Sept. 9, 1941. F. G. STEINER ET AL 2,255,627

CABINET FOR DISPENSING SHEET MATERIAL

Original Filed March 25, 1940 3 Sheets-Sheet 1

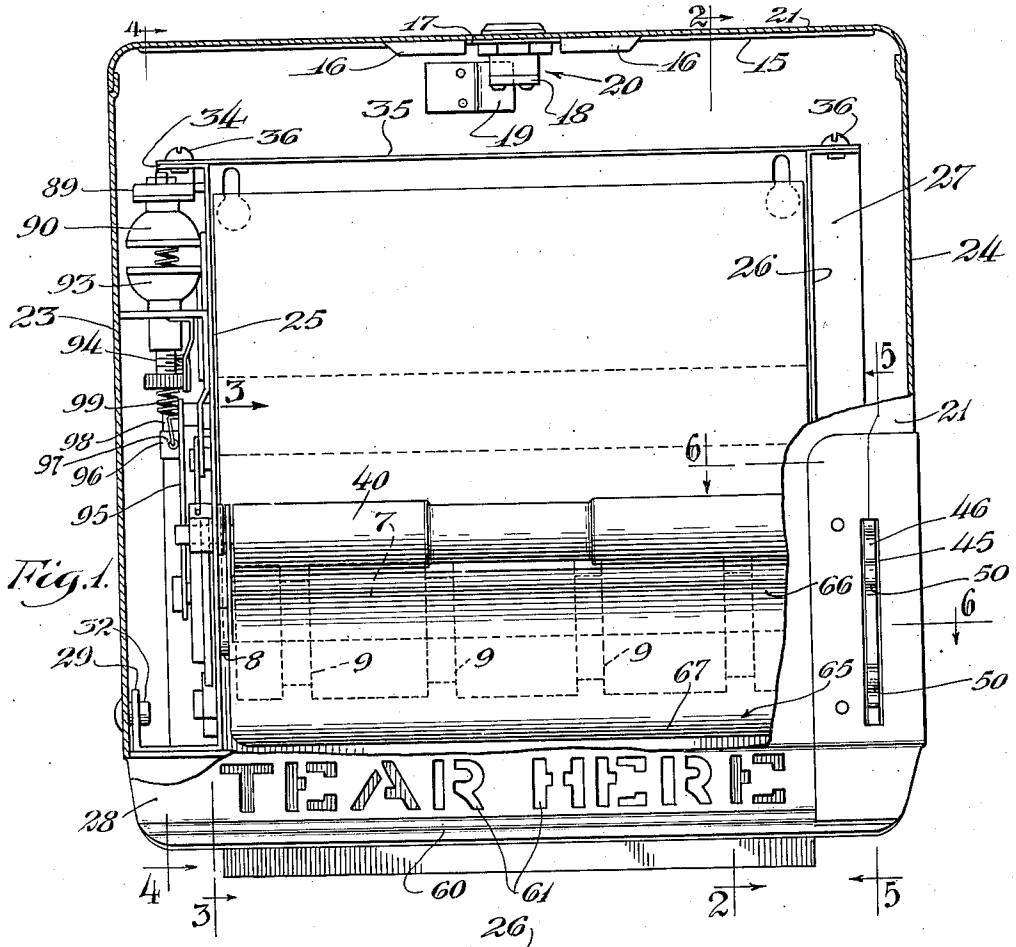


Fig. 1.

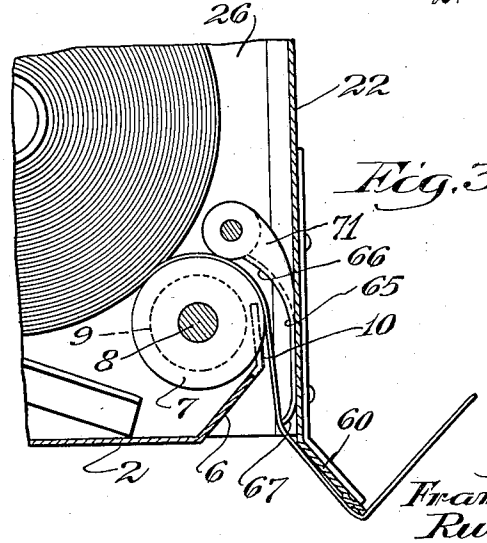


Fig. 3.

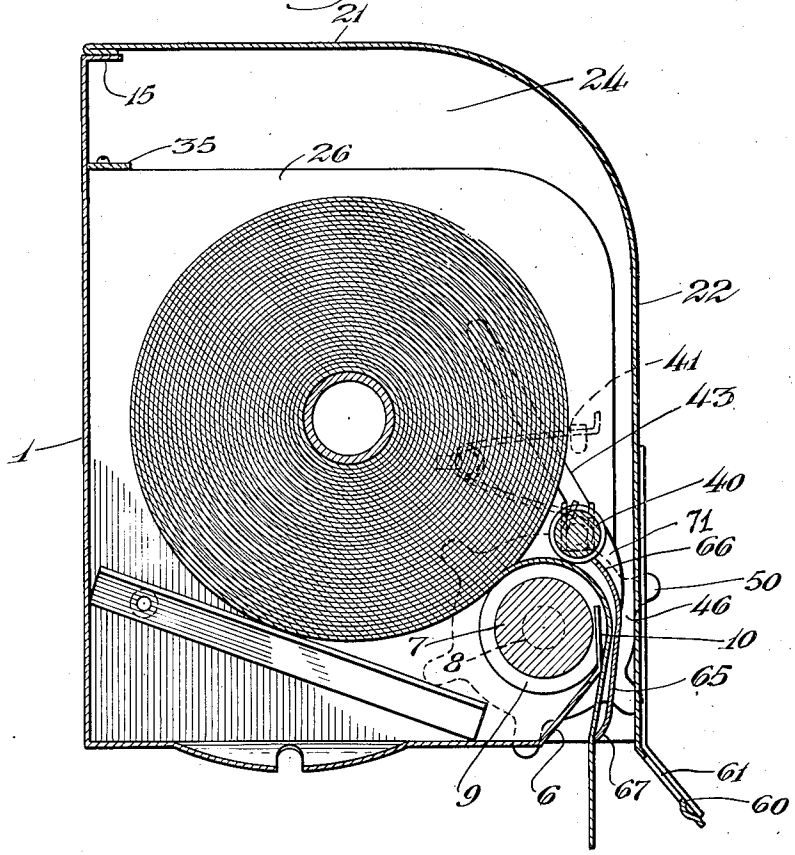
Inventors:
Frank G. Steiner
Rudolph G. Birr
By Harold Olsen
Attorney

Sept. 9, 1941. F. G. STEINER ET AL 2,255,627

CABINET FOR DISPENSING SHEET MATERIAL

Original Filed March 25, 1940 3 Sheets-Sheet 2

Fig. 2.



Inventors:
Frank G. Steiner
Rudolph G. Birr
By Harold Olsen
Attorney

Sept. 9, 1941. F. G. STEINER ET AL 2,255,627

CABINET FOR DISPENSING SHEET MATERIAL

Original Filed March 25, 1940 3 Sheets-Sheet 3

Fig. 4.

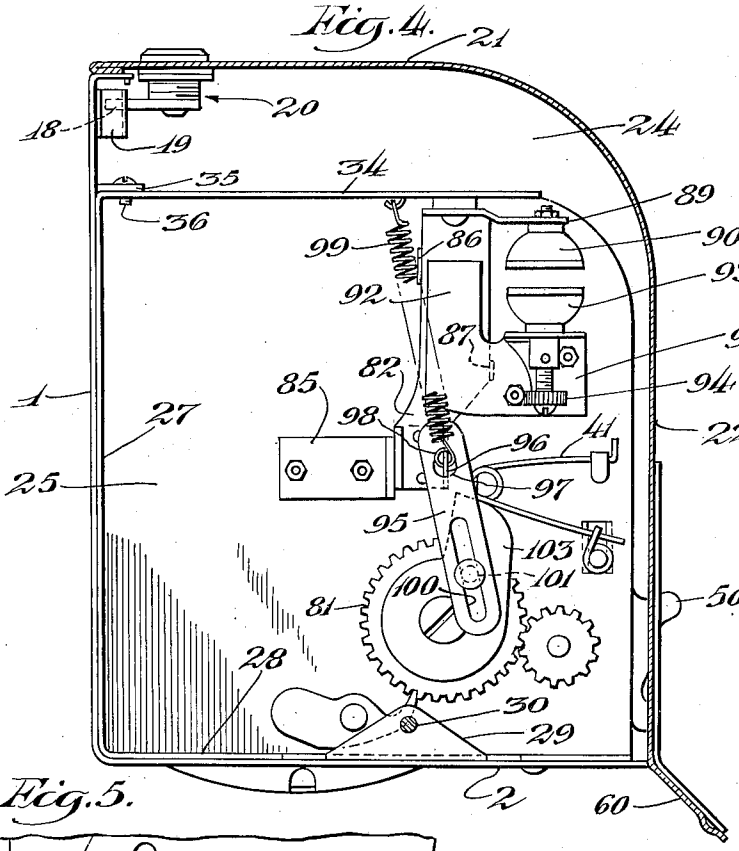
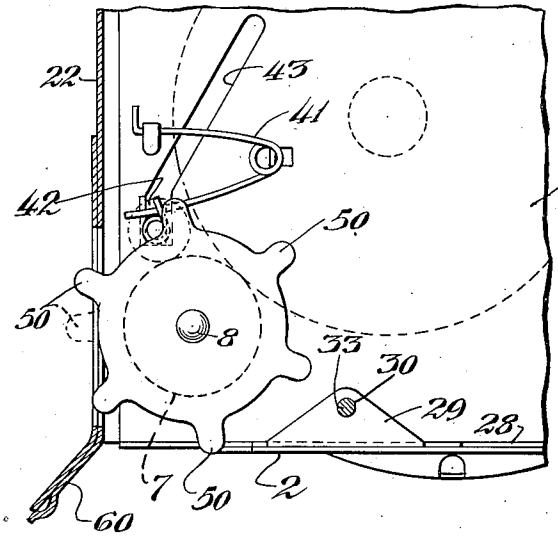


Fig. 5.



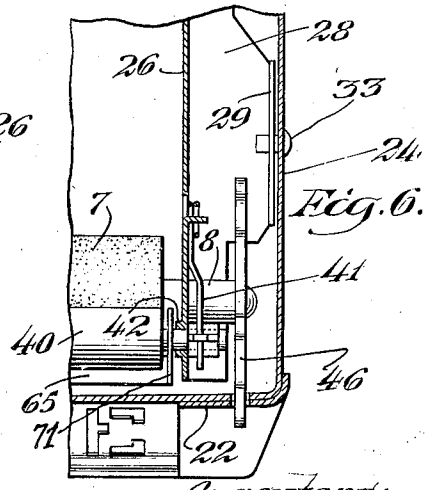


Fig. 6.

Inventors:
Frank G. Steiner
Rudolph G. Birr
By Harold Olsen
Attorney.

Patented Sept. 9, 1941 2,255,627

UNITED STATES PATENT OFFICE

2,255,627

CABINET FOR DISPENSING SHEET MATERIAL

Frank G. Steiner, Miami Beach, Fla., and Rudolph G. Birr, Lombard, Ill., assignors to Steiner Sales Company, Salt Lake City, Utah, a corporation of Utah

Original application March 25, 1940, Serial No. 325,686. Divided and this application March 17, 1941, Serial No. 383,814

12 Claims. (Cl. 164—84.5)

This invention relates to improvements in dispensing cabinet construction, and has among its objects to simplify and cheapen the construction, make it rugged and facilitate assembly and disassembly of the parts.

This application is divisional of our copending application Serial No. 325,686, filed March 25, 1940, and as divisional of that application is directed, among other things, to the arrangement of the tear-off knife and its relation to means acting on the paper after tear-off to space the paper in relation to the knife so that the paper may be easily accessible at a point behind the knife for grasping by the fingers of the user.

Features of the invention include the use of means for holding the paper spaced from the tear-off knife; the use of a plate for that purpose; the mounting of the spacing means to swing about the axis of a rotatable feeding means; the stencil-cutting in the tear-off knife of directions for operating the cabinet, and the use of these stencilled openings as means through which paper behind the knife is viewed; the use of stencilled openings as a means for obtaining a relatively large total area of sighting opening; the balanced arrangement of the paper-spacing apron in relation to the feed roll; the relation of the tear-off edge of the knife to the apron so that after tear-off the paper projects below said apron in a position to be sighted through the stencilled openings of the knife; and all details of construction relating to the above features, along with all ideas of means which are broader than the details shown.

The present invention, which relates particularly to cabinet structures used for the dispensing of paper or other sheet material, is in an art in which there is increasingly acute demand for structural simplification combined with ease of assembly, ease of servicing, cheapness and ruggedness, and ease and convenience in use. Therefore, the details of construction have assumed an important place in the development of this art.

Objects, features and advantages of the invention will appear in the description of the drawings forming a part of this specification, and in said drawings—

Figure 1 is a front elevation of the cabinet with the parts broken away to show the interior construction;

Figure 2 is a vertical transverse section on line 2—2 of Figure 1 showing the apron in gravity-balanced position and holding the paper spaced from the knife;

Figure 3 is a vertical transverse section taken substantially on line 3—3 of Figure 1 showing the paper in tear-off relation to the knife and with the paper-retracting apron engaging the front wall of the cabinet;

Figure 4 is a vertical transverse section on line 4—4 of Figure 1 illustrating the stop mechanism in release position;

Figure 5 is a vertical transverse section on line 5—5 of Figure 1 illustrating the structure in relation to the feed roll operating wheel; and

Figure 6 is a horizontal detailed section taken on line 6—6 of Figure 1 further illustrating the feeding wheel and its relations.

In the drawings (see Figures 1 and 2) the numeral 1 indicates the back of the inner section of the cabinet and the numeral 2 the bottom of that section. This inner section provides only the back and bottom of the cabinet and the back and bottom are formed by bending a single piece of sheet metal. The forward portion of the bottom of the cabinet is bent upwardly as at 6 so that its upper edge is placed close to a feed or measuring roll 7 suitably journaled on upright plates by shaft 8. The feed roll is grooved as at 9 and the upwardly, outwardly slanted portion 6 has suitable fingers 10 which cooperate with the grooves to prevent the paper from following the roll, and to direct it to a point outside of the cabinet.

The upper edge of the back 1 has an inturned or forwardly directed flange 15 which in turn has at its forward edge downwardly turned flanges 16 spaced apart to provide an opening 17. Below this gap or opening 17 and below the flange 15 is arranged a keeper 19 with which a hook 18 of the lock, generally indicated at 20, engages to secure the cover or outer casing in closed position. The locking mechanism is not described because it is of well known construction, but it will be understood that when the key is properly inserted into the lock and moved, the hook 18 may be swung to release position, thus allowing the cover to open, and in this case to swing forwardly and downwardly below the bottom of the cabinet to act as a shelf upon which a supply roll can be supported during servicing.

This cover or outer section forms the top 21, front 22 and sides 23 and 24 of the cabinet. The inner and outer sections cooperate when the outer section is closed to form a substantially rectangular compartment or box. The cover is hinged or pivoted to the inner section so that the cover can swing downwardly below the cabinet in a position to have its top 21 form a shelf. The

hinging or pivoting means is carried by a pair of spaced vertical plates forming part of an inner unit upon which the dispensing mechanism is mounted. The plates are respectively indicated by numerals 25 and 26 and each plate has three outwardly turned flanges, two of which, indicated at 27 and 28, are respectively attached as by spot welding or riveting to the back and to the bottom of the cabinet. The bottom flange of each plate has an extension (see Figure 1) having an upturned bearing-forming portion 29 which has an opening 30 (see Figure 4).

Each of the sides 23 and 24 of the cover has pins, said pins being respectively indicated at 32, 33, which pins engage corresponding bearing openings 30 of the portions 29. The pins are suitably secured in the cover as by riveting. In assembling the cover the sides of the cover are first sprung outwardly and then the pins are registered with the openings 30, and then the sides are released and the pins pass through the openings, and thereafter the resiliency of the sheet metal sides holds the pins in pivotal relation with the bearing openings. This permits easy assembly or removal of the cover for repair or repainting. Inasmuch as the cover forms the four visible sides of the cabinet, simple repainting, insofar as outside appearance is concerned, is the equivalent of supplying a new cabinet. The making of the bearing-forming elements 29 integral or of one piece with the stiffening flanges of the plates makes for strength and for simplicity in manufacture.

The top flanges 34 of the plates 25, 26 are cross-connected by a bar 35 held by suitable screws 36. These plates, as cross-connected and spot welded to the front and back, form means for stiffening the right-angularly related back and bottom elements of the inner section to provide a very rugged base upon which the outer cover is pivoted.

On the plates 25, 26 are mounted the feeding means, including two feed rolls respectively indicated at 7 and 40, the roll 40 being held yieldably against the other roll and being movable away therefrom. The roll 40 is pressed toward the roll 7 by springs 41 acting on trunnions of the roll 40, which trunnions project through slots 42 in the upright plates.

The slot 42 of plate 26 (see Figures 2 and 5) has as an extension a diagonal slot 43 which serves to facilitate assembly or removal of the roll 40. It is noted that in this embodiment the apron 65 is first assembled on the roll 40 and then the roll is assembled into the cabinet. The trunnion of the roll 40 is first inserted in slot 42 of plate 25 and then the opposite trunnion is inserted in slot 43 and moved downwardly and forwardly to position the roll 40 in operative relation with the roll 7.

The lower roll 7, known as the measuring roll, is herein provided with a positive means for turning it to initially bring the paper to a position whereat it can be grasped by the hand and pulled. Heretofore thin disks of metal have been used and a small arcuate portion of the disk has projected through the slot in the front of the casing. These disks are objectionable because they depend entirely for operation upon the friction between a finger tip and the thin edge of the disk. The load required to be moved by this frictional action on a disk in devices like that herein shown is considerable, and unless the disk is made of very thick metal (which is objectionable because it is then difficult to form them by stamping) the skin of the user's finger is likely to be broken, or painful abrasions occur. To reduce the wear and tear on the finger of the operator the operating element 46 herein is provided with abutments, shoulders or arms 50. These abutments are so arranged in relation to the slot 45 that only one projects at a time and so that the one which does project normally so lies that the operator can lay a finger upon it and press downwardly as upon a lever to operate the roll. This scheme provides what might be called a disappearing lever or a succession of appearing and disappearing levers. A better purchase for the operator's finger with less discomfort is thus afforded than by mere friction of the thumb against the thin edge of a disk. Only one abutment or lever appears outside of the cabinet at the same time, and the disk can be made of thin metal, while at the same time abrasions of the skin of the fingers is avoided. It will also be noted that as the operator moves the finger downwardly, the abutment 50 eventually disappears inwardly through the slot 45 and the operator's finger continues to slide downwardly against the front of the outer face of the outer casing. At the moment of disappearance of one abutment 50 another projects near the top of the slot. This device is also more efficient because of the greater leverage obtained. The wheel is detachably secured to the shaft of the roll 7, which shaft projects through slot 42 of the plate 26, said slot 42 acting as a bearing. The roll 7 is at the inner side of the plate 26 and the wheel at the outer side of said plate. The down-wiping action of the thumb in relation to an abutment and front face of the cabinet is very efficient.

Referring to Figure 5. The dot-and-dash lines represent a desirable position of the abutment or lever 50 at the end of an operation which corresponds to the setting of the stop mechanism or of the time-stop mechanism. In this case the abutment 50 is disposed at about the vertical middle of the slot and projects quite prominently to provide a long abutment upon which the thumb or finger can be initially placed preparatory to the application of downward pressure.

A feature particularly important relates to the means for facilitating the grasping of the paper after tear-off by causing it to be moved to and held in spaced relation to the rear of a tear-off knife 60. In this instance the knife is arranged at the bottom of the cabinet at an angle shown and so that the user's eye will be at a level above the knife. The tear-off knife projects, in this embodiment, forwardly and downwardly as a terminal element of one piece with the outer wall of the casing or cover, and in this instance the knife is preferably constituted by bending the lower edge of the front wall to the position shown.

Another feature relates to the provision of a series of paper-sighting openings which in the aggregate occupy a large part of the total area of the knife to assure an easy and good view of paper lying behind the knife so that the paper can be clearly seen after the material has been torn off and after it has been retracted by the means above mentioned to an easily accessible position spaced from the knife.

A feature is the utilization of letters of direction to provide these openings of large aggregate area. These letters on the knife as words of direction are produced by stencilled cut-outs, providing adequate areas of paper-sighting openings.

The character of the words or the letters or their number may be varied within the scope of the invention. It is believed entirely new in this art in a device in which the paper lies spaced back of the knife or is automatically spaced back of the knife, to provide the needed clear-view openings by the means above mentioned. The stencilled lettering is indicated at 51, which numeral also indicates the openings. Thus, the user simultaneously sees the directions and the paper and by the use of a relatively large number of openings it is easy to see the spaced-back paper and easy to see just where it lies. It will be understood that as a rule the cabinets are so hung or placed that the user's eyes are above the level of the knife so that the paper is viewed through the openings at an angle, which condition makes the position more difficult to judge, unless adequate sight-opening area in the knife is provided.

The automatic back-spacing means, of apron 65 in this instance, subserves the double function of automatically spacing the paper and of cooperating with the feed rolls to form a throat or passage downwardly through which the paper is fed by the rolls into tear-off relation with the knife. The apron is adapted to be moved forwardly by the paper and when so moved is adapted to change the shape of the delivery passage so that this passage becomes divergent from the meeting point of the rolls to a point at which the paper is made accessible. The shape of the apron and its relation to the rolls is such that with a tamperer's fingers held in the passage when feeding the paper by means of the abutment wheel 46, jamming of the paper eventually sets up a pressure which moves one of the feed rolls to stop feeding action. The second function which the apron may perform independently of the first is to hold the paper, which has been fed below it, in this embodiment in a substantial upright position spaced rearwardly of a knife which is angularly related to a front upright face of the cabinet. The apron is balanced, in this instance gravity-balanced, to move automatically to a position at which to hold the paper properly spaced from the knife, so that the paper can be easily grasped by the user, who reaches behind the knife after sighting paper through the opening provided by the stencilled words of direction.

The apron 65 or other equivalent movable element acts also to change the cross-sectional configuration of the delivery passage. When the apron is in rearwardmost position it holds the paper lightly against the measuring roll as shown in Figure 2, in which position the paper is spaced from the knife. In Figure 3 it will be noted that during tear-off the apron is pulled forwardly and as so positioned forms a throat divergent with relation to the meeting point of the feed rolls. Jamming occurs when someone maliciously tampers with the cabinet to try to put it out of commission, which in this day of keen competition and labor troubles is not an unusual occurrence, in fact, one which it has been found advisable to guard against.

As herein shown, the apron is curved as at 66 (see Figure 2) and has the concave side facing the rolls. In this embodiment, but not necessarily in all structures involving this invention, there is means connecting the apron to swing about the axis of the movable feed roll 40 as a center, the arrangement being such that the apron as positioned in Figure 3 is gravity balanced to hold the paper which is passed below it in a substantially upright position spaced from the knife. Another relation of the apron to the knife which is believed new is that the paper projected below the knife can be drawn forwardly, also drawing the apron forwardly so that the paper can be torn off against the knife. The relation of the knife and the lower edge of the apron are such that after tear-off and after rearward movement of the apron to its initial position, in this instance gravity-balanced position, a portion of the paper continues to project below the apron to be accessible to the finger of the user.

We believe ourselves the first to provide any means whereby deliberate jamming of the paper while it is being fed will render the feeding means inoperative, or to provide means movable by the act of tampering to obtain jamming, to provide a throat which diverges in direction of feed from the meeting point of the rolls so that if the paper is jammed it will tend to automatically release itself and move in direction of accessibility, and the first to provide for a change of configuration by the act of tampering, as well as to render futile the tamperer's effort to seriously jam the paper. It is to be noted that the middle part of the apron is straight and the lower part is curved inwardly as at 67 to obtain an edge engagement against the paper. Heretofore, the shapes of the throats have been downwardly convergent or the arrangement has been such that the paper could be pushed upwardly above the rolls and thereby became inaccessible and so jammed that it was necessary to open the cabinet, tear off (and thus waste) the jammed paper and then relock the cabinet. This naturally required the attention of a service man, and paper was wasted.

As shown in detail in our copending application, but not shown herein in detail, when the tamperer with the fingers held in the throat or delivery passage operates the feed rolls, the paper builds up by a series of reverse folds and as the feeding proceeds a compression is built up in the throat which eventually results in movement of the roll 40 upwardly to stop feeding. In other words, the paper becomes forcibly packed between the fingers as a base and the movable roll 40. Now when the tamperer having, he thinks, put the cabinet out of commission for further feeding, removes his fingers, the resiliently packed and folded condition of the paper causes it to automatically expand like an accordion whereby to bring the paper to accessible position or to cause it to loosen sufficiently to be easily withdrawn by the hand so that although wrinkled it is not wasted. Operation of the feed-wheel will also result in feeding because of the divergent throat.

The apron is pendently, swingingly attached to the shaft or trunnions of the roll 40. There is no intention to be entirely limited to this mode of attachment of the plate, whether used for its throat-forming function or its paper-spacing function. It is sufficient if the plate or equivlent means is so movably related as to be capable of performing the functions mentioned.

It will be understood, of course, that the tension of the springs 41 on the pressure roll 40 is so balanced as to obtain the proper feed under ordinary conditions, but nevertheless to properly react to the relatively small pressure produced by jamming the paper to raise the roll and stop feeding. As before stated, the paper is not wasted even though wrinkled.

The stop mechanism herein is of the vacuum-cup type, as distinguished from the dash-pot type. The stop mechanism is adapted to control and be controlled by what is known as the measuring roll 7. The roll 7 has a spur gear 80 on its shaft or trunnion, which meshes with another spur gear 81 journaled on the plate 25. There is a slide-stop indicated at 82 and this is guided by a three-point guide means, the guides being respectively indicated by the numerals 85, 86, 87. The slide-stop can simply be lifted out from between the guides and it is therefore very easy to assemble and disassemble. The face of greatest area of the slide is opposed to and slides against the outer face of the plate 25 and the slide has a bracket 89 which supports one of the vacuum cups 90. A bracket 91 has an extension 92 which overlies the slide stop to form the sole means to prevent its movement outwardly from the plate 25. Suitable fastening devices securing the bracket are shown. The guide 85 is detachably connected while the other two guides are formed by being struck out of the metal of the plate. The bracket 91 supports the second vacuum cup 93. When the cups are brought together they remain vacuum attached and immovable during the time period. Timed release is obtained by admitting air between the cups and the rate of admission of air is regulated by screw 94. The link 95 is held on a pivot 96 carried at the lower end of the slide-stop 82. There is an opening 97 in this pivot projection 96, and the hooked end 98 of the stop-retracting spring 99 passes through this opening and is easily attached and detached. The other end of the spring 99 is suitably connected to the flange 34 of plate 25. The link 95 has a slot 100 therein and this is loosely traversed by a crank pin 101 on the gear 81. The general operation of the device is well known. The gear rotates the crank and pulls the link downwardly, also pulling the stop downwardly into the path of the stop arm 103 at which point the stop slide is held by the vacuum cups until timed annulment of the vacuum occurs, immediately after which the spring pulls the stop to the position shown.

Since the claims of this divisional case are directed to the knife feature and to its relation to the paper as controlled by the apron, and to the use of stencilled cut-outs as a means for obtaining relatively large sighting area openings in the knife, the other details of the construction are not stressed herein.

It will be understood that irrespective of the use of the apron, applicants herein believe it new, where delivered paper is disposed in a substantially vertical position behind the knife after being torn off, and where the knife is angularly related in the manner shown to the paper, to increase the area of the sighting openings by the use of stencilled cut-outs or openings as letters indicative of the manner of operating the cabinet.

The apron 65 is swingingly hung on the trunnions or shaft of the roll 40 by means of plates or arms 71 located at the ends of the apron. There is no intention to entirely limit the invention to a particular manner of mounting the apron or plate, nor to the mounting of the plate on the trunnions, although this construction is preferred. The plate may be supported in any suitable manner to move to be capable of cooperating to form the downwardly flaring or diverging throat when the plate is moved in an attempt to insert the fingers to cause jamming or to move to bring the paper to and hold it in spaced relation to the knife.

We claim as our invention:

1. A dispensing cabinet having feeding means, a knife behind which the sheet material is fed by said feeding means and by which it is adapted to be torn, and means adapted to automatically move to space the paper away from the rear of the knife, following tear-off by the knife and to hold the paper in substantially upright position as so spaced, said knife being angularly related to the paper as so positioned and having openings therethrough formed by cut-out stencilled lettering which occupies a relatively large area of the knife and through which said paper can be viewed when the eyes of the observer are at a level above the knife.

2. A dispensing cabinet having feed rolls and a knife in tear-off relation with which the paper is delivered by the rolls, means interposed between the knife and the rolls and between which and said rolls the paper passes on its way to tear-off relation with the tear-off knife, said means being movable toward the tear-off knife as the paper is pulled by the user into tear-off relation with the knife and said means being adapted to immediately move said paper against said rolls and to a position spaced rearwardly of the knife, following tear-off of the paper, said knife having openings therein through which the paper can be viewed as so spaced, and when the user's eye is at a level above the knife and in front thereof.

3. A dispensing cabinet having a tear-off knife having paper-sighting openings therein, means for feeding the paper to a substantially upright position back of the knife, the tear-off knife forming an angle with an upright front face of the cabinet so that an observer's eye disposed above the level of the knife may look through openings in the knife and see the upright paper back of the knife, whereby the surface of the paper is viewed at an angle through the openings, the openings in said knife occupying a relatively large area of the knife and being formed by stencilled lettering, which lettering also serves for directions by which to operate the cabinet.

4. A dispensing cabinet having feed rolls and a delivery throat into which the feed rolls deliver the paper, said throat being in part formed by means separate from the knife which when moved away from the feed rolls makes the throat divergent from the rolls to a point at which the sheet material is made accessible to the user, and a knife against which paper delivered through the throat is torn off, the relation of the knife to the point of exit of the paper being such that after the paper is torn off it is held by said movable element in spaced relation rearwardly of the knife.

5. A dispensing cabinet having two feeding rolls, one held yieldably against the other but movable away therefrom, a swingable apron between which and said rolls the paper lies after having passed through the rolls in feeding direction, said apron being balanced to hold paper which has been fed below it, in a substantially upright position, a knife arranged forwardly of the apron and so positioned that paper projecting below the apron can be drawn forwardly and torn against the knife, the relation of the knife and the lower edge of the apron being such that after tear-off and after movement of the apron to its initial balanced position a portion of the paper continues to project below the bottom of

the apron in a position accessible to the fingers of a user.

6. In a dispensing cabinet having feeding means, a knife behind which sheet material is fed and by which it is adapted to be torn off, printed directions on the knife instructing the user in the operation of the cabinet, produced by stencilled cut-outs in the knife which serve to provide sighting openings of large aggregate area through which the paper behind the knife can be viewed after it is torn off by the knife.

7. A dispensing cabinet having two feeding rolls, one held yieldably pressed against the other but movable away therefrom, a tear-off knife for the cabinet, means separate from the knife and mounted on and swingable about the axis of rotation of the movable roll, and adapted to hold the paper spaced from the tear-off knife, said means being swingable toward the knife when the paper is pulled against the knife to tear it, and after tearing being adapted to swing away from the knife to again hold the paper spaced.

8. A dispensing cabinet having a front wall having at its bottom a tear-off knife, and having feeding means, means separate from the knife interposed between the feeding means and the front wall to form a delivery throat and automatically urged toward the feeding means, said interposed means being movable away from the feeding means toward and against the front wall during the act of pulling the paper against the knife.

9. A cabinet having a front wall having at its bottom a knife which extends below the level of the bottom of the cabinet and which forms an angle with an upright front face of the cabinet so that the observer's eye disposed above the level of the knife may look down through openings in the knife, feeding means within the cabinet comprising upper and lower feed rolls adjacent but spaced rearwardly from said front wall, and a plate interposed between the lower feed roll and the front wall and movable between those elements toward and away from the knife, and pivoted at its top to the axis of the upper roll and adapted when pulled toward the knife by the paper to engage the front wall as a stop, and further adapted when engaged with the front wall to have its lower edge at a level above the tearing edge of the tear-off knife and further adapted after the paper is torn to automatically move the paper rearwardly in spaced relation to the knife.

10. A dispensing cabinet having feed rolls and a knife extending below the lower wall of the cabinet and into tear-off relation with which paper is delivered by the rolls, one of the rolls having its axis of rotation above the axis of rotation of the other, means separate from the knife and disposed forwardly of the rolls and pivoted above the axis of rotation of the lower roll and interposed between the lower roll and a front wall of the cabinet and having its lower edge at a level well above the tear-off edge of the knife and forming with the lower roll a throat into which the paper is delivered from the rolls to a point below the lower wall of said cabinet, and in opposition to the knife blade, said means being movable toward the front of the cabinet by the paper as it is drawn toward the knife and being adapted to normally automatically hold the paper against the roll and spaced rearwardly of the knife to facilitate grasping.

11. A dispensing cabinet having a knife and having feed rolls, upper and lower, a movable apron which is separate from the knife and which forms with the rolls a delivery throat through which the feed rolls deliver the paper and from which the paper is delivered to an accessible position, said apron being adapted to automatically move the paper toward the rolls to space the paper from the knife, and after such movement being adapted to form a throat which is convergent in a direction away from the meeting line of the rolls, said apron being adapted to be pulled by the paper toward the knife for tearing the paper against the knife, and after such movement being adapted to form a throat which is divergent away from said meeting line.

12. A dispensing cabinet having a knife extending below the bottom of the cabinet and having feed rolls, upper and lower, a movable apron which is separate from the knife and which forms with the rolls a delivery throat through which the feed rolls deliver the paper and from which the paper is delivered to an accessible position, said apron being adapted to automatically move the paper toward the rolls to space the paper from the knife, said apron being adapted to be pulled by the paper toward the knife for tearing the paper against the knife, and after such movement being adapted to form a throat which is divergent away from said meeting line, the top of the apron being pivoted at a point above the rotative axis of the lower roll, and said knife forming an angle with the paper as pendently held by the apron in spaced relation to the knife.

FRANK G. STEINER.
RUDOLPH G. BIRR.