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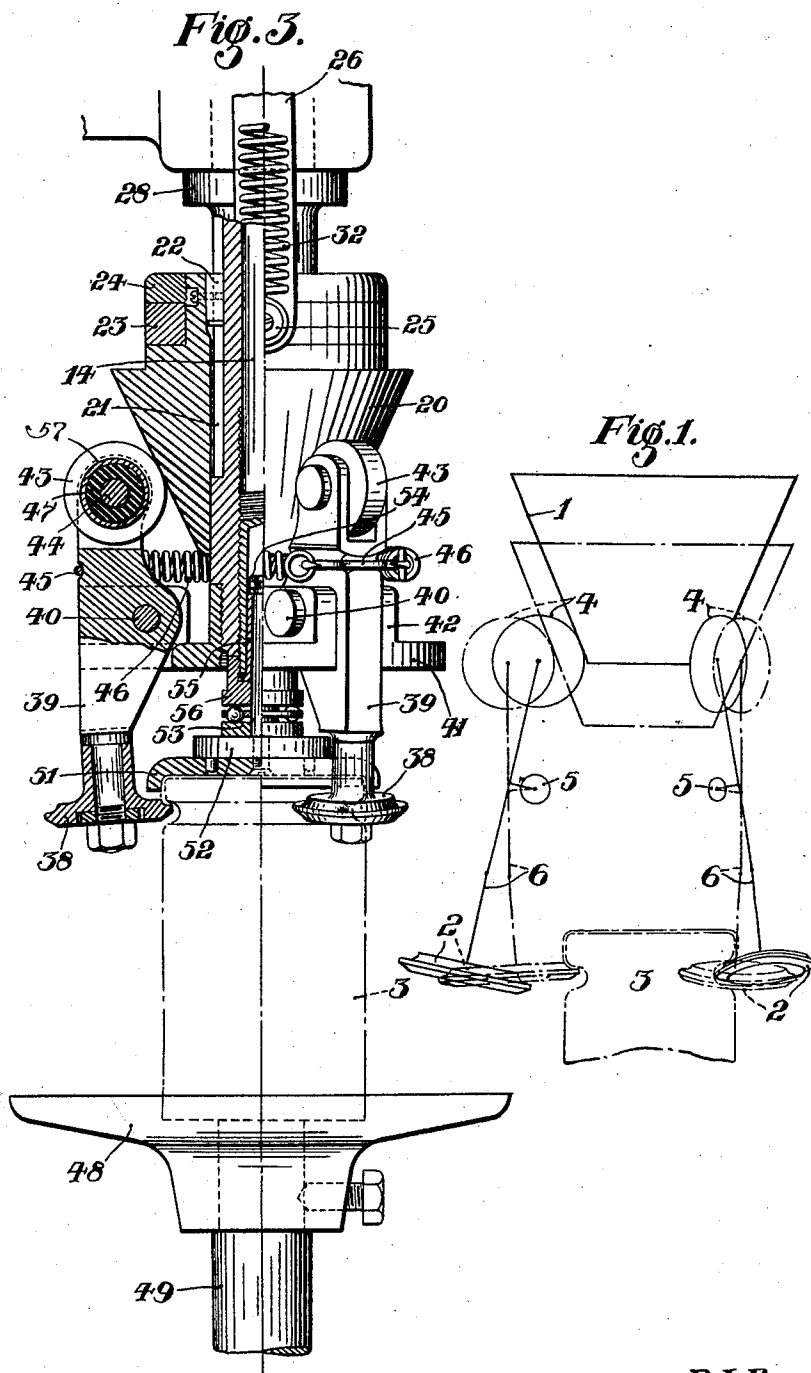
P. J. BOUCHER

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MACHINE FOR CAPPING BOTTLES OR THE LIKE

Filed May 28, 1921

2 Sheets-Sheet 1



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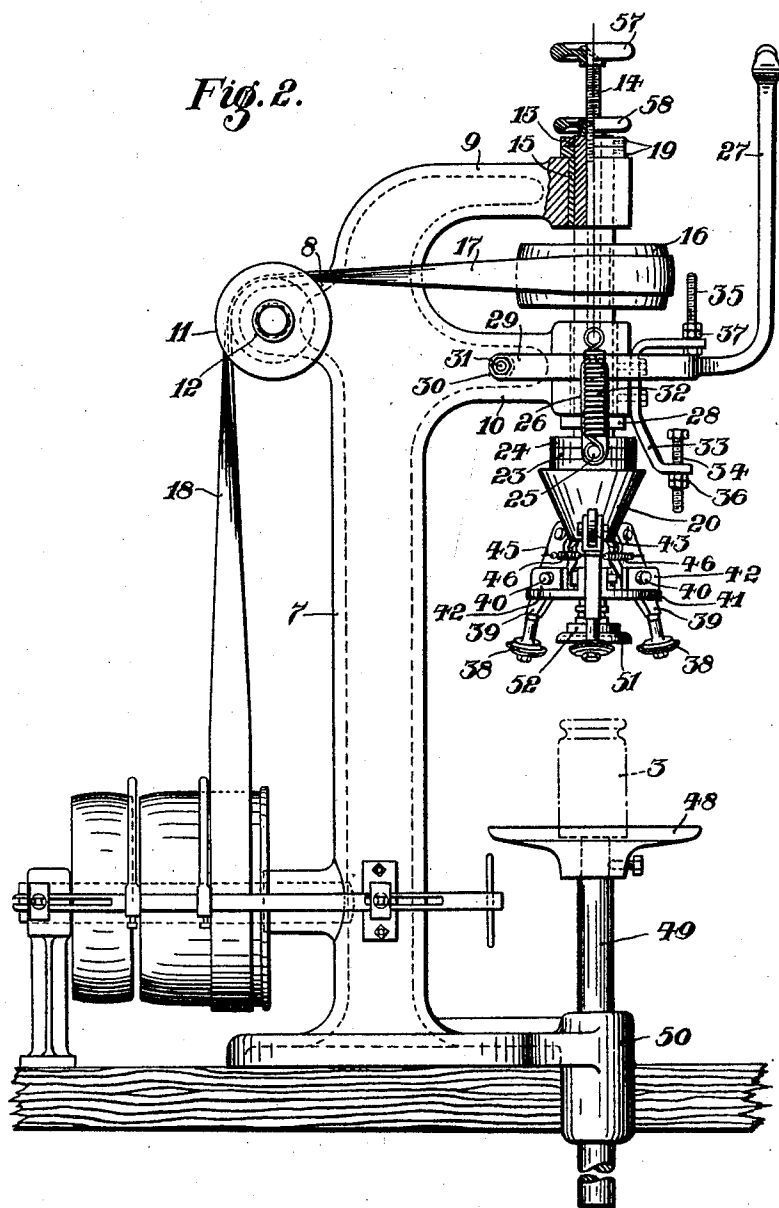
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

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MACHINE FOR CAPPING BOTTLES OR THE LIKE.

Application filed May 28, 1921. Serial No. 473,543.

To all whom it may concern:

Be it known that I, PIERRE JOSÉ BOUCHER, a subject of the King of Great Britain, residing at Kensington, London, England, have
5 invented certain new and useful Improvements in or Relating to Machines for Capping Bottles or the like, of which the following is a specification.

This invention relates to improvements in
10 or relating to machines for stoppering, capping, or sealing bottles, jars, or other receptacles, and has for its object to provide a simple construction which will effect a more intimate spinning of the cap member with
15 regard to an annular ridge formed at the mouth of the container than has been obtained heretofore.

Earlier constructions have comprised a rotatable chuck member carrying vertically
20 depending arms on which are mounted the spinning wheels. The container with the cap was placed in a holder and the spinning wheels were then advanced by lateral movement towards the cap, whilst rotating at a
25 fairly high speed. This operation forms an inturned flange on the underneath edge of the cap, which is turned under the annular ridge formed on the mouth of the body and grips thereunder, so that it is retained in
30 position.

Although it has been proposed to use a conical member as a spinning wheel, and a certain amount of flexibility has been provided for the vertical arm carrying the
35 spinning wheel, so that it may depend out of the vertical in order to deal with the irregularities in the formation of the container, yet with such constructions it is not possible to provide substantially a right angle
40 flange to the lower edge of the cap that is in intimate contact therewith.

The present invention consists in providing, in a machine of the type referred to, means for carrying the spinning wheels,
45 comprising a series of pivoted levers carrying the spinning wheels at one end, while the other ends are associated with means for simultaneously operating them, so as to obtain an arcuate movement of the wheels directed
50 upwardly towards the chuck, in order to lift and press the vessel and closure thereagainst during the spinning operation.

Generally speaking, in constructions embodying my invention I provide a plurality
55 of pivoted levers, each of which carries a spinning wheel, which is adapted to be

brought into contact with the mouth of the vessel for the spinning operation, the other ends of the pivoted levers being in contact with a conical member, the arrangement being such that the advancing of the spinning
60 wheels to the mouth of the container is effected by relative movement between the conical member and the associated extremities of the aforesaid levers.

In one construction according to my invention, the mechanism for imparting a radial motion to the spinning wheels is obtained by pivoting upon a plate, levers
65 carrying the wheels at one end, so as to bring the other end of the pivoted levers into engagement with a cone, (preferably spring-controlled), supported centrally on the machine in line with the axis of the
70 bottle, or other receptacle upon which the cap or the like is to be impressed. By forcing the cone axially into contact with the end of the pivoted levers, which preferably will comprise rollers, the diameter at which
75 the spinning wheels will work when the cap is on the top of the bottle or the like, may be varied. Alternatively, the pivoted levers may be moved axially towards a stationary
80 cone to achieve the same end.

In order to provide means for enabling
85 the spinning wheels to deal with inequalities on the surface of the bottle or other receptacle, bearings for the contact rollers are provided in which are inserted flexible sleeves. Preferably such sleeve will be surrounded by a metal sleeve 57 which will take
90 the wear occasioned by the rotation of the associated contact rollers; the contact roller would thus give somewhat, although maintaining its rotation, if a distorted neck on
95 the bottle were encountered, the pressure exerted at the other end of the lever which carries the spinning wheel remaining substantially unchanged.

Preferably the flexible sleeve will be made
100 of india rubber.

Preferably the pivoted levers are spring-controlled, and an adjustment stop may be provided on the lever operating gear to prevent the mechanism returning the full
105 stroke, thus only the necessary distance is returned to release the bottle or other receptacle for which the machine is set.

In the preferred form I fix the plate member, carrying the levers, against axial displacement and arrange the cone so that it
110 can be moved along its longitudinal axis.

In order that my invention may be more clearly understood I will now describe its preferred embodiment with reference to the accompanying drawings, in which—

5 Fig. 1 illustrates diagrammatically the movement of the spinning wheels;

Fig. 2 is a side elevation of a machine embodying the present invention in its preferred form, that is, with a displaceable cone member; and

10 Fig. 3 shows to an enlarged view, partly in section, the relative arrangement and positions of the spinning device illustrated in Fig. 2, the view being taken from a position where the true shape of one of the levers carrying the spinning wheels can be seen.

Referring first to Fig. 1, the initial positions of the cone and of the levers carrying the spinning wheels are shown by the reference numerals 1 and 2 respectively, the container, to which the cap is to be fixed, being indicated by the numeral 3. In this position it will be noted the lever arms are inclined to the vertical axis passing through the cone and the container. On the displacement of the cone to the position shown in dot and dash lines, the rollers, indicated by the numerals 4, will be pushed out by the incline presented by its outer face, so that the levers move about their respective pivots, indicated by the numerals 5. This movement of the levers, which is indicated by the numeral 6, imparts an arcuate movement to the spinning wheels, which movement, it will be noticed, has an upward direction and thereby, during the spinning operation, tends to lift the container 3 up against the work holder, so that on the top of the container the cap is maintained in pressed relation, while the spinning operation effects a close contact of the cap to the underside of the shoulder of the mouth of the container.

The dot and dash position of the spinning wheels 2 clearly indicates the ability of the wheels to advance actually into the recess formed below the said shoulder.

Referring now to Figs. 2 and 3, the machine comprises a standard member 7 provided with projecting arms 8, 9 and 10. The arm 8 is designed to carry pulleys 11, which are suitably mounted in bearings 12 formed thereon. The arms 9 and 10 are coaxially bored to receive a hollow spindle 13 in which is disposed a shaft 14 extending throughout its length. The bearings in the arms 9 and 10 are suitably formed with bushings such as 15 to permit rotation of the aforesaid hollow spindle 13. Between the arms a spinning pulley 16 is fixed for rotation on and with the aforesaid hollow spindle 13, motion being imparted thereto by means of a belt drive 17, 18 over the aforesaid pulleys 11, which is controlled in the usual well known way by means of a belt shifter and

guards as illustrated at the left hand bottom portion of the aforesaid Figure 2. To prevent axial displacement of the hollow spindle 13, lock nuts 19 are provided above the projection 9 of the standard of the machine, 70 which lock nuts act in conjunction with a collar 28 formed on the hollow spindle and abutting against the underside of the bearing on the projection 10. The cone member 20 is slidably connected to the hollow sleeve 75 for rotation therewith and also for relative axial displacement thereto. This construction is obtained by forming in the wall of the hollow spindle, a longitudinal slot 21, which is clearly shown in Fig. 3, and the cone member is provided near its top with a removable feather 22 for sliding in aforesaid slot.

In order that the cone may be axially displaced while it is rotating, it is provided at the top with a loose ring 23 which is retained in position by a superimposed keeper ring 24. The loose ring is formed with a pair of diametrically projecting arms 25, and pivotally mounted on each such arm is a link member 26, which in turn are each pivotally connected to one prong 29 of a fork handle 27. (Fig. 2), which itself is pivoted at 30 by a pin member passing through each extremity 31 of the fork of the handle 27 and also the projection 10, which the fork straddles.

The top or normal position of the cone member is maintained when the machine is not in use by a spring 32 which connects the bearing on the projection 10 to the aforesaid loose ring 23. Limited movements of the handle 27 may be predetermined in accordance with the sizes of the various containers being fitted with covers, by providing on the bearing 10 a bracket 33 which carries adjustable stop members 34 and 35, each position of which is assured by locking nuts indicated at 36 and 37 respectively.

The spinning wheels 38 are carried on levers 39, all of which are pivoted at positions indicated by the numeral 40 on a plate member 41, which is coaxial with the work holder, and which is fixed for rotation with the hollow spindle 13, being in threaded engagement therewith and which is suitably provided with shoulders 42 carrying bearings for the pivot pins of the aforesaid levers. The spinning wheels are preferably detachably connected to the levers in order that different types of spinning wheels may be interchanged if necessary.

A simple form of construction for so mounting the spinning wheels on their respective levers is clearly indicated in Fig. 3.

The top extremities of the levers each carries a roller 43, which is carried in suitable bearings provided with an axle pin, indicated at 44. The rollers are maintained in contact with the cone member 20 by means

of a bracelet member comprising links 45 and interconnecting springs 46.

In order to take up the irregularities which may occur on the underside of the shoulder of the container being operated upon, the rollers 43 are mounted on resilient bushings 47, carried on the axle pins 44.

The container is indicated by the numeral 3 and is shown supported on a table 48, which is adjustable in height with regard to the standard 7, the table 48 being carried on a spindle 49 projecting through bearings 50 in the base of the machine frame.

The cap holder for the machine, indicated by the numeral 51, is connected in the well known way with a chuck 52. As shown clearly in Fig. 3, this chuck is provided with an axial spindle 53 fitted within the hollow extremity of the central shaft 14, within which its position is maintained by a collar and pin 54, engaging over a sleeve 55, which is clamped between the lower extremity of the shaft 14 and a gland member 56, which engages over the threaded extremity of the aforesaid shaft 14. Between the gland 56 and the rear face of the chuck 52, an anti-friction device is provided.

As the lips of bottles or containers vary in depth and diameter, it is necessary to make a vertical adjustment of the cap holder so that the spinning wheels may make correct contact at the point of closure. To obtain this adjustment the locking wheel 58 is loosened and a vertical movement of the central shaft 14 is given by rotating the adjustment wheel 57 which is keyed to the central shaft and which moves the cap holder up or down as required by reason of the fact that the central shaft 14 is at its lower end in threaded engagement with said hollow spindle 13.

In operation, the container is placed on the table 48 and the table is advanced to the cap holder 51 by means, not shown, as such forms no part of the present invention. The belt shifter is then pulled over in order to drive the hollow spindle 13 through the medium of the spinning pulley 16 and then the handle 27 is pulled down.

It will be seen, then, that while the spinning wheels are revolving they are given an arcuate upward movement towards the work holder, so that they tend to lift the container from the table and press the container into the work holder, while their own action is in an upward direction against the under edge of the shoulder of the mouth of the container, the combined action effecting the spinning of the cap onto the container, so that it is in intimate contact therewith.

I claim:

1. In a machine for stoppering, capping, or sealing bottles, means for spinning the closure on to the container, comprising in combination, a work holder, a superimposed

plate, coaxial with said work holder, a series of similar levers pivotally mounted on said plate, a spinning wheel mounted on the lower end of each lever, a roller mounted on the top end of each lever, a resilient bearing for each roller, a cone coaxially mounted with said plate for rotation therewith and slidable relatively thereto, resilient means for maintaining said rollers in contact with the surface of said cone, means for rotating said cone and plate, and means for sliding said cone during its rotation, consisting of a loose ring carried on said cone, diametrically opposite projections on said ring, a lever pivoted in a fixed part of the machine, and links connecting said lever to said ring.

2. A machine for stoppering, capping, or sealing bottles, having in combination, a hollow spindle, a shaft extending through said hollow spindle, a work holder carried by the lower end of said shaft, means for longitudinally adjusting said shaft within said hollow spindle, means for rotating said hollow spindle, a cone fixed for rotation on said spindle and slidable thereon, a plate fixed on said spindle below said cone and above said work holder, a series of similar levers pivoted on said plate, a spinning wheel mounted on the lower end of each lever, a roller on the top end of each lever, a resilient bearing for each roller, resilient means for maintaining said rollers in contact with said cone, means for sliding said cone on said spindle, comprising a loose ring carried by said cone, diametrically opposite projections on said ring, a lever pivoted on a fixed part of the machine, and links connecting said levers to said ring, and spring means connecting said loose ring to a fixed part of the machine to ensure return to normal position of said cone.

3. A machine for stoppering, capping, or sealing bottles, having in combination, a hollow spindle, a shaft extending through said hollow spindle, a work holder carried by the lower end of said shaft, means for longitudinally adjusting said shaft within said hollow spindle, means for rotating said hollow spindle, a cone fixed for rotation on said spindle, and slidable thereon, a plate fixed on said spindle below said cone and above said work holder, a series of similar levers pivoted on said plate, a spinning wheel mounted on the lower end of each lever, a roller on the top end of each lever, a resilient bearing for each roller, resilient means for maintaining said rollers in contact with said cone, means for sliding said cone on said spindle, comprising a loose ring carried by said cone, diametrically opposite projections on said ring, a lever pivoted on a fixed part of the machine, and links connecting said levers to said ring, spring means connecting said loose ring to a fixed part of the machine to ensure return to normal po-

sition of said cone, and means for limiting the movement of said lever, substantially as and for the purpose set forth.

4. A machine for stoppering, capping, or
5 sealing bottles, having in combination, a hollow spindle, a shaft extending through said hollow spindle and in threaded engagement therewith, a hollow extremity at the lower
10 end of said shaft, a work holder stem supported within said hollow extremity, a gland screwed to the lower end of said shaft, an anti-friction device between said gland and said work holder, means for rotating said
15 hollow spindle, a cone fixed for rotation on said spindle, and slidable thereon, a plate fixed on said spindle below said cone and above said work holder, a series of similar levers pivoted on said plate, a spinning
20 wheel mounted on the lower end of each lever, a roller on the top end of each lever, a resilient bearing for each roller, resilient means for maintaining said rollers in contact with said cone, means for sliding said cone on said spindle, comprising a loose ring

carried by said cone, diametrically opposite
25 projections on said ring, a lever pivoted on a fixed part of the machine, and links connecting said levers to said ring, spring means connecting said loose ring to a fixed part of
30 the machine to ensure return to normal position of said cone, and means for limiting the movement of said lever, substantially as and for the purpose set forth.

5. A machine for stoppering, capping, or
35 sealing bottles, comprising in combination, a work holder, a superimposed plate coaxial with said work holder, a cone slidably arranged above said plate and connected for rotation therewith, three levers pivotally
40 mounted on said plate, a detachable spinning wheel mounted on the lower end of each of said levers, a roller mounted on the top end of each of said levers, a resilient bearing for each roller, and a resilient bracelet encircling said levers above their pivoted axes,
45 all substantially as set forth.

In testimony whereof I affix my signature.

PIERRE JOSÉ BOUCHER.