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ARTICLE TIMING DEVICE

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Fig. 1.

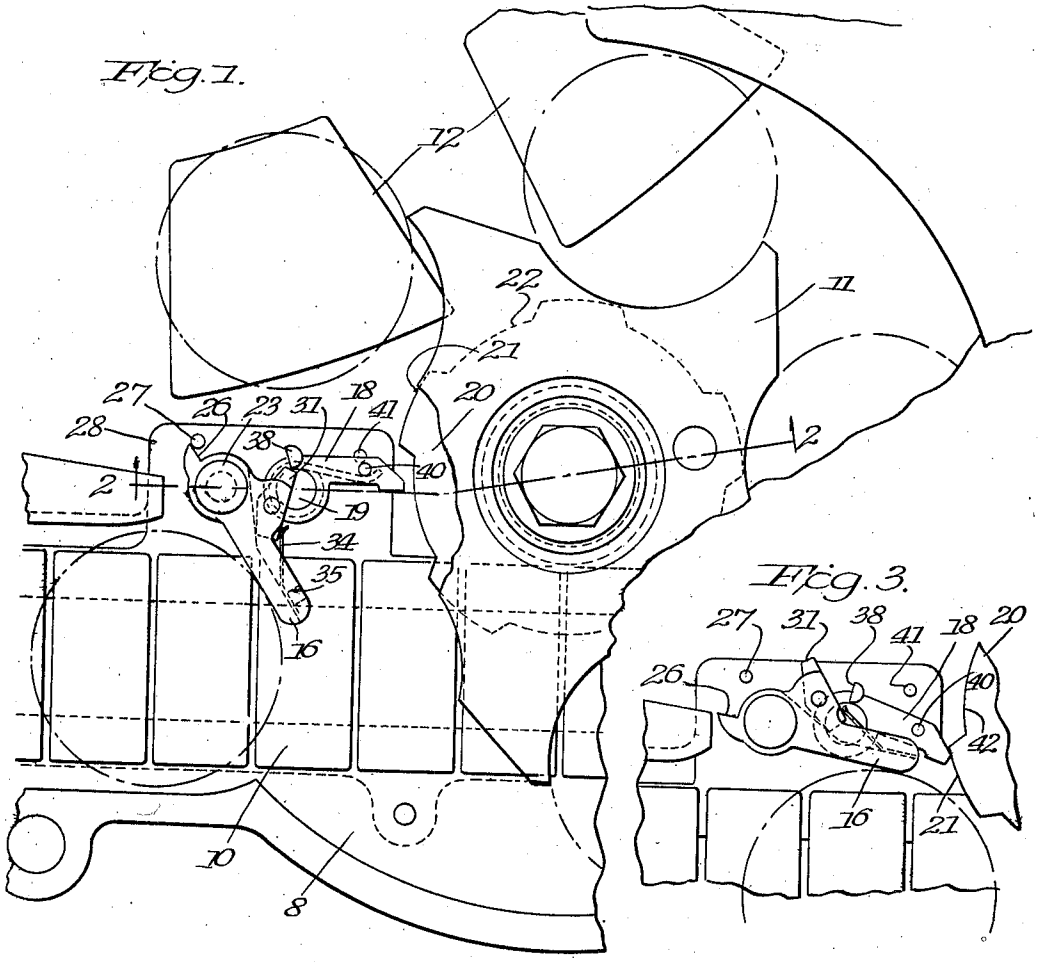
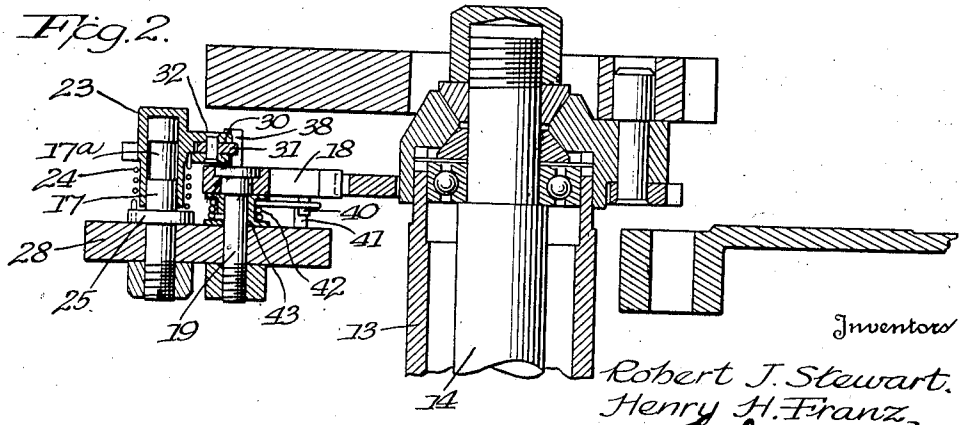


Fig. 3.

Fig. 2.



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ARTICLE TIMING DEVICE

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7 Claims. (Cl. 198—22)

The present invention relates to means for timing the movement of articles upon conveyors.

Containers are ordinarily delivered to machines such as filling and sealing machines by means of a straight-line conveyor which conducts the containers to a pocketed infeed dial synchronized with the filling machine. It is highly desirable to have a timing device associated with the conveyor to insure that the feed of containers therefrom will be properly synchronized with the infeed dial to prevent jamming of the containers at the infeed dial, since, when such a timing device is used, the containers can be positioned at random on the conveyor, thereby eliminating the necessity of any careful attention by an operator.

The principal object of the invention is to provide an article timing device which is of extreme simplicity and which is particularly adapted to enable articles to be fed at proper intervals from a straight line conveyor to a dial or other article-engaging element including pockets or similar article engaging portions.

Other objects and advantages of the invention will be apparent from the following specification and drawing, in which drawing—

Figure 1 shows the device of the present invention in plan view in normal position.

Figure 2 is a vertical sectional view on the line 2—2 of Figure 1, and

Figure 3 is a view similar to Figure 1, but showing the device in retracted position.

For purposes of illustration, the drawing discloses the device of the present invention applied to a bottle-filling machine including a stationary work table 8 and a rotating filling table. A continuously moving straight-line infeed conveyor 10 moves across the work table 8, and a continuously rotating and pocketed dial 11 receives bottles from conveyor 10 and successively positions them on bottle platforms 12 carried by the filling table. The dial 11 is fixed to and rotates with a vertical shaft 13, the rotation of the dial 11 and the filling table 9 being synchronized. As best shown in Figure 2, the shaft 13 which carries the dial 11 is hollow and rotates about a stationary post 14.

The device of the present invention comprises a container-engaging arm 16 pivotally mounted upon a post or support 17, and a latch arm 18 mounted for swinging movement upon a post or second support 19, the position of the latch arm 18 with respect to the container-engaging arm 16 being determined by a cam 20 including alternate rises 21 and dwells 22, cam 20 being adapted to rotate with the dial 11.

The container-engaging arm 16 includes a hub portion 23 which encloses the post 17, and the arm is normally urged to the position shown in Figure 1 by means of a coil spring 24 which surrounds the hub portion 23 and has one end secured to the arm 16 as shown in Figure 2, the other end of the spring being secured to a flange 25 of post 17.

The post 17 extends through an aperture in a base plate 28, which plate is secured to the work-table 8 of the filling machine. In the normal position of arm 16 shown in Figure 1, a stop shoulder 26 on arm 16 contacts with a stop pin 27 which extends up from the base plate 28. The extreme lower portion of post 17 is threaded to receive a nut 29 as shown in Figure 2. It will be observed from Figure 2 that post 17 has a kerf at its lower end so that when the nut 29 is loosened, the post may be slightly rotated to adjust the tension of spring 24, and the nut re-tightened. Also, post 17 is cut away as at 17a to reduce the bearing surface of the hub 23 on the post, and the upper end of the post is rounded for the same purpose.

The inner face of arm 16 is grooved as indicated at 30 in Figure 2, and a detent 31 positioned in this groove is pivotally mounted upon a riveted pin 32 provided intermediate the length of the detent. Detent 31 is normally held in the position indicated in Figure 1 by reason of the fact that a flat spring 34 bears upon the outer surface of the inner end of the detent, spring 34 being secured to arm 16 by means of a set screw 35. As shown in Figure 1, the opposite inner edge of detent 31 is preferably beveled and is held against the inner wall of groove 30, thereby limiting the clockwise turning movement of the detent upon its pin 32.

The detent 31 overlies the post 19, and its outer end is normally adapted to contact with a flat-sided pin 38 projecting upwardly from the latch 18. When the latch 18 is in its normal position, a pin 40 depending from the latch abuts against a pin 41 extending upwardly from the base plate 28, latch 18 being urged to this position by a coil spring 42 which surrounds a collar 43 clamped between the undersurface of the head of post 19 and the base plate 28. One end of coil spring 42 is secured to collar 43 and its opposite end bears against pin 40 which, as stated above, is fixed to latch arm 18.

In the operation of the device, the container-engaging arm 16 will project over the conveyor

10, as shown in Figure 1, the pin 38 on latch 18 then being directly behind the detent 31. Spring 42 holds latch 18 against pin 41, and spring 24 urges bottle-engaging arm 16 in a clockwise direction to hold its shoulder 26 against stop pin 27. Since the parts are thus locked in the position shown in Figure 1, containers moving with the straight line conveyor 10 will be held to the left of arm 16, with the leading container contacting with the arm.

Rotation of the dial 11 and the cam 20 carried thereby in a counter-clockwise direction will bring one of the rises 21 of the cam in contact with the free end of latch 18 just as one of the pockets of dial 11 approaches the straight line conveyor 10, with the result that the latch 18 will swing in a clockwise direction, moving pin 38 from behind the detent 31. The pressure of at least the leading container on the conveyor 10 will then cause the arm 16 to be swung in a counter-clockwise direction and out of the path of that container as shown in Figure 3 so that the conveyor 10 may move the container into the now opposed pocket of dial 11. As the leading container thus moves by the arm 16, the tip of the arm will wipe along the wall of the container because of the turning pressure exerted on the arm by the comparatively light spring 24. By the time that the container has entirely cleared the arm 16, and before a second container can move past arm 16, the rise 21 of cam 20 will have moved out of contact with the free end of latch 18 so that the container-engaging arm 16 will again be momentarily locked in the position shown in Figure 1, holding the next container against forward movement until a pocket of the dial 11 is in proper position with respect to conveyor 10. The provision of the pivoted detent 31 on arm 16 will permit the arm to return from the retracted position shown in Figure 3 to the position shown in Figure 1 regardless of the position of the pin 38. That is, the detent 31 may turn on the rivet 32 to wipe past the pin 38 if pin 38 happens to be somewhat in the path of return movement of the latch.

As is clearly shown in the drawing, the container engaging arm 16 and latch 18 move horizontally and the entire structure may be positioned above the table 8 where it is available for adjustment, lubrication and inspection. Also, with the entire structure above table 20, no supports for bearing need be provided except upon the upper surface of the table or on the plate 28. The horizontal arrangement of members 16 and 18 and their direct relation with each other and with cam 20 also simplifies the structure in that it reduces the number of elements necessary in the device.

It will be noted that while the mechanism described above is of extreme simplicity, it is fully adjustable and quite positive in its control of articles, and cannot itself become jammed in any intermediate position.

The terminology used in the specification is for purposes of description, the scope of the invention being indicated in the following claims.

We claim:

1. In a timing device for articles moving upon conveyors, a support adapted to be positioned adjacent the conveyor, a spring-urged arm on said support projecting forwardly over the conveyor, a latch arm normally locking said first arm in its spring-urged position, said latch arm being adapted to be swung from engagement with said spring-urged arm so that an article may swing the latter rearwardly, and a pivoted detent carried by one of said arms and adapted to bear against said other arm.

2. In a timing device for articles moving upon conveyors, a support adapted to be positioned adjacent the conveyor, an arm pivoted above said support and spring-urged to normally project forwardly over the conveyor in a horizontal plane, a latch member pivoted above said support and including a portion horizontally and arcuately movable above said support to normally engage said arm and lock the latter in its spring-urged position, said latch being adapted to be swung from engagement with said arm so that an article may swing the latter rearwardly.

3. In combination, a conveyor, a pocketed rotary dial adapted to receive articles from said conveyor, and a timing device for controlling the movement of articles from said conveyor to said dial comprising a support, a spring-urged arm on said support normally projecting forwardly over the conveyor, a pivoted latch member normally locking said arm in its spring-urged position, said dial having a cam member moving therewith to move said latch arm out of locking relation with respect to said spring-urged arm so that an article on the conveyor may swing the latter rearwardly, and a pivoted detent carried by said spring-urged arm and adapted to normally abut against said latch member.

4. A device for controlling the movement of containers by a conveyor comprising an arcuately movable gate normally projecting into the path of container travel and movable from said path by container pressure, said gate having a rearwardly disposed shoulder, an arcuately movable latch having a shoulder adapted to positively secure said gate in said projecting position by engagement with said gate shoulder, resilient means maintaining said gate and said latch in engagement with each other and opposing disengagement thereof, and a rotatable cam adjoining said latch and adapted to directly engage said latch to move the latter from engagement with said gate at predetermined intervals to permit movement of a container past said gate during each period of disengagement.

5. In combination, a support, a conveyor, a pocketed rotary dial to receive articles from said conveyor, said conveyor and dial being mounted upon said support, a horizontally movable arm pivoted on and above said support and spring-urged to normally project over said conveyor, an arcuately and horizontally movable latch member pivoted on and above said support to normally engage and lock said arm in its spring-urged position, said latch member including an integral cam-engaging portion, said dial having a cam moving therewith to engage said portion of said latch member to move the latch member out of locking relation to said spring-urged arm so that an article on the conveyor may swing the arm rearwardly.

6. A device for controlling the movement of containers by a conveyor comprising an arcuately movable container arresting member normally projecting into the path of container travel and movable from said path by container pressure, a second arcuately movable member normally engaging said arresting member to retain the latter in said projecting position, said two arcuately movable members being movable horizontally, resilient means maintaining said arresting member and said securing member in engagement with each other and opposing disengage-

ment thereof, and rotatable means for disengaging said two members to permit movement of said arresting member from said container path at predetermined intervals, said rotatable means directly engaging said second member.

7. In combination, a support, means for conveying containers across said support and means mounted on said support to receive containers from said conveying means, means for controlling the movement of containers from said conveying means to said receiving means comprising an arcuately movable container arresting member normally projecting into the path of container travel on said conveying means and movable from said path by an arrested container, an arcuately movable member for positively securing said arresting member in said projecting position by engagement therewith, said two arcuately movable members being mounted on said support for horizontal movement parallel to and above the latter, resilient means maintaining said arresting member and said securing member in engagement with each other and opposing disengagement thereof, and rotatable means adjoining said securing member and adapted to periodically contact with the latter to disengage it from said arresting member in timed relationship with presentation of said container receiving means in receiving position and thereby permit movement of a container past said arresting member during said periods of disengagement.

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