

**No. 712,679.**

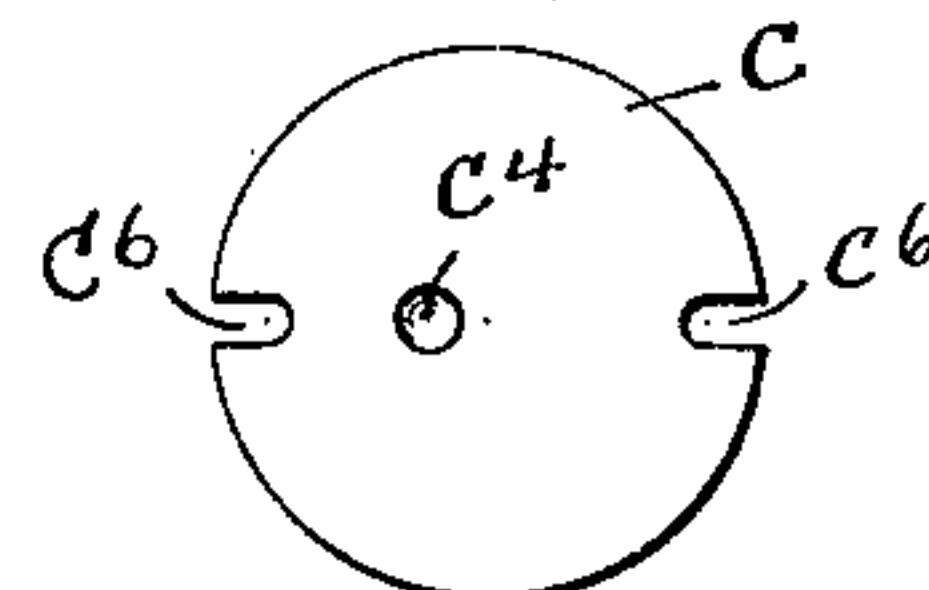
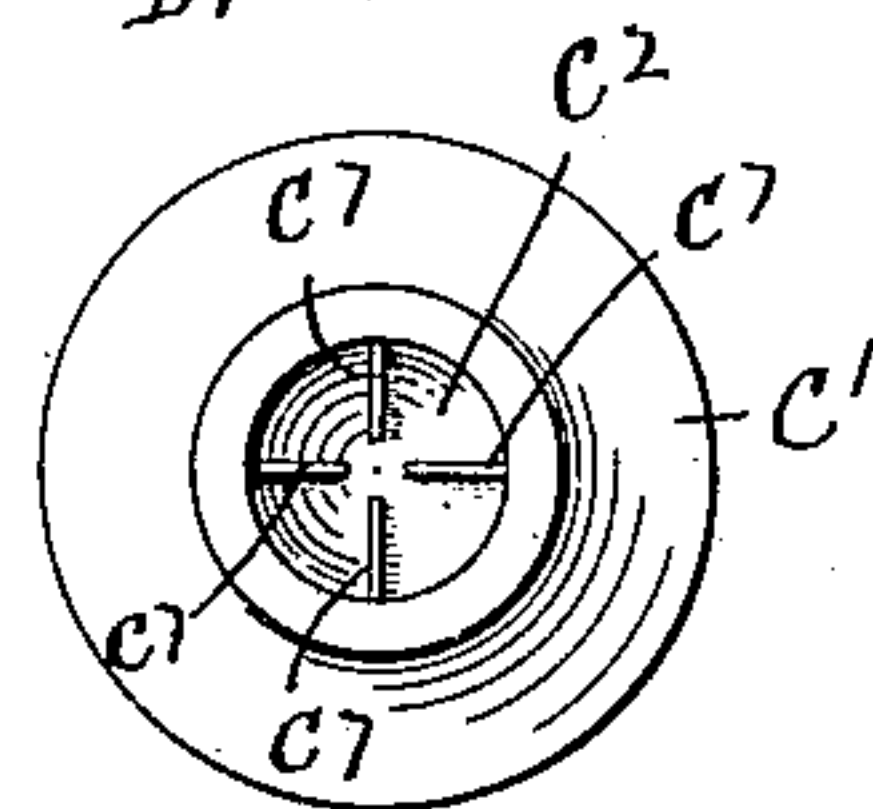
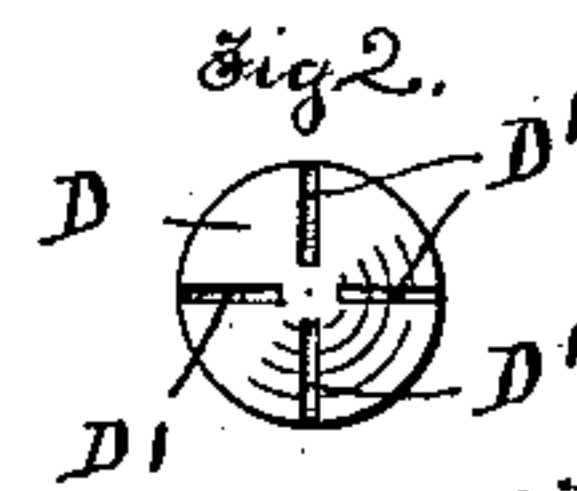
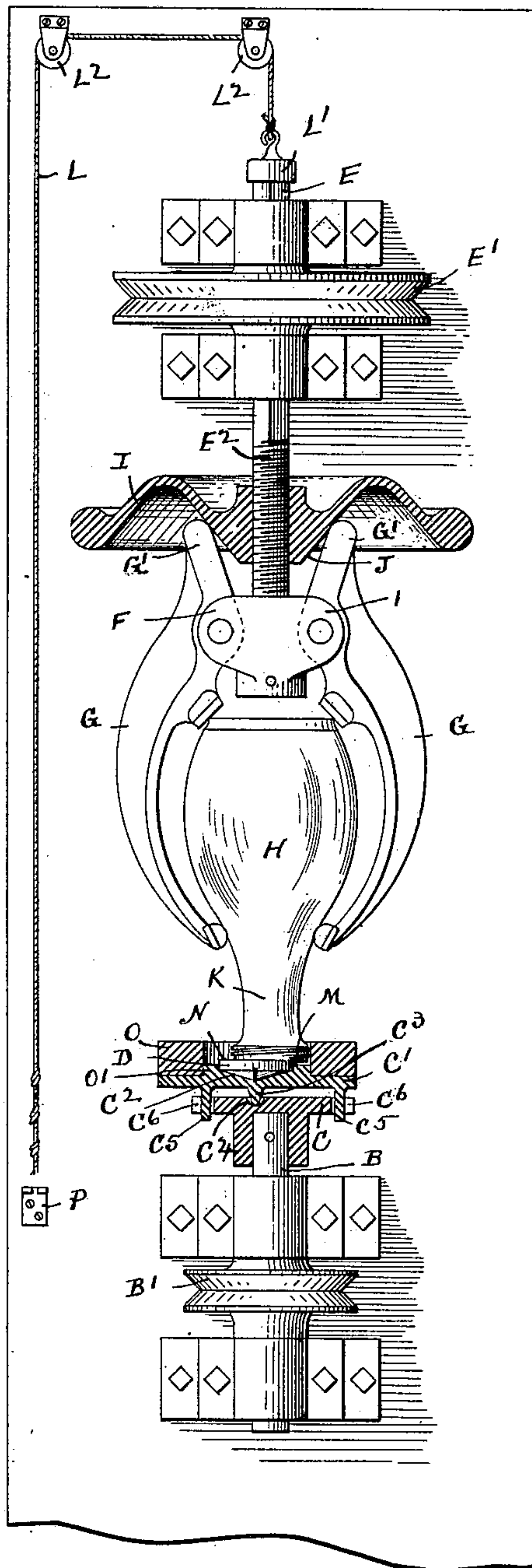
Patented Nov. 4, 1902.

E. G. HOWE.

## APPARATUS FOR GRINDING BOTTLES AND THEIR CAPS.

Application filed Mar. 25, 1901.)

(No Model.)



Witnesses:

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# UNITED STATES PATENT OFFICE.

ELBRIDGE G. HOWE, OF MILLBURY, MASSACHUSETTS.

## APPARATUS FOR GRINDING BOTTLES AND THEIR CAPS.

SPECIFICATION forming part of Letters Patent No. 712,679, dated November 4, 1902.

Application filed March 25, 1901. Serial No. 52,666. (No model.)

*To all whom it may concern:*

Be it known that I, ELBRIDGE G. HOWE, a citizen of the United States, residing at Millbury, in the county of Worcester and Commonwealth of Massachusetts, have invented a new and useful Improvement in Apparatus for Grinding Bottles and Their Caps, of which the following is a specification, accompanied by drawings forming a part of the same, in which—

Figure 1 represents a front view, partly in section, of my improved apparatus. Fig. 2 is a top view of a cap. Fig. 3 is a top view of the seat upon which the cap is held during the process of grinding, and Fig. 4 is a top view of the revolving disk by which the cap is rotated.

Similar reference-letters refer to similar parts in the different views.

My present apparatus is designed to grind a plain surface on the mouths of bottles and a similar plain surface on the contacting rim or under side of a glass cap adapted to close the mouth of the bottle, said ground surfaces enabling an air-tight contact to be maintained, so that the contents of the bottle may be preserved in a vacuum by pumping the air therefrom before closing; and my invention consists in an apparatus, as hereinafter described, whereby the contacting surfaces of the bottle and cap are simultaneously ground by the attrition of any suitable grinding material placed between them—such, for example, as flour of emery. My improved grinding apparatus by which this result is accomplished is provided with means for holding the cap in a rocking and rotating seat and supporting the bottle in an inverted position above said cap in a rotating frame or clamping apparatus, with the contacting surfaces of the bottle and cap brought into such close proximity that the rotary motion of the bottle and cap will cause their opposing surfaces to be simultaneously ground away by the application of suitable grinding material, such as flour of emery, which is preferably moistened with some slightly-adhesive material, such as molasses or glycerin. The grinding material may conveniently be put within the mouth or neck of the bottle, so that it will automatically feed itself to the surfaces being ground. In order to grind the surfaces in a true plane

and prevent the formation of concentric ridges or grooves, I place the axis of the cap out of alinement with or slightly concentric to the axis of rotation of the bottle, so as to secure a slight traversing motion of the ground surfaces upon each other.

Referring to the accompanying drawings, A denotes the post or framework upon which the rotating parts of the apparatus are mounted. B is a rotating spindle arranged to be driven by a belt-pulley B' and a belt connection with a counter-shaft and carrying upon its upper end a disk C, upon which is mounted a cradle C', having a depression C<sup>2</sup>, forming a seat for the glass cap D. The cradle C' is provided on its under side with a spur C<sup>3</sup>, concentric with the seat C<sup>2</sup>. The cradle C' is supported upon the spur C<sup>3</sup>, which rests in a depression C<sup>4</sup>, formed in the upper surface of the disk C. Depending arms C<sup>5</sup> on the cradle C' enter slots C<sup>6</sup> in the disk C, causing the rotation of the disk to be imparted to the cradle, which is capable of a slight rocking motion upon the projection C<sup>3</sup>. The seat C<sup>2</sup> is provided with radial ribs C<sup>7</sup>, adapted to enter radial grooves D' in the cap D and cause the rotation of the disk and cradle to be imparted to the cap. Rotating in bearings attached to the frame A is a spindle E, driven by a belt-pulley E', preferably larger than the pulley B' and having a spline connection with the spindle E, permitting a sliding motion of the spindle E, while the pulley E' is held from longitudinal movement between the journal-bearings of the spindle. Attached to the lower end of the spindle E are lugs F, to which are pivoted the clamping-levers G, adapted to embrace and hold the bottle H. The spindle E is screw-threaded at E<sup>2</sup> and carries a weighted nut I, having a conical or beveled surface J, which entering between the short arms G' of the levers G separates them, causing the bottle to be securely clamped between the levers G. Flour of emery or other grinding material is placed within the neck K of the bottle, which is then placed in an inverted position between the levers G and securely clamped, the spindle E being raised for that purpose by means of a cord L, attached to the upper end of the spindle by a swivel connection L' and passing over pulleys L<sup>2</sup>. When the bottle has been clamped between the le-



vers G and the cap D placed in position, the bottle is lowered until the surface M of the bottle which is to be ground is brought into contact with the surface N of the cap, when  
 5 rotary motion is imparted to the bottle and cap, the bottle rotating about the axis of the spindle E and the cap D rotating about the axis of the spindle B, but at different rates of speed, and as the cap D is placed eccentrically to the axis of the spindle B a slight  
 10 traversing motion will be given to the contacting surfaces of the bottle and cap. Resting upon the cradle C' is an annular wooden block O, held concentric therewith by a central boss O' on the cradle for the purpose of  
 15 inclosing a space around the cap D and mouth of the bottle to prevent the grinding material from working off the edge of the cradle.

The operation of my grinding apparatus is  
 20 as follows: The spindle E is raised by the cord L, which may be fastened to a bracket P on the framework A. The bottle is inserted between the levers G, which are then clamped against the bottle by lowering the  
 25 weighted nut I on the screw-threaded section E<sup>2</sup> of the spindle E. The cap D is placed in an inverted position in the seat C<sup>2</sup> of the cradle C'. A quantity of grinding material is placed within the neck K of the bottle and  
 30 the bottle is lowered into slight contact with the cap D and a rotary motion is imparted to the spindles B and E at different rates of speed, the cord L being held in the hand of the operator in order to counterbalance that  
 35 part of the apparatus supported upon the revolving spindle E in order to prevent too great a pressure between the contacting surfaces of the bottle and cap. As the surfaces of the cap and bottle are brought together  
 40 the rocking motion of the cradle C' enables the cap to accommodate itself to any irregularities upon the contacting surfaces and to maintain during the process of grinding a bearing-surface against the mouth of the bottle. In case the ground surface upon the  
 45 mouth of the bottle should stand at a slight inclination to the axis of rotation, the cradle C' will rock at each revolution and hold the contacting surface of the cap against the opposing surface of the bottle. The maximum  
 50 amount of pressure required between the sur-

faces of the bottle and cap is secured by the weighted nut I, and this pressure is regulated by the operator by means of the cord L.

What I claim as my invention, and desire  
 55 to secure by Letters Patent, is—

1. In a grinding apparatus, the combination of means for holding and rotating a bottle about its axis, means for holding and rotating a cap therefor and in contact with the  
 60 mouth of the bottle, whereby their opposing surfaces are simultaneously subjected to the operation of grinding and means for traversing the ground surfaces in a plane at right angles to their axis of rotation, substantially  
 65 as described.

2. In a grinding apparatus, the combination of means for holding a bottle in an inverted position, means for rotating the same  
 70 about its axis, a seat for holding the cap in an inverted position, means for rotating the cap, means for traversing the contacting surfaces of the cap and bottle during the process of grinding, means for traversing said cap in a plane at right angles to its axis of rotation  
 75 and an abrading material held within the neck of said bottle, substantially as described.

3. The combination of a frame, a rotating spindle journaled in said frame, clamping-levers carried by said spindle by which a bottle  
 80 is held, means for raising and lowering said spindle, a second rotating spindle, a seat carried by said second spindle adapted to receive and rotate a cap held in said seat eccentrically to its axis of rotation, substantially  
 85 as described.

4. In a grinding apparatus, the combination of means for holding and rotating a bottle, a holder for a cap capable of allowing the  
 90 cap to rock as it rotates and means for rotating said holder, substantially as described.

5. The combination with means for holding and rotating a bottle, of a spindle, a disk supported on the end of said spindle and a seat for a cap held on said disk and capable of a  
 95 rocking motion thereon, substantially as described.

Dated this 14th day of March, 1901.

ELBRIDGE G. HOWE.

Witnesses:

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 FLORENCE C. COOK.