No. 850,288. PATENTED APR. 16, 1907.

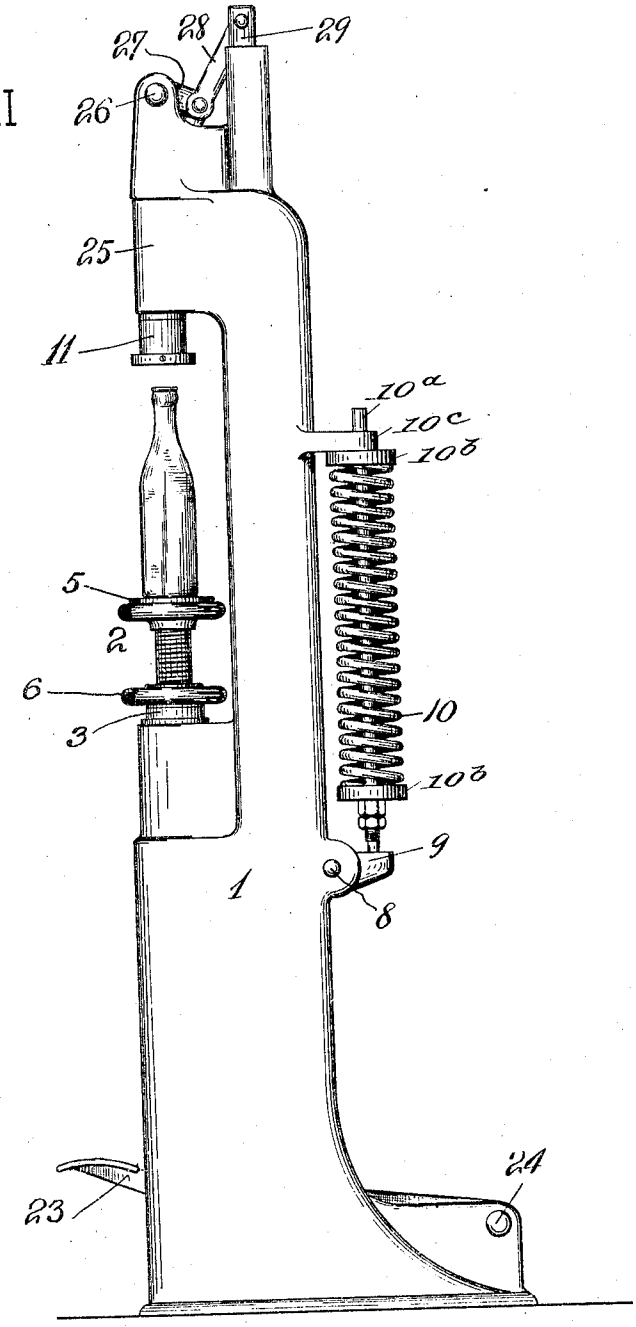
O. S. BEYER.

BOTTLE CAPPING MACHINE.

APPLICATION FILED NOV. 16, 1906.

3 SHEETS—SHEET 1.

FIG. 1



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3 SHEETS—SHEET 2.

FIG. 2

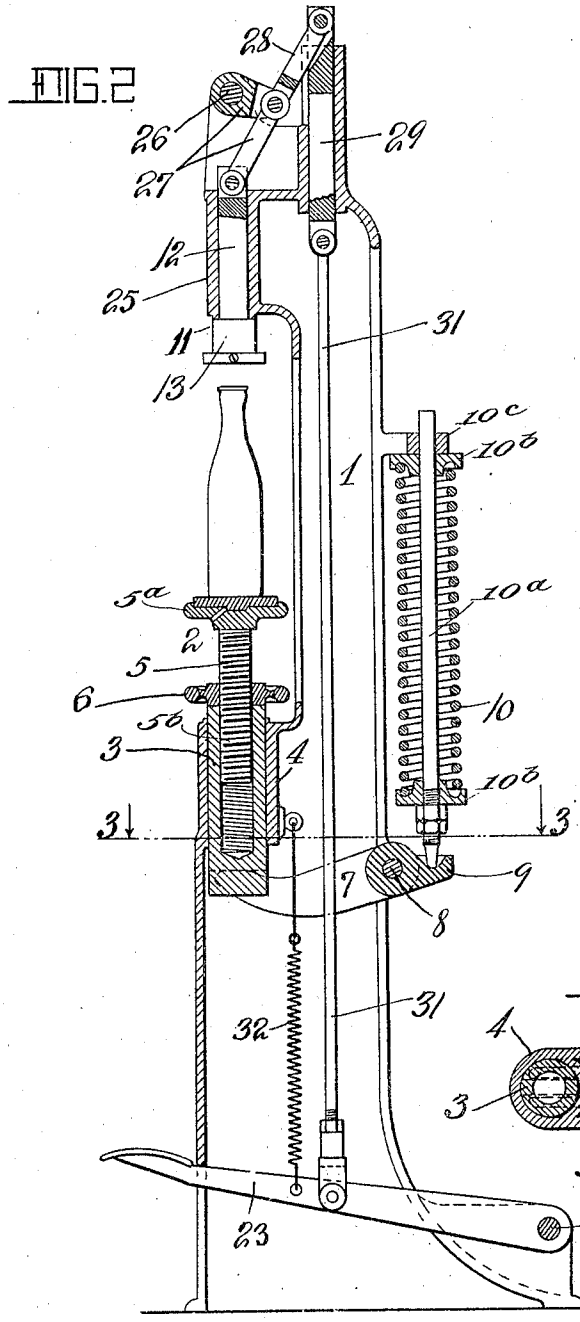
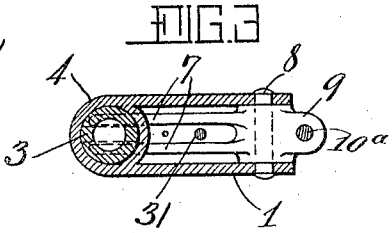


FIG. 3



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3 SHEETS—SHEET 3

FIG. 4

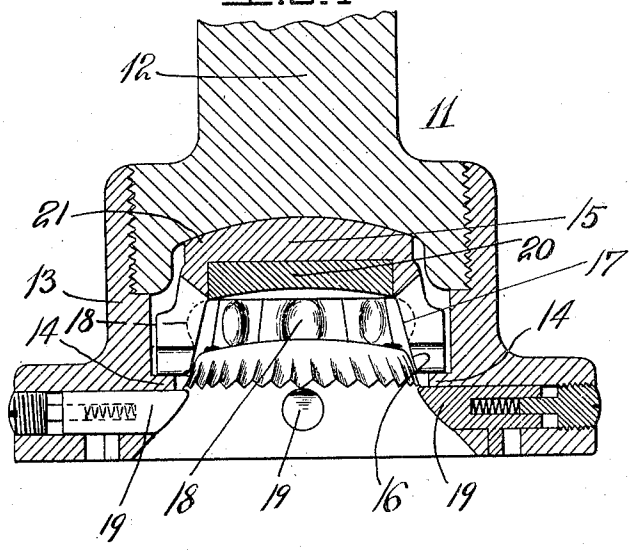


FIG. 5

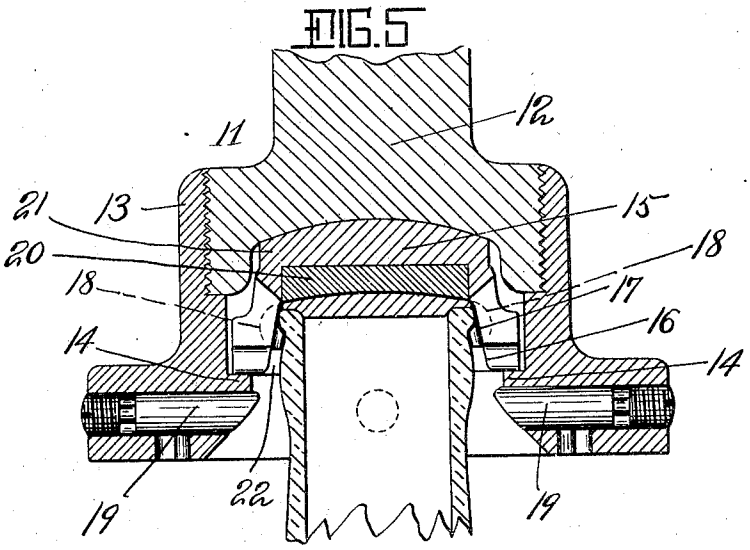
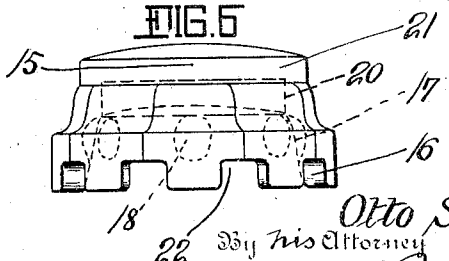


FIG. 6



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UNITED STATES PATENT OFFICE.

OTTO S. BEYER, OF EAST RUTHERFORD, NEW JERSEY, ASSIGNOR TO THOMAS H. PENISTON, OF ORANGE, NEW JERSEY.

BOTTLE-CAPPING MACHINE.

No. 850,288. Specification of Letters Patent. Patented April 16, 1907.

Application filed November 16, 1906. Serial No. 343,659.

To all whom it may concern:

Be it known that I, OTTO S. BEYER, a citizen of the United States of America, and a resident of East Rutherford, county of Bergen, State of New Jersey, have invented certain new and useful Improvements in Bottle-Capping Machines, of which the following is a specification.

The present invention relates to bottle-capping machines, and has more particularly reference to a machine for applying metallic caps to the outside of bottle-necks.

In the art as heretofore practiced it has been customary to force a metallic cap into sealing contact with the bottle by applying pressure simultaneously to all parts of the cap, or if the cap is corrugated simultaneously to the several corrugations. This is apt to produce a shock which may result in breaking the bottle, especially when the latter is not of standard size or dimensions.

One object of the present invention is the production of a machine in which the cap will be applied more gradually and easily than heretofore and without unduly straining the bottle

To this end the invention consists in providing non-rotatable bending means adapted to bend certain portions of the metallic cap into sealing relation with the bottle, leaving intermediate unbent portions, and then subsequently bending the intermediate portions into sealing relation with the bottle. If the metallic cap to be applied is of the corrugated type, the bending-tool will first bend substantially alternate corrugations, leaving intermediate unbent corrugations, and will then bend the said intermediate corrugations into sealing relation with the bottle. In the specific form here followed the bending-tool assumes the form of a die having a plurality of bending-faces divided into two sets located in different vertical planes and alternating with each other. These bending-faces will preferably be arranged to form a substantially circular bending-tool, by which it is meant to include a bending-tool having a plurality of faces forming a polygonal-shaped die.

In order to permit of the bottle and bending-die accommodating themselves to each other and in order to cause the bottle to center itself with relation to the bending-tool, the latter is loosely supported in a bending-head formed of two supporting members, with relation to which the bending-die has a lateral movement.

To facilitate the withdrawal of the bottle from the bending-tool, the latter is provided with an elastic cushion adapted to be compressed by the top of the bottle-cap and which assists in releasing the cap from the bending-faces on the withdrawal of the bottle.

A suitable bottle-support is provided, and means are provided for causing the said support and bending-head to approach and recede from each other. This may be done by imparting a motion to the bottle-support or to both the bottle-support and bending-head; but preferably, and as herein disclosed, the bending-head is given a motion with reference to the bottle-support. In order to compensate for any discrepancies in the size of the bottle, the said support is held yieldingly. This obviously could be accomplished by mounting a spring underneath the support. This, however, would impose a great strain on the bottle, and it is therefore preferred to interpose a lever connection between the bottle-support and the spring, bearing the relation of, say, one to four, or any other proportion found suitable whereby the spring need only be compressed one-fourth the distance of the movement of the bottle-support.

Other features of construction, combinations of parts, and arrangement of elements will appear as the specification proceeds.

In the drawings, the invention is embodied in a concrete and preferred form, but changes of construction may of course be made without departing from the legitimate and intended scope of the invention.

In the drawings, Figure 1 is a side elevation of a machine embodying my invention. Fig. 2 is a longitudinal sectional view of the machine. Fig. 3 is a transverse section on the line 3 3 of Fig. 2. Fig. 4 is a vertical sectional view of the bending-head. Fig. 5 is a view similar to Fig. 4, but showing a bottle in the act of being sealed. Fig. 6 is a side elevation of the bending-die.

Similar characters of reference indicate corresponding parts in the different views.

1 indicates a framework of any suitable

construction for properly mounting the parts of the machine.

2 represents a bottle-support consisting of the sleeve 3 capable of a vertical movement by sliding in the bracket 4.

5 indicates a bottle-socket composed of the platform 5^a and the spindle 5^b in threaded engagement with the sleeve 3. By adjusting the said spindle with reference to the sleeve 3 different sizes of bottles can be accommodated. A lock-nut 6 is employed for the purpose of holding the parts in the position to which they have been adjusted. This sleeve 3 rests on the bifurcated lever 7, pivoted at 8 and provided with a short arm 9, extending in a direction opposite to that of the bifurcated lever.

10 indicates a spring mounted on the rod 10^a and held between the two collars 10^b. The upper end of the rod 10^a has a seat in the bracket 10^c, and the lower end engages with the short arm 9 and normally holds the bottle-support in its elevated position.

11 represents the bending-head, comprising an upper supporting member 12 and a lower supporting member 13 secured thereto. This lower supporting member is provided with an inwardly-extending flange 14, on which rests the bending tool or die 15, held loosely between the two supporting members and capable of a slight lateral movement. The bending-die is substantially circumferential and is provided with a plurality of internal tapering bending-faces divided into two sets 16 and 17, located in different vertical planes and alternating circumferentially with relation to each other. This construction gives the bending-die a scalloped appearance. In order to prevent undue pressure, that part of the faces of the bending-die which is located directly above the lower set of bending-faces 16 is cored out, as at 18. The lower supporting member is provided with a plurality of spring-detents 19, which yieldingly support the bottle-cap before it is applied to the bottle.

In order to facilitate the withdrawal of the bottle from the die, there is provided an elastic cushion 20, which is seated in the closed end 21 of the die and with which the top of the bottle-cap is adapted to come in contact when it is inserted through the open end 22 of the die.

Any suitable means may be employed for imparting motion to the bending-head, such as a power-driven shaft provided with a one-revolution clutch, but in the present instance it is preferred to provide a treadle 23, pivoted at 24, as an operating means. The bending-head is mounted to reciprocate in the bracket 25 and is suspended from the pivot 26 by means of the toggles 27. Connected to these toggles is a link 28, carried by the reciprocating member 29, which latter in turn is attached to the treadle 23 by means of the rod 31. A spring 32 normally keeps the treadle in its raised position.

When it is desired to seal a bottle, the latter is placed upon the bottle-support and a cap is inserted in the bending-head. The treadle is then depressed, causing the bending-head to descend and the lower set of bending-faces to come in contact with the cap, bending certain portions thereof into sealing relation with the bottle, leaving intermediate portions of the cap unbent. This insures the proper centering of the bottle and bending-die, as the latter will shift laterally to accommodate itself to any discrepancy. The continued downward motion of the bending-head will then cause the upper set of bending-faces to come into action, thereby bending the remaining portions of the cap into sealing relation with the bottle. During this action the top of the cap will compress the elastic cushion within the die, and on the withdrawal of the bottle the expansion of the rubber will assist in releasing the bottle-cap from the bending-faces. Should the bottle be somewhat larger than the predetermined size or pressure be brought to bear upon the cap beyond that exerted by the spring 10, the bottle-support will yield a sufficient distance to compensate for the discrepancy.

What I claim is—

1. In a bottle-capping machine, means for supporting a bottle, and non-rotatable means for first bending certain portions of a metallic cap into sealing relation with the bottle, leaving intermediate unbent portions, and then subsequently bending the said intermediate portions into sealing relation with the bottle.

2. In a bottle-capping machine, means for supporting a bottle, and means for first bending substantially alternate corrugations of a metallic cap into sealing relation with the bottle, leaving intermediate unbent corrugations, and then subsequently bending the said intermediate corrugations into sealing relation with the bottle.

3. In a bottle-capping machine, means for supporting a bottle, and non-rotatable means for first-bending substantially alternate corrugations of a metallic cap into sealing relation with the bottle, leaving intermediate unbent corrugations, and then subsequently bending said intermediate corrugations into sealing relation with the bottle.

4. In a bottle-capping machine, an upper supporting member, a lower supporting member secured thereto and having an inwardly-extending flange, a bending-die resting loosely upon said flange between the two supporting members, and spring-detents, for yieldingly supporting the bottle-cap, carried by the lower supporting member.

5. In a bottle-capping machine, a bending-

die having a plurality of bending-faces divided into two sets located in different vertical planes and alternating with each other.

6. In a bottle-capping machine, a hollow substantially circular bending-die having a plurality of internal bending-faces divided into two sets located in different vertical planes and alternating with each other circumferentially.

7. In a bottle-capping machine, a bottle-support, a bending-head, means for causing the bottle-support and bending-head to approach and recede from each other, a bending-die, within the bending-head, capable of lateral motion and having a plurality of bending-faces divided into two sets located in different vertical planes and alternating with each other, whereby the lower set of bending-faces will bend certain portions of a metallic cap into sealing relation with the bottle, leaving intermediate unbent portions, and will tend to center the bottle and bending-die with relation to each other, the upper set of bending-faces acting subsequently to bend the said intermediate portions into sealing relation with the bottle.

8. In a bottle-capping machine, a bottle-support, a bending-head, means for causing the bottle-support and bending-head to approach and recede from each other, a bending-die, within the bending-head, capable of lateral motion, and having a plurality of bending-faces divided into two sets located in different vertical planes and alternating with each other, whereby the lower set of bending-faces will bend substantially alternate corrugations of a metallic cap into sealing relation with the bottle, leaving intermediate unbent corrugations, and will tend to center the bottle and bending-die with relation to each other, the upper set of bending-faces acting subsequently to bend the said intermediate corrugations into sealing relation with the bottle.

9. In a bottle-capping machine, a bottle-support, a bending-head, means for causing the bottle-support and bending-head to approach and recede from each other, a bending-die, within the bending-head, capable of lateral motion and having a plurality of bending-faces divided into two sets located in different vertical planes and alternating with each other, whereby the lower set of bending-faces will bend certain portions of a metallic cap into sealing relation with the bottle, leaving intermediate unbent portions, and will tend to center the bottle and bending-die with relation to each other, the upper set of bending-faces acting subsequently to bend the said intermediate portions into sealing relation with the bottle, and an elastic cushion seated within the said bending-die adapted to be compressed by the top of the bottle-cap and to assist in releasing the said cap from the bending-faces on the withdrawal of the bottle.

10. In a bottle-capping machine, a bottle-support, a bending-head, means for causing the bottle-support and bending-head to approach and recede from each other, a bending-die, within the bending-head, capable of lateral motion, and having a plurality of bending-faces divided into two sets located in different vertical planes and alternating with each other, whereby the lower set of bending-faces will bend substantially alternate corrugations of a metallic cap into sealing relation with the bottle, leaving intermediate unbent corrugations, and will tend to center the bottle and bending-die with relation to each other, the upper set of bending-faces acting subsequently to bend the said intermediate corrugations into sealing relation with the bottle, and an elastic cushion seated within the said bending-die adapted to be compressed by the top of the bottle-cap and to assist in releasing the said cap from the bending-faces on the withdrawal of the bottle.

11. In a bottle-capping machine, a bottle-support capable of a vertical movement, a bifurcated pivoted lever on which the said bottle-support rests, an arm shorter than the bifurcated lever extending in a direction opposite from that of the said bifurcated lever and connected thereto, and a spring bearing against the end of the short arm.

12. In a bottle-capping machine, a bottle-support consisting of a sleeve capable of vertical movement, a bottle-socket adjustably carried by the said sleeve, a bifurcated pivoted lever on which the said sleeve rests, an arm shorter than the bifurcated lever extending in a direction opposite from that of the said bifurcated lever and connected thereto, and a spring bearing against the end of the short arm.

Signed at Riverside, New Jersey, this 1st day of November, 1906.

OTTO S. BEYER.

Witnesses:
LOUIS F. BUCHLER,
IVAN KONIGSBERG.