

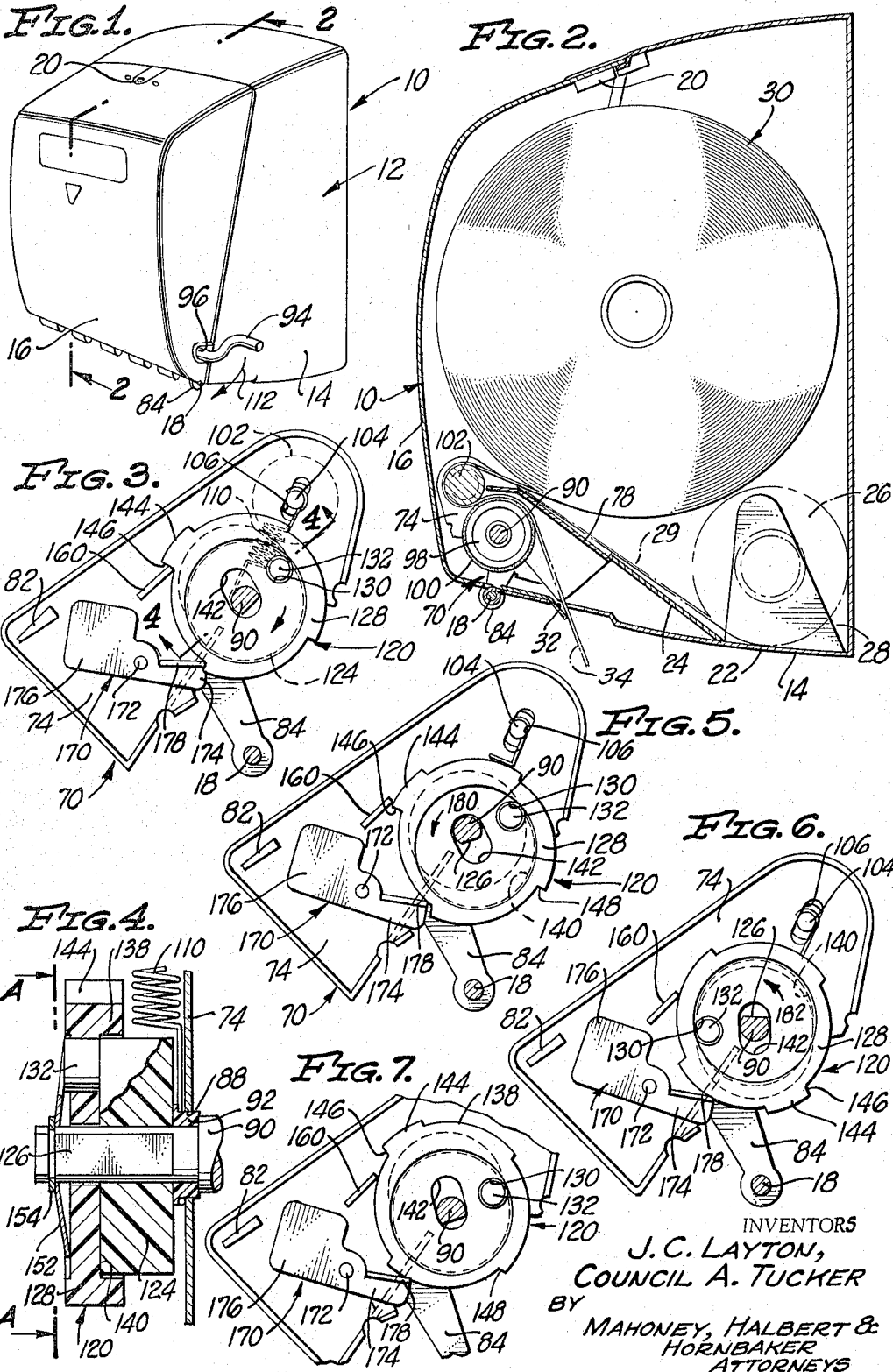
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ROTATION CONTROL UNIT FOR TOWEL DISPENSERS

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## ROTATION CONTROL UNIT FOR TOWEL DISPENSERS

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 Original application Apr. 18, 1960, Ser. No. 22,943, now Patent No. 3,140,060, dated July 7, 1964. Divided and this application Apr. 30, 1964, Ser. No. 363,759  
 4 Claims. (Cl. 74-565)

This invention relates to a towel dispenser and, more particularly, to a rotation control unit for a dispenser for roll toweling.

This application is a divisional application of our co-pending application Serial No. 22,943, filed April 18, 1960, entitled "Dispenser for Roll Material," now Patent No. 3,140,060.

Incorporated in the towel dispenser is a rotation control unit of the invention operatively connected to one of the rollers constituting a part of the dispensing mechanism and adapted to limit the rotation of the associated roller and, thus, to determine the length of toweling dispensed from the dispenser.

An associated object of the invention is the provision of a rotation control mechanism which is characterized by its simplicity of operation and the manner in which all of the elements thereof are mounted upon or in association with a pivotally movable enclosure for said dispensing mechanism.

A further object of the invention is the provision of a rotation control mechanism which includes a rotatable element and a pivotal element pivotally connected to the rotatable element and having first and second dogging surfaces thereupon engageable, respectively, by a fixed dog and a freely movable dog on the enclosure.

Because of the provision of a dispenser incorporating a rotation control unit of the invention, the elimination of excessive towel consumption is achieved with consequent economic savings.

Other objects and advantages of the invention will be apparent from the following specification and the accompanying drawing, which is for the purpose of illustration only, and in which:

FIG. 1 is an isometric view showing the external housing of a roll towel dispenser constructed in accordance with the teachings of the invention;

FIG. 2 is a vertical, sectional view taken on the broken line 2-2 of FIG. 1;

FIG. 3 is a side elevational view of the rotation control mechanism;

FIG. 4 is a transverse, sectional view taken on the broken line 4-4 of FIG. 3;

FIG. 5 is a view similar to FIG. 3 showing the component parts of the rotation control unit in the position assumed immediately after the conclusion of the reverse rotation of the rotation control unit;

FIG. 6 shows the position assumed by the components of the rotation control unit at the initiation of a dispensing cycle; and

FIG. 7 illustrates the position assumed by the elements of the control unit immediately prior to the termination of a dispensing cycle.

Referring to the drawing and, particularly to FIGS. 1-4 thereof, we show a towel dispenser 10 for paper toweling in roll form, said dispenser being incorporated in a housing 12 constituted by an enclosure 14 and a cover 16 hingedly connected thereto at the lower extremity thereof by means of a hinge pin 18. The cover 16 is normally maintained in closed position with respect to the enclosure 14 by means of a lock 20 of conventional construction, not shown in detail in the drawing.

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The enclosure 14 and the cover 16 therefor may be fabricated from sheet metal or the like and the enclosure 14 is adapted to be secured to a wall surface or similar support by means of screws, not shown, extending through the rear wall of said enclosure.

Mounted within the confines of the enclosure are supporting bearings, not shown, for a replacement roll 30 of paper toweling, said replacement roll being shown in position in FIG. 2 of the drawing. It will be noted that the bottom wall 22 of the enclosure 14 includes an upwardly inclined section 24 which, as best shown in FIG. 2 of the drawing, serves both to maintain a stub roll 26 at a secondary or auxiliary dispensing position 28 and as a guide for a length 29 of toweling being dispensed from said stub roll. The bottom wall 22 also incorporates, as best shown in FIG. 2 of the drawing, a dispensing opening 32 through which a length 34 of toweling from the replacement roll 30 can issue simultaneously with the length 29 from the stub roll of toweling.

Mounted at the lower extremity of the enclosure 14 is a dispensing mechanism 70 which, as best shown in FIG. 2, includes a sheet metal enclosure 72 having side plates 74, only one of which is shown, and a top plate 78. The side plate 74 and the opposite extremities of the top plate 78 are secured thereto by means of tabs 82 extending through corresponding openings in said plates. Each of the plates 74 has a depending leg 84 which has an opening therein adapted to receive a corresponding extremity of the hinge pin 18 so that the enclosure 72 is pivotally movable between a first position, wherein the enclosure lies within the confines of the housing enclosure 14, and a second position in which the enclosure 72 is disposed externally of the housing enclosure 14 to facilitate access to the components of the dispensing mechanism 70.

Mounted between the side plates 74 in openings 88 in said side plates, as shown in FIG. 4 of the drawing, is an elongated shaft 90 which is rotatable in bearings 92 located in the openings 88. The shaft 90 has an actuating handle 94 formed integrally therewith and extending through a corresponding slot 96 in the cover 16 of the housing 12, as best shown in FIG. 1 of the drawing. Mounted on the shaft 90 intermediate the extremities thereof is a dispensing roller 98 which, as best shown in FIG. 2 of the drawing, incorporates a rubber sheath 100 adapted to increase the frictional effect of said roller.

Mounted in juxtaposition to the dispensing roller 98 is a back-up roller 102 which is secured on a shaft 104, the opposite extremities of which are located, as best shown in FIGS. 3, and 5-7 of the drawing, in slots 106 in the side plates 74 of the dispensing mechanism enclosure 72. Tension springs 110 engage the opposite extremities of the shaft 104 and, as best shown in FIG. 4 of the drawing, the opposite extremities of the shaft 90 to pull the back-up roller 102 into engagement with the dispensing roller 98.

A length 34 of toweling from the replacement roll 30 and a corresponding length 29 of toweling from the stub roll 26 may be simultaneously threaded over the back-up roller 102 and through the space between the back-up roller 102 and the periphery of the rubber sheath encompassing the dispensing roller 98, said lengths depending through the dispensing opening 32 in the bottom 22 of the housing enclosure 14. Therefore, rotation of the handle 94 in a clockwise direction, as indicated by the arrow 112 in FIG. 1 of the drawing, will cause lengths of toweling 29 and 34 to be dispensed through the dispensing opening 32. Of course, exhaustion of the stub roll 26 will result in only one length 34 of toweling from the replacement roll 30 being dispensed through the dispensing opening 32.

In order to control the lengths of toweling dispensed by the dispenser 10, a rotation control unit 120 is pro-

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vided upon the left-hand extremity of the shaft 90, as shown in FIGS. 3-7 of the drawing. The rotation control unit includes a rotatable element 124 of circular configuration which is fixed against rotation relative to the shaft 90 by means of a flat 126 on said shaft, as best shown in FIG. 4 of the drawing. The rotatable element 124 may be formed from any desired material but, in the present case, is formed from nylon.

Disposed in operative relationship with the rotatable element 124 which is, in essence, a circular disk, is a substantially disk-like pivotal element 128, said pivotal element incorporating an opening 130 in which is engaged a pivot pin 132 formed integrally with the rotatable element 124. The rotatable element 124 and the pivotal element 128 have mutually engageable surfaces and the pivotal element 128 incorporates a skirt 138 which encompasses the rotatable element 124 and defines a substantially elliptical recess 140 in the pivotal element 128.

The pivotal element also includes a centrally located slot 142 which encompasses the contiguous portion of the shaft 90 and which is adapted, by engagement of its opposite extremities with the shaft 90, to limit movement of the pivotal element 128 with respect to the rotatable element 124. The perimeter of the pivotal element 128 has a radially directed boss 144 provided thereupon which defines a first dogging surface 146. The perimeter of the pivotal element 128 also includes a plurality of notches defining second dogging surfaces 148.

The adjacent surfaces of the rotatable element 124 and the pivotal element 128 are urged into engagement with each other by means of a spring washer 152 which is retained in operative relationship with the shaft 90 by means of a retainer 154, as best shown in FIG. 4 of the drawing. It should be mentioned that the pivotal element 128 can also be fabricated from nylon or any other suitable material.

A fixed stop 160 is secured to the side plate 74 adjacent the rotation control unit 120 and is adapted to be engaged by the first dogging surface 146 in a manner to be described in greater detail below. In other words, the tab 82 constituting the fixed stop 160 projects beyond the adjacent surface of the associated side plate 74. A freely movable stop 170 is mounted on the side plate 74 by a pivot pin 172 and consists of a rotatable dog 174 having an integral counterweight 176 and a dogging lug 178. The dogging lug 178 is adapted to engage the second dogging surfaces 148 provided on the perimeter of the pivotal element 128, in a manner to be described in greater detail below.

In considering the operation of the rotation control unit 120, as viewed in FIGS. 3, and 5-7 of the drawing, it should be pointed out that the views of FIGS. 3 and 5-7 are taken from the broken line A-A of FIG. 4 of the drawing and that clockwise rotation of the actuating handle 94, as viewed in FIG. 1 of the drawing, appears as counterclockwise rotation of the shaft 90, as viewed in FIGS. 3 and 5-7 of the drawing. The rotation control unit 120 is adapted to permit a dispensing cycle constituted by one rotation of the shaft 90 and the corresponding dispensing roller 98.

Rotation of the actuating handle 94 is accompanied by corresponding rotation of the shaft 90 as indicated by the arrow 180 in FIG. 5 of the drawing. FIG. 5 of the drawing illustrates the position of the elements of the rotation control unit 120 as they appear immediately after the conclusion of a dispensing cycle and upon the initiation of another dispensing cycle. It will be noted that the first dogging surface 146 is clearing the fixed stop 160 and that the counterweight 176 urges the dogging lug 178 of the movable stop 170 against the perimeter of the pivotal element 128.

As the pivotal element 128 is rotated with the rotatable element 124, the pivotal element 128 is maintained against movement with respect to the rotatable element 124 by the action of the spring washer 152. Therefore,

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the elements 124 and 128 can be rotated without alteration in the relative positions thereof. During the continued rotation of the shaft 90, the boss 144 and its first dogging surface 146 pass freely over the dogging lug 178, the direction of rotation being indicated by the arrow 182 in FIG. 6 of the drawing.

As rotation of the rotary and pivotal elements 124 and 128 continues, as indicated in FIG. 7 of the drawing, the first dogging surface 146 engages the fixed stop 160 which drives the lower extremity of the slot 142 against the shaft 90, thus terminating the dispensing cycle.

In order to initiate another dispensing cycle, it is necessary to reversely rotate the rotatable and pivotal elements 124 and 128 by counterclockwise rotation of the actuating handle 94, as viewed in FIG. 1 of the drawing. This causes the dogging lug 178 on the movable stop 170 to engage the juxtaposed second dogging surface 148 which, upon clockwise rotation of the pivotal element 128, as indicated by the arrow 180, results in the pivotal element 128 being drawn downwardly to urge the upper extremity of the slot 142 against the shaft 90, as shown in FIG. 5 of the drawing. In this manner, the first dogging surface 146 and the lug 144 defining the same are moved into the position shown in FIG. 5 of the drawing and can thus clear the fixed stop 160 for an additional rotational cycle.

Furthermore, the second dogging surfaces 148 prevent continued reverse rotation of the pivotal member 128 and rotatable member 124 and thus prevent reverse rotation of the shaft 90 which would cause dislodgment of the lengths or length of toweling from the dispensing mechanism 70 and thus prevent continued dispensing of toweling.

Of course, the positive positioning of the elements of the rotation control mechanism with respect to each other insures against manipulation of the rotation control mechanism by a user to obtain more than a predetermined amount of toweling. Moreover, the limiting action of the pivotal element of the rotation control mechanism and the construction thereof is such that even the imposition of a great amount of force will not cause the rotation control mechanism to fail.

We claim:

1. In a mechanism adapted to control the rotation of a rotary member, the combination of: a rotary element operatively connected to said rotary member for rotation therewith; a pivotal element pivotally secured to said rotary element for movement with respect to said rotary element, said pivotal element having first and second dogging surfaces thereupon; a fixed dog located adjacent said pivotal element and engageable with said first dogging surface to prevent rotation of said rotary element in one direction; a movable dog located adjacent said pivotal element and engageable with said second dogging surface to prevent rotation of said rotary element in the other direction; and means for restraining said pivotal element against free movement with respect to said rotary element.

2. In a mechanism adapted to control the rotation of a rotary member, the combination of: a rotary element operatively connected to said rotary member for rotation therewith; a pivotal element pivotally secured to said rotary element for movement with respect to said rotary element, said pivotal element having first and second dogging surfaces thereupon; a fixed dog located adjacent said pivotal element and engageable with said first dogging surface to prevent rotation of said rotary element in one direction; a movable dog located adjacent said pivotal element and engageable with said second dogging surface to prevent rotation of said rotary element in the other direction; and a spring urging said pivotal and rotary elements into frictional engagement with each other.

3. In a rotation control mechanism for a rotary member, the combination of: a rotatable disk secured to said rotary member for rotation therewith; a pivotal disk pivotally mounted on said rotatable disk and encompassing the same, said pivotal disk having means adapted to

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limit its pivotal movement with respect to said rotatable disk and incorporating first and second dogging surfaces therein; means for restraining said pivotal disk against free movement in respect to said rotatable disk; a fixed dog engageable with said first dogging surface to prevent rotation of said member in one direction; and a movable dog engageable with said second dogging surface to prevent rotation of said member in the other direction.

4. In a rotation control mechanism for a rotary member, the combination of: a rotatable disk secured to said rotary member for rotation therewith; a pivotal disk pivotally mounted on said rotatable disk, said pivotal disk having means adapted to limit its pivotal movement with respect to said rotatable disk and incorporating first and second dogging surfaces therein; a fixed dog engage-

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able with said first dogging surface to prevent rotation of said member in one direction; a movable dog engageable with said second dogging surface to prevent rotation of said member in the other direction; and spring means for urging said pivotal disk against said rotatable disk.

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