

March 14, 1961

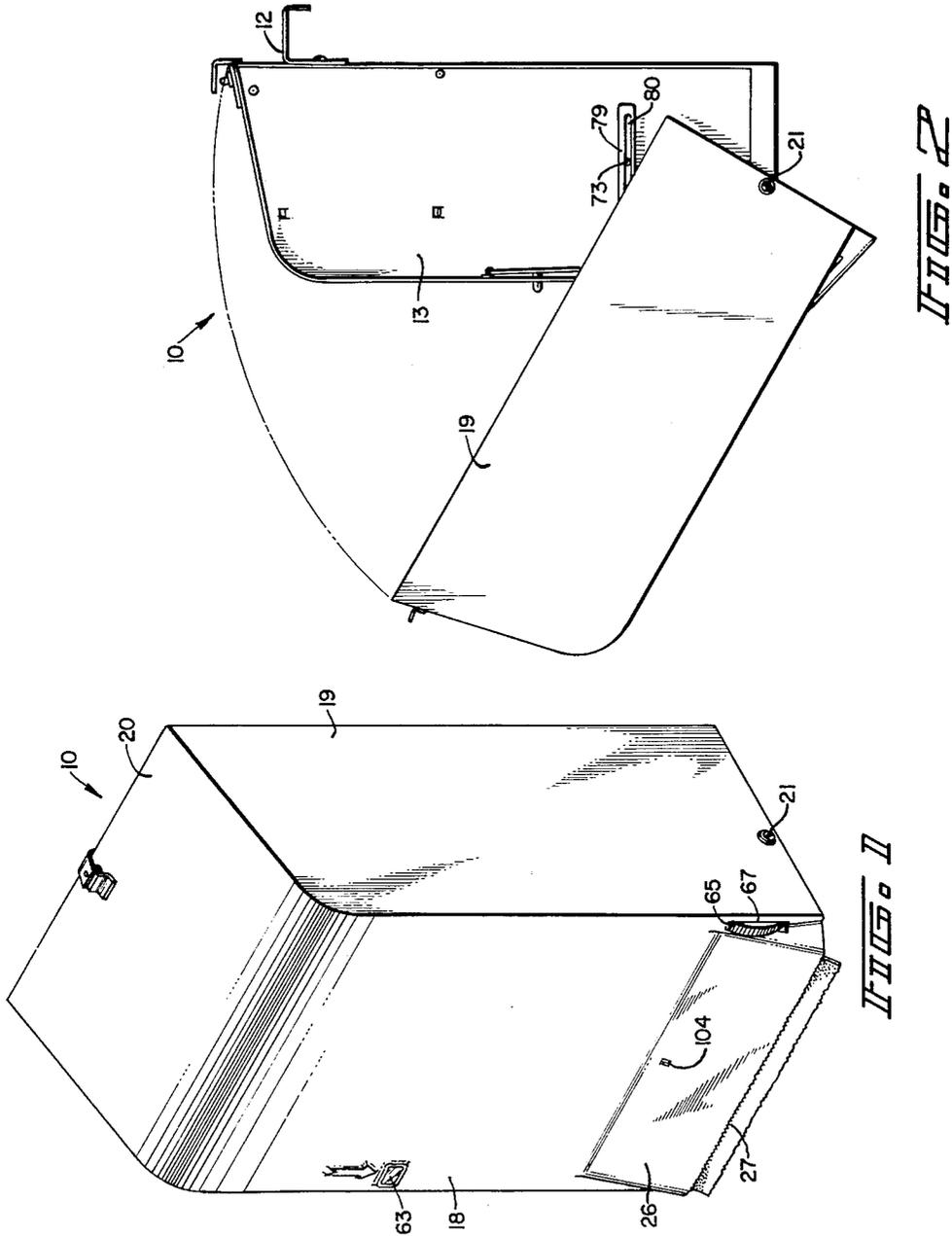
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2,974,839

DISPENSERS FOR PAPER TOWELING

Filed July 16, 1958

4 Sheets-Sheet 1



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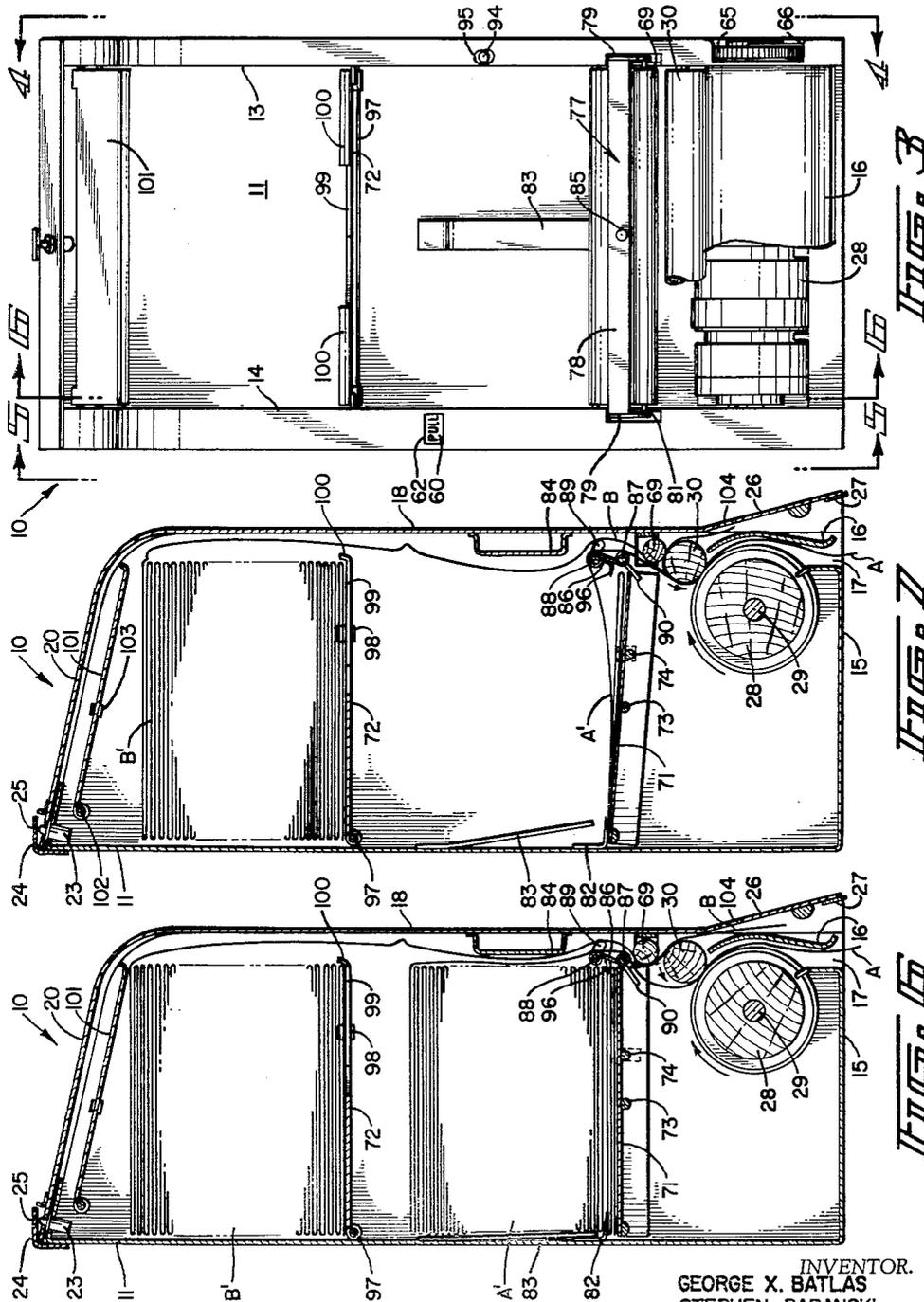
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DISPENSERS FOR PAPER TOWELING

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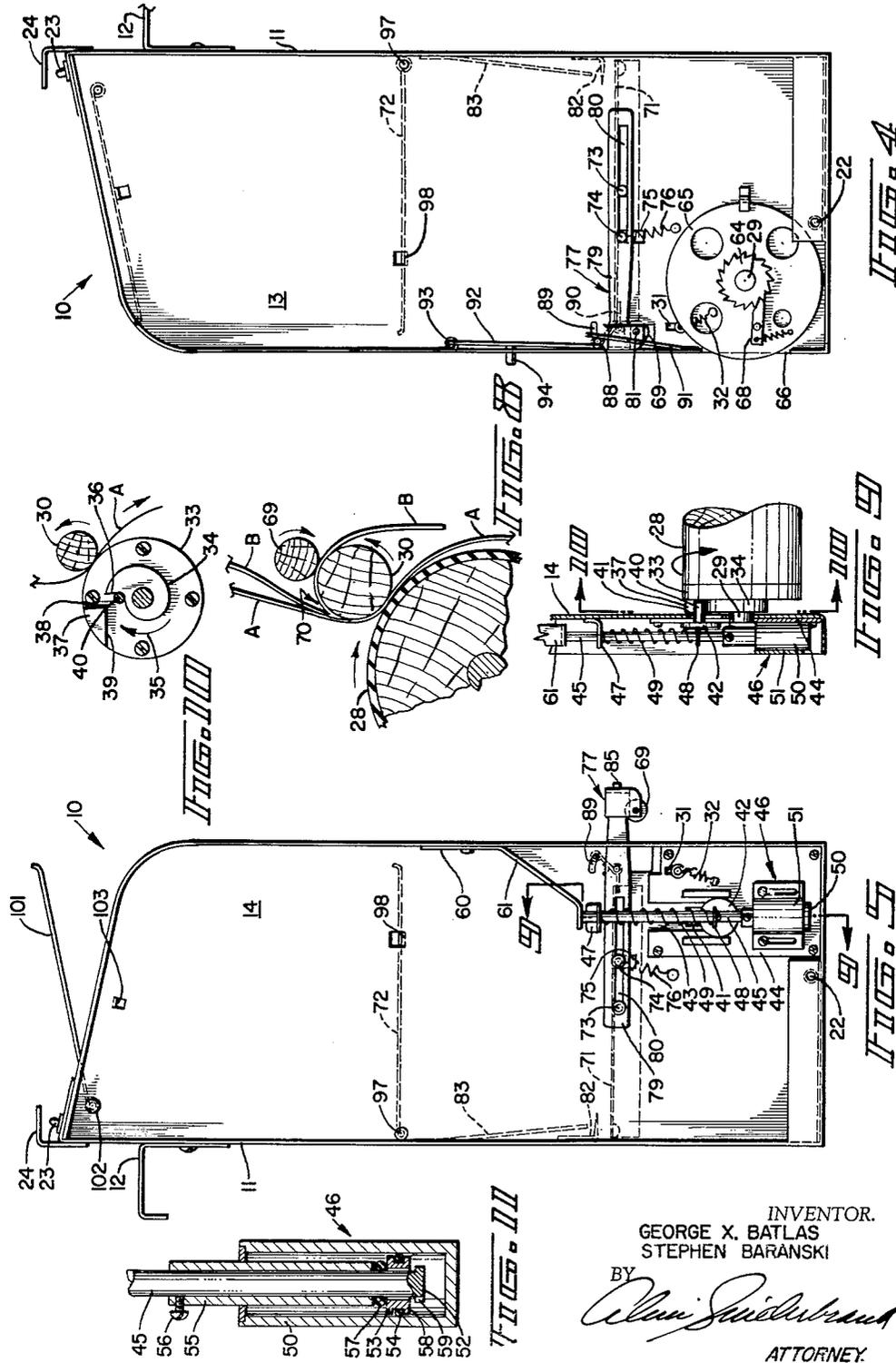
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DISPENSERS FOR PAPER TOWELING

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4 Sheets-Sheet 3



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DISPENSERS FOR PAPER TOWELING

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4 Sheets-Sheet 4

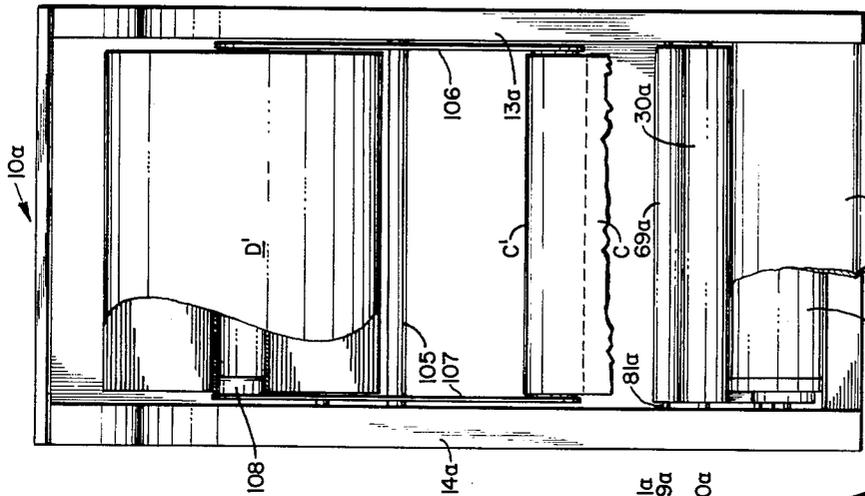


FIG. 12

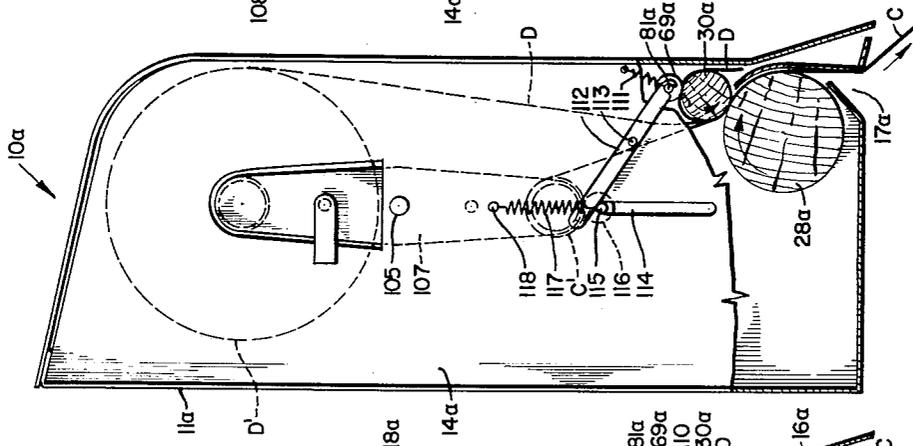


FIG. 13

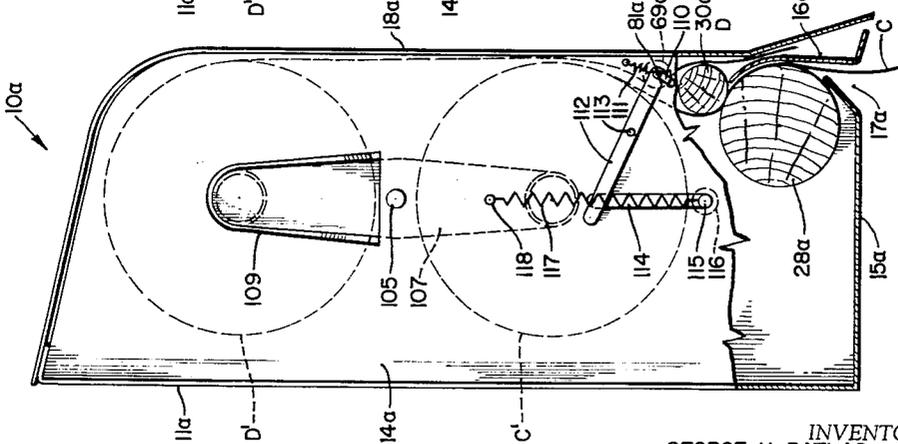


FIG. 14

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2,974,839

DISPENSERS FOR PAPER TOWELING

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Filed July 16, 1958, Ser. No. 748,965

19 Claims. (Cl. 225—12)

This invention relates generally to dispensers for paper toweling, and more particularly is directed to dispensers operative to provide separated lengths of paper toweling or other sheet material supplied as a continuous web or strip in either folded or roll form.

Usually, paper towel dispensers of the described character are installed in public washrooms and the like and are periodically serviced by an attendant or custodian whose task it is to renew the supply of folded or rolled paper toweling in the dispenser so that such supply will not be exhausted during the intervals between the periodic service calls. Thus, if the attendant, upon opening the dispenser, finds that the portion of the folded stack or roll of paper toweling then remaining therein is not likely to last until the next service call on that dispenser, it has been the usual practice to remove the partly depleted folded stack or roll and install a new folded stack or roll in its place. The partly depleted folded stack or roll, which has been removed, is then discarded, in which case all of the paper toweling remaining in such folded stack or roll is wasted, or, in the interest of economy the removed partial folded stack or roll may be placed in an exposed position, for example, on the top of the dispenser or on a wash basin, where it soon becomes soiled so that patrons are reluctant to use such paper toweling and, in any case, substantial quantities of the latter are regularly wasted.

Accordingly, it is an object of the present invention to provide paper towel dispensers which permit dispensing of all of the paper toweling in each folded stack or roll without the danger that the supply of paper toweling will be exhausted during the intervals between the times when an attendant regularly examines the dispenser to replenish the supply of folded or rolled paper toweling therein.

In accordance with an aspect of this invention, the above object is achieved by providing a dispenser adapted to hold two folded stacks or rolls of paper toweling, and wherein the dispenser is constructed and arranged to initially dispense paper toweling from a first folded stack or roll thereof and, when that first folded stack or roll is exhausted, to automatically dispense paper toweling from a second folded stack or roll, so that, during the dispensing of the first folded stack or roll, the full second folded stack or roll is available in reserve and, during the dispensing of the second folded stack or roll, the exhausted first folded stack or roll can be replaced by a new supply without discarding the paper toweling that may then remain in the second folded stack or roll.

Another object is to provide simple means within the dispenser for obtaining the above mentioned dispensing of paper toweling from the two folded stacks or rolls, in sequence, and without requiring any alteration or modification of the folded stacks or rolls of paper toweling such as would increase the cost of the latter.

In accordance with another aspect of the invention, the dispenser for successively dispensing paper toweling from first and second folded stacks or rolls thereof includes parallel dispensing and pressure rollers between which the paper toweling passes during the dispensing thereof,

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an auxiliary or control roller disposed adjacent the pressure roller at a location on the circumference of the latter which is remote from the line of rolling contact of the pressure roller with the dispensing roller, and control means for bodily moving the auxiliary roller toward and away from the surface of the pressure roller in accordance with the supply of paper toweling remaining in the folded stack or roll from which the paper toweling is first dispensed so that so long as a substantial supply of paper toweling remains in the first folded stack or roll the auxiliary roller is spaced from the pressure roller and the leading end of the web of paper toweling in the second folded stack or roll may hang loosely and immobile therebetween, whereas, when the supply of paper toweling in the first folded stack or roll is almost depleted, the auxiliary roller is pressed against the pressure roller and the leading end of the web of paper toweling therebetween is frictionally engaged by the pressure roller and carried by the latter between the pressure roller and the dispensing roller to thereby commence dispensing of the paper toweling from the second folded stack or roll as the supply of paper toweling in the first folded stack or roll becomes exhausted.

A further object of the invention is to provide a relatively simple dispenser for folded or rolled paper toweling, wherein the paper toweling is in a continuous web or sheet and feeding thereof is effected merely by exerting a pull on the free end of the web or sheet in order to expose a predetermined length of the toweling, whereupon further feeding of the web or sheet of paper toweling is interrupted for a controlled period and the exposed length of the toweling can be separated from the remainder of the latter by tearing along a serrated cutting edge, and wherein the period during which feeding of the paper toweling is periodically interrupted is adjustably determined by an improved timing mechanism.

A still further object is to provide dispensers for folded stacks or rolls of paper toweling which are effective to avoid waste of the latter, as previously described, and which embody structural features to ensure the reliable operation thereof even when the folded stacks or rolls of paper toweling are negligently installed in the dispenser.

The above, and other objects, features and advantages of the present invention, will be apparent in the following detailed description of illustrative embodiments thereof which is to be read in connection with the accompanying drawings forming a part hereof, and wherein:

Fig. 1 is a perspective view of a dispenser for folded paper toweling constructed in accordance with one embodiment of the present invention;

Fig. 2 is a side elevational view, on a reduced scale, of the dispenser of Fig. 1, but with the cover thereof being shown in a partly opened position;

Fig. 3 is an enlarged front elevational view of the dispenser of Figs. 1 and 2, but with the cover removed;

Fig. 4 is a side elevational view of the dispenser with the cover removed as viewed in the direction of the arrows 4—4 on Fig. 3;

Fig. 5 is a view similar to that of Fig. 4, but showing the side of the dispenser seen when viewed in the direction of the arrows 5—5 of Fig. 3;

Fig. 6 is a vertical sectional view taken along the line 6—6 of Fig. 3, but showing the dispenser with the cover thereon and illustrating the manner in which the paper toweling is dispensed from a first folded stack thereof;

Fig. 7 is a view similar to that of Fig. 6, but illustrating the operation of the dispenser when feeding of the paper toweling from the second folded stack thereof is commenced;

Fig. 8 is a fragmentary detail view of a portion of Fig. 7 for better illustrating the commencement of the

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feeding of paper toweling from the second folded stack when the supply of paper toweling of the first folded stack is nearly depleted.

Fig. 9 is a vertical sectional view taken along the line 9-9 of Fig. 5 and illustrating a timing mechanism associated with the dispenser in accordance with the invention;

Fig. 10 is a vertical sectional view taken along the line 10-10 of Fig. 9 and showing the configuration of a control cam associated with the dispensing roller of the dispenser embodying the invention;

Fig. 11 is an enlarged sectional view showing the interior of an element included in the timing mechanism of Figs. 5 and 9;

Fig. 12 is a front elevational view similar to that of Fig. 3, but showing a dispenser constructed in accordance with another embodiment of the invention and adapted to sequentially dispense paper toweling from first and second rolls thereof;

Fig. 13 is a side elevational view of the dispenser of Fig. 12, partly broken away and in section, and illustrating the operation of the dispenser during the feeding of paper toweling from the first roll therein; and

Fig. 14 is a view similar to that of Fig. 13, but showing the operation of the dispenser during the commencement of feeding of paper toweling from the second roll therein.

Referring to the drawings in detail, and initially to Figs. 1 to 7 thereof, it will be seen that a dispenser embodying the present invention and there generally identified by the reference numeral 10 includes a cabinet adapted for mounting on a wall or other vertical supporting surface and having a back wall 11 with a mounting bracket 12 thereon (Figs. 2, 4 and 5), inner side walls 13 and 14 with outwardly directed peripheral flanges, and a bottom wall 15 (Figs. 6 and 7) which, at its forward edge, is bent upwardly and spaced rearwardly from the lower edge of an arcuate guide piece 16 extending laterally between side walls 13 and 14 to define a downwardly opening discharge slot 17. The cabinet of dispenser 10 further has a removable cover including a front wall 18 (Figs. 1, 6 and 7), side walls 19 extending rearwardly from front wall 18 and spaced laterally apart so that such side walls 19 will be disposed outside of the inner side walls 13 and 14 when the cover is in its closed position, and a top wall 20. The cover is suitably mounted for providing convenient access to the interior of the cabinet while the latter is supported on a wall or other vertical supporting surface. For example, a screw 21 (Figs. 1 and 2) may extend through an opening in each side wall 19 of the cover adjacent the bottom of the latter and into a tapped hole 22 (Figs. 4 and 5) formed in a flange on the adjacent inner side wall 13 or 14 of the cabinet so that the cover can swing from a closed position (Figs. 1, 6 and 7) forwardly to an open position, as indicated in Fig. 2.

In order to hold the cabinet cover in its closed position, a detent 23 (Figs. 6 and 7) can be mounted in a forwardly directed flange at the top of back wall 11 to engage in an opening formed in top wall 20 of the cover adjacent the back edge thereof. Opening of the cabinet cover by unauthorized persons is discouraged by an angle member 24 secured to the top of back wall 11 and having a leg extending over detent 23 with a small opening 25 therein aligned with the detent so that the latter can be depressed for release from the opening in the top wall 20 only through the use of a tool in the possession of the servicing personnel which is shaped so as to be extended through the opening 25 of angle member 24. It is also apparent that the screws 21 may be removed, thereby to permit bodily removal of the cover from the remainder of the cabinet.

As shown in Figs. 1, 6 and 7, the front wall 18 of the cover has a lower portion 26 which extends laterally thereacross coextensive with the slot 17 and which is inclined downwardly and forwardly so that a blade 27

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secured to the inside of portion 26 along the lower edge thereof and having a serrated tearing or cutting edge is spaced forwardly a substantial distance from the lower edge of the guide plate 16 for a purpose hereinafter described in detail.

The dispenser 10 includes a dispensing roller 28 having trunnions 29 projecting axially from the opposite ends and rotatably mounted in suitable bearings carried by the side walls 13 and 14 and located so that the roller 28 extends across the lower front portion of the cabinet in back of the guide plate 16 and a vertical plane tangent to the front of the roller 28 passes through the discharge slot 17. A pressure roller 30 (Figs. 3, 6, 7 and 8) is rotatably mounted above the dispensing roller 28 in front of the vertical plane passing through the axis of rotation of the latter and is yieldably urged toward the dispensing roller to press a web or sheet of paper toweling against the surface of roller 28 so that the feeding of the paper toweling downwardly through the slot 17 will be controlled by the rotation of the dispensing roller. The pressure roller 30 may also have trunnions projecting axially from the opposite ends and rotatably received in bearings which are slidably accommodated in slots 31 (Figs. 4 and 5) which extend generally vertically in the side walls 13 and 14 of the cabinet. Springs 32 are connected to the bearings receiving the trunnions at the opposite ends of pressure roller 30 and to suitable anchors on the side walls 13 and 14 below slots 31 to urge the pressure roller downwardly against the dispensing roller 28.

The dispenser 10 further includes mechanism for controlling the rotation of the dispensing roller 28 so that, at the end of each complete revolution thereof, rotation of the roller 28 will be arrested for a predetermined period to permit tearing-off of an exposed length of the paper toweling against the cutting edge of the blade 27, as hereinafter described in detail, and then the roller 28 will be automatically released for renewed rotation without requiring any manipulation by the user other than the natural and instinctive exertion of a downward pulling force upon the free end of the web or strip of paper toweling projecting downwardly from the slot 17.

The control mechanism for dispensing roller 28 in the illustrated embodiment of this invention is generally similar to that described in the application for United States Letters Patent identified as Serial No. 571,017, filed March 12, 1956, by George X. Batlas and Emanuel N. Pantazis, and includes a cam member 33 (Figs. 9 and 10) in the form of a disc of the same diameter as the body of roller 28 and secured to the end of the latter adjacent side wall 14 of the cabinet. The cam member 33 has a spiral cam surface 34 projecting from its outer surface and increasing in radius in the direction opposed to the normal rotation of the cam member with roller 28, as indicated by the arrow 35 on Fig. 10, between a radially inner end and a radially outer end which are connected by a substantially radial shoulder 36. The cam member 33 also has an abutment 37 projecting from its outer surface and formed with a stop surface 38 (Fig. 10) at its leading end, considered in the direction of the normal rotation of the cam member. The stop surface 38 extends substantially radially with respect to the axis of rotation of the cam member across the radially outer end of cam surface 34 and is spaced from the shoulder 36 in the direction opposed to the normal rotation of the cam member. The inner edge 39 of the abutment 37 is spaced radially outward from the adjacent portion of the spiral cam surface 34.

The mechanism for controlling the rotation of dispensing roller 28 further includes a follower pin 40 which projects through a vertically elongated slot 41 (Figs. 5 and 9) in the side wall 14 and which is engageable with the spiral cam surface 34 and the abutment 37, as hereinafter described in detail. The fol-

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lower pin 40 has two axially spaced apart discs 42 fixed on the outer end portion thereof, and the length of the pin 40 between such discs 42 is adapted to be slidably received in an upwardly opening, vertically elongated slot 43 (Fig. 5) formed in a mounting plate 44 which is secured to the outside of side wall 14 and spaced from the latter. The vertical longitudinal axis of slot 43 intersects the axis of rotation of the cam member 33 with dispensing roller 28.

A piston rod 45 extends upwardly from a timing mechanism mounted on the plate 44 and generally identified by the reference numeral 46, and which is hereinafter described in detail, and the upper end of rod 45 is slidably guided in an aperture of an angle member 47 projecting from side wall 14. A lug 48 projects from the outer disc 42 on the follower pin 40 and is suitably secured to the rod 45 so that the latter will move vertically with the follower pin 40. Further, a helical compression spring 49 extends around rod 45 between the angle member 47 and the lug 48 in order to urge both the follower pin 40 and the rod 45 in the downward direction. Thus, the inner end of follower pin 40 is made to bear radially against the spiral cam surface 34 of cam member 33. The diameter of at least the inner end portion of pin 40 is slightly smaller than the distance between top surface 38 and shoulder 36 and the distance between the inner edge 39 of abutment 37 and the adjacent portion of the spiral cam surface 34 so that the pin 40 can move radially, with respect to the axis of cam member 33, through the space between stop surface 38 and shoulder 36 and so that the inner surface 39 of abutment 37 and the adjacent portion of spiral cam surface 34 can pass the pin 40, at opposite sides of the latter, when the cam member 33 is initially rotated with the roller 28 in the direction of the arrow 35 from the position illustrated in Fig. 10.

Assuming that a web, strip or continuous sheet A of paper toweling from a folded stack thereof mounted within the cabinet, as hereinafter described in detail, is led downwardly in back of the pressure roller 30 and then forwardly between the pressure roller and the dispensing roller 28 before being deflected downwardly by the guide plate 16 for exit through the slot 17, it is apparent that any advancement of the web or strip A, in response to a downward pull exerted on the free exposed end thereof, will produce a corresponding rotation of dispensing roller 28. Thus, starting with the cam member 33 in the position of Fig. 10, a downward pull on the free exposed end of web A will withdraw an increasing length of the latter from the cabinet and, simultaneously, the cam member 33 will rotate with roller 28 in the direction of the arrow 35 so that the spiral cam surface 34 will progressively urge the follower pin 40 upwardly against the force of the spring 49. Toward the end of a complete revolution of cam member 33 with roller 28, the outer end of cam surface 34 will have moved the pin 40 radially upward into the path of stop surface 38 which will engage the pin 40 and thereby arrest the rotation of the cam member 33 with the roller 28 so that withdrawal of the web A is then halted.

After rotation of the dispensing roller 28 has been arrested, as indicated above, the spring 49 will cause movement of the pin 40 radially downward, with respect to the axis of rotation of cam 33, between stop surface 38 and shoulder 36 until the follower pin 40 is again disposed in the radial position of Fig. 10, whereupon the cam 33 and the dispensing roller are again free to rotate in response to a pull exerted on the web A for withdrawing the latter through slot 17.

During the time that the rotation of roller 28 is arrested, the length of the paper toweling web A withdrawn from the cabinet may be separated from the re-

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mainder of the continuous web within the cabinet by tearing along the serrated cutting edge of the blade 27.

The timing mechanism 46 is provided for the purpose of adjustably slowing the downward movement of follower pin 40 from the radially upward position where it is engaged by the stop surface 38, and thereby halts rotation of the dispensing roller, to the radially lowered position of Fig. 10, wherein the dispensing roller is again free to rotate. Referring to Figs. 5, 9 and 11, it will be seen that the timing mechanism 46 includes a vertical cylinder 50 mounted in a bracket 51 which is vertically adjustably secured to the mounting plate 44. The piston rod 45 extends downwardly into cylinder 50 and has a radial flange 52 at its lower end (Fig. 11), and a piston 53 is loosely slidable on rod 45 above the flange 52 and carries an O-ring 54 in a circumferential groove for sealing engagement with the inside surface of cylinder 50. A sleeve 55 is axially slidable on rod 45 above piston 53 and is held in any axially adjusted position with respect to rod 45 by means of a set screw 56. Further, an O-ring 57 extends closely around rod 45 below the lower edge of sleeve 55 so that, during downward movement of rod 45, the O-ring 57 is pressed downwardly against piston 53 to transmit the downward movement to the latter and to substantially seal the upper end of the annular clearance 58 existing between rod 45 and the piston 53, whereby the air in cylinder 50 is substantially trapped below piston 53 to resist the downward movement of rod 45. However, the upper surface of piston 53 is provided with at least one radially extending groove (not shown) of small cross-sectional area to provide a small discharge outlet under the ring 57 for the air escaping from below piston 53 through the annular clearance 58 to the space within cylinder 50 above the piston 53.

Thus, it will be apparent that the speed of the downward movement of follower pin 40 from its raised position where stop surface 38 engages the follower pin, to its lowered position of Fig. 10, where the dispensing roller 28 is again free to rotate, will be determined, following the engagement of sealing ring 47 with the top surface of piston 53, by the rate at which the air can escape radially outward under ring 57 through the radial groove cut in the upper surface of piston 53, as mentioned above. When it is desired to adjust the period during which rotation of dispensing roller 28 is arrested in each operating cycle, it is only necessary to loosen the set screw 56 and to suitably adjust the sleeve 55 axially with respect to the rod 45. Thus, if the sleeve 55 is raised relative to the rod 45, it is apparent that the follower pin 40 will be free to move downwardly a substantial distance from its raised position where it is engaged by the stop surface 38 prior to the engagement of sealing ring 57 with the top surface of piston 53. During such initial downward movement of follower pin 40, rod 45 will move axially relative to piston 53 so that the air below the latter in cylinder 50 will not offer any resistance to the downward movement of rod 45 with pin 40 and such downward movement may occur at a relatively high speed under the influence of the spring 49. The downward movement of pin 40 at a reduced speed will occur only following the engagement of ring 57 with the top surface of piston 53, and the axial adjustment of sleeve 55 relative to rod 45 serves to vary the portion of the downward operating stroke of rod 45 which occurs with the ring 57 in engagement with piston 53.

In order to avoid any substantial pneumatic resistance to the upward movement of the rod 45 with the follower pin 40 during rotation of cam 33 with the dispensing roller 28, the flange 52 at the bottom of rod 45 is formed with a radial notch 59 (Fig. 11) having a relatively large cross-sectional area and communicating directly with the clearance 58 so that, when the flange 52 bears upwardly against piston 53 to cause upward movement of the latter,

air within the cylinder 50 above piston 53 can pass downwardly, with little resistance, through the clearance 58 and the notch 59 into the part of cylinder 50 below piston 53.

It will be apparent that, during each revolution of cam 33 with roller 28, a length of the web A of paper toweling equal to the circumference of roller 28 will be withdrawn through the discharge slot 17 of the cabinet. The successive withdrawn lengths of the web A may be individually separated from the remainder of the paper toweling in the cabinet by tearing along the cutting edge of blade 27, as previously described, or the user may repeatedly operate the dispenser prior to tearing off a length of the web of paper toweling which is equal to any desired whole multiple of the circumference of roller 28.

The dispenser 10 may also include a signaling device which is operative to indicate to the user when the dispensing roller 28 is again free for rotation following the arresting of the rotation of the dispensing roller at the conclusion of an operating cycle of the dispenser. As shown in Figs. 3 and 5, such signaling device may include an elongated signaling member 60 which is slidably guided against the back surface of the peripheral flange extending along the front edge of side wall 14 of the cabinet and having an extension 61 (Fig. 5) which is engageable with the upper end of rod 45, so that the signaling member 60 moves vertically with the rod 45. The signaling member 60 has the word "pull" or some other suitable legend printed or engraved on the front face thereof, and the peripheral flange of side wall 14 is provided with a cut-out 62 (Fig. 3) which is vertically located so that such legend on the signaling member 60 will be exposed at the cut-out or opening 62 only when the rod 45 is in a lowered position corresponding to the lowered position of follower pin 40 illustrated in Fig. 10, where the dispensing roller 28 is free to rotate in response to the withdrawal of the web A from the cabinet. As shown in Fig. 1, the front wall 18 of the cover is also provided with a window 63 which is aligned with the opening 62 when the cover is in its closed position. Thus, during withdrawal of the web A from the cabinet, the corresponding upward movement of follower pin 40 and rod 45 will effect upward displacement of signaling member 60 so that the legend or word "pull" is displaced upwardly with respect to the opening 62 and window 63. After the rotation of dispensing roller 28 has been arrested by engagement of the stop surface 38 with the raised follower pin 40, the word "pull" will not reappear at the window 63 until the pin 40 has returned to its lowered position of Fig. 10 at the speed determined by the timing mechanism 46. When the word "pull" reappears at the window 63, this signals that the exposed end of the web A of paper toweling may again be pulled downwardly to withdraw a length of the toweling from the cabinet.

By reason of the fact that the cutting edge of the blade 27 is spaced a substantial distance forwardly from the lower edge of the guide plate 16, as shown in Figs. 6 and 7, the line along which the web is torn by the blade 27 will be spaced substantially by that distance from the line on the web where the latter contacts the lower edge of guide plate 16. Thus, after a portion of the web has been torn from the remainder thereof and the free edge of the web again depends substantially vertically from the discharge slot 17, such free edge of the web will project out of the discharge slot by substantially the horizontal distance between the lower edge of plate 16 and the cutting edge of blade 27 to provide a substantial exposed free end portion that can be easily grasped for again pulling a length of the web of paper toweling from the cabinet.

In the event that the web of paper toweling inadvertently tears in back of the cutting edge of the blade 27, as may happen infrequently, the dispensing roller 28 may be manually rotated, by a device to be described in detail, until an adequate free end portion of the web again projects from the slot 17 and can be conveniently grasped for

exerting the necessary pull thereon. As shown in Fig. 4, the device for manually rotating the dispensing roll 28 includes a ratchet 64 fixed to the trunnion 29 of the roller 28 which is rotatably mounted in side wall 13, a wheel 65 rotatable on the trunnion 29 next to the ratchet 64 and projecting forwardly from the cabinet through registering openings 66 (Fig. 4) and 67 (Fig. 1) formed in the flange of side wall 13 and in the front wall 18 of the cover, respectively, and a spring urged pawl 68 pivotally mounted on the wheel 65 and engageable with the toothed periphery of ratchet 64. When the wheel 65 is manually rotated in the direction of the normal rotation of roller 28, that is, in the counter-clockwise direction as viewed in Fig. 4, such rotation is transmitted to the dispensing roller 28 by the pawl 68 and ratchet 64. However, if the wheel 65 is inadvertently turned in the reverse direction, the pawl 68 slips over the teeth of ratchet 64 and thereby prevents corresponding reverse rotation of the dispensing roller which would have the effect of pushing the web of paper toweling back into the cabinet and out of its proper threaded engagement between rollers 28 and 30.

The dispensers embodying the present invention are adapted to contain two supplies of paper toweling which are successively dispensed without interruption. Thus, the dispenser 10 presently being described is adapted to first dispense the continuous web A of paper toweling which is supplied in the form of a folded stack A', and, upon the depletion or exhaustion of the web A, to then dispense the continuous web B of paper toweling which is supplied in the form of a folded stack B'.

In order to effect the successive dispensing of the webs A and B, the dispenser 10 embodying the present invention includes a control roller 69 extending laterally across the cabinet above the pressure roller 30 and initially spaced from the latter, as shown in Fig. 6. The control roller 69 is mounted, as hereinafter described in detail, for movement toward and away from the pressure roller 30 in accordance with the amount of the first dispensed web A remaining within the cabinet. Thus, when a substantial portion of the folded stack A' remains within the cabinet, the control roller 69 is spaced from the pressure roller 30, as in Fig. 6, and, when the stack A' is almost completely depleted, as in Fig. 7, the control roller 69 moves downwardly against the pressure roller 30.

As is shown in Fig. 6, when the cabinet of the dispenser 10 is loaded, the web A of the lower folded stack A' is fed in back of the rollers 69 and 30 and then forwardly between the rollers 30 and 28 prior to being deflected downwardly through the discharge slot 17 by the plate 16, while the web B from the upper folded stack B' is led downwardly in back of control roller 69 and then forwardly through the gap between the roller 69 and the pressure roller 30. Thus, when the user exerts a downward pull on the exposed end of web A for withdrawing a length of the latter from the cabinet, the rollers 28 and 30 rotate in the clockwise and counter-clockwise directions, respectively, as viewed in Fig. 6, by reason of their frictional contact with the withdrawn web A. However, by reason of the spacing of control roller 69 from pressure roller 30, the free end portion of the web B passing therebetween remains immobile. Thus, during the dispensing of almost all of the web A contained in the lower folded stack A', the web B remains in the position illustrated in Fig. 6. However, when the lower folded stack A' is almost entirely depleted and control roller 69 is moved downwardly against pressure roller 30, as in Figs. 7 and 8, the web B is gripped between rollers 30 and 69 and is frictionally gripped by the pressure roller 30 to move with the latter as the rollers 28 and 30 are rotated in response to further withdrawal of the web A from discharge slot 17 of the cabinet. It will be apparent that, during such rotation of pressure roller 30, the top portion of the surface thereof which is frictionally engaged with the web B moves rearwardly, as is shown in detail

in Fig. 8, and forms a fold in the web B between the downwardly moving web A and the downwardly and rearwardly moving portion of the surface of pressure roller 30, as at 70. Thus, the web B is frictionally gripped between the web A and the surface of pressure roller 30 and is drawn with the web A between the pressure roller and dispensing roller 28 for guidance by the plate 16 out of the discharge slot 17. Upon exhaustion of the web A, the web B projects from the discharge slot 17, and the user may then pull downwardly upon the exposed portion of the web B so that paper toweling continues to be dispensed, without interruption, following the complete depletion of the folded stack A'.

In the dispenser 10, the lower and upper folded stacks of paper toweling A' and B' are supported on lower and upper shelves 71 and 72, respectively, extending laterally across the cabinet between side walls 13 and 14 at vertically spaced apart locations. The lower shelf 71 is pivotally supported on a pin 73 extending laterally thereacross approximately mid-way between the front and rear edges of the shelf and having its opposite ends rotatably received in laterally aligned openings formed in side walls 13 and 14 so that the lower shelf 71 can rock between the horizontal position of Fig. 6 and the tilted position of Fig. 7 wherein the front of the shelf is lowered and the back of the shelf is raised. A rod 74 also extends laterally across shelf 71 and is spaced forwardly from the pivoting axis defined by the pin 73. The opposite ends of rod 74 project slidably through vertically elongated slots 75 formed in side walls 13 and 14 (Figs. 4 and 5), and tension springs 76 are connected between the ends of rod 74 and suitable anchors provided therebelow on side walls 13 and 14, so that the springs 76 tend to urge shelf 71 to the tilted position of Fig. 7.

Further, as shown in Figs. 3, 4 and 5, the dispenser 10 includes a support for the control roller 69 which is generally identified by the reference numeral 77 and which has a laterally extending cross member 78 (Fig. 3) and two side members 79 extending rearwardly from the opposite ends of cross member 78 and formed with elongated slots 80 in which the ends of the pin 73 and the rod 74 are slidably received so that the support 77 is slidable forwardly and rearwardly with respect to shelf 71 in the plane of the latter. The control roller 69 has an axle 81 projecting from its opposite ends and rotatably journaled in openings formed in side members 79 of support 77 adjacent the forward ends thereof. Thus, when the support 77 is moved forwardly relative to shelf 71 until the back ends of the slot 80 are engaged by the pin 73, as in Fig. 5, the control roller 69 is spaced substantially forwardly with respect to pressure roller 30 thereby to facilitate the loading of the dispenser and particularly the threading of the web B between rollers 30 and 69. On the other hand, when the support 77 is moved to its rearmost position relative to shelf 71 where the ends of rod 74 engage the forward ends of slot 80, as in Fig. 4, the control roller 69 is disposed adjacent the front edge of shelf 71 and moves in the generally vertical direction with such front edge of the shelf in response to rocking of the latter between the horizontal position of Fig. 6 and the tilted position of Fig. 7. It will be apparent that, when shelf 71 is in its horizontal position, control roller 69 is spaced substantially from pressure roller 30 (Fig. 6) so that, as previously described, the web B therebetween will remain immobile during the dispensing of the web A from the folded stack A' supported on shelf 71. On the other hand, when shelf 71 is tilted, as in Fig. 7, control roller 69 is moved downwardly against pressure roller 30 to cause the feeding of the web B with the concluding portion of the web A, as previously described in detail.

In order to maintain shelf 71 in its horizontal position of Fig. 6 so long as a substantial portion of the stack A' remains thereon and to permit the tilting of shelf 71 to the position of Fig. 7 by the springs 76 upon

the substantial depletion of the stack A', the dispenser 10 includes an angle member 82 mounted on the front surface of the back wall 11 of the cabinet and vertically located so that the forwardly extending leg of angle 82 will be spaced upwardly by a relatively small distance, for example, the thickness of several folds of the continuous web of paper toweling in the stack A', from the upper surface of shelf 71 with the latter in its horizontal position of Fig. 6. Thus, when the dispenser is loaded with the shelf 71 moved to its horizontal position, as hereinafter described in detail, the stack A' is placed upon shelf 71 and moved rearwardly on the latter so that the forwardly extending leg of angle member 82 will enter between two of the folds of the stack A' with several of the folds being disposed between the top surface of shelf 71 and the forwardly extending leg of angle member 82. Accordingly, when the shelf 71 is permitted to tilt to the position of Fig. 7, as hereinafter described in detail, the folds of paper toweling interposed between the shelf and the forwardly directed leg of angle member 82, as in Fig. 6, will prevent such tilting of the shelf until substantially all of the web A has been dispensed to withdraw such folds from between the shelf and the angle member 82, as in Fig. 7.

In order to ensure that the necessary several folds of the stack A' will be interposed between the horizontal shelf 71 and the angle member 82 during the loading of the dispenser, the latter further includes a leaf spring 83 which is secured, at its upper end, to back wall 11 and diverges downwardly therefrom toward the front edge of the forwardly directed leg of angle member 82, as shown in Fig. 7. Thus, if the attendant loading the dispenser merely drops the folded stack A' upon the horizontal shelf 71, the spring 83 will ensure that the bottom of the folded stack will be disposed ahead of the forward edge of the forwardly directed leg of angle member 82, and a laterally extending member 84 is secured to the back surface of front wall 18 of the cover and spaced rearwardly therefrom so that, when the cover is closed, the laterally extending member 84 will push rearwardly against the stack A' to slide the latter rearwardly on the shelf 71 and thereby effect the entry of the horizontally extending leg of angle member 82 between the folds of stack A' in the required manner.

Further, it will be seen that, when the cover of the cabinet is closed, the front wall 18 thereof will bear against a projection 85 (Figs. 3 and 5) on cross member 78 of support 77, thereby to move the latter rearwardly with respect to shelf 71 for ensuring the disposition of control roller 69 in the position of Figs. 4 and 6, even in the event that the attendant loading the dispenser forgets to rearwardly displace support 77 prior to closing of the cover.

Referring now to Figs. 6 and 7, it will be seen that a rim or flange 86 extends laterally between side walls 13 and 14 along the front edge of shelf 71. The lower edge of rim 86 is secured to a laterally extending pin 87 which, at its opposite ends, is rotatably received in suitable openings provided in side walls 13 and 14 so that the rim 86 is rockable about a horizontal, laterally extending axis coincident with its lower edge. A rod 88 extends along the upper edge of rim 86 and, at its opposite ends, extends slidably through arcuate slots 89 formed in side walls 13 and 14 (Figs. 4 and 5) concentric with the axis of pivot pin 87. Lugs 90 (Figs. 6 and 7) extend from the lower edge of rim 86 under the front edge portion of shelf 71 and lie in a plane which is angularly spaced from the plane of rim 86 by more than 90 degrees. Thus, when the rim 86 is in the substantially vertical position of Figs. 6 and 7, the lugs 90 are inclined downwardly and rearwardly to permit tilting of shelf 71 to the position of Fig. 7. However, when the rim 86 is inclined forwardly with respect to the vertical to the extent permitted by the arcuate slots 89, the lugs 90 extend substantially horizontally from the pivoting axis of

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rim 86, as defined by pin 87, and engage under the leading or front edge portion of shelf 71 to prevent the tilting of the latter from its horizontal position, as shown in Figs. 4 and 5.

Referring to Fig. 4, it will be seen that a leaf spring 91 is secured, at its lower end, to the peripheral flange along the front edge of side wall 13 and bears forwardly against the end of the rod 88 which projects slidably through the slot 89 in side wall 13. The spring 91 is dimensioned and of a sufficiently stiff spring metal so that the force exerted by spring 91 on rod 88 and tending to tilt the rim 86 forwardly to the position where the lugs 90 engage under shelf 71 to retain the latter in its horizontal position, is large enough to overcome the forces exerted by the springs 76 and tending to move the shelf 71 to the tilted position of Fig. 7. Thus, so long as the spring 91 is free to exert its force upon the engaged end of rod 88, the shelf 71 will be maintained in its horizontal position. However, the dispenser 10 further includes a finger 92 (Fig. 4) which is pivotally suspended, at its upper end, from a bracket 93 secured to the back face of the peripheral flange extending along the front edge of the side wall 13, and the lower end of finger 92 engages in front of the end of rod 88 engaged by spring 91. A projection 94 extends forwardly from finger 92 through an opening 95 in the peripheral flange of side wall 13 and is engageable by the front wall 18 of the cover when the latter is in its closed position. Thus, when the cover is opened, to permit loading of the dispenser, spring 91 acts upon the rod 88 of rim 86 to tilt the latter forwardly and cause the lugs 90 to hold the shelf 71 in its horizontal position during loading of the dispenser, whereby the necessary gap will appear between the forwardly directed leg of angle member 82 and the rear portion of shelf 71 to receive the lower folds of the stack A'. When the cover is closed, following the loading of the dispenser, the front wall 18 of the cover acts rearwardly upon projection 94 and thereby swings the finger 92 rearwardly about the pivot bracket 93 so that the lower end of the finger acts on rod 88 to move the rim 86 to its substantially vertical position wherein the lugs 90 are directed downwardly away from the front edge of shelf 71, as in Fig. 6, to permit the tilting of shelf 71 to the position of Fig. 7 when the portion of the web A making up the folds originally disposed between angle member 82 and the rear edge portion of the shelf has been dispensed.

The rim 86 also has a tongue 96 (Figs. 6 and 7) projecting rearwardly therefrom at a location spaced upwardly from the pivoting axis of the rim so that, when the rim 86 is moved toward its substantially vertical position upon closing of the cover, the tongue 86 will enter between the folds of stack A' a short distance above the horizontal shelf 71 and will frictionally bear downwardly upon the folds of the paper toweling disposed below the tongue 96 to balance the frictional effect of the forwardly directed leg of angle member 82 and thereby ensure that the final folds of the stack A' will unfold one at a time during the dispensing of the final portion of web A.

Although the upper shelf 72 may be fixed within the cabinet, it is preferred, as shown in Figs. 6 and 7, that the shelf 72 be pivotally mounted on a rod 97 extending along its rear edge and received, at its opposite ends, in suitable openings formed in side walls 13 and 14, while lugs or tabs 98 are struck inwardly from side walls 13 and 14 to be engaged by the side edge portions of shelf 72 and thereby limit the downward swinging of the latter to the horizontal position shown in Figs. 6 and 7. However, the shelf 72 can be pivoted upwardly from its illustrated horizontal position thereby to facilitate the loading of lower folded stack A' into the dispenser. The shelf 72 further preferably has a centrally located cut-out 99 opening at the front edge of the shelf to facilitate grasping of the upper folded stack B' during the insertion

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or removal of the latter, and an upstanding rim 100 is formed along the front edge of shelf 72 at the opposite sides of cut-out 99 in order to retain the stack B' on shelf 72 during dispensing of the web B.

The cabinet of dispenser 10 is completed by an upper plate 101 disposed near the top of the cabinet and pivotally mounted, along its rear edge, on a pin 102 having its opposite ends rotatably received in suitable openings in side walls 13 and 14, with tabs 103 being struck inwardly from side walls 13 and 14 to engage under member 101 for limiting the downward swinging of the latter to a position illustrated in Fig. 6 where the forward edge of member 101 bears downwardly on the top of the full stack B' to initially frictionally resist the withdrawal of web B from such folded stack. However, it will be apparent that the member 101 can be swung upwardly, as in Fig. 5, to facilitate the loading of the stack B' on shelf 72 or the removal of the upper stack from the upper shelf.

The front wall 18 of the cover further preferably has a central opening 104 located in the lower portion of the front wall to permit the viewing therethrough of the free end portion of web B when the latter extends loosely between rollers 30 and 69, as in Fig. 6. Thus, if the free end portion of web B is visible through opening 104 of the cover, this fact indicates that at least a portion of the lower stack A' still remains within the dispenser as well as the full upper stack B'. However, if the attendant cannot observe the leading edge portion of web B through the opening 104, this signifies that the lower stack A' has been exhausted, and that dispensing of the upper stack B' has commenced. In that case, the attendant opens the cover of the dispenser and moves the remainder of the upper stack to the lower shelf 71, whereupon a fresh folded stack of paper toweling is installed upon the upper shelf 72 and the free end portion of the web in such fresh upper stack is then threaded between the spaced apart rollers 30 and 69. Upon closing of the cover, the various parts of the dispenser will be again disposed in the positions of Fig. 6 so that dispensing of the web of paper toweling will continue from the stack on lower shelf 71 and, upon the exhaustion of such stack, dispensing of the web of paper toweling from the stack on upper shelf 72 will then automatically commence, as in Fig. 7.

Although the above described dispenser 10 is intended to successively dispense webs of paper toweling supplied in the form of two folded stacks thereof, it is to be noted that the present invention may be embodied in a dispenser which similarly successively dispenses webs of paper toweling from two supplies thereof which are in the form of rolls, as in Figs. 12, 13 and 14.

The dispenser 10a of Figs. 12, 13 and 14 is generally similar to the previously described dispenser 10 and differs from the latter obviously in the means for mounting the two supplies of paper toweling within the cabinet and in the means for sensing the depletion of the lower supply of paper toweling and responding thereto in order to effect the dispensing of paper toweling from the upper supply. In the illustration of the dispenser 10a, the various parts thereof which correspond to the previously described parts of the dispenser 10 are identified by the same reference numerals, but with the letter "a" appended thereto. Thus, the dispenser 10a includes a cabinet having a back wall 11a, peripherally flanged side walls 13a and 14a, and a bottom wall 15a having an upwardly bent front edge which is spaced from an arcuate guide plate 16a to define a downwardly opening discharge slot 17a. The cabinet further includes a cover having a front wall 18a and a top wall 20a with side walls (not shown) which extend rearwardly outside of the side walls 13a and 14a when the cover is in its closed position.

The dispenser 10a further includes a dispensing roll 28a, the rotation of which is controlled by devices pre-

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viously described in connection with the dispensing roll 28, a pressure roll 30a disposed above dispensing roll 28a in front of a vertical plane passing through the axis of the latter and being pressed downwardly against the dispensing roller 28a so that a downward pull exerted on a web C projecting from slot 17a and passing between rollers 28a and 30a will cause rotation of such rollers. Further, the dispenser 10a has a control roller 69a which is disposed above the pressure roller 30a and which is movable toward and away from the latter in the same manner as the control roller 69 of the first described embodiment.

The cabinet of the dispenser 10a is intended to contain two rolls C' and D' of paper toweling from which lengths of the paper toweling are dispensed successively and without interruption. Preferably, the rolls C' and D' are mounted within the cabinet of dispenser 10a on a structure of the kind disclosed in the application for United States Letters Patent Serial No. 645,343, filed March 11, 1957, by George X. Batlas, one of the applicants herein, and which briefly includes an axle 105 having its opposite ends journaled in the side walls 13a and 14a, and two laterally resilient arms 106 and 107 mounted, at their centers, on the opposite end portions of axle 105 and extending parallel to each other to swing together with the supporting axle 105. Each of the arms 106 and 107 has circular lugs 108 extending from the opposite ends thereof toward the other of the arms so that the lugs 108 of arm 106 and the lugs 108 of arm 107 are adapted to extend axially into, and to rotatably support, the opposite open ends of the usual hollow tubular cores of the rolls C' and D'. The arms 106 and 107 are disposed immediately inside the side walls 13a and 14a so that the latter can, in certain dispositions of the support, prevent lateral spreading apart of the arms 106 and 107 and thereby prevent release of the lugs 108 from the ends of the related tubular cores.

In order to permit removal of a core from which all of the paper toweling has been dispensed and the replacement thereof with a full roll, each of the side walls 13a and 14a has a cut-out 109 therein registering with the upper end portion of the adjacent arm 106 or 107 when the support is disposed with the arms 106 and 107 extending vertically so that the upper end portions of the arms can then be sprung or bowed outwardly through the cut-outs 109 to withdraw the lug 108 from the core of the roll disposed in the upper position.

It will be apparent that the core of a roll of paper toweling is releasable from between the lugs 108 only when the ends of the arms 106 and 107 carrying the latter are disposed uppermost and the arm extend vertically. Assuming that the dispenser 10a is operative to dispense all of the paper toweling from the lower roll C' and then to automatically dispense paper toweling from the upper roll D', it will be apparent that the core of the exhausted lower roll C' can be removed, and a full roll installed in place thereof, only after the support for the rolls has been rotated through 180 degrees in the clockwise direction as viewed in Figs. 13 and 14 to dispose the empty core at the top. In order to avoid the removal of the lower roll by the attendant at a time when a substantial quantity of paper toweling remains thereon, the back wall 11a of the cabinet is positioned, in relation to the axis of the axle 105, so as to be engaged by the lower roll containing a substantial quantity of paper toweling, and thereby to prevent reversal of the positions of the upper and lower rolls so long as a predetermined quantity of paper toweling remains on the lower roll. Accordingly, the core of the lower roll will be movable to the upper position, for removal and replacement by a full roll, only after the paper toweling of the lower roll has been fully dispensed, thereby avoiding the wasteful discarding of a roll having substantial quantities of paper toweling remaining therein.

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In the dispenser 10a, the control roller 69a has the opposite ends of its axle 81a slidably guided in arcuate slots 110 formed in side walls 13a and 14a, and tension springs 111 are connected between the ends of shaft 81a and suitable anchors on the side walls 13a and 14a to urge the control roller 69a upwardly away from pressure roller 30a so that, when the web D from roll D' is threaded between rollers 69a and 30a, the web D will remain immobile, as in Fig. 13 during the feeding of substantially all of the web C from the roll C'.

In order to urge the roller 69a against pressure roller 30a upon the depletion of the roll C', the dispenser 10a further includes a lever 112 pivotally mounted intermediate its ends, as at 113, on each of side walls 13a and 14a, with the forward end of each lever 112 bearing downwardly on the adjacent end of the shaft 81a of the control roller. The rear end of each lever 112 extends across a vertical slot 114 in the related side wall 13a or 14a which is directed radially with respect to the axis of rotation of the lower roll C', and the opposite ends of a shaft 115 are slidably received in the slot 114 with a roller 116 being rotatable on the shaft 115 and engageable with the underside of the roll C'. Springs 117 are connected between the ends of the shaft 115 and suitable anchors 118 extending from side walls 13a and 14a in order to urge the roller 116 upwardly for maintaining rolling contact between roller 116 and the surface of roll C' as paper toweling is dispensed from the latter to reduce the diameter thereof.

The pivot 113 of lever 112 is disposed so that when the paper toweling of roll C' is substantially depleted, as in Fig. 14, the ends of shaft 115 carrying the roller 116 will act upwardly against the levers 112 to cause pivoting of the latter in the clockwise direction, as viewed in Figs. 13 and 14, whereby the forward ends of the levers 112 will act downwardly on the end of shaft 81a to move the control roller 69a against pressure roller 30a. It will be apparent that, in order to obtain the foregoing operation of the dispenser 10a, the springs 117 urging roller 116 upwardly must be sufficiently strong to overcome the action of the springs 111 which urge the control roller 69a upwardly away from pressure roller 30a.

When the control roller 69a moves against the pressure roller 30a in response to the depletion of the lower roll C', the web D from the upper roll D' will be moved rearwardly over the pressure roller and thereby folded between the web C and the pressure roller 30a in order to commence the dispensing of the web D, as has been previously described in connection with Fig. 8 of the drawings.

It will be apparent that the previously described dispensers 10 and 10a are both operative to successively dispense paper toweling from two different sources or supplies thereof within the cabinet so that, when one source or supply is depleted and toweling is being dispensed from the other source or supply, the exhausted or depleted supply may be replenished without discarding or wasting the paper toweling remaining in the cabinet. Further, it will be apparent that, in both described embodiments of the invention, the successive dispensing of paper toweling from two different folded stacks or rolls thereof is achieved without resort to any alteration or modification of the conventional paper toweling, thereby to avoid any increase in the cost of the latter.

Although illustrative examples of the invention have been described in detail herein with reference to the accompanying drawings, it is to be understood that the invention is not limited to such examples or embodiments, and that various changes and modifications may be effected therein without departing from the scope or spirit of the invention, except as defined in the appended claims.

What is claimed is:

1. A dispenser for continuous sheet material comprising a cabinet having a discharge slot, means within

said cabinet for supporting two sources of sheet material, two rollers in rolling contact with each other in said cabinet and between which the sheet material from one of said sources initially passes prior to projecting from the cabinet through said discharge slot so that said two rollers are rotated in response to the withdrawal of the sheet material from the cabinet, a third roller mounted for movement toward and away from one of said two rollers, and means for displacing said third roller relative to said one roller, said displacing means being operative to hold said third roller spaced substantially from said one roller so long as a predetermined amount of sheet material remain in said one source so that the sheet material from the other source can then remain immobile between said one roller and said third roller, and to move said third roller against said one roller when the sheet material in said one source decreases beyond said predetermined amount so that the sheet material from the other source is then frictionally engaged by said one roller and said third rollers and thereby fed between said two rollers with the sheet material from said one source to project the sheet material from said other source through said discharge slot for withdrawal from the cabinet.

2. A device for automatically dispensing two continuous webs of sheet material in succession, comprising a cabinet having a downwardly opening discharge slot, means in the cabinet for supporting the two webs to be dispensed, a dispensing roller rotatably mounted in said cabinet, a pressure roller rotatably mounted in said cabinet parallel to said dispensing roller and pressed against the latter so that, when one of said webs is passed between said dispensing and pressure rollers and then withdrawn from said cabinet through said discharge slot, said rollers are rotated, a control roller extending parallel to said pressure roller and located with respect to the latter substantially in diametrical opposition to said dispensing roller, means mounting said control roller for movement toward and away from said pressure roller, and means for displacing said control roller acting in response to the amount of said one web remaining in said cabinet to hold said control roller substantially spaced from said pressure roller so long as the remaining amount of said one web exceeds a predetermined value so that the other web can extend between said control and pressure rollers and remain immobile during rotation of said pressure and dispensing rolls, and to move said control roller against said pressure roller when the remaining amount of said one web falls below said predetermined value so that said other web between the control and pressure rollers is then frictionally engaged by the latter and fed with said one web between said pressure and dispensing rollers to project said other web through said discharge slot for withdrawal from said cabinet.

3. A device for automatically dispensing two continuous webs of sheet material in sequence, comprising a cabinet having a downwardly opening discharge slot, means in said cabinet for supporting the two webs to be dispensed, a dispensing roller rotatably mounted in said cabinet above said slot, a pressure roller rotatably mounted in said cabinet above said dispensing roller and urged against the latter so that, when one of said webs is withdrawn through said slot after passing downwardly in back of said pressure roller and then forwardly between said pressure and dispensing rollers, said rollers are thereby rotated, a control roller above said pressure roller mounted for movement toward and away from said pressure roller so that, when the other web is passed downwardly in back of said control roller and then forwardly between said pressure and control rollers, the spacing of said control roller from said pressure roller permits said other web to remain immobile as said pressure and dispensing rollers are rotated in response to withdrawal of said one web, while the movement of said control roller against said pressure roller causes the

rotation of the latter to move said other web rearwardly into frictional engagement with said one web for passage with the latter between said pressure and dispensing rollers and out of said slot where said other web is then exposed for withdrawal from the cabinet, and actuating means for said control roller acting in response to the amount of said one web remaining in said cabinet to hold said control roller spaced from said pressure roller so long as the remaining amount of said one web exceeds a predetermined value and to move said control roller against said pressure roller when the remaining amount of said one web decreases below said predetermined value, thereby to automatically expose said other web for withdrawal from the cabinet prior to the complete exhaustion of said one web.

4. A device as in claim 3; further comprising means defining a cutting edge extending parallel to said discharge slot, and means periodically arresting the rotation of said dispensing roller so that the length of a web projecting out of said slot can then be separated from the remainder of the web in the cabinet by tearing the web along said cutting edge.

5. A device as in claim 4; further comprising a timing mechanism operatively associated with said means periodically arresting the rotation of said dispensing roller to adjustably determine the extent of the time during which rotation of the dispensing roller is arrested.

6. A device as in claim 5; wherein said means periodically arresting the rotation of said dispensing roller includes a cam member rotatable with the latter and having a spiral cam surface with radially inner and outer ends connected by a radial shoulder and a stop surface extending across said radially outer end of the spiral cam surface and spaced from said radial shoulder, a follower pin movable radially with respect to the axis of rotation of said cam member, and resilient means urging said follower pin radially inward, said pin having a diameter less than the space between said stop surface and shoulder so that, during rotation of said dispensing roller, said follower pin rides on said spiral cam surface and is moved radially outward into the path of said stop surface to be engaged by the latter for halting the rotation of the dispensing roller, whereupon, said follower pin moves radially inward between said shoulder and stop surface to again engage the radially inner end of the spiral cam surface and thereby release said dispensing roller for renewed rotation; and wherein said timing mechanism includes a rod movable with said follower pin and carrying a piston, a cylinder having said piston reciprocable therein, and means for restricting the flow of fluid past said piston in said cylinder during the movement of said rod corresponding to the radially inward movement of said follower pin so that such radially inward movement of the pin is slowed to delay the release of the dispensing roller for renewed rotation.

7. A device as in claim 6; wherein said piston is loosely slidable on said rod to define an annular clearance therebetween, and said means for restricting the flow of fluid past said piston includes a sleeve slidable on said rod, means for securing said sleeve with respect to said rod in an adjusted position along the latter, and a sealing ring on said rod between said sleeve and said piston to substantially seal said clearance between said piston and rod when said sealing ring is moved against an end face of the piston by said sleeve, said end face of the piston having a radial groove of small cross-sectional area through which fluid can leak past said sealing ring.

8. A device for automatically dispensing sheet material from first and second folded stacks thereof in sequence, comprising a cabinet having a downwardly opening discharge slot, lower and upper shelves in said cabinet for supporting the first and second stacks, respectively, a dispensing roller rotatably mounted in said cabinet above said slot, a pressure roller rotatably mounted in said cabinet above said dispensing roller and urged against

the latter so that, when the sheet material of said first stack is withdrawn through said slot after passing from said lower shelf downwardly in back of said pressure roller and then forwardly between said pressure and dispensing rollers, said rollers are thereby rotated, a control roller above said pressure roller mounted for movement toward and away from the latter so that, when the sheet material from said second stack is passed downwardly in back of said control roller and then forwardly between said pressure and control rollers, the spacing of said control roller from the pressure roller permits the sheet material therebetween to remain immobile as said pressure and dispensing rollers are rotated, while the movement of said control roller against said pressure roller cause the rotation of the latter to move the sheet material into frictional engagement between said pressure roller and the sheet material from the first stack for movement with the latter between the dispensing and pressure rollers and out of said slot where the sheet material from the second stack is then exposed for withdrawal from the cabinet, and actuating means for said control roller acting in response to the amount of the first stack remaining on said lower shelf to hold said control roller spaced from said pressure roller so long as the remaining amount of said first stack exceeds a predetermined value and to move said control roller against said pressure roller when the remaining amount of said first stack decreases below said predetermined value, thereby to automatically expose the sheet material from the second stack for withdrawal from the cabinet prior to the complete exhaustion of said first stack.

9. A device as in claim 8; wherein said lower shelf is mounted in said cabinet for pivoting about an axis parallel to the axis of said control and pressure rollers; and wherein said actuating means for the control roller includes means mounting said control roller on said lower shelf so that tilting of the latter effects movement of said control roller toward and away from said pressure roller, means yieldably urging said lower shelf to tilt in the direction moving said control roller toward said pressure roller, and a control member projecting from said cabinet above said lower shelf and adapted to engage between folds of said first stack when the latter is loaded on said lower shelf so that a predetermined number of folds at the bottom of said first stack are interposed between said lower shelf and said control member to prevent tilting of said lower shelf in said direction moving said control roller toward said pressure roller until the folds at the bottom of the first stack have been withdrawn from said cabinet.

10. A device as in claim 8; wherein said lower shelf is mounted in said cabinet for pivoting about an axis parallel to the axes of said control and pressure rollers between a horizontal position and a tilted position in which the front edge and the back edge of said lower shelf are respectively lowered and raised; and wherein said actuating means for the control roller includes means rotatably supporting said control roller from said lower shelf so that said control roller is spaced from said pressure roller when said lower shelf is in said horizontal position and said control roller bears against said pressure roller when said lower shelf is in said tilted position, first spring means yieldably urging said lower shelf to said tilted position, and a fixed control member projecting forwardly in said cabinet over said back edge of the lower shelf and spaced upwardly from the latter when said lower shelf is in its horizontal position so that a predetermined number of folds at the bottom of said first stack are interposed between said control member and the lower shelf to prevent pivotal movement of the latter to said tilted position until the folds at the bottom of said first stack have been withdrawn from the cabinet.

11. A device as in claim 10; wherein said cabinet further includes a cover movable between a closed position and an open position in which the interior of said cabinet is exposed to permit the loading of folded stacks of sheet material on said shelves; and further comprising spring actuated means operative, only when said cover is in said open position, to overcome the effect of said first spring means and, thereby, to hold said lower shelf in said horizontal position so that the back edge of the lower shelf will be spaced downwardly from said fixed control member for accommodating the folds at the bottom of said first stack therebetween during the loading of said first stack on said lower shelf.

12. A device as in claim 11; wherein said spring actuated means for holding the lower shelf in its horizontal position only when said cover is open includes a laterally extending member pivoted about an axis parallel to the pivoting axis of the lower shelf and arranged adjacent said front edge of the lower shelf, said laterally extending member having rearwardly directed portions extending under said front edge of the lower shelf and movable between horizontal and downwardly inclined positions where said rearwardly directed portions respectively hold said lower shelf in said horizontal position and permit pivoting of said lower shelf to said tilted position, second spring means acting on said laterally extending member to pivot the latter in the direction moving said rearwardly directed portions to said horizontal positions with a force exceeding the force exerted by said first spring means on said lower shelf, and means actuated by said cover, on movement of the latter to said closed position, to positively pivot said laterally extending member in the direction moving said rearwardly directed portions to said inclined positions so that said lower shelf is then released for pivoting to said tilted position.

13. A device as in claim 12; wherein said laterally extending member is in the form of a rim which is substantially vertically directed when said rearwardly directed portions are downwardly inclined to retain said first stack on said lower shelf, and which is forwardly inclined when said rearwardly directed portions are horizontal, thereby to facilitate loading of the first folded stack on the lower shelf.

14. A device as in claim 11; further comprising a leaf spring mounted within said cabinet, and diverging downwardly from the back of the latter toward the front edge of said fixed control member to prevent the improper loading of said first stack on said lower shelf with the bottom of said first stack resting on said fixed control member, and means on the inside of said cover engageable with said first stack during movement of said cover to its closed position to displace the first stack rearwardly against said leaf spring so that folds at the bottom of the first stack enter between said fixed control member and said lower shelf.

15. A device as in claim 11; wherein said means rotatably supporting said control roller from said lower shelf includes a frame having support members extending rearwardly from said control roller at the opposite ends of the latter, and means slidably connecting said support members to said lower shelf so that said frame pivots with the latter while being free to move with respect to said shelf between a forward loading position, where said control roller is spaced forwardly from said pressure roller to facilitate the initial passage of the sheet material from said second stack between said control and pressure rollers, and a rearward operative position where said control roller is above said pressure roller, said frame being engageable by said cover, upon movement of the latter to its closed position, to move said frame to said operative position with respect to said lower shelf.

16. A device for automatically dispensing sheet material from first and second rolls thereof in sequence, comprising a cabinet having a downwardly opening discharge slot, means in said cabinet for rotatably support-

ing said first and second rolls of sheet material in upper and lower positions, respectively, a dispensing roller rotatably mounted in said cabinet above said slot, a pressure roller rotatably mounted in said cabinet above said dispensing roller and urged against the latter so that, when sheet material from said first roll is withdrawn through said slot after passing downwardly in back of said pressure roller and then forwardly between said pressure and dispensing rollers, said rollers are thereby rotated, a control roller above said pressure roller mounted for movement toward and away from the latter so that, when the sheet material from said second roll is passed downwardly in back of said control roller and then forwardly between said pressure and control rollers, the spacing of said control roller from said pressure roller permits the sheet material therebetween to remain immobile as said pressure and dispensing rollers are rotated, while the movement of said control roller against said pressure roller causes the rotation of the latter to move the sheet material from the second roll rearwardly over the pressure roller into frictional engagement between said pressure roller and the sheet material from said first roll for movement with the latter sheet material between the dispensing and pressure rollers and out of said slot where the sheet material from the second roll is then exposed for withdrawal from the cabinet, and actuating means for said control roller acting in response to the diameter of said first roll to hold said control rollers spaced from said pressure roller so long as the diameter of said first roll exceeds a predetermined value and to move said control roller against said pressure roller when the diameter of said first roll decreases below said predetermined value, thereby to automatically expose the sheet material of said second roll for withdrawal from the cabinet prior to the complete exhaustion of said first roll.

17. A device as in claim 16; wherein said actuating means includes first spring means urging said control roller in the direction away from said pressure roller, a follower roller mounted for movement radially with respect to the axis of the first roll, second spring means urging said follower radially toward said axis of the first roll so that said follower roller moves radially in accordance with decreases in the diameter of said first roll, and lever means pivotally mounted on said cabinet and engageable with said follower and control rollers to move said control roller against said pressure roller as said follower roller moves radially inward with the reduction of diameter of said first roll below said predetermined value.

18. In a towel dispenser having a roller which is rotated during dispensing operation and a locking mem-

ber which is moved from a release position to a locking position during a dispensing operation in order to halt rotation of said roller at the completion of a dispensing operation and which is thereafter returned to said release position to permit renewed rotation of the roller; a mechanism for timing the return of said locking member to said release position comprising a rod connected with said locking member to move longitudinally in one direction in response to return of said locking member to its release position and in the opposite direction in response to movement of said locking member from said release position to said locking position, a piston loosely slidable on said rod to define an annular clearance therebetween, a fluid containing cylinder having said piston reciprocable therein, first abutment means on said rod at the side of said piston facing in said one direction of movement of the rod and engageable with said piston during movement of said rod in said opposite direction to cause said piston to move with said rod in said opposite direction, second abutment means on said rod at the side of said piston facing in said opposite direction of movement of the rod and operative to cause movement of said piston with said rod in said one direction of movement of the latter so that the resistance to movement of said rod is determined by the resistance to the flow of fluid through said clearance during movement of said piston with said rod, and a sealing ring on said rod between said second abutment means and said piston to substantially seal said clearance when said ring is moved against an end face of the piston by said second abutment means, said end face of the piston having a radial groove of small cross-sectional area through which fluid can leak past said sealing ring while providing substantial resistance to movement of said rod in said one direction corresponding to return of the locking member to its release position, thereby to delay said return to the release position.

19. In a towel dispenser, a timing mechanism as in claim 18; wherein said second abutment means includes a sleeve slidable on said rod, and means for securing said sleeve with respect to said rod in an adjusted position along the latter, thereby to vary the length of the stroke of said rod in said one direction during which said sealing ring is pressed against said end face of the piston for correspondingly varying the extent of the delay of said return of the locking member to its release position.

References Cited in the file of this patent

UNITED STATES PATENTS

1,443,573	Hinckley	Jan. 30, 1923
2,847,264	Tansley	Aug. 12, 1958