June 6, 1933. L. J. MARINGER 1,912,906

BOTTLE CAPPING MECHANISM

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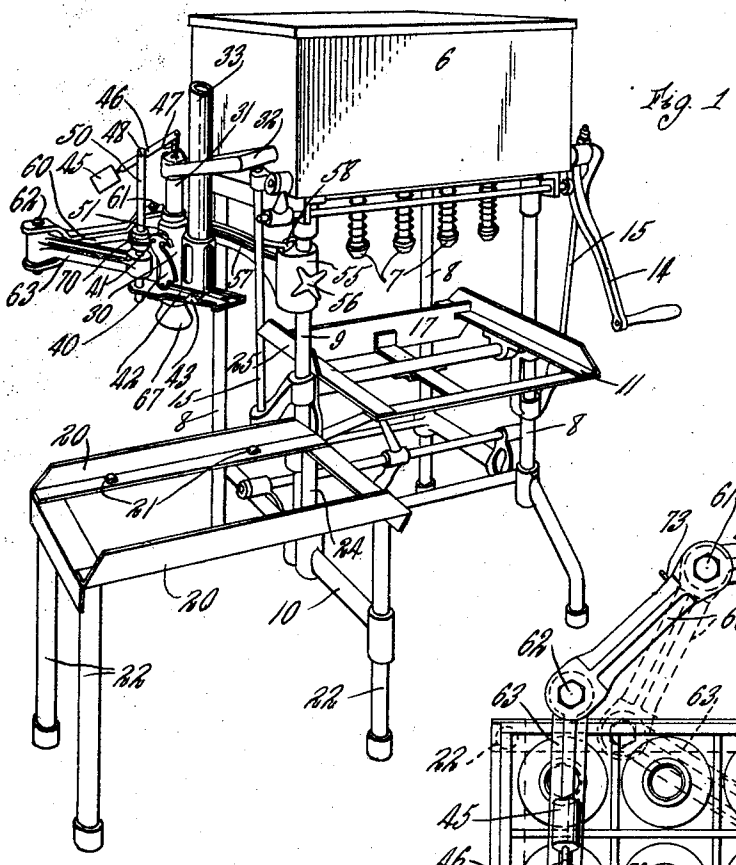


Fig. 1

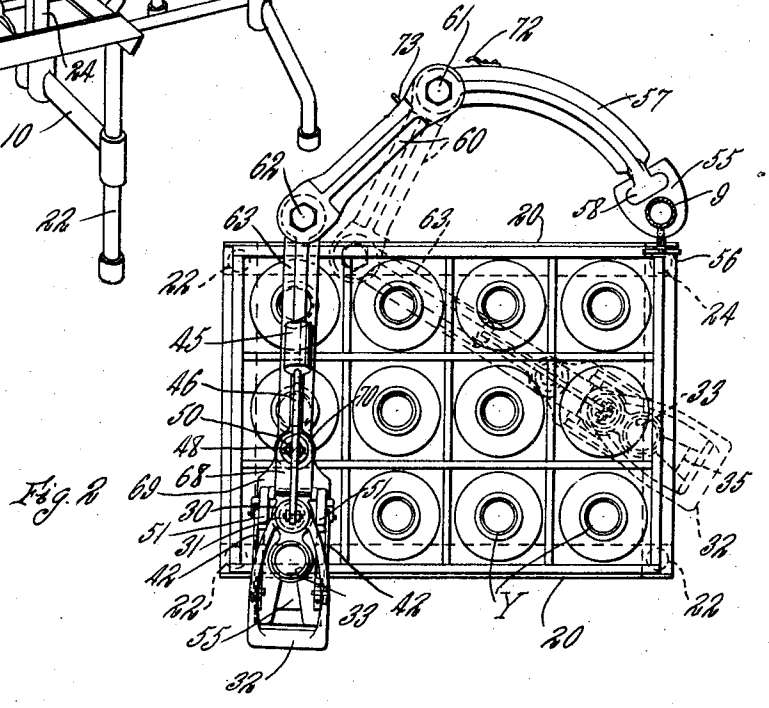


Fig. 2

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Fig. 3

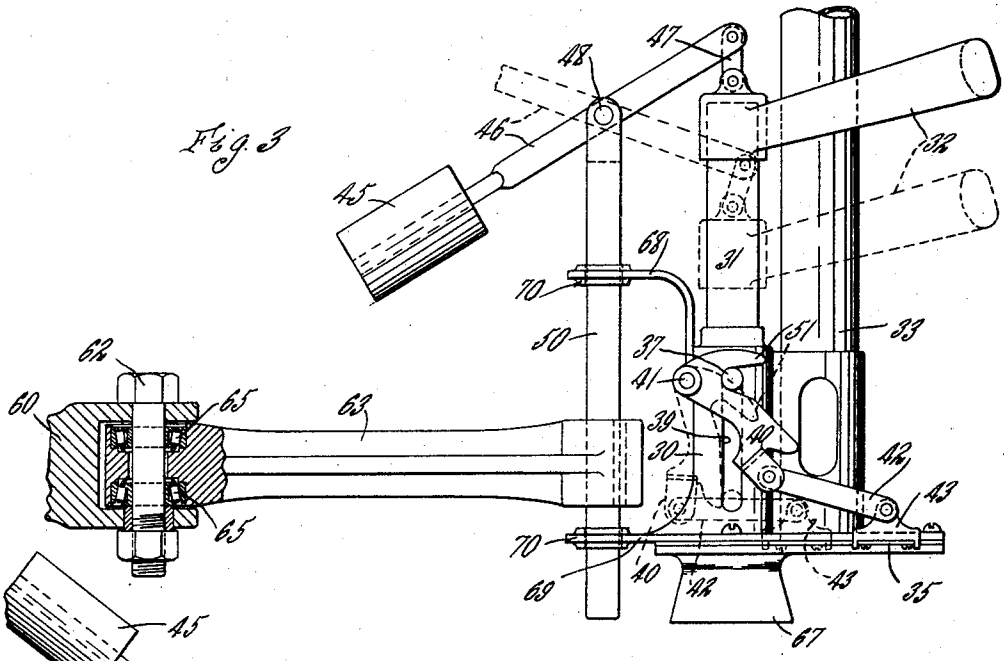
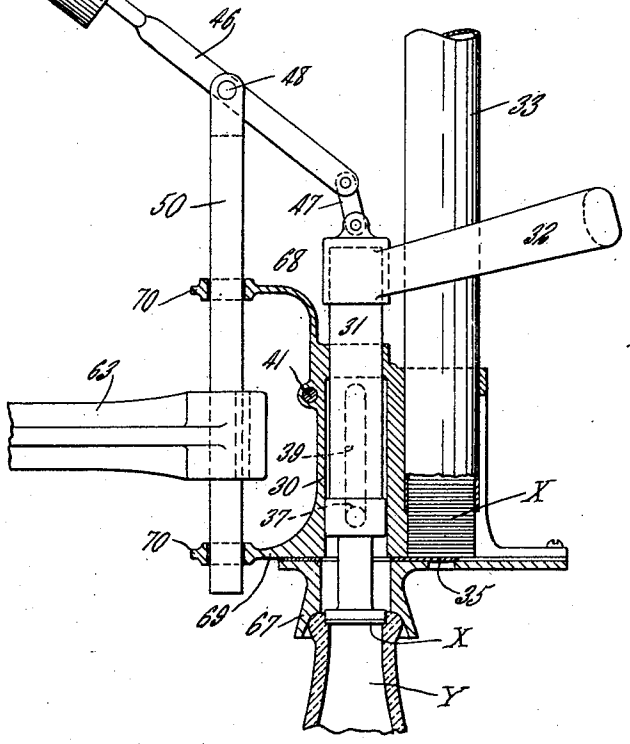


Fig 4



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UNITED STATES PATENT OFFICE

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BOTTLE CAPPING MECHANISM

Application filed April 1, 1932. Serial No. 602,410.

This invention relates to bottle capping mechanisms and to the application of mechanisms of this kind to bottle filling machines.

The objects of this invention are to provide a mounting or support for a capping mechanism which is arranged so as to permit the capping mechanism to swing into operative relation to each of the bottles in a case; also to provide a mounting or supporting mechanism for a capping device by means of which the capping device will be held at all times in an upright position so that the caps will be correctly placed on each bottle; also to provide a mounting for the capping mechanism on a bottle filling machine; also to provide a supporting mechanism of this kind which is adjustable to readily adapt the capping mechanism to operate on bottles of various sizes; also to provide a support for a case of bottles to be capped which is in operative relation to the bottle filling mechanism and to the capping device; also to improve the mounting of capping devices of this kind in the other respects hereinafter specified.

In the accompanying drawings:

Fig. 1 is a perspective view of a bottle filling machine having a capping mechanism mounted thereon in accordance with my invention.

Fig. 2 is a fragmentary, top plan view thereof, the bottle filling mechanism being omitted in this view.

Fig. 3 is an elevation of the capping mechanism and the arm on which the same is mounted.

Fig. 4 is a similar view thereof, showing the parts of the capping mechanism in different positions.

In small dairies or other bottling works, it has been customary to place caps on bottles by means of a portable hand-operated capping device which is placed manually over each bottle and then operated. It has been found, however, that such capping devices depend for their efficient operation upon the holding of the capping device in such a position that the axis of the capping device is substantially in alinement with the axis of the bottle to be capped. If the capping device is held at an angle to the axis of the bottle, the cap is so insecurely placed on the mouth of the bottle as to be readily displaced, resulting in the spoilage of the contents of the bottle. In accordance with this invention, the capping device is supported in such a manner that its axis is always parallel to the axes of the bottles to be capped, and consequently, when the capping device is lowered into engagement with the bottles and centered with reference to the bottles in the usual manner, it can only be operated when in correct relation to the bottles. In accordance with my invention, I preferably, but not necessarily, attach the support for the capping device on an upright leg or standard of the bottle filling machine and also, to provide on this machine or in immediate vicinity thereto a support for a case of the bottles to be capped, so that by holding the case and the capping device in correct relation to each other, the correct and accurate placing of the caps on the bottles is insured. Furthermore, the support for the capping device enables the bottles to be more quickly and easily capped, thus effecting a saving of labor.

Fig. 1 shows a bottle filling machine of a construction heretofore commonly employed, including a tank 6 for the milk or other liquid, and a plurality of bottle filling nozzles 7. The tank and filling mechanism is supported on upright legs or standards 8 and 9, the standard 9 in the particular construction shown extending upwardly from a horizontal or cross bar 10. The other legs or standards 8 are supported more or less directly from the floor. The front leg or standard 8 and the standard 9 also act as guides for a vertically movable table or support 11 for a case of bottles, and this support may be raised and lowered in the usual manner by means of a handle or crank 14 suitably connected by intermediate parts to upright links 15. It will be understood that by raising the case so that empty bottles engage the filling nozzles 7, the nozzles will discharge milk into the bottles. In the construction shown, only four of these nozzles are shown, and the support 11 is pro-

vided with a case shifter including a member 17 by means of which the case is moved forwardly after each actuation of the handle or crank 14 so as to place another row of bottles into operative relation to the nozzles 7. The case shifting mechanism may be of usual construction and is not shown in detail in the accompanying drawings. A bottle filling machine of any other construction may be employed in place of the one shown.

In order to facilitate the handling of the cases of bottles after the bottles have been filled, it is desirable to provide a second support for the case in immediate proximity to the support 11, and for this purpose in the construction shown, a second support is shown connected with or partly mounted on the frame of the bottle filling machine. This second support may include a pair of oppositely spaced angle bars 20, and if desired, rollers 21 may be provided on the horizontal flanges of the angle bars to facilitate movement of the case lengthwise of the bars 20. These bars, in the construction shown, are supported by three legs 22, one of which also forms a support for the front end of the horizontal frame member or bar 10 of the bottle filling machine. The fourth leg of the second support is formed by an upright member 24 extending from the cross bar 10 to the second support. In order to facilitate the transfer of the case of filled bottles from the support 11 of the bottle filling machine to the second support, one of the angle bars of the support 11 preferably has its upright flange 25 cut away at the portion thereof adjacent to the second support. Consequently, as the case of bottles is fed forwardly by the case shifter 17, it can readily be moved endwise from the support 11 to the second support between the upright flanges of the angle bars 20 thereof. When the case has thus been positioned upon the second support, the bottle filling machine is ready to operate on another case of bottles, and the capping of the bottles in the case on the second support can be proceeded with.

The capping device used in connection with this machine may be of any suitable or desired construction, and of itself does not constitute a part of this invention.

Briefly stated, the capping device illustrated, by way of example, in the accompanying drawings includes a cylindrical plunger guide 30 in which an upright plunger 31 may reciprocate, the upper end of the plunger having a handle 32 secured thereto for moving the plunger. 33 represents a magazine of caps which is suitably held in correct relation to the cylindrical part 30 so that the caps X can be fed from the bottom of the stack in the magazine by means of a slide 35 into position below the plunger 31. The slide may be actuated by the movement of the plunger 31, for which purpose the plunger is provided with a pin 37 extending through a slot 39 in the cylindrical plunger guide 30, and this pin engages a cam member 40 pivoted at 41 on the capping device. The lower end of the cam member 40 is connected by means of a link 42 with an upwardly extending projection or part 43 of the slide 35. As the plunger is moved downwardly from the full line position shown in Fig. 3, it will be obvious that the cam member 40, link 42 and the part 43 of the slide will also move from the full line positions to the dotted line positions in this figure, resulting in the moving of a cap from the magazine into a position below the plunger, so that the plunger upon further downward movement will press the cap into the mouth of the bottle Y, as shown in Fig. 4. The plunger and the parts connected therewith are returned to and yieldingly held in their initial positions by any suitable means, such for example, as a counterweight 45 arranged on one end of a lever 46, the other end of which is pivotally connected by means of a link 47 to the upper end of the plunger 31, the intermediate portion of the lever 46 being pivoted at 48 on an upright bar or rod 50.

During the upward movement of the plunger, the pin 37 engages with a projection or cam 51 formed integrally with the cam member 40 for returning the cam member and slide 35 to their initial positions in which another cap is supplied to the slide 35 from the magazine.

The capping device is held in position to move into and out of operative relation to the bottles in any suitable or desired manner from a part which is fixed with reference to the second support for the case. In the particular construction shown, the capping device is supported from the upright standard or leg 9 of the bottle filling machine, and this standard 9 has a sleeve or clamping device 55 secured thereto, that shown having a clamping screw 56 engaging in a threaded hole therein, the inner end of the screw engaging the standard 9. Consequently, the clamping member 55 may be adjusted at different elevations on the standard 9 according to the height of the bottles to be capped. The clamping sleeve 55 has an arm 57 extending outwardly therefrom. In the particular construction shown, the arm 57 is detachably mounted on the clamping sleeve, this being done by providing a downwardly tapering undercut slot or recess in the clamping sleeve 55 into which a correspondingly shaped end portion 58 of the arm 57 extends. The tapering slot limits the downwardly movement of the end 58 and permits the arm to be removed from the

clamping sleeve 55 by merely raising the end 58 of the arm out of the slot in the sleeve.

The arm 57 in the construction shown extends substantially rearwardly and laterally from the bottle filling machine and forms a part of an articulated or pivotal bracket. For this purpose, the outer end of this arm has an arm or link 60 pivoted thereto by means of an upright pivot 61. The other end of the link or arm 60 is pivotally connected by an upright pivot 62 to one end of an arm or a link 63 on the other end of which the upright post or rod 50 is rigidly secured. The pivotal connections between the links or arms may be of any suitable construction and, if desired, roller bearings 65 may be provided as indicated in Fig. 3.

By means of this arrangement, it will be clear that the capping device on the outer end of the arm or link 63 can move in a substantially horizontal plane over all parts of the case of bottles, as is clearly shown in Fig. 2, and the capping device is arranged at such an elevation by the correct adjustment of the clamping sleeve 55 that the lower end of the capping device, for example, the centering bell or mouth 67 of the capping device, will easily pass over the upper edges of the case and the bottles. When the capping device is placed over a bottle to be capped, the device is first moved bodily downwardly until the centering member 67 is properly seated on the top of a bottle. In order to permit this movement of the capping device relatively to the rod 50, the plunger guide 30 or other part of the capping device is provided with extensions or brackets 68 and 69 terminating in cylindrical guide bearings 70 through which the rod 50 extends. These guide bearings permit the capping device to move downwardly against the action of the counter weight 45 until the centering device 67 is seated on the top of a bottle. This downward movement is also effected by means of the handle 32, and after the centering device 67 engages the top of the bottle, the capping mechanism will be actuated upon further downward movement of the handle 32, to effect the capping of the bottle. Upon completion of the downward movement, the handle 32 is released, whereupon the weight 45 again draws the capping device bodily upwardly from the position shown in Fig. 4 to that shown in Fig. 3.

The mounting for the capping device herein described relieves the operator of the capping mechanism entirely from the necessity of supporting the device in axial alinement with the bottles in the case and makes it merely necessary to place the centering device on top of the bottle to effect the proper capping of the bottle. The second support for the case is in fixed relation to the standard 9 so that the bottles themselves will be supported in correct relation to the capping device by merely placing the case on the support. When the capping of the bottles in a case is completed, it is merely necessary for the operator to push the capping device rearwardly out of the way so that the case can be removed without any interference from the capping device, and when in this position, the capping device is ready for immediate use, by merely pulling the same over the bottle to be capped. Preferably, means are provided for yieldingly holding the articulated bracket in a rear or out-of-the way position when the capping of the bottles in a case is completed, and for this purpose the arm 57 may be provided with a spring latch or catch 72 with which a part of a V-shaped bolt 73 on the arm 60 may engage to hold the arm 60 from swinging forwardly until enough pull is exerted on the capping device to swing the link 60 out of its locked position, whereupon the bolt 73 becomes disengaged from the spring latch 72. Other means for holding the articulated bracket out of the way to avoid interfering with the handling of the case on the second support may be employed.

I claim:

1. The combination with a bottle filling machine having a support for a case of bottles to be filled and having an upright standard, of a second support connected with said bottle filling machine and arranged to receive a case of bottles from said first mentioned support, a bottle capping device mounted on said standard and including a bracket for holding said capping device in a position having its axis parallel to the axes of the bottles on said second support, said mechanism including links for permitting said capping device to swing into capping relation to each of the bottles in the case on said second support.

2. A bottle capping apparatus including a support for a case of bottles, a capping device, a plurality of pivotally connected arms, one of which is pivoted in fixed relation to said support and the others of which are connected by upright pivots to support said capping device in an upright position and to permit said capping device to swing over each of the bottles in said case, and means for releasably supporting said capping device in different elevations relatively to said support to enable said capping support to operate on bottles of different sizes.

3. A bottle capping apparatus including a support for a case of bottles, a capping device, a plurality of arms each pivotally connected at one end to the other, one of said arms having an end thereof mounted on a pivot which is fixed with reference to said support, and an end of another arm supporting said capping device, whereby said capping device may swing over each of said bot-

tles and above said case, and means for moving said capping device downwardly into said case relatively to said arms and into engagement with said bottles.

4. A bottle capping apparatus including a support for a plurality of bottles, a capping device, an articulated bracket, one end of which is secured in fixed relation to said support, and the other end of which carries said capping device, said bracket being formed to cause said capping device to swing over each of said bottles, and guide means connecting said bracket and said capping device for moving said capping device downwardly into engagement with said bottles.

5. A bottle capping apparatus including a support for a plurality of bottles, a capping device, an articulated bracket, one end of which is secured in fixed relation to said support, and the other end of which carries said capping device, said bracket being formed to cause said capping device to swing over each of said bottles, guide means connecting said bracket and said capping device for moving said capping device downwardly into engagement with said bottles, and means connecting said capping device and said bracket for normally holding said capping device in an upper position with reference to said bracket.

6. In a bottle capping apparatus, the combination of a support for a plurality of bottles, an articulated bracket pivoted to swing only in a horizontal plane in fixed relation above said support, a capping device mounted on the end of said bracket and movable vertically on the end of said bracket, and means for yieldingly holding said capping device in its upper position with reference to said bracket.

7. In a bottle capping apparatus, the combination of a support for a plurality of bottles, an articulated bracket pivoted to swing only in a horizontal plane in fixed relation above said support, a capping device mounted on the end of said bracket and movable vertically on the end of said bracket, and means for yieldingly holding said capping device in its upper position with reference to said bracket, and a handle on said capping device for moving the same downwardly relatively to said bracket into operative relation to a bottle and for actuating said capping device.

8. In a bottle capping apparatus, the combination of a support for a plurality of bottles, an articulated bracket pivoted to swing only in a horizontal plane in fixed relation above said support, a capping device mounted on the end of said bracket and movable vertically on the end of said bracket, said capping device including a plunger for placing a cap on a bottle, a handle on said plunger for actuating the same, said handle also moving said capping device downwardly relatively to said bracket, and means for yieldingly urging said plunger and capping device upwardly.

9. In a bottle capping apparatus, the combination of a support for a plurality of bottles, an articulated bracket pivoted to swing only in a horizontal plane in fixed relation above said support, an upright part arranged on the end of said bracket, a capping device slidable vertically on said upright part and including a plunger movable relatively to said capping device, a handle on said plunger for moving said plunger and capping device downwardly, a lever mounted on said upright part and connected at one end to said plunger, and means acting on the other end of said lever for yieldingly moving said plunger into an upper position.

10. The combination with a bottle filling machine, including a frame, bottle filling mechanism supported on said frame, a support for a case of bottles arranged in operative relation to said filling mechanism, and a second support for a case of bottles arranged to extend beyond the front end of said first support and at one side thereof to permit a case to be readily moved from said first support to said second support, and a bottle capping device mounted to swing into different positions over said second support and movable into operative relation with each of the bottles in a case on said second support.

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