

July 28, 1942.

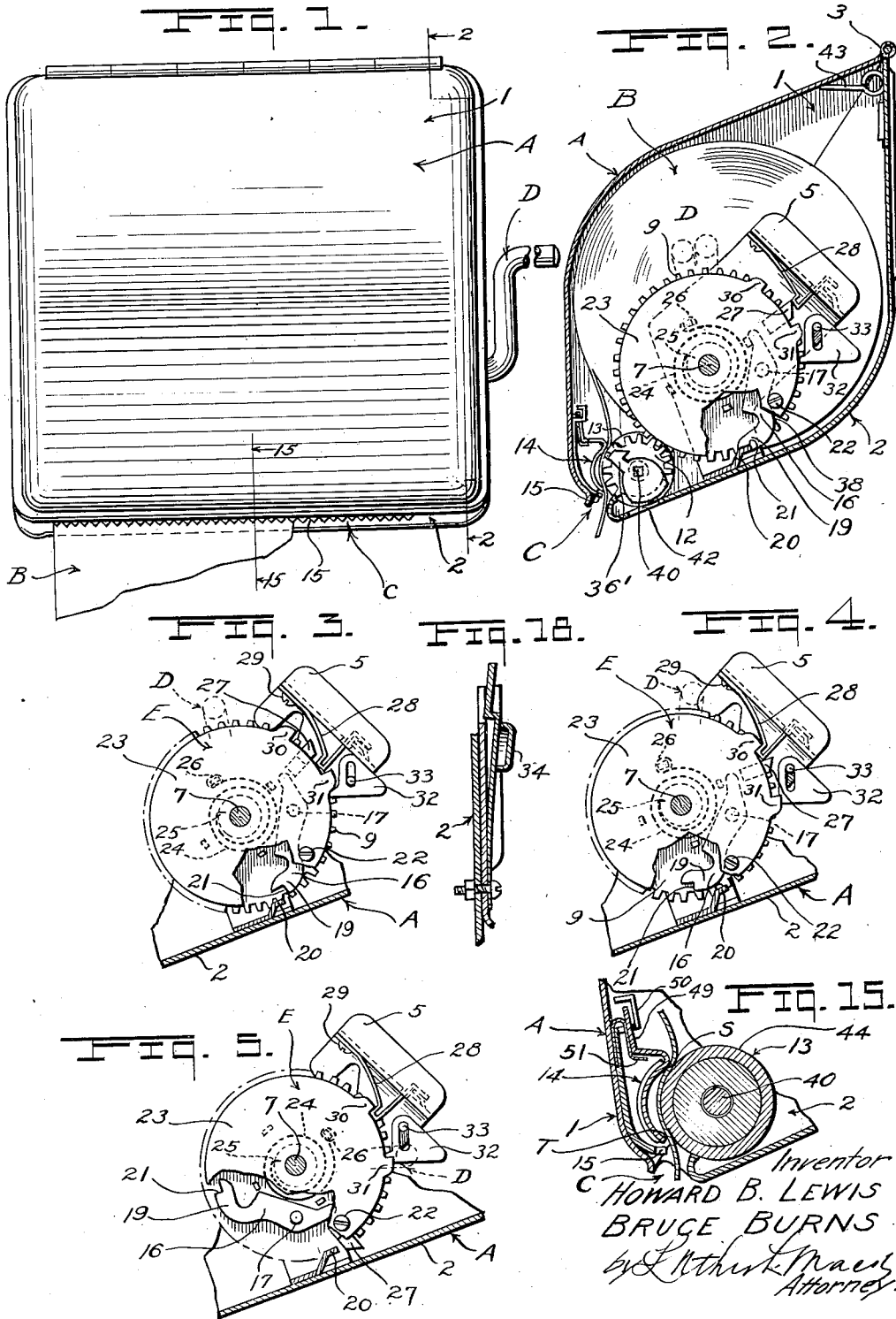
H. B. LEWIS ET AL

2,291,047

DELAYED ACTION TOWEL DISPENSER

Filed March 6, 1939

2 Sheets-Sheet 1



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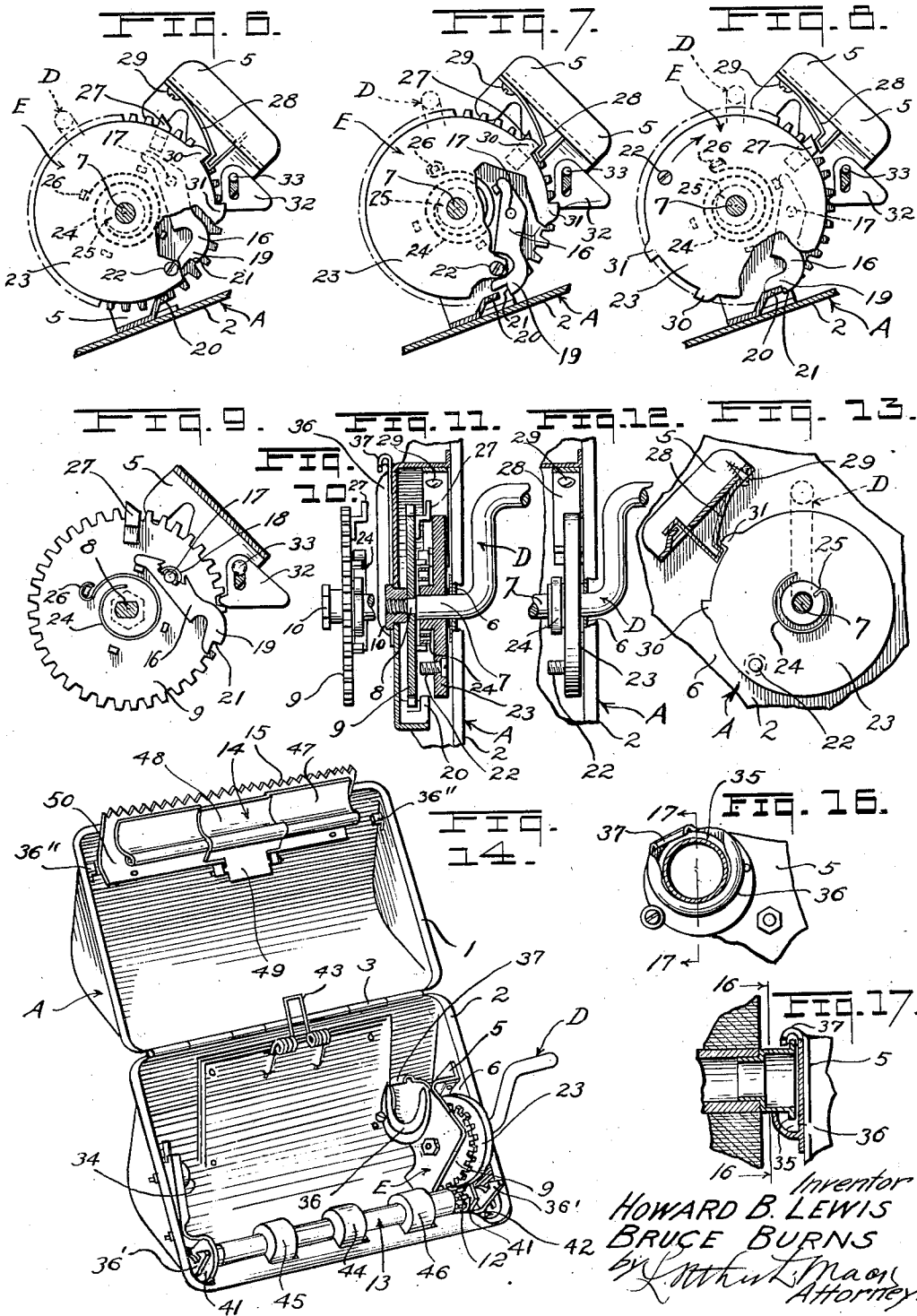
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UNITED STATES PATENT OFFICE

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DELAYED ACTION TOWEL DISPENSER

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12 Claims. (Cl. 271—2.3)

This invention relates to improvements in towel dispensers wherein the dispensing or feed mechanism is automatically rendered inoperative when a given length of a towel is dispensed and must then be manipulated as by moving the operating crank in a particular manner, in order to again become operative for dispensing another length of toweling, the purpose being to render difficult, if not prevent, such repeated operations as would cause a wasteful issuance of a greater amount of toweling than needed per person.

The present invention resides in the provision of a towel dispenser wherein latch means automatically locks the feeding mechanism against operation when a given length of toweling is dispensed, and a time delay latch releasing means, such as a fly wheel device, automatically commences to rotate during or at the expiration of the feeding operation and must rotate for a given period of time before moving to a position in which a predetermined operation of the crank or operating member causes said device to release the latch, whereby another movement of the crank may be effected to bring about another dispensing operation.

One of the objects of this invention is to provide a compact delayed action feed means of the character described which may be localized at one point of the cabinet in small compass, and wherein the entire mechanism is comparatively small and compact and takes up approximately no more room than that required to house a standard size roll of paper toweling, such a mechanism affording the use of a new type of cabinet or casing consisting of like shallow receptacle-like halves hingedly connected and so constructed the unit may be made comparatively small and, therefore, conveniently positioned in closets and other places in which towel dispensers of standard size cannot be conveniently placed.

A further object of the invention is to provide a towel dispenser of the character described wherein the delayed action mechanism includes an inertia or fly wheel device, and is actuated by a spring means which is placed under tension during the dispensing operation and becomes effective at the end of the dispensing operation for rotating said fly wheel device to a position for releasing the latch means, the actual release of the latch means being effected, however, through a reverse movement of the operating handle or crank, this delayed action means being much more simple, reliable in operation and adaptable than dashpot, gravity actuated and

other time delay means heretofore used in the art.

Another object is to provide a dispenser of the character described wherein an improved cabinet facilitates the loading of the dispenser with toweling and eliminates the necessity of threading the toweling through a slot or other opening inasmuch as upon closing the cabinet the dispensing members are automatically brought into engagement with the toweling ready for issuing the latter upon operation of the feed mechanism.

We have shown a preferred form of delayed action towel dispenser in the accompanying drawings, embodying our invention, subject however, to modification within the scope of the appended claims, without departing from the spirit of our invention.

Referring to the drawings:

Fig. 1 represents a front elevation of a dispenser constructed in accordance with this invention,

Fig. 2 represents a sectional view taken on the plane of line 2—2 of Fig. 1 and particularly showing the dispensing and time control mechanism as when the dispensing means is locked and requires a reverse movement of the operating handle to release same,

Figs. 3, 4, 5, 6, 7 and 8 are similar fragmentary sectional views taken on the plane of line 2—2 of Fig. 1, with portions of the mechanism broken away and other parts omitted for clarity of illustration, and showing the dispensing and control mechanism in different positions assumed sequentially during a given dispensing operation,

Fig. 9 represents a fragmentary detail elevation of the dispensing gear and its associated elements,

Fig. 10 represents an edge elevation of said gear and said elements,

Fig. 11 is a fragmentary vertical sectional view of the complete dispensing and delayed action unit as when assembled, excepting the dispensing rollers,

Fig. 12 is a fragmentary elevational view, partly in section, of the fly wheel device,

Fig. 13 is a fragmentary front elevation of the device shown in Fig. 12, and

Fig. 14 is a perspective view of the dispenser as when opened in preparation for mounting a roll of toweling therein.

Fig. 15 is a sectional view taken on the plane of line 15—15 of Fig. 1.

Fig. 16 is a detail section taken on the plane of line 16—16 of Fig. 17.

Fig. 17 is a detail section taken on the plane of line 17—17 of Fig. 16.

Fig. 18 is a fragmentary detail section of the wall device for supporting the paper roll.

One form of the invention as shown in detail in the accompanying drawings generally comprises a housing or cabinet A containing a roll B of paper toweling so that the paper may be extended through a dispensing opening C upon manipulation of a crank handle or like operating member D for actuating a combined dispensing and delayed action means E contained in said housing.

In accordance with this invention, and due particularly to the smallness and compactness of the dispensing and delayed action means, the housing A is comparatively small and consists of shallow shell-like halves or sections 1 and 2 hinged together as at 3, and having the edges opposite the hinges, spaced apart to define the dispensing opening C. One of the members is adapted to be placed against a wall or other support and may be secured thereto as by any suitable means, not shown.

The means here employed for dispensing toweling from the housing includes an angular bracket 5 secured to an end wall 6 of the section 2 of the housing and rotatably supporting with said end wall, the shaft portion 7 of the crank D. The inner end of this shaft portion is reduced and flattened as at 8 so as to support a driving gear 9, which latter is held thereon for rotation with the crank by means of a nut 10 turned on the threaded extremity of the portion 8 (see Figs. 11 and 12). This nut is flanged and engages the bracket 5 so as to rotatably secure the crank thereto.

The gear 9 meshes with a pinion 12 (Figs. 2 and 14) fixed to one end of a dispensing roller 13 suitably journaled in the housing section 2 adjacent the dispensing opening C formed when the housing sections are held together. This roller 13 cooperates with secondary spring loaded dispensing shoe 14 mounted upon the section 1 of the housing. The toweling is extended between said shoe and roller and therefore will be frictionally engaged and moved outward through the dispensing opening C, upon rotation of the roller 13. A serrated tear-off blade 15 is fixed to the housing section 1 so as to extend through the dispensing opening and afford a means for tearing off a measured strip of paper toweling, as will be apparent with reference to Figure 2. It is seen that the gear ratio of the dispensing means is such that a single turn of the operating crank will rotate the dispensing roller several times whereby, with each operation, a strip of paper toweling will be issued.

For the purpose of preventing repeated operations such as would cause wasteful issuance of more toweling than is needed per person, we employ a time delay mechanism which automatically renders the dispensing means inoperative for a predetermined period of time following a dispensing operation, and at the expiration of said time, requires a particular manual operation of the dispensing means, such as a reverse movement of the crank handle, before the dispensing means may again be operated. This control means includes a locking dog 16 pivoted as at 17 between its ends on the gear 9 and having a spring or tensioning washer 18, or the like (Fig. 9), mounted upon the pivot 17 for the purpose of frictionally holding the dog 16 in any position to which it is moved during the operation of the control means. This dog is provided with a hook-shaped end 19 adapted to engage a stop

member 20 fixed to the housing section 2 so that when the dog is in one position, said end will present a shoulder 21 thereon in position to engage said stop whereby to prevent movement of the gear as necessary to effect a dispensing operation, this being a clockwise movement. The movement of the dog 16 is controlled by a pin 22 extending laterally from the inner face of a circular fly wheel 23, which is mounted for free rotation on the shaft 7. This fly wheel has one end of a spiral spring 24 fixed thereto, as at 25, and the other end of the spring is fixed as at 26, to the opposite face of the gear 9. During the dispensing operation, this spring is wound up, as will be hereinafter explained.

Fixed to the gear 9 is a beveled projection 27 which is adapted to engage a spring detent member 28 fixed, as at 29, to the bracket 5. This detent member is adapted to engage projections 30 and 31 on the periphery of the fly wheel 23 for controlling the movement of the latter. A slotted ratchet pawl 32 is pivoted, as at 33, upon the bracket 5 and operates by reason of its slot and its contact with the teeth of gear 9 to permit a limited anti-clockwise movement of said gear, as required when releasing the latch dog by a reverse movement of the handle or crank D, as will be hereinafter described.

The roll of paper toweling B is maintained in proper position within the housing by means of a yieldable supported male bearing member 34 secured, as shown in Fig. 14, to the housing section 2 and adapted extend into the core at one end of said roll, whereas a cup-shaped trunnion member 35 is carried at the other end of said roll and is rotatably engaged in a socket 36 formed in the outer face of the bracket 5. The sections or halves 1 and 2 are closed upon the end of the toweling and thereby dispose the roller 13 and shoe 14 upon opposite sides of said end without requiring the threading of the paper in place. Latch members 36' cooperate with keepers 36'' to hold the sections 1 and 2 closed. A lip 37 on the socket 36 prevents unintentional dislodgment of the member 35 from said socket.

In the operation of the dispenser, assuming that it is in position shown in Fig. 2, and a predetermined length of paper toweling has been issued, as shown in said figure, the dog 19 is engaged with the stop 20 and the gear 9 is locked against such movement as necessary to effect a dispensing operation. In order to release the latch and render the dispensing mechanism operative, the operator must turn the handle D in a reverse direction an extent as indicated by dotted showing thereof in Fig. 2. Since the pawl 32 will permit a limited reverse movement of the gear 9 (see Figs. 2 and 3), it is seen that when the handle is moved in a reverse direction, as aforesaid, the dog 16 carried by said gear is moved away from the stop 20. The dog will move inwardly so that the shoulder 21 thereof will be disposed out of the path of the member 20, as the pin 22 on the fly wheel 23 engages the curved surface 38 of the dog. As soon as the beveled projection 27 on the gear 9 moves clear of the spring detent 28, as takes place upon the initial reverse movement of gear 9, the detent 28 moves towards the periphery of the fly wheel 23 and the projection 31 on said fly wheel encounters said detent 28, as shown in Fig. 3, whereupon the fly wheel and pin 22 are stationarily held so that as the gear 9 completes its reverse movement, the curved face 38 of said dog engaging said pin 22 causes the dog to swing

Inwardly into position clear of the member 20, as shown in Fig. 3. The operator may now turn the handle in clockwise direction to effect rotation of the gear 9 and the driving of the pinion 12, whereupon the roller 13 and shoe 14 will function to extend a given length of the paper toweling.

As shown in Fig. 4, the fly wheel 23 is held against rotation in a clockwise direction with said gear 9, by means of the projection 30 encountering the detent 28. Thus, as the gear 9 continues to turn in a clockwise direction during the dispensing operation, the spring 24 is placed under tension by the movement of the outer end relative to the inner end thereof as in the hair spring of a watch. Near the end of the rotation of the gear 9, through one revolution, as shown in Fig. 6, the hook end of the dog 16 encounters the pin 22 on the fly wheel and said dog is rocked on its pivot 17 so that the shoulder 21 is extended outwardly into a position to engage the member 20, as shown in Fig. 7. As the gear completes one revolution, the beveled projection 27 thereon engages and lifts the detent 28, as shown in Fig. 8, and the shoulder 21 on the dog 16 abuts the member 20. As soon as the detent member 28 is lifted to the position shown in Fig. 8 and is clear of the projection 30 on the fly wheel, the latter is released and is then rotated in a clockwise direction by the spring 24. This movement of the fly wheel commences when the gear 9 is locked by means of the shoulder 21 and stop member 20, and during the time of such rotation of the fly wheel, the machine is inoperative as to a dispensing operation, due to the fact that should the operator move the handle D in a reverse direction and thereby correspondingly move gear 9, such movement will not cause the dog 16 to move out of the path of the member 20 inasmuch as said dog must contact the pin 22 on the fly wheel in order to be rocked into a releasing position, and at such time said pin is not in position to contact the dog. However, as soon as the fly wheel has completed its predetermined rotation and assumes the position shown in Fig. 2, with the pin 22 bearing against the curved face 38 of the dog 16, retractive or reverse movement of the gear 9 will cause said dog to be rocked and the shoulder 21 thereof to be moved out of the path of the member 20 into the position shown in Fig. 3 whereby to release the dispensing means.

It will now be seen that the delayed action mechanism hereof will automatically render the dispenser inoperative when a predetermined length of toweling has been issued and that the dispenser will remain inoperative until such time that the operator moves the crank D in a reverse direction and thereby releases the locking means, as hereinbefore noted. These two delay factors will discourage, if not prevent, such operation of the dispenser as would cause a greater amount of toweling to be issued than needed per person.

It will be noted that the latch members 36' are fixed to the ends of a rotary shaft 40 on which shaft the roller 13 is freely revoluble. This shaft is supported in suitable bearings 41 and when the two sections 1 and 2 are brought together or "closed," the latches 36' will automatically lock with the keepers 36'' on section 1 and the cabinet will be locked in closed position. To unlock the cabinet a suitable instrument, not shown, is inserted through an opening 42 on the section 2 and engaged with the adjacent member 36' so that it may be moved out of latching posi-

tion, the other member 36' being correspondingly moved, due to being mounted on the shaft 40 which turns when said first-named member is moved out of latching position. A spring 43 is associated with the two sections 1 and 2, as shown in Fig. 14, so that it will automatically raise the section 1 when the latches are released, thus providing ready access to the interior of the cabinet.

The roller 13 and shoe 14 are especially constructed to insure the proper feeding of the paper and to prevent jamming or clogging of the paper. As here shown, the roller 13 is provided with spaced rubber rings 44, 45, and 46, of which the one 44 is centrally disposed. The shoe 14 is in the form of an arcuate plate 47 having a centrally offset portion 48 which extends outwardly from the remainder thereof and is adapted to engage the ring 44, or better, to frictionally hold the paper against said ring 44. The other portions of the shoe do not force the paper into frictional contact with the rings 45 and 46 and it is thus seen that the feeding action takes place as between the ring 44 and offset portion 48 of the shoe centrally of the edges of the strip of paper. However, when the paper is pulled in preparation for tearing off a strip thereof, it comes in contact with the rings 45 and 46 so as to prevent the paper from slipping or sliding sideways and this insures a clean cut along the serrated edge of the tear-off lip 16. Preferably, the plate 14 is provided with a supporting tongue 49 which is loosely mounted in a keeper member 50 fixed to the section 1 of the case whereby said plate is flexibly or hingedly supported. A suitable leaf spring 51 is mounted between the case and said plate so as to yieldably urge the latter into frictional contact with the roller 13, that is, the ring 44 of said roller. Preferably, the plate is so curved that it will hold the paper in contact with the roller 13 at the widely spaced points S and T, as particularly shown in Fig. 15. This is desirable inasmuch as it not only insures the proper frictional contact of the paper with the roller 13, but also insures the retention of the strip of paper between the shoe and roller after a retractive movement of the handle has been effected and the roller 13 has been reversely rotated. Such reverse movement of the roll 13 will retract the strip of paper lying between it and the shoe 14 but not sufficiently to withdraw the paper past the point S where the shoe forces the paper against the ring 14 of the roller. This therefore insures the operativeness of the device at all times and inasmuch as the shoe is loosely and resiliently held in place, it will be permitted a universal movement and will therefore accommodate itself to the paper and rolls so as to insure the proper frictional engagement of the latter with the paper. Another advantage of this shoe is that should the paper tend to bunch up or jam, the pressure of the jammed or bunched up portion of the paper will move the yieldable shoe outwardly away from the roller 13 so that the latter will not have sufficient frictional engagement with the paper to continue a feeding operation. Therefore, upon the initial formation of a jam or bunching of paper between the shoe and roll, the feeding action of the paper is automatically stopped.

We claim:

1. A towel dispenser including a cabinet adapted to contain toweling, latch means operating automatically to arrest the issuance of toweling from the cabinet when a predetermined length

of toweling has been issued, time control means including a fly wheel member adapted to rotate freely, means for bringing said member to rest after predetermined rotation, means associated with said member for rendering the latch means releasable only when said member is at rest, means automatically effecting a predetermined rotative movement of said fly wheel member when a predetermined length of toweling is issued, and a combined dispensing and latch releasing means operatively associated with said time control means and said latch means and initially operable for releasing said latch means and subsequently operable for dispensing a given length of toweling.

2. A towel dispenser including a cabinet adapted to contain toweling, latch means operating automatically to arrest the issuance of toweling from the cabinet when a predetermined length of toweling has been issued, time control means including a fly wheel member adapted to rotate freely, means for bringing said member to rest after predetermined rotation, means associated with said member for rendering the latch means releasable only when said member is at rest, means automatically effecting a predetermined rotative movement of said fly wheel member when a predetermined length of toweling is issued, and a combined dispensing and latch releasing means operatively associated with said time control means and said latch means, including a member manually movable exteriorly of said cabinet for effecting release of the latch means and for operating said dispensing means to issue a given length of toweling.

3. A towel dispenser comprising a cabinet adapted to contain a supply of toweling, latch means automatically arresting the issuance of toweling when a predetermined length thereof has been dispensed, time control means including a fly wheel member adapted to rotate freely, means for bringing said member to rest after predetermined rotation, means associated with said member for rendering the latch means releasable only when said member is at rest, and a combined latch releasing and dispensing means including means automatically effecting a predetermined rotative movement of said fly wheel member after issuance of a predetermined length of toweling and an operating handle operatively associated with said combined means and said latch means and initially movable to release said latch means and subsequently movable to operate the dispensing means to issue a predetermined length of toweling.

4. A towel dispenser including a cabinet adapted to contain a supply of toweling, stop means automatically arresting the issuance of toweling when a predetermined length thereof has been dispensed, a combined operating means for dispensing toweling from the cabinet and releasing the stop means, including a single operating handle movable for releasing the stop means and for operating the dispensing means, and a fly wheel means which is automatically and freely rotated a predetermined extent after a towel issuing operation of said dispensing means and which prevents release of the stop means until cessation of said predetermined rotative movement thereof takes place, said fly wheel means including means for driving the fly wheel, and means carried by the fly wheel for releasing the dispensing means when the operating means is operated in a given direction.

5. A towel dispenser comprising a cabinet

adapted to contain toweling, dispensing means for issuing predetermined lengths of toweling from said cabinet including a handle manually movable exteriorly of the cabinet, stop means for automatically arresting the issuance of toweling from the cabinet when a predetermined length thereof has been dispensed, means operatively associated with and operating upon movement of said handle, for controlling and releasing said stop means, including a fly wheel member, means for automatically rotating said fly wheel freely after the issuance of a predetermined length of toweling, and means preventing during such free rotative movement thereof the release of said stop means thru movement of said handle, and operating upon cessation of said predetermined rotation thereof, to render said stop means releasable thru said movement of the handle.

6. A towel dispenser comprising a cabinet adapted to contain toweling, dispensing means for issuing predetermined lengths of toweling from said cabinet including a handle manually movable exteriorly of the cabinet, stop means for automatically arresting the issuance of toweling from the cabinet when a predetermined length thereof has been dispensed, means operatively associated with and operating upon movement of said handle, for controlling and releasing said stop means, including a spring operated fly wheel member, automatic means for rotating said fly wheel freely after the issuance of a predetermined length of toweling and means preventing during such free rotative movement thereof the release of said stop means thru movement of said handle, and operating upon cessation of said predetermined rotation thereof, to render said stop means releasable thru said movement of the handle.

7. A towel dispenser comprising a cabinet adapted to contain toweling, dispensing means for issuing toweling from said cabinet, including a rotary shaft, a handle for rotating said shaft, a roller for frictionally engaging and feeding toweling from said cabinet, means cooperating with said roller for holding toweling in frictional engagement therewith, a drive gear fixed to said shaft, a driven gear mounted on said roller and meshing with said drive gear, a fly wheel freely rotatable on said shaft, spaced peripheral projections on said fly wheel, a spring detent member fixed to said cabinet and normally disposed for engagement with said projections for limiting the rotative movement of the fly wheel, a spiral spring fixed at its ends to said drive gear and said fly wheel and arranged to be placed under tension upon a dispensing rotation of said drive gear while said detent holds the fly wheel against rotation, and to rotate the fly wheel when said detent is retracted and said drive gear is held against rotation, a stop member fixed to said cabinet, a dog pivoted on said drive gear for movement into and out of locking engagement with said stop, a dog engaging member on said fly wheel for moving the dog into and out of position of engagement with said stop, a pawl pivotally mounted on said cabinet and engaging said drive gear for affording a limited movement thereof in a reverse direction, and a member mounted on said drive gear so as to engage and move said spring detent out of fly wheel holding position and thereby release the fly wheel when said dog is locked with said stop following a predetermined dispensing rotation of said drive gear, said dog having a cam surface with which said dog engaging member contacts upon comple-

tion of the rotary movement of said fly wheel and which causes said dog to be retracted from stop engaging position when the gear is moved reversely to the dispensing rotation thereof, said dog also having a cam surface with which said dog engaging member contacts for moving said dog into stop engaging position when said drive gear completes a predetermined rotative movement for dispensing toweling.

8. A towel dispenser comprising a cabinet adapted to contain toweling, dispensing means for issuing toweling from said cabinet, including a rotary shaft, a handle for rotating said shaft, a drive gear fixed for rotation with said shaft, means driven by said gear for engaging and issuing toweling from said cabinet, a fly wheel freely rotatable on said shaft, a spiral spring fixed at its ends to said gear and said fly wheel so as to be placed under tension during a dispensing rotation of said gear while said fly wheel is held against rotation, and to rotate said fly wheel upon release of the latter while the gear is held against rotation, a spring loaded detent means normally holding said fly wheel against rotation, detent means for holding said gear against rotation, a detent operating member on said fly wheel for moving the detent means for said gear out of gear holding position when said fly wheel completes a predetermined rotative movement following its release, a detent operating member on said gear for moving the spring loaded detent means out of fly wheel holding position and releasing said fly wheel at the time said gear is held by its detent means, the detent operating member on said fly wheel being operable to retract the detent for said gear when said handle is operated to move said gear in a direction opposite that required for dispensing toweling.

9. A towel dispenser comprising: a cabinet for supporting a roll of toweling, a rotatable dispensing means supported in said cabinet, and including a manually rotatable member, an automatically rotatable time delay member, means operative for stopping the movement in a given direction of said dispensing means at the completion of each operation, means for rotating said time delay member following the completion of each operation into position preparatory to releasing the dispensing means for a succeeding operation, and cooperating means on said manually rotatable member and said time delay member for releasing the dispensing means when said manually rotatable member is reversely moved.

10. A towel dispenser comprising: a cabinet for supporting a roll of toweling, a rotatable dispens-

ing means supported in said cabinet, and including a manually rotatable member, an automatically rotatable time delay member, means operative for stopping the movement in a given direction of said dispensing means at the completion of each operation, means for rotating said time delay member following the completion of each operation into position preparatory to releasing the dispensing means for a succeeding operation, and cooperating means on said manually rotatable member and said time delay member for releasing the dispensing means when said manually rotatable member is reversely moved, and means engaging said manually rotatable member for limiting the reverse movement thereof.

11. A towel dispenser comprising: a cabinet for supporting a roll of toweling, a rotatable dispensing means supported in said cabinet, and including a manually rotatable member, an automatically rotatable time delay member, means operative for stopping the movement in a given direction of said dispensing means at the completion of each operation, means for rotating said time delay member following the completion of each operation into position preparatory to releasing the dispensing means for a succeeding operation, and cooperating means on said manually rotatable member and said time delay member for releasing the dispensing means when said manually rotatable member is reversely moved, and means engaging and for limiting the movement of said time delay member.

12. A towel dispenser comprising: a cabinet for supporting a roll of toweling, a rotatable dispensing means supported in said cabinet, and including a manually rotatable member, an automatically rotatable time delay member, means operative for stopping the movement in a given direction of said dispensing means at the completion of each operation, means for rotating said time delay member following the completion of each operation into position preparatory to releasing the dispensing means for a succeeding operation, and cooperating means on said manually rotatable member and said time delay member for releasing the dispensing means when said manually rotatable member is reversely moved, the movement of said manually rotatable member in a dispensing operation serving to render said time delay rotating means operative for operating the time delay means following the completion of each dispensing operation.

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