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B. A. DAHLIN ET AL

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STOP MECHANISM FOR ROLL TOWEL DISPENSERS

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Fig. 1.

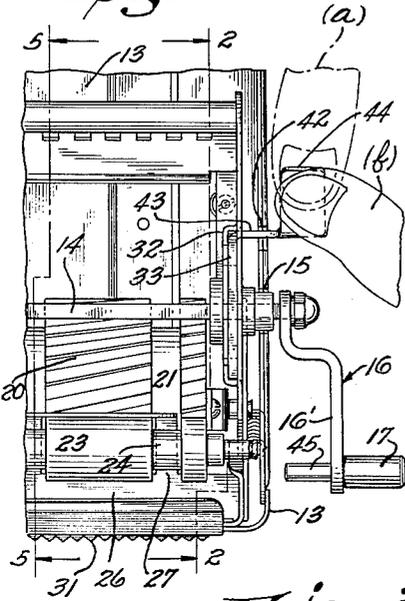


Fig. 2.

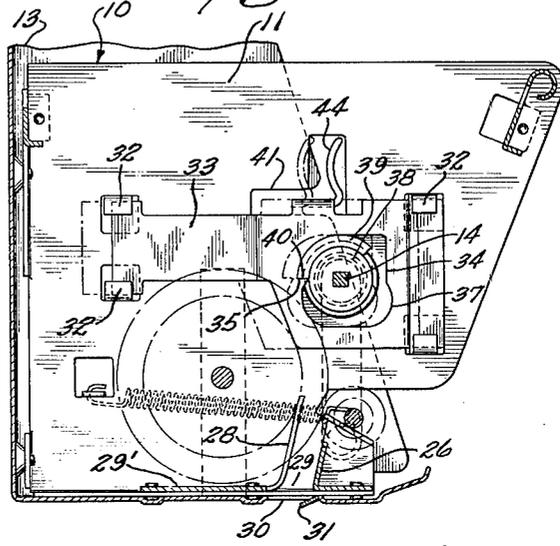


Fig. 3.

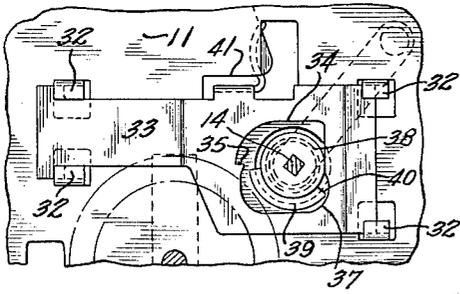


Fig. 4.

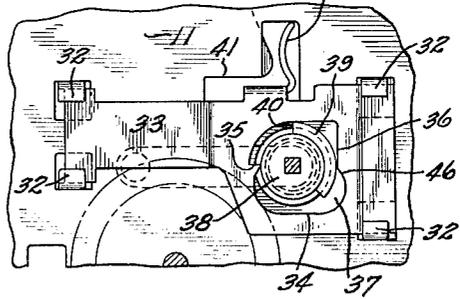
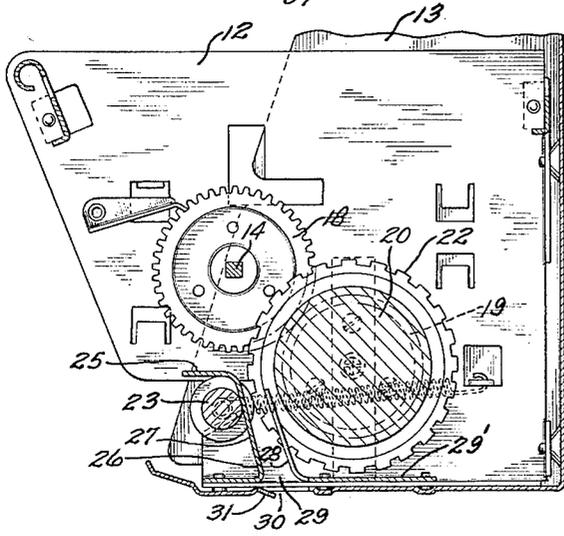


Fig. 5.



INVENTORS
Bernard O. Dahlin
Joseph H. Rademacher
BY Edwin C. Filipowicz
Morsell & Morsell
ATTORNEYS.

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STOP MECHANISM FOR ROLL TOWEL DISPENSERS

Bernard A. Dahlin and Joseph A. Rademacher, Green Bay, and Edwin A. Filipowicz, Milwaukee, Wis., assignors to Fort Howard Paper Company, Green Bay, Wis., a corporation of Wisconsin

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6 Claims. (Cl. 226-130)

This invention relates to improvements in stop mechanism for roll towel dispensers.

One of the principal problems in connection with roll towel dispensers is that of preventing the user from stripping off unnecessary lengths of toweling, with consequent waste. Heretofore some cabinets have utilized dash-pots as timers, which mechanisms prevent further dispensing until after a predetermined interval of time has elapsed. In still other types of cabinets it is necessary to reverse the crank for a short distance in order to free a stop. These prior devices are relatively expensive and complicated. In those cabinets where it has been attempted to simplify the constructions, levers have been utilized which must be pressed or pushed before a new dispensing operation can be performed. In these devices, however, if continuous pressure is exerted on the lever or button it is still possible to continuously crank and thus waste toweling.

It is a general object of the present invention to provide an improved, foolproof, and simplified mechanism designed to make it difficult to dispense more than a predetermined length of roll toweling at a time, the invention being particularly useful in connection with paper toweling.

More specifically, an object of the invention is to provide a construction as above described wherein the toweling is dispensed by a crank operation, and wherein there is a slide having a cam opening which is automatically moved to stop position during rotation of a cam disk on the crankshaft, it being necessary to manually move the slide to stop-releasing position before the crank can again be turned.

A still further object of the invention is to provide, in a construction as above described, a releasable slide having a trigger wherein the thumb or finger cannot be kept indefinitely on the trigger while the crank is being operated, to obtain continuous dispensing.

A further objection of the invention is to provide a construction as above described which is so worked out that the crank handle must be in its lowermost position at the end of a dispensing cycle before the trigger can again be pressed.

With the above and other objects in view, the invention consists of the improved stop mechanism for towel dispensers, and all of its parts and combinations, as set forth in the claims, and all equivalents thereof.

In the accompanying drawing, illustrating one complete embodiment of the preferred form of the invention, in which the same reference numerals designate the same parts in all of the views:

FIG. 1 is a fragmentary front elevational view of the dispensing unit for a towel cabinet showing the crank handle in its lowermost or "home" position, and showing two possible positions of the thumb on the slide trigger;

FIG. 2 is a sectional view taken on the line 2-2 of FIG. 1, the full line position of the slide showing the locked position of the parts and the dot and dash line position showing the slide in stop-releasing position to permit cranking;

FIG. 3 is a fragmentary sectional view like FIG. 2, showing the position of the parts after the crank has been partly rotated;

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FIG. 4 is a similar view showing how further rotation of the crank has moved the slide to locking position, ready to stop rotation at the end of a dispensing cycle; and

FIG. 5 is a sectional view taken on the line 5-5 of FIG. 1.

Referring now more particularly to the drawing, the numeral 10 designates a dispensing unit generally, said unit having a frame which includes plates 11 and 12. The unit 10 is a self-contained unit and is adapted to be mounted in an external cabinet 13.

A crankshaft 14 has its ends journaled in suitable bearings in the end plates 11 and 12 and has one end projecting through an opening 15 in the outer cabinet 13, where it is provided with a crank 16 having a handle 17. On the opposite end of the crankshaft (see FIG. 5) is a gear 18 which meshes with a gear 19 rigid with the end of a dispensing roller 20—the latter being suitably mounted for rotation between the end plates 11 and 12. The roller 20 is preferably provided with axially spaced annular grooves, as at 21, and the portions between grooves are preferably covered with ribbed rubber 22 for more readily gripping and feeding the paper toweling.

Also suitably journaled for rotation between the end plates 11 and 12 is a pressure roller 23, of less diameter, having spaced annular grooves 24. The portions between grooves are preferably covered with suitable friction material such as rubber. At the bottom of the unit is an upstanding, longitudinally extending guiding strip 26 having upwardly projecting fingers 27 which are accommodated behind the roller 23 in the grooves thereof, said fingers being also projected forwardly over the roller as shown in FIG. 5, where they may be connected by a strip 25. Other guiding fingers 28 are bent upwardly from a longitudinal strip 29' at the bottom of the dispensing unit. These fingers 28 project into the grooves 21 of the dispensing roller 20. With this arrangement there is a slot 29 at the bottom of the dispensing unit 10 which slot communicates with a slot 30 at the bottom of the cabinet 13, there being a serrated tearing edge 31 at the front margin of said slot 30.

Paper toweling to be dispensed is adapted to be fed from a suitable upper supply roll (not shown) into the bite between the rollers 20 and 23, to be directed between the guiding fingers 27 and 28, out of the slots 29 and 30. In this way, after a predetermined length has been ejected, it may be manually torn off on the serrated edge 31.

Horizontally slidably mounted in flanged offset ears 32, which are preferably stamped from the end plate 11, is a locking slide 33 formed of sheet metal. The slide is formed with a cam opening 34 having a stop shoulder 35. Opposite the stop shoulder the margin of the cam opening has an inwardly directed "high" cam surface 36 and at the forward lower corner the margin is outwardly lobed as at 37.

The crankshaft 14 extends through the cam opening 34 of the slide and rigidly carries a cam disk having a high area 39 with a stop end 40. The stop end 40, when in the full line position of FIG. 2, is adapted to engage the stop shoulder 35 of the slide so that rotation of the crank when the slide is in the full line position of FIG. 2 is prevented. The lower portion of the cam opening 34, which is between the shoulder 35 and the cam surface 36, is enlarged to accommodate, with the lobed margin 37, the high portion 39 of the cam 38, as is shown in FIG. 3, it being apparent from FIGS. 3 and 4 that the end 40 is adapted to engage the high part 36 of cam opening margin as shown in FIG. 4, to move the slide from the position of FIG. 3 to the position of FIG. 4.

Connected to an upper portion of the slide 33, and projecting laterally outwardly therefrom through a slot 41 in the end plate 11, and also through a slot 42 in the outer

cabinet 13, is a lever 43 having an upwardly projecting thumb trigger 44. The crank 16 has portion 16' which is outwardly offset just far enough to clear the trigger when the crank is operated; and extending inwardly toward the cabinet from the outer end of said offset portion 16', in alignment with the crank handle 17, is a pin 45. The pin 45 is so located that when the crank handle is at the top position, the pin will just clear the upper end of the trigger 44. If, however, it is attempted to keep the thumb on the trigger 44, as at (a) in FIG. 1, while cranking, it is obvious that the pin 45 will hit the thumb so that further cranking is prevented while the thumb is in the position of FIG. 1. If the thumb is in position (b) it will be hit by the offset position 16'. The arrangement is so worked out that it is not possible to complete a dispensing operation with the thumb held in position on the trigger 44, and also it is not possible to move the slide to release position until the crank handle is almost in its lowermost position as in FIG. 1.

Operation

Summarizing the operation of the device, with the crank handle 17 in the position of FIG. 1, and with the slide in the full line position of FIG. 2, in order to obtain a towel from the machine it is necessary to first press the trigger 44 rearwardly to the dot and dash line position of FIG. 2. This moves the stop shoulder 35 clear of the end 40 of the cam surface 39. The crank handle is then gripped to operate the crank in a clockwise direction. During the first part of this operation the cam shoulder 40 is moved from the position of FIG. 2 to the position of FIG. 3. As rotation is continued, the cam end 40 engages the inclined end 46 of the cam surface 36 and rides into engagement with said cam surface 36 causing movement of the slide toward the right, referring to FIG. 4. This movement resets the stop shoulder 35 to a position where it will stop further rotation when the cam end 40 again meets it. In the position of FIG. 4 there is still another 90° of rotation possible. Thus, in one cranking operation the crank handle is moved 360°. During this rotation the gear 18 on the opposite end of the crankshaft 14 has acted through the gear 19 to cause rotation of the dispensing roll 20. This pulls the toweling downwardly due to the fact that it is between the bite of the rolls 20 and 23. This 360° operation of the crank is so worked out as to cause dispensing through the opening 30 of a predetermined length of paper toweling, usually sufficient for a single use. This length of toweling is then torn off by the user on the serrated edge 31.

Before the crank can be again manipulated, the trigger 44 must be again pushed. This makes it a separate operation to obtain another length of toweling, and tends to minimize waste. If it is attempted to hold the thumb or finger of the left hand on the trigger 44 while cranking, the pin 45 will hit the thumb or finger, as above explained, if the finger comes down from above as at (a) FIG. 1, or if the thumb or finger comes in from the side, as at (b) FIG. 1, it will be hit by the portion 16' of the crank. In either event, cranking is stopped after a half turn unless the finger is removed. Thus it is not possible to keep a finger or thumb continuously on the trigger while continuously cranking to obtain an unlimited length of toweling. Furthermore, the cam slide and associated parts are so worked out that due to the engagement of the cam 39 with the surface 36 as in FIG. 4, the trigger cannot again be moved until the crank has been rotated almost 360° to its lowermost "home" position of FIG. 1 when the cam 39 has left the high surface 36. Thus an attempt to push the trigger just after the pin 45 and crank offset 16' have passed it will be unsuccessful.

It is apparent from the above that the towel metering mechanism is simple and foolproof. The slide is disposed in a horizontal position so no springs are required to return the slide. Thus there is nothing to get out of order. It is further apparent that the operation of the

crank automatically causes resetting of the slide to a stop position at a proper point in the cycle of operation. In addition it is clear that the arrangement is so worked out as to make it impractical and difficult to obtain continuous dispensing.

It is to be understood that the present invention is not to be limited to the exact details of construction shown and described, for obvious modifications will occur to persons skilled in the art.

What we claim is:

1. In a roll towel dispenser having a crankshaft equipped with an external crank and having means responsive to rotation of said crankshaft for dispensing toweling, stop means movably mounted adjacent said crankshaft, means on said crankshaft positioned for engagement with said stop means when the latter is in a first position, an externally accessible trigger connected to said stop means and independent of said crank for moving the stop means to releasing position, and means for returning said stop means to said first position, said trigger being located adjacent said crank, and said crank having means positioned to normally just clear said trigger when the crank is rotated but to hit a finger on the trigger if it is attempted to retain the finger on the trigger during rotation of the crank.

2. In a roll towel dispenser having a crankshaft equipped with an external crank and having means responsive to rotation of said crankshaft for dispensing toweling, stop means movably mounted adjacent said crankshaft, means on said crankshaft positioned for engagement with said stop means when the latter is in a first position, an externally accessible trigger connected to said stop means for moving the latter to releasing position, and means for returning said stop means to said first position, said trigger being located adjacent said crank, and said crank having means including an inwardly projecting pin positioned to normally just clear said trigger when the crank is rotated but to hit a finger on the trigger if it is attempted to retain the finger on the trigger during rotation of the crank.

3. In a roll towel dispenser having a crankshaft equipped with an external crank having a handle and having means responsive to rotation of said crankshaft for dispensing toweling, a movably mounted slide having a cam opening through which said crankshaft extends, a cam disk on said crankshaft rotatable within said cam opening, the margin of said cam opening having stop shoulder, means on said cam disk positioned for engagement with said stop shoulder when said slide is in a first position, manually operable means including an external trigger positioned radially outwardly from the crankshaft for moving said slide to release position, said trigger being located close to said crank while being clear of the same, and means on said cam disk for automatically returning said slide to said first position and for holding it in said position until a predetermined length of toweling has been dispensed and until the handle is remote from the trigger.

4. In a roll towel dispenser having a cabinet and having a crankshaft equipped with an external crank and having means responsive to rotation of said crankshaft for dispensing toweling, said crank having an arm portion spaced outwardly from the cabinet, stop means movably mounted adjacent said crankshaft, means on said crankshaft positioned for engagement with said stop means, at a predetermined point in the rotation of the crankshaft when the latter is in a first position, an externally accessible trigger between said crank arm portion and the cabinet connected to said stop means for moving the latter to releasing position, and means for returning said stop means to said first position, said crank arm portion being positioned to normally clear said trigger when the crank is rotated but to hit a transversely extending finger on the trigger if it is attempted to retain the finger on the trigger during rotation of the crank.

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5. In a roll towel dispenser having a cabinet and having a crankshaft equipped with an external crank and having means responsive to rotation of said crankshaft for dispensing towelling, said crank having an arm portion spaced outwardly from the cabinet, stop means movably mounted adjacent said crankshaft, means on said crankshaft positioned for engagement with said stop means, at a predetermined point in the rotation of the crankshaft when the latter is in a first position, an externally accessible trigger between said crank arm portion and the cabinet connected to said stop means for moving the latter to releasing position, and means for returning said stop means to said first position, said crank arm portion being positioned to normally clear said trigger when the crank is rotated but to hit a transversely extending finger on the trigger if it is attempted to retain the finger on the trigger during rotation of the crank and said crank arm portion having an inwardly projecting pin positioned to hit a finger inserted from above into the trigger if said finger remains during cranking.

6. In a roll towel dispenser having a cabinet and having a crankshaft equipped with an external crank and having means responsive to rotation of said crankshaft for

dispensing towelling, said crank having an arm portion which is offset outwardly from the cabinet and which is provided with a handle, stop means movably mounted adjacent said crankshaft, means on said crankshaft positioned for engagement with said stop means when the latter is in a first position, an externally accessible trigger connected to said stop means and located to be between said offset portion of the crank and the cabinet to be cleared by said offset portion when the crank is rotated, said trigger being adapted to move said stop means to releasing position, means for returning said stop means to said first position, and a pin projecting inwardly toward the cabinet from said outwardly offset portion of the crank arm, said trigger being so positioned that it is just within the circular path of movement of said pin so that a finger held on said trigger during cranking will be hit either by said pin or by said outwardly offset portion of the crank.

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