United States Patent

Berg

[15] **3,677,485**

[45] **July 18, 1972**

[54] **PAPER ROLL DISPENSER**

[72] Inventor: **Coleman David Berg,** Philadelphia, Pa.

[73] Assignee: **Fleck Industries, Inc.,** Willow Grove, Pa.

[22] Filed: **Aug. 19, 1970**

[21] Appl. No.: **64,960**

[52] **U.S. Cl.** **242/55.3,** 312/38

[51] **Int. Cl.** **B65h 19/04**

[58] **Field of Search** 242/55.3, 55.53; 312/38, 39

[56] **References Cited**

UNITED STATES PATENTS

3,387,902 6/1968 Perrin et al. 312/39

2,592,346 4/1952 Scogin 242/55.3

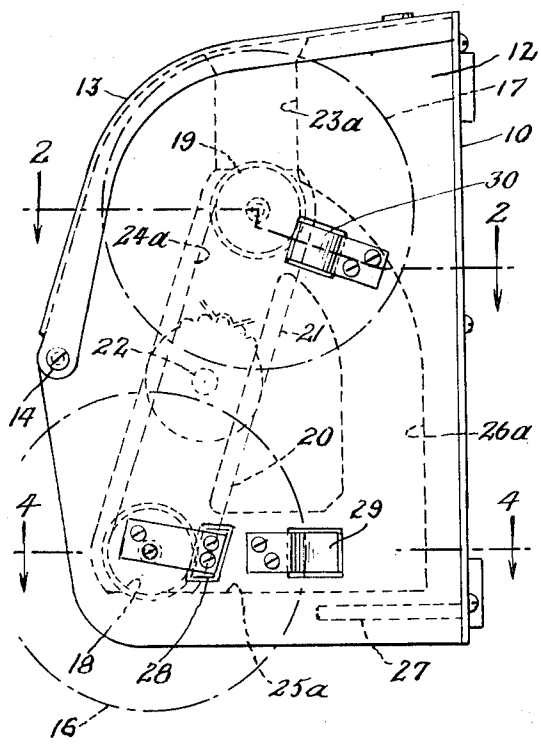
Primary Examiner—Leonard D. Christian

Attorney—Synnestvedt & Lechner

[57] **ABSTRACT**

A paper roll dispenser adapted to sequentially dispense paper from a plurality of paper rolls and including a pair of roll mounting spindles having interconnecting linkage for positioning the spindles in spaced parallel relation, and mounting means for the spindles including guiding means providing for sequential movement of the paper rolls to a dispensing station.

13 Claims, 9 Drawing Figures



Patented July 18, 1972 3,677,485

2 Sheets-Sheet 1

Fig. 1.

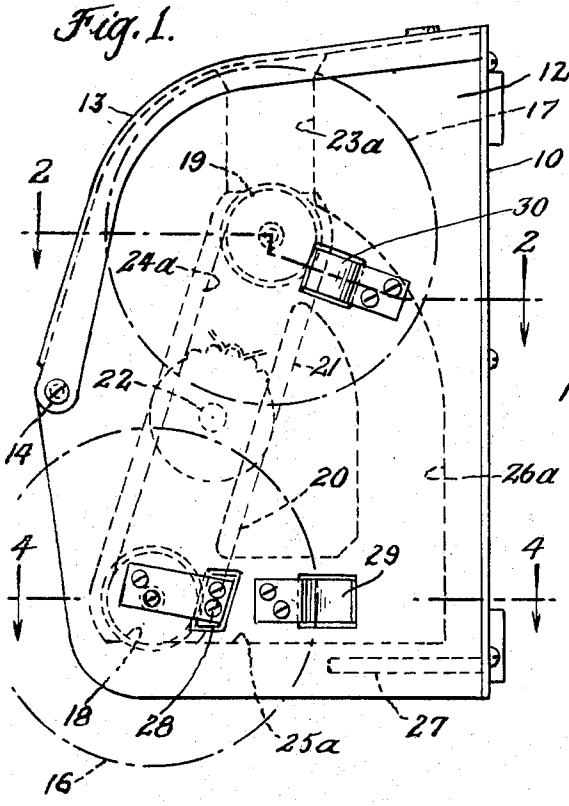


Fig. 3.

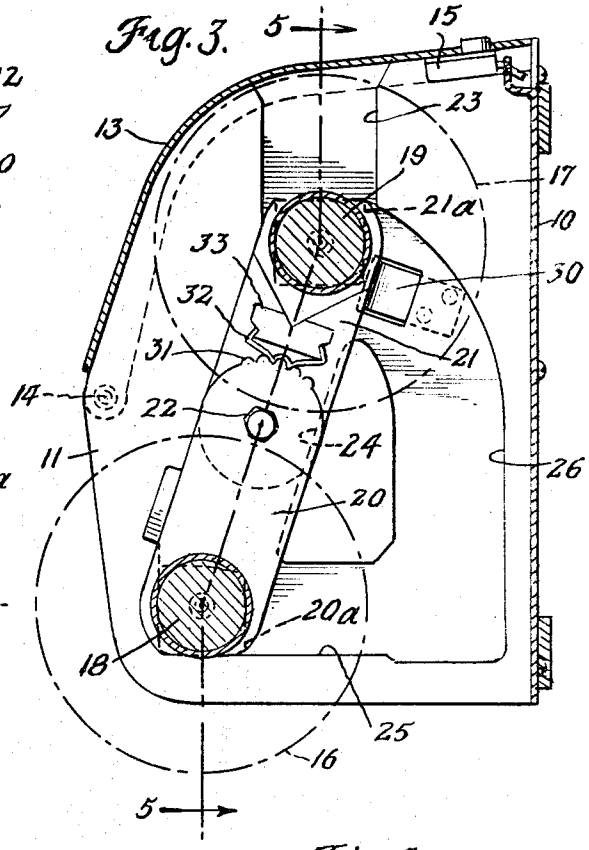


Fig. 2.

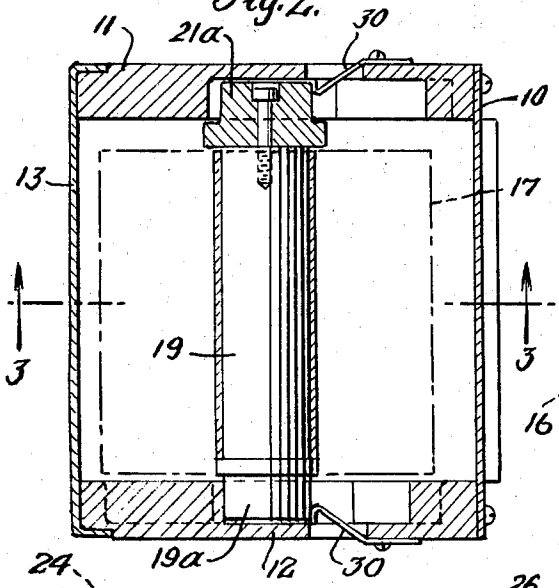


Fig. 4.

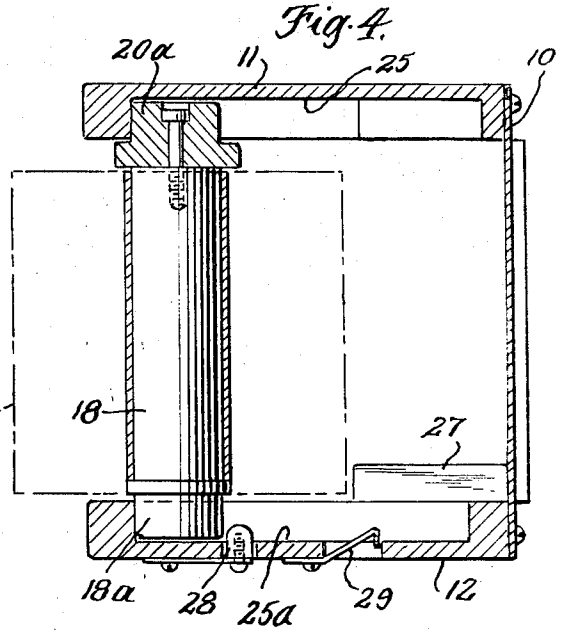
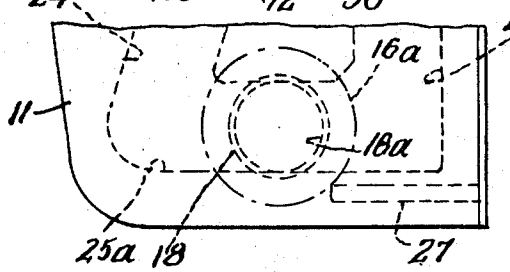


Fig. 9.



INVENTOR.
COLEMAN DAVID BERG
BY
Symmes Maier & Lechner
ATTORNEYS

Fig. 5.

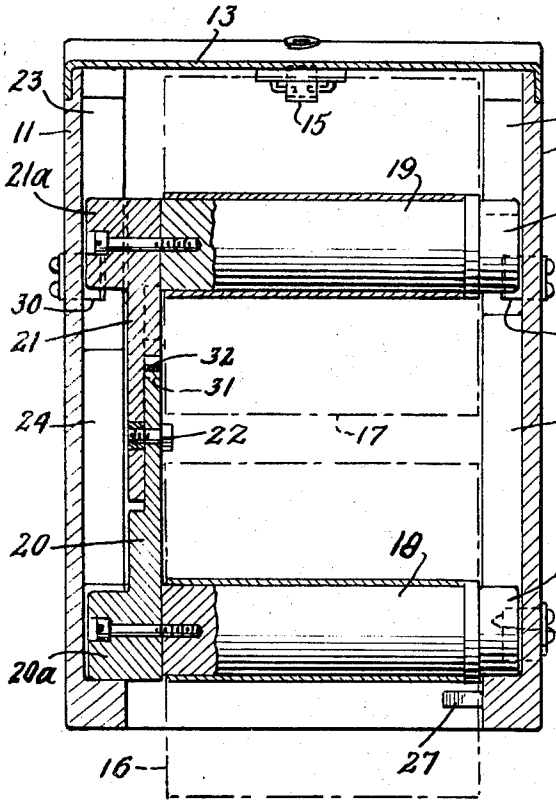


Fig. 6.

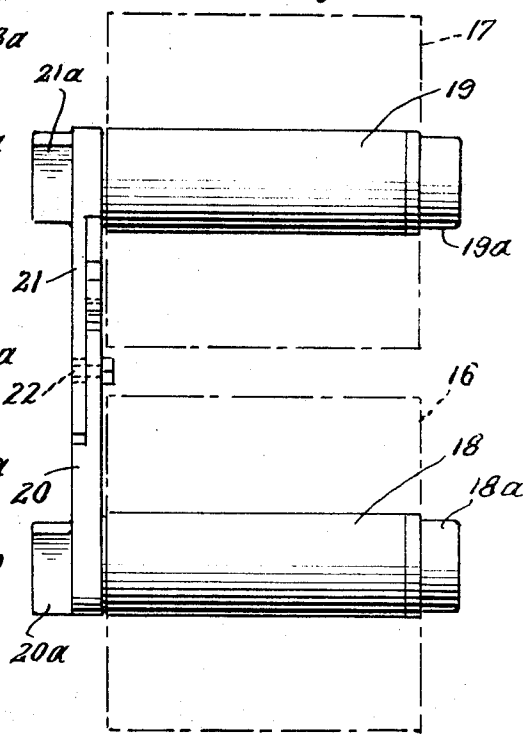


Fig. 7.

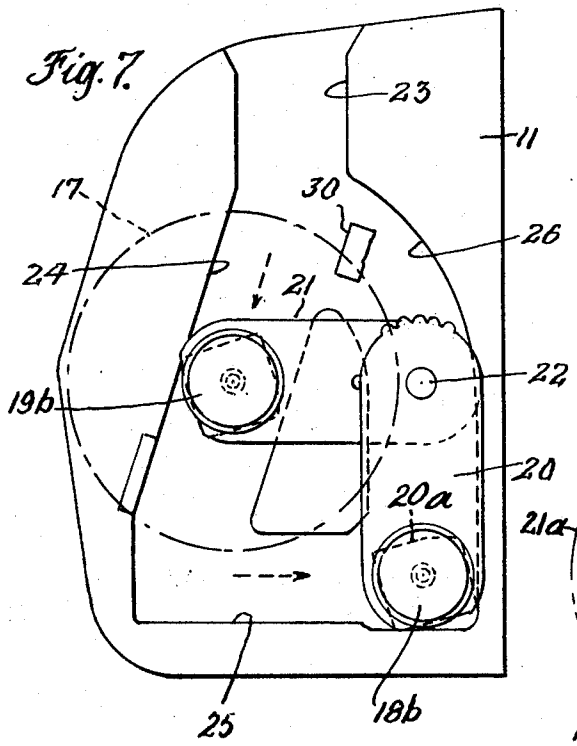
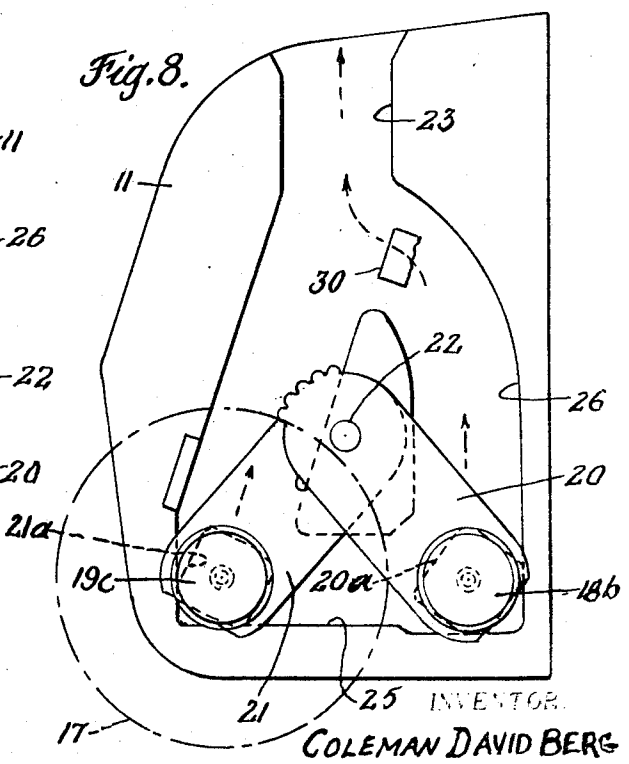


Fig. 8.



INVENTOR.
COLEMAN DAVID BERG
BY
ATTORNEYS

PAPER ROLL DISPENSER

This invention relates to paper roll dispensers and especially to dispensers adapted to sequentially dispense paper from a plurality of rolls.

While the invention is of general applicability and may be used for the dispensing of roll paper of various types, including paper toweling, the invention is particularly advantageous in the dispensing of toilet paper, and the invention is therefore illustrated and described herebelow in an embodiment adapted for the dispensing of toilet paper.

In many situations, such as public toilet rooms, it is desired to provide paper roll dispensing equipment capable of being loaded with a plurality of paper rolls, most commonly with two such rolls and it is further desirable to provide for the sequential use of the two or more rolls, thereby preventing use of a reserve roll until after a first roll has been used.

Several forms of equipment have been employed for the above general purposes, but they are subject to a variety of disadvantages and difficulties, notably inconvenience and awkwardness in the arrangements provided for loading and also for shifting or change-over from a first roll to a reserve roll.

Among the important objectives of the present invention is the provision of equipment for the sequential dispensing of a first and a reserve paper roll in which the change-over operation may be effected in a simple manner.

The invention also provides a dispenser in which a first and a reserve roll are positioned in the dispenser on spaced parallel axes, both of which are horizontal, and one of which is located above the other. This makes possible the accommodation of the rolls within an enclosure of relatively small overall dimensions and of such proportions as to minimize encroachment upon the available space in toilet rooms and toilet stalls.

The foregoing represents a substantial improvement over prior art arrangements in which the first and reserve paper rolls have generally been positioned in the dispenser in axially aligned relation to each other, with the common axis of the rolls either horizontal or vertical. Such prior art arrangements are undesirable or awkward from the standpoint of proportions of the dispenser and also in use of the dispenser.

How the foregoing together with other objects and advantages are attained, will appear more fully from the following description referring to the accompanying drawings, in which:

FIG. **1** is an elevational view looking toward one side face of a dispenser constructed according to the present invention;

FIG. **2** is a generally horizontal but somewhat irregular sectional view taken as indicated by the line **2—2** on FIG. **1**;

FIG. **3** is a vertical sectional view taken as indicated by the line **3—3** on FIG. **2**;

FIG. **4** is a horizontal sectional view taken as indicated by the line **4—4** on FIG. **1**;

FIG. **5** is an irregular generally vertical sectional view taken as indicated by the line **5—5** on FIG. **3**;

FIG. **6** is an elevational view of a spindle assembly or unit employed in the embodiment shown in FIGS. **1–5**;

FIGS. **7** and **8** are somewhat diagrammatic views illustrating certain parts of the dispenser shown in the other figures and showing the spindles in different positions, as will be described; and

FIG. **9** is a fragmentary view similar to the lower portion of FIG. **1** but illustrating the action of a stop means provided for the purpose of preventing dispensing of paper from the reserve roll until the first roll is substantially completely used.

The dispenser illustrated in the drawings comprises an enclosure having a back or base wall **10** adapted to be fastened to a vertical supporting wall. The enclosure also includes a pair of side walls or side frame members **11** and **12**. Still further the enclosure includes the door or cover **13** mounted by means of pivots indicated at **14**. The door pivots or hinges are mounted upon the forward edges of the side frame members **11** and **12**, and the door extends upwardly and then rearwardly to meet the upper edge of the rear or mounting plate **10**, in which region a latch **15** (see FIGS. **3** and **5**) may be provided, operable by a key if desired, so as to prevent normal access to the interior of the enclosure through the doorway, but to permit authorized personnel to load the dispenser.

As seen in FIGS. **1** and **3**, the dispenser is proportioned so as to accommodate first and reserve paper rolls **16** and **17** positioned upon spaced horizontal axes, with the reserve roll above the first roll. The first roll **16** projects from the access aperture of the enclosure which is provided at the lower forward portion of the enclosure between the side frame members **11** and **12**.

The two rolls are adapted to be carried by spindles **18** and **19**, these spindles being interconnected in their spaced parallel relationship by means of linkage including links **20** and **21**. Links **20** and **21** are pivotally interconnected at **22** and the adjacent portions of the two links are cut away and overlapped, as is clearly illustrated in FIGS. **5** and **6**. The two spindles **18** and **19** are thus interconnected in a unitary separately handleable structure, and the two spindles, because of the pivotal interconnection of the links **20** and **21** may be swung or moved toward and away from each other. When the two spindles **18** and **19** are pivotally separated to the maximum extent (as shown in FIGS. **1**, **3**, **5** and **6**), the spindles will accommodate a pair of full paper rolls. However, by pivotal movement of the links, the spindles may be moved toward each other to positions in which they would accommodate one but not two full paper rolls, the purpose of this being explained hereinafter.

The position and motion of the spindles in the dispenser is determined or established and is guided by guiding channels formed on the inside faces of the side frame members **11** and **12**, and by the cooperating projections at the end of the spindles. Referring particularly to FIGS. **2–6**, it will be seen that at one end, the spindles are provided with projections **18***a* and **19***a*, preferably of somewhat reduced diameter as compared with the main body of the spindles, and these projections engage in the guiding channels at one side of the dispenser. Similarly projections **20***a* and **21***a* are provided on the links **20** and **21** in general alignment with the other ends of the spindles **18** and **19**, the projections **20***a* and **21***a* being adapted to cooperate with the guiding channel at the other side of the dispenser. The projections **20***a* and **21***a* are of square shape for purposes to be described.

The side frame member **11** is provided with a guidinG channel for the projections **20***a* and **21***a* at the ends of the spindles interconnected by the linkage **20** and **21**. As seen particularly in FIGS. **3**, **7** and **8**, this guiding channel includes an upwardly open portion or run **23** which is accessible for insertion of the spindles when the loading door **13** is opened. From the lower end of the channel portion **23**, another channel portion **24** extends downwardly and preferably also somewhat forwardly to a point or region establishing a paper dispensing station, i.e., a station in which the spindle **18** as seen in FIG. **3** is positioned so that the first paper roll **16** is accessible for dispensing through the dispensing aperture at the lower forward portion of the enclosure of the dispenser. The channel further includes a portion **25** extended horizontally and rearwardly from the dispensing station to an inactive station adjacent to the back or mounting plate **10** of the enclosure. From this latter station the channel includes still another run indicated at **26** extended upwardly to rejoin the uppermost or terminal portion **23** in the manner of a loop.

The pivotally interconnected spindles are adapted to be guided through the various portions of the channel **23**, **24**, **25** and **26** and, as will be further explained, in this way the spindles and the paper rolls carried thereby are adapted to be brought sequentially to the dispensing station at the junction between the channel portions **24** and **25**.

For stability of operation it is preferred to provide guiding channels of the kind referred to not only in the side frame of the dispenser adjacent to the linkage interconnecting the spindles, but also in the opposite side frame **12** of the dispenser. The guiding channel in the side frame **12** is desirably formed as a mirror image of the channel in the side frame **11**, and the

various runs or portions of this channel are indicated at **23***a*, **24***a*, **25***a* and **26***a* in FIG. 1. This guide channel is shown somewhat narrower than the channel in the side frame **11** but is of a width appropriate to accommodate and guide the spindle projections **18***a* and **19***a*. This arrangement prevents improper insertion of the spindle assembly.

Certain phases of the action of the dispenser will appear to best advantage by comparison of FIGS. **3**, **7** and **8**, the latter two of which are somewhat diagrammatic representations of parts only of the equipment.

Assume first that a pair of spindles loaded with full paper rolls have been inserted through the loading doorway to the position illustrated in FIG. **3**. In this loaded condition it will be noted that the roll **16** is accessible, but the roll **17** is positioned above and within the enclosure and is not accessible. When roll **16** has been completely used or dispensed, the reserve roll **17** may be brought to dispensing position simply by manually shifting the spindle **18** rearwardly in the channel **25** to the position indicated at **18***b* shown in FIG. **7**. In connection with this motion of the spindle **18** it is noted that the channel portion **25** is of smaller transverse dimension than the channel portion **24** and further that the size and anGular position of the square projection **20***a* (see FIG. **3**) is such as to pass readily through the channel portion **25**.

The motion of spindle **18** as just described will be accompanied by pivotal motion of the links **20** and **21**, gravity serving to lower the reserve roll **17** and thus also the spindle **19** for the reserve roll through the position indicated at **19***b* in FIG. **7** to the position indicated at **19***c* in FIG. **8**, which latter position coincides with the dispensing position defined by the junction between the runs **24** and **25** of the guide channel. The reserve roll is thus now positioned for free access and dispensing of paper.

When it is desired to reload the dispenser, the authorized attendant opens the loading door **13** and reaches into the dispenser to grasp the spindle **18** at the position **18***b* shown in FIG. **8**, and the attendant draws this spindle upwardly into the guiding channel **26**, the pivotal interconnection **22** between the links **20** and **21** providing freedom for this motion. After the spindle **18** is drawn upwardly to some appreciable extent, the squared projection **20***a* enters the entrance portion **23** of the guide channel and the spindle assembly may then readily be drawn upwardly out of the dispenser through the terminal portion **23** of the guiding channel, the squared projection **21***a* moving upwardly through the portion **24** of the guide channel and out of the enclosure through the entrance portion **23** of the channel. From FIG. **8** it will be noted that the squared projection **21***a* associated with the spindle **19** is angularly positioned so that it will not pass through the channel run **25** while the spindle **18** is positioned as shown in FIG. **8** or is located in channel portion **26**.

Upon reloading the spindles may be returned into the dispenser as described above with reference to FIG. **3**. With respect to reloading it is to be noted that the spindle unit or assembly is so constructed that it may be inserted with either of the two spindles in the leading position.

The arrangement of the dispenser also includes several additional features providing for foolproof operation including prevention of undesired access to the reserve paper roll until the first paper roll has been substantially completely used. These various features are as follows:

As seen in FIGS. **1**, **4**, **5** and **9** an abutment or stop **27** is positioned below the horizontal run **25***a* of the guiding channel in the side frame member **12** in a position so that it would strike and interfere with rearward movement of a full paper roll **16** and, in fact, would prevent rearward motion of the spindle **18** until the roll **16** is substantially completely used, as indicated at **16***a* in FIG. **9**. When the roll **16** is completely dispensed, it will readily pass over the abutment means **27**, thereby permitting the spindle **18** to be shifted back to the inactive station, and the spindle **19** for the reserve roll to drop downwardly into the dispensing station.

It is preferred to provide a spring pressed detent **28** (see FIGS. **1** and **4**) serving to yieldingly retain either of the spindles in the dispensing position. This detent however may readily be displaced by manually moving the spindle from the dispensing position to the inactive position.

A spindle which has been moved from the dispensing station to the inactive station will be retained in the inactive station by means of the spring stop **29** which is arranged to provide relative freedom for motion of the spindles from the dispensing station into the inactive station, but to prevent motion of the spindle in the reverse direction. Similarly, spring stops **30** are arranged at each side of the dispenser in the region of the junction between the return runs **26** and **26***a* of the guiding channels with the terminal portions **23** and **23***a*. These spring stops permit free motion of the spindles from the return runs into the terminal runs and thence out of the dispenser, but prevent entrance of the spindles into the return run when the dispenser is being loaded.

It is also preferred to provide a means for retaining the pivotally interconnected links **20** and **21** in certain relative positions. This is best shown in FIG. **3** where it will be seen that the link **20** is provided with a series of projections **31** adapted respectively to cooperate with the spring detent device **32** which is mounted by means of a block **33** carried by the arm **21**. Although this device will yield by manually applying a force tending to pivot the links, nevertheless it tends to maintain the links in the position illustrated in FIG. **3** in which the spindles are separated to the maximum spacing. This detent device will still further tend to maintain the links in various relative pivoted positions, so that the links and spindles will not be completely free to shift their relative positions, but will only do so upon application of positive manual pressure.

From the foregoing it will be seen that the dispenser of the invention provides for the accommodation of first and reserve Paper rolls in positions mounted upon spaced parallel and superimposed spindles, thereby providing for accommodation of first and reserve rolls within the compass of a relatively small and well proportioned enclosure. In addition the invention provides a simple change-over arrangement which may be readily actuated by the user. Assurance is also provided against undesired premature use of the reserve roll.

I claim:

1. A paper roll dispenser comprising an enclosure having an access aperture in a lower portion thereof providing for paper dispensing, the enclosure being proportioned to receive first and reserve paper rolls in positions with the first roll at a dispensing station accessible through said aperture and with the reserve roll above the first and inaccessible through said aperture, spaced parallel spindles for mounting the paper rolls, and guide means establishing a path of motion for the spindles and providing for movement of the spindle for the first roll away from said dispensing station and for movement of the spindle for the reserve roll into said dispensing station and thereby provide for dispensing of paper sequentially from the first and reserve rolls from the same position in said enclosure.

2. A paper roll dispenser comprising an enclosure having a paper dispensing aperture, the enclosure being proportioned to receive a plurality of paper rolls in positions with one roll accessible through said aperture and another roll inaccessible through said aperture, spaced parallel spindles for mounting the paper rolls, and guide means including means establishing a paper dispensing station and meanS establishing a path of motion for the spindles and providing for bringing the spindles sequentially into said dispensing station for dispensing the paper of said rolls from the same position in said enclosure.

3. A dispenser as defined in claim **2** and further including stop means for restraining spindle movement to bring a second paper roll to said dispensing station until the roll in said station has been substantially completely dispensed.

4. A dispenser as defined in claim **2** in which the roll spindles are provided with interconnecting linkage providing a multiple spindle unit unitarily removable from and insertable in the enclosure.

5. A paper roll dispenser comprising an enclosure having an access aperture in a lower portion thereof providing for paper dispensing and further having a loading door in an upper portion thereof, the enclosure being proportioned to receive first and reserve paper rolls in positions with the first roll at a dispensing station accessible through said aperture and with the reserve roll above the first and inaccessible through said aperture, spaced parallel spindles for mounting the paper rolls, and guide means establishing a path of motion for the spindles from the loading door to a position providing for dispensing of the paper rolls and providing for movement of the spindle for the first roll away from said dispensing station and for movement of the spindle for the reserve roll into said station and thereby provide for dispensing of paper sequentially from the first and reserve rolls from the same position in said enclosure.

6. A dispenser as defined in claim 5 and further including stop means restraining movement of the spindle for the first roll away from the dispensing station until the first roll has been substantially completely dispensed.

7. A paper roll dispenser comprising a pair of roll spindles, linkage interconnecting the spindles, and mounting structure for the spindles having a channel formed therein for guiding sequential motion of the spindles into and out of a paper dispensing station, the guide channel being extended in a looped path and providing for insertion of the spindles into one side of the looped path and for withdrawal of at least one of the spindles from the other side of the looped path, and portions of said looped path being spaced from each other a distance less than the length of said linkage, the linkage including a pair of links pivotally interconnected and providing for swinging of the spindles toward and away from each other to accommodate motion of said spindles in said portions of the looped path.

8. A paper roll dispenser comprising an enclosure having a paper dispensing aperture and a loading doorway, a pair of roll spindles, linkage interconnecting the spindles and providing for unitary loading of the dispenser through said doorway, and mounting structure for the spindles including a side frame having a channel formed therein for guiding sequential motion of the spindles into and out of a paper dispensing station in which the paper rolls are sequentially accessible at the same station through said aperture and thus from the same position in said enclosure and further providing for guiding of the spindles into and out of the enclosure through said doorway.

9. A paper roll dispenser comprising an enclosure having a paper dispensing aperture in a lower forward portion thereof and a loading doorway in an upper portion thereof, a pair of roll spindles for a first and a reserve paper roll, and mounting structure for the spindles having a channel formed therein for guiding motion of the spindles after insertion thereof through the loading doorway, the guiding channel having a run for guiding the spindles downwardly to a dispensing station in which the paper is accessible through the dispensing aperture and having a run extended rearwardly from said station to an inactive station sufficiently remote from the dispensing station to permit the spindle for the reserve roll to move to the dispensing station.

10. A dispenser as defined in claim 9 in which the guiding channel has a run extended from said inactive station upwardly to the region of the loading doorway to provide for removal of the spindle for the first roll.

11. A dispenser as defined in claim 9 and further including means for restraining motion of a spindle from the dispensing station to the inactive station when the paper roll on the spindle still retains most of its paper but providing freedom for such movement when most of the paper has been dispensed.

12. A paper roll dispenser comprising a pair of roll spindles, linkage interconnecting the spindles in parallel relation at a spacing sufficient to provide for concurrent mounting of a pair of full paper rolls, mounting structure for the spindles having a channel formed therein for guiding sequential motion of the spindles into and out of a paper dispensing station, the guide channel being extended in a looped path and providing for insertion of the spindles into one side of the looped path and for withdrawal of at least one of the spindles from the other side of the looped path, and portions of said looped path being spaced from each other a distance less than the length of said linkage, the linkage including a pair of links pivotally interconnected and providing for swinging of the spindles toward and away from each other to accommodate motion of said spindles in said portions of the looped path, and spring pressed detent means yieldingly acting to retain the pivoted links in spaced positions providing for accommodation of a pair of full paper rolls.

13. A paper roll dispenser comprising an enclosure having a paper dispensing aperture in a lower forward portion thereof and a loading doorway in an upper portion thereof, a pair of roll spindles for a first and a reserve paper roll, mounting structure for the spindles having a channel formed therein for guiding motion of the spindles after insertion thereof through the loading doorway, the guiding channel having a run for guiding the spindles downwardly to a dispensing station in which the paper is accessible through the dispensing aperture, having a run extended rearwardly from said station to an inactive station sufficiently remote from the dispensing station to permit the spindle for the reserve roll to move to the dispensing station when the spindle for the first roll is moved to said inactive station, and further having a return run extended from said inactive station upwardly to the region of the loading doorway to provide for removal of the spindle for the first roll, and means providing against entry of spindles from the loading doorway into the return run of the guiding channel.

* * * * *