

G. KIRKEGAARD.
BOTTLE CAPPING MACHINE.
APPLICATION FILED DEC. 16, 1908.

962,029.

Patented June 21, 1910.

Fig. 1.

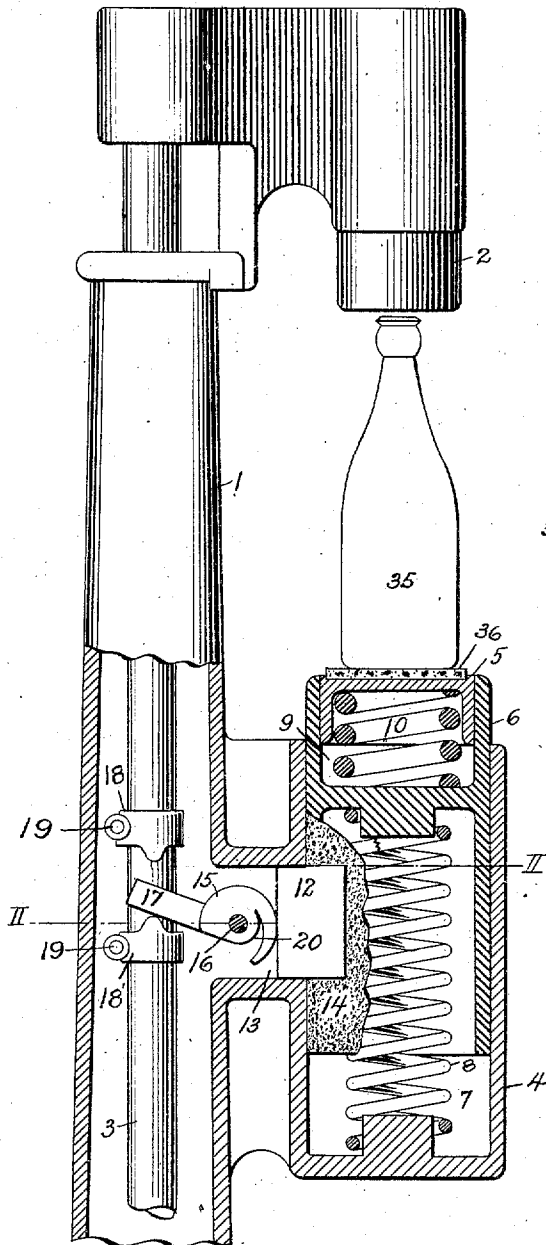


Fig. 3.

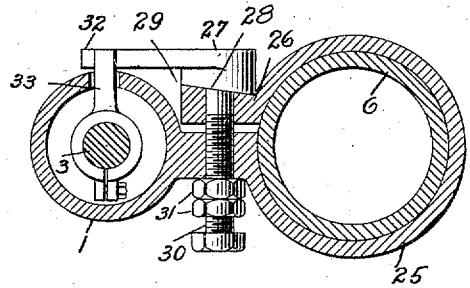
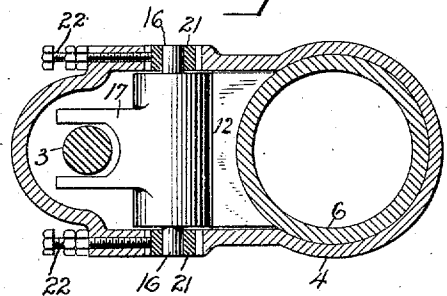


Fig. 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

GEORG KIRKEGAARD, OF NEW YORK, N. Y., ASSIGNOR TO IMPERIAL STOPPER COMPANY, A CORPORATION OF MAINE.

BOTTLE-CAPPING MACHINE.

962,029.

Specification of Letters Patent. Patented June 21, 1910.

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To all whom it may concern:

Be it known that I, GEORG KIRKEGAARD, a citizen of the United States, residing at the city of New York, in the borough of Brooklyn and State of New York, have invented certain new and useful Improvements in Bottle-Capping Machines, of which the following is a full, clear, and exact description.

My invention relates to bottle capping machines of the type having a cap-applying head adapted to be depressed upon a bottle, the latter being supported by a table which resists the downward thrust of the cap applying operation. A certain predetermined resistance to pressure must be provided in all cases, and the varying heights of different bottles, due to imperfect manufacture or otherwise, should be compensated for, so that tall bottles will not be crushed and broken, while the shorter bottles will be sure to receive adequate pressure.

One object of the invention is to provide a table which initially supports the bottle in a position slightly elevated in the path of descent of the cap applying head, but capable of yielding downwardly, so that in every operation the head descends and depresses the bottle and the table together for a greater or less distance, at the conclusion of which the cap applying operation takes place. The latter action is brought about by the arrest of the table in its descent with the bottle and head, such an arrest occurring when the head is within a predetermined distance of its lower limit of movement.

A further object of the invention is to provide mechanical means for securing the above functions.

A further object of the invention is to provide a friction brake acting on the table at the conclusion of its freely yielding movement to resist the pressure of the cap applying operation.

In the drawings: Figure 1 is a side elevation, partly in section, of a capping machine embodying the principles of my invention; Fig. 2 is a sectional view on the line II—II of Fig. 1; Fig. 3 is a view similar to Fig. 2 showing a slightly modified construction.

1 designates the frame or standard of a bottle capping machine and 2 indicates a cap applying head of any ordinary or improved construction. The head 2 is guided

by the frame 1 to have a rectilinear movement, and any suitable means, such as an operating rod 3, connected with a power or other source, may be employed for reciprocating the head.

4 designates a bracket forming part of the frame 1, and which supports the table 5, on which the bottles are received for the cap applying operation. In accordance with the present invention the table 5 is yieldable or depressible in the bracket 4. I have illustrated the table as forming part of a plunger 6, which is vertically slidable in a corresponding cylindrical chamber 7 of the bracket, being normally elevated therein by a spring 8, which permits depression of the table upon the application of a sufficient force, somewhat greater than the weight of a bottle, but less than the requisite pressure for the cap applying operation. The table 5, in the preferred form of my invention, is not made absolutely rigid with the plunger 6, but is depressible with respect to said plunger, being guided in a cavity 9 therein. This last movement is, however, resisted by a very strong spring 10, so strong that the movement only takes place under extraordinary circumstances. In ordinary use, the table 5 may be considered as rigid with the plunger 6, and the exterior surface of the plunger 6 is preferably roughened.

In connection with the plunger 6, or its equivalent means for supporting the table, I provide mechanical gripping means which is thrown into action to arrest the depression of the table when the cap applying head has approached within a predetermined distance of its limit of movement. 12 designates a brake shoe guided in a recess 13 of the frame 1, so as to be movable laterally into contact with the cylindrical wall 14 of the plunger 6. The brake shoe 12 is adapted to be impelled in this action by a cam or circular wedge 15 pivoted to the frame of the machine at 16, and having a bifurcated arm 17 which embraces the operating rod 3. 18 and 18' denote tappets which are each independently adjustable vertically on the rod 3, by any suitable clamping screws 19. The tappets 18 are positioned in the path of the bifurcated arm 17 so as to impinge against and displace said arm as the rod 3 approaches its limits of movement. In order to make the action of the cam wedge 15 slightly yielding; I have shown the latter

undercut at 20, so that the portion which engages the brake shoe is somewhat resilient. As a further means of securing a proper action of these elements, I make the pivot or fulcrum 16 of the cam wedge adjustable laterally in the frame of the machine. This is conveniently accomplished as shown in Fig. 2, by having journal boxes 21 for the pivot shaft 16, which can be displaced laterally by adjustment screws 22.

As an alternative construction for the means for arresting the depression of the table as above described, I have illustrated another form of friction brake in Fig. 3. In this case a strap 25 entirely surrounds the plunger 6, one end being fixed to or forming part of the frame 1 and the other end 26 being engaged by a cam 27 to constrict the strap upon the plunger. The cam 27 has an inclined shoulder 28 working against a lug 29 on said free end 26 of the strap. This cam is fulcrumed on a short pivot shaft 30, extending through the fixed and the free ends of the strap and anchored by adjustment nuts 31. The lever arm 32 of the cam 27 is in the path of tappets 33 on the rod 3, generally similar to the parts 18 and 18' already described. The movement of the rod 3 is accompanied by angular displacement of the cam 27, which tightens or loosens the strap 25 in an obvious manner. I do not, of course, desire to be limited or restricted to any particular form of brake or applying means therefor.

The use in operation is as follows: The bottles 35 are placed upon the table 5, which has any suitable mat 36, to take up minor irregularities in the bottom surface, and the mechanism is actuated to depress the cap applying head 2. The descent of the latter is greater than the needs of the cap applying operation, by an amount at least corresponding to the greater differences in the heights of the bottles to be capped. At this stage of the action, the brake 12 is released, and the table is freely depressible, being only resisted by the spring 8. The cap applying head descends on the bottle and carries the latter downward with the table until the cap applying head is within a predetermined distance of its lower limit of movement, or in other words, until the tappet 18 contacts with the arm 17. When this takes place, the cam moves to tighten the brake upon the plunger 6, so that the depression of the table is arrested. Thereafter further movement of the cap applying head is effective to compress and apply the cap to the bottle. Inasmuch as the cap was within a predetermined distance of its lower limit of movement when the table was arrested, it follows that the final movement of the cap applying head can be made a fixed amount, suitable to the needs of the cap applying operation. In extraordinary

cases, the spring 10 yields and prevents breakage of the bottle where an undue resistance is encountered for any reason. In the return movement of the cap applying head the table is temporarily held depressed until the bottle is removed. At the limit of upward movement of the cap applying head the lower tappet strikes the arm 17 and releases the brake, so that the table ascends in position for the new operation.

What I claim, is:

1. In a bottle capping machine, a cap applying head, a bottle supporting table, means for altering the relative positions of said head and table with respect to each other, and means for impeding the movement of one of said parts, said means comprising a brake, a force applying member, and a resilient member interposed between said brake and said force applying member.

2. In a bottle capping machine, a cap applying head, a bottle supporting table, means for altering the relative positions of said head and table with respect to each other, and frictional braking means for impeding the movement of one of said parts, said means comprising a brake, an adjustable force applying member and a resilient member interposed between said brake and said adjustable member.

3. In a bottle capping machine, a cap applying head, a bottle supporting table, means for altering the relative positions of said head and table with respect to each other, and frictional braking means for impeding the movement of one of said parts, said means comprising a brake, a force applying member and an adjustably mounted member interposed between said brake and said force applying member.

4. In a bottle capping machine, a cap applying head, a table depressible in the path of said head, mechanical means for arresting the depression of the table when the cap applying head approaches within a predetermined distance of its limit of movement, and independent means for permitting a further depression of the table under extraordinary pressure.

5. In a bottle capping machine, a cap applying head, a table depressible in the path of said head, a spring for resisting depression of the table, a brake for arresting depression of the table, and tappets movable with the cap applying head and operating to apply and to release said brake.

6. In a bottle capping machine, a cap applying head, a table depressible in the path of said head, a spring for resisting depression of said table, a brake for arresting depression of said table, a cam for operating said brake, and tappets movable with the cap applying head and acting on said cam to cause the application and release of the brake.

7. In a bottle capping machine, a cap applying head, a bottle supporting table, means for altering the relative positions of said head and table with respect to each other, and frictional braking means for impeding the movement of one of said parts, said means comprising a brake-member, a force applying member, and a cam having a resilient portion for engagement with one of said members.

8. In a bottle capping machine, a cap applying member, a bottle supporting member, means movable through a predetermined distance for causing the approach of one of said members toward the other, means for causing the other of said members to moderately oppose the approach of the first mentioned member while yielding thereto, means for impeding said yielding of said second member after the first member has approached within a predetermined distance of its limit of movement, and supplemental independent means for permitting one of said members to yield under extraordinary pressure.

9. In a bottle capping machine, a cap applying member, a bottle supporting member, means for altering the relative positions of

said members with respect to each other, a friction brake for impeding the movement of one of said members when the other of said members has approached within a predetermined distance of its limit of movement, a brake engaging member, and positive means for driving the said engaging member into engagement with said brake.

10. In a bottle capping machine, a cap applying head, a bottle supporting table depressible in the direction of movement of said head, means comprising a rod for causing said head to approach said table, a brake for arresting the depression of said table when the cap applying head approaches within a predetermined distance of its limit of movement, a cam acting member having a resilient extension for engagement with said brake, and tappets mounted on said rod for cooperating with said cam acting member to apply and release said brake.

In witness whereof, I subscribe my signature, in the presence of two witnesses.

GEORG KIRKEGAARD.

Witnesses:

WALDO M. CHAPIN,
JAMES D'ANTONIO.