March 31, 1964 A. BABIN 3,127,121

ROLL PAPER TOWEL DISPENSER

Filed Oct. 12, 1959 3 Sheets-Sheet 1

Fig. 1.

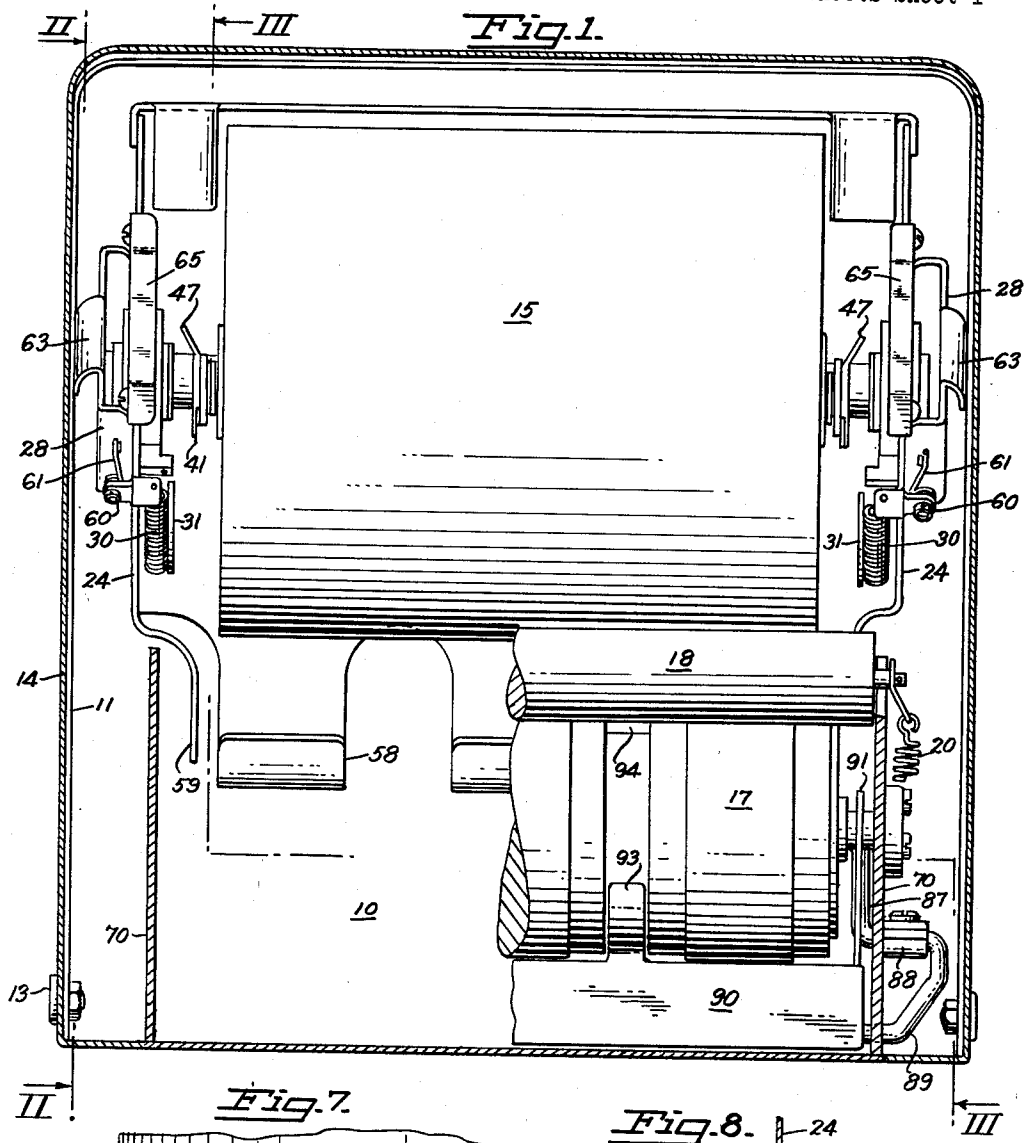


Fig. 7.

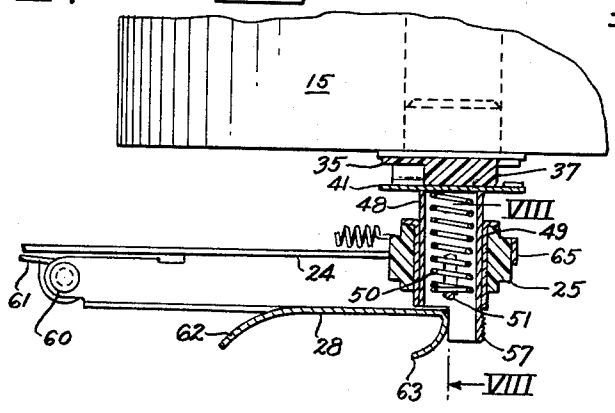
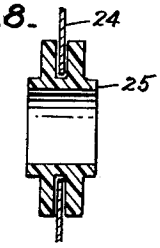


Fig. 8.



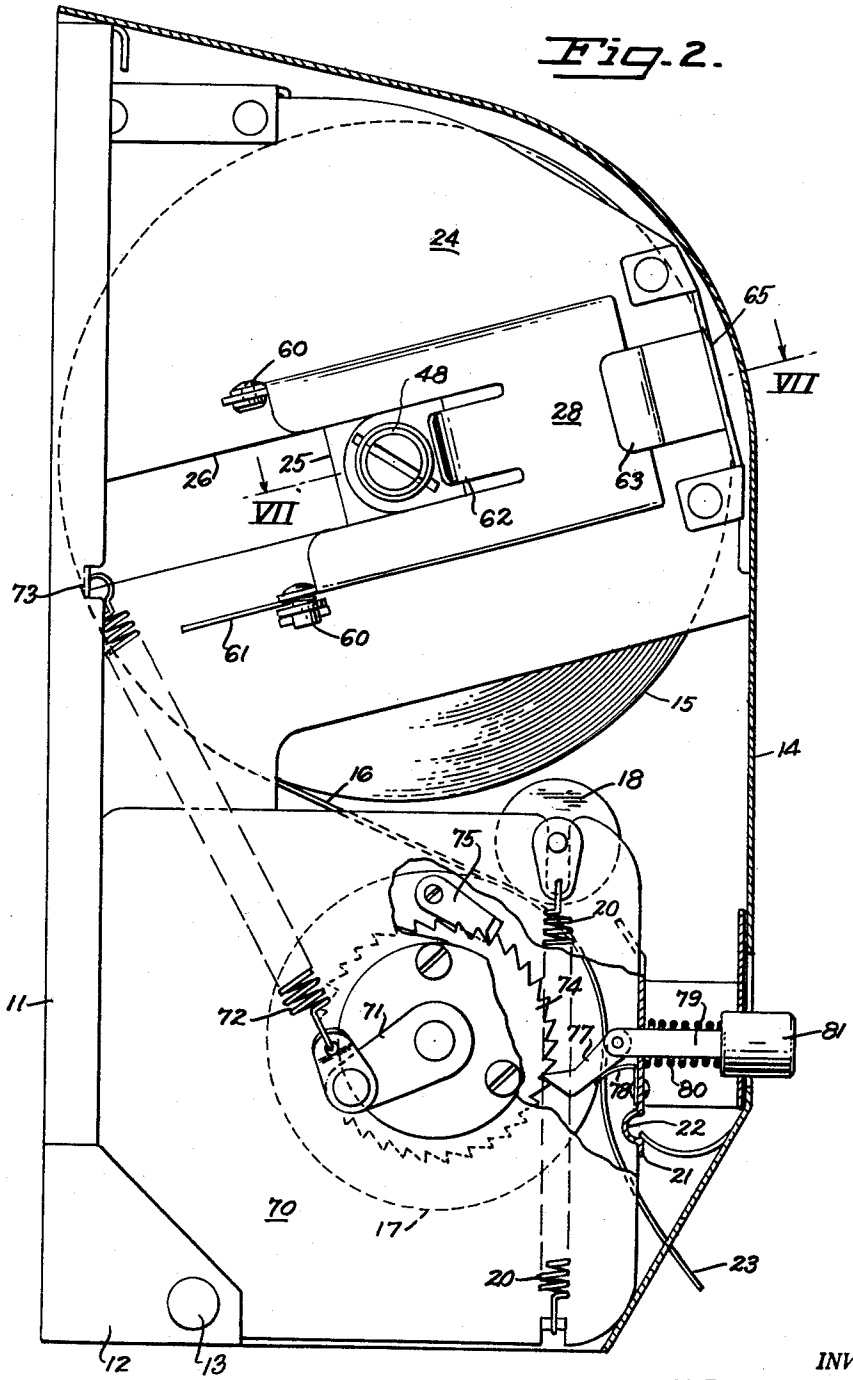
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ROLL PAPER TOWEL DISPENSER

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Fig. 2.



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ROLL PAPER TOWEL DISPENSER

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Fig. 3.

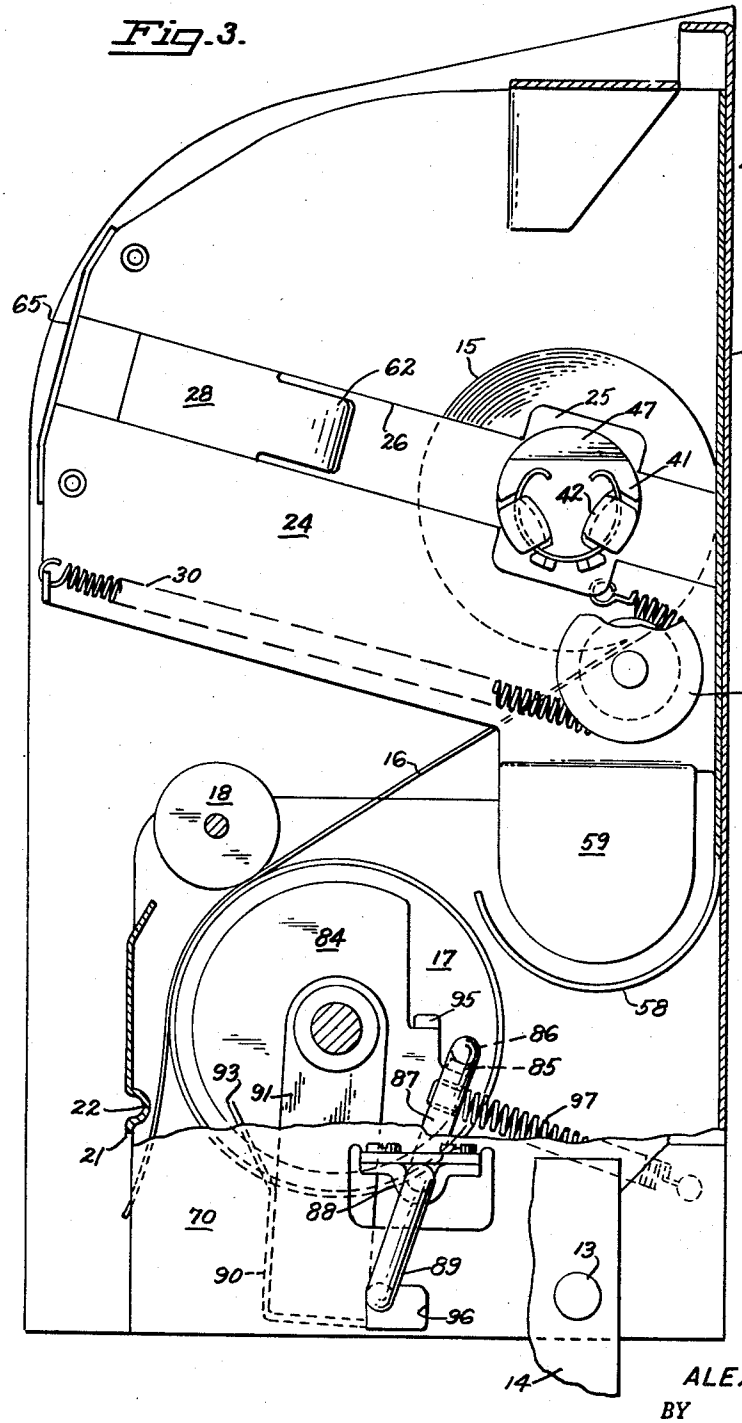


Fig. 4.

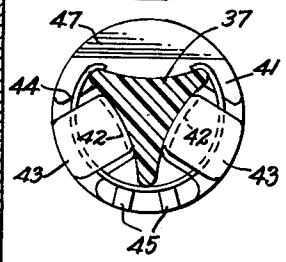


Fig. 5.

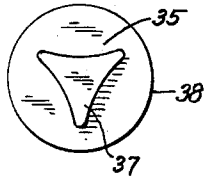
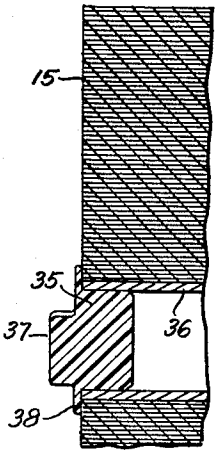


Fig. 6.



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3,127,121

ROLL PAPER TOWEL DISPENSER

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Filed Oct. 12, 1959, Ser. No. 845,870
13 Claims. (Cl. 242—55.53)

This invention relates to dispensers for paper toweling or other paper or paper-like material of the type contained on a roll as a continuous web and withdrawn from the roll and torn therefrom in lengths suitable for use and more particularly to the type of dispenser in which withdrawal of a given length of toweling or paper loads a spring motor to supply energy for subsequently ejecting a short end portion of the web to a position where it may be grasped for withdrawing another measured length.

It is an object of the present invention to provide a towel dispenser in which a roll of toweling can be easily inserted and securely held for rotation by means capable of movement to a readily accessible position for replacing a roll from which the toweling is exhausted.

Another object is to provide means to facilitate threading of the web of toweling between feed rolls of the dispenser including means to employ the energy of a spring motor normally used for ejecting the leading edge of the web.

Another object of the invention is to provide a coupling device for securely supporting a roll of toweling from both ends while permitting it to rotate and including means to quickly release a spent or partially spent roll, means to insure proper positioning of parts of the coupling device in a dispenser for reception of other parts thereof carried by the roll itself and said means also serving to insure proper quality of the sheet material replaced in the cabinet.

Another object is to provide a dispenser in which a stub roll or partially used roll of paper may be retained in a position for use while a new roll is inserted whereby toweling from both rolls will be fed in the normal operation of the dispenser until that on the stub roll is completely used to thereby prevent the usual waste occasioned by discarding stub rolls.

Another object is to provide improved means for braking the rotation of the roll of toweling in a dispenser to prevent it from overspooling or turning under the influence of inertia after dispensing.

A further object is to provide stop means to limit the length of toweling which may be withdrawn from a dispenser for each dispensing operation and capable of being released prior to the next dispensing operation together with means to prevent sustained actuation of the release such as would enable a continuous or uninterrupted withdrawal of toweling.

It is also an object of the invention to provide a dispenser having a spring motor energized by withdrawal of each length of toweling to provide force for ejection of the leading edge of the next length and with means operable manually from the exterior of the dispenser to energize the spring motor and eject the leading edge under certain conditions when it becomes necessary to do so.

Still further and more specific objects and advantages of the invention reside in the construction and arrangement of its several components and will become apparent upon reading the following specification wherein the invention is described in detail by reference to the accompanying drawings.

In the drawings:

FIG. 1 is a view in front elevation with parts broken away of the operating mechanism of a towel dispenser embodying the present invention and with the front portion of a hinged cabinet which encloses it removed showing the side and top walls thereof in section;

FIG. 2 is a sectional view taken on the line II—II of FIG. 1 to illustrate the operating mechanism of the dispenser in side elevation;

FIG. 3 is a sectional view taken on the line III—III of FIG. 1;

FIG. 4 is an enlarged detail of a paper supporting coupling shown in FIG. 3 illustrating in section, a part of the coupling which is carried in the core of the paper roll;

FIG. 5 is a view in elevation of the coupling part which is carried by the roll;

FIG. 6 is a fragmentary view of one end of a roll of paper toweling showing the position of one of the coupling parts in the core thereof;

FIG. 7 is a sectional view taken on the line VII—VII of FIG. 2 but with the paper supporting coupling part in a different position; and

FIG. 8 is a sectional view taken on the line VIII—VIII of FIG. 7.

The dispenser of the present invention is enclosed by a cabinet which, as illustrated in FIGS. 1, 2 and 3, has a back plate **10** adapted to be secured against a wall in any suitable manner and having edge flanges **11** extending forwardly with brackets **12** adjacent their lower ends for the support of hinge pins **13** for a cover **14** which forms an enclosure for the front, top and sides of the dispensing mechanism and may be swung downwardly to an inverted position. A small portion of the cover in its open or inverted position is illustrated in the lower right corner of FIG. 3. A roll of toweling **15**, illustrated as a new or full size roll in FIG. 1 and in broken lines as a partially used roll in FIG. 3, is supported for rotation in the upper portion of the cabinet and its free end illustrated at **16** passes downwardly and forwardly between a feed roller **17** and a pressure roller **18**, the latter being guided in slots as shown for vertical movement and urged downwardly as by springs **20**. The function of the pressure roller **18** is to provide sufficient friction between the paper and the feed roller **17** to feed or withdraw paper from the roll of toweling **15** when the feed roller is rotated. The surface of the feed roller may be provided with spaced bands of rubber-like material as is conventional practice to augment the frictional effect in feeding the toweling. Disposed forwardly of the feed roller and adjacent the lower edge of the cabinet is an opening, the upper edge of which is serrated to form a tearing edge **21**. The metal plate of which the tear edge is formed is provided with an inwardly projecting bulge at **22** which serves to prevent engagement of the toweling with the tear edge when it is pulled downwardly.

In operation a spring motor presently to be described is employed to actuate the feed roller a distance sufficient to project the leading edge of the toweling beyond the tear edge **21**, as indicated at **23** in FIG. 2, so that the leading edge may be grasped to withdraw a suitable length of toweling which is then separated from the web by tearing against the edge **21**. The roll of toweling is supported for rotation between side plates **24** of a towel supporting structure in the upper portion of the cabinet and between a pair of carriage blocks **25** adapted to slide in inclined slots **26** formed in the side plates. The cross-sectional configuration of the carriage blocks **25** is illustrated in FIG. 8 where the block is shown as grooved to embrace the edges of the slots **26** which serve as guide tracks as the blocks move forwardly and rearwardly of the cabinet. The carriage blocks may be made of any tough plastic material which slides freely and with little friction on the metal edges of the slot.

When a new roll of toweling is inserted in the cabinet, the cover having been swung to its open position, the carriage blocks are first pulled forwardly and upwardly in

the slots 26 until they occupy the position illustrated in FIG. 7 which later will be described in detail. They are held in this position by latch plates 28 until the roll is properly positioned and then released to slide inwardly of the cabinet to the position illustrated in FIG. 2 under the influence of springs 30 (see FIG. 3) anchored at one end to the forward edges of the supporting plates 24 and at their opposite ends to the carriage blocks 25 after passing over guide rollers 31. The springs 30 constantly urge the roll inwardly of the cabinet and into frictional contact with the back wall thereof, even as the size of the roll decreases as illustrated in FIG. 3, to provide a braking action to prevent over-spooling of the roll and consequent wrinkling of the toweling within the cabinet as it is being withdrawn.

The invention provides means to securely support the towel roll for rotation and to permit it to be easily inserted as well as easily removed to a position within the cabinet where it may be used even after a new roll is inserted and threaded between the feed and pressure rollers. To this end each of the carriage blocks 25 carries a chuck portion of a roll supporting coupling designed to engage a generally triangularly shaped projection formed on a complementary coupling portion which is inserted in each end of the roll of toweling as shown in FIGS. 5 and 6. The coupling portion shown at 35 fits snugly into the hollow or tubular pasteboard core 36 upon which the toweling is wound and has a generally triangular outwardly extending projection 37. A radially projecting flange or plate member 38 limits the distance to which the plug 35 may be inserted. There is such a coupling part for each end of the roll and the equi-lateral triangular projections thereon are oriented so that the triangles occupy the same positions at opposite ends of the roll. These coupling parts may be of metal or other material which can be pressed into the ends of the core of the roll or preferably may be molded of inexpensive plastic material adhesively secured in the core and discarded therewith when the roll is spent. The chuck portions of the coupling, which are best shown in FIGS. 3, 4 and 7, comprise disc-like members 41 with shoulders 42 bent forwardly from the material of which they are made to cradle the sides of the triangular extensions 37. The metal of which the shoulders 42 are formed is bent again to a plane parallel with the surface of the disc 41 to form retaining plates 43 for a C-shaped spring 44. The closed side of the spring rests against lugs 45 on the face of the disc. The ends of the spring 44 are curved slightly to embrace two points of the triangular projection on the roll while the two sides of the projection are supported by the shoulders 42. The roll may, therefore, be dropped or pressed into place between the two chucks with one apex of the triangle projections directed downwardly and the two adjacent sides acting as cams to spread the ends of the C-shaped spring. The projections 37 may be of true triangular shape but are preferably formed as shown with concave sides and rounded points so that they slip easily into place in the chucks and are securely held in dogged relationship with the parts in the relative positions illustrated in FIG. 4. The edge of the disc 41 adjacent the open side of the spring 44 is preferably bent outwardly or away from the roll as indicated at 47 and best illustrated in FIG. 1 to facilitate entry of the coupling parts carried by the roll. The discs 41 are carried on tubular members 48 (FIG. 7), each of which is slidably supported in a bearing bushing 49 rotatably mounted in a suitable bearing bore which extends through the carriage block 25. As shown in FIG. 7, a spring 50 is held under compression between the disc 41 and a pin 51 which projects through the bearing bushing 49 to urge the chucks resiliently inwardly or toward their roll supporting position. The pin 51 extends through a slot in the tubular member 48 to permit retraction of said member outwardly away from the roll when it is desired to release the roll. When the toweling on a roll is nearly depleted and a new roll is to be inserted in the cabinet, the cover is swung to its open position and an attendant grasps the outer ends of the tubular members 48, which are knurled or serrated as illustrated at 57, and pulls them outwardly against the force of the springs 50. The stub roll then falls into a cradle formed by curved extensions 58, see FIGS. 1 and 3, bent forwardly from the back plate of the towel supporting mechanism. End plates 59 extend downwardly from the side plates 24 to center the stub roll, the free end of which still extends between the feed roller and the pressure roller so that the toweling remaining on the stub roll is dispensed together with the toweling from the new roll to be inserted.

After the stub roll has been dropped from between the chuck portions of the couplings, the chucks on the carriage blocks 25 are drawn forwardly in the slots 26 and latched in the forward position illustrated in FIG. 7 by the latch plates 28. These plates are pivoted to the side walls 24 as by pins 60 as shown in FIG. 1 and a torsion spring 61 urges their free ends inwardly. Each latch plate includes a cam surface 62 against which the outer end of the tube 57 engages to swing the plate outwardly. The outer or latching edge of each plate is bent outwardly and rearwardly as shown in FIGS. 2 and 7 at 63 to afford means for grasping the plates to swing them outwardly. When the carriage blocks and chucks are drawn forwardly, the chucks are automatically oriented with the open side of the C-shaped spring 44 disposed upwardly as shown in FIG. 4 by providing a cut-away portion in the end of the tubular members 48 leaving a semicircular configuration at the end which will fit between the latching end of the latch plate and a stop bar 65, against which the carriage block engages, only when the tubular member 48 is rotated to a position with the open side of the spring 44 disposed upwardly for convenient reception of the triangular projections 37. With the chucks in this forwardly disposed convenient position, a new roll is dropped into them and automatically locked in place by the springs 44. After the coupling parts are so engaged, the latch plates are spread apart by grasping the projection 63 and the couplings and roll of toweling supported by them slide inwardly of the cabinet until the back of the roll engages the back wall.

With the roll in place, the free end of toweling is tucked loosely into the nip between the feed roller 17 and pressure roller 18 and the feed roller is rotated by operation of the spring motor, presently to be described in detail, a sufficient distance to start the end of the toweling between the rollers, together with the toweling from the stub roll which may already be disposed between them.

The dispensing mechanism is disposed between side plates 70 of a supporting frame which is preferably removably secured within the cabinet for convenience in inspection or repair of the feed mechanism when necessary. The feed roller and pressure roller are both journaled between these side plates, as shown, and at one end the trunnion of the feed roller carries a crank 71 and a spring motor 72 is connected between the crank and an anchor 73 adjacent the rear of the cabinet. A ratchet disc 74 is secured to the end of the feed roller adjacent the crank 71, as shown in FIG. 2, and a pivoted pawl 75 engages the ratchet to prevent reverse or counterclockwise rotation of the feed roller. When a length of toweling is withdrawn from the cabinet, rotation of the feed roller and crank 71, which then moves in a clockwise direction as viewed in FIG. 2, energizes the spring motor. Stop means, presently to be described, limits the length of toweling withdrawn and stops the roller with the crank in the position shown where the spring motor is energized to advance the feed roller and project the free end of the toweling outwardly beyond the tear edge as illustrated at 23. This is accomplished by release of the stop means but there may be occasions when the end of the toweling cannot be projected in this manner, such

for example as when a user withdraws a very short piece of toweling and tears it off so that the spring motor is not energized or cocked to perform its intended function. To correct such a condition, a second pawl 77 engages the ratchet disc 74 and is held in such engagement as by a leaf spring 78. This pawl is pivoted to the end of a plunger 79 urged outwardly by a spring 80 and terminating in a button 81 which projects through the cover at the front of the cabinet. Depression of the button 81 therefore serves to advance the feed roller in steps as the pawl 77 engages successive teeth on the ratchet until the end of the toweling is exposed and may be withdrawn to complete the energization and cocking of the spring motor.

The stop mechanism and release therefor are best shown in FIGS. 1 and 3 wherein the opposite end of the feed roller 17 is shown as carrying a plate 84 which is cut away on one side and has a stop lug 85 projecting outwardly therefrom for engagement with the inwardly projecting end 86 of a stop lever 87 which is pivotally supported in a bearing 88 and has a downwardly and inwardly extending tail 89. A release plate 90 is pivotally supported on arms 91, the upper ends of which embrace the trunnions of the feed roller while the lower rear edge of one engages the depending tail 89 of the stop lever. The release plate 90 also has upwardly projecting fingers 93 which enter grooves 94 in the feed roller and thereby prevent the toweling from adhering to the roller instead of feeding outwardly through the front of the cabinet as intended.

When a user approaches the cabinet to withdraw a towel, the parts are normally in the positions illustrated in FIGS. 2 and 3 and the user touches the release bar 90 to swing the stop lever counterclockwise as viewed in FIG. 3 until its upper end clears the lug 85 and the spring motor 72 rotates the feed roller a short distance to project the end of the toweling where it may be grasped and withdrawn. A withdrawn length of towel is measured by the diameter of the feed roller so that upon reengagement of the lug 85 with the stop lever the motion is arrested and the spring motor has been energized and cocked. The withdrawn length of toweling may be torn off against the tear edge 21 and the dispenser is again ready for use.

To discourage vandalism or any undesirable withdrawing from the dispenser of long lengths of toweling, an auxiliary stop lug shown at 95 in FIG. 3 is provided slightly above and inwardly of the stop lug 85. In the event a person attempts to hold the release bar 90 inwardly with one hand and withdraw toweling continuously with the other hand, the auxiliary stop lug will engage the end 86 of the stop lever 89 in slightly less than a full turn of the feed roller so that continuous depression of the release bar 90 is ineffective to permit continuous withdrawal of toweling. The inwardly projecting tail end of the stop lever passes through an opening 96 in one of the walls 70, as shown in FIG. 3, and the edges of this opening limit its movement to both of its functioning positions. It is braced toward its normal position where it is engaged by the lug 85 by a spring 97.

I claim:

1. A coupling device for mounting a roll of paper toweling or the like on coupler mechanism mounted for rotation about an axis in a dispensing cabinet, comprising a member having a plug part insertable into a hollow portion in an end of the roll at the axis thereof and a radially projecting part for limiting the distance to which the plug can be inserted, at least a pair of opposed camming faces projecting outwardly from said member and angularly disposed with respect to each other to provide a wedge for effecting relative spreading apart of spaced apart spring means mounted on said coupler mechanism when said wedge is inserted between said spring means in a direction transverse to said axis, said camming faces terminating at the wide part of said wedge in abutments adapted to become dogged by said spring means after such insertion of said coupling device.

2. Mounting means for a supply roll of sheet material in a towel dispensing cabinet or the like, said cabinet including a coupler mechanism mounted for rotation about an axis and having spaced apart spring means thereon and a supporting cradle for said roll, a coupling device on said roll secured to an end portion thereof adjacent the axis of the roll, at least a pair of opposed camming faces on said coupling device projecting outwardly beyond said end of the roll and providing a wedge adapted to spread apart said spring means when said wedge is inserted downwardly between said spring means in a direction transverse to said axis of rotation, said camming faces terminating at the wide part of said wedge in abutments adapted to become dogged by said spring means after such insertion of said coupling device and support of said wedge on said cradle.

3. In a dispenser for paper toweling or the like contained on a supply roll, means for supporting the roll from at least one end thereof comprising a first coupling part rotatably mounted in the dispenser, a second coupling part carried by an end of the roll, said first coupling part having spring means with spaced ends, and said second coupling part having a generally triangular projection adapted upon assembly of the parts to spread the ends of the spring means and then to be embraced and dogged by them, and means slidably supporting the first coupling part for movement away from and along the axis of the roll to separate the coupling parts and release the roll.

4. In a dispenser for paper toweling or the like contained on a supply roll, means for supporting the roll from at least one end thereof comprising a first coupling part rotatably mounted in the dispenser, a pair of angularly related shoulders on said coupling part, a C-shaped spring embracing said shoulders and having spaced ends adjacent the diverging ends of the shoulders, a second coupling part carried by an end of the roll and having a projection with two angularly related sides adapted to enter between and rest upon said shoulders and to act as cams in so doing to spread the ends of said spring, said spring being shaped to engage the projection on the second coupling part and dog it in place between said shoulders.

5. In a dispenser for paper toweling or the like contained on a supply roll, means for supporting the roll from at least one end thereof comprising a first coupling part rotatably mounted in the dispenser, a pair of angularly related shoulders on said coupling part, a C-shaped spring embracing said shoulders and having spaced ends adjacent the diverging ends of the shoulders, a second coupling part carried by an end of the roll and having a projection with two angularly related sides adapted to enter between and rest upon said shoulders and to act as cams in so doing to spread the ends of said spring, said spring being shaped to engage the projection on the second coupling part and dog it in place between said shoulders, and means in said dispenser slidably supporting the first coupling part for movement along the axis of and away from the roll to separate the coupling parts and release the roll.

6. A coupling device for rotatably supporting a roll of sheet material to be dispensed which comprises a pair of spaced apart coupling parts each having resilient chuck means thereon for reception of a second pair of coupling parts secured to and projecting from the ends of said roll when it is moved into position between said first coupling parts in a direction normal to the axis of the roll, said chuck means embracing and dogging said second coupling parts normally to prevent removal of the roll, and means mounting said first coupling parts for slidable movement away from each other along the axis of the roll to enable release of a spent roll from between them.

7. Mounting means for a supply roll of sheet material in a towel dispensing cabinet or the like, said cabinet including a coupler mechanism mounted for rotation about an axis and having a supporting cradle for said roll, said

cradle comprising a pair of spaced support members, the coupler mechanism also having spaced spring thrust elements in cooperative relationship with said support members, a coupling device on said roll secured to an end portion thereof adjacent the axis of the roll and carrying at least a pair of angularly related opposed camming faces projecting outwardly beyond said roll end, said camming faces providing a wedge to spread apart said elements when the narrow part of the wedge is inserted downwardly between them in a direction transverse to said axis for supporting said wedge between and on said spaced support members, and said camming faces having abutments which become dogged by said elements after insertion of said coupling device and support of said wedge on said cradle whereby the wedge is non-rotatably mounted on said cradle.

8. The mounting means of claim 7 wherein said spring thrust elements are the ends of a C-shaped spring member embracing said support members.

9. The mounting means of claim 7 wherein said cabinet is provided with means for supporting said coupler mechanism for slidable movement along said axis.

10. The mounting means of claim 7 wherein said cabinet is provided with a carriage member slidably mounted in said cabinet for movement in a direction transverse to said axis, and said coupler mechanism is rotatably mounted in and also slidably supported by said carriage member for movement along said axis.

11. A supply roll of paper toweling or the like provided with a hollow core; and a coupling device secured in said core for supporting said roll on coupler mechanism rotatably mounted in a dispenser cabinet, comprising a member having a plug part inserted into said core at an end of said roll, a radially projecting part engaging an end of said roll, and at least a pair of angularly related camming faces projecting outwardly from said member and forming a wedge to spread apart a pair of spring thrust dogging elements on said coupler mechanism, said camming faces having abutments adapted to become dogged by said elements.

12. A coupling part for supporting a roll of paper toweling or the like in a dispenser, comprising a plug for insertion into the core of said roll and having a radially projecting part limiting the distance of such insertion and a portion projecting outwardly therefrom of generally equilateral triangular configuration with a center common to the axis of the roll, each apex of said projecting portion and the adjacent sides leading therefrom providing a camming wedge for spreading apart a pair of spring thrust dogging elements.

13. In a cabinet dispenser for paper toweling or the like contained in a supply roll; means for supporting the roll from at least one end thereof comprising coupler mechanism mounted in said cabinet for rotation about an axis and having a supporting cradle for said roll, said cradle comprising a pair of spaced apart support members, the coupler mechanism also having spaced apart spring thrust elements in cooperative relationship with said spaced apart support members; a coupling device having a plug part inserted into a hollow portion in an end of said roll, a radially projecting part engaging an end of said roll, and a portion projecting outwardly therefrom of generally equilateral triangular configuration with a center common to the axis of said roll; each apex of said outwardly projecting portion and the adjacent sides leading therefrom providing a camming wedge for spreading apart said spaced apart spring thrust elements, said outwardly projecting portion being supported on said spaced apart cradle members with a wedge between and on said spaced apart support members; and each pair of adjacent camming sides leading from an apex terminating in abutments which become dogged by said spaced apart spring thrust elements when such apex of said outwardly projecting portion is inserted downwardly therebetween.

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