with the axis of the wheel and operatively related to the bottle-conveyer, and means for adjusting said hood, the hood being movable into coöperative relation to the chute.

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

THEODORE GREBE.

Witnesses:
JNO. M. RITTER,
H. F. BERNHARD.