Dec. 17, 1935. W. H. KNOWLES 2,024,824

CAPPER

Filed Nov. 14, 1931

Fig. 1.

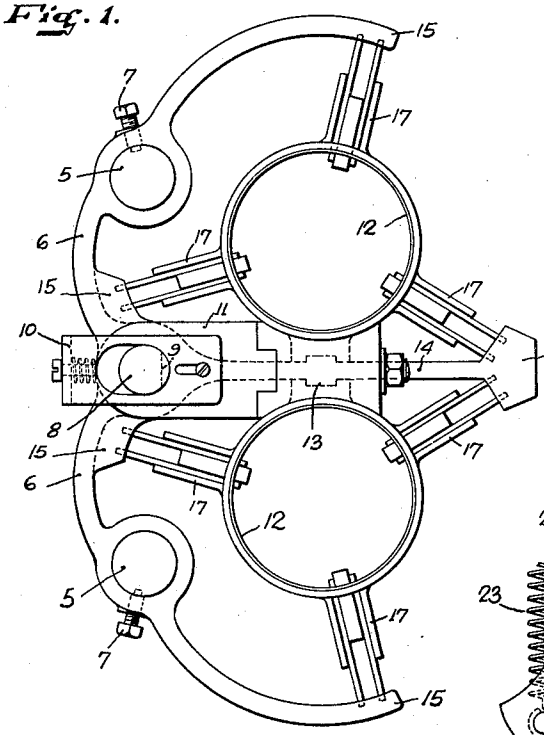


Fig. 3.

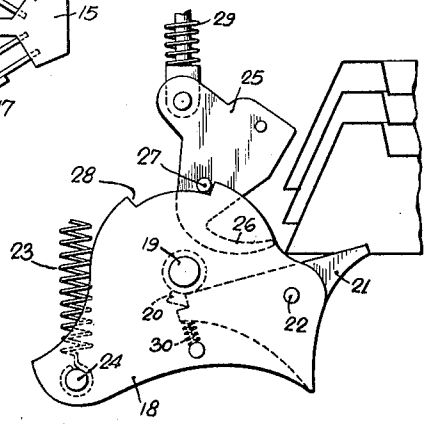
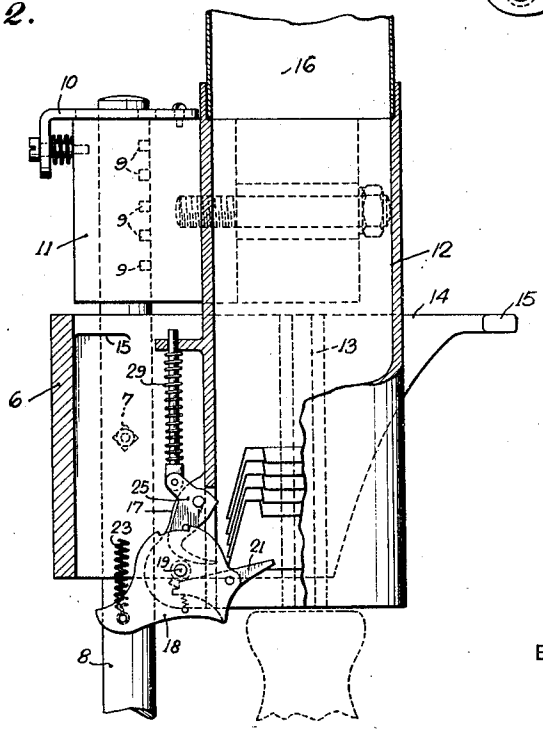


Fig. 2.



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CAPPER

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5 Claims. (Cl. 226—88.1)

This invention relates to a structurally and functionally improved depositing machine and, in its more specific aspects, aims to provide an apparatus by means of which articles, and particularly caps, are deposited upon receptacles.

With this in mind, it is an object of the invention to provide an apparatus of this character by means of which manual handling of the articles will be reduced to a minimum. This is particularly desirable where milk bottles are being capped, in that operators' hands will not touch the pouring lip of the receptacle nor the inner face of the cap. Moreover, no delay will be experienced in applying the caps to the receptacles after the latter are filled and it will be practical to have a substantially continuous cycle of operation involving filling of the receptacles, capping of the same and sealing thereof.

A further object of the invention is that of constructing a depositing or capping machine which will be of an automatic character and which will take cognizance of the fact if the receptacle is not in proper operative position with respect to the same so that no cap will be deposited under these circumstances.

A still further object is predicated upon providing a capper or depositor which not alone will perfectly position a cap in place, but will also tend to center the receptacle with respect to the apparatus if such receptacle is out of proper alignment with reference thereto.

Among other objects are those of furnishing an apparatus of this character which will embody relatively few and individually simple and rugged parts, these parts being capable of ready assemblage to provide a machine operating over long periods of time with freedom from difficulty and which may be sold at a relatively nominal figure.

With these and other objects in mind, reference is had to the attached sheet of drawings illustrating one practical embodiment of the invention and in which

Figure 1 is a plan view of a depositing machine or capper;

Figure 2 is a partly sectional side view thereof, and

Figure 3 is a detailed fragmentary view of certain of the operating mechanism.

In these views no attempt has been made to show the conveyor which will ordinarily serve to bring the receptacles into proper registry with the machine. Moreover, no showing of the filling and sealing units has been attempted, nor has there been illustrated the operating mechanism or prime mover for the present apparatus. Suffice it to say that the latter may be in the form of a treadle or a power-driven shaft suitably timed with reference to the conveyor which feeds the receptacles. Also, according to the present layout of apparatus, one pair of receptacles is simultaneously capped. Obviously a greater or lesser number of receptacles might be operated upon by mechanism following the teachings of the present invention.

Thus, in these several views the numeral 5 indicates posts to which a bracket 6 is secured in any suitable manner, as, for example, by set screws 7. Centrally disposed between these posts is an operating rod 8. This rod preferably has sliding bearing in the bracket 6 and is moved, as afore brought out, in any suitable manner to actuate the apparatus hereinafter described.

In the capping art, and especially where receptacles of the milk bottle type are involved, different heights of receptacles will be encountered. In other words, the machine may for a certain period of time act to cap bottles of the half pint size; thereafter it may function to cap bottles of the pint or quart size, etc. It is with this in mind that the bracket 6 is preferably mounted to be adjustable along the posts 5. Likewise, the head (hereinafter described) should be capable of movement throughout various ranges in accordance with the height of the receptacle to be capped and it is preferred that the rod be notched as at 9, so that in addition to supporting the head (hereinafter described) it may accommodate the edge of a spring pressed plate 10 mounted by this head. In this manner this portion of the apparatus may be conveniently adjusted.

Referring to the head, it preferably includes a body 11 encircling the upper end of the post 8 and this head mounts—in the present embodiment— a pair of tubes 12. These tubes have adjacent central extensions, providing, in co-operation with rail portions 13, a guide structure. These rail portions may be formed as a part of or secured to a central arm 14 of the bracket 6 and this arm, together with other parts of the bracket may provide contact or pad portions 15, the purpose of which will be hereinafter brought out.

Each of the tubes 12 is preferably counterbored to receive magazines 16, each containing a stack of caps or similar articles, and by the construction described, it will be apparent that by reciprocating the rod 8, a corresponding movement occurs on the part of the tubes 12 and the magazine supported thereby, this movement being

adequate to permit the lower ends of the tubes to clear the upper edges of receptacles positioned below the same or to enclose the upper ends of such receptacles. Accordingly, the stack of caps within each magazine 16 on tube 12 will be brought to positions overlying the pouring lips of the receptacles and will also be moved to a point relatively remote therefrom.

Now, with a view to providing a mechanism which will serve to support the stack of caps and to individually deposit the same upon a series of receptacles, it will be noted, as in Figure 1, that preferably at least three actuating units are provided in association with each of the tubes and adjacent the lower ends thereof. These units are preferably equally spaced and mounted between pairs of bracket portions 17 extending from the outer face of the tube. These units may each include a pair of spaced plates 18 supported upon a pin or shaft 19, which latter is fixed to and extends between the arms of the brackets 17. Each of these pins is formed with a radially extending abutment or latch portion 20 and cooperating with this abutment or latch portion is the rear end of a lever 21, pivotally mounted as at 22, between the pairs of plates 18. Springs 23 are provided, one for each of the units, and each of these springs has its upper end suitably attached to the body of the head 11 or to any proper portion of the apparatus, its lower end extending between and being secured to a pin 24 common to the pairs of plates 18. In line with the actuating units the lower ends of the tubes are slotted so as to accommodate and permit of the passage of the plates and associated parts through the side walls of the tube and into the space defined by such walls.

Supported between each pair of arms 17 is a tooth member 25 formed with a projection 26, which—as hereinafter described—performs the functions of a restraining, separating and ejecting element. This tooth member carries a stop pin 27 which rides within a notch 28 formed in the edges of the plates 18, and a spring pressed rod 29 normally serves to tend to press the tooth member beyond the position shown in Fig. 3. Finally, with reference to the actuating members, it will be noted that those portions of the plates 18 which are adjacent to the pin 24 follow a path of travel—as the tubes are raised and lowered—in which they will strike against the portions 15 of the bracket 6 and the arm 14 thereof.

Consequently, in operation it will be appreciated that with the magazines 16 filled with caps or similar articles, and with receptacles below the tubes 12, an operator by simply effecting an elevating of the post 8, together with the head carried thereby, will cause all of the parts other than those associated with the bracket 6 to move upwardly to a point at which the outer ends of the plates 18 co-act with the portions 15 to rock these plates to the position shown in Figures 2 and 3. In such position it will be observed that the levers 21 extend outwardly into supporting relationship with respect to the cap stack and that the projections 26 of the tooth members 25 are retracted with the pin 27 in engagement with the inner end wall of the cut-out or slot 28.

As the head lowers, the parts will be maintained in this position due to the fact that the inner end of the lever will be in engagement with the abutment or lug 20, this serving as a latch structure preventing any further movement of the several parts. Continued downward movement on the part of the head will eventually result in the outer ends of the levers 21 camming against the pouring lips of the two underlying receptacles (conceding that a pair of tubes are employed). This camming action will cause the receptacles to be centralized with respect to the tube axes if the receptacles are slightly off position. Continued downward movement will cause the outer ends of the levers to swing upwardly with respect to the plates 18. Consequently, the latch afforded by the abutment 20 and the rear end of the lever will be released and thereupon, due to the urging of the spring 23, the plates 18 will swing around the pivots 19. This will release the pin 27 from engagement with the forward edges of the plates and consequently the projections 26 will enter the space between the lowermost cap and the second cap, which will support all caps beyond the first cap; will separate the first cap from the overlying stack and will additionally cam against the walls of the lowermost cap to cause the same to be ejected from the stack. The plates 18 will finally move to a position at which the ends of the levers 21 entirely clear the skirt of the cap and permit the same to drop on to the receptacle. Movement of the plates beyond a predetermined position is prevented by engagement of the rear edge of the slot or cut-out portion 28 with the pin 27, and it will be understood that the parts are now in a position at which the latch structure between the abutment 20 and the rear end of the lever is released; the outer end of the lever is supporting no caps, these being all supported upon the projection 26 of the tooth members, and the spring 23 has moved the plates to their second extreme position.

At this time it will be appreciated that if desired, and as has been indicated in dotted lines in Fig. 3, a coil spring 30 may be employed which tends normally to press the latching inner end of each lever towards the lug so that no difficulties will be experienced in this connection.

Under the influence of the rod 8, the parts will now rise until the outer ends of the plates 18 strike the portions 15 associated with the bracket 6. Under continued upward movement the plates 18 will now be rocked back to the position shown in Figures 2 and 3, it being appreciated that due to the notch 28 the projections of the tooth members 25 will not be withdrawn from supporting relationship with respect to the stack until the levers 21 are in position to receive the same. In such positions the parts are in the initial condition previously described, and the entire cycle of operation may be repeated indefinitely.

Thus, a machine is provided which, in the embodiment under consideration, will efficiently deposit a single article upon each of the receptacles and in which if no receptacle is presented no depositing will follow because the levers 21 will not be tripped.

As previously brought out, the spring pressed plate 10 permits of an accurate positioning of the head in accordance with the height of the receptacles to which caps or similar elements are to be applied. Adjustment in this connection is also provided by the set screws or their equivalents by means of which the bracket may be adjusted along the posts.

Thus, among others, the several objects of the invention, as specifically afore noted, are achieved. Obviously numerous changes in construction and rearrangements of the parts—ac-

cording to the type of article to be deposited, and also according to the type of receptacles—may be resorted to without departing from the spirit of the invention as defined by the claims.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A depositing machine including, a frame, a cap magazine movably carried thereby, means secured to said magazine for singly discharging said caps, said means being normally inoperative, additional means responsive to the presence of a receptacle to be capped for releasing said cap discharging means, and an abutment carried by said frame and cooperating with said cap discharging means whereby the latter is reset when said magazine is shifted with respect to said frame.

2. A depositing machine including a support, a magazine movably carried thereby, said magazine comprising a guide for articles to be deposited, a plate normally connected to said guide, a lever rockingly mounted by said plate, a tooth member movably connected to said magazine, means for normally maintaining said lever and plate in projected positions wherein they support articles within said magazine and adjacent said guide, means for normally maintaining said tooth member in a position at which no articles are engaged thereby, and means operable upon said lever engaging a unit upon which an article is to be deposited for releasing said maintaining means to cause shifting of the lever and plate to a position at which no article support occurs and to cause shift of said tooth member to a position at which articles within said magazine are supported thereby.

3. A depositing machine including a support, a magazine movably carried thereby, said magazine comprising a guide for articles to be deposited, a plate normally connected to said guide, a lever rockingly mounted by said plate, a tooth member movably connected to said magazine, means for normally maintaining said lever and plate in projected positions wherein they support articles within said magazine and adjacent said guide, means for normally maintaining said tooth member in a position at which no articles are engaged thereby, means operable upon said lever engaging a unit upon which an article is to be deposited for releasing said maintaining means to cause shifting of the lever and plate to a position at which no article support occurs and to cause shift of said tooth member to a position at which articles within said magazine are supported thereby, and means forming a part of said tooth member and functioning during the shifting thereof to cause the same to cooperate with an article to deposit the latter.

4. A depositing machine including a support, a magazine movably carried thereby, said magazine comprising a guide for articles to be deposited, a plate normally connected to said guide, a lever rockingly mounted by said plate, a tooth member movably connected to said magazine, means for normally maintaining said lever and plate in projected positions wherein they support articles within said magazine and adjacent said guide, means controlled by said plate and lever for normally maintaining said tooth member in a position at which no articles are engaged thereby, and means operable upon said lever engaging a unit upon which an article is to be deposited for releasing said lever and plate maintaining means to cause said lever and plate to shift to a position at which no article support occurs, such shifting additionally resulting in a release of said tooth member maintaining means whereby said member shifts to a position at which articles associated with said magazine are supported by said member.

5. A depositing machine including a support, a magazine movably carried thereby, said magazine comprising a guide for articles to be deposited, a plate normally connected to said guide, a lever rockingly mounted by said plate, a tooth member movably connected to said magazine, means for normally maintaining said lever and plate in projected positions wherein they support articles within said magazine and adjacent said guide, means for normally maintaining said tooth member in a position at which no articles are engaged thereby, means tending to retract said lever and plate, means tending to project said tooth member, and means operable upon said lever engaging a unit upon which an article is to be deposited for releasing said maintaining means to cause shifting of the lever and plate to a position at which no article support occurs and to cause shift of said tooth member to a position at which articles within said magazine are supported thereby.

WILLIAM H. KNOWLES.