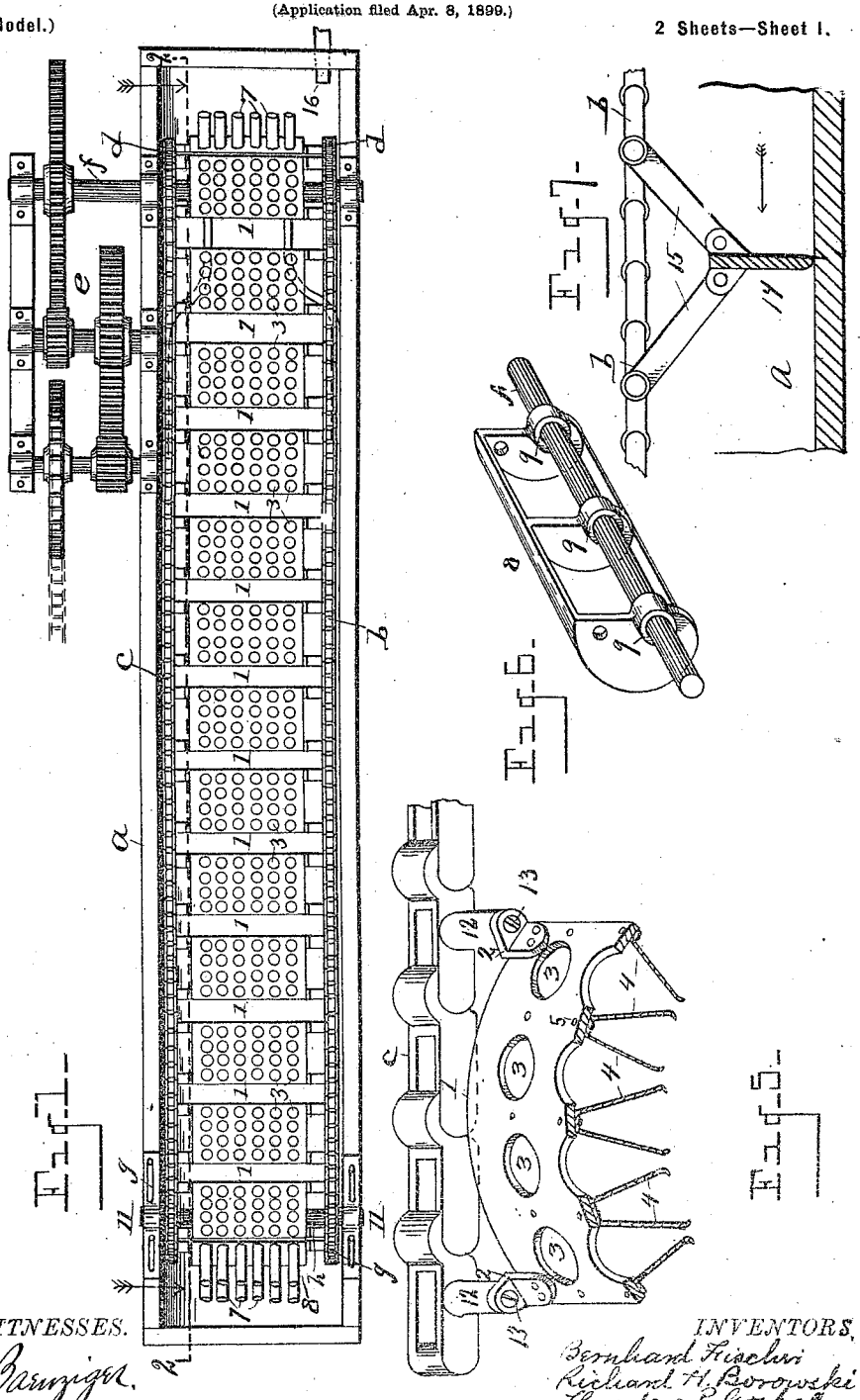
No. 627,612. Patented June 27, 1899.

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## BOTTLE CLEANING APPARATUS.

(Application filed Apr. 8, 1899.)

No Model.) 2 Sheets—Sheet 1.



WITNESSES.

O. B. Barringer.

Mary Hickey.

INVENTORS,

Bernhard Fischer,
Richard H. Borowski
Theodore P. Goebel
By Newell D. Wright & Co.
their Attorneys.

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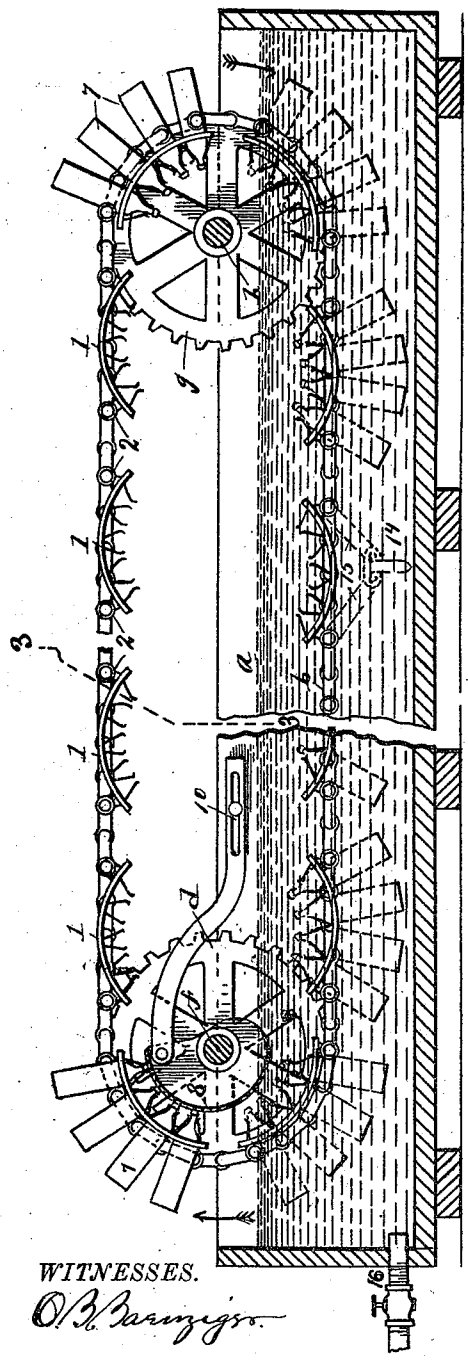


Fig. 2.

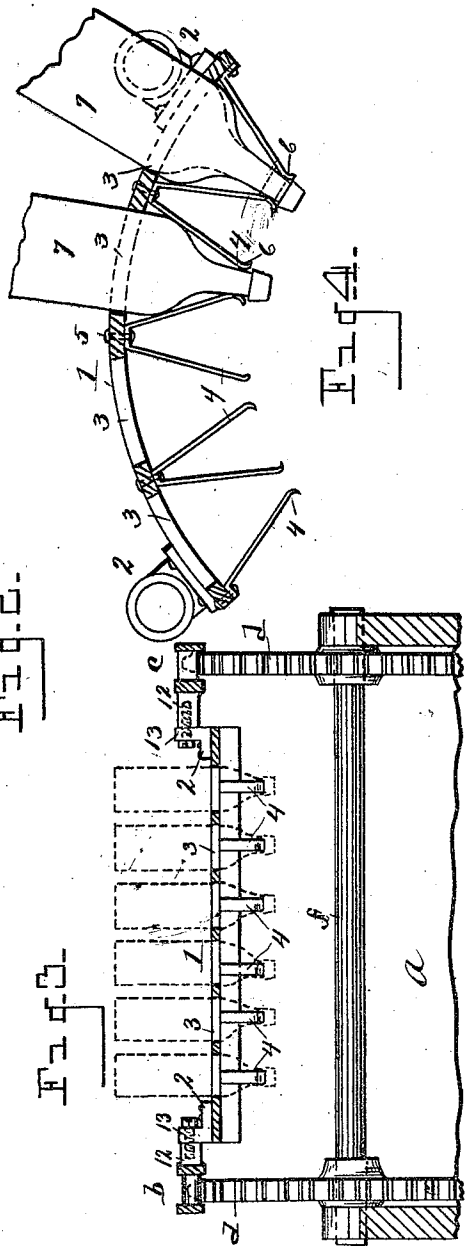


Fig. 4.

Fig. 3.

WITNESSES.

O. B. Barrigar.

Mary Hickey.

INVENTORS.

Bernhard Fischer
Richard H. Borowski
Theodore P. Goebel
By Newell S. Wright
their Attorneys.

# UNITED STATES PATENT OFFICE.

BERNHARD FISCHER, RICHARD H. BOROWSKI, AND THEODORE P. GOEBEL, OF DETROIT, MICHIGAN.

## BOTTLE-CLEANING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 627,612, dated June 27, 1899.

Application filed April 8, 1899. Serial No. 712,218. (No model.)

*To all whom it may concern:*

Be it known that we, BERNHARD FISCHER, RICHARD H. BOROWSKI, and THEODORE P. GOEBEL, citizens of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Bottle-Cleansing Apparatus; and we declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

Our invention has for its object a bottle-cleaning apparatus of novel construction; and it consists of the combination and arrangement of parts hereinafter described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a plan view illustrating features of our invention. Fig. 2 is a vertical longitudinal section of the apparatus on the line 2 2, Fig. 1. Fig. 3 is a vertical cross-section on the line 3 3, Fig. 2. Fig. 4 is a transverse section through one of the bottle-carrying plates. Fig. 5 is a detail view of a portion of one of the bottle-carrier plates in perspective. Fig. 6 is a detail view of the eccentric-ejector. Fig. 7 is a view illustrating a scraper attachment.

More particularly, our invention is designed to provide an apparatus for soaking, cleansing, and emptying bottles and whereby the bottles will be filled with a proper solution, the air being entirely excluded therefrom, and whereby the bottles will be duly soaked, so that labels and other matter adhering thereto may readily be cleansed therefrom when the bottles are removed from the apparatus by means of other suitable appliances or machines for washing or scrubbing and rinsing the same.

To properly soak and cleanse the bottles, it is desirable that the bottles should be conveyed into and through a proper solution in such a manner that when in the cleansing solution the bottles shall be carried with their open necks uppermost and whereby air will be entirely expelled from the bottles and the bottles filled with the desired solution, the bottles remaining in the solution a sufficient time to loosen all foreign matter therefrom. This our improved apparatus is adapted to accomplish and when the bottles have been sufficiently soaked to release the bottles from the retaining device, so that they may be readily removed from the apparatus for further action in a ready and simple manner. To secure these results, we carry out our invention as follows:

A suitable receptacle or tank is indicated at *a*, adapted to contain a desired solution. This receptacle may be of any desired proportions both as to length and width and height. In this receptacle is caused to move a suitable bottle-carrier, consisting, as shown, of sprocket-chains *b* and *c*, said chains being carried by sprocket-wheels *d*, driven by any suitable source of power, as by means of any suitable gearing (indicated at *e*, Fig. 1) arranged to drive the shaft *f* of said sprocket-wheels. Toward the opposite end of the tank or receptacle are located additional sprocket-wheels *g* for carrying the sproceet-chains, the same being mounted upon a shaft *h*. The shafts *f* and *h* may be suitably journaled in the walls of the receptacle *a*. These carrier-chains *b* and *c* may be of any desired length corresponding to the length of the receptacle *a*. Engaged with the carrier-chains are a series of bottle-carrying plates or holders, (indicated by the numeral 1,) any desired number of such plates or holders being secured to the carrier-chains. These plates or holders are shown provided at each extremity with attaching-arms, (indicated at 2,) by means of which these individual plates are connected at their four corners with the two sprocket-chains *b c* in any suitable manner. These bottle-carrier plates are provided with a series of openings 3, each arranged and adapted to receive the upper end of a bottle. These plates 1 are preferably constructed on the arc of a circle, the arc extending transversely of the plates or longitudinally of the carrier-chains, the plates being concaved on their inner faces. This curved construction of the plates is of special utility, especially for the passage of the chains and plates over the sprocket-wheels at the ends of the receptacle or tank. The plates are

made arc-shaped in cross-section to correspond with the arc of the circles of the sprocket-wheels. The plates 1 are also provided with retaining-arms, (indicated at 4.) These arms are made of spring metal and are attached to the inner surfaces of the respective plates in any suitable manner, as by rivets 5. These arms 4 converge on opposite sides of the openings 3, so as to grasp the neck of a bottle, as indicated in detail in Fig. 4, for example, the bottle being forced between two adjacent arms, so that the end or mouth of the bottle will project therebeyond. The arms are preferably curved away the one from the other at their inner ends, as indicated at 6, the inner ends of two adjacent arms engaging the bottle when held therebetween just below the head or customary flange of the bottle, so that the bottles are thereby securely held and supported even in inverted position. These arms 4 project from the inner face of the plates. The bottle-holder plates 1 are so engaged with the sprocket-chains as to be held in rigid connection therewith. As the bottle-holding plates are moved with the chains in the direction indicated by the arrows in Fig. 2 the bottles are carried into upright position, with their mouths uppermost, and in this position the bottles are carried through the solution to the discharge end of the tank.

Referring to Fig. 2, the right hand of the figure is preferably the receiving end—that is, the end of the apparatus at which the bottles to be soaked and cleansed are inserted into the bottle-holding plates 1. At the right hand of Fig. 2 a series of bottles are shown engaged in the bottle-holding plate, the bottles being preferably engaged in the plates in successive order, as the plates reach practically the position indicated by the plate occupying the right-hand upper corner of the drawings in Fig. 2.

It will be seen that the bottles are inserted into the plates successively above the waterline in the tank; but as the plates revolve over the adjacent sprocket-wheels or over and about the shaft of said wheels the bottles are carried gradually into an angular position as they enter the fluid and are gradually inverted into upright position within the fluid, the air being thus readily expelled from the bottles and the bottles being filled with the solution in the tank. In this upright position the air being expelled from the bottles and the bottles being filled with the solution they are carried in upright position through the solution in the tank to the discharge end of the apparatus. (Indicated at the left hand in Fig. 2.) The bottles are indicated by the numeral 7. At the discharge end of the tank we locate an ejecting device 8. This ejecting device is shown in the form of an eccentric or cam plate provided with a series of ribs 9, by which it is supported upon the shaft *f* of the adjacent sprocket-wheels. This eccentric or cam plate may be adjusted into desired position in any suitable manner, as by means of a bar 10, which may be adjustably engaged with the wall of the tank. The cam is of such form that as the bottle-carrier plates rotate thereabout the necks of the bottles when in partially-inverted position will contact with the cam and be forced gradually from the grip of the arms 4, so that the head of the bottle shall be released from the arms and forced upward above the extremities of the arms. In this position the bottles, although not discharged from the openings 3 of the carrier-plates, will be practically released from the spring-arms 4, so that the said arms will have no tension upon the bottles, permitting the bottles to be readily removed from the plates.

It will be observed that as the plates ride upward on the arc of a circle, with the sprocket-chains over the adjacent sprocket-wheels at the discharge end of the apparatus, the bottles will be gradually inverted bottom end uppermost, whereby the solution within the bottles will be entirely discharged therefrom, leaving the bottles empty as well as released from the spring-arms 4.

The boxes of one of the shafts of the sprocket-wheels may be made adjustable in any suitable manner, so that the sprocket-chains are readily disengaged from and engaged with the sprocket-wheels and whereby any desired tension may be given to the sprocket-chains. The bottle-carrier plates 1, being connected at the four corners thereof with the sprocket-chains, will be held in rigid connection with the chains, so as to be carried through the solution in an inverted position relative to that occupied by said plates when moving above the solution.

As shown more specifically in Fig. 3, corresponding links of the sprocket-chain may be formed with an attaching lug or shoulder 12, with which the corresponding arms 2 are connected, as by screws 13, permitting the rigid engagement of the plates with the chains and the removing of the plates therefrom, if necessary.

In Figs. 2 and 7 we have shown a scraper-blade (indicated at 14) secured to the sprocket-chains, as by arms 15, whereby any refuse matter within the tank may be forced to one end of the tank to be removed therefrom. The solution may be heated in any suitable manner, as by means of an inlet steam-pipe, (indicated at 16.) It will be perceived that the operator is not required to place his hands in the solution in the tank at all, so that the solution may be of greater strength and may be more highly heated than would otherwise be the case, permitting more effective work to be done. We do not limit ourselves to any definite number of the bottle-carrier plates, but ordinarily they may be of sufficient number so that two operators may be employed, the one to insert the bottles to be soaked and cleaned in the plates at one end of the tank, another operator being stationed

at the opposite end of the tank to remove the bottles when they have been emptied and ejected from the grip of the spring-retaining arms 4. However, we do not limit ourselves to any particular position in which an operator may be stationed. An operator might be stationed, for example, intermediate the ends of the tank to insert the bottles into the plates. Where two operators are employed at the two extremities of the apparatus, it will be perceived that the plates will travel from the discharge end back to the receiving end empty in the customary use of the apparatus; but while traveling from the receiving end to the discharge end the plates would ordinarily all be filled with bottles being slowly carried through the solution in the tank.

It will be perceived that the retaining-arms 4 of the bottle-carrier plates all project toward a horizontal plane or center intermediate the upper and lower portions of the traveling chains, whereby the mouths of the bottles are constantly held toward said horizontal center.

What we claim as our invention is—

1. In a bottle-cleansing apparatus, the combination of a receptacle, endless horizontally-traveling carrier-chains, means to give a traveling movement to said chains, and bottle-holding plates rigidly attached to said chains, said plates each provided with bottle-receiving openings and adjacent retaining clamping devices projecting toward a horizontal center intermediate the upper and lower portions of the traveling chains to hold the mouth of a bottle constantly toward said horizontal center, substantially as set forth.

2. In a bottle-cleansing apparatus, the combination of a receptacle, endless horizontally-traveling carrier-chains, means to give a traveling movement to said chains, bottle-holding plates rigidly attached to said chains, said plates each provided with bottle-receiving openings and adjacent retaining clamping devices projecting toward a horizontal center intermediate the upper and lower portions of the traveling chains to hold the mouth of a bottle constantly toward said horizontal center, and means to loosen the bottles from the retaining devices, substantially as set forth.

3. In a bottle-cleansing apparatus, the combination of the receptacle, the wheels, the chains passing over said wheels, bottle-holding devices attached to said chains, and an eccentric or cam to release the bottles from the retaining devices, substantially as set forth.

4. In a bottle-cleansing apparatus, the combination of a receptacle, horizontally-traveling carrier-chains, means to give a traveling movement to said chains, and bottle-holding plates rigidly attached to said chains, said plates constructed arc-shaped in cross-section, and each with bottle-receiving openings and adjacent retaining clamping devices projecting toward a horizontal center intermediate the upper and lower portions of the traveling chains, for the purpose described.

5. In a bottle-cleansing apparatus, a bottle-holding plate arc-shaped in cross-section and provided with a series of bottle-receiving openings, and adjacent retaining clamping-arms projecting toward the center of the arc, substantially as described.

6. In a bottle-cleansing apparatus, the combination of the receptacle, the wheels, the chains passing over said wheels, means attached to said chains to carry the bottles, and a scraper attached to said chains, for the purpose described.

In testimony whereof we sign this specification in the presence of two witnesses.

BERNHARD FISCHER.
RICHARD H. BOROWSKI.
THEODORE P. GOEBEL.

Witnesses:
HARRY JOSLING,
N. S. WRIGHT.