Jan. 9, 1940. R. G. BIRR 2,186,798

STOP MECHANISM FOR DISPENSING DEVICES

Filed Jan. 23, 1939 2 Sheets-Sheet 1

Fig. 1.

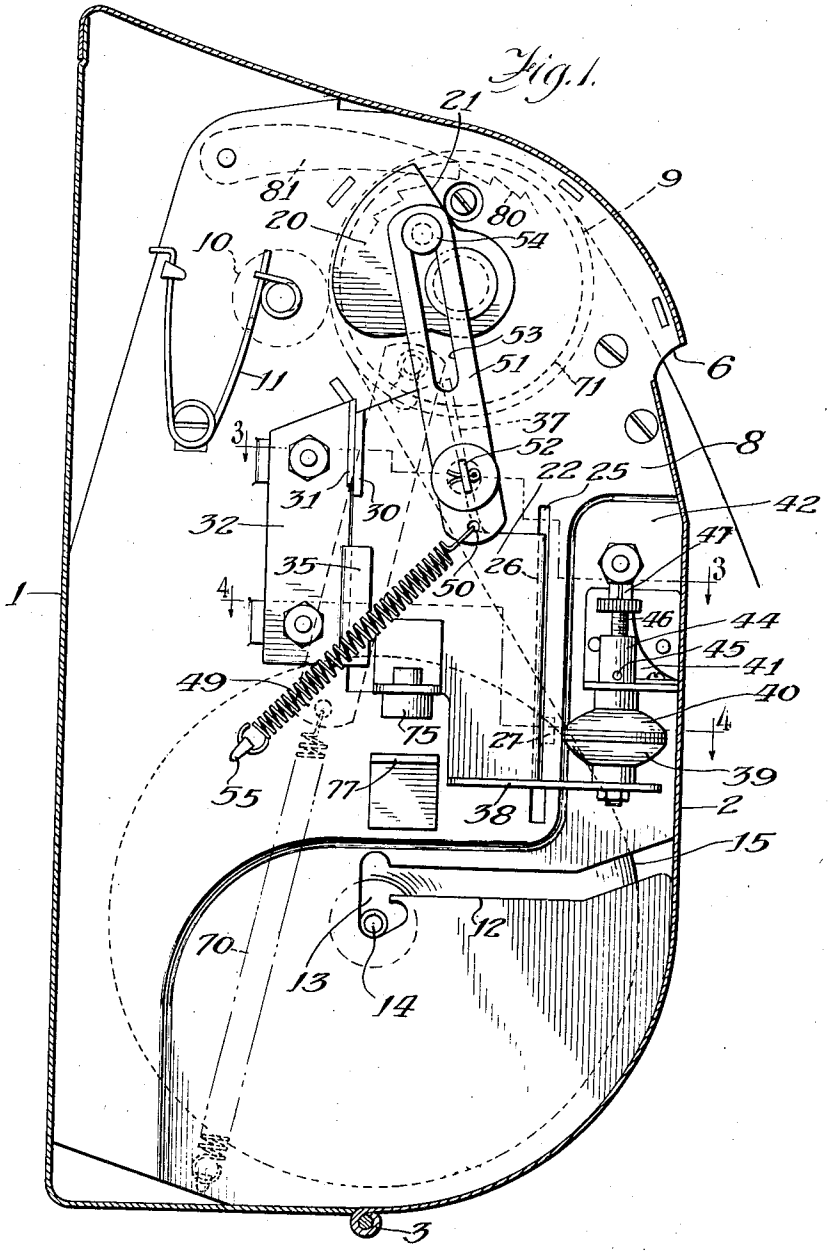
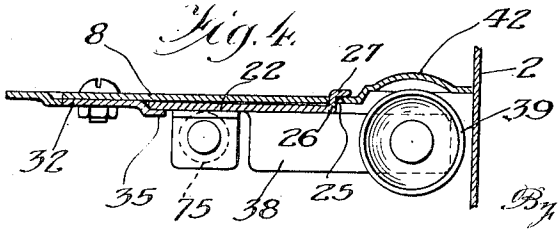


Fig. 4.



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STOP MECHANISM FOR DISPENSING DEVICES

Filed Jan. 23, 1939 2 Sheets-Sheet 2

Fig. 2.

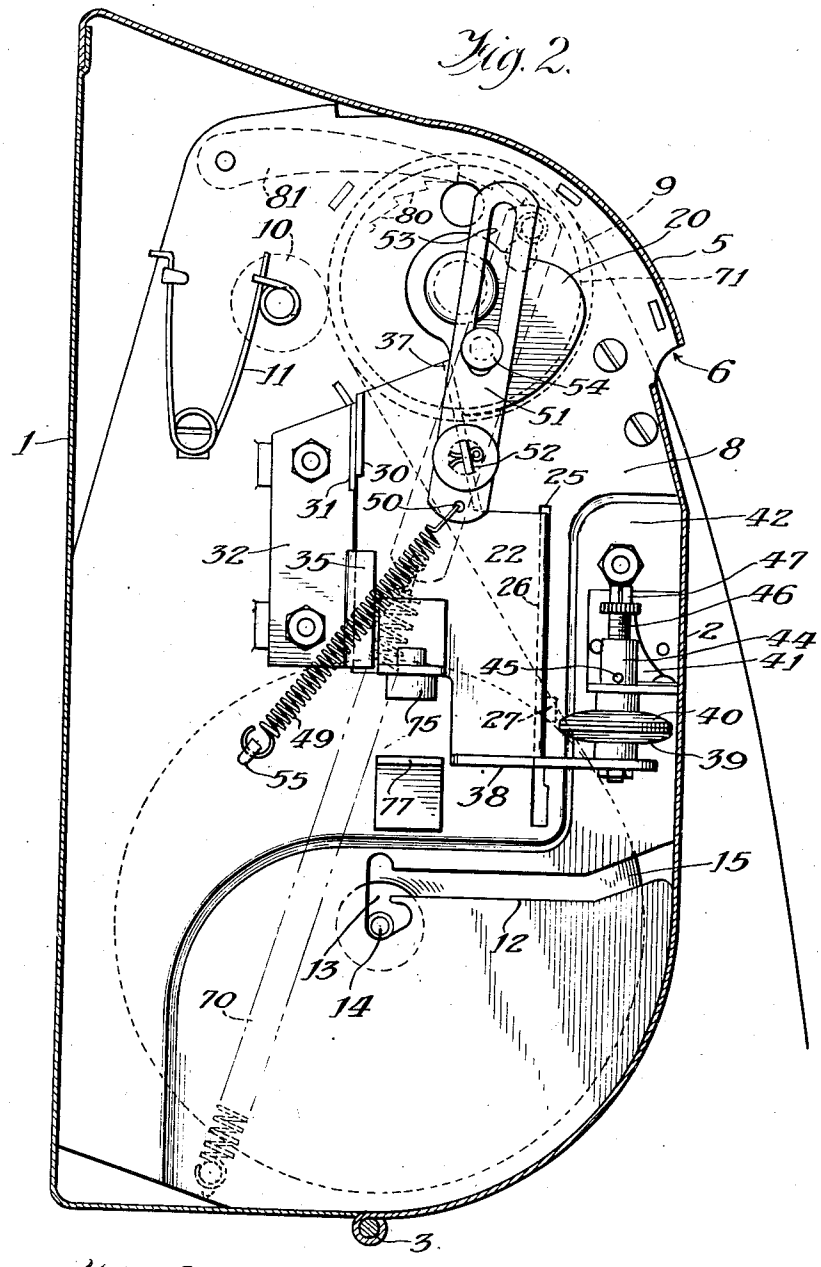
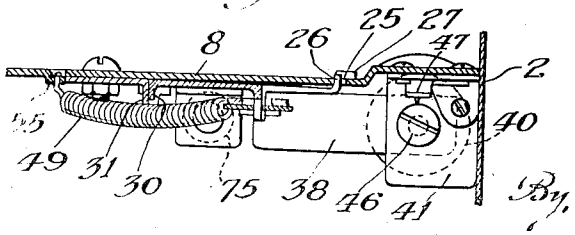


Fig. 3.



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UNITED STATES PATENT OFFICE

2,186,798

STOP MECHANISM FOR DISPENSING DEVICES

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Application January 23, 1939, Serial No. 252,281

15 Claims. (Cl. 271—2.3)

This invention relates to improvements in stop mechanisms for dispensing devices, and has among its objects to provide a dispensing cabinet having a time-stop mechanism, which is so placed as to have its timer-adjustment means accessible at the front of the cabinet.

Another object is to provide such an arrangement, in conjunction with a feeding means which is arranged rearwardly in the cabinet, relatively to the timer and its adjusting means.

Another object is to provide a stop mechanism, one of the stops of which carries a part of the timer, and to provide means whereby the dispensing mechanism operates the stop to move it to stopping position and then release it for independent movement away from that position at the end of the timing period and under control of the timer.

A timer of the type shown herein, that is of the vacuum-attachable type, is shown in my copending application Serial No. 91,515, and in that application is also shown the form of means by which the movable stop (carrying a part of the timer) is controlled by feeding means to be moved into stop position and then released for independent movement away from that position. In my earlier application Serial No. 76,040 a slide type of stop is shown which is controlled by a link mechanism in the manner just mentioned. In this earlier case the timer is of the so-called dashpot type.

An object of the present invention is to provide a sliding type of stop so arranged as to be operated or controlled by the feeding means or measuring roll and yet so arranged that it can carry a part of a timer, which timer is placed at the front of the cabinet so that its timer-adjusting mechanism is accessible. This arrangement involves the problems of obtaining proper sliding or translation of the stop, a positive movement of the stop away from stop position, and the avoidance of noise due to rattling.

The device is particularly adapted for use with a timer in which an element of the timer moves with one of the stops, whether it be a dashpot type of timer or vacuum-attachable type, as respectively shown in my applications Serial Nos. 15,271 and 76,040.

It is to be understood that the present device can be applied to any commodity-feeding mechanism in which a part moves as the commodity is dispensed, whether it be a measuring roll, as in the present case, or whether it be some other form of feeding mechanism having a stop which must be conditioned for independent motion away from stop position.

Features of the invention include: the use of a stop plate guided by horizontally spaced guide means; the use of two guide means; the wide spacing of said guide means; the loose sliding mounting of the plate; the use of a flat plate having its face of greatest area opposed to a corresponding face of a support; the positioning of the means by which the plate is raised to stop position by operation of the feeding means, relative to the guide means; the attachment of a link to the plate at a point intermediately of the guide means; the use of a plate with a timer arranged laterally of one of its guide means; the use of a spring for moving the plate away from stop position; the attachment of the retracting spring at a point intermediately of the guide means; specifically, the attachment of the spring to the link by which the feeding means moves the plate; the use of the spring to prevent rattling of the plate in its guide means; the use of a cushioning member in conjunction with a spring which operates the feeding means to automatically feed out material at the end of the timing period; all details of construction shown in the combination; and all broader ideas of means inherent in the disclosure.

Features and advantages will be set forth in the description of the drawings, and in said drawings:

Figure 1 is a vertical section showing in side elevation the mechanism of this invention, said mechanism being in its initial position, as when a portion of the paper is projecting sufficiently for grasping to be pulled out and then torn off;

Figure 2 shows the mechanism in stopping position as when the full length of paper has been withdrawn and it is ready to be torn off. In this view the timer is supposedly performing its timing function, at the end of which the mechanism will resume the position shown in Figure 1;

Figure 3 is a horizontal section through the slide approximately on line 3—3 of Figure 1; and

Figure 4 is a horizontal section through the slide approximately on line 4—4 of Figure 1.

The numeral 1 generally indicates the outer case of the cabinet which has a door 2 hinged as at 3 at the bottom to swing downwardly below the bottom of the cabinet. The upper edge of the door cooperates with the top 5 of the cabinet to form a delivery slot 6 which extends entirely across the front of the cabinet.

In this case it has not been thought necessary to show any of the details except those relating

to the stop mechanism, and to the measuring roll and measuring-roll operating spring associated therewith. It will be understood, however, that the feeding means, in this instance rotary, is journaled in two upright plates, one of which is indicated at 8 and which has the stop mechanism thereon. The other (not shown) is spaced from the first in a direction transversely of the cabinet, and has connected therewith one end of a spring for operating the roll, to feed the paper at the end of the time period.

The roll, symbolic of feeding means, is indicated by dotted lines at 9 and a second pressure roll 10 is shown in dotted lines and cooperates with the roll 9. This roll 10 is pressed by means of the spring 11. Each one of the plates 8 has a slot generally indicated at 12 for receiving a supply roll receiving shaft 13 having trunnions 14 disposed as shown. On this roll 13 a supply roll of sheet material 15 is mounted. It will be understood from the prior art that the paper is fed from the supply roll 15 upwardly over the feed roll 9, thence downwardly and outwardly through the delivery slot 6. Whenever the paper is pulled by the user the roll is rotated. The operation of these devices is so well known that no other description is considered necessary except that which will be given hereafter, and which relates to the action of the mechanism, which is the particular subject matter of this application.

In the present embodiment, which is only illustrative of the invention but which at present is a preferred form (see Figure 1), there is attached to the roll 9 or to a part which moves during dispensing, a plate 20 having a stop shoulder 21. This shoulder 21 for the sake of convenience will be referred to as the first stop, and the stop now to be described will be referred to as the second or slide stop. This second stop is on or has the form of a plate 22, a face of greatest area of which is parallel with a corresponding face of the face or support 8, upon which plate the dispensing mechanism is mounted. The upright 8 (see Figures 3 and 4) is slotted vertically as at 25, and the stop plate 22 has a right angle guide extension 26 entering the slot, and in this case passing through it. This flange extension 26 has near its bottom a right angle extension 27 of small area engaging the inside surface of the upright 8 to prevent movement of the plate 22 outwardly or away from the outer face of the upright 8.

At the opposite side the plate 22 has a right angle slide-forming extension or flange 30 which slidably engages a corresponding abutment 31 of a guide plate 32, the extension 30 sliding against the upright surface of the abutment 31. The guide plate 32 has a portion 35 which overlaps the front or outer face of the slide or plate 22, and the parts 31, 35, guide slot 25 and the extension 27 cooperate to guide the plate so that it can freely move vertically. This stop plate 22 is further provided with a right angle flange extension 37 which may be referred to as the second stop, and when the plate is positioned, as in Figure 2, this stop 37 is engaged by the stop shoulder 21.

The stop plate or slide 22 also has a laterally extending portion 38 upon which is mounted a vacuum cup 39 which cooperates with another vacuum cup 40 secured to a bracket 41, which bracket is in turn secured within a recessed portion 42 of the upright 8. These two cups form part of a timer of the type shown in my copending application Serial No. 91,515 and there is no intention here to claim this device per se, but only in combination with a slide plate, as distinguished from a slide bar. The timer has the elements 44, 45, 46, 47 for regulating the rate of release of the vacuum, and it will be understood that when the vacuum is released the slide 22 promptly moves downwardly to bring its stopping portion out of the path of the stop shoulder 21. Figure 1 shows the mechanism in the released position and Figure 2 shows it in stop position.

There were problems involved in providing a slide for the purposes, and in the combinations herein, which would be strong, which would unfailingly move away from stop position without sticking. These problems involved the reduction of friction and the prevention of rattle and noise, combined with sturdiness.

I have solved these problems by providing guide means for the slide so placed as to be balanced relatively to other elements, and by providing means to simultaneously act to hold the edge 30 of the plate against the slide surface 31 and to dispose the greater portion of the inner surface of the plate away from the corresponding flat surface of the upright, that is, to reduce frictional engagement between the sliding parts to a minimum, and to positively urge the stop plate in stop-release direction. I believe myself the first to have conceived of using a single means for any one of these purposes, in a stop-mechanism.

In the drawings a single spring 49 is used to hold the sliding parts to prevent rattle and to retract the stop plate. In this embodiment the spring has been attached at one end as at 50 to a link 51 pivoted as at 52 to a projection of the flange or stop 37. This link has a slot 53 loosely traversed by a pin 54, which pin is carried by the stop plate 20. The opposite end of the spring is attached as at 55 to the plate 8. The operation of this link is the same as that in my copending application Serial No. 15,271 and the link connection per se is not claimed herein, but only its balanced connection in relation to the guide means of the plate 22.

The invention in part consists in the combination of the link, in combination with a plate which has a broad surface opposed to a corresponding surface of the upright, and in the means by which this plate is made to operate freely, yet relatively noiselessly, so that the plate will unfailingly, positively and quickly move away from stopping position, or so that it will virtually drop to stop release position only at the end of a time period at which the vacuum action of the timer is annulled.

In this instance the spring is diagonally arranged so that it tends to move the plate 22 to the left, as shown in the figure, and tends through its connection with the link and the link's connection with the plate to move the plate slightly away from the upright plate 8, to reduce friction and stop rattle by moving it for these purposes about the part 31 as a fulcrum or hinge point. All but slight movement is prevented by means of the flange 27. It is to be noted that the frictional contact surface of this flange with the inside of the upright 8 is very small.

Figures 3 and 4, which are horizontal sections, illustrate the relations of the inner face of the slide to the outer face of the upright, and show how the spring tends to slightly separate the parts to reduce the area of frictional contact between these surfaces to a minimum, and to hold

the slide to prevent rattle. The friction slide surfaces are also reduced to a minimum.

Although I have described the spring as being attached to the link, this is not absolutely necessary and I broadly claim the application of any means so arranged that it will perform the anti-rattle or anti-friction or stop-retracting functions previously referred to.

This invention is applied in a type of device in which a portion of the paper sufficient to be grasped is projected immediately following the completion of a timed release of the stop mechanism. In Figure 2 the parts are shown in the stop position and it is assumed that the timer is operating, and that at the end of the time period the slide stop will fall to non-stop position. It can be seen by the dotted lines of the figure that when this occurs the spring 70, acting on a disk 71 attached or fixed to the feed roll 9, will move the roll in feeding or clockwise direction and in so doing paper will be automatically fed out for grasping. The feed-out is rapid, and during the same the parts suddenly again assume the position of Figure 1.

This involves a rapid down movement of the slide to fully released position, then a rapid up movement to a position where the vacuum elements of the timer are again engaged, but not vacuum-held. The plate is thus suddenly urged downwardly under action of the spring 49.

To reduce noise and cushion the elements at the end of this rapid downward movement, a cushioning element 75 is mounted on a bracket or extension of the slide, the cushioning element engaging a small shelf 77 of the upright 8. It does not particularly matter to which element the cushion is attached. The cushion element is compressed and immediately after the slide is brought to the position of Figure 1. This cushion element may act as a stop to limit the downward movement. In case it is dispensed with as it may be in some instances, the lower end of the flange 30 may engage the upper edge of the part 35.

It is to be noted that the vacuum cups are engaged rather suddenly, and this engagement tends to rotate plate 22 in clockwise direction against the tension of the spring 49, which results in a cushioning effect. The spring, therefore, substantially overcomes this tendency, at least to the extent that the device is less noisy, the reason being that the spring is set at an angle so that it pulls in a direction toward the abutment and therefore in a direction away from the timer. A ratchet wheel 80 attached to the roll 9 and a pawl 81, both shown only in dotted lines, prevent reverse motion of the feed or measuring roll 9.

As the parts assume the position of Figure 1 after stop release and under the action of the feed-out after timing spring 70, the vacuum cups are engaged as shown in the figure, but are only slightly compressed. However, at this time there is no vacuum holding the cups together and as soon as the paper is grasped by the user and the roll 9 is turned, the stop 21 moves around and at the same time the slide moves downwardly and then upwardly again, and by the time it has reached its uppermost position the stop 21 of the roll engages the slide stop 37. Timing now begins and at the end of the time period the slide suddenly drops to its lowermost position under the action of the spring 49. It is conceivable that under some conditions the spring may be eliminated and yet have a prompt dropping action occur. This is possible due to the fact that the elements are balanced as a result of the connection of the link at a point intermediately of the guide means of the plate. This feature of vertical guiding by relatively widely horizontally spaced vertical guide means with the link connection made intermediately thereof is a feature per se.

For an understanding of the feed-out after timing action attention is particularly called to the relation of the roll-operating spring 70 to the axis of rotation and to the roll 9 and to the stops 21 and 37, respectively, in Figures 1 and 2. In Figure 1 the spring 70 is ready to be put under greater tension as soon as the user pulls out the paper and thereby turns the roll. In Figure 2 the spring has assumed such a position that it will automatically turn the roll in feed-out direction immediately on release of the stop as governed by the annulment of the vacuum, controlled by the timed entrance of air between the cups.

I have heretofore spoken of the spring 49 or its equivalent as having three functions, one to hold the left side of the slide in close sliding relation, another to move the slide outwardly to reduce friction between its face and the face of the upright, and another to positively move the stop away from stop position. It will be understood that at the same time the anti-rattle function is performed. Moreover, I do not intend to limit myself to the simultaneous performance of all three functions but intend to cover the anti-rattle function only per se, the hinging function only per se, and the hinging or anti-friction function per se.

In practice instead of having the spring or its equivalent perform the hinging function, the plate can be so formed that its inner face is spaced from the corresponding face of the upright over the greater portion of its area. However, it is noted that there is an advantage in having a relatively wide plate in that the opposite guide edges are a greater distance apart and a better balance can be had to reduce the tendency of the plate to rock in a plane parallel with its face and the face of the upright. It will be understood that lifting link is so pivoted to the plate in relation to the guided opposite edges of the plate and in relation to the center of gravity of the plate and of its attached rubber cup and cushioning element as to give, as nearly as possible, a straight vertical lift to reduce rocking of the plate in a plane parallel to the face of the upright 8, thus avoiding binding with the guides.

Another feature of the invention relates to the angular relation of the stop surface of the element 37 or second stop, to the direction of translation of the plate 22 to facilitate separation of the stops as the plate moves away from stop position at the end of the time period, under action of spring 49, or by gravity action of the plate only.

I claim as my invention:

1. A dispensing cabinet having therein an upright support having feeding means mounted thereon, a stop for the feeding means, a plate having a stop adapted to be moved into the path of the feeding means stop, means slidably mounting the plate, including a vertical slot in the support, a flange on one edge of the plate slidable in the slot, means on the flange engageable with the inner face of the support in the manner to slidably hold the plate against motion away from

the support, an abutment on the support with which the opposite vertical edge of the plate slidably engages, means on the abutment for limiting outward movement of the plate away from the support, a spring functioning to move the plate away from stop position and acting to urge the edge of the plate against said abutment, and means by which the feeding means moves the plate to stopping position and then releases the plate for independent movement away therefrom.

2. A dispensing cabinet having therein an upright support having feeding means thereon, a stop for the feeding means, a plate having a stop adapted to be moved into the path of the feeding means stop, means slidably mounting the plate, including a vertical slot in the support, a flange on one edge of the plate slidable in the slot, means on the flange engageable with the inner face of the support in the manner to slidably hold the plate against movement away from the support but to limit that movement, an abutment on the support with which the opposite vertical edge of the plate slidably engages, means on the abutment for limiting outward movement of the plate away from the support, a link pivoted to the plate intermediately of the slot and abutment, means by which the feeding means operates the link to move the plate to stopping position and then releases the plate for independent movement away from stop position, and a spring attached to the link and functioning to move the plate away from stop position and acting to urge the edge of the plate against said abutment.

3. A dispensing cabinet having therein an upright support having a measuring roll journaled thereon, a stop for the roll, a plate having a stop adapted to be moved into the path of the stop for the roll, means slidably mounting the plate, including a vertical slot in the support, a flange on one edge of the plate slidable in the slot, means on the flange engageable with the inner face of the support in the manner to allow slight movement of the face of the plate away from the face of the support but to limit that movement, an abutment on the support with which the opposite vertical edge of the plate slidably engages, means on the abutment for limiting movement of the plate away from the support, and a spring having the triple function of acting to move the plate away from stop position, of urging the edge of the plate against said abutment, and of urging the plate away from the support whereby to cause the first mentioned limiting means to slidably engage the inner face of the support, and means by which the roll moves the plate to stop position and thereafter releases the same for independent movement away therefrom.

4. In a dispensing cabinet having a feeding means, said feeding means having a stop, a stop plate loosely guided by transversely spaced guide means adapting the plate to move into the path of the stop of the feeding means, means by which the plate is moved to stop position by operation of the feeding means and then released for independent movement away from that position, a timer arranged laterally of the guide means, and means by which it is controlled by and controls said stop plate to hold the stop in stop position during the timing period and to automatically release it at the end of said period, and a spring acting on the plate to move it downwardly and toward that guide means which is farthest from said laterally spaced timer.

5. A dispensing cabinet having rotary dispensing means, having a stop shoulder, a slide loosely guided by parallel means spaced transversely of the slide, said slide having a stop shoulder engageable with the stop shoulder of the rotary means, a link pivoted to the slide, and means by which operation of the dispensing means operates the link to move the slide upwardly to stop position and then releases the slide for independent motion away from such position, and a spring for moving the slide away from stop position, and for holding the slide against its guide means.

6. A dispensing cabinet having rotary dispensing means, having a stop shoulder, a slide loosely guided by parallel means spaced transversely, said slide having a stop shoulder engageable with the stop shoulder of the rotary means and disposed intermediately of said guide means, a link pivoted to the slide at a point intermediately of the guide means, a spring acting on the slide to move it from stop position and serving to hold the slide against its guide means, and means by which operation of the dispensing means operates the link to move the slide upwardly to stop position and then releases the slide for independent motion away from such position.

7. A dispensing cabinet having a feeding means having a stop, a stop plate guided by horizontally spaced guide means adapting the plate to move into the path of the stop of the feeding means, means by which the plate is moved to stop position by operation of the feeding means, including a link one end of which is attached to the plate at a point intermediately of said guide means, a timer arranged laterally of one of the guide means, and means by which it is controlled by and controls said stop plate, and a spring acting on the plate to move it away from stop position and toward that guide means which is farthest from said laterally spaced timer, said spring acting to prevent rattling of said plate, and means for cushioning said plate during downward motion under the action of said spring.

8. In a dispensing cabinet having a dispensing means, a time-stop mechanism controlled by and controlling said means, including a slidable plate having a part constituting one of two independently movable stops, first means slidably guiding the plate at one side and allowing the plate to swing as a hinge, second means slidably guiding the plate at the opposite side, means associated with said second guiding means to limit the hinging motion, and means so placed as to simultaneously act to hold the edge of the plate in hinging relation, move the plate as a hinge, and positively urge the plate in stop release direction.

9. In a dispensing apparatus having dispensing means mounted in part upon an upright plate, a stop mechanism for said dispensing means, including first and second movable stops and means by which the first operates the second to move it into stopping relation with the first and thereafter release it for automatic movement away from stopping position, said second stop comprising one edge of a plate, which plate is arranged flatly against said upright plate, means guiding the plate at opposite vertical sides, a spring for retracting the plate from stop position, and attached to the plate intermediately of those sides, and a timer lying laterally of one of said guiding means and including an element carried by the plate and adapted to become attached to a stationary element when the plate moves to stop position, said elements being constituted by vacuum cups which become vacuum

attached when the stopping portion of the plate is in the stopping path of the first stop.

10. A dispensing cabinet having feeding means having a stop, a slidable plate adapted to be engaged by the stop of the feeding means, means translatably guiding said plate at two points which are spaced in a direction transverse to the direction of translation of the plate, a timer placed laterally of the plate and its guiding means and having parts which are adapted to be brought together when the plate is moved toward stop position, means by which the feeding means operates the plate to bring it to stop position and release it for independent movement away from such position, and yieldable means acting on the plate to resist tipping of the plate in its guiding means as the parts of the timer engage one another by impact.

11. A dispensing cabinet having feeding means having a stop, a slidable plate adapted to be engaged by the stop of the feeding means, means translatably guiding said plate at two points which are spaced in a direction transverse to the direction of translation of the plate, and a timer placed laterally of the plate, one part of the timer being carried by the plate to set the timer as the plate moves to stop position, means by which the feeding means operates the plate to bring it to stop position and release it for independent movement away from such position, and yieldable means acting on the plate to resist tipping of the plate in its guide means as the timer is set during the movement of the plate to stop position.

12. A dispensing cabinet having feeding means and a stop mechanism for said means including, a stop movable with said feeding means, a slidable plate and guides for the plate, one at each opposite edge, said feeding means stop being adapted to engage said plate as a stop to urge said plate toward and against one of said guides, and a spring acting on the plate to move it also toward the last mentioned guide and to also move the plate away from stopping position.

13. A dispensing cabinet having feeding means having a stop, a slidable plate and guides for the plate, one at each opposite edge, said feeding means stop being adapted to engage said plate as a stop to urge said plate toward and against one of said guides, a spring acting on the plate to move it also toward the last mentioned guide and to also move the plate away from stopping position, said plate having a support extending laterally of the opposite guide, said support having thereon a vacuum cup, a second vacuum cup with which said first cup is engageable when the slide moves toward stopping position, said cups when engaged acting to hold the plate in stopping position, means for automatically releasing the vacuum at the end of a time period, and means by which said feeding means moves the plate into stopping position and then releases it for independent movement away from such position.

14. A stop mechanism for a feeding means, including a first stop movable with the feeding means, a slidable element and first and second guides therefor which allow free sliding and tilting motions of said slidable element, said first stop being adapted to engage the slidable element as a stop to urge said element toward the first guide, a timer comprising members adapted to be engaged by impact, one of the members being carried by said slidable element, and means acting on said slidable element to yieldably resist tipping of the same in its guides as the parts of the timer engage one another by impact.

15. A stop mechanism for a feeding means, including a first stop movable with the feeding means, a slidable element and first and second guides therefor which allow free sliding and tilting motions of said slidable element, said first stop being adapted to engage the slidable element as a stop to urge said element toward the first guide, a timer arranged laterally of the second guide and of the slidable element and in opposition to both, said timer comprising members adapted to be engaged by impact, one of the members being carried by said slidable element, and means acting on said slidable element to yieldably resist tipping of the same in its guides as the parts of the timer engage one another by impact.

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