Dec. 21, 1943. L. L. PRICE 2,337,065

CONTROLLED INTERFOLD DISPENSER

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Fig. 1

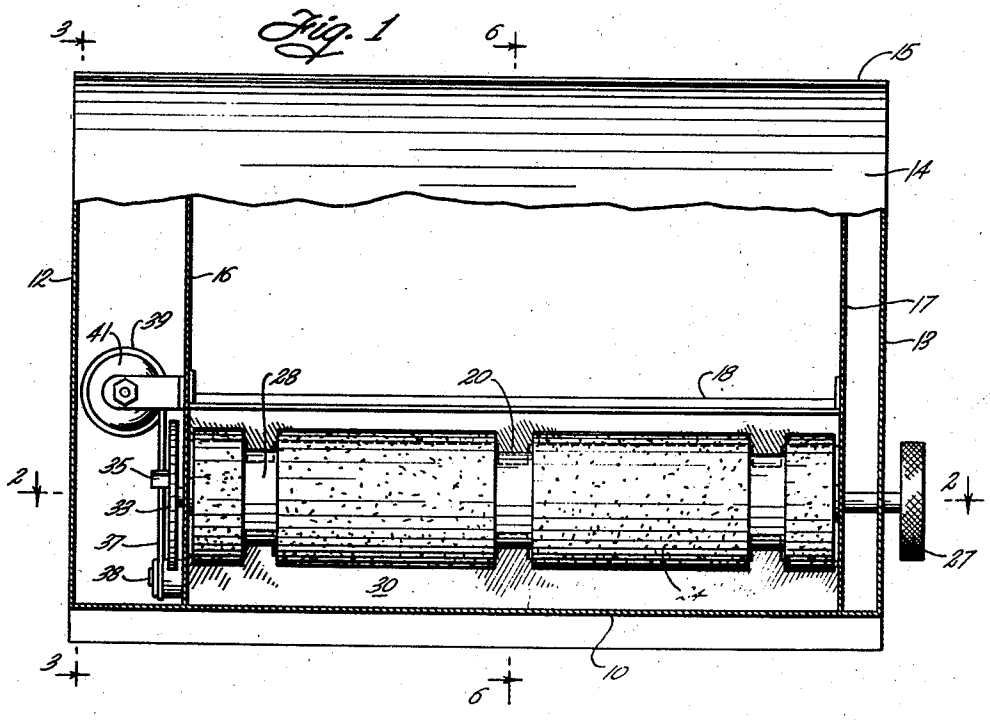
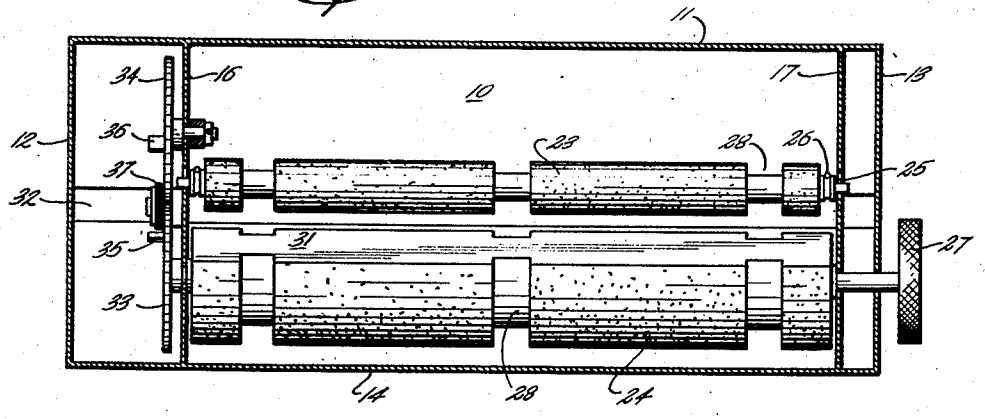


Fig. 2



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Fig. 3

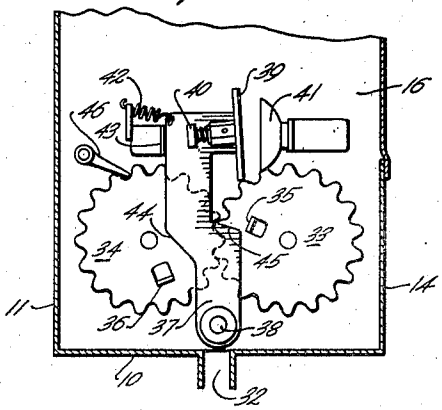


Fig. 6

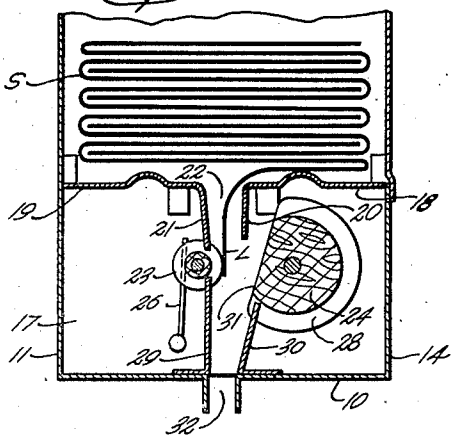


Fig. 4

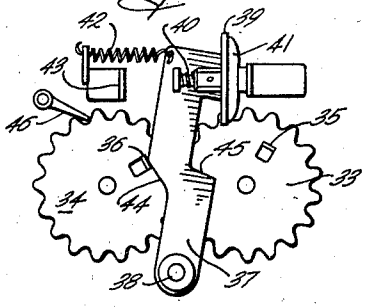


Fig. 7

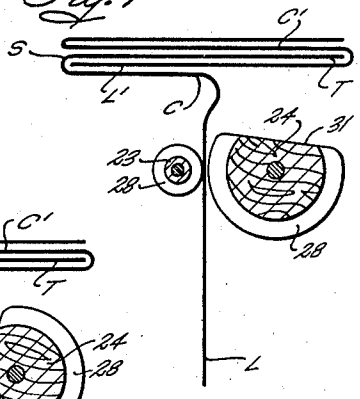


Fig. 8

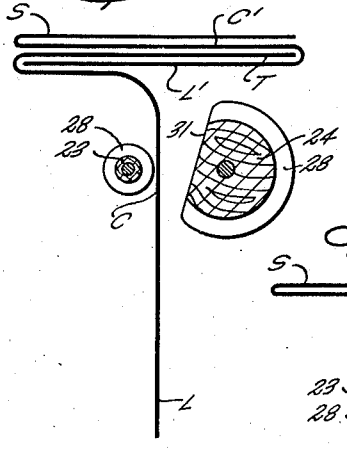


Fig. 5

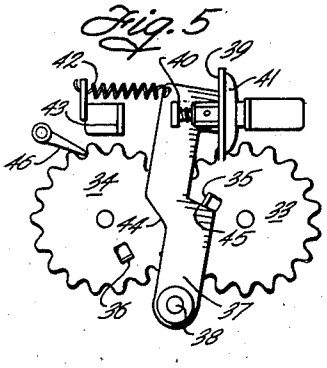
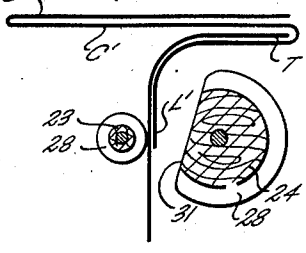


Fig. 9



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Fig. 10

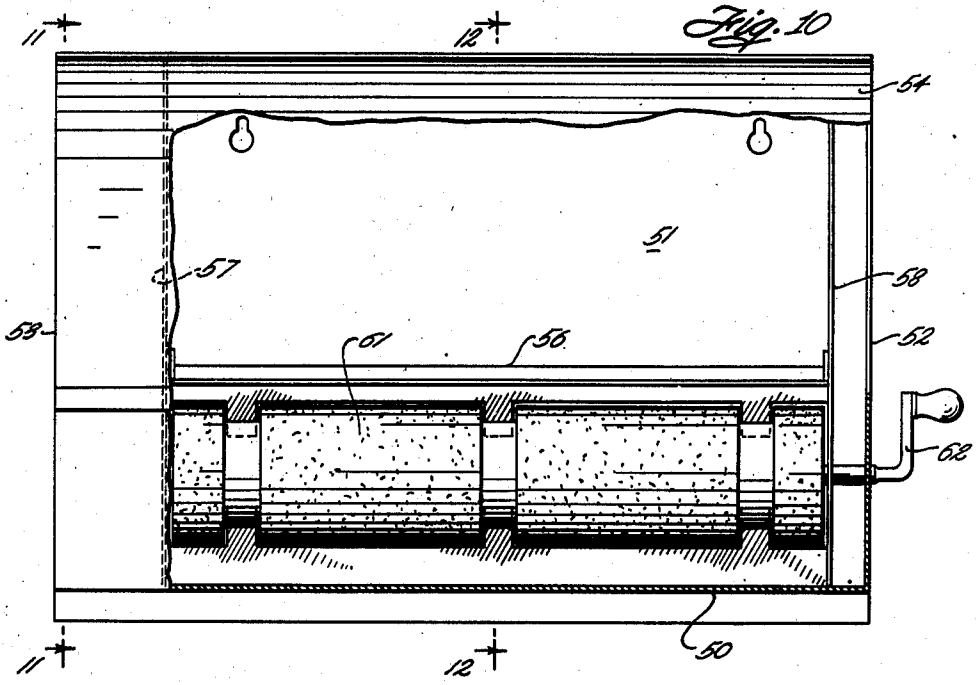
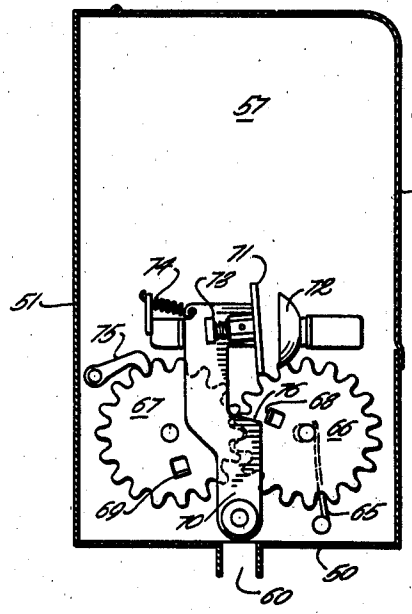


Fig. 11



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Fig. 12

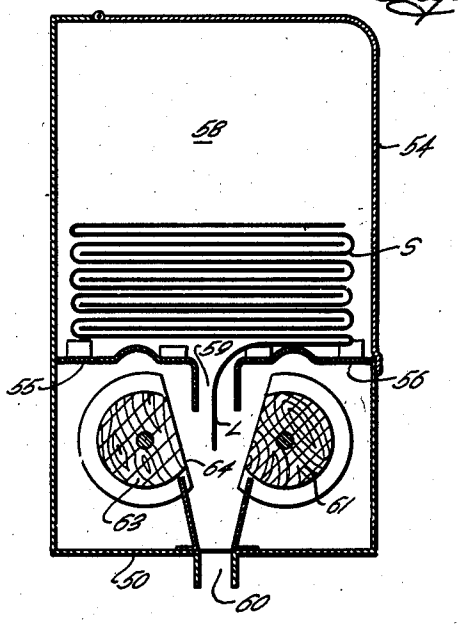


Fig. 13

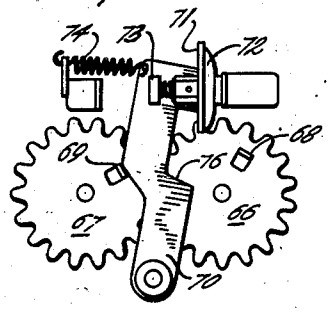


Fig. 14

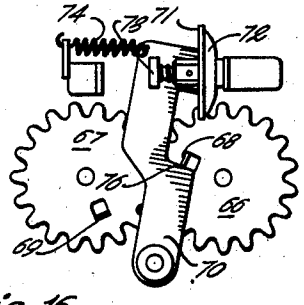


Fig. 15

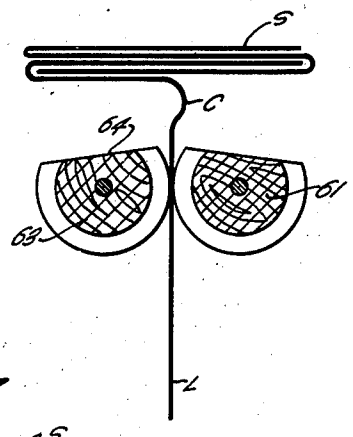


Fig. 16

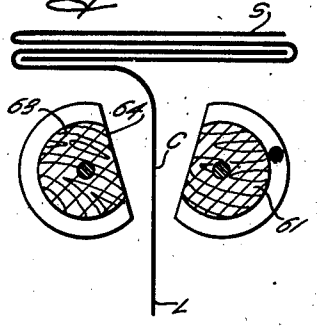
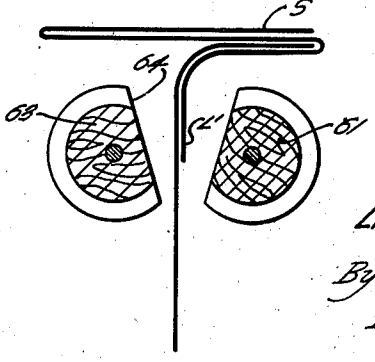


Fig. 17



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Patented Dec. 21, 1943

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UNITED STATES PATENT OFFICE

2,337,065

CONTROLLED INTERFOLD DISPENSER

Laurence L. Price, Los Angeles, Calif., assignor, by mesne assignments, to Philip A. Wooster

Application April 30, 1940, Serial No. 332,423

2 Claims. (Cl. 312—53)

This invention relates to improvements in dispensers of sheet material, such as for example, paper toweling.

Paper toweling is now on the market wherein the individual paper towels are separated from one another and folded together so that each towel has a leading portion partially overlapping and interfolded with a portion of the preceding towel and a trailing portion which is similarly overlapping and interfolded with a portion of the succeeding towel. Supplies of such towels are usually delivered and handled in stacked condition.

An object of the present invention is to provide a dispensing mechanism for dispensing towels or the like from such a stacked supply. In this dispensing mechanism it is necessary that a towel be removed from the stack and then released so that the trailing portion of the towel may be pulled from the device leaving the leading portion of the succeeding towel in a position to be engaged upon a subsequent operation of the dispensing mechanism. It has heretofore been proposed to devise a mechanism of this character using a pair of opposed rolls, one of which is relatively movable toward and away from the other to accomplish the engagement with the toweling during dispensing and to disengage or release the toweling to permit withdrawal of the trailing portion of the dispensed towel. By a construction involving the use of a roll which shifts toward and away from its opposed roll, an unnecessary number of moving parts may be employed and the mechanism is rendered somewhat complicated. Particularly is this true, where a time delay mechanism is incorporated which causes a time delay to occur between successive operations of the dispensing apparatus.

An object of the present invention is therefore to provide an improved simplified mechanism for dispensing towels or like sheet material which are interfolded one within the other and which are grasped or pinched and then released during the dispensing whereby the number of moving parts employed is greatly reduced.

It is also an object of the invention to provide a simplified mechanism or apparatus having the above-described characteristics which is so designed that a simple, yet efficient time delay mechanism may be incorporated therein.

Still a further object of the invention is to provide an improved and simplified time delay mechanism which may be employed either in dispensing devices for interfolded towels or in any other type of dispensing mechanism wherein it is desired to incorporate a time delay means.

Another object of the invention is to provide a towel dispensing apparatus wherein adjustment can be easily accomplished to make the device properly dispense towels of varying lengths.

With the foregoing and other objects in view, which will be made manifest in the following detailed description and specifically pointed out in the appended claims, reference is had to the accompanying drawings for an illustrative embodiment of the invention, wherein:

Figure 1 is a front view in elevation parts being broken away and shown in vertical section of the preferred form of the improved towel dispensing apparatus.

Fig. 2 is a horizontal section taken substantially upon the line 2—2 upon Fig. 1;

Fig. 3 is a partial vertical section taken substantially upon the line 3—3 upon Fig. 1 in the direction indicated illustrating the time delay mechanism in its initial position;

Fig. 4 is a view illustrating the time delay mechanism as having been shifted to its set position;

Fig. 5 is a view similar to Fig. 4 illustrating the manner in which the time delay mechanism arrests rotation of the feed roll of the device during the time delay period;

Fig. 6 is a partial view in vertical section taken substantially upon the line 6—6 upon Fig. 1 in the direction indicated, the feed roll being shown in that position which it occupies when the time delay mechanism is in the position shown in Fig. 3;

Fig. 7 is a sectional view illustrating the feed roll in that position that it assumes when the time delay mechanism is in the position shown in Fig. 4;

Fig. 8 is a view similar to Fig. 7, illustrating the roll in that position that it assumes when the time delay mechanism is in the position shown in Fig. 5;

Fig. 9 is a view similar to Fig. 7 illustrating the manner in which withdrawal of the released and dispensed towel positions the leading portion of the succeeding towel in a position between the rolls so as to be capable of being dispensed thereby;

Fig. 10 is a view similar to Fig. 1, illustrating an alternative form of construction that may be employed;

Fig. 11 is a sectional view taken substantially upon the line 11—11 upon Fig. 10;

Fig. 12 is a sectional view taken substantially upon the line 12—12 upon Fig. 10 in the direction indicated;

Fig. 13 is a view of the time delay mechanism illustrating the time delay mechanism in its set position at the start of the time delay period;

Fig. 14 is a view similar to Fig. 13, illustrating the time delay mechanism in that position wherein rotation of the feed roll is arrested;

Fig. 15 is a view illustrating the manner in which the rolls of the mechanism illustrated in Figs. 10 to 14, engage and dispense the toweling;

Fig. 16 is a view similar to Fig. 15 illustrating the manner in which the rolls release the toweling; and

Fig. 17 is a view similar to Fig. 15, illustrating the manner in which the withdrawal of the trailing end of one towel serves to position the leading end of a succeeding towel in such a position as to be engageable by the rolls.

Referring to the accompanying drawings wherein similar reference characters designate similar parts throughout, and referring first to the device as illustrated in Figs. 1 to 9, inclusive, the improved dispensing apparatus comprises a suitable cabinet having a bottom wall 10, a back wall 11, end walls 12 and 13, and a front wall 14. Front wall 14 is usually hinged adjacent the top of the back wall as by a hinge 15. Within the cabinet there are disposed partitions 16 and 17. Between the front and back walls there are suitable supports, the front support being indicated at 18 and the rear support at 19 which serve to support a stack of the interfolded paper towels indicated at S. The rear edge of the forward support 18 is bent downwardly as at 20 and the forward edge of the rear support 19 is likewise bent downwardly as indicated at 21, these downwardly bent portions being spaced from each other to provide a feed mouth 22 leading between opposed rolls 23 and 24. The roll 23 may be regarded as an idler or pinch roll and is journaled in the partitions 16 and 17. Although not absolutely necessary the journaling connection for this roll is preferably loose as indicated at 25 and springs 26 bear upon this roll so as to yieldably urge it toward the opposed roll 24. The roll 24 may be regarded as a feed roll and is rotatably mounted in the partitions 16 and 17. At one end thereof it is equipped with a suitable handle 27 by which it may be manually rotated. Both rolls are preferably circumferentially grooved as indicated at 28 and portions of the downwardly bent edges 20 and 21 extend into the grooves. Similarly, portions of sheet metal members 29 and 30 which are mounted on the bottom wall 10 extend into these grooves. The portions that enter the grooves 28 on the rolls 23 and 24 serve to prevent toweling or like sheet material from following either roll and consequently becoming jammed in the mechanism. They serve somewhat as strippers, stripping the paper from either roll that it has any tendency to follow.

The major portion of the peripheral surface of roll 24 is so arranged as to be engageable with the peripheral surface of roll 23 so as to grasp or pinch upon the leading portion L of a paper towel that may be positioned therebetween. Along one side, however, the roll 24 is flattened as indicated at 31 so that when this flattened portion is disposed opposite roll 23 the leading portion L is disengaged or released as clearly shown in Fig. 6. In the bottom 10 of the container there is a slot 32 through which the towel that is dispensed by the rolls is discharged. On the end of roll 24 opposite handle 27 there is mounted a gear 33 which meshes with an idler gear 34 which is rotatably mounted on partition 16.

Each gear has a lug struck out of its body portion, the lugs being indicated at 35 and 36. They are so arranged as to be capable of engaging the opposite edges of a lever or movable member 37 illustrated as being pivoted at 38. The lever or movable member 37 carries a plate or seat 39 in which is formed a small aperture that is controlled by an adjustable needle valve 40. This plate or seat is engageable with a small rubber vacuum cup 41 which is stationarily mounted on the outer side of partition 16. The lever or movable member 37 is urged out of engagement with the vacuum cup by means of a tension spring 42 adjacent which there is a bumper or stop 43 against which the lever 37 is pulled. The rear edge of the lever or movable member 37 is shifted to provide a cam edge 44 that is engageable by lug 36 to move the lever or movable member 37 from the position shown in Fig. 3 into the position shown in Fig. 4 wherein the seat or plate 39 is forced against the vacuum cup 41 to cause the plate to be vacuum attached to the vacuum cup for the time delay period. The forward edge of the lever 37 is provided with a shoulder 45 constituting a stop that is engageable by the lug 35. Lug 35 constitutes a rotary stop that is rotatable with the rotation of feed roll 24 capable of engaging this shoulder 45 as illustrated in Fig. 5 to arrest rotation of the roll 24 during the time delay period.

The operation of the above-described construction is as follows. Figs. 3 and 6 illustrate the mechanism in starting position. When it is desired to withdraw a towel from the stack S, handle 27 is manually rotated which produces rotation of roll 24 until its cylindrical surface engages and pinches upon the leading portion L of the lowermost towel. Continued rotation of the roll causes the lowermost towel to be pulled from the bottom of the stack and also causes the leading portion L to be discharged through the outlet opening 32.

The first portion of the revolution of the roll 24 causes gears 33 and 34 to rotate from the position shown in Fig. 3 to the position shown in Fig. 4, wherein lug 36 engages the lever or movable member 37 and causes the plate 39 to be forced against vacuum cup 41, thus causing the plate and vacuum cup to be temporarily vacuum attached.

As rotation of roll 24 continues the gears 33 and 34 move from the position shown in Fig. 4 to the position shown in Fig. 5 wherein the lug or rotary stop 35 engages the shoulder on lever 37, thus arresting further rotation of roll 24. During the rotation of roll 24 and consequently of gears 33 and 34 from the position shown in Fig. 3 to the position shown in Fig. 4, the roll 24 rotates from the position shown in Fig. 6 to the position shown in Fig. 7. During the rotation of gears 33 and 34 from the position shown in Fig. 4 to the position shown in Fig. 5, roll 24 rotates from the position shown in Fig. 7 to the position shown in Fig. 8. In the position shown in Fig. 8 it will be noted that the flattened portion 31 is disposed opposite roll 23 thus releasing or disengaging the center portion C of the towel. The trailing portion T still remains folded between the leading portion L′ and the center portion C′ of the succeeding towel. The leading portion L which has been projected through the outlet opening 32 then can be grasped and pulled from the dispensing mechanism. This pulling of the towel causes the leading portion L′ of the succeeding towel to be swung downwardly between the rolls as shown in Fig. 9 during the withdrawal of the trailing portion T. Thus, on removal of the towel the leading portion L′ of the succeeding towel is positioned between the rolls in the same position as that illustrated in Fig. 6 and the machine is ready for a subsequent operation.

Subsequent operation of the device however is

delayed by the time delay mechanism. The needle valve 40 permits air to slowly enter through the plate or seat 39 and to destroy or annul the vacuum attachment between the plate and the vacuum cup. The length of time required to accomplish this depends upon the seating of the needle valve but when it is accomplished the tension spring 42 becomes effective to return the lever 37 from the position shown in Fig. 5 to the position shown in Fig. 3 wherein shoulder 45 has moved out of the path of the lug or rotary stop 35. Thus at the end of the time delay period the machine is ready for subsequent operation. Reverse rotation of roll 24 and consequently of gears 33 and 34 is prevented by means of a back-up pawl 46 engageable with the teeth of gear 34.

It sometimes occurs that the length of the towels that form the stack S vary. By means of the present mechanism this can be compensated for by substituting a larger or smaller roll 24 or a roll that has a greater or less cylindrical surface. On making such a substitution of rolls it is not necessary to substitute or alter the size of the gears 33 and 34.

While the invention has been described in connection with interfolded towels, it will be appreciated that it may be used with other sheet materials if desired. In some instances, interfolded towels are in the form of doubled towels in which case such doubled towels will be dispensed through the device in substantially the same manner as that above-described in connection with the use of single towels.

In the alternative form of construction illustrated in Figs. 10 to 17, inclusive, the cabinet comprises a bottom wall 50, a back wall 51, end walls 52 and 53, and a front wall or cover 54. The stack S is supported within the container by supports 55 and 56 between the partitions 57 and 58 in substantially the same manner as that previously described and arranged to have the towels progressively dispensed through the throat 59 and the outlet opening 60. The roll 61 is substantially the same in construction as roll 24 and may be manually rotated by means of crank 62. Roll 63 which is opposed to roll 61 is of substantially the same size and shape as roll 61 having an opposed flattened portion 64. In this form of construction one of the rolls is loosely journaled in the partitions 57 and 58 and yieldably urged toward the opposed roll by means of springs 65. The gears 66 and 67 are similar in shape and design to the gears 33 and 34 but gear 67 is rigidly attached to roll 63 while gear 66 is likewise rigidly attached to roll 61. In this form of construction it is necessary to have the gear teeth on the gears 66 and 67 fit each other somewhat loosely in order to permit of the slight adjustment of roll 61 under the action of spring 65.

The time mechanism employed is substantially the same as that previously described comprising lugs 68 and 69 on the gears 66 and 67 respectively which are engageable with the opposite edges of the movable or pivoted lever 70 which carries seat 71 engageable with the vacuum cup 72. The needle valve is illustrated at 73 and the movable member is returned to its initial position by the tension spring 74. The pawl 75 prevents reverse rotation.

The operation of this form of construction is as follows. Figure 11 illustrates the time delay mechanism in its initial position. Fig. 12 illustrates the rolls 61 and 63 in their initial position and in that position corresponding to the position of the time delay mechanism shown in Fig. 11. When roll 61 is rotated by crank 62 through the medium of gears 66 and 67 roll 63 is rotated in the opposite direction so that the cylindrical surfaces on the two rolls are brought into pinching engagement with the leading portion L of the towel. Continued rotation of the rolls brings them into the position shown in Fig. 15 where the time delay mechanism has moved from the position shown in Fig. 11 to the position shown in Fig. 13. Continued rotation of the rolls moves them from the position shown in Fig. 15 to the position shown in Fig. 16 wherein the center portion C of the towel is released and further rotation is temporarily arrested by lug or stop 68 engaging the shoulder 76. On pulling on the projecting portion of the towel the leading portion L' of the succeeding towel is brought downwardly between the rolls as shown in Fig. 17 to position the device ready for subsequent operation as soon as the time period has elapsed allowing a spring 74 to return the lever 70 to the initial position shown in Fig. 11.

From the above-described construction it will be appreciated that the present mechanism has a minimum number of moving parts and that the time delay mechanism is quite simple. It will further be appreciated that the towel is grasped or pinched and dispensed and then released because of the shape of the roll as distinguished from constructions that undertake to shift the roll toward and away from the toweling. By the present construction the rolls rotate about substantially stationary axes except for the slight yieldable adjustment of one roll to compensate for towelings of various thicknesses. If the tread surface of the rolls is made of quite yieldable rubber even this slight adjustment may be eliminated entirely.

Various changes may be made in the details of construction without departing from the spirit or scope of the invention as defined by the appended claims.

I claim:

1. A device for dispensing interfolded towels from a cabinet comprising a pair of rolls disposed beneath a stack of towels in the cabinet, a handle connected directly with one end of one roll by means of which it may be rotated, a pair of meshing gears fixed one to each roll whereby the rolls will rotate in unison, and means for imposing a time delay period between successive operations of the rolls, comprising a pivoted lever and a lug on each of said gears, one of said lugs being engageable with said lever to swing it toward the other gear when the gears are rotated and the other lug engaging the lever to stop the gears.

2. A device for dispensing interfolded towels from a cabinet comprising a pair of rolls disposed beneath a stack of towels in the cabinet, a handle connected directly with one end of one roll by means of which it may be rotated, a pair of meshing gears fixed one to each roll whereby the rolls will rotate in unison, and means for imposing a time delay period between successive operations of said rolls, comprising a pivoted lever, means on one of said gears to engage and swing said lever, and means on the other gear engageable with the lever to cause the gear to stop.

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