

[54] **ROLL PAPER DISPENSER**  
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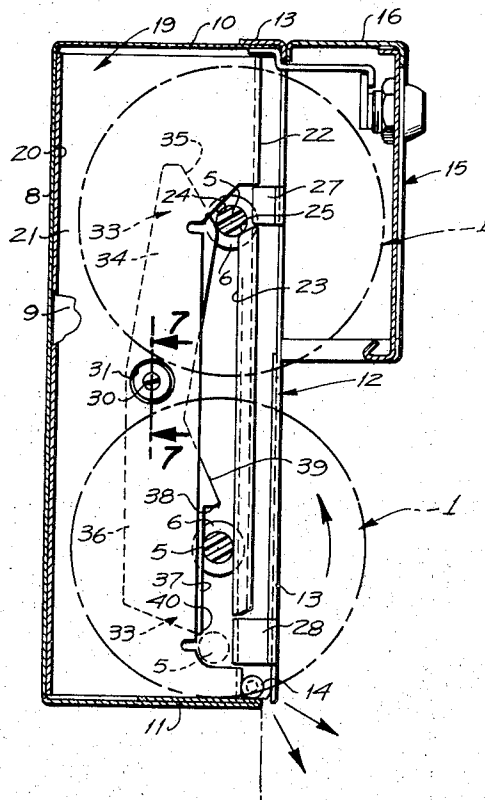
[52] U.S. Cl. .... 242/55.3, 312/39  
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 [58] Field of Search ..... 242/55.3, 55.53, 242/55.42; 312/39

[57] **ABSTRACT**

A dispenser for roll paper, such as toilet tissue, in which the dispenser receives two rolls of paper, one above the other. The rolls are mounted on mandrels which are guided in vertical guide slots with the lower roll in a dispensing position. A lever engaged by the mandrel of the lower roll holds the upper roll in reserve until the lower roll is depleted, whereupon, the lever is released to permit the use of the upper roll which rotates on the depleted lower roll as the paper is dispensed.

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7 Claims, 8 Drawing Figures



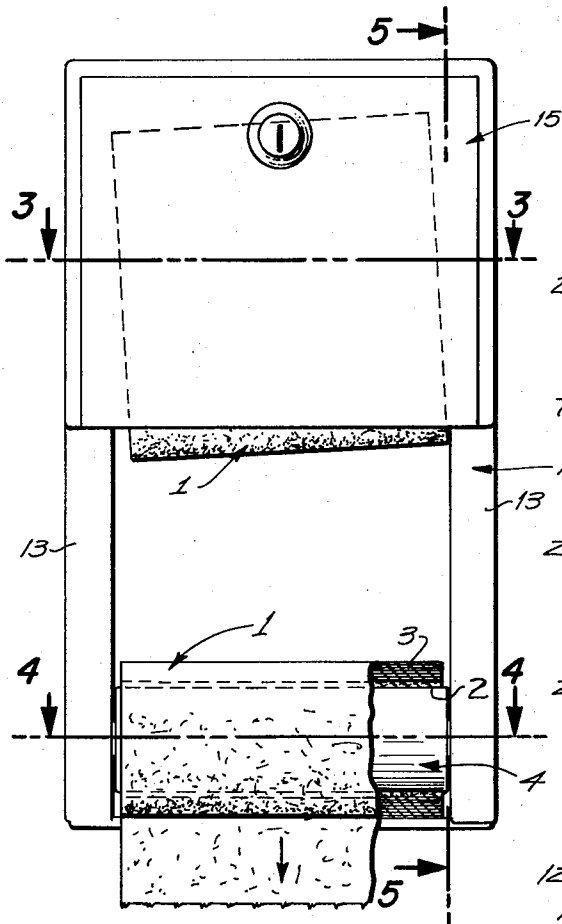


Fig. 1

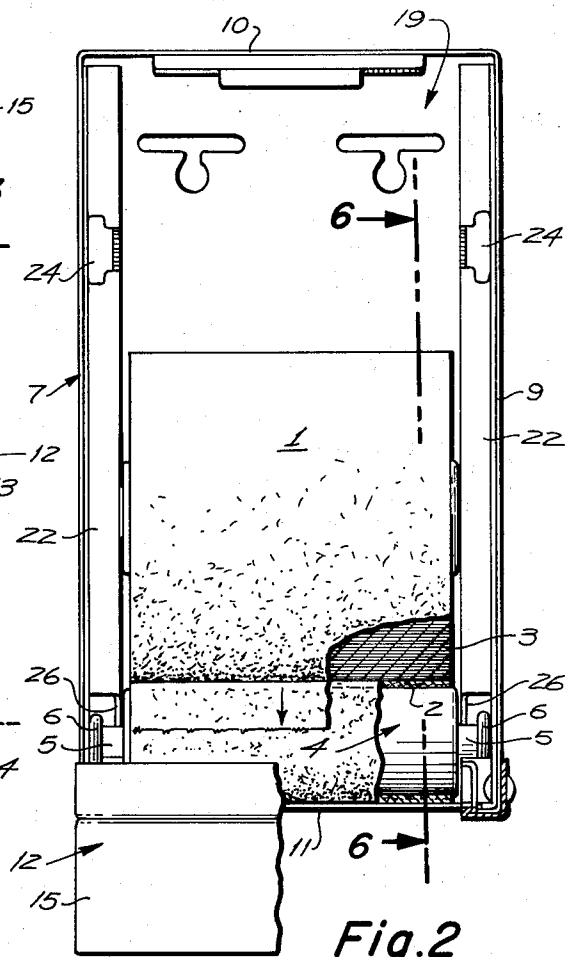


Fig. 2

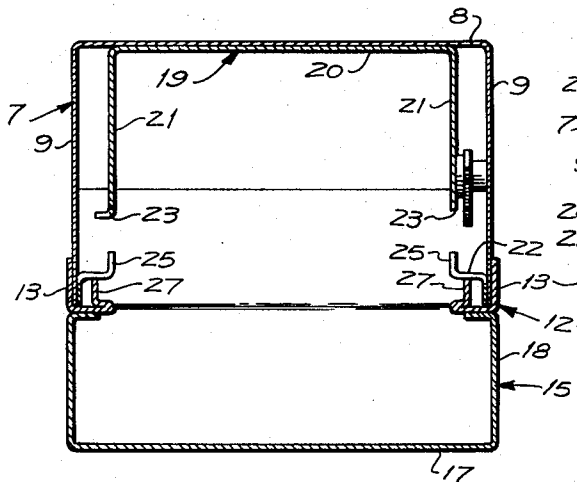


Fig. 3

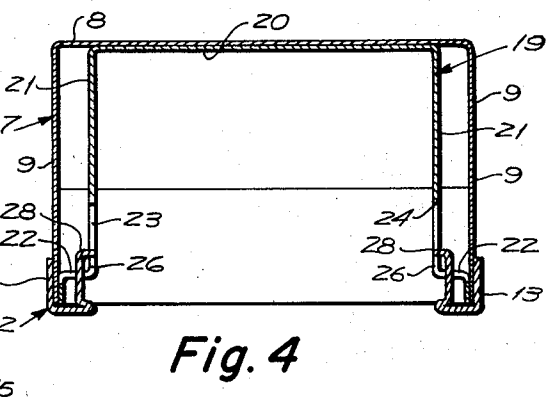


Fig. 4

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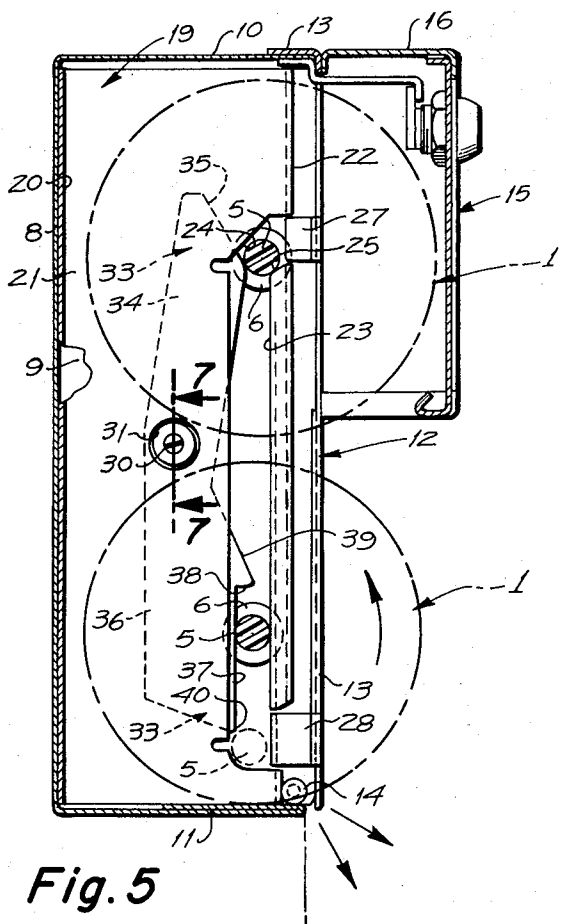


Fig. 5

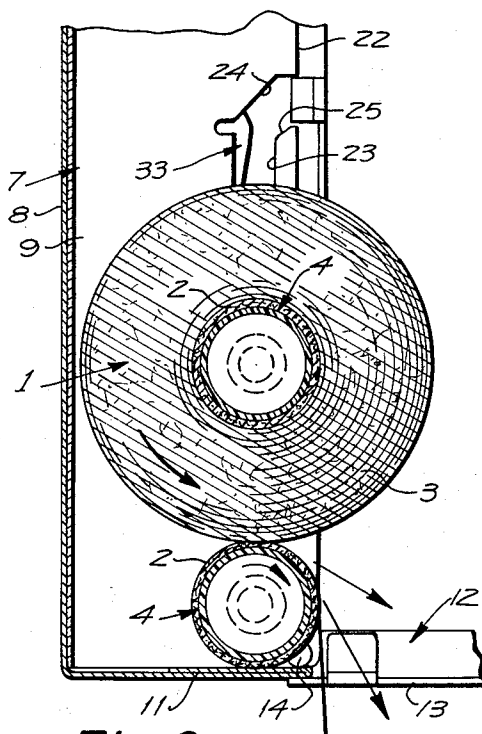


Fig. 6

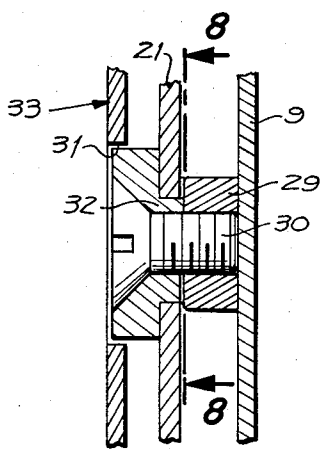


Fig. 7

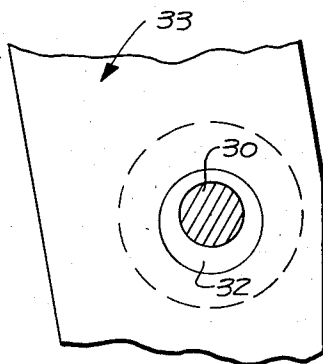


Fig. 8

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## ROLL PAPER DISPENSER

### BACKGROUND OF THE INVENTION

The trend in paper dispensers, particularly toilet tissue dispensers installed in public places, is to provide an extra or backup roll for use when the preceding roll has been depleted. A reason for this trend is due to the increased cost of janitorial personnel; that is, by supplying two rolls, the task of replacement is reduced materially. It has been found that the public cannot be depended upon to substitute the new roll when needed, even if this involves only the manual operation of a lever; that is, the change must be fully automatic. This involves some means to sense, rather accurately, depletion of the first roll to avoid wastage of toilet tissue. A further problem is related to the need for a mandrel on which to journal the roll. While the mandrels may be made of plastic material, still, the cost requires reuse of the mandrel, rather than discarding the mandrel with the cardboard core. Thus, the mandrels must be secured against removal except when the dispenser is opened by service personnel for replacement of tissue rolls.

While several toilet tissue dispensers have been developed, none have heretofore solved all of the problems involved, and all have been expensive to manufacture.

### SUMMARY OF THE INVENTION

The present invention is directed to a roll paper, particularly toilet tissue, dispenser, which is summarized in the following objects:

First, to provide a roll paper dispenser which incorporates a novel means, controlled by a first or lower roll of paper, to retain a second or upper roll of paper until the paper on the first roll is depleted a predetermined amount, and a retainer means having adjustment means to minimize the amount of paper remaining on the first roll, when the second roll is released.

Second, to provide a roll paper dispenser, as indicated in the preceding object, wherein, upon depletion of the first or lower roll, and release of the second or upper roll, the first roll forms a rotatable support for the second roll.

Third, to provide a dispenser for roll paper in which the lowermost roll rests on the bottom of the housing to provide nominal resistance to unwrapping of the toilet tissue, thus facilitating tearing the toilet tissue as needed without causing additional unwrapping of the toilet tissue, and further, when the upper roll is in use, the depleted lower roll continues to provide nominal resistance.

Fourth, to provide a roll paper dispenser, as indicated in the other objects, wherein the paper rolls are received on mandrels having end flanges slidable in opposed guides, accessible at their upper and lower ends for insertion and removal of the mandrels, the dispenser including a novel arrangement of cover movable between a locked position closing the guides and an open position exposing the guides.

Fifth, to provide a roll paper dispenser which is particularly inexpensive of construction, yet dependable in operation, access to the second roll being automatic upon depletion of the first roll without manipulation by the user.

### DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front view of the roll paper dispenser in

its operating condition, with the cover structure closed.

FIG. 2 is a front view of the roll paper dispenser, with the cover structure shown in its open position and partially in section.

FIG. 3 is a transverse sectional view, taken through 3—3 of FIG. 1, with the rolls of paper omitted.

FIG. 4 is a transverse sectional view, taken through 4—4 of FIG. 1, also with the rolls of paper omitted.

FIG. 5 is a longitudinal sectional view, taken through 5—5 of FIG. 1, with the paper rolls indicated in outline by broken lines.

FIG. 6 is a fragmentary sectional view, taken through 6—6 of FIG. 2.

FIG. 7 is an enlarged fragmentary sectional view, taken through 7—7 of FIG. 5.

FIG. 8 is a fragmentary sectional view, taken through 8—8 of FIG. 7.

The dispenser is intended to handle paper rolls 1, more particularly, rolls of toilet tissue. Each roll comprises a cardboard sleeve 2 with a multiple wrapping of paper 3. In order to dispense the paper, each roll is mounted on a mandrel 4, slidable within the cardboard sleeve 2. The ends of the mandrel are reduced in diameter to form necks 5, having flanges 6.

The dispenser includes a rectangular housing 7, having a back wall 8, side walls 9, a top wall 10 and a bottom wall 11. The front or forward side of the housing is open. The housing is dimensioned to receive two or more paper rolls 1, one above the other, for rotation about horizontal axes.

The housing is provided with a cover structure 12, which includes a frame 13 overlying the forward margins of the side walls 9 and the top wall 10. The lower extremities of the frame 13 are joined by pivotal connections 14 to the housing so that the frame may be pivoted from a position overlapping the margins of the housing, such as shown in FIGS. 1 and 5, and a horizontal position exposing the front of the housing, as shown in FIGS. 2 and 6. The upper portion of the frame 13 is provided with a cover member 15, having a top wall 16, a front wall 17 and side walls 18. The bottom and back side of the cover member are open. The cover member is dimensioned to enclose a paper roll located in the upper portion of the housing 7.

The housing is provided with a liner 19, having a back side 20 secured to the back wall 8 of the housing, and side walls 21 confronting the side walls 9, but spaced inwardly therefrom. Near the forward extremity of the housing 7, the side walls 21 are provided with forwardly facing offsets or shoulders 22.

Each side wall is provided with a vertical guideway or slot 23. At the upper end of each guideway, there is formed an upper access slot 24 formed in part in the shoulder 22, which includes downwardly sloping lower walls 25. The lower end of each guideway is provided with a lower access slot 26, a portion of which is formed in the forwardly facing offset or shoulder 22. When the cover is in its open position, a pair of paper rolls may be inserted in the housing by aligning the necks 5 of the corresponding mandrel with the access slots 24 for movement into the vertical guideways 23.

The frame 13 of the cover structure is provided with an upper pair of closure bars 27 and a lower pair of closure bars 28. The upper bars align with and close the upper access slots 24 and the lower closure bars align with and close the lower access slots 26 when the cover

structure is in its closed position, as shown best in FIGS. 3, 4 and 5.

Supported from one side wall 9 of the housing 7, behind the corresponding side wall 21, is a mounting nut 29, which receives a mounting screw 30, accessible through an access opening 31 provided in the side wall 21. Journalled on the mounting screw 30 is an eccentric hub 32, having a flange. Pivotaly mounted on the hub 32, intermediate its ends, is a retainer lever 33.

The retainer lever 33 includes an upwardly extending arm 34, having a beveled cam edge 35. The retainer lever also includes a downwardly extending arm 36, having a deflecting cam 37 at its forward edge and occupying about half the length of the arm 36. Above the cam 37 there is provided a downwardly facing shoulder 38 and an angular cam edge 39. The lower extremity of the deflecting cam 37 terminates in a releasing tip 40.

Operation of the dispenser is as follows:

Assuming an initially empty dispenser, a pair of paper rolls is inserted in the housing by guiding the necks 5 of each mandrel through the upper access slots 24. The first or lower paper roll descends to the lower portion of the housing so that the lower surface of the paper tissue rests on the bottom wall 11, as shown in FIG. 5. This spaces the necks 5 of the lower mandrel in the region opposite the deflecting cam edge 37, deflecting the upwardly extending arm 34 forwardly so as to place the lower portion of the cam edge 35 in opposition to the lower downwardly sloping connection portion 25. The space therebetween is less than the diameter of the neck 5 of the upper mandrel 4 so that the upper paper roll is restrained against downward movement in the vertical guideways 23.

The lower paper roll is now ready for use. It is preferred to place the paper roll so that the paper tissue may be unwrapped by forward movement at the lower side of the paper roll; that is, the paper roll is intended to rotate counter-clockwise, as viewed in FIG. 5. As the paper is unwrapped from the roll, the diameter of the roll diminishes, causing the neck 5 to move downward until it clears the releasing tip 40, as indicated by dotted outline of the neck in the lower portion of FIG. 5. When this occurs, the weight of the upper roll carried by the neck 5 of the upper mandrel causes the lever 33 to turn in a counter-clockwise direction, as viewed in FIG. 5, permitting the upper roll to descend until it is resting on the depleted or almost depleted lower roll, as shown in FIG. 6. If the upper roll has been placed so that the roll turns in a counter-clockwise direction when the tissue is unwrapped therefrom, the upper roll tends to turn the lower roll in a clockwise direction, as the paper tissue is unwrapped.

When the upper roll has been depleted, or partially so, the cover structure is opened, and the two essentially depleted rolls are removed, one at a time, from the lower access slots 26. Usually, however, the uppermost roll has not been fully depleted. In this case, the depleted roll is removed, the upper roll is allowed to drop into contact with the lower or bottom wall 11 of the housing, and a new paper roll is inserted in the upper access slots 24 and held by the lever 33, as shown in FIG. 5, until the lower roll is depleted.

At the time of manufacture, the eccentric hub 32 is adjusted so that the tip 40 is at precisely the desired height so that a minimum amount of tissue paper is left on the cardboard sleeve 2. What residual paper is left

does not interfere with operation of the upper roll, for if the paper is positioned so as to discharge by counter-clockwise movement of the lower roll, rotation of the upper roll will turn it in the opposite direction, keeping the residual paper on its cardboard sleeve. If, however, the roll has been put in so that the paper is removed by clockwise rotation, then the driving force applied by the upper roll merely causes the residual paper to move off the lower roll, with the paper from the upper roll.

It should be noted that only one retainer lever 33 is needed, for the upper paper roll need not be held in a strictly horizontal position, but may be held slightly inclined, as indicated in FIG. 1, and yet is free to drop into position when the retainer lever is operated to release the paper roll.

The cover structure may be locked in position by means of a latch strip 41 extending from the top wall 10, which cooperates with a keeper 42, forming part of a lock 43.

While particular embodiments of this invention have been shown and described, it is not intended to limit the same to the details of the constructions set forth, but instead, the invention embraces such changes, modifications and equivalents of the various parts and their relationships as come within the purview of the appended claims.

I claim:

1. A dispenser for roll paper received on a mandrel, the dispenser comprising:

- a. a rectangular housing having an open forward side, the housing being dimensioned to receive at least a pair of mandrel mounted paper rolls, horizontally disposed one above the other;
- b. fixed means underlying and frictionally supporting the periphery of the bottom side of the lower roll while permitting frictionally restrained rotation thereof;
- c. vertical guideways for the ends of the mandrels, the lower mandrel being movable downwardly as paper is unwrapped from the lower roll;
- d. and a movable retainer means including a lower extended portion protruding into the lower portion of a corresponding guideway for engagement by a corresponding end of the lower mandrel to be held thereby against movement;
- e. the lower extended portion terminating in a lower end disposed a preselected distance above the fixed means to permit the lower mandrel to release the retainer means for movement when the lower roll has been depleted and its mandrel lowered a predetermined amount;
- f. the retainer means also including an upper shoulder portion cooperating with a margin of the upper portion of the guideway to support the upper mandrel until the lower mandrel clears the lower end of the retainer means to permit free movement of the retaining means and release of the upper mandrel for fall of the upper roll into rolling contact with the depleted lower roll.

2. A dispenser for roll paper, as defined in claim 1, wherein:

- a. the retainer means is a lever pivoted intermediate its ends and pivotable to release the upper mandrel when the lower mandrel clears the lower end of the lever;

b. and a vertically adjustable fulcrum is provided for the lever to permit maximum depletion of the lower roll before releasing the upper roll.

3. A dispenser for roll paper, as defined in claim 1, wherein:

- a. the guide means include vertical guide slots and upper and lower forwardly facing access openings;
- b. and a frame is pivotally connected to the housing, and includes a cover for the upper roll and closures for the access openings.

4. A dispenser for roll paper, as defined in claim 1, wherein:

a. the supporting means for the lower roll is a bottom wall of the housing.

5. A dispenser for roll paper received on a mandrel having reduced and flanged ends, the dispenser comprising:

a. a rectangular housing having side, top and bottom walls and open at its forward side, the housing being vertically dimensioned to receive one above the other, at least a pair of horizontally disposed mandrel mounted paper rolls, the lower periphery of the lower roll resting on and being supported for frictionally restrained rotation on the bottom wall of the housing, whereby, on unwrapping of paper from the roll, the axis of its mandrel moves downward;

b. vertical guideways for the ends of the mandrels confronting the side walls and accessible from the forward side of the housing for insertion and removal of the mandrels and paper rolls, if any,

thereon;

c. a lever pivotally mounted intermediate its ends rearwardly of at least one of the guideways and having a lower extended portion engageable by an end of the lower mandrel until the mandrel has moved downwardly to a position clearing said lower extended portion, and an upper portion engageable with an end of the upper mandrel to retain the upper roll in a raised position while the lower portion of the lever is engaged by the lower mandrel;

d. the upper mandrel and the roll thereon being released upon movement of the lower mandrel past the lower portion of the lever, to drop downwardly for rotatable support of said upper roll on the lower roll to permit unwrapping of the upper roll by simultaneous rotation of both rolls.

6. A dispenser for roll paper, as defined in claim 5, wherein:

a. means is provided to effect vertical adjustment of the lever to determine the extent of depletion of paper from the lower roll upon release of the upper roll.

7. A dispenser for roll paper, as defined in claim 5, wherein:

a. a frame is pivotally connected at the lower forward side of the housing and includes a cover for the upper roll, and means for closing access to the guideways.

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