No. 880,671. PATENTED MAR. 3, 1908.

G. KIRKEGAARD.

BOTTLE CAPPING MACHINE.

APPLICATION FILED JUNE 13, 1906.

2 SHEETS—SHEET 1.

Fig. 2.

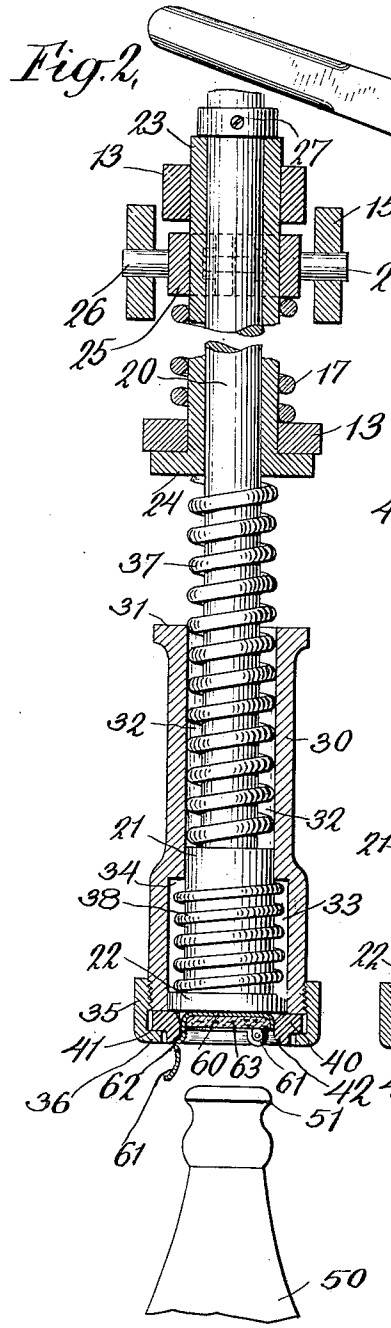


Fig. 4.

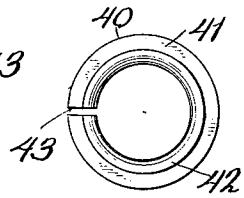


Fig. 3.

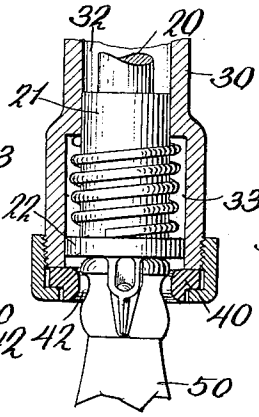


Fig 1.

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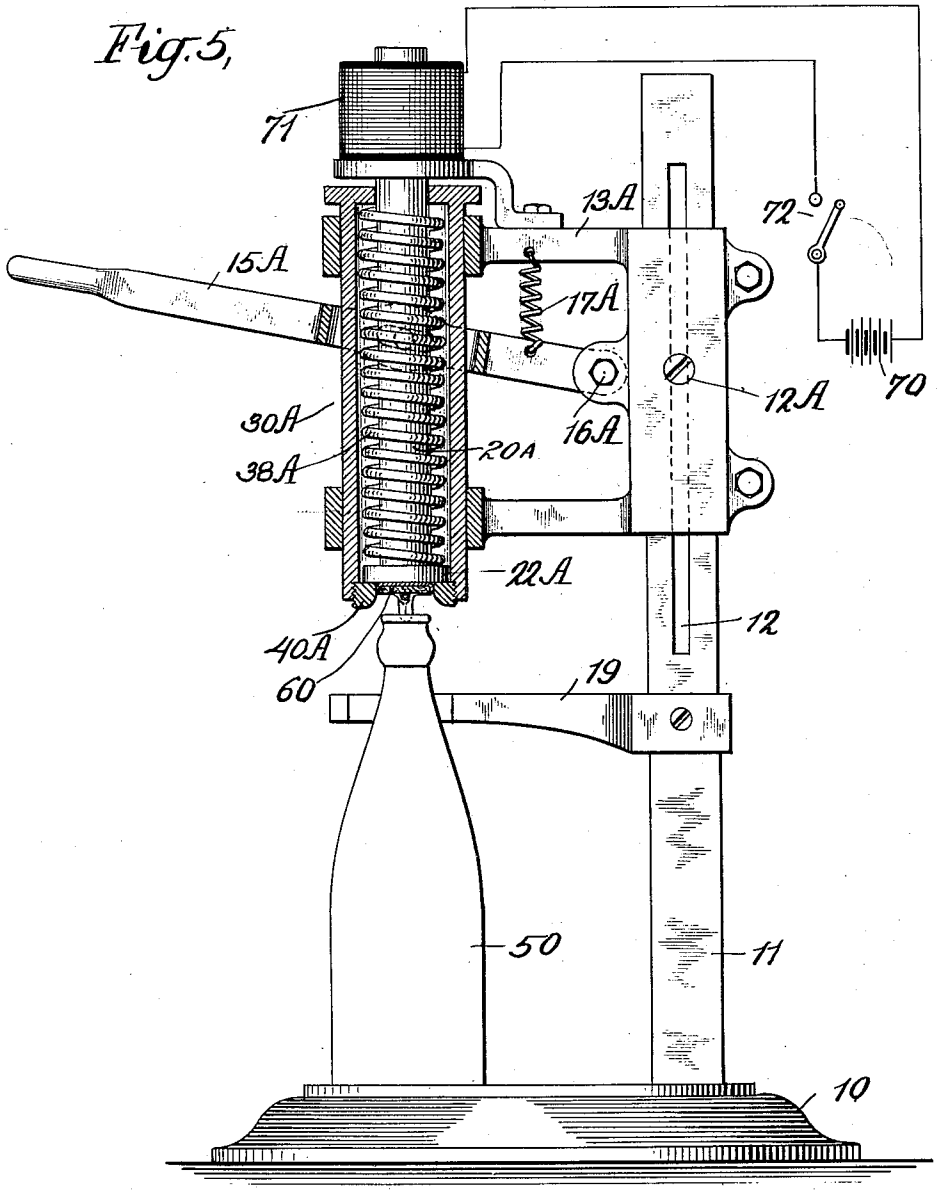
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2 SHEETS—SHEET 2.

Fig. 5,



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UNITED STATES PATENT OFFICE.

GEORG KIRKEGAARD, OF NEW YORK, N Y.

BOTTLE-CAPPING MACHINE.

No. 880,671. Specification of Letters Patent. Patented March 3, 1908.

Application filed June 13, 1906. Serial No. 321,431.

To all whom it may concern:

Be it known that I, GEORG KIRKEGAARD, a citizen of the United States, and a resident of the city of New York, in the county of New York and State of New York, United States of America, have invented certain new and useful Improvements in Bottle-Capping Machines, of which the following is a specification.

My invention relates to a bottle capping machine and its object is to provide a simple apparatus for securing bottle stoppers or caps over the mouths of bottles.

I will describe my invention in the following specification and point out the novel features thereof in claims.

Referring to the drawings, Figure 1 shows, in side elevation, my improved bottle capping machine. Fig. 2 is a front sectional elevation of some of the parts shown in Fig. 1. Fig. 3 is a side sectional elevation of some of the parts shown in Fig. 2, showing these parts in different relative positions. Fig. 4 is a plan view of a forming ring which I use in carrying out my invention. Fig. 5 is a side elevation, partly in section, illustrating a modification of my invention.

Like characters of reference designate corresponding parts in all of the figures.

10 designates a base upon which the various parts of my machine are mounted. 11 is a standard securely attached to this base. This standard 11 is provided with a slot 12.

13 designates a supporting-head or carriage which is slidably mounted upon the standard 11 and which may be secured to the standard 11 at any desired position by means of lock-nuts 14, 14.

15 designates a lever which is pivoted to the carriage 13 at 16 and which is normally held in a raised position, as shown in Fig. 1, by means of a retractile spring 17. The lever 15 is provided with slots 18 which are arranged to engage with trunnions 26, 26.

20 designates a shaft which is supported by the head or carriage 13 and which is arranged to move vertically in said head. The lower portion of this shaft 20 is provided with an enlarged portion 21, the bottom of which is enlarged to a still greater diameter as shown at 22. This shaft 20 is preferably constructed of hardened steel and may be magnetized so that it forms a permanent magnet.

23 designates a sleeve which is loosely mounted on the shaft 20 near its upper end. The lower end of this sleeve is enlarged to form a shoulder 24.

25 designates a ring which is attached to the sleeve 23 and which carries upon it trunnions 26, 26.

27 is a collar rigidly attached to the upper part of the shaft 20 and arranged to limit the upward movement of the sleeve 23 on the shaft 20.

30 designates a plunger-head. The upper portion of the plunger-head 30 is bored out, as shown at 32, to a diameter slightly larger than the diameter of the portion 21 of the shaft 20, and the lower portion of the plunger-head is bored out, as shown at 33, to a diameter somewhat larger than the portion 22 of the shaft 20. These two portions will form between them a shoulder 34.

35 is a collar which is arranged to be secured onto the bottom of the plunger-head, and this collar is provided with a shoulder 36.

37 designates a main compression spring which is placed about the shaft 20 and between the portion 21 and the lower portion 24 of the collar 23.

38 designates an auxiliary compression spring which is placed about the portion 21 of the shaft 20, and between the portion 22 of the shaft 20 and the shoulder 34 which is formed inside of the plunger-head 30.

40 designates a forming-ring of hardened steel or other suitable material. This ring is provided with a shoulder 41 and a forming-surface 42. It may, if desired, be split as shown at 43 by a radially disposed slot. This forming-ring is arranged to be held by the plunger-head 30 between the bottom of the plunger-head and the upper portion of the shoulder 36 on the collar 35. This collar may be screwed onto the plunger-head 30 a sufficient amount to support the forming-ring 40, but still, not screwed on tight enough to prevent a limited movement of the forming-ring between the plunger-head and the collar 35.

50 designates a bottle which is provided near its upper end with an annular rim or shoulder 51.

19 is a guide for the bottle which is supported upon the standard 11 by means of a set-screw 19^A.

60 designates a cap which is adapted to fit over the top of the neck of the bottle 50. This cap is provided with depending fingers 61, which fingers are arranged with project-

ing portions 62 upon which the forming-ring acts, as will appear later.

63 designates a packing of cork or other resilient material which may be placed within the cap 60 before the cap is placed upon the bottle. These caps are preferably contructed of magnetic material such, for example, as commercial tin, which is a sheet of iron coated with metallic tin.

The operation of this device is as follows: A bottle 50 is placed upon the base 10, and the guide 19 is so adjusted as to hold this bottle in alinement with the center of shaft 20. The supporting-head or carriage 13 is then securely clamped to the standard 11 at a proper distance above the bottle 50. A cap 60 is placed upon the plunger or enlarged portion 22 of the shaft 20 with its projecting fingers pointing downward. As this plunger or shaft 20 is magnetized, and as the cap is preferably made of magnetic material, this magnetism will hold the cap against the end of the shaft or plunger. The operator may then pull the lever 15 downward and thereby cause the loose sleeve 23 to move. This downward movement will be transmitted to the plunger-head 30 and to the shaft, which are resiliently connected together and to the loose sleeve by means of the springs 38 and 37. The parts will travel downward together until the cap 60 rests upon the top of the bottle 50. A further movement of the lever 15 and the shaft 20 will cause the cap and its resilient packing to be compressed against the top of the bottle with a pressure depending upon the strength of the spring 37. A still further movement of the lever 15 and loose sleeve 23 will cause the lower part 24 of this sleeve 23 to be brought against the upper part 31 of the plunger-head 30, and will cause the loose sleeve 23 and the plunger-head 30 to be positively moved downward together. This will cause the forming-ring 40 to be moved down past the top of the bottle, and its forming surface 42, engaging with the projecting portions 62 on the depending fingers 61 of the cap 60, will cause the latter to be bent inward about the annular rim or shoulder 51 on the bottle. This will cause the cap to be securely fastened to the bottle, and it will remain in this position when the operator releases the lever 15 and allows the retractile spring 17 to move the lever and its connected parts upward again.

A screw 12^A may be placed through the head 13 and the slot 12 and this will limit the movement of the head on the support 11 and help to guide the head when it is moved upon the standard 11.

The forming-ring 40 may be split as at 43 for the purpose of preventing the ring from breaking such bottles as may be of a slightly larger diameter than those for which it is adapted The ring may be loosely mounted in the end of the plunger-head, in a manner previously described, for the purpose of adapting itself to the position of the bottle.

In Fig. 5 I have shown another form of my invention, in which case the forming-ring 40^A is screwed directly into a plunger-head 30^A. This plunger-head is supported and guided by a traveling-head or frame 13^A which is mounted upon the standard 11 in the manner previously described.

A lever 15^A is pivoted to the head 13^A at 16^A and is connected to act directly upon the plunger-head 30^A. A shaft 20^A is placed within this plunger-head 30^A and connected to it by means of a spring 38^A, one end of which spring rests upon an enlarged portion 22^A of the shaft 20^A and the other end of which rests upon the upper end of the plunger-head 30^A. The lever 15^A may be held in its upper position by means of a spring 17^A. After a cap 60 has been placed upon the end of the enlarged portion 22^A of the shaft 20^A, the apparatus may be operated in a manner similar to that previously described. In this case, when an operator depresses the lever 15^A he will thereby positively move the plunger-head 30^A and the forming-ring 40^A downward and will, at the same time, depress the shaft 20^A through the spring 38^A. The cap will thus become pressed down upon the top of the bottle and the movement of the shaft 20^A will thereby become arrested. A further movement of the lever 15^A will cause the forming-ring 40^A to be moved down past the cap 60 and will cause the latter to be secured to the bottle.

70 designates an electric battery or some other source of electrical supply.

71 designates a coil or winding which may be placed about the shaft 20^A.

72 designates a switch whereby the battery may be connected to the coil 71. When this is done a current will be supplied to the coil 71 and it will cause the shaft 20^A to be magnetized thereby. This is one method for magnetizing the shaft for the purpose of causing it to hold the cap 60, which is preferably constructed of magnetic material. The shaft, however, may be made of hardened steel and may be permanently magnetized if desired.

I have shown this apparatus in two forms adapted to be operated by hand, or, it is obvious that it may be operated by foot-power or by any desirable mechanical motive power. These two forms which I have shown clearly illustrate my invention, but it may, of course, be made in many other forms without departing from the spirit of this invention.

It is evident that the apparatus is adaptable for use with different sizes and shapes of bottles, as the guiding bracket 19 and the supporting-head or carriage 13 are adjust-

able upon the standard 11. The forming-ring 40 is separate from the rest of the apparatus, and a different size or shape of forming-ring may be substituted for it whenever desired.

What I claim is.—

1. In a bottle capping machine, the combination of a shaft, a forming ring surrounding the lower end of the shaft, cam surfaces upon the forming ring arranged to directly engage with a portion of a bottle cap, said forming ring being split so that it may yield when subjected to undue pressure, and means for moving said shaft and ring together until the movement of the shaft is arrested and for imparting a further movement in the same direction to the forming ring.

2. In a bottle capping machine, the combination of a shaft, a forming ring surrounding the lower end of the shaft, cam surfaces upon the forming ring arranged to directly engage with a portion of a bottle cap, said forming ring being split so that it may yield when subjected to undue pressure, a resilient connection between said shaft and forming ring, a lever arranged to move said shaft and ring together through the resilient connection until the movement of the shaft is arrested, and to positively impart a further movement in the same direction to the forming ring.

3. In a bottle capping machine, the combination of a magnetized shaft arranged to support a cap of magnetic material, a split forming-ring arranged to directly engage with a bottle cap, said forming-ring being about the lower end of the shaft, a compression spring connecting the shaft and the forming-ring, a lever arranged to move said shaft and ring together through the spring until the movement of the shaft is arrested, and to positively impart a further movement in the same direction to the forming-ring.

4. In a bottle capping machine, the combination of a shaft, a plunger-head slidably mounted upon said shaft, a forming-ring loosely mounted on said plunger-head, a resilient connection between the shaft and the plunger-head, a lever arranged to move said shaft and plunger-head together through the resilient connection until the movement of the shaft is arrested, and to positively impart a further movement in the same direction to the plunger-head.

5. In a bottle capping machine, the combination of a magnetized shaft, a plunger-head slidably mounted upon said shaft, a split forming-ring loosely mounted on said plunger-head, a resilient connection between the shaft and plunger-head, a spring connecting the shaft and the plunger-head, a lever arranged to move said shaft and plunger-head together through the resilient connection until the movement of the shaft is arrested, and to positively impart a further movement in the same direction to the plunger-head.

6. In a bottle capping machine, the combination of a shaft, a forming-ring surrounding the lower end thereof, a lever, a compression spring connecting the shaft and the lever, and a second spring connecting the shaft and the forming-ring, said lever arranged to move the shaft and the ring together through said springs until the movement of the shaft is arrested, and for positively imparting a further movement in the same direction to the forming-ring.

7. In a bottle capping machine, a support for a bottle, a vertically movable magnetized shaft above said support arranged to hold a cap of magnetic material, a forming-ring surrounding the lower end thereof, a spring connecting the shaft and the ring, a lever arranged to move the shaft and to move the ring with the shaft through said spring until the movement of the shaft is arrested, and for positively imparting a further movement to the forming-ring in the same direction.

8. In a bottle capping machine, a support for a bottle a vertically movable magnetized shaft above said shaft arranged to support a cap of magnetic material, a forming-ring associated therewith, a lever, a compression spring connecting the shaft and the lever, a second spring connecting the shaft and the forming-ring, said lever arranged to move the shaft and to move the ring with the shaft through said spring until the movement of the shaft is arrested, and for positively imparting a further movement to the forming-ring in the same direction.

9. In a bottle capping machine, a base for supporting a bottle, a standard connected to said base, a head adjustably mounted upon said standard, a vertically movable magnetized shaft supported by the adjustable head, a plunger-head mounted upon said shaft, a forming-ring loosely mounted upon the plunger-head, a lever, a compression spring connecting the lever and the shaft, a second spring connecting the shaft and the plunger-head, said lever arranged to move the shaft through the compression spring and to move the plunger-head with the shaft through said second spring until the movement of the shaft is arrested, and to positively impart a further movement to the forming-ring in the same direction; and a retractile spring for the lever.

10. In a bottle capping machine, a base for supporting a bottle, a guide for a bottle, a standard connected to said base, a head adjustably mounted upon said standard, a vertically movable magnetized shaft supported by the adjustable head, a plunger-head mounted upon said shaft, a split forming-ring loosely mounted upon the plunger-

head, a lever, a compression spring connecting the lever and the shaft, a second spring connecting the shaft and the plunger-head, said lever arranged to move the shaft through the compression spring and to move the plunger-head with the shaft through said second spring until the movement of the shaft is arrested, and to positively impart a further movement to the forming-ring in the same direction; and a retractile spring for the lever.

11. In a bottle capping machine, a base for supporting a bottle, a standard connected to said base, a slot in said standard, a head adjustably mounted upon said standard, a screw in said head projecting into the slot, a vertically movable magnetized shaft supported by the adjustable head, a plunger-head mounted upon said shaft, a forming-ring loosely mounted upon the plunger-head, a lever, a compression spring connecting the lever and the shaft, a second spring connecting the shaft and the plunger-head, said lever arranged to move the shaft through the compression spring and to move the plunger-head with the shaft through said second spring until the movement of the shaft is arrested by the bottle, and to positively impart a further movement to the forming-ring in the same direction; and a retractile spring for the lever.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORG KIRKEGAARD.

Witnesses:

ERNEST W. MARSHALL,

ELLA LUCK.