

Dec. 6, 1938.

F. P. VAUGHAN ET AL

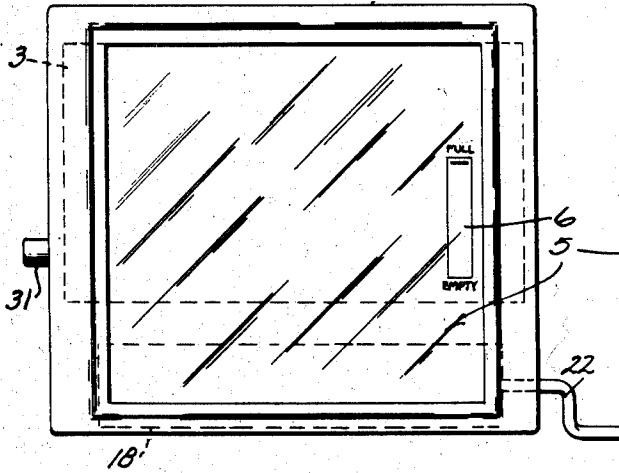
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DISPENSER FOR PAPER ARTICLES

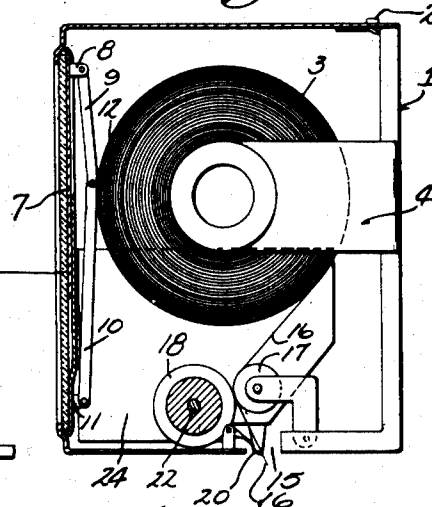
Filed April 25, 1936

2 Sheets-Sheet 1

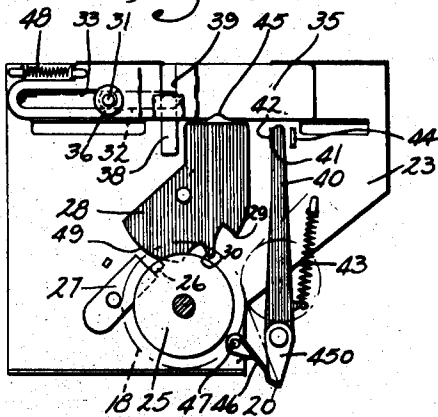
*Fig. 1.*



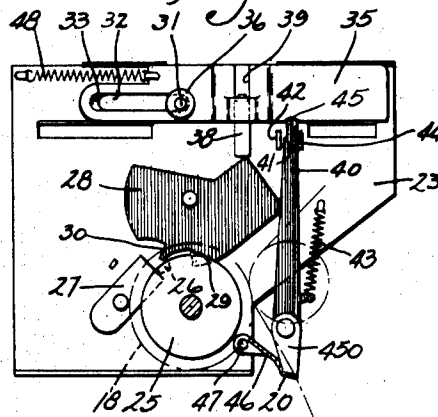
*Fig. 2.*



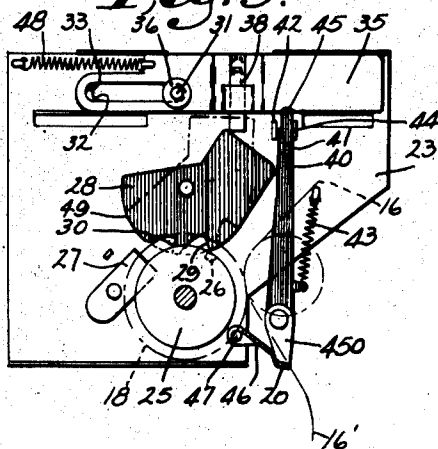
*Fig. 3.*



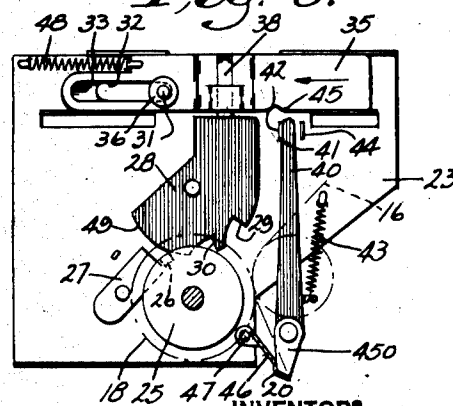
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



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2 Sheets-Sheet 2

Fig. 8.

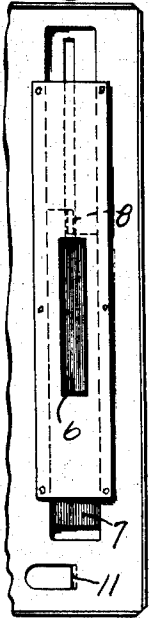


Fig. 9.

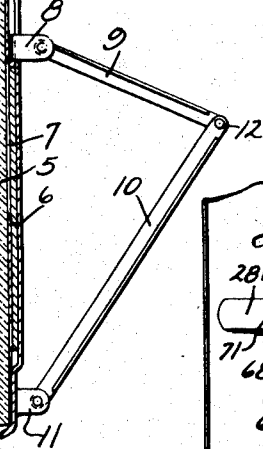


Fig. 15.

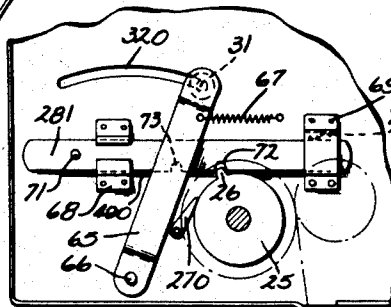


Fig. 7.

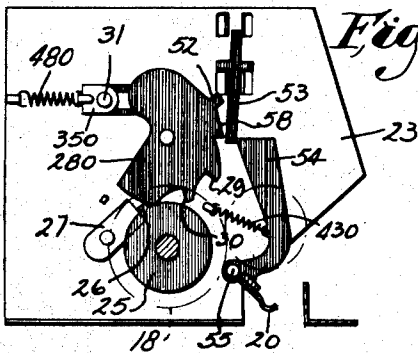
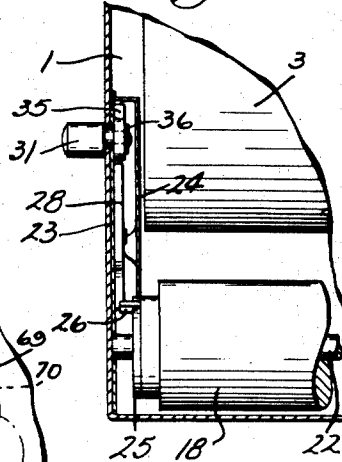


Fig. 11.

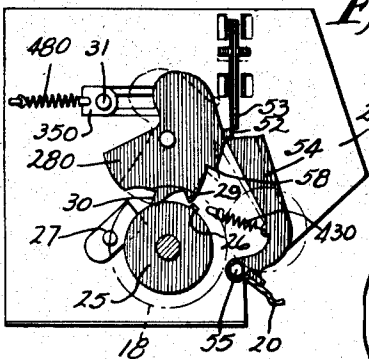
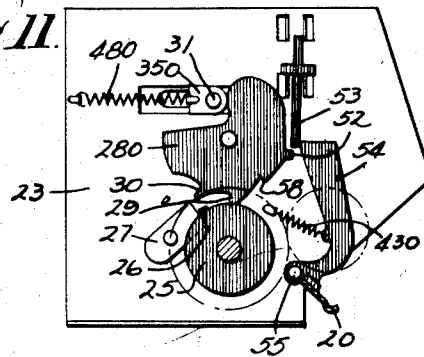


Fig. 13.

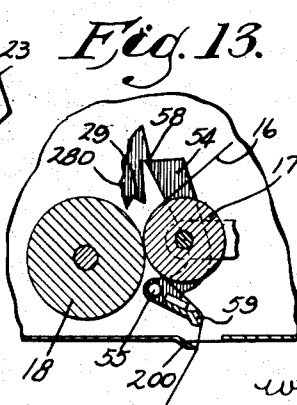
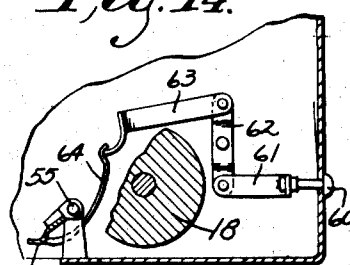


Fig. 14.



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## UNITED STATES PATENT OFFICE

2,139,339

## DISPENSER FOR PAPER ARTICLES

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Application April 25, 1936, Serial No. 76,442

19 Claims. (Cl. 164—42)

This invention relates to improvements in dispensers for paper articles.

It is the primary object of the invention to provide an improved means for preventing waste in the dispensing of paper toweling or the like from a continuous web.

The apparatus is of a character which requires the operator to manipulate successively different parts of the apparatus in order to withdraw a given length of web and tear off the projecting portion thereof, and for use as a towel or otherwise. It has been found that if unlimited portions of the web may be withdrawn by a single operation, a large portion of the material will be wasted, but that if the amount of the web which can be withdrawn by any single operation is mechanically limited by means which requires resetting before another withdrawal can occur, a large proportion of this wastage will be saved. To provide a simple and inexpensive mechanism for this purpose is one of the objectives of this invention. We have, however, gone further to prevent the withdrawal limiting mechanism from being reset until the projecting portion of the web is definitely severed. This makes it impossible for the operator to have in one piece more than a given length of the web, and this feature is found to save most of the remaining waste. To accomplish this objective, therefore, is a further object of the invention.

More specifically stated, the objects of the invention include first, the provision of a novel control device locked by a mutilated pinion; the provision of a novel control device which cannot be reset until a detent is released by the tension of the web incident to its severance and the provision of a novel control device in which the handle manipulated by the operator is movable independently of the control mechanism operated thereby.

In the drawings:

Figure 1 is a front elevation of a supply cabinet embodying this invention.

Figure 2 is an end view partially in section of the mechanism within the cabinet as it appears with the end wall removed.

Figures 3, 4, 5 and 6 are interior elevational views of the control mechanism in its successive operating positions.

Figure 7 is a fragmentary view in transverse section through the side of the cabinet and the control mechanism therewithin.

Figure 8 is a fragmentary detail in elevation showing the inner side of the gauge mechanism.

Figure 9 is a view in vertical section through

the gauge mechanism showing the operating parts in side elevation.

Figures 10, 11 and 12 show a modified type of control mechanism in elevation as viewed from the interior of the cabinet, the several views showing the mechanism in its successive operating positions.

Figure 13 is a fragmentary view similar to Figs. 10, 11 and 12, showing a further modified embodiment with particular reference to that portion of the mechanism which is operated by the tension of the web in the severing thereof.

Figure 14 is a fragmentary detail view in transverse section looking at the end of the cabinet opposite the control mechanism and showing a modified arrangement for tripping the detent.

Figure 15 is a view similar to Figs. 3 to 6, showing a simplified control mechanism.

Like parts are identified by the same reference characters throughout the several views.

The cabinet may be of the type shown in a companion application Serial No. 64,986, Filed February 20 1936, entitled Web dispenser mountings. Its back 1 may be fixed to a wall or other suitable support and the entire front portion, upon release of the latch 2, may be withdrawn, either pivotally or otherwise, from the back 1, to permit the supply roll 3 to be introduced between any suitable supporting arm such as that illustrated at 4 in Fig. 2.

In the particular cabinet illustrated, the front is provided with a mirror at 5 having an opening at 6 through which a slide 7 is visible to perform the function of a gauge in indicating how much paper remains on the roll 3. The slide 7 is provided with a rearwardly projecting arm at 8. A pair of links 9 and 10 are pivotally connected with each other and with the arm 8 and a fixed arm 11. Thus the movement of the links between the positions in which they are illustrated in Fig. 2 and the position in which they are illustrated in Fig. 9, progressively lowers the slide 7 to indicate the reduction in diameter of the supply roll 3, it being understood that the fulcrumed connection 12 between the links rests directly on the surface of the roll.

There is a space provided at 15 between the front and rear portions of the cabinet through which predetermined lengths of web from the supply roll 3 are ejected. The web 16 passes over the pressure roll 17 into engagement with the feed roll 18 and thence downwardly across the pivoted bar 20 which serves as a straight edge or knife across which the projecting length of web may be torn. In order that the feed roll 18

may be turned to eject a length of web, it is provided with an operating handle at 22.

For the purposes of this invention, however, the operation of the feed roll 18 is subject to control mechanism which will now be described.

The control mechanism is mounted on a supporting plate 23 fastened within the left hand end of the case, and is normally enclosed by a housing 24 which is shown only in Figs. 2 and 7 and is elsewhere omitted to expose the mechanism.

The feed roll 18 carries a pinion 25 disposed within this housing and there carrying a single tooth 26. When the operator approaches the apparatus the pinion 25 is locked against reverse movement by a pawl 27, and is locked against clockwise movement (in the normal direction of feed) by engagement with the untoothed portion of a peculiar gear-like member 28 having but two teeth 29 and 30 respectively.

To release the feed roll 18 it is necessary for the operator to rotate the gear 28 in a clockwise direction toward the position in which it is illustrated in Fig. 4. The handle pin 31 is shown in Fig. 3 at the extreme forward end of a slot 32 in the end wall of the cabinet and at the extreme rearward end of a slot 33 in the slide 35. The pin is positioned by a head or washer 36 which prevents it from falling out of the registering portions of these slots, but the handle pin is free of the slide and is not dependent thereon for its position.

When the operator pushes rearwardly upon the handle 31 he moves slide 35 rearwardly to the position in which it is illustrated in Fig. 4. The latch bar 38, which hangs at the lower extremity of its range of movement in guideway 39, strikes the upper end of the gear plate 28 and operates the gear plate in a clockwise direction to the position shown in Fig. 4. In moving to this position the gear plate 28 dislodges the detent lever 40 from its Fig. 3 position in which its shoulder portion 41 was engaged beneath the stop lug 42 under the tension of spring 43. When dislodged, the detent lever is not only oscillated in a clockwise direction toward engagement with the other stop lug 44, but is permitted to be drawn slightly upwardly under tension of spring 43 until its end engages in the notch 45 in the lower margin of the slide 35, thus holding the slide in its retracted position against the tension of the slide return spring 48.

The upward movement of the detent lever 40 is provided for by providing a fulcrum for this lever upon the arm 450 connected with the tear-off knife 20. The support 46 for the tear-off knife 20 is in turn pivoted at 47 so that when the detent lever is freed in the first operation of the device the tear-off knife is lifted slightly by the tension of spring 43 in the elevation of the detent lever 40.

The handle 31 is now completely ineffective. The slots 32 and 33 in the casing and in the slide 35 respectively are in substantial registry, and the manipulation of handle 31 from one end to the other of these slots has no effect whatever on the mechanism.

The only portion of the mechanism which may now be operated is the feed roller 18 which may be turned by means of the crank 22 in a clockwise direction as viewed in Figs. 3 to 6. Its single tooth 26 engages tooth 29 of the gear plate 28 to oscillate the gear plate one step in a counter-clockwise direction as shown in Fig. 5. This movement slightly raises the latch bar 38 and frees the single tooth 26 so that the feed

roll 18 may be rotated for one full turn without further effect on the control mechanism.

Following its rotation for one turn, the tooth 26 of the feed roll engages the second tooth 30 of the gear plate 28, thereby oscillating the gear plate to the position shown in dotted lines in Fig. 5, in which its imperforate margin 49 is again interposed in the path of the tooth 26, as in the Fig. 3 position of the parts.

Before the tooth 26 of the pinion 25 again strikes the portion 49 of the gear plate, however, the feed roll 18 will have made two complete rotations, its circumference being so worked out that this will eject from the apparatus the required amount of web for one paper article (for example, a towel). The feed roll has now come to rest with its pinion confined between the pawl 27 and the gear plate 28, exactly as in the Fig. 3 situation, and the operator's manipulation of the handle cannot effect any rotation of the feed roll either forwardly or backwardly. It only remains for him to tear off the length of toweling or other web material which projects beyond the cut-off knife 20.

When the operator pulls upon the projecting length of web 16, the tension of the web required to sever the projecting end portion therefrom pulls the tear-off knife downwardly with its supporting lever 46 to the position shown in Fig. 6 where lever 46 encounters the front bottom portion of the cabinet and comes to rest. The bodily downward movement of the cut-off knife draws with it the detent lever 40 against the tension of spring 43, thereby freeing the notched portion 45 of the slide 35 as shown in Fig. 6. The slide thereupon moves in the direction of the arrow under the bias of its retracting spring 48. Fig. 6 shows the slide as it appears when the movement has just been initiated. The completion of the movement will leave the parts as shown in Fig. 3.

In the mechanism shown in Figs. 10, 11 and 12, a similar cycle of operations takes place. The handle 31 is in this case made fast in a slide 350 subject to the tension of a spring 480. The slide, in its rearward movement from the Fig. 10 position to the Fig. 11 position, acts directly upon the gear plate 280 to oscillate this plate in a clockwise direction, thereby freeing the pinion tooth 26, in order to permit the clockwise rotation of the feed roll 18.

This oscillation of the gear plate 280 causes the finger 52 thereon to pass beneath the cruciform detent 53 as shown in Fig. 11.

As the crank is turned to rotate the feed roll 18, the pinion tooth 26 on the feed roll engages the first tooth 29 of the gear plate 280 to oscillate the gear plate 280 one step in a counter-clockwise direction to the full line position shown in Fig. 12. This movement lifts the detent 53 and allows spring 430 to oscillate lever 54 about its fulcrum 55, thereby swinging upwardly the cut-off knife 20 which is carried by lever 54.

During the second rotation of the feed roll 18 the tooth 26 of pinion 25 will engage the second tooth 30 of the gear plate to complete the movement of the gear plate to the position shown in dotted lines in Fig. 12, this being the same position shown in full lines in Fig. 10. The detent 53 has, however, passed above the latch lever 54 so that when the gear plate reaches the position shown in dotted lines in Fig. 12, the latch lever 54 will engage beneath the shoulder 58 to lock the gear plate so that it cannot further be manipulated by handle 31 until the web is torn off.

The tearing off of the web draws the cut-off blade 20 downwardly about the fulcrum at 55, thereby retracting lever 54 from engagement with the gear plate 280, and also permitting the detent 53 to drop between lever 54 and the gear plate as shown in Fig. 10, so that the gear plate may now be pushed backwardly by means of handle 31 to renew the sequence of operations and to permit the withdrawal of another sheet.

10 The release incident to the tearing off of the first sheet need not necessarily be effected by the movement of the cut-off knife itself. In Fig. 13 I have shown the bottom of the cabinet formed to provide a cut-off knife 200 which is stationary. 15 Immediately above this I have mounted a transverse pawl 59 which is carried by the lever 54 exactly as was the cut-off knife in Figs. 10, 11 and 12. The tensioning of the web across the cut-off knife 200 will oscillate the pressure bar 59 in a 20 clockwise direction to retract the latch lever 54 in the manner already described. Obviously the same arrangement is adaptable to the construction shown in Figs. 3 to 6.

If desired, the means which releases the control mechanism may have an emergency connection to the exterior of the cabinet to be operated by hand if it does not operate by the tearing off of the web. In Fig. 14 I show a button 60 on the exterior of the cabinet which is connected by link 30 61, lever 62, and push rod 63, with an arm 64 attached to the cut-off knife 20 so that the pulling of the button 60 will operate the knife in the same direction in which it should be operated by the tearing of the web.

35 In Fig. 15 I have shown a very simple device embodying the mutilated pinion principle of operation, as well as the free handle movement, which may be used in any case where the tearing of the web is not essentially a prerequisite to the renewed operation of the control mechanism.

40 In the Fig. 15 construction the handle 31 is secured to a lever 65 fulcrumed at 66, the handle moving in an arcuate slot 320 in the end wall of the cabinet. The lever 65 is normally held 45 in a retracted position by means of the tension spring 67.

The pinion 25 with its single tooth 26 is identical with the corresponding parts already described. A pawl 270 prevents retrogressive movement of the pinion just as does pawl 27 in the previously described devices.

50 The gear plate, however, takes the form of a bar 281 mounted on guide straps 68 and 69, one of which may preferably be provided with a spring friction device 70 to hold the bar in any position to which it is adjusted.

The bar has been moved to the left in Fig. 15 by a counter-clockwise oscillation of lever 65 through manipulation of handle 31 in slot 320. 60 The edge of lever 65 has engaged the pin 71 for this purpose. The movement of the gear plate or bar 281 to the left moved its notch 72 into position where it could be entered by the pinion tooth 26, so that during the continued rotation of the feed roll in a clockwise direction as indicated by the arrow, the bar 281 will be moved one 65 step to the right. In its second rotation the pinion tooth 26 will engage the second notch 73 of the bar and will move the bar further to the 70 right.

Upon the completion of its rotation, however, the pinion tooth 26 will have no further possible movement, for it will encounter the unnotched margin 490 of the bar. This will prevent any 75 further movement of the pinion until the handle

31 is again manipulated to retract the bar to a position somewhat beyond that in which it is illustrated in Fig. 15. This simple mechanism effects most of the saving which is possible in a device of this character, but it does not latch the control mechanism subject to release upon the tearing off of the paper as in the devices previously described, and consequently it is possible for the operator to get a multiple length sheet by operating the handle after ejecting the first 10 length and before tearing off the ejected portion of the web.

We claim:

1. In a web dispensing device, the combination with a web feeding means and a part connected 15 therewith for movement in accordance with the operation of said means, of a second part complementary to the first mentioned part and comprising a mechanism for regulating the operation of said web feeding means, one of said parts having at least one tooth and the other of said parts having at least one space in which said tooth is 20 receivable to communicate movement from the toothed part to the part provided with such space, said last mentioned part having a portion beyond 25 said space with which said tooth is positively engageable as a means of limiting the movement of the toothed part and thereby limiting the operation of said web feeding means.

2. The combination with web feeding means, of 30 a pinion connected therewith to partake of the movement thereof, a gear plate having teeth engageable by the pinion to receive motion therefrom through a predeterminedly limited range of pinion rotation, said gear plate being provided 35 beyond said range with a portion comprising a positive stop for said pinion, and means for rotating the pinion until stopped by said plate.

3. The combination with web feeding means, of a pinion connected therewith and toothed for 40 less than its entire periphery, a gear plate provided with means for its manual retraction and having in its retracted position at least one tooth engageable by a pinion tooth for the advance of said gear plate, said gear plate providing, in the 45 course of its advance, an untoothed portion comprising a positive stop against which the toothed portion of said pinion is engageable to limit the movement of said web feeding means.

4. In combination, a web feeding means, a pinion 50 connected therewith and toothed for a limited portion of its periphery, a gear plate co-acting with the pinion and having teeth engageable by the pinion in a retracted position of the gear plate, and a pinion stop engageable by the pinion 55 in the advanced position of the gear plate, said gear plate being movable by engagement of a pinion tooth therewith from its retracted to its advanced position, and means normally free of said gear plate for manually returning said gear 60 plate from its advanced to its retracted position.

5. The combination with a web feeding device, of a pinion connected therewith toothed for a limited portion of its periphery, a gear plate having means engageable by the toothed portion of the 65 pinion in each of a plurality of pinion rotations, said gear plate having a stop portion presented to the toothed portion of the pinion upon the completion of said rotations, and means for manually restoring said gear plate to a position to 70 again present its said means to the toothed portion of the pinion.

6. The combination with a web feeding device, of a pinion connected to move therewith, a rack co-operative with said pinion and provided with 75

a toothed portion and an untoothed portion, said toothed portion meshing with said pinion to transmit motion therefrom to said rack, and said untoothed portion being thereupon opposed to said pinion to limit the movement thereof and of said web feeding means, and means for primarily actuating said web feeding device and pinion for delivering motion to said rack until said rack is stopped by engagement of its untoothed portion with said pinion to define the limit of operation of said web feeding device.

7. The combination with a web feeding device, of a pinion connected to move therewith, a rack co-operative with said pinion and provided with a toothed portion and an untoothed portion, said toothed portion meshing with said pinion to transmit motion therefrom to said rack, and said untoothed portion being thereupon opposed to said pinion to limit the movement thereof and of said web feeding means, together with a handle, means biasing said handle to maintain it normally free of said rack, and means operable upon the motion of said handle against said biasing means to reset said rack in a position where its toothed portion will mesh with the toothed portion of the pinion.

8. The combination with a paper feed roll, of a toothed pinion member connected therewith, a rack bar provided with means guiding it for reciprocation adjacent said pinion and having tooth receiving notches in a limited portion of its area, whereby to receive a limited motion from said pinion, said rack bar having another unnotched area engageable with said pinion upon the conclusion of said range of motion as a stop, a manually operable handle provided with a mount movable across said rack bar in the direction of its advance by said pinion, biasing means acting on said mount in a direction to force it normally in the direction of rack bar advance, and means engageable between said mount and rack bar in the course of the mount retraction of said handle for the retraction of said rack bar.

9. The combination with a web feed roll, of a toothed pinion connected therewith, an oscillatory gear plate fulcrumed adjacent said roll and provided with teeth adapted to be acted upon in the successive rotations of said pinion for the oscillatory advance of said gear plate at a predetermined distance in each rotation of the roll, said gear plate having means providing a positive stop for the toothed portion of said pinion after a predetermined advance of said plate thereby, a member movable to and fro adjacent said plate and provided with a handle, means engageable between said member and said plate for the retraction of said plate to permit the toothed portion of said pinion re-engagement with said plate for the operative oscillatory advance thereof, and means biasing said member in opposition to the direction of its manually operated engagement with said plate.

10. The combination with a web feeding roll and means for limiting the advance of said roll in a web feeding direction, manually operable mechanism for resetting said limiting means to permit a further advance of the roll, a web severing device, and means operatively associated with said device for precluding the functioning of said resetting means pending the severing of the web upon said device.

11. The combination with a web advancing roll and a web severing device, of means for limiting the rotation of the roll in a web feeding direction, manually operable means for resetting said

limiting means to permit further roll rotation, a detent releasably preventing the operation of said resetting means, and motion transmitting connections leading to the detent and operable thereon in a detent releasing direction and including means for making the operation of said connections dependent upon the use of said resetting device for releasing said detent.

12. The combination with a web feeding roll and an adjacent cut-off knife, of means yieldably supporting said knife, means limiting the rotation of said roll in a web feeding direction, means for resetting said limiting means to permit a further advance of said roll, and a detent including means for releasably holding said resetting means inoperative, said detent being operatively connected with the supporting means for said cut-off knife for release upon the yielding thereof.

13. The combination with web feeding means and an adjacent cut-off knife, of a toothed pinion connected with said feeding means, a toothed stop member actuated by the toothed portion of said pinion and provided with a stop portion finally engaged by the toothed portion of said pinion for arresting the movement of said web feeding device, a handle normally free of said member and provided with means for the resetting thereof to free said pinion for further rotation, a detent including means for restraining said handle operated means from resetting said member, and mechanism operatively connecting said detent with said knife for the release of said detent upon the operation of said knife.

14. In a dispensing device, the combination with a web feeding means, a movable handle independent of said means, and a web severing device, of mechanism rendering the manipulation of the handle prerequisite to the operation of said means, and mechanism rendering the operation of said web severing device prerequisite to the operative action of the handle.

15. In a device of the character described, the combination with a feed roll, means for manually operating the feed roll, a tear-off blade yieldably mounted beyond said feed roll in the path of web advance, a toothed pinion connected with said feed roll, a gear plate movable adjacent said pinion and having a portion provided with means acted on by said pinion in the course of pinion rotation to advance said gear plate, and stop means engaged by the toothed portion of said pinion in the ultimate position of said gear plate, a gear plate retracting member having means for its manual operation in a plate retracting direction, means biasing said member for movement in a direction opposite to that of its manual operation, a detent including means for preventing the retraction of said plate by said handle, and a connection from said detent to said yieldable blade for the release of said detent upon the yielding of said blade.

16. The combination with web advancing means, of manually resettable means for limiting the extent of web advance possible in one operation of said means, a detent having means providing for its self-adjustment to a position for opposing the resetting of said limiting means, a web severing device, and a member operable in the functioning of said resetting device for releasing said detent.

17. The combination with web advancing means, of a handle independent of said means, resettable means actuated thereby for limiting the extent of web advance possible in one opera-

tion of said means, a detent having means providing for its self-adjustment to a position for opposing the resetting of said limiting means, a web severing device, and a member operable in the functioning of said resetting device for releasing said detent, said last mentioned member comprising a bar adjacent said device and projecting across the direct path of the paper, whereby to be acted upon in the tensioning of said paper incident to its severing by said device.

18. In a dispensing device, the combination with a web feeding means provided with a first handle for its actuation, of mechanism connected with said means to be operated thereby for limiting the movement of said means in a web feeding direction, a member for resetting said mechanism to permit of the renewed advance of said web feeding means, a second handle normally free of said member and provided with motion transmitting connections engageable with said member in a direction for the performance of the resetting function of said member, a detent engageable with said member to restrain it from functioning in response to the actuation of said second handle, a cut-off knife in the path of a web advanced by said feeding means, means yieldably supporting the cut-off knife, and motion transmitting connections from said knife to said de-

tent for the release of said detent on the operation of said knife, the yielding of the knife being a prerequisite to the release of the detent and the release of the detent being a prerequisite to the use of the second handle for the resetting of said limiting means, and the resetting of said limiting means being a prerequisite to the use of the first handle to advance said web feeding means.

19. In a dispenser, the combination with a web feeding means and a web severing device, of mechanism for limiting the advance of said feeding means, a handle independent of said feeding means provided with a lost motion connection to said mechanism for the resetting thereof, a detent provided with means for preventing the resetting of the handle, a mounting on which said severing device is yieldable, and motion transmitting connections from said device to said detent for the release of said detent upon the use of said device to sever a web, whereby the severing of the web is a prerequisite to the resetting of said mechanism and the resetting of said mechanism is a prerequisite to the operation of said web feeding means.

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