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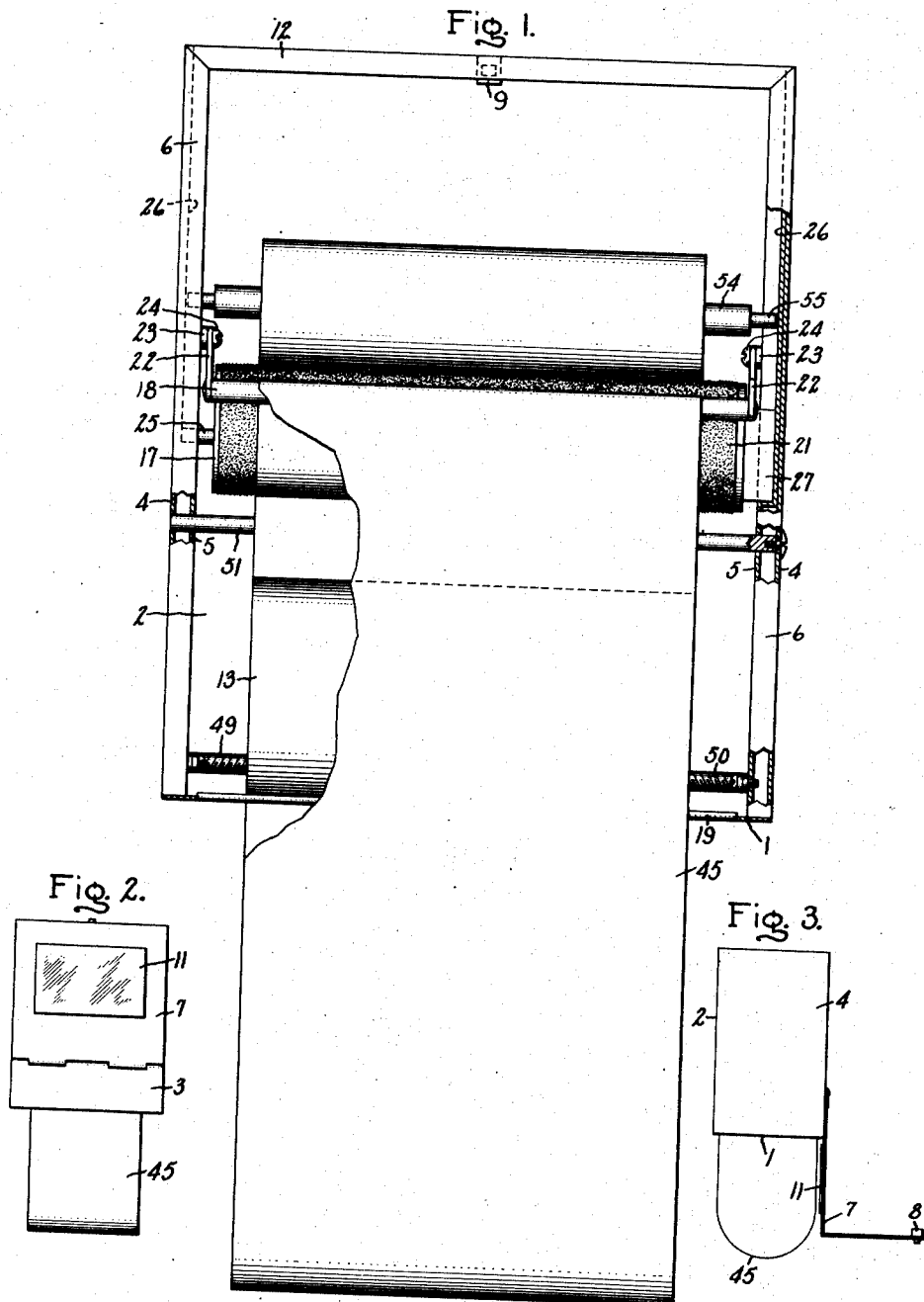
E. J. FRIDAY

2,652,303

SHEET MATERIAL DISPENSING MECHANISM

Filed Feb. 17, 1950

3 Sheets-Sheet 1



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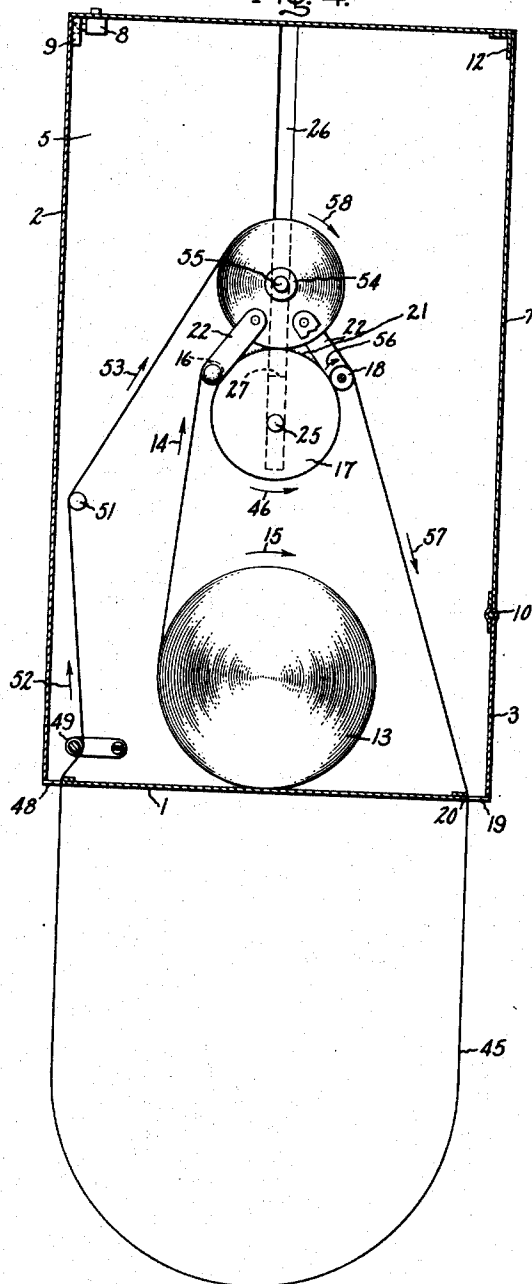
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SHEET MATERIAL DISPENSING MECHANISM

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3 Sheets-Sheet 2

Fig. 4.



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UNITED STATES PATENT OFFICE

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SHEET-MATERIAL DISPENSING MECHANISM

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Application February 17, 1950, Serial No. 144,645

18 Claims. (Cl. 312—38)

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My invention relates to sheet-material dispensing mechanisms and particularly to the type used to dispense a predetermined length of towel and then to latch the mechanism for a predetermined time before another length of towel can be obtained.

This application is a substitute for my abandoned application Serial No. 735,780 and is also somewhat similar in certain features to my co-pending application Serial No. 30,710.

An object of my invention is to provide an improved sheet-material dispensing mechanism.

Another object of my invention is to provide an improved sheet-material dispensing mechanism in which the material withdrawn at any one time is limited to a predetermined length.

A further object of my invention is to provide an improved sheet-material cabinet comprising a dispensing mechanism in which the material withdrawn at any one time is limited to a predetermined length and substantially the same length of material is rewound on a rewind roll.

A still further object of my invention is to provide an improved towel-dispensing mechanism in which the towel withdrawn and rewound is substantially equal and limited to a predetermined length at any one time with a time delay of predetermined duration after each withdrawal of towel during which the mechanism is latched against operation.

Further objects and advantages of my invention will become apparent, and my invention will be better understood from the following description referring to the accompanying drawings, and the features of novelty which characterize my invention will be pointed out with particularity in the claims annexed to and forming part of this specification.

In the drawings, Fig. 1 is a front-elevational view, partly broken away, showing a sheet-material dispensing mechanism provided with an embodiment of my invention; Fig. 2 is a front-elevational view of the construction in Fig. 1; Fig. 3 is a side-elevational view of the arrangements shown in Figs. 1 and 2 with the door open; Fig. 4 is a side-elevational view of the mechanism shown in Fig. 1 with the side panel of the container broken away; Fig. 5 is a side-elevational view of the friction roll shown in Figs. 1 and 4, partly broken away to show the metering and time-delay mechanism within this roll; Fig. 6 is a plan view of the friction roll shown in Fig. 5, partly broken away to show details of the mechanism; Fig. 7 is an end view of the right-

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hand end of the friction roll shown in Figs. 1, 5, and 6; and Fig. 8 is a sectional view taken along line 8—8 of Fig. 5.

Referring to the drawings, I have shown an embodiment of my improved sheet-material dispensing mechanism in the form of a reroll fabric towel dispenser. The combination of elements forming the towel-supply regulating part of this arrangement can equally well be adapted to control the towel supply in a dispenser of paper towels in which the clean towel portion is torn off by the user. Both of these types of towel dispensers are generally used in public or general use lavatories where users are not as a rule overly careful in the use of the facilities provided. It, therefore, has been found desirable to limit the amount of clean toweling made available at any one time and to provide for a lapse of time between each available new supply of toweling. This time-delay feature tends to make the user more economical in the use of the towel and provides for an equitable distribution of towel among the various users. Fabric toweling has been found to be most practical when it is arranged so that a predetermined length of clean towel supply is obtainable between predetermined time delays and provided with a rewinding system which will take up exactly the same amount of soiled towel into the container as the clean towel which is fed out, thereby maintaining a predetermined loop of towel depending from the container for use. Such an arrangement is shown in Figs. 1 through 4, in which the mechanism includes a container having a bottom or base 1 preferably formed integral with an upwardly extending back 2 and a partial front 3. This container may be made entirely of pressed and formed sheet metal and, if desired, the various parts may be welded together at suitable abutting edges to provide a tight enclosure for the dispensing arrangement. The sides of the container preferably also are formed of sheet metal to provide a light rigid structure and to form a smooth exterior which can easily be kept clean. These sides are shown as comprising an outer sheet portion 4 and an inner sheet portion 5 formed of a single sheet with a small outer front wall portion 6. If desired both sides and the back 2 may be made of a single metal sheet, although this is not essential. The edge of the inner sheet portion 5 of each side is secured to the back 2 in any suitable manner, as by welding or by tabs extending through slots in the back 2. To complete the enclosure of the mechanism and to facilitate replacement of the towel, the con-

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tainer is provided with a large closure 7, also preferably formed of sheet metal, which includes a front closure portion and a top closure portion provided with a suitable lock element 8 for co-operation with a complementary lock element 9 on the back 2 to lock the closure securely to the back to prevent tampering with the mechanism. Preferably the closure is hinged to the front 3 by a suitable pintle or hinge pin 10 and a mirror 11 may be mounted on the outside of the front closure portion 6. In order to strengthen the container, a cross-brace 12, shown as a channel section element, is arranged to extend between the upper front corners of the sides and is secured thereto in any suitable manner, as by welding. This provides the desired rigidity to the container and also assures the correct spacing between the sides for rotatably and movably supporting parts of the dispensing mechanism.

This dispensing mechanism includes an arrangement for metering and limiting the clean towel obtainable at any one time to a predetermined length, and in the illustrated system provides for simultaneously rewinding a length of towel on a rewind roll equal in length to that withdrawn. The towel adapted to be used in the illustrated arrangement is of suitable fabric and a roll 13 of clean towel is merely placed in the container and rests on the bottom 1 which rotatably supports it to permit unwinding the towel as shown by the arrow 14 which causes the roll 13 to turn as indicated by the arrow 15. The towel then passes over a towel-tensioning roll 16 around a part of the circumference of a rotatably mounted cylindrical friction roll 17 in good frictional contact with the underside thereof, and over a second towel-tensioning roll 18 to a supply slot 19 formed in the lower part 1 of the container adjacent the front thereof. This opening preferably is formed by turning in the edge of the bottom plate 1, as shown at 20, to provide a smooth curved surface over which the towel is drawn.

In order to obtain the desired operation of this mechanism, the friction roll 17 is formed with a high friction outer surface 21, which may comprise any suitable roughened surface, such as sprayed metallized surface, or a sheet of suitable sandpaper or emery paper securely fastened to the outside of the roll 17, and the pair of towel-tensioning rolls 16 and 18 are pivotally mounted angularly relative to the friction roll 17 by hanger straps 22 to assure good contact between the towel and the surface 21 and allow movement of the towel only when the roll 17 is turned. These straps 22 are pivotally secured over bushings 23 to the sides 5 of the container by screws 24 to provide for moving the rolls 16 and 18 outwardly from the friction roll 17 in threading the towel around these rolls when installing a new roll of clean towel. This is also desirable to allow for a slight movement of the friction roll during normal operation and yet to keep the towel taut around the roll 17.

The desired turning of the friction roll 17 to provide for the limited withdrawal of towel from the container is regulated by the operation of a metering and time-delay mechanism mounted within and enclosed by the roll 17 and arranged around a mounting rod 25 which extends into a guide slot 26 formed in one of the inner sides 5. The other end of the rod 25 is provided with a flat-sided guide key 27 arranged in vertically slidable engagement with another guide slot 26 formed in the other inner side wall 5 for pre-

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venting rotation of the mounting rod, thus providing a nonrotatable mounting for the mounting rod in the container. This mounting allows the friction roll 17 to rotate around the rod 25 and to slide vertically in the two guides 26 which extend downwardly a predetermined length on each side of the container.

The metering and time-delay features are illustrated in detail in Figs. 5, 6, 7, and 8, and include an arrangement for permitting a predetermined rotation of the friction roll 17 and for latching the friction roll 17 against rotation for a predetermined time after each of these predetermined rotations, that is, between successive rotations thereof. This mechanism is interposed between and connected to the friction roll 17 and to its mounting rod 25 and comprises a cam 28 mounted on the mounting rod 25 and rigidly secured thereto in any suitable manner, as by a setscrew 29, and formed with a spiral cam portion of substantially one complete turn, shown as a spiral groove 30. The ends of the spiral cam portion 30 are connected together by a longitudinally extending cam portion 31, shown as a groove in the cam 28. A cam follower 32 is longitudinally slidably mounted on a pair of spaced apart guide rods 33 which are held in nonrotatable positions relative to the friction roll 17 by a mounting plate 34 secured to the inner surface of the roll 17 in any suitable manner, as by welding, press fit, or otherwise. This plate 34 is further firmly held in position by a pair of spacing rods 35 secured at one end to the mounting plate 34 and at the other end to an end closure plate 36 rigidly mounted in an end of the friction roll 17 and substantially closing this end of the friction roll. A similar closure plate forms a substantially closed end at the other end of the friction roll 17, as shown in Figs. 5 and 6. The ends of the guide rods 33 adjacent the mounting plate 34 are secured thereto and the other ends thereof are secured to the end closure plate 36. In order to provide the desired travel of the cam follower 32, it is provided with a cam engagement element formed as a pin 37 which extends into the cam groove, such that relative rotation between the cam 28 and the follower 32 will result in the follower pin moving along the spiral cam portion 30 from one end to the other where it is stopped by the wall 33 of the longitudinally extending cam portion 31 that is, the cam follower 32 moves from an initial roll-rotatable position at one end of the cam along the spiral cam portion to a roll-stop position at the other end of the spiral portion of the cam. The cam follower then is adapted to be biased resiliently along the longitudinal cam portion 31 toward the mounting plate 34 under the action of a pair of compression coil springs 39 arranged one on each of the guide rods 33 and held under compression between the follower 32 and the friction roll end plate 36. This movement of the cam follower would be almost instantaneous were not a delaying action provided, and a suitable time-delay member, such as a dashpot 40, is adapted to give the desired time delay for the return movement of the follower to the initial roll-rotatable position thereof. The dashpot may be of any suitable type and is shown as including a piston 41 mounted on a rod 42 which slidably extends through the mounting plate 34 and is suitably secured to the follower 32, as by a pin 43. Adjustment of the time delay can be made to provide the desired delay interval by adjusting a relief screw 44. In this manner, ro-

tation of the friction roll 17 around the mounting rod 25 carries the cam follower pin 37 around the spiral cam groove 30 and the follower 28 slides longitudinally of the guide rods 33, thereby compressing the springs 39 until such movement is stopped by engagement of the follower pin with the longitudinal cam groove side 38. This limits further rotation of the follower around the cam and thereby limits the rotation of the friction roll 17 to the same amount predetermined by the spiral cam portion 30. With such an arrangement, when towel 45 is pulled through the supply slot 19, it rotates the friction roll, as indicated by the arrow 46, until the friction roll is stopped by engagement of the follower pin 37 with the longitudinal cam groove wall 38. This prevents further rotation of the friction roll 17 and the frictional force between the friction surface 21 and the towel 45 prevents further withdrawal of towel from the container until the follower pin has traveled through the longitudinal groove 31 to the other end thereof adjacent the mounting plate 34. This provides the desired predetermined time delay between withdrawals of clean towel.

In order to assure further the proper operation of the metering mechanism, I have found it desirable to mount the friction roll 17 eccentrically on the mounting rod 25 and relative to the cam 28 which is concentric with the rod 25. The amount of this eccentricity may be varied but has been found to provide the desired effect of producing a turning moment about the rod 25 by the weight of the roll 17 and the equipment in this roll so as to cause the cam follower pin 37 to be biased slightly away from the side 38 of the longitudinally extending cam groove portion 31 furthest from the dashpot when displaced substantially the radius of the mounting rod from its center, as indicated by the point 47 in Fig. 7. This provides a release of the follower pin 37 from the side 38 of the cam groove and prevents the pin from becoming frozen against this flat side of the cam and allows the pin to move freely along the cam longitudinal portion 31.

With this type towel dispenser, it is desirable that only a limited length of towel be left exposed and that soiled towel be rewound for removal from the container for replacement with a new roll when the clean towel roll is used up. In addition, it is desirable that the length of usable towel extending from the container should remain the same at all times by taking up just the same length of used towel as the length of clean towel which is withdrawn to prevent lessening the towel loop available for use and to prevent its lengthening and possibly dragging on the floor. This is obtained by providing a predetermined length of towel 45 extending as a loop which is simultaneously rewound to the same extent as it is withdrawn from the container. In thus rewinding used towel, it is desirable that it be automatically smoothed out and straightened before it is re-rolled. In order to obtain this effect the towel is arranged to pass into the container through a return slot 48 made similar to the supply slot 19 and located in the lower part of the container adjacent the back end thereof and to be drawn over a towel-straightening rod 49 adjacent the lower back part of the container and extending transversely between the sides thereof. This straightening rod 49 preferably is formed with spiral grooves or threads 50 extending in op-

posite directions from the center towards the ends of the rod. The towel then is drawn over a second straightening rod 51 as indicated by the arrows 52 and 53. This second rod 51 is spaced upwardly from the rod 49 and extends transversely between the sides of the container preferably slightly nearer the back 2 than the rod 49 to obtain a slight wrapping action of the towel around these two rods to produce more effectively the desired smoothing out of the towel. The towel passes from around the second straightening rod 51 to a rewind roll 54 which is rotatably supported by a mounting rod 55 journaled rotatably and in upwardly slidable relation in the guide slots 26 in the container sides 5. This provides for vertical movement of the rewind roll as the towel increases its diameter and for supporting the rewind roll in contact with the friction roll 17 with the towel in frictional contact with the friction surface 21 of this roll.

Whenever towel 45 is pulled out of the container it will pass from the clean towel roll 13 successively as indicated by the arrows 15, 14, 46, 56, 57, 52, 53 and around the rewind roll 54, such that, as the friction roll 17 turns, the towel in frictional contact with the upper side of the roll 17 will provide a driving force for rotating the rewind roll, as indicated by the arrow 58. Since only so much towel 45 is withdrawn from the container as is measured by a turn of the friction roll 17 metered by the travel of the cam follower from one end to the other of the cam spiral groove, exactly the same length of towel is wound on the rewind roll 54, as the same peripheral length of friction surface 21 which measures the towel withdrawn, drives the rewind roll by contact with the used towel. This automatically keeps the loop of the towel 45 at the same desired length and since the friction roll 17 is not reversible, it acts as a brake and prevents reverse rotation of the rewind roll. This rewind feature may be omitted if paper toweling is to be dispensed.

My single friction roll and its mounting mechanism is particularly advantageous should it be found desirable for any reason to replace the friction roll. It is only necessary to open the cabinet and to slide the rewind roll 54 and the friction roll 17 out of the guide slots 26 at the top of the cabinet and then replace the friction roll 17 by insertion of a new roll and reinsert the rewind roll, all without disturbing the clean towel roll. The timing and metering mechanism is the only part of the mechanism which may wear out in time, and since it is all within the friction roll, it can be replaced at any time without tools by merely replacing the friction roll as described above. In addition, with my mechanism, if the follower pin 37 should for any reason snap, thereby preventing the operation of the timing and metering mechanism, the arrangement remains operable until a new friction roll can be installed. The rewinding feature continues as effective as with the timing mechanism, since the friction roll continues to be rotatable and functions to rewind the same length of towel as is paid out of the cabinet, thus further enhancing the utility of my improved cabinet.

While I have illustrated and described a particular embodiment of my invention, modifications thereof will occur to those skilled in the art. I desire it to be understood, therefore, that my invention is not to be limited to the par-

particular arrangement disclosed, and I intend in the appended claims to cover all modifications which do not depart from the spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A metering and time-delay mechanism for a towel dispenser friction roll including a mounting rod for supporting the friction roll, a cam rigidly mounted on said mounting rod and having a spiral portion with a longitudinally extending portion connecting together the ends of said spiral portion, a cam follower nonrotatably and longitudinally movably mounted relative to and within the friction roll extending into engagement with said cam, means for providing a desired time delay for return movement of said follower along said cam longitudinal portion, and means for resiliently biasing said cam follower toward said time-delay means during return movement of said cam follower.

2. A metering and time-delay mechanism for a towel dispenser having a friction roll supported on a mounting rod, said metering and time-delay mechanism including a cam rigidly mounted on the mounting rod and having a spiral portion of substantially one complete turn with a longitudinally extending portion connecting together the ends of said spiral portion, a mounting plate rigidly secured in the friction roll, a pair of guide rods extending within the friction roll between said mounting plate and one end of the friction roll, a cam follower longitudinally movably mounted on said guide rods and extending into engagement with said cam, means including a compression coil spring on each of said guide rods between said follower and said one end of the friction roll for resiliently biasing said follower toward said mounting plate, and a time-delay means secured to said cam follower for providing a desired time delay for movement of said follower along said cam longitudinal portion under pressure of said resilient coil spring biasing means.

3. A metering and time-delay mechanism for a towel dispenser including a mounting rod and a friction roll mounted on said rod, means including a cam mounted on said rod within said friction roll, a cam follower, means for supporting said follower within said friction roll in engagement with said cam for metering rotation of said friction roll to a predetermined amount at any one rotation thereof by movement of said follower along said cam from an initial roll-rotatable position to a stop position, and means for providing a desired time delay for return movement of said follower from the stop position to the initial roll-rotatable position of said follower.

4. A metering and time-delay mechanism for a towel dispenser friction roll including a mounting rod and a friction roll mounted on said mounting rod, means including a cam non-rotatably mounted on said mounting rod within said friction roll and having a spiral portion with a longitudinally extending portion connecting together the ends of said spiral portion, means including a cam follower mounted within said friction roll for rotation therewith and extending into engagement with said cam for metering rotation of said friction roll to a predetermined amount at any one time by movement of said follower along said cam on rotation of said friction roll from an initial roll-rotatable position to a roll-stop position, means for pro-

viding a desired time delay for return movement of said follower along said cam longitudinal portion from the roll-stop position to the initial roll-rotatable position, and means for resiliently biasing said cam follower toward said initial roll-rotatable position.

5. A metering and time-delay mechanism for a towel dispenser including a mounting rod, a cylindrical friction roll formed with substantially closed ends and mounted on said rod, stop means mounted within and enclosed by said friction roll and interposed between and connected to said friction roll and said mounting rod operable from a non-stop to a stop position by rotation of said friction roll relative to said mounting rod for limiting rotation of said friction roll to a predetermined amount at any one rotation thereof and including means for biasing said stop means to a non-stop position, and time-delay means within said friction roll connected to said stop means for providing a desired time delay for the return of said stop means from a stop to a non-stop position.

6. A metering and time-delay mechanism for a towel dispenser including a friction roll with substantially closed ends, mounting means for said friction roll, metering stop means mounted within and enclosed by said friction roll and interposed between and connected to said friction roll and said mounting means operable from a non-stop to a stop position by rotation of said friction roll relative to said mounting means for limiting rotation of said friction roll to a predetermined amount at any one rotation thereof, means for biasing said stop means to a non-stop position, and a time-delay device connected to said stop means and arranged within said friction roll for providing a desired time delay for the return of said stop means from a stop to a non-stop position.

7. A sheet-material dispensing mechanism including a friction roll formed with substantially closed ends, means including a container for rotatably mounting said friction roll therein and arranged for passage of clean sheet material in good frictional contact with a part of said friction roll on withdrawal of clean sheet material from said container, a sheet-material metering mechanism mounted within and enclosed by said friction roll and interposed between and connected to said friction roll and said mounting means for limiting rotation of said friction roll to a predetermined amount at any one rotation thereof on withdrawal of sheet material from said container, and a time-delay device within said friction roll for providing a predetermined time delay between successive rotations of said friction roll.

8. A towel dispensing mechanism including a towel cabinet adapted to contain a clean towel-supply roll, a towel roll, a towel-length regulating mechanism including a cylindrical friction roll formed with substantially closed ends arranged in said cabinet for passage of clean towel in good frictional contact with a part of said friction roll for rotation of said friction roll on withdrawal of towel from said cabinet, means including said cabinet for rotatably mounting said friction roll, means for rotatably mounting said rewind roll in said cabinet for passage of towel around said rewind roll in good frictional contact with a part of said friction roll to provide for thereby turning said rewind roll by said friction roll, and a metering mechanism mounted within and enclosed by said friction roll and interposed

between and connected to said friction roll and said friction roll mounting means for limiting rotation of said friction roll to a predetermined amount at any one rotation thereof thereby limiting the length of clean towel obtainable from said cabinet and rewinding a length of towel on said rewind roll substantially equal to the length of towel drawn from said cabinet as measured by the predetermined rotation of said friction roll.

9. A sheet-material dispensing mechanism including a cabinet adapted to contain a clean sheet-material supply roll, a rewind roll, a regulating mechanism including a cylindrical friction roll formed with substantially closed ends arranged in said cabinet for passage of sheet material from a supply roll around a part of said friction roll in good frictional contact therewith for rotating said friction roll on withdrawal of sheet material from said cabinet, means including said cabinet for rotatably mounting said friction roll, means for rotatably and upwardly slidably mounting said rewind roll for passage of sheet material around said rewind roll in contact with a part of said friction roll to provide for turning said rewind roll, and means arranged within and enclosed by said friction roll interposed between and connected to said friction roll and said friction roll mounting means for limiting rotation of said friction roll to a predetermined amount at any one rotation thereof for limiting to a predetermined length the sheet material withdrawn at any one time and for rewinding a length of sheet material on said rewind roll equal in length to that withdrawn from said cabinet, said rotation limiting means including a means for latching said friction roll for a predetermined time between successive rotations thereof.

10. A towel dispensing mechanism including a cabinet having a supply slot for passage of towel from said cabinet and a return slot for passage of towel into said cabinet and adapted to contain a clean towel-supply roll, a towel-rewind roll, a cylindrical friction roll formed with substantially closed ends arranged in said cabinet for passage of clean towel in good frictional contact with a part thereof for rotating said friction roll on withdrawal of towel from said cabinet, means for rotatably mounting said friction roll in the cabinet, means for rotatably supporting said rewind roll in said cabinet for passage of towel from said return slot around said rewind roll in good frictional contact with a part of said friction roll to provide for turning said rewind roll and rewinding a length of towel thereon substantially equal to the length of towel drawn from the cabinet through said supply slot, and a metering mechanism mounted within and enclosed by said friction roll and interposed between and connected to said friction roll and said mounting means therefor for limiting the rotation of said friction roll to a predetermined amount at any one rotation thereof thereby limiting the length of clean towel obtainable at any one time from said cabinet to a predetermined amount as measured by a predetermined rotation of said friction roll and rewinding substantially an equal length of towel on said rewind roll.

11. In a towel cabinet adapted to contain a clean towel-supply roll, a towel-rewind roll, a mechanism including a cylindrical friction roll formed with substantially closed ends, means for rotatably supporting said friction roll for passage of clean towel in good frictional contact with a part of said friction roll for rotating said friction

roll, means for rotatably supporting said rewind roll in the cabinet for passage of towel around said rewind roll in good frictional contact with a part of said friction roll to provide for rotating said rewind roll by said friction roll and for thereby rewinding a length of towel on said rewind roll substantially equal to the length of towel drawn from the cabinet, and a metering and time-delay mechanism mounted within and enclosed by said friction roll interposed between and connected to said friction roll and said mounting means therefor for rotation of said friction roll a predetermined amount at any one rotation thereof thereby limiting the length of clean towel obtainable at any one time from the cabinet as measured by a predetermined rotation of said friction roll and rewinding substantially an equal length of towel on said rewind roll, said metering and time-delay mechanism including means for latching said friction roll against rotation for a predetermined time between successive rotations thereof.

12. A towel dispensing mechanism including a cabinet, a cylindrical friction roll formed with closed ends, means for rotatably supporting said friction roll in said cabinet for passage of towel from a supply into contact with a part of said friction roll for rotating said friction roll on withdrawal of towel from said cabinet, said means including a mounting rod nonrotatably supported in said cabinet, a towel dispensing metering mechanism mounted within and enclosed by said friction roll including a cam rigidly and concentrically mounted on said mounting rod and having a spiral portion of substantially one complete turn with a longitudinally extending portion connecting together the ends of said spiral portion, a cam follower connected to and nonrotatably and longitudinally movably mounted relative to and within said friction roll arranged in engagement with said cam for limiting rotation of said friction roll at any one time to meter the length of towel withdrawn from said cabinet as measured by travel of said cam follower along said spiral cam portion, said mechanism including means for providing a desired time delay for return movement of said follower along said cam longitudinal portion, and means for resiliently biasing said cam follower against the action of said time-delay means during return movement thereof.

13. In a towel cabinet adapted to contain a clean towel-supply roll, a towel-rewind roll, a towel-dispensing mechanism including a cylindrical friction roll formed with substantially closed ends, means for rotatably supporting said rewind roll in the cabinet in contact with a part of said friction roll for passage of towel around said rewind roll in frictional contact with said friction roll to provide for rotating said rewind roll, means including a mounting rod for rotatably supporting said friction roll in the cabinet, a metering and time-delay mechanism within and enclosed by said friction roll for limiting rotation of said friction roll to a predetermined amount at any one rotation thereof for limiting the length of clean towel obtainable at any one time from the cabinet and for controlling the rewinding of a length of towel on said rewind roll substantially equal to the length of towel drawn from the cabinet, said mechanism including a cam rigidly mounted on said mounting rod and having a spiral portion of substantially one complete turn with a longitudinally extending portion connecting the ends of said spiral portion,

said metering mechanism including a cam follower connected to and nonrotatably and longitudinally movably mounted relative to and within said friction roll arranged in engagement with said cam, means for providing a desired time delay for return movement of said follower along said cam longitudinal portion, means enclosed in said friction roll for resiliently biasing said cam follower against the action of said time-delay means during return movement thereof, and means including a pair of rolls mounted one on each side of said friction roll arranged for passage of towel from the towel supply over one of said pair of rolls around a part of said friction roll and over the other of said pair of rolls for assuring good contact of the towel with said friction roll.

14. In a towel cabinet having a supply slot and a return slot for passage of a towel out of and into the cabinet and adapted to contain a clean towel-supply roll, a towel-rewind roll, a towel-dispensing mechanism including a cylindrical friction roll formed with substantially closed ends, means for rotatably and upwardly slidably supporting said rewind roll in said cabinet in contact with said friction roll for passage of towel from the return slot around said rewind roll in contact with said friction roll to provide for rotating said rewind roll, means including a mounting rod for rotatably and eccentrically supporting said friction roll and being upwardly slidably and nonrotatably mounted in said cabinet, a metering and time-delay mechanism mounted within and enclosed by said friction roll including a cam rigidly and concentrically mounted on said mounting rod and having a spiral portion of one substantially complete turn with a longitudinally extending portion connecting the ends of said spiral portion, said mechanism including a cam follower connected to and nonrotatably movably mounted relative to and within said friction roll arranged in engagement with said cam for thereby controlling rewinding a length of towel on said rewind roll substantially equal to the length of towel drawn from the cabinet through the supply slot measured by a turn of said friction roll as metered by said follower in traveling from one end to the other of said cam spiral portion, means for providing a desired time delay for return movement of said follower along said cam longitudinal portion, and means enclosed by said friction roll for resiliently biasing said cam follower against the action of said time-delay means during return movement thereof.

15. In a towel cabinet having a supply slot and a return slot for passage of towel into the cabinet and adapted to contain a clean towel-supply roll, a towel-rewind roll, a towel-dispensing mechanism including a cylindrical friction roll formed with substantially closed ends, means including a pair of rolls mounted one on each side of said friction roll arranged for passage of towel from a towel-supply roll over one of said pair of rolls around a part of said friction roll and over the second of said pair of rolls, means for rotatably and upwardly slidably supporting said rewind roll in the cabinet in contact with said friction roll for passage of towel from the return slot around said rewind roll in contact with said friction roll to provide for rotating said rewind roll, means including a mounting rod for rotatably supporting said friction roll and being upwardly slidably and nonrotatably mounted in the cabinet, a metering and time-delay mechanism

mounted within and enclosed by said friction roll including a cam rigidly mounted on said mounting rod and having a spiral portion of one substantially complete turn with a longitudinally extending portion connecting the ends of said spiral portion, a cam follower connected to and nonrotatably and longitudinally movably mounted within and relative to said friction roll arranged in engagement with said cam thereby controlling rewinding of a length of towel on said rewind roll substantially equal to the length of towel drawn from the cabinet through the supply slot measured by a turn of said friction roll as metered by said follower in traveling from one end of said cam spiral portion to the other end thereof, means for providing a desired time delay for return movement of said follower along said cam longitudinal portion, and means enclosed by said friction roll for resiliently biasing said cam follower against the action of said time-delay means during return movement thereof.

16. In a towel cabinet adapted to contain a clean towel-supply roll, a towel-rewind roll, a towel-dispensing mechanism including a cylindrical friction roll with end closures, means including a pair of towel-tensioning rolls mounted one on each side of said friction roll arranged for passage of towel from the towel-supply roll over one of said tensioning rolls around the underside of said friction roll and over the second of said tensioning rolls, means including a mounting rod for rotatably supporting said friction roll in the cabinet and being upwardly slidably and nonrotatably supported in the cabinet, a metering and time-delay mechanism mounted within and enclosed by said friction roll for limiting rotation of said friction roll to a predetermined amount at any one rotation thereof, thereby limiting the length of clean towel obtainable at any one time from the cabinet to a predetermined amount, said metering and time-delay mechanism including a cam rigidly mounted on said mounting rod and having a spiral portion with a longitudinally extending portion connecting the ends of said spiral portion, a mounting plate rigidly secured in said friction roll, a pair of guide rods extending within said friction roll between said mounting plate and one of said end closures of said friction roll, a cam follower longitudinally movably mounted on said guide rods and extending into engagement with said cam, means for resiliently biasing said follower toward said mounting plate, and means for providing a desired time delay for movement of said follower along said cam longitudinal portion under pressure of said resilient biasing means.

17. In a towel cabinet having a supply slot and a return slot for return passage of towel into the cabinet and adapted to contain a clean towel-supply roll, a towel-rewind roll, a guide extending downwardly from the top of the cabinet for a predetermined length on each side of the cabinet, a towel-dispensing mechanism including a cylindrical friction roll formed with end closures, means including a pair of towel-tensioning rolls pivotally mounted angularly relative to said friction roll one on each side thereof arranged for passage of towel from the towel-supply roll over one of said tensioning rolls around the underside of said friction roll and over the second of said tensioning rolls, means including a mounting rod extending into said guides for rotatably supporting said friction roll in the cabinet and having a guide key at one end slidably arranged in one of said guides for preventing rotation of said

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mounting rod, a metering and time-delay mechanism arranged within and enclosed by said friction roll for limiting rotation of said friction roll to a predetermined amount at any one rotation thereof thereby limiting the length of clean towel obtainable at any one time from the cabinet, said metering and time-delay mechanism including a cam rigidly mounted on said mounting rod and a spiral portion with a longitudinally extending portion connecting the ends of said spiral portion, a mounting plate rigidly secured in said friction roll, a pair of guide rods extending within said friction roll between said mounting plate and one of said end closures of said friction roll, a cam follower longitudinally slidably mounted on said guide rods and extending into engagement with said cam, means including a compression coil spring on each of said guide rods between said follower and said one end closure of said friction roll for resiliently biasing said follower toward said mounting plate, and means including a dashpot having a plunger therein secured to said cam follower for providing a desired time delay for movement of said follower along said cam longitudinal portion under pressure of said coil spring biasing means.

13. In a towel cabinet having a supply slot and a return slot for passage of towel from and into the cabinet and adapted to contain a clean towel-supply roll, a towel-rewind roll, a guide extending downwardly from substantially the top of the cabinet for a predetermined length on each side of the cabinet, a towel-dispensing mechanism including a cylindrical friction roll with end closures, means including a pair of towel-tensioning rolls pivotally mounted angularly relative to said friction roll one on each side thereof arranged for passage of towel from the towel-supply roll over one of said tensioning rolls around the underside of said friction roll and over the second of said tensioning rolls, means including a mounting rod supported in said guides for rotatably

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ably supporting said friction roll in the cabinet and having a guide key at one end slidably arranged in one of said guides for preventing rotation of said mounting rod, means including a mounting rod for rotatably supporting said rewind roll in said guides in upwardly slidable relation above said friction roll, a metering and time-delay mechanism mounted within and enclosed by said friction roll for limiting rotation of said friction roll to a predetermined amount at any one rotation thereof thereby limiting the length of clean towel obtainable at any one time from the cabinet, said metering and time-delay mechanism including a cam rigidly mounted within said friction roll on said mounting rod and having a spiral portion of substantially one complete turn with a longitudinally extending portion connecting the ends of said spiral portion, a mounting plate rigidly secured in said friction roll, a pair of guide rods extending within said friction roll between said mounting plate and one of said end closures of said friction roll, a cam follower longitudinally slidably mounted on said guide rods and extending into engagement with said cam, means including a compression coil spring on each of said guide rods between said follower and said one end closure of said friction roll for resiliently biasing said follower toward said mounting plate, and means including a dashpot having a plunger secured to said cam follower for providing a desired time delay for movement of said follower along said cam longitudinal portion under pressure of said coil spring biasing means.

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