April 11, 1961 G. W. HAAB 2,979,182

STOP ASSEMBLY

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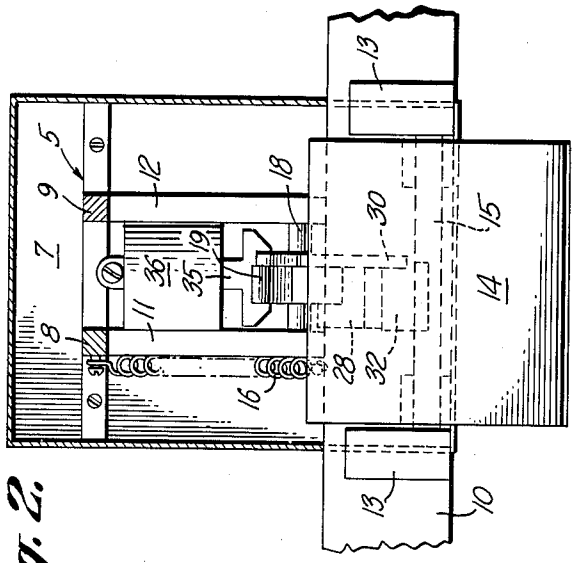


Fig. 2.

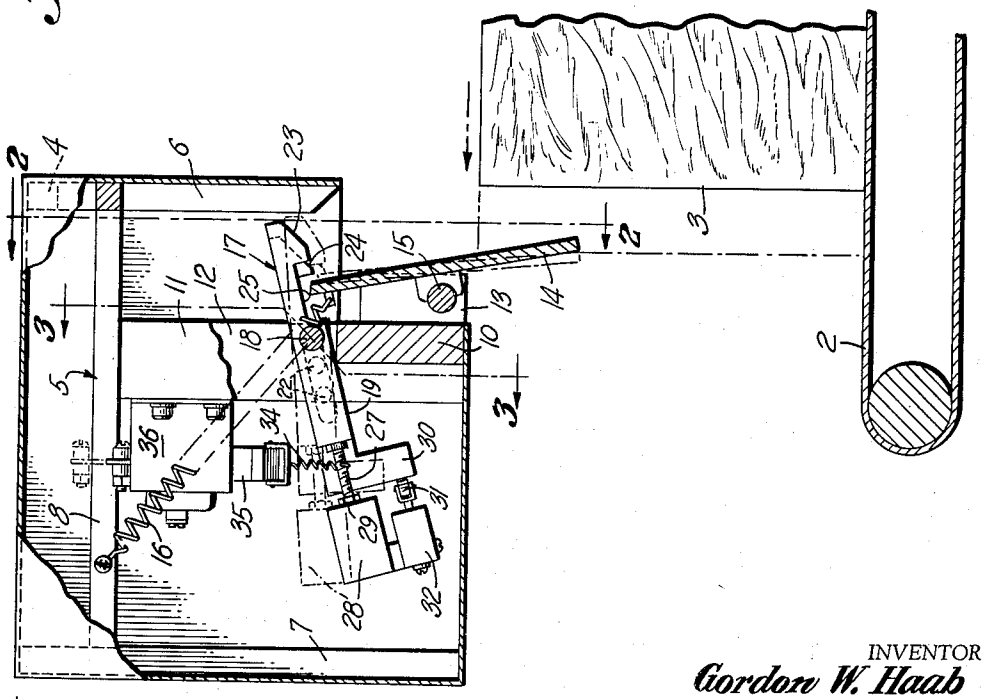


Fig. 1.

INVENTOR
Gordon W. Haab

BY Mason, Fenwick & Lawrence
ATTORNEYS

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Fig. 3.

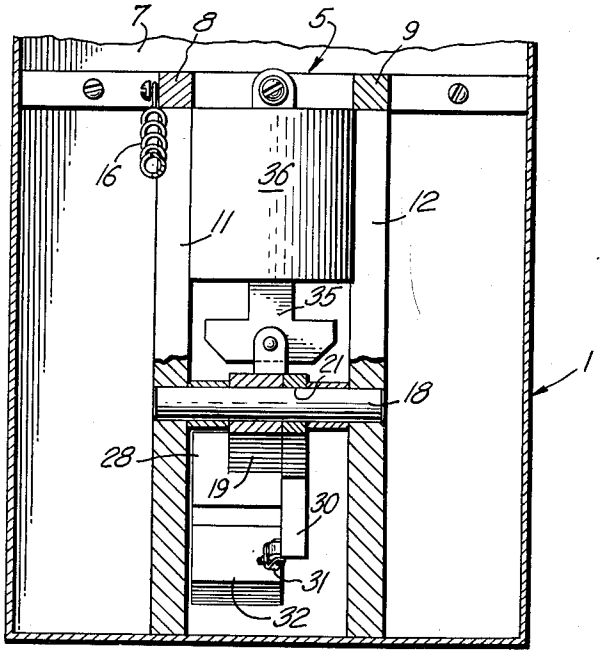
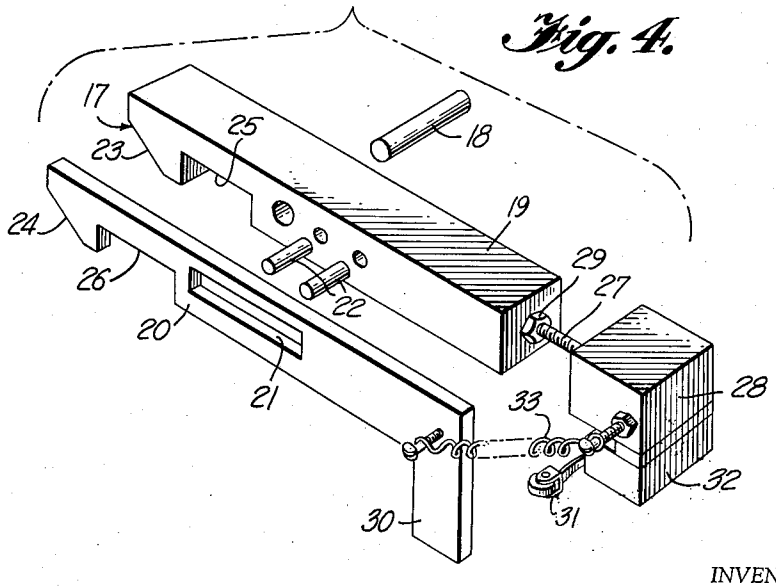


Fig. 4.



INVENTOR
Gordon W. Haab

BY Mason, Fenwick & Lawrence
ATTORNEYS

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STOP ASSEMBLY

Gordon W. Haab, 2203 Oakwood Lane, Richmond 28, Va.

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6 Claims. (Cl. 198—34)

This invention relates to stop mechanisms, and particularly to stop mechanisms for halting at a predetermined position articles advancing along a conveyor, or feed path, and holding the article in position until the completion of a specified operation.

Stops of various kinds have been used to control the movements of articles along a conveyor path. These have taken the form of hook-like members to engage over the edge of the article to be held, pivoted stop plates, pins, etc. All of these require extreme accuracy of location and preciseness of movement for proper operation. Where a combination of such elements are used, the same problems are present, and springs are usually relied upon as the actuating means to lock the stop in position.

The object of the present invention is to provide an improved stop mechanism which will operate smoothly and positively to accurately position the article to be stopped.

A further object is the provision of a stop assembly which will be latched by positive means and operated by movement of the article to be stopped along its feed path.

Another object is to provide a latch type stop assembly in which the latch member is a balanced, floating member, positively moved to, and held in, latching position.

Yet another object is to provide a stop assembly which includes a floating latch member and a stop plate, normally out of engagement, but in which movement of the stop plate in a predetermined direction will cause actuation of the latch to hold the plate against further movement.

A still further object is the provision of such an assembly wherein there are means to adjust the floating action of the latch member.

Other objects of the invention will become apparent from the following description of one practical embodiment thereof, when taken in conjunction with the drawings which accompany, and form part of, this specification.

In the drawings:

Figure 1 is a vertical section through a stop assembly embodying the principles of the present invention, with the stop assembly being shown in association with a case conveyor with a case moving into position to be stopped, and with the case and stop assembly being shown in dotted lines in the positions occupied when the case is held in stopped position;

Figure 2 is a vertical transverse section through the stop assembly housing, taken on the line 2—2 of Figure 1;

Figure 3 is another vertical transverse section taken in the plane of the latch pivot and substantially on the line 3—3 of Figure 1; and

Figure 4 is a perspective view of the latch arm with the parts shown separated from one another for clarity.

In general, the invention concerns a stop assembly for articles, such as bottle, or carton, cases, moving along a conveyor line to stop successive articles, or cases, and hold them in predetermined position on the line. The stop assembly includes a stop plate to be contacted by the cases, and a latch operable when the plate is contacted to latch the plate against movement to hold a case in position. The latch is solenoid operated to latched position, and has a counterbalanced, free floating movement when released.

Referring to the drawings in detail, there is shown a stop assembly 1 mounted above a case-feeding conveyor 2 on which a case 3 is being fed to a predetermined position where it will be stopped and held for loading or other operation. The case and its conveyor are merely illustrative of any article which is to be stopped and held, and its conveying means.

The stop assembly is mounted in a housing 4 upon a suitable frame 5. The frame may consist of front and back plates 6 and 7, longitudinal struts 8 and 9, a transverse brace 10, and vertical struts 11 and 12, extending from the transverse brace to the longitudinal. This frame may be modified as needed, and is merely illustrative of a suitable frame for supporting the operating members of the device.

The transverse brace 10 carries two brackets 13 near its ends, between which a stop plate 14 is pivoted. The plate is of rectangular shape and has a pivot pin 15 extending across its back with its ends journaled in the brackets 13. The plate may have free swinging movement about its pivot, but is biased toward an angular position wherein its lower end is advanced toward the direction from which cases will move to the stop. It is yieldingly held in this position by means of a spring 16 connected to the plate near its top end to the longitudinal strut 8. Upon contact of a case with the lower end of the plate, the plate may swing in a clockwise direction as viewed in Figure 1 against the action of spring 16.

A latch 17 is pivotally mounted upon a pivot pin 18 fixed in the vertical struts 11 and 12. The latch consists of a latch body 19 and a latch trigger 20 mounted side by side, with the trigger having an elongated slot 21 surrounding the pivot pin 18 to permit the trigger to slide longitudinally relative to the latch body. Pins 22 in the body and projecting through the slot 21 hold the trigger to longitudinal movement relative to the body and attach the trigger to the body. The body and trigger have similar inclined cam faces 23 and 24 at their latch ends and are provided with latching notches 25 and 26.

At the back end of the latch body 19 there is a support post 27 having its opposite ends threaded and screwed into the latch body and a counter-weight 28. Lock nuts 29 hold secure the post to those elements and permit adjustment to vary the distance of the counter-weight from the body. This, of course, will vary the effective weight of the counter-weight upon the latch member. The latch trigger has a down-turned arm 30 at its rear in contact with a switch arm 31 of a micro-switch 32 mounted beneath the counter-weight. It will be seen that adjustment of the counter-weight toward and from the latch body will also serve to determine the position of the micro-switch arm and the relative positions of the latch body and trigger when contact between the trigger and switch arm is made and broken. A spring 33 connected to pins on the trigger and counter-weight serves to bias the trigger rearwardly against the arm of the micro-switch. This will serve to hold the switch in open position. When the parts are in this position, the trigger is retracted and their respective notches are in stepped relation, with the notch of the trigger rearwardly disposed relative to that of the latch body.

The support post 27 has one end of a coil spring 34 connected to it, and the other end of the spring is connected to the movable core member 35 of a solenoid 36.

This serves to yieldingly, or floatingly, suspend the rear portion of the latch against the weight of the counterbalance **28**. It will be seen that by adjusting the counterweight position, more or less weight will be imposed upon the spring **34**, and the angular position of repose of the latch may be closely adjusted. When in this position, only slight pressure is required to swing the latch on its pivot **18** in either direction. It will be understood that micro-switch **32** and solenoid **36** are in circuit with a source of power and that when the switch closes the solenoid will be energized and lift the back end of the latch to swing the latch about its pivot to assume a horizontal position, as shown in dotted lines in Figure 1.

Referring particularly to Figure 1, it will be seen that the upper end of stop plate **14** rests in the notch **25** of the latch body, held against the back edge of the notch by spring **16**. At the angle which the latch assumes, the stop plate would move out of the notch when swung about its pivot. The retracted trigger, however, effects a reduction of the notch opening, and the stop plate will not clear the trigger notch but will contact it. Thus, if a casing moving along the conveyor **2** strikes the lower end of the stop plate it will rock the plate in a clockwise direction about its pivot causing the upper end of the stop plate to move forward and contact the trigger notch. Continued movement of the plate will move the trigger forward relative to the latch body, thus moving the arm **30** from the switch arm **31** and allowing switch **32** to close, energizing the solenoid. The solenoid will lift its core and swing the latch to a substantially horizontal position, positively locking the stop plate against further movement when it strikes the edge of the latch body notch and definitely holding the case in position. When the case is filled, or other operation performed, the solenoid circuit will be broken by other means not shown. The weighted latch will swing immediately about its pivot, lifting its notched end free of the stop plate and permitting the plate to rotate and allow the case to move freely on the conveyor. When the case has passed, the stop plate will swing back about its pivot under the influence of spring **16**. By this time, spring **33** will have retracted the trigger to its original position. This will place at least the trigger portion of the latch in the path of swinging movement of the stop plate, but the plate will strike the cammed edges of the latch or trigger and the latch will lift to allow the top of the stop plate to drop into the notch. Spring **34** will give freely to allow this movement. The assembly is now ready to operate upon the movement of another case along the conveyor toward the stop position.

While in the above one practical embodiment of the invention has been disclosed, it will be understood that the details of construction shown and described are merely by way of example, and the invention may take other forms within the scope of the appended claims.

What is claimed is:

1. A stop assembly for positioning an article moving along a conveyor comprising, a frame, a stop plate pivotally mounted intermediate its ends and the frame adapted to be positioned to have one end in the path of movement of articles along the conveyor, a latch pivotally mounted on the frame, said latch including a latch body and a latch trigger slidably mounted on the latch body, the latch body and latch trigger having companion notches for engagement over the end of the stop plate, the effective span of the combined notch being determined by the position of the latch trigger relative to the latch body, means to retract the latch trigger to reduce the effective span of the notch, a micro-switch carried by the latch body and actuated by contact of the latch trigger when in retracted position, a solenoid connected to the latch to swing the latch to locking engagement with the stop plate actuated by the micro-switch when contact between the micro-switch and latch trigger is broken by forward sliding movement of the latch trigger, said trigger when in retracted position having its notch engageable with the stop plate for forward movement by the stop plate when the stop plate is rocked about its pivot.

2. A stop assembly as claimed in claim 1 wherein the latch has a counterbalance positioned to normally swing the latch to stop plate releasing position.

3. A stop assembly as claimed in claim 2 wherein the counterbalance is movable relative to the latch body to adjust the weight distribution of the latch.

4. A stop assembly as claimed in claim 1 wherein the connection between the solenoid and latch is a yieldingly extensible one.

5. A stop assembly as claimed in claim 1 wherein the stop plate is biased to urge said one end in a direction contra to that of movement of articles on the conveyor.

6. A stop assembly for positioning an article moving along a conveyor comprising, a frame, a stop plate pivotally mounted on the frame to provide an article-engaging end and a latch-engaging end, a latch pivoted to the frame and having a notch to seat over the latch-engaging end of the stop plate when the latch is moved to plate-engaging position, said latch being biased away from plate-engaging position, a latch trigger slidably mounted in the latch and having a notch to engage the latch-engaging end of the stop plate, means to bias the latch trigger to stop plate engaging position, means to move the latch to engage the stop plate, means to actuate the latch moving means normally held in inactive position by engagement with the latch trigger in biased position, and means to bias the stop plate latch-engaging end in the same direction as the latch trigger is biased, whereby upon movement of the stop plate in an opposite direction by contact of the article moving along the conveyor the stop plate will move the trigger from engagement with the latch moving actuating means to actuate the latch to engage the stop plate.

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