The present invention relates in general to improvements in paper or sheet material dispensing devices and, more particularly, to improvements in means for facilitating the mounting of a supply roll of sheet material, such as paper, on a swingable frame which is adapted to position the roll in proper relationship with respect to the feeding mechanism of a dispensing cabinet.

It is the main object of the present invention to provide in a dispensing cabinet a supply roll retainer that will prevent the improper placement of a supply roll of paper in the dispensing cabinet.

It is another object of the present invention to provide in a dispensing cabinet a supply roll mounting retainer of predetermined configuration which is adapted to support a roll of paper having preformed in at least one end thereof a corresponding predetermined configuration.

It is a further object of the invention to provide in a dispensing cabinet a roll mounting retainer which is preformed in such a manner that it simulates a key and unless the supply roll to be supported thereby is also preformed in the predetermined manner to fit and cooperate with the keyed retainer, the roll cannot be supported on the retainer mounting.

It is a further object of the invention to provide supply roll mounting retainers having a plurality of different predetermined key-like combinations so that they may be utilized to support only such supply rolls that have corresponding predetermined key-like configurations preformed therein, thereby preventing the unauthorized use of paper rolls which have not been preformed to fit the corresponding key-like retainers.

It is a further object of the invention to arrange the retainer roll supports so that they will fit into cooperating cut-outs, slots or the like, preformed in at least one end of the paper supply rolls to be supported by such retainers and to arrange such cut-outs or slots so that they are relatively shallow and so that they extend outwardly away from the core of the supply roll a relatively short distance. With this arrangement, the cut-outs or slots in the end of a supply roll will not appear on the edge of the paper, during the dispensing of the paper from the cabinet, until a substantial portion of the paper has been dispensed from the roll. Thus, the slots or cut-outs appearing along the edge of the paper during the dispensing operation will function to indicate the fact that another new roll of paper should be placed within the cabinet.

Further objects and advantages of the invention will best be understood by reference to the following specification taken in conjunction with the accompanying drawings in which:

Figure 1 is a vertical section taken through a dispensing cabinet showing the swingable frame thereof, in full lines at a loading position outside of the cabinet and showing the frame in dot-dash lines within said cabinet with the supply roll properly supported with respect to the paper feeding mechanism;

Figure 2 is a front elevation, partially in vertical longitudinal section, showing the swingable frame of the dispensing cabinet and the manner in which a supply roll is mounted for rotation on the swingable frame;

Figure 3A is a partial perspective view of a supply roll of paper showing the slots or cut outs formed therein and a corresponding retainer, turned at right angles to the supply roll to clearly illustrate the same, which is rotatably supported on one end of the swingable frame and which is provided with a plurality of projections which are adapted to cooperate with the corresponding slots formed in the paper roll;

Figure 3B is a partial perspective view of a supply roll of paper showing the slots or cut outs formed therein and a modified form of a cooperating supply roll retainer, turned at right angles to the supply roll to clearly illustrate the same which is rotatably supported on one end of the swingable frame;

Figure 3C is a partial perspective view of a supply roll of paper showing the slots or cut outs formed therein and another modified form of a cooperating supply roll retainer, turned at right angles to the supply roll to clearly illustrate the same, which is rotatably supported on the swingable frame; and

Figure 4 is a perspective view of the opposite end of each of the supply rolls shown in Figures 3A, 3B and 3C together with the supply roll retainer plug, turned at right angles to the roll to clearly illustrate the same, which is rotatably supported on the opposite end of the swingable frame.

Referring to the drawings, the dispensing cabinet 10 and the cover 12 therefor may be of conventional construction, such for example, as the towel dispensing cabinet of the type disclosed in the Patent No. 2,601,056, granted July 1, 1952, to Rudolph G. Birr. The cover 12 of the cabinet is pivotally supported so that it can be swung downwardly below the cabinet so that access may be had to the interior of the cabinet for servicing. The cabinet is provided with a feeding mechanism which includes the measuring roll 14 which may be operated by pulling downwardly on the end of the paper or it may be operated, for example, by means of a crank. Also, the feeding mechanism includes a pressure roll 15 which is normally placed in contact with the measuring roll 14. The sheet material carried by the supply roll 30 is delivered in a counterclockwise direction, as viewed in Figure 1, downwardly between the surfaces of the measuring roll 14 and the pressure roll 15 through a throat 16 provided in the lower surface of the dispensing cabinet.

Above the feeding mechanism, a swingable frame assembly 17 is provided which includes a right arm 19 which are cross-connected or joined by means of an elongated sheet metal strap 20. Preferably, the strap 20 is resilient to permit the roll supporting arms 18 and 19 to be spread apart, when they are in the loading position outside the cabinet, to facilitate the proper insertion of a supply roll in the manner to be described hereinafter. The swingable frame assembly 17 is pivotally supported by pivot pins 22 on the side walls 23 of the cabinet so that the swingable frame assembly may be swung in and out of the cabinet.

The arms 18 and 19 are provided with laterally extending flanges 24 which are turned inwardly and are utilized to secure the strap 20, by means of rivets or the like, to the respective arms. As illustrated, the strap 20 is engaged by the inner surface of the cover 12 when the latter is in its closed position on the cabinet.

In addition to the foregoing, the arms 18 and 19 are provided with laterally extending wing members 25.
which are turned outwardly so that they engage the front edges 27 of the side walls 23 and thereby limit the inward movement of the swingable frame assembly as best shown in Fig. 1. The wing members 25 are also arranged so that they limit the outward movement of the swingable frame assembly since they also engage the outer edges 17A on the side walls 23 of the cabinet.

In the drawings, the supply roll 30 is a roll of paper toweling which may be provided with a paper core 31 upon which the material is wound. The right arm 18 of the swingable frame assembly is provided with a short tubular plug 33 which is of appropriate size to snugly fit into the core 31 of the supply roll 30. Also, the plug 33 is provided with a flange or flat ring 34 which engages a portion of the end surface of the roll 30 surrounding the core 31 when the plug 33 is inserted into the core 31. The tubular plug 33 and the flange 34 integrally formed thereon, is rotatably supported on the free end of the arm 18 by means of the pivot pin 32 to provide a rotatable mounting for the supply roll 30.

At the opposite end of the swingable frame assembly 17, the arm 19 is provided with a flat retainer plate 35 which is rotatably mounted on the arm 19 by means of a pivot pin 36. As is best illustrated in Fig. 3A, the retainer plate 35 is formed of flat sheet metal and is provided with a relatively flat surface 35A which is adapted to abut or engage at least a portion of the end surface of the roll 30 surrounding the core 31. The upper right-hand portion of the retainer 35, as illustrated in Fig. 3A, is provided with a key-like member or lug 35B which is turned at right angles to the surface 35A. One edge 35C on the lug 35B is perpendicular with respect to the flat surface 35A of the retainer 35 and the edge 35D on the lug 35B is arcuate shaped, having a radius substantially equal to the length of the perpendicular edge 35C, to form a projection on the retainer 35 that is relatively thin and is substantially one-fourth of a circle. The lug 35B is offset to the right with respect to a vertical line drawn through the pivotal center 37 of the retainer 35. An identical key-like member or lug 35E is also provided on the lower left-hand portion of the retainer 35 which is offset to the left with respect to the vertical line drawn through the pivotal center 37. As shown, the lugs 35B and 35E in their longitudinal directions are spaced apart on opposite sides of a vertical line drawn through the pivotal center 37 and corresponding perpendicular edge 35C on the respective lugs are diametrically spaced apart a distance substantially equal to the diameter of the core 31.

In order to mount the roll 30 on the swingable frame assembly 17, the assembly is first moved to the position illustrated by the full lines of Fig. 1. Thereafter, the arms 18 and 19 are manually spread apart sufficiently to permit the roll 30 to be inserted between the arms and to permit the core 31 to be slipped over the plug 33. Since the retainer 35 is provided with the key-like members or lugs 35B and 35E, the roll cannot be secured to the retainer 35 unless slots 36B and 36E of corresponding configurations have been precut in the end of the roll 30 to form key-like slots to receive the corresponding key-like members of the retainer 35. The slots 36B and 36E may be precut in the end roll 30 by sawing or the like and are respectively provided with longitudinally arcuate bottoms 36C and 36D which correspond in shape to the arcuate shape of the edges 35D of the lugs 35B and 35E.

When the lugs 35B and 35E on the retainer 35 are in the proper position to cooperate with the corresponding slots 36B and 36E in the roll 30, the arms 18 and 19 may be released so that the resilient strap 20 will clamp the roll 30 for rotatable mounting on the plug 33 and the retainer 35, the lugs 35B and 35E entering the slots and coming to rest with their arcuate edges 35D in intimate engagement with the arcuate bottoms of the slots to automatically center and support the end of the roll.

The sheet material on the roll 30 may then be passed over the top of the roll 30 as seen in Fig. 1 and the measure roll 15 and the measure roll 14 so that the end of the sheet material will extend through the throat 16 in the lower surface of the cabinet. The swingable frame assembly may thereupon be rotated in a counterclockwise direction (Fig. 1) about the pivot 23 until it assumes the position illustrated in Fig. 1 with the flanges 25 engaging the front edge 27 on the side walls 23 of the cabinet. The cover 12 may then be closed to render the dispensing cabinet available for use in dispensing the paper from the roll 30.

One object of the retainer 35 is to assure the correct placement of the supply roll 30 with respect to the feeding mechanism including the pressure roll 15 and the measuring roll 14 within the cabinet. Another object of the retainer for supporting the supply roll is to prevent the placement of a supply roll thereon with the outer sheet of material unwinding in a clockwise direction instead of a counterclockwise direction during the dispensing operation of the cabinet. Another object of the retainer for supporting the roll 30 is to prevent the use of any unauthorized paper sheet material of improper quality in the cabinet. Thus, the retainer 35 assures that the paper roll will be properly supported and fed by the primary mechanism only when the roll is properly slotted to cooperate with the corresponding lugs on the retainer. Since the reputation of the manufacturer of the dispensing cabinets, as well as the reputation of the manufacturer of the paper is of considerable importance, it is desirable to prevent the unauthorized use of paper sheets in the dispensing cabinet. With the retainer 35, illustrated in Fig. 3A, ordinary unslotted rolls of paper cannot be supported by the retainer 35. In fact, if the slots in the end of the paper roll 30 are not provided to exactly receive the key-like members or lugs 35B and 35E on the retainer 35, the end surface of the roll 30 will not engage the flat surface 35A on the retainer. When this occurs, the arms 18 and 19 will be held sufficiently spread apart so that the frame assembly 17 cannot be rotated back into the cabinet between the side walls thereof.

The modified flat retainer 45 illustrated in Fig. 3B may be substituted for the retainer 35 illustrated in Fig. 3A. The retainer 45 is substantially identical to the retainer 35 except that the key-like members or lugs 45B and 45E have been positioned respectively on the left and right-hand sides of a vertical line drawn through the pivotal center of the retainer to form a right-hand retainer instead of a left-hand retainer as is illustrated in Fig. 3A. It should be understood that the retainer 45 may be used to replace the retainer 35 on the arm 19 of Fig. 2. The slots 46B and 46E formed in the roll 30B of Fig. 3B are respectively provided with arcuate bottoms 46C and 46D and are arranged to cooperate with the lugs 45B and 45E on the retainer 45, and it is apparent that paper rolls which have been slotted at one end in the manner illustrated in Fig. 3B cannot be used in cabinets having single end retractors of the type illustrated in Fig. 3A. Conversely, the rolls of paper therein may be slotted to cooperate with re-
mounted on the left-hand arm 19. By merely reversing the parts, as noted above, a cabinet constructed in this manner will not accept rolls of paper which have been slotted on the left end in the manner illustrated in Figs. 3A and 3B. In other words, the supply roll that is to be used in a cabinet with the retainer 35 mounted on the right arm 18 instead of the left arm 19 must be slotted on the right end in a corresponding manner so that the sheet material will be drawn from the roll in a counter-clockwise direction (Fig. 1).

Still another modification may also be made by mounting the retainer 45 on the right arm 18 instead of on the left arm 19 on the swingable frame assembly 17. Corresponding slots must then be present in the right end of the rolls of paper to be supported in the latter type cabinets.

Fig. 3C illustrates still another modification of a retainer for supporting a roll of paper. In this figure, the retainer 55 is provided with two key-like members or lugs 55B and 55E which are positioned below a horizontal line drawn through the pivotal center 57 of the retainer as seen in Fig. 3C and which are spaced apart on opposite sides of a vertical line drawn through the pivotal center 57. The key-like members or lugs 55B and 55E are arranged to cooperate with corresponding slots 56B and 56E present in the end of the paper roll 30C. Since the roll 50E of paper in the member 30C would tend to be dislodged from the lugs 55B and 55E during the rotation of the roll in the dispensing cabinet, an additional supporting projection 56 is provided on the retainer 55. The projection 56 is turned at right angles to the flat surface of the retainer 55 and then curved sufficiently along its upper surface so that it will fit the contour of the inner peripheral surface of the core 31C on the roll 30C. The projection 56, in conjunction with the lugs 55B and 55E will rotatably support the roll on the swingable frame assembly in substantially the manner described previously. Thus, still another arrangement for supporting a supply roll of paper in a dispensing cabinet has been provided.

From the previous description it is apparent that the retainer 55 may also be rotatably supported on the right-hand arm 18 on the swingable frame instead of on the left-hand arm 19 to provide still another modification. In all forms of the retainers for supporting a supply roll of paper on the swingable arm of a dispensing cabinet, the roll of paper to be dispensed from the cabinet will not be supported therein unless the roll has been provided with slots having a predetermined configuration to accept the key-like members or lugs having corresponding configurations provided on the roll supporting retainer of the cabinet. It will also be apparent that a roll having slots present in accordance with one configuration cannot be used in a cabinet having key-like members or lugs of another configuration.

Three different types of retainers have been illustrated respectively in Figs. 3A, 3B and 3C and a description has been given to point out the fact that the three different retainers may be used as rights and lefts to constitute six different arrangements. It will be understood, however, that various combinations of the retainers illustrated in Figs. 3A, 3B and 3C may be mounted respectively on the right and left-hand arms 18 and 19 on the swingable frame assembly 17 to provide additional modifications. If the different combinations of the retainers of Figs. 3A, 3B and 3C are utilized on the respective right and left-hand arms of the swingable frame, then the plug 33 may be omitted.

After a roll of paper has been placed in the cabinet using any one of the previously noted retainers or combinations thereof, the paper may be dispensed from the dispensing cabinet in the manner described, for example, in the previously noted Birr application. After a new roll has been placed in the cabinet, the paper being dispensed therefrom will not have any slots visible along the edges of the paper. However, after approximately three-fourths of the paper has been dispensed from a roll, small spaced-apart notches will begin to appear along the edge of the paper. These notches will gradually increase in length and gradually become closer together as the dispensing of the paper continues due to the fact that the slots in the end of the roll are curved and due to the fact that the diameter of the roll is gradually reduced. The serviceman or janitor assigned to service the dispensing cabinet may readily observe the spacing and length of the slots on the edge of the paper being dispensed through the opening in the cabinet and quickly determine whether or not a new roll of paper should be placed in the cabinet.

What is claimed is:

In a dispenser for paper toweling, a substantially cylindrical supply roll of paper toweling, means for supporting a first end of said roll for rotation about an axis, said supply roll having a pair of substantially parallel elongated slots in its second end, said slots extending outwardly in opposite directions from the central portion of said roll toward the periphery thereof and each having a longitudinally arcuate bottom that ascends gradually from the inner end of the slot and meets the surface of said second end of said roll at the exterior extremity of the slot, a plate abutting said second end of said roll and mounted for rotation about said axis, and a pair of projecting lugs carried by said plate and respectively received in said slots, said lugs having arcuate outer edges corresponding in shape to the arcuate bottoms of said slots and being in intimate engagement therewith along substantially the entire lengths of said slots for automatically centering said second end of said roll with respect to said axis and for supporting said second end for rotation about said axis, said lugs providing the sole means engaging said roll for vertical support of said second end thereof.

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