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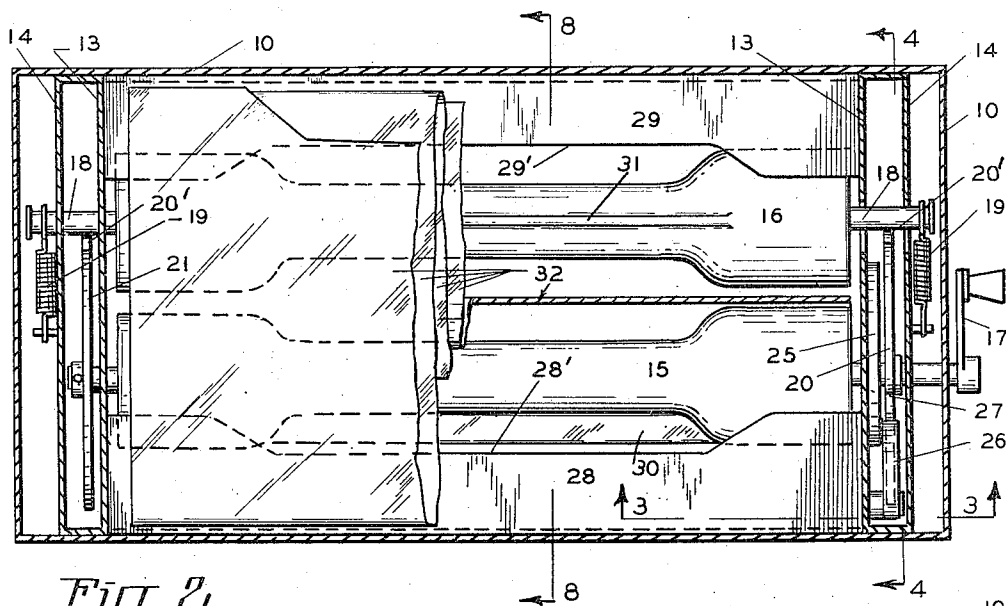


Fig 2

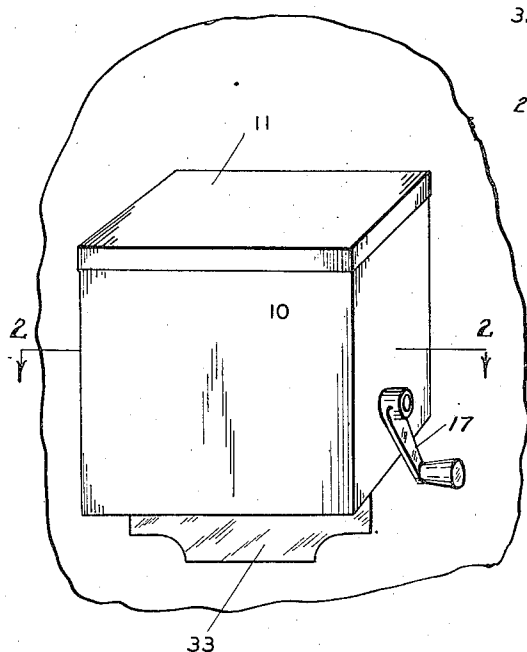
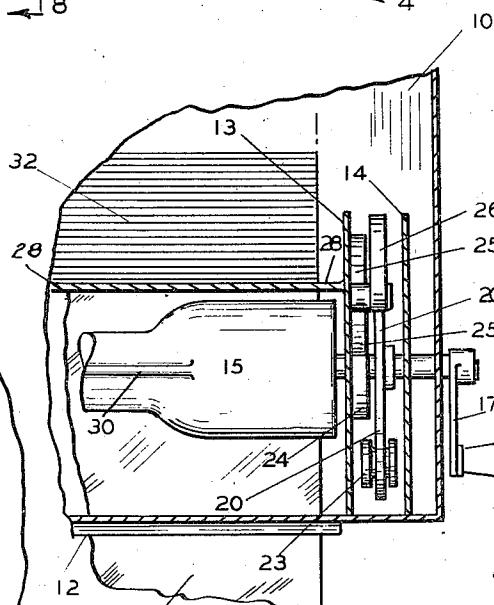


Fig 1



32 *Fig 3*

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FOLDED PAPER TOWEL AND DISPENSER THEREFOR

Filed Sept. 4, 1944

3 Sheets-Sheet 2

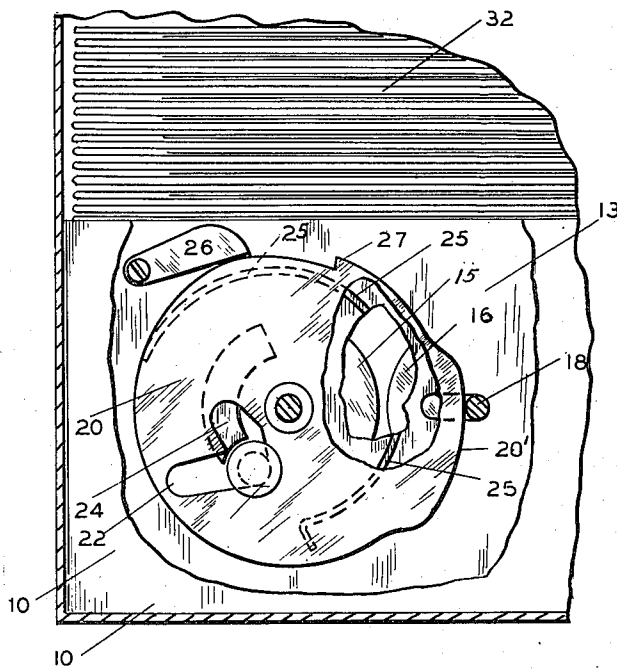


Fig. 4

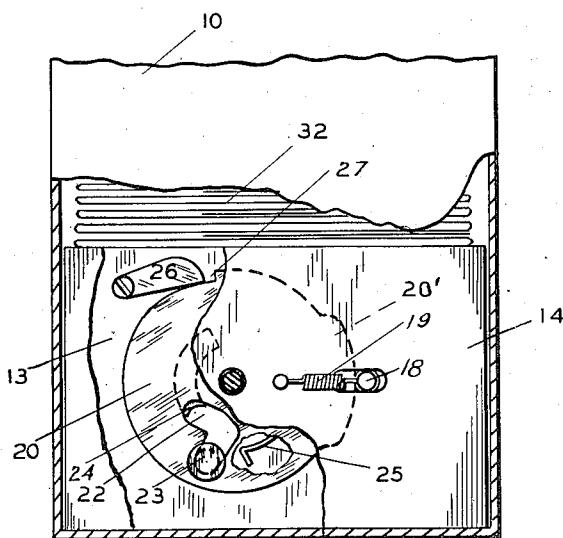


Fig. 5

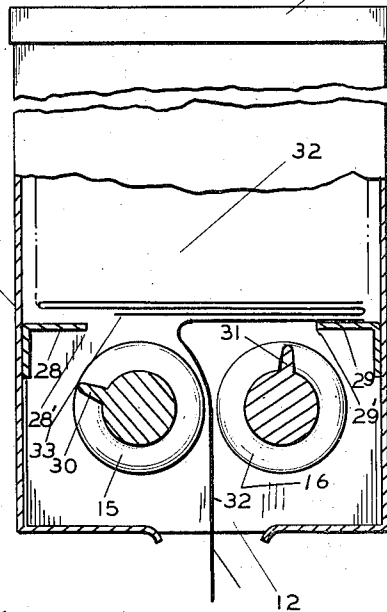
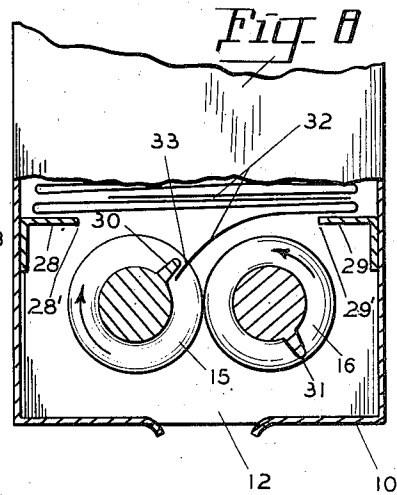


Fig. 9

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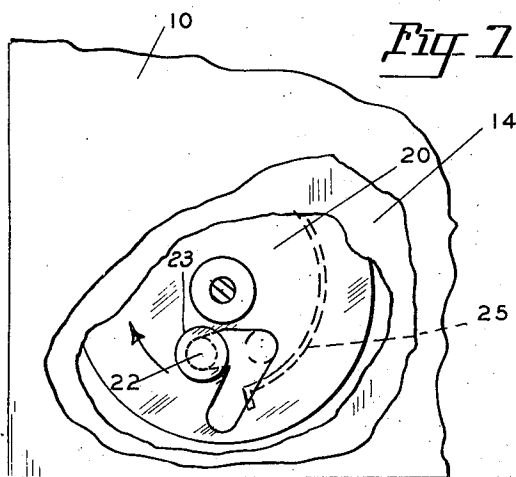
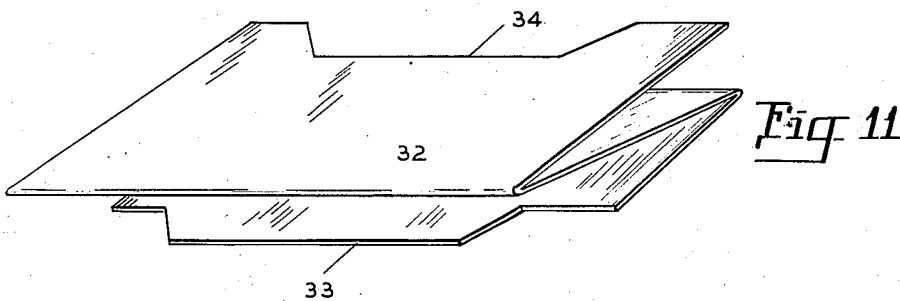
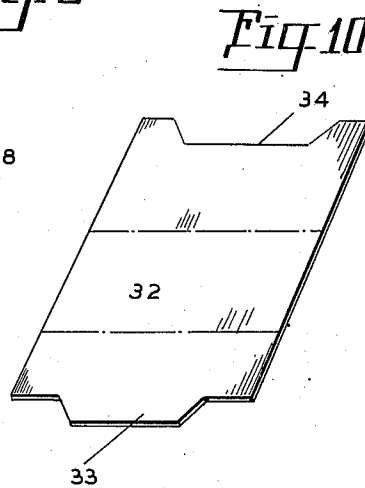
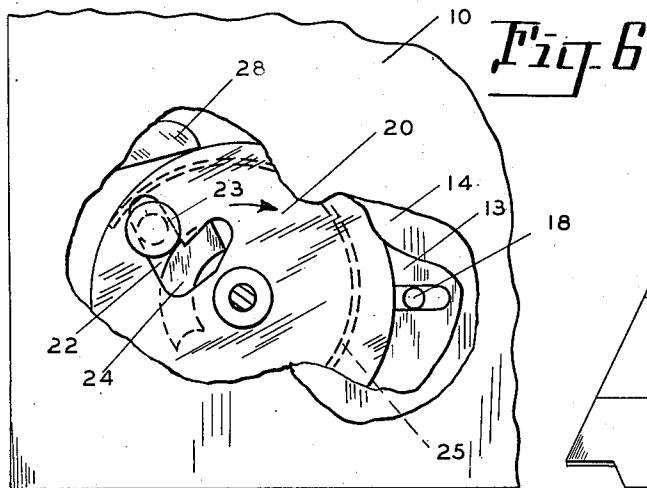
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FOLDED PAPER TOWEL AND DISPENSER THEREFOR

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3 Sheets-Sheet 3



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2,440,993

FOLDED PAPER TOWEL AND DISPENSER
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Application September 4, 1944, Serial No. 552,704

9 Claims. (Cl. 312—37)

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This invention relates to paper towels and dispensing cabinets for the same, and, more particularly, to folded paper towels and means for delivering such towels one at a time from a container or cabinet.

One of the objects of this invention is to provide a folded paper towel with an extended tab so that the protruding end of the tab from the towel cabinet or dispenser will enable the tab to be grasped and thus facilitate the pulling out of the towel.

A common requirement heretofore with separate folded paper towels and the customary dispensing cabinets for them is that the folded rear end of each towel must be "interleaved" with the first fold of the next successive towel, so that as each towel is removed the end of the next towel will be brought into protruding position for subsequent removal of the next towel. While such "interleaving" of the towels in each package can be done by suitable means as the towels are stacked and made into bundles or packages, nevertheless care must be taken when each refill batch of towels is placed in the dispenser to "interleave" the first towel of the refill batch with the last towel of the old batch. Carelessness on the part of the person refilling the container with a new batch of folded towels frequently results in difficulty in obtaining a towel from the container and resulting annoyance.

Another object of this invention therefore is to provide folded paper towels which will be so designed, and a dispenser which will be so arranged, that each towel will be delivered separately in turn by the dispenser regardless of the manner in which the towels are stacked in the dispenser, and whereby the necessity of "interleaving" the towels and refill batches of towels will be entirely eliminated.

A further object of this invention is to provide a container and dispenser for separate folded paper towels which will permit only one towel to be removed at a time, and in which the delivery operation will be temporarily arrested after each towel is delivered, thus discouraging, if not entirely preventing, use of more than one towel at a time.

An additional object is to provide a dispenser for folded paper towels which will be operated manually by means of a crank similar to the improved dispensing devices which are customary with paper towels dispensed from a supply roll, and to provide such a dispenser which will be practical and simple in construction.

The manner in which I attain these objects

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and other advantages will be explained briefly with reference to the accompanying drawings.

In the drawings:

Fig. 1 is an outside view of my towel dispenser showing a towel delivered into position and ready to be pulled freely from the dispenser;

Fig. 2 is a plan section through the dispenser of Fig. 1, taken on the line 2—2 of Fig. 1 but drawn to a larger scale;

Fig. 3 is a fragmentary sectional elevation corresponding to line 3—3 of Fig. 2;

Fig. 4 is a transverse section on the line 4—4 of Fig. 2, with parts broken away for the sake of clarity, showing the dispenser control means in one position;

Figs. 5, 6 and 7 are sections similar to Fig. 4 but showing the control means in different positions;

Fig. 8 is a transverse section on line 8—8 of Fig. 2 illustrating the action of the delivery rollers in the first stage of delivering a towel;

Fig. 9 is a similar section showing the towel delivered into position to be pulled free from the dispenser;

Figs. 10 and 11 show the shape of my improved towel adapted for use in my dispenser.

The dispenser includes an outer housing 10 (see Fig. 1) with a hinged or removable cover 11. The housing is adapted to be attached to a wall or other support as customary with towel dispensers. The bottom of the housing has the usual discharge opening or slot 12 (see Figs. 8 and 9) through which the towel is delivered.

A pair of spaced, transversely extending walls 13 and 14 (Fig. 2) secured within the housing near each end thereof, provide supports and bearings for the dispensing mechanism. The dispensing mechanism includes a pair of rollers 15 and 16, the roller 15 constituting the drive roller and the roller 16 acting as an auxiliary roller. One end of the shaft of the drive roller 15 extends through an end wall of the outer housing and a crank 17 is rigidly secured to the shaft. The shaft 18 of the auxiliary roller 16 extends through horizontal slots in the pairs of walls 13 and 14 to enable the auxiliary roller to be moved laterally away from the drive roller 15. A pair of springs 19, each having one end attached to the auxiliary roller shaft 18 and the other end attached to a pin secured to the walls 14 respectively, normally hold the auxiliary roller 16 in frictional contact with the drive roller 15. Cam disks 20 and 21, rigidly secured to the shaft of the drive roller 15, engage the shaft 18 of the auxiliary roller and act to move the auxiliary

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roller out of contact with the drive roller for a brief interval during each rotation of the drive roller. Fig. 2 shows the auxiliary roller 16 spaced from the drive roller 15 as the result of such cam action. The purpose of moving the auxiliary roller away from the drive roller is to permit a towel to be pulled freely between the rollers and out of the dispenser, as will be explained more fully later.

The cam disk 20 has a V-shaped slot 22 (Figs. 4, 5, 6 and 7) in which a "tumbler" or movable engaging element 23 is movably carried. The "tumbler" or element 23 has a flange at each end, and thus extending on opposite sides of the cam disk, which flanges keep it from dropping out of the V-shaped slot while permitting it to move freely in the slot during the rotation of the disk. The purpose of the "tumbler" or element 23 is to cause further operation of the dispenser to be arrested temporarily when a towel has been delivered in position for removal.

Secured to the wall 14 facing the cam disk 20 is an arcuate stop lug 24 (see Figs. 4, 5 and 6). This lug is so positioned that its lower end will engage the "tumbler" or element 23, when the disk 20 is rotated clockwise as viewed in Fig. 4, if the "tumbler" is in the upper fork of the V-shaped slot 22 or in the apex of the slot, as shown in Fig. 4, but will not engage the "tumbler" when the "tumbler" drops to the end of the lower fork in the position shown in Fig. 5.

A guide rim or flange 25 is also secured to the face of the wall 14 and is in the form of a partial spiral approaching the axis of rotation of the disk as the flange extends clockwise as viewed in Fig. 4.

The operation of the arresting mechanism is as follows:

When the disk 20 is rotated in clockwise direction from the position shown in Fig. 5 to the positions shown in Figs. 6 and 7 successively, the "tumbler" 23, acted upon by gravity and by the flange 25, moves from the outer fork to the inner fork of the V-shaped slot 22, as shown in Fig. 7. When rotation of the disk 20 then brings the "tumbler" into engagement with the lug 24, the "tumbler" is pushed to the vertex of the slot 22 as shown in Fig. 4. Now any further rotation of the disk 20 in clockwise direction is temporarily prevented. A partial rotation in the reverse or counterclockwise direction, however, will cause the "tumbler" to drop into the outer fork of slot 22 and thus again to be in the position shown in Fig. 5, whereupon the operation can be repeated. A pawl 26, engaging a shoulder 27 on the disk 20, limits the extent of counterclockwise rotation which may be imparted to the disk 20. When the clockwise rotation of the disk 20 is temporarily arrested in the manner described the cam extension edge 20' of the disk 20 will be in engagement with the shaft 18 of the auxiliary roller 16, forcing the rollers apart in order to permit a towel to be pulled freely down between the rollers.

The two rollers 15 and 16 are identical in size and shape and are preferably spool-shaped, as shown in Fig. 2. Each roller has a longitudinally-extending flange along the smaller diameter portion, the outer edge of which flange does not extend beyond the surface of the larger diameter end portions of the roller. The flange 30 of roller 15 is shown in Figs. 2 and 3, and flanges 30 and 31 of the rollers 15 and 16 respectively are indicated in Figs. 8 and 9.

The shape of the towel which I have designed especially for use with the particular spool-shaped

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rollers of the dispenser is shown in Figs. 10 and 11. The towel 32 is rectangular in general shape but one end is formed with an extended tab 33 and the other end has a corresponding recess 34, thus enabling the towels to be severed from the continuous web of paper toweling stock without any difficulty or waste. Each towel is then folded twice, as shown in Fig. 11, thus becoming Z-shape in cross section. The size of the tab 33 corresponds approximately to the reduced diameter portion of the rollers 15 and 16.

Two horizontal shelves 28 and 29 (see Fig. 2 and also Figs. 8 and 9) are provided in the dispenser for supporting the stack of paper towels. The edges of the shelves are cut away, as indicated at 28' and 29' in Fig. 2, more or less conforming to the shape of the tab end of the towel so as to permit the tab end of the bottom towel in the stack to drop down and be engaged by the flange of one of the rollers, as indicated in Fig. 8.

The manner in which each towel is dispensed will be understood from Figs. 8 and 9. Assuming the towels to be stacked on the shelves 28 and 29 in the dispenser cabinet as shown in Fig. 8, the tab end of the bottom towel of the stack, due to the fact that it is not engaged by the shelf 28, will drop down on the rollers and, as the rollers are rotated, the tab end will be engaged by the flange 30 of the drive roller 15 until it is brought between the rollers, and the side edges of the towel are frictionally engaged by larger diameter portions of the rollers. The further rotation of the rollers then draws the towel down between the rollers until the tab end extends far enough below the bottom of the dispenser to enable the protruding end of the towel to be grasped by the person operating the dispenser. By this time, however, the cam disks 20 and 21 will have forced the rollers apart, as indicated in Fig. 9 and the "tumbler" on cam disk 20 will engage the stop lug 24 in the manner previously described. This arresting of the rotation of the drive roller and the forcing of the rollers apart prevents the towel from being pulled entirely away from the bottom of the stack of towels and the upper end of the towel which is being delivered will continue to rest on one of the shelves, thus on shelf 29, in the arrangement shown in Fig. 9. Even if the towel which is being delivered were the last towel in the dispenser it still would not drop out of the dispenser of its own accord, when in the position shown in Fig. 9, since ordinary paper towels are stiff enough so that the mere weight of the towel itself will not straighten out the upper crease in the towel being delivered and the towel therefore will remain in the position shown in Fig. 9. Thus the separation of the rollers when the towel is in this position does not cause the towel to drop onto the floor but does enable the towel to be pulled from the dispenser by hand with slight effort. For the next towel the operation is repeated, after a slight reverse movement of the hand crank 17 to start.

Should the person operating the towel dispenser continue the dispensing operation after the towel is in position for removal instead of removing the towel, such continuation of the dispensing movement of the mechanism will operate only to move the same towel down the circumferential distance allowed by contact of the rollers 15 and 16 as controlled by the cams 20, 21 due to the fact that the towel which is being delivered is stiff enough to hold up the bottom flap of the next towel. Thus if the towel is not manually removed as intended after the first operation of

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the dispenser, a second operation of the dispensing mechanism will not result in delivery of a second towel. In this respect my dispenser differs from other towel dispensers now in common use.

Should the stack of towels be oppositely placed in the container, thus with the tab end dropping onto the roller 16, the towels will still be delivered in the desired manner, since the flange 31 of auxiliary roller 16 will now engage the tab and bring the tab end of the towel similarly between the friction rollers. Thus all that is necessary in refilling the dispenser is to make sure that the tab end is on the bottom. Obviously no "interleaving" of the individual towels is required nor any "interleaving" of a new batch with the old batch.

I claim:

1. In a container and dispenser for folded paper towels, a pair of rollers, means for rotating one of said rollers, a mounting for the other roller permitting said other roller to be moved laterally with respect to said first mentioned roller, spring means normally holding said other roller in frictional engagement with said first mentioned roller, cams associated with said first mentioned roller adapted to move said other roller away from said first mentioned roller temporarily with each rotation of said first mentioned roller, means in said container and dispenser for supporting folded paper towels above said rollers, a sufficiently large opening in said supporting means to permit the end of the towel directly above said rollers to drop down on said rollers for engagement thereby, one of said rollers being spool-shaped with a central reduced diameter portion, a flange extending longitudinally along said reduced diameter portion and adapted to engage the end of the towel above said rollers and thereby direct said towel end between said rollers, whereby said rollers, when rotating in frictional engagement, will operate to draw the towel down between them and, when separated, will then permit such towel to be pulled away manually.

2. In a container and dispenser for folded paper towels, a drive roller and an auxiliary roller, a crank for rotating said drive roller, a mounting for said auxiliary roller permitting said auxiliary roller to be moved laterally with respect to said drive roller, means normally holding said auxiliary roller in frictional engagement with said drive roller, cam means associated with said drive roller adapted to move said auxiliary roller away from said drive roller temporarily with each rotation of said drive roller, means in said container and dispenser for supporting folded paper towels above said rollers, a sufficiently large opening in said supporting means to permit the end of the towel directly above said rollers to drop down on said rollers for engagement thereby, both of said rollers being spool-shaped with central reduced diameter portions, a flange extending longitudinally along each reduced diameter portion and adapted to engage the end of the towel above said rollers and thereby direct said towel end between said rollers, whereby said rollers, when rotating in frictional engagement, will operate to draw the towel down between them and, when separated, will then permit such towel to be pulled away manually.

3. In a container and dispenser for folded paper towels, a pair of rollers, a crank for rotating one of said rollers, a mounting for the other roller permitting said other roller to be moved laterally with respect to said first mentioned roller, means

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normally holding said other roller in frictional engagement with said first mentioned roller, cam disks associated with said first mentioned roller adapted to move said other roller away from said first mentioned roller temporarily with each rotation of said first mentioned roller, means in said container and dispenser for supporting folded paper towels above said rollers, a sufficiently large opening in said supporting means to permit the end of the towel directly above said rollers to drop down on said rollers for engagement thereby, a V-shaped slot in one of said cam disks, a movable element in said slot, a stationary stop lug adapted to engage said movable element in one portion of said slot at a certain point during the rotation of said slotted cam disk, said stop lug so positioned as to permit said movable element to pass around said lug when said movable element is in another portion of said slot, said lug and movable element serving to arrest the operation of said first mentioned roller temporarily at the end of each predetermined rotation and to permit further operation when said movable element has moved out of engagement with said lug, whereby said rollers, when rotating in frictional engagement, will operate to draw a towel down between them and, when separated, will then permit such towel to be pulled away manually, and whereby, when the end of one towel has been drawn down between the rollers and said rollers have been separated to permit the towel to be withdrawn, further operation of the dispenser will be momentarily stopped, thus discouraging any effort to have more than one towel delivered at a time.

4. In a container and dispenser for folded paper towels, a drive roller and an auxiliary roller, means for rotating said drive roller, a mounting for said auxiliary roller permitting said auxiliary roller to be moved laterally with respect to said drive roller, spring means normally holding said auxiliary roller in frictional engagement with said drive roller, cam disks associated with said drive roller adapted to move said auxiliary roller away from said drive roller temporarily with each rotation of said drive roller, means in said container and dispenser for supporting folded paper towels above said rollers, a sufficiently large opening in said supporting means to permit the end of the towel directly above said rollers to drop down on said rollers for engagement thereby, a V-shaped slot in one of said cam disks, a tumbler in said slot, a stationary stop lug adapted to engage said tumbler in one portion of said slot at a certain point during the rotation of said slotted cam disk, said stop lug so positioned as to permit said tumbler to pass around said lug when said tumbler is in another portion of said slot, said lug and tumbler serving to arrest the operation of said drive roller temporarily at the end of each predetermined rotation and to permit further operation when said tumbler has moved out of engagement with said lug, whereby said rollers, when rotating in frictional engagement, will operate to draw a towel down between them and, when separated, will permit such towel to be pulled away manually, and whereby, when the end of one towel has been drawn down between the rollers and said rollers have been separated to permit the towel to be withdrawn, further operation of the dispenser will be momentarily stopped thus discouraging any effort to have more than one towel delivered at one time.

5. In a container and dispenser for folded paper towels, a pair of rollers, means for rotat-

ing one of said rollers, means in said container and dispenser for supporting folded paper towels above said rollers, a sufficiently large opening in said supporting means to permit the end of the towel directly above said rollers to drop down on said rollers for engagement thereby to enable said towel to be dispensed, both of said rollers being spool-shaped with central reduced diameter portions, a flange extending longitudinally along each reduced diameter portion and adapted to engage the end of the towel above said rollers and thereby direct said towel end between said rollers.

6. A container and dispenser for folded paper towels comprising a housing having a bottom opening, a drive roller and an auxiliary roller, a crank for rotating said drive roller, a mounting for said auxiliary roller permitting said auxiliary roller to be moved laterally with respect to said drive roller, spring means normally holding said auxiliary roller in frictional engagement with said drive roller, cam disks associated with said drive roller adapted to move said auxiliary roller away from said drive roller temporarily with each rotation of said drive roller, means in said container and dispenser for supporting folded paper towels above said rollers, a sufficiently large opening in said supporting means to permit the end of the towel directly above said rollers to drop down on said rollers for engagement thereby, both of said rollers being spool-shaped with central reduced diameter portions, a flange extending longitudinally along each reduced diameter portion and adapted to engage the end of the towel above said rollers and thereby direct said towel end between said rollers, whereby said rollers, when rotating in frictional engagement, will operate to draw the towel down between them and, when separated, will then permit such towel to be pulled away manually, a V-shaped slot in one of said cam disks, a movable element in said slot, a stationary stop lug adapted to engage said movable element in one portion of said slot at a certain point during the rotation of said slotted cam disk, said stop lug so positioned as to permit said movable element to pass around said lug when said movable element is in another portion of said slot, said lug and movable element serving to arrest the operation of said drive roller temporarily at the end of each predetermined rotation and to permit further operation when said movable element has moved out of engagement with said lug, whereby, when the end of one towel has been drawn down between the rollers and said rollers have been separated to permit the towel to be withdrawn, further operation of the dispenser will be momentarily stopped thus discouraging any effort to have more than one towel delivered at a time.

7. In a paper towel dispenser, a pair of rollers, each of said rollers having a reduced diameter portion, towel supporting means above said rollers, a folded paper towel on said supporting means, said supporting means having a sufficiently large opening to permit the bottom portion of said towel to drop down on said rollers, a projecting tab on the bottom end of said towel, the width of said tab not exceeding the axial length of said reduced diameter portions, whereby said tab will drop into one of said reduced diameter portions, a flange extending longitudinally along each reduced diameter portion for engaging said tab and directing said tab between said rollers, whereby when said rollers are rotated in frictional engagement said tab end of said towel will be drawn down between said rollers.

8. In a paper towel dispenser, a pair of rollers, one of said rollers being spool-shaped with a central reduced diameter portion, towel supporting means above said rollers, said supporting means having a sufficiently large opening to permit the bottom portion of a folded towel when supported thereon to drop down on said rollers and thence into said reduced diameter portion of said spool-shaped roller, a flange extending in said reduced diameter portion of said spool-shaped roller adapted to engage said bottom portion of said towel and then to direct said bottom portion of said towel between said rollers, whereby when said rollers are rotated in frictional engagement said towel will be drawn down between said rollers without requiring said towel to be pulled down by any other means.

9. In a paper towel dispenser, a pair of rollers, one of said rollers having a central cut-away portion intermediate its ends, towel supporting means above said rollers, said supporting means having a sufficiently large opening to permit the bottom portion of a folded towel when supported thereon to drop down on said rollers and into said cut-away portion of said roller, and means on said last mentioned roller for contacting said bottom portion of said towel when said bottom portion of said towel has dropped into said roller cut-away portion, whereby when said rollers are rotated in frictional engagement said towel will be drawn down between said rollers without requiring said towel to be pulled down by a preceding towel.

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