July 20, 1937. A. C. GOUGH 2,087,251

BOTTLE CAPPER

Filed June 22, 1935 2 Sheets-Sheet 1

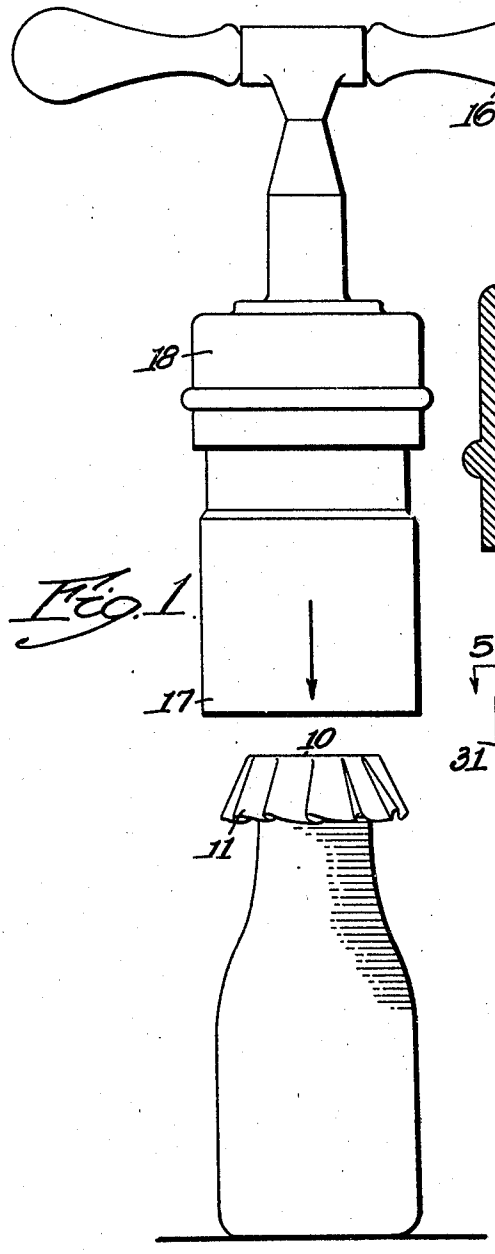


Fig. 1.

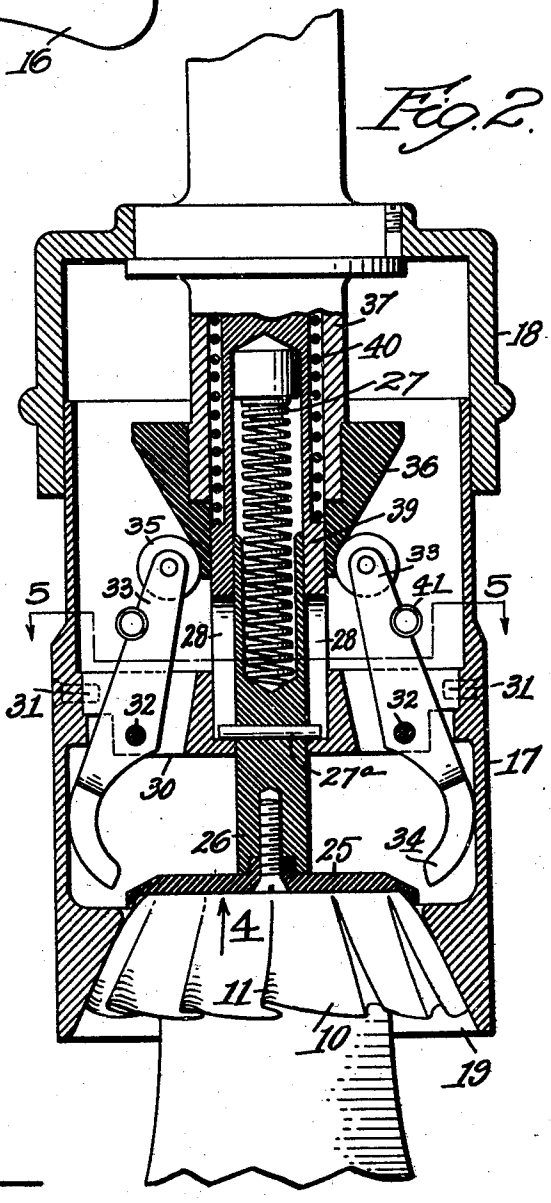


Fig. 2.

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July 20, 1937. A. C. GOUGH 2,087,251

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Filed June 22, 1935 2 Sheets-Sheet 2

Fig. 4.

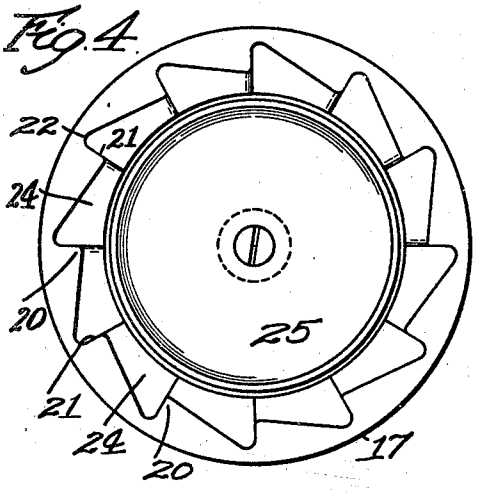
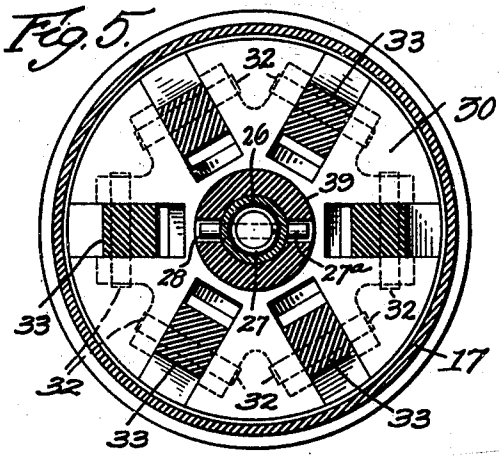


Fig. 5.



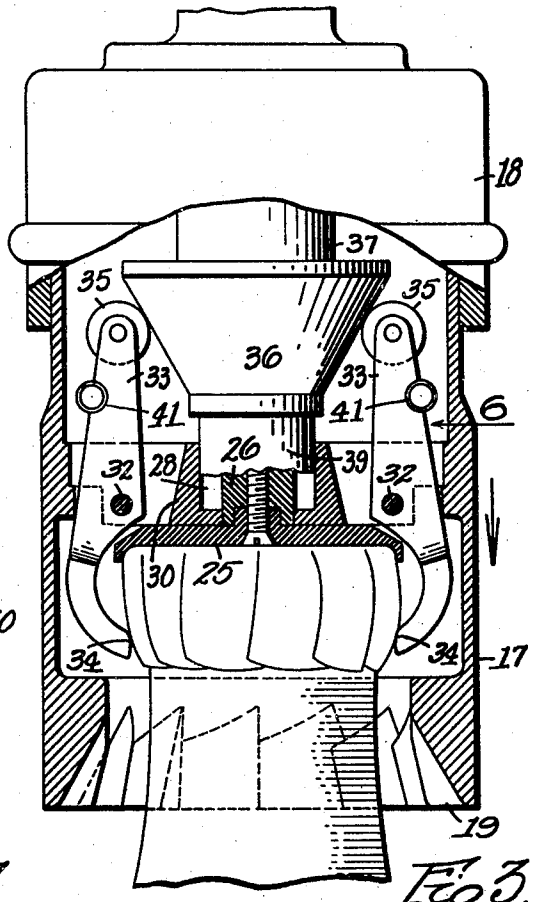


Fig. 3.

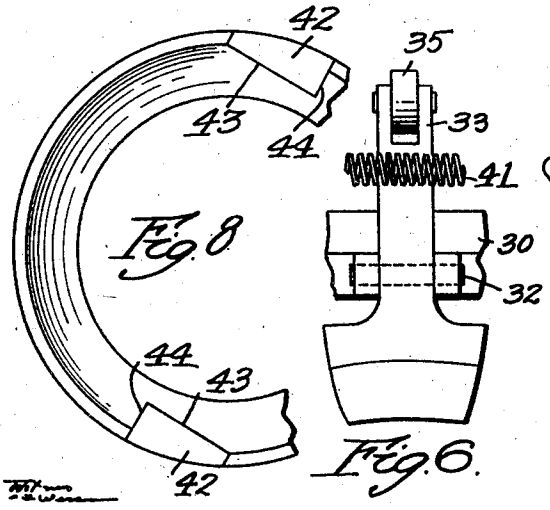


Fig. 8

Fig. 6.

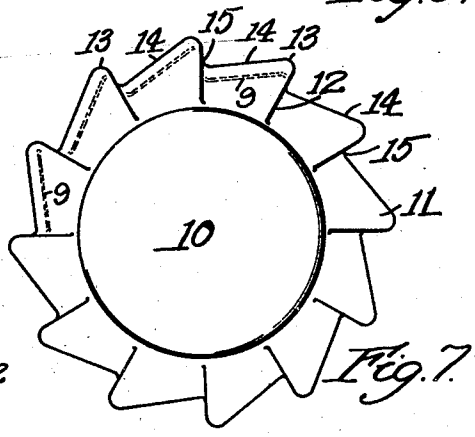


Fig. 7.

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UNITED STATES PATENT OFFICE

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BOTTLE CAPPER

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Application June 22, 1935, Serial No. 27,995

6 Claims. (Cl. 226—86)

This invention relates to a device for capping milk bottles especially but capable of use for capping other bottles and receptacles on which a paper cap is used.

The principal objects of this invention are to provide a method of capping milk bottles which consists in placing a fluted edged paper or other flexible cap on a bottle, bringing a casing, having an opening for receiving the head of the bottle, equipped with means for turning the cap on the bottle, down around the circumference of the cap; to provide a telescoping casing for supporting the cap turning means of such a nature that, when brought down on the top of the cap, a plunger will rest on the top of it to hold it; to provide means whereby the two parts of the telescoping casing will be forced together by further downward pressure so as to operate levers which carry shaping ends or tools for operating on the lower part of the surrounding periphery of the cap to bring the same down to its final condition against the neck of the bottle; to provide the said casing with a toothed conical surface, or opposite pins, for engaging the flutes in the periphery of the bottle cap for the purpose of turning it, and to provide a suitable cam for operating the said levers.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which

Fig. 1 is an elevation of a preferred form of this invention in which it is shown as a hand-operated device located above the milk bottle which is arranged with its cap in a position ready to be operated on;

Fig. 2 is a diametrical sectional view of the entire tool showing the first step of the operation;

Fig. 3 is a similar view showing the next step of the operation;

Fig. 4 is a bottom plan view as indicated by the arrow 4 in Fig. 2;

Fig. 5 is a sectional view on the line 5—5 of Fig. 2;

Fig. 6 is an elevation of one of the levers for performing the final pressing down operation;

Fig. 7 is a plan of a paper milk bottle cap as it is constructed ready to apply to a bottle, and

Fig. 8 is a view similar to Fig. 4 showing a modification.

This invention is intended to be applied particularly to milk bottles each of which is supplied with a paper or flexible cap 10 having its edge turned down in a truncated cone, as indicated in Fig. 1, and previously shaped in the form of a circular series of flutes 11 which are provided with triangular surfaces 12 arranged substantially radial and ending in a peak 13 extending down at an angle so that all these peaks are located in an imaginary conical surface. A surface 14 from each one of the peaks back to the bottom of the next radial surface 12 is slanted from the peak 13 back to the next surface 12 at a point nearer the center, forming a trough 15. These troughs also are located in a conical surface coinciding at the top with the conical surface including the peaks 13 and spaced inwardly from them at the bottom. The cap preferably is provided with an embedded soft metal wire 9 which will hold these flutes in the position shown in Figs. 1 and 7 ready to apply to the bottle and will also hold them in finally contracted position around the neck of the bottle.

In the operation of the device, one of these caps 10 is placed on the top of a milk bottle, as shown in Fig. 1, and the tool which is to shape it is lowered down on it as indicated by the arrow in that figure, although it is not essential that the bottle be placed in vertical position. This tool is provided with a handle 16 for operating it by hand and lifting it from one place to another, but it can be mounted on a machine and operated in the same way without the use of such a handle.

The tool comprises a casing 17 which is hollow and cylindrical and a cap 18 which is telescopically connected with the casing and mounted outside it. It is on this cap that the handle 16 is mounted. The bottom of the casing 17 has an opening 19 which is provided with teeth 20 slanting and having the same general shape as the flutes on the paper bottle cap that have been described. It will be seen that each tooth is provided with a triangular radial surface 21 which has an edge 22 nearer the center that is slanting and therefore all these edges are in an imaginary cone. The inner side 24 extending outwardly from the bottom of the radial surface 21 in each case is also on an incline and is nearly rectangular. These surfaces 24, bearing against the surface 14 of the milk bottle cap, will turn this cap when the casing is brought down vertically from the position shown in Fig. 1 to that shown in Fig. 2, unless the cap is already located in the proper position circumferentially. The purpose of turning the cap is to bring its peaks 13 into proper position for operation upon them by levers which will be described below. These peaks are all forced in and smoothly laid around

the bottle neck and in contact therewith by said levers.

For the purpose of holding the bottle cap in position, a plunger 25, in the form of a circular plate, is provided mounted on a rod 26 which is pressed by a spring 27 bearing on the cap 18 at one end so that it holds the bottle cap and yields as the casing descends. This rod has a cross-pin 27*a* which operates in a pair of vertical slots 28 in a hollow cylinder 39. A partition 30 is fixed to the casing 17 by pins 31. On the partition 30 are pivoted at 32 a circular series of levers 33 which have forming surfaces 34.

As the casing 17 descends still further, rolls 35 on the levers 33 will engage a conical cam 36 fixedly mounted with respect to a cylinder 37 carried by the cap 18. This pushes the levers inwardly at the bottom and the shaped surfaces 34 come into contact with the peaks of the flutes on the paper bottle cap, as shown in Fig. 3, to press them down into a position to fix the bottle cap on the bottle. It is to cause the peaks of the bottle cap to register with the surfaces 34 that the cap 10 has to be turned. Fig. 3 is not the lowest position but the casing is on the way down here and these shaping surfaces 34 will press the flutes still further in so that they will fit tightly against the neck of the bottle. It will be held there by the wire which has been mentioned.

When the parts reach the position shown in Fig. 3, the rod 27*a* comes up against the top of the slots 28 in the hollow cylinder 39. Between these two cylinders 37 and 39 is a spring 40 which tends to force the cylinder 39 downwardly. Around the levers 33 is a circular coil spring 41 which holds the rolls 35 against the cam 36.

The operation will be apparent from reference to Figs. 1, 2 and 3. In Fig. 1 the casing 17 has not yet come down into contact with the bottle cap but when it does the parts reach the position in Fig. 2. It will be noticed that the springs 40 and 27 have not yet yielded. However, the paper cap has been turned to the right position for registration with the shaping surfaces 34 and the plunger 25 is located on the cap. The parts 17 and 18 have not commenced to telescope but now that the plunger is in contact with the bottle, the further depression of the handle 16 will cause this telescoping action to commence and it will be carried through the different stages until it reaches that shown in Fig. 3 and it still has a little further to go as explained.

This constitutes an effective device for registering by a slight rotation and shaping the milk bottle cap to its final condition by a single motion downward of the handle 16 and cap 18.

In Fig. 8 is shown a modification in which two opposite pins 42 are used instead of a circular series of teeth. These pins have slanting surfaces 43 similar to the teeth and radial surfaces 44 for turning the cap.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:—

1. As an article of manufacture, a bottle capping device comprising a casing adapted to be moved over the top of a bottle having a paper cap thereon, said casing having a circular opening for receiving the head of the bottle, the opening having an inner surface formed of a series of inwardly projecting teeth, each tooth comprising a triangular radial surface slanting outwardly and a nearly circumferential, nearly rectangular, surface slanting outwardly toward the extreme end of the casing.

2. In a bottle capping device, the combination of a telescoping casing and cap, cap pressing means in the casing, means whereby, when the casing and cap are given a relative telescoping movement, said means will be operated to compress a fluted bottle cap at its outer edge, and means for first turning said cap to a position in which the flutes thereon register with said means.

3. In a bottle capping device, the combination of a casing made up of two parts telescopically connected, a series of levers circularly located in the casing and having surfaces for pressing inwardly the edges of a fluted paper bottle cap, means for swinging said levers into final pressing position upon a telescoping motion of the two parts of the casing, and means for turning the bottle cap, by a rectilinear motion of one of said parts, into a position in which the flutes register with said levers so as to be pressed inwardly thereby.

4. In a bottle capping device, the combination of a casing having a cap telescopically connected therewith, the casing having an opening in the end provided with a configuration comprising teeth having circumferentially slating surfaces for operation on a paper bottle cap having flutes in its edge of corresponding shape, said opening being adapted to receive the open end of a bottle having such a cap loosely mounted thereon, said casing and its cap being adapted to be moved longitudinally of the bottle to turn the bottle cap on its center, pivoted levers in the casing, and means carried by the casing cap for operating said levers, when the casing cap is forced further toward the bottle, to press down the flutes of the bottle cap into their final position.

5. As an article of manufacture, a bottle capping device comprising a casing having an opening in the end provided with circumferentially inclined surfaces shaped to engage the inclined flutes of a fluted paper bottle cap on a bottle and adapted to turn said cap thereby on the bottle by the relative rectilinear movement of said casing in the direction of the axis of the bottle.

6. As an article of manufacture, a bottle capping device comprising a casing adapted to be pressed over the head of a bottle with a fluted cap thereon, said casing having an opening in the end thereof provided with a conical toothed surface, the teeth thereof slanting circumferentially for turning the bottle cap on the bottle to the proper position by the straight relatively downward motion of the casing.

ARTHUR C. GOUGH.