CUP-FEEDER FOR BOTTLE-CAPPERS.

To all whom it may concern:

Be it known that I, EDWARD F. EDGECOMBE, JR., a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented a new and useful Cap-Feeder for Bottle-Cappers, of which the following is a specification.

The object of my invention is to produce a device by means of which caps may be automatically delivered to bottles on their way to cap-attaching mechanism, the apparatus being of such character that considerable variation in heights of the bottles will not interfere with the proper application of the caps to the successive bottles.

The accompanying drawings illustrate my invention. Figure 1 is a central vertical section; Fig. 2 a section on line 2–2 of Fig. 1; Fig. 3 an elevation in partial vertical section, on a larger scale, of the cap delivery chute; Fig. 4 a transverse section of a portion of the parts shown in Fig. 3.

In the drawings, 10 indicates a depending chute rigidly attached to a stationary part of the machine and having a channel 11 through which the caps 12 may pass by gravity in the usual manner. In order to accommodate bottles of varying heights, the chute 10 is supplemented at its lower end by a vertically movable chute section 13, provided with a cap channel 14 and the possible gap between these two chute sections is bridged by two mating U-section channels 15 and 16, attached respectively to the chute sections 10 and 13. Forming the lower end of the rear wall of channel 14 is a swinging plate 17 pivoted at 18 and normally moved to the position shown in Fig. 1 by a spring 19.

At its lower end, plate 17 is provided with an extension 20 to which is secured a hardened wearing plate formed into a pair of fingers 21 which normally project into the channel 14 at each side thereof, at its lower end, to form obstructions upon which the lowermost cap 12 will rest, said fingers lying a distance below the lower end of the forward wall of section 13 approximately half the diameter of the bottle cap.

The parts 13–20, inclusive, are preferably carried by a carrier 25 which is conveniently removably attachable to the lower end of the chute section 10, as clearly indicated by the drawings, and pivoted at 26, 26, upon this carrier is a yoke 27 to the outer end of which is pivoted, at 28, a forwardly-extending arm 29 which is pivotally attached at 30 to the vertically movable slide 13. Mounted in carrier 25 is a slide 31 provided with a recess 32 into which the toe 13' of element 13 projects so as to engage slide 31 upwardly only. Slide 31 carries a curved shoe 40 which conforms to the arc of movement of the bottles 41 immediately preceding their arrival at the cap-applying point, and this shoe terminates just in front of the lowermost cap 12 at a point somewhat above the level of the wearing plate 21, as indicated in Fig. 1. Pivot pins 30 are projected through slots 25' in carrier 25 so that the section 13, and the parts which it carries, may be moved vertically, the slots limiting this vertical movement.

Pivoted at 42 on slide 31 is an arc-shaped shoe 43 to the outer end of which is pivoted at 44 an arc-shaped extension shoe 45 which is preferably bifurcated at its outer end. Both the shoes 43 and 45 are formed, on their under surfaces, to slidingly engage the caps 12 after they have been applied to the bottle and as the bottle continues to move in its arc-shaped path on its way to the cap-attaching mechanism, the exact path of movement of the bottles before and immediately following the application of the cap being immaterial but most conveniently accomplished by means of a rotary driving wheel 46 of the usual construction and operation.

The operation is as follows: Bottles arrive successively and contact shoe 40. If the bottles are of standard minimum height, they will barely touch, or just escape, the lowest and most advanced point of shoe 40 and will come into engagement with the lowermost cap 12 without materially raising the arm 29 and parts attached thereto. As the bottle contacts the lowermost cap 12, it will swing said cap upon the edge of plate 21 as a fulcrum, so that the cap will be delivered upon the bottle, the plate 17 yielding rearwardly, as indicated in Fig. 4, under the action of the tilting cap, and a bottle with the applied cap will then pass on with the cap held in place upon the bottle by the shoes 43 and 45.

If a bottle of more than minimum height arrives, it will contact shoe 40 at an earlier point and will thus raise arm 29 together with its attached parts, so that the lowermost cap 12 will be automatically raised so as to be presented to the oncoming bottle in ex-
actly the same position relative to the on-
coming bottle as it would be presented to a
bottle of minimum height, so that irrespec-
tive of the height of the bottle, the caps will
be applied thereto in the most efficient man-
ner. As the arm 29 rises and carries chute
section 18, and the column of caps upwardly,
the toe 19" engages the slide 31 and forces it
to move upwardly, thus carrying the shoe
sections 43 and 45 upwardly, but owing to
the pivotal connections 42 and 44, it will be
apparent that the forward portions of the
shoes 43 and 45 will remain successively in
contact with the cap which immediately pre-
ceding has been applied to a bottle, so as to
hold this cap against accidental displacement
as it proceeds to position where the capping
plunger may engage it. As the tall bottle
engages its cap and proceeds forwardly un-
der plate 21, it will engage the shoes 43 and
45 successively and those shoes will swing
upwardly to accommodate the excessive
height, but as soon as the tall bottle passes
from beneath plate 21, slide 15 and shoe 40
move downwardly to normal position, so that
if the next oncoming bottle is of minimum
height, the parts will be in proper position
for most efficient operation.

I claim as my invention:

1. Cap-applying mechanism comprising a
vertically yieldable support for a cap compris-
ing a fulcrum and means for supporting the
cap with a portion extending below the
fulcrum, means for driving packages suc-
cessively beneath the cap fulcrum and into
engagement with the supported cap, a shoe
arranged in the path of travel of the package
preceding the cap for controlling the vertical
position of the cap by the height of the cap-
receiving portion of the package, a flexible
shoe arranged to engage the applied caps, and
one-way interengaging members carried by
the cap support and the shoe support.

2. Cap-applying mechanism comprising a
vertically yieldable support for a cap compris-
ing a fulcrum and means for supporting the
cap with a portion extending below the
fulcrum, means for driving packages suc-
cessively beneath the cap fulcrum and into
engagement with the supported cap, a shoe
arranged in the path of travel of the package
preceding the cap for controlling the vertical
position of the cap by the height of the cap-
receiving portion of the package, and a flexible
shoe arranged to engage the applied caps.

3. Cap-applying mechanism comprising a
vertically yieldable support for a cap compris-
ing a fulcrum and means for supporting the
cap with a portion extending below the
fulcrum, means for driving packages suc-
cessively beneath the cap fulcrum and into
engagement with the supported cap, and a
shoe arranged in the path of travel of the
package preceding the cap for controlling
the vertical position of the cap by the height
of the cap-receiving portion of the package.

4. Cap-applying means comprising a ver-
tical cap chute, a vertically movable cap
chute section arranged at the lower end of
said cap chute and provided with a cap ful-
crump and supports for retaining a cap pro-
jected partially below said fulcrum, means for
propelling packages successively into en-
gagement with a supported cap and beneath
the fulcrum, a vertically movable shoe ar-
ranged above the path of travel of the pack-
ages preceding the cap chute, connections
between said shoe and the vertically movable
cap chute section, a flexible shoe arranged
above the path of travel of the packages be-
yond the cap chute, the initial end of said
flexible shoe having a flexible connection
with the first-mentioned shoe, and one-way
interengaging members carried by the verti-
cally movable chute section and the support
for the flexible shoe.

5. Cap-applying means comprising a ver-
tical cap chute, a vertically movable cap
chute section arranged at the lower end of said
cap chute and provided with a cap fulcrum
and supports for retaining the cap projected
partially below said fulcrum, means for
propelling packages successively into en-
gagement with a supported cap and beneath
the fulcrum, a vertically movable shoe arranged
above the path of travel of the packages pre-
ceding the cap chute, connections between
said shoe and the vertically movable cap
chute section, a flexible cap engaging shoe
arranged beyond the cap chute, and one-way
interengaging members carried by the verti-
cally movable chute section and the support
for the flexible shoe.

6. Cap-applying means comprising a ver-
tical cap chute, a vertically movable cap
chute section arranged at the lower end of
said cap chute and provided with a cap ful-
crump and supports for retaining a cap pro-
jected partially below said fulcrum, means for
propelling packages successively into en-
gagement with a supported cap and beneath
the fulcrum, a vertically movable shoe ar-
ranged above the path of travel of the pack-
ages preceding the cap chute, connections
between said shoe and the vertically movable
cap chute section, and a flexible shoe ar-
ranged above the path of travel of the pack-
age beyond the cap chute, the initial end of
said flexible shoe having a flexible connection
with the first-mentioned shoe.

7. Cap-applying means comprising a ver-
tical cap chute, a vertically movable cap chute
section arranged at the lower end of said cap
chute and provided with a cap fulcrum and
supports for retaining a cap projected par-
tially above said fulcrum, means for pro-
propelling packages successively into engage-
ment with a supported cap and beneath the
fulcrum, a vertically movable shoe arranged
above the path of travel of the packages preceding the cap chute, connections between said shoe and the vertically movable cap chute section, a flexible shoe arranged above the path of travel of the packages preceding the cap chute, connections between said shoe and the vertically movable cap chute section, and the support for the flexible shoe.

8. Cap-applying means comprising a vertical cap chute, a vertically-movable cap chute section arranged at the lower end of said cap chute and provided with a cap fulcrum and supports for retaining a cap projected partially below said fulcrum, means for propelling packages successively into engagement with a supported cap and beneath the fulcrum, a vertically movable shoe arranged above the path of travel of the packages preceding the cap chute, connections between said shoe and the vertically movable cap chute section, and a flexible shoe arranged above the path of travel of the packages beyond the cap chute.

In witness whereof I have hereunto set my hand at Indianapolis, Indiana, this 12th day of October, A. D. one thousand nine hundred and twenty.

       EDWARD F. EDGECOMBE, Jr.