

July 2, 1940.

A. C. GRUNWALD

2,206,320

DISPENSING DEVICE FOR SHEET MATERIAL

Filed July 19, 1939

3 Sheets-Sheet 1

Fig. 2.

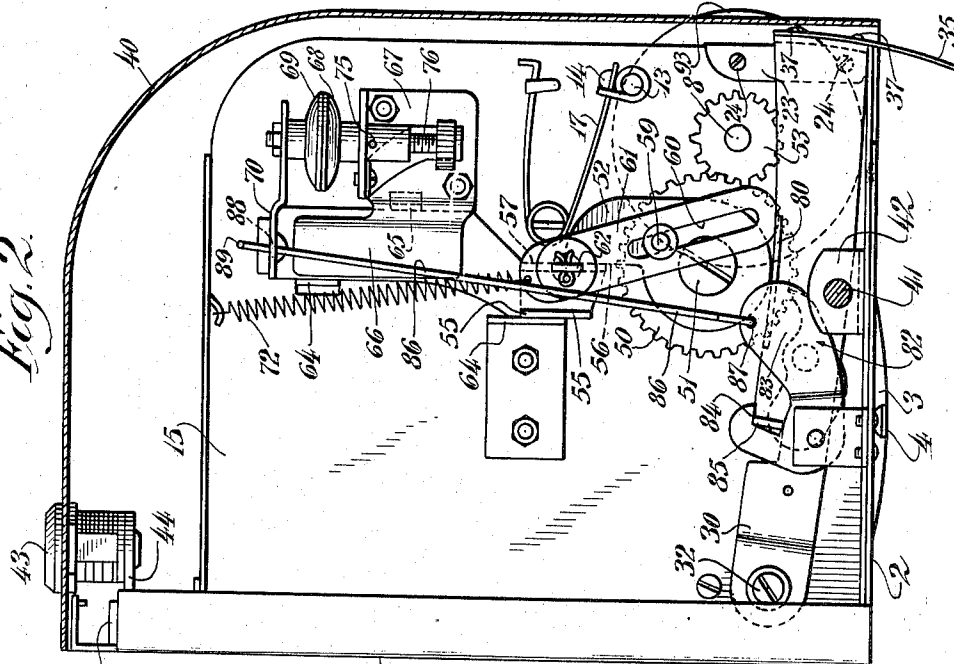
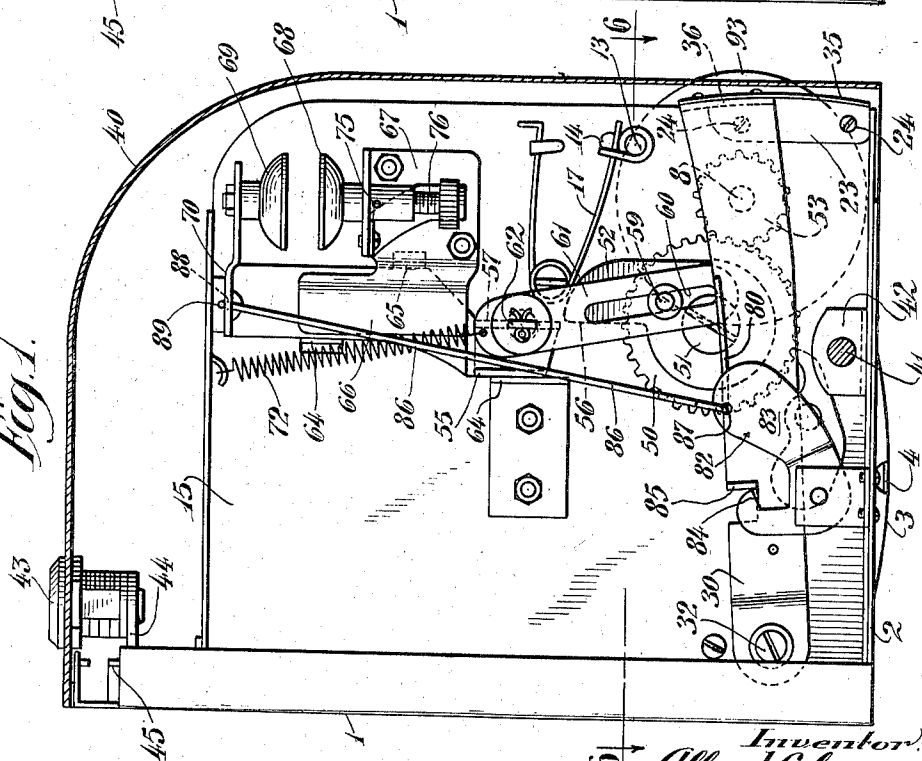


Fig. 1.



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3 Sheets-Sheet 2

Fig. 4.

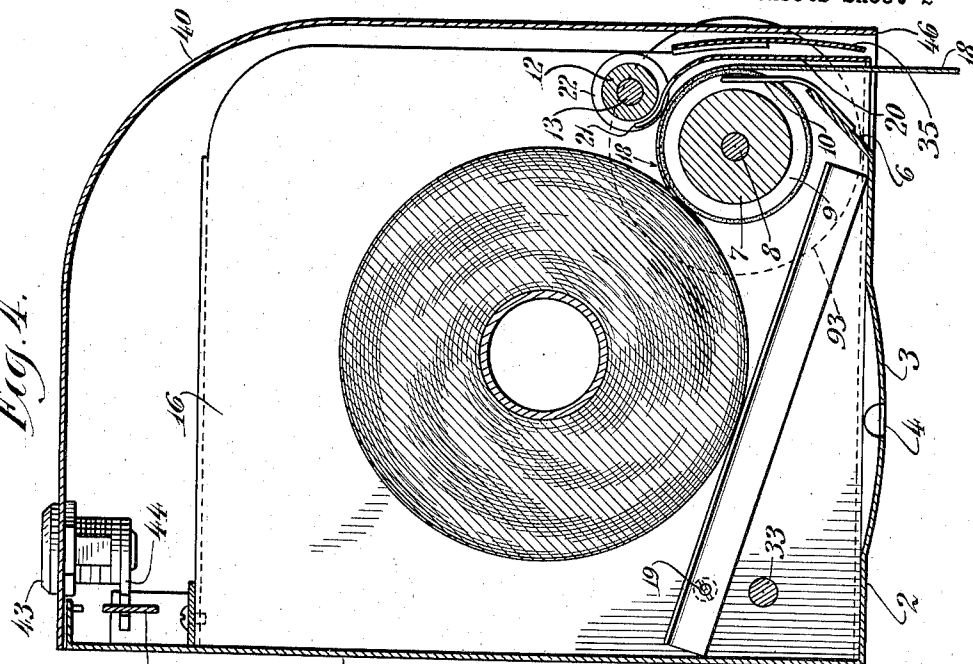
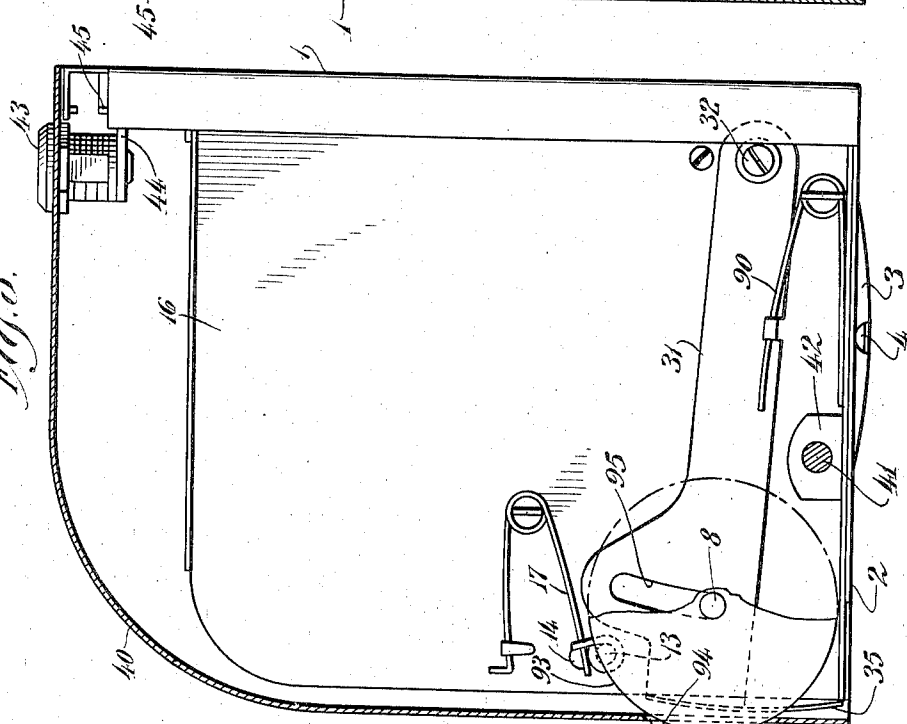


Fig. 3.



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3 Sheets-Sheet 3

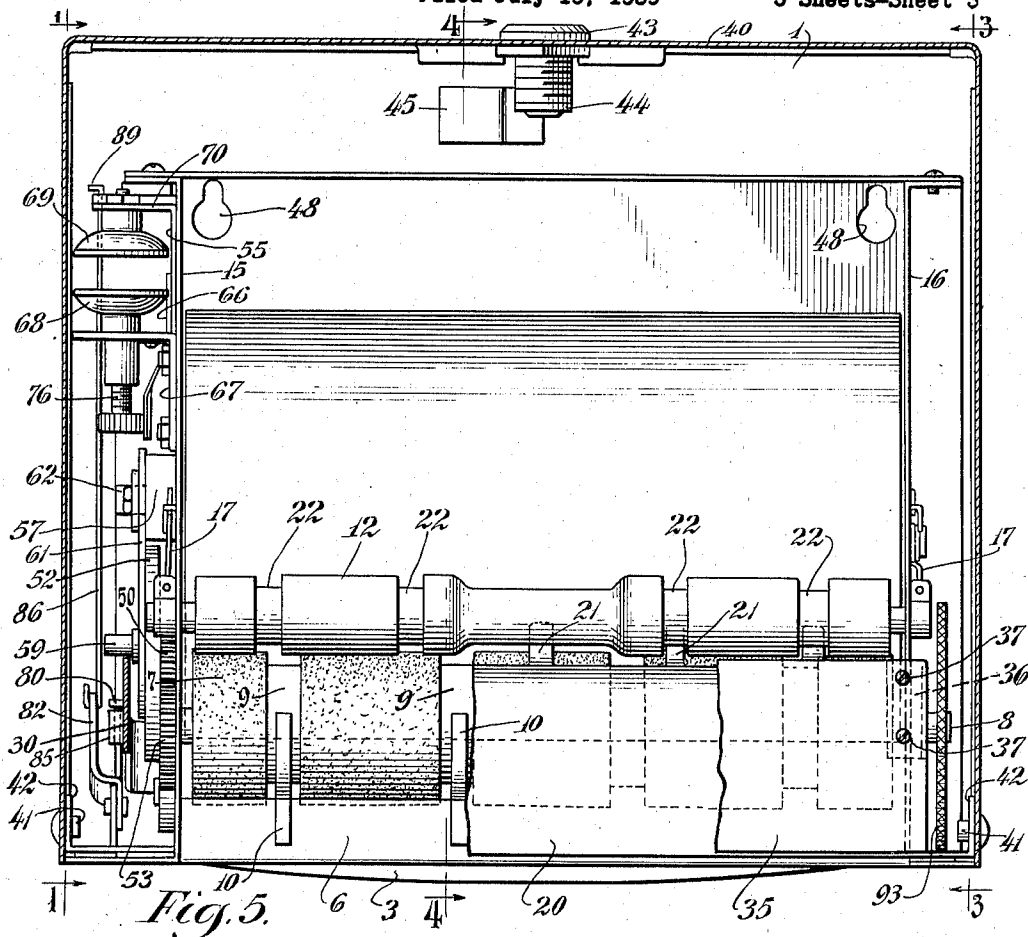


Fig. 5.

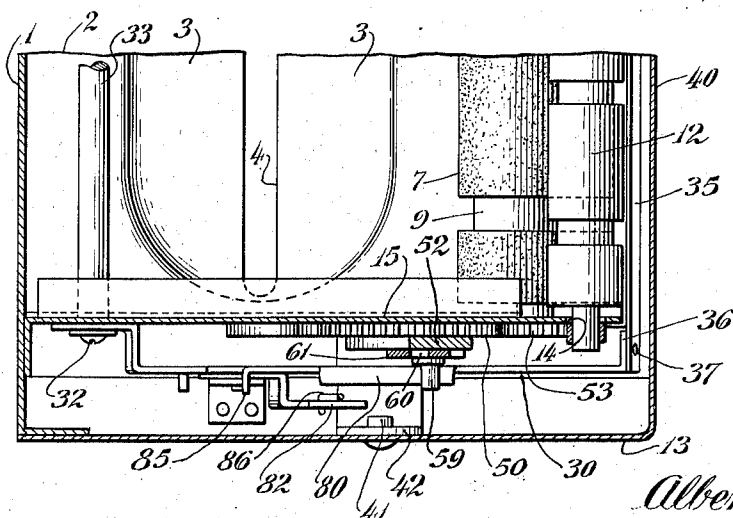


Fig. 6.

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UNITED STATES PATENT OFFICE

2,206,320

DISPENSING DEVICE FOR SHEET MATERIAL

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Application July 19, 1939, Serial No. 285,240

15 Claims. (Cl. 164—84.5)

This invention relates generally to improvements in dispensing devices for sheet material, and has for a special object to provide a device in which a tear-off knife is timer-controlled to move from one position to another.

Other objects are: to provide a movable knife with a timer for controlling it; to provide a knife which is controlled by a timer of a time-stop mechanism of a dispensing device for sheet material; to provide a knife which is moved from one position by means controlled by the act of dispensing, and which is automatically restored to that position at the end of the timing action of a timer; to provide a combined signal and tear-off means which is operated by and in a predetermined relation to the actions of a dispensing mechanism and a time-stop mechanism therefor; to provide means by which the act of dispensing moves the knife and/or signal member to a visible and/or operable position, and to provide means by which the movement of a timer-controlled stop controls knife movement.

Objects, features and advantages of the invention will be set forth in a description of the drawings, and in said drawings

Figure 1 is a vertical section taken substantially on line 1—1 of Figure 5 and showing the tear-off knife in its retracted, inoperative and invisible position, and with the stops released;

Figure 2 is a view similar to Figure 1, but showing the knife in its projected, operative and visible position, and locked therein with the stops in stopping engagement as at the beginning of the timing action of the timer;

Figure 3 is a vertical section taken approximately on line 3—3 of Figure 1, showing the knife in its retracted position;

Figure 4 is a vertical section taken substantially on line 4—4 of Figure 5;

Figure 5 is an elevation of the inner mechanism, the cover only having been shown in section, certain parts of the inner mechanism being broken away; and

Figure 6 is a horizontal section taken approximately on line 6—6 of Figure 1.

Referring to the drawings:

Numeral 1 indicates the back of the cabinet and numeral 2 the bottom thereof. The bottom and back are formed in one piece or section, as best shown in Figure 4. The bottom is pressed outwardly and downwardly to form a depression 3 having slots 4. The slots are so positioned that dust or dirt rolls downwardly and outwardly through them. The depressed portion 3 is elongated, as shown in Figures 1 and 5, in a direction

transverse of the cabinet or parallel to the axis of rotation of the feed rolls.

The forward portion of the bottom is bent up as shown at 6 in Figures 4 and 5, so that its upper edge is arranged close to the measuring or feed roll 7, suitably journaled on an axis or shaft or trunnions 8. The feed roll is circumferentially grooved as at 9 and the upwardly, outwardly slanted portion 6 of the bottom has attached thereto suitable fingers 10 which lie in the grooves to prevent the paper following the roll. Cooperating with the feed roll 7 is a presser roll 12 having suitable shaft or trunnions 13 movable in slots 14, of plates 15 and 16. The plates 15 and 16 are suitably secured to the back 1 and bottom 2 and act as supports for the mechanisms and as braces or reinforcements. Springs 17 acting on the shaft ends or trunnions 13 yieldably urge the presser roll into operative relation with the paper 18. The paper supply roll rests on inclined supports, each pivoted as at 19 to the inner side of the corresponding upright plates 15 and 16.

Arranged forwardly of the parts 6 and 10 and forwardly of the roll 7 is a throat plate 20, the upper part of which is provided with fingers 21 entering grooves 22 of the presser roll to assist in threading the paper between the rolls. As shown in Figure 4, this element 20, with the elements 6 and 10, form a downwardly leading throat. The paper leads from between the rolls into this guiding throat. The throat plate 20 overlaps the front edges of the supporting plates 15, 16 and has flanges 23 (see Figure 1) engaging the outer sides of the said plates as shown, and is removably held by screws 24.

The main feature of the present invention relates to a member which may be considered to be a signal device and/or a tear-off knife. In this embodiment it performs both functions, but may perform either, alone. The tear-off knife is mounted in any suitable manner so that it is movable to visible and invisible positions in relation to the user. The member, when in its visible position, is outside of the cabinet, near or at the point of exit or delivery of the paper. As a knife it may be considered to move to operative and inoperative positions in relation to the fed paper. The broad feature of the invention is the timing of the movement of this knife. In the present embodiment the knife is so operated as to be moved to visible or operative position during dispensing, and so as to be moved from that position by a timer at the end of the timing action of the timer. It is understood, however, that since

the broad invention is a timer-controlled knife, there is no intention to be entirely limited to the details shown. Moreover, stop mechanisms do not have to be released by a timer. It is common to release them by hand.

In the present embodiment of the invention there is provided a pair of pivoted arms 30, 31, each arranged at the outside of one of the supporting plates 15, 16. Each arm is pivoted as at 32 by means of a suitable screw which is threaded into a cross-bar 33 extending between the plates 15 and 16. Arranged forwardly of the throat plate 20 (see Figures 4 and 5) and connected to the outer ends of the arms is a tear-off knife plate 35 which may function alone, as a signal. In the preferred form of the invention it functions as a tear-off knife and signal.

The forward end of each arm 30, 31 (see Figure 6) is bent inwardly as shown in 36, and the knife 35 is secured thereto by suitable fastening devices such as screws 37 (see Figure 5). The plate 35 is slightly curved as shown, and lies just forwardly of the throat-forming element 20. The knife thus supported is adapted to swing from one position to another. As shown in Figure 1 it is in inoperative and invisible position, and is swung to the position of Figure 2 in which it is visible and operatively positioned. It will be noted that when the knife is in its upper position its cutting edge is at substantially the same level as that of the lower edge of the plate 20, that is, at the lower end of the forward wall of the throat 22, or throat plate 20.

The cover for the cabinet is indicated at 40, and has pins 41 entering openings in ears 42 attached to the bottom and spaced inwardly from the front of the cabinet. The top of the cover has a lock generally indicated at 43 which has a hook-shaped element 44 engageable with a keeper 45, as best shown in Figure 4. The cover can be swung downwardly below the level of the bottom 2, and being L-shaped, acts as a temporary support for the roll during servicing of the machine. When so swung its lower forward edge 46 engages the bottom 2 as a stop to hold the cover in a shelf-forming position. It will, of course, be understood that the cabinet is hung on the wall by means of fastening devices passing through keyhole slots 48 (see Figure 5).

Referring now to the mechanism by which the dispensing means controls the knife to move it to one of its positions as dispensing occurs, and to timing means by which the knife is moved to its other position. In this embodiment the arrangement is such that as dispensing occurs the knife is brought from an invisible, inoperative position to a visible, operative position, whereat it remains only for a predetermined time. It will be understood that it is not necessary to have the knife visible, although it constitutes one phase of this invention. It is enough, of course, if the knife is brought to operative position, in this case during dispensing. In this case also the knife is brought to inoperative, invisible position at the end of a timing period, which period begins in this embodiment immediately following the engagement of the stop to limit the withdrawal of paper.

The stop mechanism per se is not claimed herein. A stop mechanism of substantially the same structure is covered in an application of Birr, Serial No. 275,450.

Referring first to Figures 1 and 6. A gear 50 is suitably pivoted on the outer face of the plate 15. The pivot for the gear is indicated at 51.

The gear has a stop arm 52 movable therewith. Meshing with this gear is a small spur-gear 53 on the shaft 8 of the feed or measuring roll 12. When the feed roll is moved in clockwise direction during dispensing the gear 50 is moved in counter-clockwise direction from its initial position in Figure 1, at which time the stop is released.

The stop arm 52 engages the bottom part of a slide stop generally indicated at 55. The face 56 of the arm 52 engages a flange 57 of the slide, as in Figure 2, to limit further withdrawal of the material. This engagement is shown in Figure 2. The gear 50 or the arm 52 has a crank pin 59 passing through a slot 60 of a link 61, which link is pivoted on the element 62 which is an extension of the flange 57. The slide 55 is suitably laterally guided as at 64 and 65, and the slide 55 is held against the face of the plate 15 by means of an extension 66 of bracket 67 secured to plate 15. This bracket supports a vacuum cup 68 and the slide stop 55 has a vacuum cup 69 engageable with the cup 68, and these cups constitute a vacuum timer. The cups do not move during timing and are suddenly released at the end of the timing period. The cup 69 depends from a bracket or shelf 70 carried by the slide stop 55. A spring 72 attached as shown to the link 61 and to the plate 15 automatically moves the slide away from stop position.

The operation of the dispensing-controlled time-stop mechanism is as follows: Referring to Figure 1 which shows an initial position of the parts, it will be seen that when the arm 52 is rotated in counterclockwise direction the crank pin 59 will eventually engage the bottom of the slot 60 to move the slide stop 55 downwardly to the position shown in Figure 2 and into the path of the arm 52. On continued rotation of the arm, said arm engages the slide stop 55, as shown in Figure 2, to limit dispensing. As the slide stop moves downwardly the cups are brought together and are vacuum attached. After the pin 59 and link 61 have pulled the slide down, the slide remains immovable and the pin rides upwardly in the slot 60 to the position of Figure 2. The vacuum is gradually released by a controlled entrance of air through an opening 75, and the speed of air entry to release the cups is controlled by regulating screw 76. It will be seen that as soon as the vacuum is released the spring 72 moves the slide upwardly to its stop-released position, as in Figure 1. It will be further noted that as the crank pin 59 moves in counter-clockwise direction from its position in Figure 1 to that in Figure 2, it engages a flange 80 of the knife-supporting arm 30 and depresses the arm to the position shown in Figure 2 whereat the knife is visible and in operative position.

In order to hold the knife and signal member in their lower, visible, operative position shown in Figure 2, a timer-controlled means is provided, in this instance a latching mechanism. The latching mechanism comprises a gravity-operable latch 82 weighted as at 83 to fall by gravity to latching position. The latch head is indicated at 84 and this head engages a lateral extension or keeper 85 of the arm 30. The latch is normally held against downward gravity movement (see Figure 1) by means of a wire or rod 86 pivotally attached as at 87 to the weighted portion of the latch and passing through an opening 88 of the shelf 70 of the slide stop 55. The wire passes loosely through this opening 88 and the wire is

bent at the top as shown at 89 to form a stop which is engaged by the shelf 70 as the slide stop rises (moves from stop position) to pull the wire upwardly and raise the weighted latch to the position in Figure 1. It has previously been explained that the spring 72 raises the slide stop 55, and therefore with it the wire 86 and weighted side of the latch lever 82. It will be seen that no latching can occur while the slide stop is in its fully retracted (upper) position and therefore as long as this condition continues the knife can be moved independently.

When dispensing occurs the knife is forced downwardly by the pin 59, and the slide stop is moved downwardly and the latch is allowed to correspondingly move so that its head 84 lockingly engages the keeper extension 85 of the arm 30 as in Figure 2.

Referring to Figure 3, it will be seen that the knife, through the arm 31, is normally held in retracted position, invisible, non-signaling position, by means of a spring 90 so that just as soon as the latch is released the knife automatically moves to the invisible, inoperative position of Figure 1.

The measuring roll or feed roll is hand-operated by means of a disk 93 which is attached to the shaft or to the end of the roll 7 and projects through an opening 94 in the front cover (see Figure 3). The trunnion or shaft 8 of the measuring roll passes non-frictionally through a slot 95 of the arm 31, inasmuch as the arm lies between the outer face of the plate 17 and the inner face of the feed roll operating disk. The bottom of the slot engages the shaft 8 to limit upward motion of the knife.

As before stated, in this embodiment the tear-off knife is moved to visible position as dispensing occurs and is withdrawn from its operative position at the end of a timing period, which period begins immediately following dispensing-limiting engagement of the stops. It is conceivable, however, that the reverse could occur, that is, that the knife would be normally visible or in the position of Figure 2 and would move to an invisible, but operative, position during dispensing. I do not, therefore, intend to entirely limit the invention to the particular sequence, but claim broadly any mechanism in which the movement of the knife or visible signal is controlled by a timer.

I claim as my invention:

1. In a dispensing cabinet having dispensing means and a time-stop mechanism therefor, a tear-off knife movable from one position to another, means operated by the dispensing means for moving the knife from one position as a result of dispensing, and means in part operated by the time-stop mechanism for restoring the knife to said position at the end of the timing action of the timer of said time-stop mechanism.

2. In a sheet dispensing cabinet having feeding means, a combined signal and tear-off member adapted to move from visible to invisible positions, means by which the feeding means moves the member to visible position, and means by which said member is automatically moved to invisible position at the end of a predetermined time period.

3. In a dispensing cabinet for sheet material having dispensing means and a time-stop mechanism therefor, a tear-off knife adapted to automatically move from one position to another, and means controlled by the timer of the time-stop mechanism for releasing the knife for automatic

movement at the end of the timing action of the timer.

4. In a dispensing cabinet for sheet material having feeding means, a tear-off knife adapted to move automatically from a visible to an invisible position, a timer and means by which the feeding means during feeding sets the timer for independent timing action, means for releasably holding the knife in visible position, and means operated by the timer as it is set to hold the knife in operative position and to release said holding means at the end of the timing action of the timer.

5. A cabinet for dispensing sheet material having feeding means, a knife and means mounting it to move from an invisible position within the cabinet to a visible position outside the cabinet, means operated by the feeding means for moving the knife outwardly to visible tear-off position as dispensing occurs, means for automatically moving the knife to invisible position, a time-stop mechanism for said feeding means, and means controlled by said time-stop mechanism for holding the knife in its tear-off position for a time period immediately following dispensing, and for releasing the knife for automatic movement to invisible position at the end of the timing action of the timer.

6. A cabinet for dispensing sheet material having feeding means, a knife and means pivoting it so that it may move from an invisible position within the cabinet to a visible position outside the cabinet, means operated by the feeding means for moving the knife outwardly to visible tear-off position as dispensing occurs, means for automatically moving the knife to invisible position, a time-stop mechanism for said feeding means, a latch adapted to move automatically to latching position for holding the knife in its visible position, and means controlled by the time-stop mechanism for releasing said latch at the end of the timing action of the timer.

7. A cabinet for dispensing sheet material having feeding means, means operable by said feeding means and having a crank pin, a knife and means pivoting it so it can be moved from an invisible position to a visible position, said pin being adapted during dispensing movement of the feeding means to engage and move said tear-off knife to visible tear-off position and thereafter release the knife for independent motion away from such position.

8. A cabinet for dispensing sheet material having feeding means, a tear-off knife to which the feeding means delivers, said knife being initially invisible within the cabinet, means mounting the knife so that it can move to a visible position outside of the cabinet whereat the fed material can be torn off against it, means normally yieldably holding the knife in invisible position, a stop mechanism comprising one stop moving with the feeding means, and a second stop movable independently of and into and out of the path of the first stop and adapted to be automatically moved out of said path, means operated by the feeding means for moving the second stop into the path of the first and then releasing the second stop for independent movement out of said path, timing means for said second stop which is set for automatic timing when said stop is moved into the path of the first stop, said timing means being adapted to hold the stop in said path for a predetermined time period after which said second stop is released, means operated by said dispensing means for moving the knife to visible

position as a result of dispensing, and means controlled by said second stop as a result of its movement to stopping position for holding the knife in operative position and for releasing the knife as a result of movement of the second stop from the path of the first.

9. A dispensing cabinet for sheet material having a feed roll, a throat for leading paper out of the bottom of the cabinet and into which the feed roll delivers, a cover for the cabinet, a tear-off knife normally disposed between said throat and said cover and invisibly within the cabinet, means mounting the knife to move to a visible position below the cabinet in tear-off relation to material delivered from the throat, means for automatically moving the knife from said visible to said invisible position, a time-stop mechanism for said roll, means for automatically locking the knife in its visible position, and means controlled by the time-stop mechanism for releasing said locking means at the end of the timing action of the timer.

10. A dispensing cabinet for sheet material having a feed roll, a throat for leading paper out of the bottom of the cabinet and into which the feed roll delivers, a tear-off knife normally invisible within the cabinet, means mounting the knife to move to a visible position below the cabinet in tear-off relation to material delivered from the throat, means for automatically moving the knife from said visible to said invisible position, a time-stop mechanism for said roll, means for automatically locking the knife in its visible position, and means controlled by the time-stop mechanism for releasing said locking means at the end of the timing action of the timer.

11. A cabinet for dispensing sheet material having, inner and outer casings, the outer casing having a front wall, a pair of feed rolls first and second, a plate arranged between and spaced from the first roll and said front wall of said outer casing whereby it is disposed to form a throat downwardly through which the paper is projected and to form a forwardly disposed hous-

ing space, a tear-off knife normally housed in said housing space, and means for automatically causing the knife to move from said housing space to a visible position below the cabinet, whereat paper projected from the throat may be engaged with and torn off by said visibly placed knife.

12. In a device of the class described, a knife and means beyond the control of the user by which the knife is automatically moved from an initial to a final position, a timer adapted for automatic timing action after setting, and means by which said timer controls the knife to allow said automatic movement from said initial position only at the end of the timing action of the timer.

13. In a device of the class described, a knife and means beyond the control of the user by which the knife is automatically moved from an initial to a final position, a timer adapted for automatic timing action after setting, means by which said timer controls the knife to allow said automatic movement from said initial position only at the end of the timing action of the timer, and manually operable means for setting the timer for automatic action.

14. In a sheet dispensing cabinet having dispensing means, a knife and means beyond the control of the user by which the knife is automatically moved from an initial to a final position, means operated by the dispensing means for moving the knife to said initial position, means for releasably holding the knife in said initial position, a timer adapted for automatic timing action after setting, and means controlled by said timer to release said holding means at the end of timing action of the timer.

15. In a device of the class described, a knife and a spring which automatically moves said knife from an initial to a final position, a timer adapted for automatic timing action after setting, and means by which said timer controls the knife to allow said automatic movement by said spring from said initial position only at the end of the timing action of the timer.

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