

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Improvements in or relating to Capping Heads for Bottle Capping Machines

We, ANTHONY JOSEPH MARRK, a Hungarian subject, of 22, Park Lodge, Blackheath Park, London, S.E.3, and KORK-N-SEAL LIMITED, a British Company, of 8 Leicester Street, London, W.C.2, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to a capping head for a machine for capping bottles by forcing a peripheral portion of the skirt of a metal cap under an annular lip on the bottle neck. This method of capping bottles and machines for performing the capping operations are known per se. The object of the present invention is to provide improved means for this purpose and relates more particularly to the actual capping head, the particular object of the invention being to provide a compact capping head of unit construction, which may be inserted into or removed from the machine frame as a self contained unit of small compass. The invention is not concerned with the construction of the machine frame, but it may be mentioned that in its simplest form same may consist of any fixture to which the self contained capping head may be attached, or the machine frame may also include hand or power operated means for performing the capping operation.

According to the invention, a capping head for capping bottles by forcing a peripheral portion of the skirt of a metal cap under an annular lip on the bottle neck comprises an outer casing having a cylindrical bore, a plunger axially movable in said bore, an integral or sectional deformable ring coaxially mounted in said plunger and adapted to engage the skirt of the metal cap, a plurality of equiangularly disposed slide members in the plunger surrounding and engaging said ring and a plurality of radially disposed toggle elements, each pivotally engaging the inner surface of said outer casing at its outer end and one of the said slide members at its inner end,

so as to cause said slide members to move inwardly when the plunger moves in one direction and to allow them to move outwardly when the plunger moves in the opposite direction.

The invention will now be more particularly described with reference to the accompanying drawings, wherein two embodiments of the invention are illustrated by way of example. In the drawings:—

Figure 1 is a sectional view of the unit construction capping head, on the line I—I of Figure 2;

Figure 2 is a section on the line II—II of Figure 1, certain parts being omitted for clearness;

Figure 3 is a section similar to Figure 2, showing the slide members and the deformable ring in operative position;

Figure 4 is a perspective view of the plunger;

Figures 5 to 7 show details in perspective;

Figure 8 is a section similar to Figure 1 of another embodiment;

Figures 9 and 10 show details of the embodiment illustrated in Figure 8, in plan view and perspective respectively; and

Figure 11 shows a detail applicable to either of the two embodiments.

Referring to Figures 1 to 7 of the drawings, the outer casing of the capping head comprises a head portion 1 and a skirt portion 2. The head portion 1 has a central, axial tapped bore 3, whereby the complete head may be screwed on to a threaded spindle or bolt provided on a frame or any suitable fixture of the capping machine. The skirt portion 2 has an axial cylindrical bore 4, wherein a plunger 5 is mounted for axial sliding. A spring 6 is disposed between the head 1 and the plunger 5, tending to press the plunger downwards. The downward stroke of the plunger 5 is limited by screw bolts 7, which are screwed into the plunger 5 and engage with their heads shoulders 8 formed at the bottom of recesses 9 in the head portion 1. The upward stroke of the plunger is limited by washers 10 surrounding the shanks of

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the bolts 7.

The plunger 5 is formed on its under-
side with a plurality of equiangularly and
radially disposed recesses 11, having
parallel side walls. Each of the recesses
has mounted therein for radial sliding a
slide member 12, the slide members being
held in position by a ring 13 secured to
the underside of the plunger 5 by screws
14. Normally, each slide member 12 is
pressed outwardly by a spring 15 housed
in a recess of the ring 13 and engaging
with its outer end a depending skirt
portion 16 of the associated slide member
12.

Each slide member 12 is associated
with a toggle element 17, shown in
perspective in Figure 7. The toggle
elements are radially disposed and each
is laterally guided in a recess 11 of the
plunger 5. In plan view the inner end
of each toggle element is straight and in
end elevation rounded and engages a
correspondingly formed shoulder on the
associated slide member 12, as clearly
shown in Figures 1 and 6. The outer
end of each toggle member is formed with
a rounded head enlargement and is curved
in plan view. The outer ends of the
toggle elements bear against a shoulder 18
of the skirt portion 2 and are held in
position by a ring 19, which in turn is
held in position by a resilient ring 20
sprung into a groove of the skirt portion
2.

It will be appreciated that in the
arrangement described the toggle
elements 17 are in pivotal engagement at
their outer and inner ends with the skirt
of the outer casing and their associated
slide members respectively. In the
inoperative position shown in Figure 1
each toggle occupies a downwardly
inclined position, owing to the pressure
exerted upon its inner end by the spring
6 through the plunger 5. In this position
the slide members 12, which bear against
said inner ends of the toggle elements 17,
are farthest apart from the axis of the
machine.

Coaxially mounted in the plunger 5
there is a deformable ring 21, e.g. of
rubber, which is held in position by an
annular element 22 screwed into the ring
13. The deformable ring 21 is provided
with a plurality of peripheral notches 23,
in each of which engages a portion of the
plunger 5 situated between two of the
recesses 11 when the machine is in its
inoperative position shown in Figures 1
and 2. Each peripheral portion of the
deformable ring 21 between two of the
notches 23 is engaged by one of the slides
12. Further, the bottom of the plunger
5 is dished at 24 to receive the top part

of a metal cap whereby a bottle is to be
sealed. The deformable ring 21 is so
positioned with reference to the dished
portion 24 of the plunger 5 that when the
bottle to be sealed is inserted into the
capping head through the opening of the
ring 22, the deformable ring is co-planar
with the portion of the bottle neck
underneath the lip.

In operation the bottle neck with the
cap placed thereon is introduced through
the opening of the annular member 22
until the top surface of the cap touches
the bottom of the dished portion 24,
whereupon the plunger 5 is pushed up
with the aid of the bottle against the
action of the spring 6. The upward
movement of the plunger causes the
toggle elements 17 to rock about their
outer ends upwardly, whereby the
toggles push the slides 12 inwardly,
thereby causing the ring 21 to be
deformed and its inner diameter to be
reduced, whereby the ring 21 presses the
skirt of the metal cap with all-round
uniformity under the lip of the bottle
neck inwardly, thus sealing the bottle.
When the upward pressure on the bottle
is released the parts return into their
positions shown in Figure 1, whereupon
the sealed bottle can be removed.

During the deformation of the ring 21
the notches 23 close up as shown in
Figure 3, the notches enabling the
deformation to result in symmetrical and
uniform contraction of the ring 21.

The embodiment shown in Figures 8 to
10 differs from that described in that the
toggle elements 25 thereof have an outer
end which is straight in plan view. In
order that the outer ends of these toggle
elements 25 may have a good seat, an
annular member 26 having flat faces 27 is
inserted into the skirt portion 2, the
outer ends of the toggle element bearing
against the curved corners formed
between the flat faces 27 and the flange
28 of the member 26, which is held in
position by a ring 29 screwed into the
skirt portion 2 and having a flange lip
retaining the toggle elements 25 in
position.

In Figure 8 a bottle just being sealed
is indicated, the parts being accordingly
shown in operative position.

It is possible to make the deformable
ring 21 in arcuate sections by dividing it
radially in planes bisecting the angles
formed by the notches 23. This modifica-
tion is illustrated in Figure 11 which
shows a ring section 31 secured to a slide
member 12 by a tongue and groove
connection. These ring sections 31 form
a complete ring, similar to 21, in the
inoperative as well as in the operative

position, and the action of a sectional ring is exactly the same as the action of an undivided ring.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A capping head for a machine for capping bottles by forcing a peripheral portion of the skirt of a metal cap under an annular lip on the bottle neck, comprising an outer casing having a cylindrical bore, a plunger axially movable in said bore, an integral or sectional deformable ring coaxially mounted in said plunger and adapted to engage the skirt of the metal cap, a plurality of equiangularly disposed slide members in the plunger surrounding and engaging said ring and a plurality of radially disposed toggle elements, each pivotally engaging the inner surface of said outer casing at its outer end and one of said slide members at its inner end, so as to cause said slide members to move inwardly when the plunger moves in one direction and to allow them to move outwardly when the plunger moves in the opposite direction.

2. A capping head according to Claim 1, wherein the plunger is provided with radial recesses having parallel side walls, each recess housing and radially guiding one of the slide members.

3. A capping head according to Claim

2, wherein each of the toggle elements extends into one of the recesses of the plunger and is laterally guided thereby during the toggle action.

4. A capping head according to any of the preceding claims, wherein the toggles have rounded outer and inner ends and bear with said ends against corresponding rounded portions of the outer casing and slide members respectively.

5. A capping head according to any of the preceding claims, wherein the deformable ring has peripheral notches, each slide member engaging a portion of the ring between two of said notches.

6. A capping head according to Claim 5, wherein the ring is composed of arcuate sections formed by dividing the ring radially in planes bisecting the angles formed by the notches.

7. A capping head according to Claim 6, wherein each section of the deformable ring is connected to one of the slide members.

8. A capping head according to any of the preceding claims, wherein each slide member is pressed outwardly by a spring.

9. A capping head for a machine for capping bottles, substantially as herein described with reference to the accompanying drawings.

Dated this 17th day of December, 1937.

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