United States Patent

[11] 3,589,227

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[54] **PAPER TOWEL DISPENSER**
2 Claims, 9 Drawing Figs.

[52] U.S. Cl. 83/232, 83/261, 83/590, 83/602
[51] Int. Cl. B26d 5/20
[50] Field of Search 83/259, 261, 232, 589, 590, 922, 260, 602

[56] References Cited

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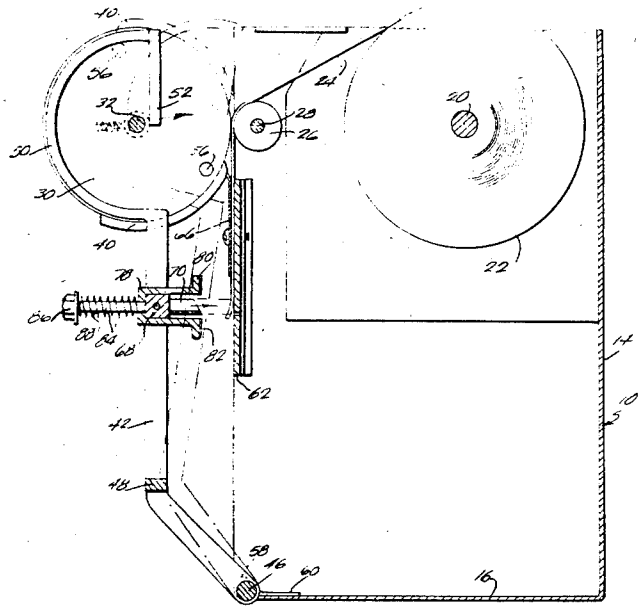
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ABSTRACT: A feeding and cutting mechanism is provided for rolls of paper towels and the like. A single rotation of an operating handle feeds a predetermined length of towel to a cutting device, renders the feeding device inoperative, and then cuts the towel to supply a length thereof to the user.



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SHEET 1 OF 2

Fig. 1

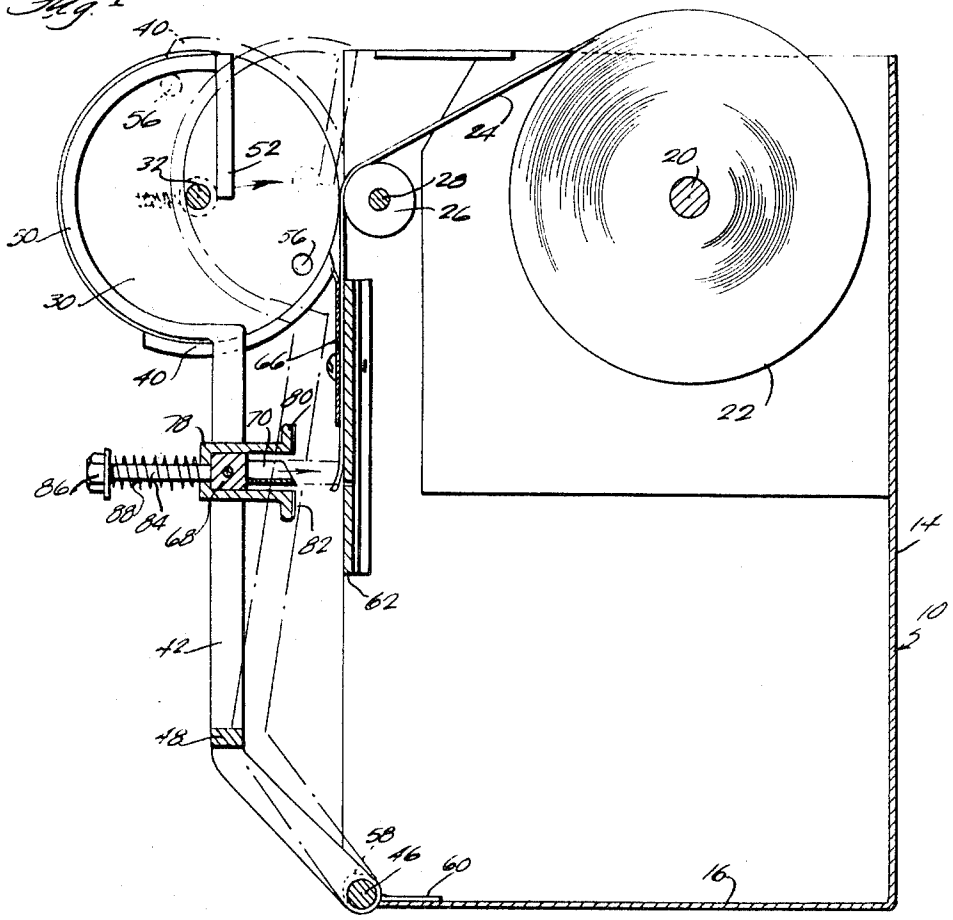


Fig. 3

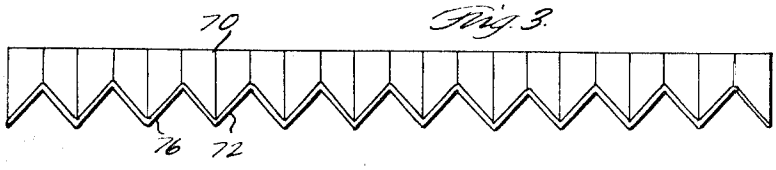


Fig. 4



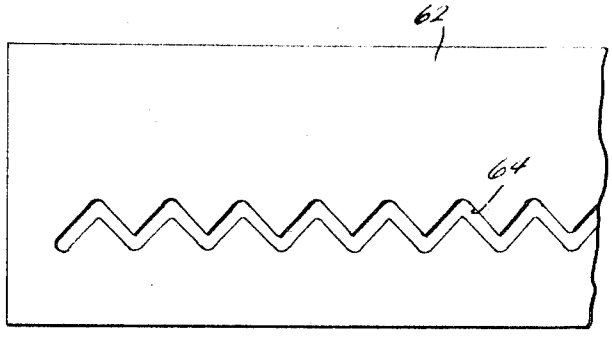


Fig. 5

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Fig. 5.

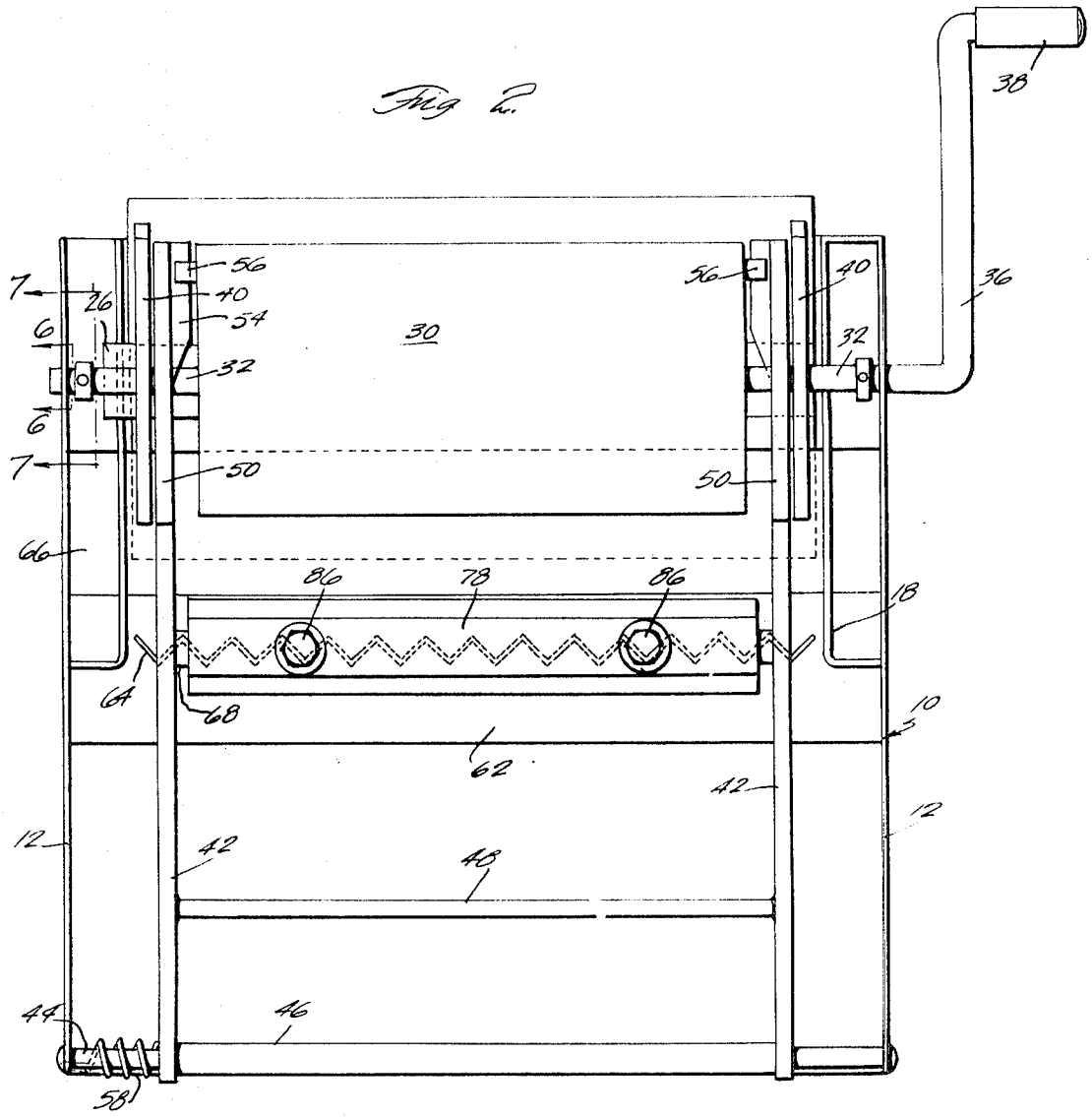


Fig. 6.

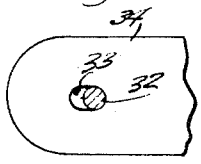
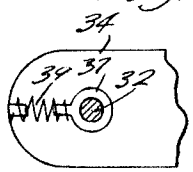


Fig. 7.



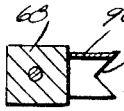


Fig 8.

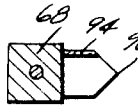


Fig 9.

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PAPER TOWEL DISPENSER

BACKGROUND OF THE INVENTION

The invention relates to the field of feeding paper from rolls of substantial size and automatically cutting the paper into predetermined lengths free from the web, to supply paper towels to a user. Where cranks are used for feeding paper towels, it is necessary to make a number of turns of the handle to feed sufficient paper to use as a towel, whereupon the user must tear off the towel, which very often will be torn irregularly. Some towel dispensers are provided with individual towels which are pulled singly from the bottom of a cabinet. These are more expensive than rolls, since the towels must be cut in individual lengths, and folded in interlocking relationship so that when pulling one towel from the dispenser, the leading edge of the next towel will project from the cabinet. It is expensive to cut, fold and interlock all of the individual towels.

SUMMARY OF THE INVENTION

A roll of paper toweling or the like is supported for rotation in a suitable cabinet and the web is fed outwardly and then downwardly between an idler roll and a rotatable feed roll. A crank connected to the shaft of the feed roll is rotatable through one complete revolution to perform all of the functions of the apparatus. During the first portion of the turning of the feed roll, the latter grips the advancing web from the roll and feeds it downwardly between a guide and a cutter plate. The next portion of the turning movement of the feed roll moves cams carried thereby into engagement with the idler roll, thus moving the feed roll out of engagement with the web so that the feeding operation stops. Further turning movement of the crank causes engagement between end pins, carried by the feed rolls, and a portion of supporting arms carrying a shearing device. The pins referred to swing the arms to project the shearing device through the plane of the web to shear off one length of paper towel. Upon the completion of one revolution of the crank, the parts are returned to normal position.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a transverse vertical sectional view through the mechanism;

FIG. 2 is a face view of the same;

FIG. 3 is a plan view of the shearing blade;

FIG. 4 is an edge view of the same;

FIG. 5 is a fragmentary face view of the shearing plate;

FIG. 6 is a detail section on line 6–6 of FIG. 2;

FIG. 7 is a similar view on line 7–7 of FIG. 2;

FIG. 8 is a detail section showing a modified form of shearing blade; and

FIG. 9 is a detail sectional view of a further modified form of blade.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIGS. 1 and 2, the numeral 10 designates a casing as a whole including sidewalls 12 (FIG. 2), a back wall 14 and a bottom wall 16. Supplemental end walls 18, carried by the end walls 12, rotatably support a shaft 20 on which is mounted a roll of paper toweling or similar material 22.

The web 24 from the roll 22 extends forwardly and downwardly around an idler roll 26, mounted on a shaft 28 supported by the sidewall portions 18. The strip passing over the idler roll normally contacts with a feed roll 30 mounted on a shaft 32 and rotatable in slots 33 formed in tabs 34 carried by the sidewalls 12. One end of the shaft 32 projects beyond the casing and turns perpendicularly as at 36 to form an operating crank provided with a handle 38.

The shaft 32 carries collars 37 biased by springs 39 to urge the feed roll toward the idler roll. The shaft of the feed roll 30 is provided adjacent opposite ends with concentric arcuate cams 40 engageable against the idler roll 26. These cams normally occupy the solid-line position shown in FIG. 1.

The shaft 32 is supported by spaced arms 42, the lower ends of which surround a shaft 44 shouldered to provide a spacer 46 engaging the arms 42. Above the spacer 46 a brace 48 is welded at its ends to the arms 42.

The upper end of each arm 42 is provided with a semicircular portion 50 normally approximately concentric with the forward roll 30. Each of these arms at the top thereof is provided with a depending finger 52, a portion of which projects laterally as at 54 (FIG. 2) to be engaged by a pin 56. Obviously, one of these pins is fixed to each end of the feed roll 30 to engage the associated finger 52. Each pin 56 is normally arranged in the solid-line position shown in FIG. 1. Any suitable means may be employed for biasing the upper ends of the arms 42 toward the idler roll 26, for example, a torsion spring 58, surrounding each end of shaft 44. Each spring may have one end fixed to the shaft 44 and its other end 60 (FIG. 1) bearing upon the bottom wall 16.

A shear plate 62 is fixed at its ends to the sidewalls 12 and is provided with a zigzag slot 64 as shown in detail in FIG. 5. The free end of the web 24 feeds downwardly over the outer face of the plate 62 and beneath a guide plate 66 as shown in FIG. 1.

A bar 68 extends between the arms 42 and is fixed thereto, and this bar carries a shearing knife 70 shown in detail in FIGS. 3 and 4. The shearing knife is provided with sawlike teeth 72 and is preferably formed zigzag in edge elevation as shown in FIG. 4. The teeth of the member 30 are ground as at 76 to provide sharp points and edges.

A substantially U-shaped bar 78 straddles the rod 68 as shown in FIG. 1 and is turned outwardly at its free ends as at 80 to provide surfaces on which are preferably cemented rubber or other antifriction pads 82. These pads are not really necessary, but their use is preferred. The bar 68 is provided with two spaced rods 84 slidable through the bar 78. The rods 84 are provided at their outer ends with nuts 86 and a spring 88 surrounds each rod 84 between the nuts 86 and the bar 78. Thus the bar 78 is biased to the right in FIG. 1 to maintain the base thereof in engagement with rod 68.

By way of illustrating that the invention is not dependent on the specific type of cutting element previously described, attention is invited to the modifications shown in FIGS. 8 and 9. For example, in FIG. 8, the bar 68 may be provided with a cutting device 90 which will be notched as at 92 throughout the undulations of the blade from end to end. In FIG. 9, a cutting blade 94 is provided in which the undulations centrally of the height of the blade project forwardly in V-shape as at 96. It will be understood that in edgewise profile, the blades 90 and 94 will correspond to FIG. 4.

OPERATION

The parts normally occupy the solid-line positions shown in FIG. 1. When it is desired to feed a length of paper towel, the handle 38 will be rotated through one complete revolution, the shaft 32 turning clockwise in FIG. 1 as indicated by the arrow. The cams 40 are normally adjacent the bottom of the feed roll 30. This feed roll engages the paper web to hold it against the idler roll 26, and rotation of the feed roll accordingly feeds the paper web downwardly between the guide 66 and plate 62. When the cams 40 reach the dotted-line position shown in FIG. 1, the feeding of the web is about to stop. Further turning movement of the crank 36 will cause the advancing ends of the cams 40 to engage the feed roll 26 outwardly of the ends of the paper web, and thus these cams force the feed roll outwardly away from the idler roll 26 against the loading of the springs 39 to release pressure against the paper web. No further feeding of the paper, accordingly, will take place. As the cams 40 approach their camming positions referred to, the pins 56 will move past the dotted-line position shown in FIG. 1. While the cams render the feed roller inoperative to feed paper, the pins 56 will engage the lips 54,

thus causing the arms **42** to swing to the right, carrying with them the rod **68** and the bar **78**. The rubber pads **82** will be brought into engagement with the paper web, after which the arms **44** will cause the shearing element **70** to advance and operate through the slot **64** of the plate **62** to shear the paper. This movement of the shearing element **70** takes place with the bar **78** remaining stationary while the rod **68** compresses the spring **84** in its inward movement. When a complete revolution of the crank has taken place, the parts will return to their normal positions and the severed sheet is free to be moved away from the apparatus.

It will be noted that the slot **64** is wider than the thickness of the metal of the shearing blade **70**. It is unnecessary that the shearing blade fit snugly in the slot **64** since the plate **62** adequately holds the paper web against the force exerted by the blade during the cutting operation. Since the teeth **72** and elements of the slot **64** need not fit accurately, the construction is much less expensive to make.

From the foregoing, it will be apparent that a large paper roll may be inserted in the machine and that the feeding of the free ends of the web, the rendering inoperative of the feeding action, and the shearing of the paper, take place sequentially during a single rotation of the crank **36**.

From the foregoing it will now be seen that there is herein provided an improved paper towel dispenser which accomplishes all of the objects of this invention and others, including many advantages of great practical utility and commercial importance.

As various embodiments may be made of this inventive concept, and as many modifications may be made in the embodiments hereinbefore shown and described, it is to be understood that all matter herein is to be interpreted merely as illustrative, and not in a limiting sense.

I claim:

1. A paper feeding mechanism comprising means for supporting a roll of paper, means for feeding the web of paper from the roll comprising an idler roll and a feed roll between which the paper web passes, means operative after a predetermined length of paper has passed between said rolls for rendering said feed means inoperative, means operative after said feed means has been rendered inoperative for severing the paper, means for rotating said feed roll, said means for rendering said feed means inoperative comprising cam means rotatable with said feed roll for moving the latter away from said idler roll to release the paper, a pair of arms pivoted at one end, a shear blade carried by said arms, said arms having their other ends extending to positions adjacent the ends of said feed roll, and means carried by said feed roll and engageable with said arms after said cam means has moved said feed roll away from said idler roll to move said arms to move said shear blade through the paper to sever it, the other ends of said arms extending over the ends of said feed roll, said means carried by said feed roll and engageable with said arms comprising pins carried by and projecting beyond the ends of said feed roll.

2. A device according to claim **1** provided with a shaft for said feed roll having an operating crank at one end thereof, means biasing said feed roll toward said idler roll, and means biasing said other ends of said arms away from said idler roll.