G. W. BEADLE.

MACHINE FOR CRIMPING PAPER BOTTLE CAPS.

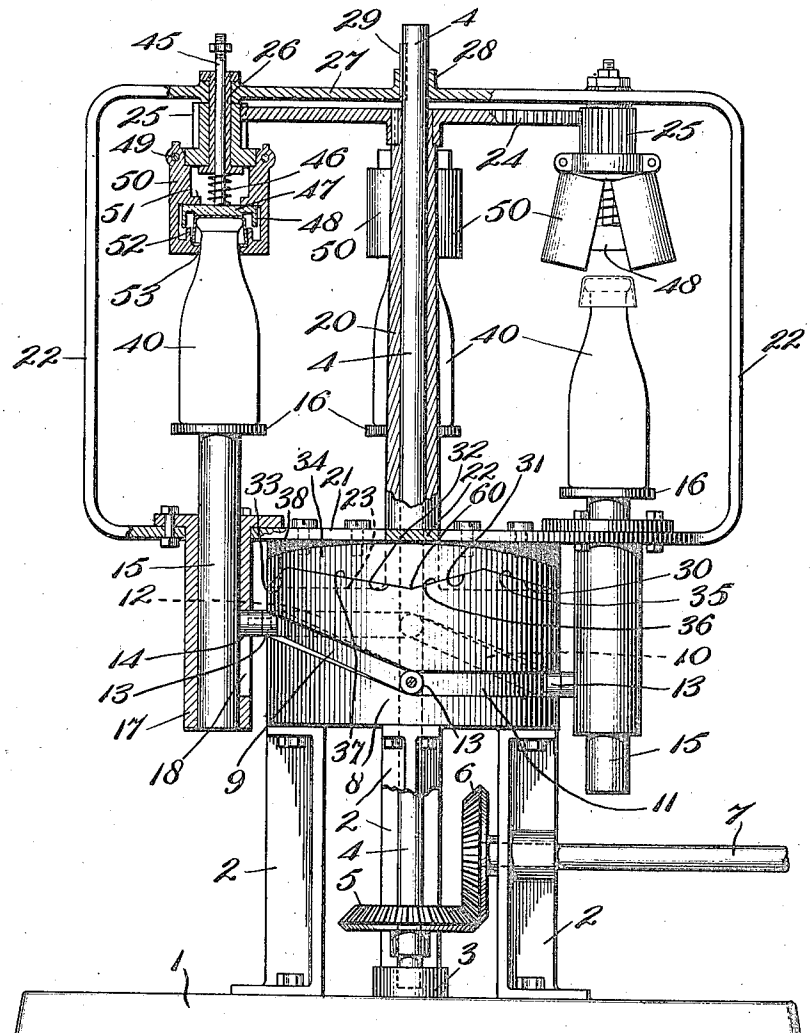
APPLICATION FILED APR. 8, 1915.

1,170,598.

Patented Feb. 8, 1916.

2 SHEETS—SHEET 1.

Fig. 1.



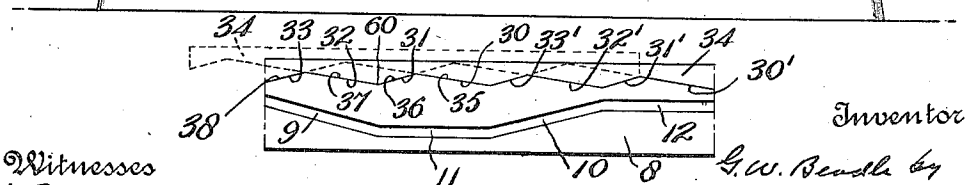


Fig. 5.

Witnesses

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2 SHEETS—SHEET 2.

Fig. 1.

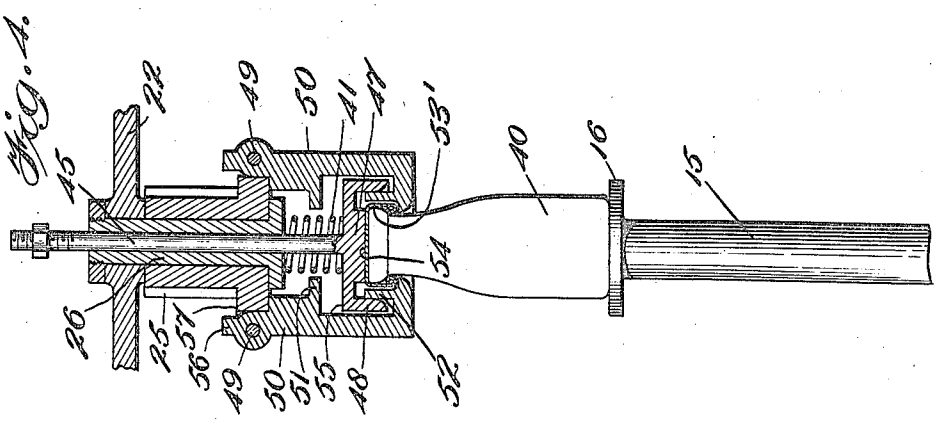


Fig. 3.

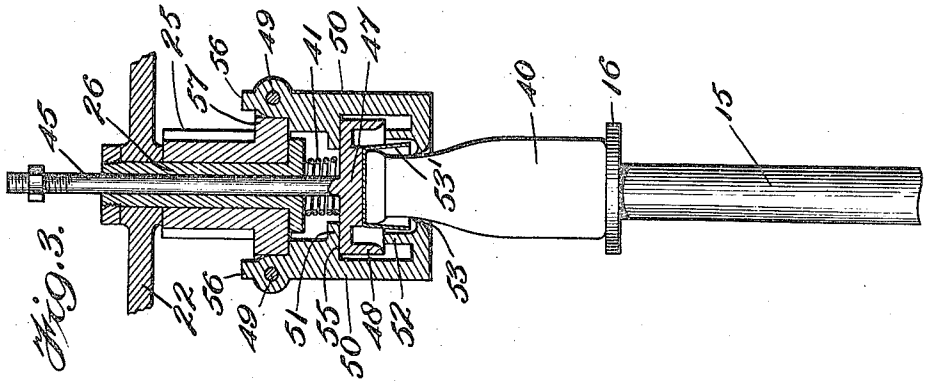
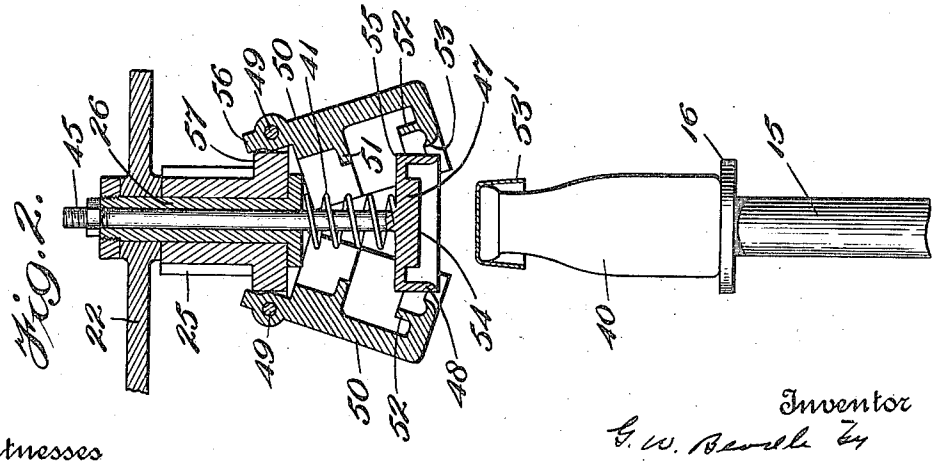


Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

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MACHINE FOR CRIMPING PAPER BOTTLE-CAPS.

1,170,598. Specification of Letters Patent. Patented Feb. 8, 1916.

Application filed April 8, 1915. Serial No. 20,089.

To all whom it may concern:

Be it known that I, GEORGE W. BEADLE, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Machines for Crimping Paper Bottle-Caps; and I do hereby 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.

This invention relates to machines for crimping paper bottle caps onto jars or bottles, and has for its object to provide an apparatus which will accomplish this result in a manner more efficiently and less expensively than has heretofore been proposed.

With these and other objects in view the invention consists in the novel details of construction and combinations of parts more fully hereinafter disclosed and particularly pointed out in the claims.

Referring to the accompanying drawings forming a part of this specification in which like numerals designate like parts in all the views—Figure 1 is an elevational view partly in section of an apparatus made in accordance with my invention; Fig. 2 shows in greater detail the first step in the operation of the machine shown in Fig. 1; Fig. 3 shows a second step in said operation; Fig. 4 illustrates a third step in said operation; and Fig. 5 is a diagrammatic development of the cam members employed in this device.

1 indicates any suitable base or foundation for the machine from which rise the standards 2 and on which is placed the pivot member 3 adapted to receive the end of the shaft 4 provided with the bevel gear 5 with which meshes the bevel gear 6 carried by the power shaft 7. Mounted on the standards 2 and rigid therewith is the cam member 8 provided with the track cams composed of two inclined portions 9 and 10 and two horizontal portions 11 and 12, as will be clear from the drawings. Traveling in the track members 9, 10, 11 and 12 and completely around the cam member 8 are the rollers 13 carried by the pins 14 on the plungers 15 of the bottle rests 16 supported in the sleeves 17 having the slots 18 to accommodate the said pins 14 all as will be clear from the drawings.

The shaft 4 is surrounded by the sleeve 20, and passes down through the spider 21 provided with the standards 22, and is integrally joined with the stationary cam member 8 as indicated by the dotted lines at 23. At the upper end of the sleeve 20 is the gear 24 meshing with the elongated pinions 25 mounted on the sleeves 26 carried by the upper spider member 27 integral with the upper ends of the standards 22, all as will be clear from the drawings. The upper end of the shaft 4 is slidingly fitted to a bearing 28 in the member 27 as illustrated.

From the construction so far disclosed it will be evident that power being applied to the shaft 7 rotation will be imparted to the bevel gears 6 and 5 and to the shaft 4. The cam member 8 being stationary the sleeve 20 will also remain stationary as well as the gear 24. On the other hand the shaft 4 will through the engagement of its spline 29 with the bearing 28 cause the spider member 27 and standards 22 of the spider 21 to be rotated, which in turn will cause the sleeves 17, the plungers 15 and the bottle rest 16 to be revolved around the shaft 4 as a center.

The upper end of the cam member 8 for 180° of its circumference is formed into cam surfaces 30, 31, 32 and 33 as indicated in full lines in Fig. 1. For the other 180° of the circumference of said cam member 8 its opposite side which does not appear in Fig. 1 is formed with duplicate cam surfaces corresponding to the said surfaces 30, 31, 32 and 33, and which if illustrated in Fig. 1 would be projections of the full lines 30 to 33 shown in said figure. These corresponding surfaces are illustrated in Fig. 5 and there lettered 30′, 31′, 32′ and 33′ respectively.

Bolted to the spider 21 is a revolving cam member 34 provided at its lower end with cam surfaces 35, 36, 37 and 38 to match the said cam surfaces 30, 31, 32 and 33 respectively, all as is clearly shown in Fig. 1. The said cam member 34 is further provided on its opposite side not shown in said Fig. 1 with cam surfaces which are the duplicate of the said cam surfaces 35 to 38, and which match the cam surfaces 30′, 31′, 32′ and 33′ which are provided on the cam member 8 as above stated. It therefore follows that as the spider 21 revolves it will carry with it the cam member 34, and will

lift the top member 27 as well as the sleeve 26, while the elongated pinions 25 are being revolved by the said spider 21 and are being rotated on their axes by means of the stationary gear 24. In other words it will now be clear that the bottle rests 16 carrying the bottles 40 will be rapidly revolved around the shaft 4 as a center, that they will be elevated while the rollers 13 are traversing the track 9, that they will continue to revolve at the same elevation while the said rollers 13 are traversing the horizontal track 12, that they will be depressed while the said rollers are traversing the inclined track 10 and that the supports 16 will continue to revolve around the shaft 4 as a center at the same depression while the said rollers 13 are traversing the horizontal track 11 until they reach the inclined track 9 all as will be apparent from Fig. 1. It will be further observed that the inclination of the tracks 9 and 10 is considerably greater than is the inclination of the inclined cam surfaces 32 and 38 so that the bottles 40 while revolving around the shaft 4 as a center will rise more rapidly than will the spider 21.

Passing through the centers of the sleeves 26 are the rods 45 provided with the encircling springs 46 and carrying at their lower ends the pressure disks 47, provided with the circular flanges 48. Also pivoted to the elongated pinions 25 as at 49 are the crimping members 50 provided with the horizontal lugs 51, the vertical lugs 52 and the crimping grooves 53. It accordingly follows that as the bottles 40 rise relatively to the top member 27 of the spider 21 the tops of the said bottles having been previously provided with paper cup shaped caps 53′ will strike the lower surfaces 54 of the pressure disks 47 thus compressing the springs 46. The outer edges 55 of the said disks 47 always underlie the lower surfaces of the lugs 51 by reason of the fact that the members 50 are provided with the lugs 56 which take against the edges 57 of the elongated pinions 25 and prevent said members 50 from being thrown out by centrifugal force to a distance so great as to permit the edges 55 to escape contact with the said lugs 51 when the disks 47 are raised. It accordingly follows that when the bottles 40 rise in the manner just stated they will cause the said edges 55 of the disks 47 to contact with the lugs 51, and the said lugs 51 being located inside the pivots 49 of the crimping members 50, the said crimping members will be swung inwardly on said pivots 49 against the action of centrifugal force from the positions shown in Fig. 2 to the position shown in Fig. 3. When the parts have reached the positions shown in Fig. 3 the roller 13 pertaining to the bottle in question will be at the top of the inclined track 9 as illustrated in Fig. 1, and the point 60 between the cam surfaces 36 and 37 on the cam member 34 will also be in its lowest position as illustrated in Fig. 1. Now as the parts continue to be revolved by the shaft 4 the said point 60 will ride up along the inclined surfaces 32 of the cam member 8 and raise the spider 21 along with the crimping members 50 from the position shown in Fig. 3 to the position shown in Fig. 4. In the meantime the roller 13 will traverse the horizontal track 12 and the parts continue to rapidly rotate around the shaft 4 as a center. The rapid rotation on the axis of the rod 45 of the cup shaped crimping members 53 of the crimpers 50 combined with the upward movement of the said members, will roll up and crimp the lower edge of the cap 53′ into the position shown in Fig. 4. When this has been accomplished the roller 13 will enter the inclined track member 10 and at the same time the point 60 will contact with the inclined cam surface 33 and begin to descend. Accordingly the pivoted crimping members 50 will be released from the pressure disk 47 and centrifugal force will permit them to fly out whereupon the bottles 40 through the said inclined track member 10 will be lowered out of engagement with the said disk 47 and may be removed from its bottle support 16 in any desired manner.

It is obvious that those skilled in the art may vary the details of construction as well as the arrangement of parts without departing from the spirit of my invention and therefore I do not wish to be limited to the above disclosure except as may be required by the claims.

What I claim is:

1. In a machine for crimping paper bottle caps around bottle heads, the combination of a support for the bottle; a stationary cam guide; a connection between said support and said stationary guide adapted to raise and lower said support; a revolving cam adapted to revolve with said support around a fixed center; a pressure disk adapted to be revolved with said support and to hold a paper cap in place on a bottle head; a pivoted crimping means adapted to be raised and lowered by said revolving cam, moving with said support, and adapted to be controlled by said disk; and means for rotating said crimping means around the axis of said support while the support is in motion, substantially as described.

2. In a machine for crimping paper bottle caps around bottle heads the combination of a shaft; means for rotating said shaft; a spider having a sliding engagement with said shaft and rotating therewith; a rotating cam member fixed to said spider for moving said spider up and down; a sta-

tionary cam member with which said rotating cam member contacts; a bottle support carried by said spider and revolving around said shaft as a center; connections between said stationary cam member and said bottle support adapted to raise and lower said support, at a rate different from said rotating cam member; a pinion carried by said spider; a crimping member carried by said pinion; means to rotate said pinion and crimping member on the axis of said bottle support while said spider is revolving; and means to cause said crimping member to automatically move toward said axis prior to the crimping operation, substantially as described.

3. In a crimping apparatus the combination of a pinion; means to revolve said pinion around an axis; means comprising a stationary gear to rotate said pinion around another axis while it is revolving; a pivoted crimping member carried by said pinion adapted to engage the lower edge of a paper cap; a bottle support revolving with said pinion for holding a bottle carrying a paper cap in position to be engaged by said crimping means; a pressure disk adapted to engage said crimping means and cause the same against the action of centrifugal force to engage said paper cap, means for raising and lowering said pinion while in motion; and means for raising and lowering ing said bottle support while in motion, substantially as described.

4. In an apparatus for crimping paper caps onto bottles, the combination of a pinion; a sleeve on which said pinion is mounted; a rod carrying a pressure disk passing through said sleeve; a vertical flange carried by said disk; a pivoted crimping member having a lug adapted to be engaged by said disk and carried by said pinion; and a vertical lug carried by said crimping member adapted to engage said flange, substantially as described.

5. In an apparatus for crimping paper caps onto bottles the combination of a pinion; a sleeve on which said pinion is mounted; a rod carrying a pressure disk passing through said sleeve; a spring surrounding said rod; a pivoted crimping member having a lug adapted to be engaged by said disk carried by said pinion; a stationary gear around which said pinion is adapted to revolve; and means for raising and lowering said pinion while in engagement with said gear, substantially as described.

6. In an apparatus for crimping paper caps onto bottles the combination of a pinion; a sleeve on which said pinion is mounted; a rod carrying a pressure disk passing through said sleeve; a spring surrounding said rod; a pivoted crimping member having a lug adapted to be engaged by said disk carried by said pinion; means for revolving said pinion around an axis; means for rotating said pinion around said sleeve; and means for raising and lowering said pinion while in motion, substantially as described.

7. In an apparatus for crimping paper caps onto bottles, the combination of a pinion; a crimping member having a stop lug at its upper end, pivoted to said pinion, and carrying a lug below said pivot; a spring pressed disk having a depending vertical flange and adapted to contact with said last named lug to turn said crimping member on said pivot; an upwardly extending lug on said crimping member adapted to engage said flange; and a stationary gear to revolve said crimping member and disk around an axis, substantially as described.

In testimony whereof I affix my signature, in presence of a witness.

GEORGE W. BEADLE.

Witness:

SAUL W. LEVY.