(No Model.)

A. L. BERNARDIN.

BOTTLE WASHING APPARATUS.

No. 332,582. Patented Dec. 15, 1885.

Fig. 1.

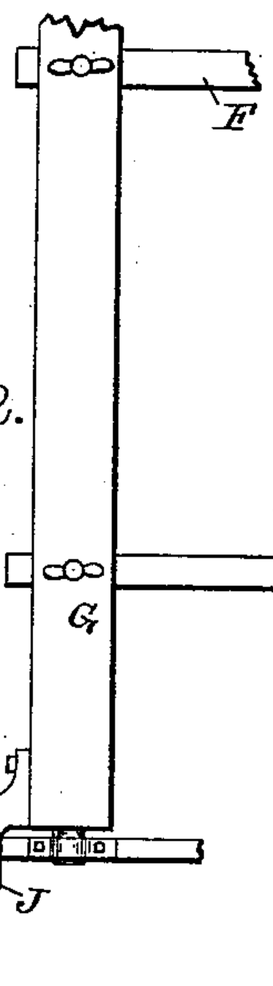


Fig. 2.

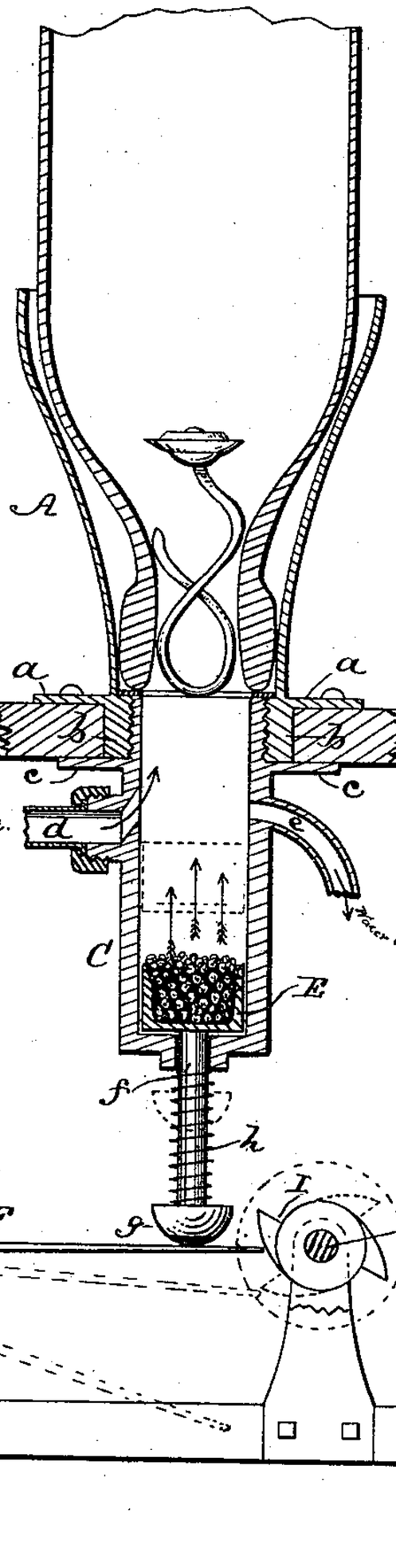


Fig. 3.

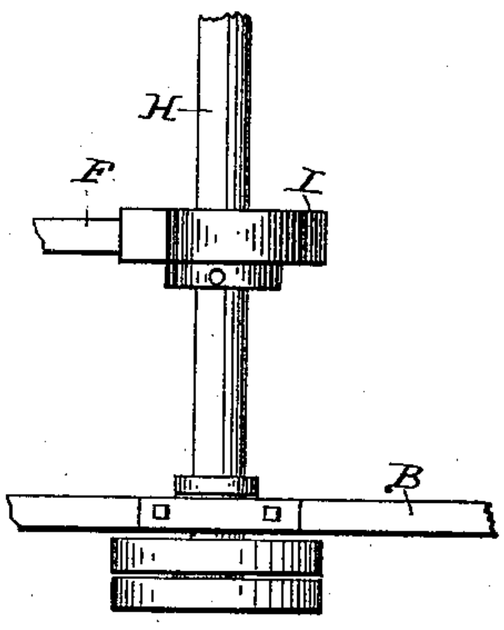
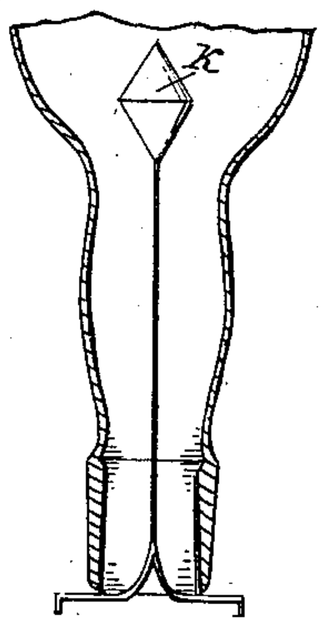


Fig. 4.



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ALFRED L. BERNARDIN, OF EVANSVILLE, INDIANA.

BOTTLE-WASHING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 332,582, dated December 15, 1885.

Application filed February 18, 1885. Serial No. 156,275. (No model.)

To all whom it may concern:

Be it known that I, ALFRED L. BERNARDIN, a citizen of the United States, and a resident of Evansville, in the county of Vanderburg and State of Indiana, have invented certain new and useful Improvements in Bottle-Washing Apparatus, of which the following is a description.

My invention has for its object to provide an improved apparatus for cleansing the interior of bottles.

The leading feature of the invention is the projection of shot upward into the bottles, held inverted, simultaneously with the discharge of water into the same. The shot is projected by plungers that work in vertical cylinders, or guides, and are forced upward by spring-hammers arranged horizontally and actuated intermittently by suitable mechanism. The latter consists, preferably, of a series of cams fixed on a rotating shaft, and arranged to engage with and depress the free ends of the spring-hammers at every rotation.

The invention embodies details of construction and combination of parts, as hereinafter described and claimed.

In accompanying drawings, Figure 1 is partly a sectional and partly an end view of my apparatus. Fig. 2 is a detail horizontal section, and Fig. 3 is a detail plan view. Fig. 4 represents the application of a device for spreading the shot.

The letter A indicates one of a series of metal sockets or holders for the bottles to be cleaned. These holders are approximately bell or funnel shaped, the larger end being uppermost, and are set vertical on a table, B, each over an opening in the latter. The base or lower end of the holders A is provided with a horizontal flange, *a*, that rests on the table and serves to support the former, and also with a boss or extension, *b*, that fits in said opening and is screw-threaded internally, to adapt it for connection with the shot-plunger cylinder C, whose upper end is correspondingly screw-threaded exteriorly. A horizontal flange, *c*, is formed on the cylinder C, and when the latter is screwed into the bottle-holder A such flange is pressed against the under surface of the table B, around the edge of the opening therein. Thus both bottle-holder and plunger-cylinder are removably yet firmly secured to the table. Water inlet and outlet tubes *d e* are attached to the cylinder near its upper end, and on the lower side of the inlet-opening is formed a lip or upwardly-projecting flange that gives direction to the water-current. The latter is produced by any suitable water-impelling device, or by connecting with the inlet a pipe leading to a water-reservoir having sufficient "head" for the purpose. The plunger E works freely in the cylinder C, and is cup-shaped on its upper side, to adapt it to hold all or a portion of the quantity of shot required to be projected into the bottle at each reciprocation. The plunger has a stem, *f*, that projects through the bottom of cylinder C, and has a conical nut or head, *g*, secured on its lower end. The stem *f* is encircled by a spiral spring, *h*, which aids gravity in bringing the plunger E downward after each upward movement.

My preferred means for driving the plungers E upward are springs or spring-hammers F, which are secured in a bar, G, and arranged horizontally, so that the free end of each is directly beneath and normally in contact with or adjacent to the head *g* of a plunger. Parallel to and directly in front of the free ends of the springs F is a rotary shaft, H, on which are fixed a number of cams, I, one opposite each spring. The cams may be single or double, as required, but in this instance they are double, so that each spring F will be depressed and released twice in each revolution of the shaft H. I arrange the cams in such order that they will act successively instead of simultaneously on the springs F. The bar G is adapted to rotate in its bearings, and provided at one end with a rigid arm, J, for shifting it around its axis, in order to throw the springs F downward out of range of contact with cams I, as shown in dotted lines, Fig. 1. This arm J is locked to a rigid portion, *i*, of the frame B in either of the two positions required (for action or non-action of the apparatus) by a pin or suitable catch, *j*. In case the bottles should be provided with a stopper of the kind illustrated in Fig. 1, it will cause the shot to diverge or spread in their upward flight; but for bottles having no such stopper I propose to use a "spreader," K, as shown

in Fig. 4. It is conical in form on both upper and under side, so as to cause divergence of the shot both in passing upward and downward. It is attached to a stem or rod whose lower end is adapted for attachment at the junction of holder and cylinder C. Instead of the plunger working inside of the cylinder C, I may make it hollow and arrange it exteriorly so as to fit over the cylinder.

A gasket of rubber is in practice applied on the upper end of the cylinder C, which forms a support or shoulder for the bottle-nozzle.

The operation of the apparatus is as follows: The bottles it is desired to clean being placed in the holders A, as shown in Fig. 1, the shaft H is set in rotation, and its cams I successively engage with and bear down the free ends of the spring-hammers F, which, on being released, deliver a smart and sudden blow upon the heads *g* of the plungers E, and drive the latter upward with such force and rapidity that, when arrested by the spiral springs *h*, the shot held in their cavities is projected into the bottles and against the bottoms thereof. So soon as the blow of the spring-hammer has been given, the latter resume their normal horizontal position, the shot also fall back into the plunger-cups, and the plungers themselves drop back to the bottom of the cylinders C, all in readiness to repeat the operation. Simultaneously with these movements water is being constantly forced up into and discharged from the bottle, as indicated by arrows.

What I claim is—

1. In a bottle-washing apparatus, the combination, with a bottle-holder and a cylinder or plunger-guide placed below the latter, of a reciprocating plunger containing a quantity of shot and having a projecting stem, substantially as shown and described, to operate as specified.

2. In a bottle-washing apparatus, the combination, with a bottle-holder, of a reciprocating plunger, a quantity of shot, and a device, substantially as described, for forcing the plunger upward, substantially as specified.

3. In a bottle-washing apparatus, the combination of a spring-hammer and tripping-cam with reciprocating plunger, the guide-cylinder, and a bottle holder or support, substantially as specified.

4. In a bottle-washing apparatus, the combination of the funnel-shaped inverted bottle-holder, the cylinder pendent beneath it, the shot-forcing plunger having a stem, *f*, having head *g*, a spiral spring encircling said stem, a spring-hammer arranged horizontally, and a tripping-cam, substantially as specified.

5. In a bottle-washing apparatus, the cylinder having the water-inlet with upwardly-projecting flange or lip and a water-outlet and the shot-forcing plunger working in said cylinder, all arranged as shown and described.

6. In a bottle-washing apparatus, the combination of the plunger, made recessed or cup-shaped, the cylinder for guiding the same, and a bottle-holder, as shown and described.

7. In a bottle-washing apparatus, the combination of the spring-hammers with the cam-shaft, a rotatable bar for holding the hammers, and a device, substantially as described, for locking it in different positions, substantially as specified.

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