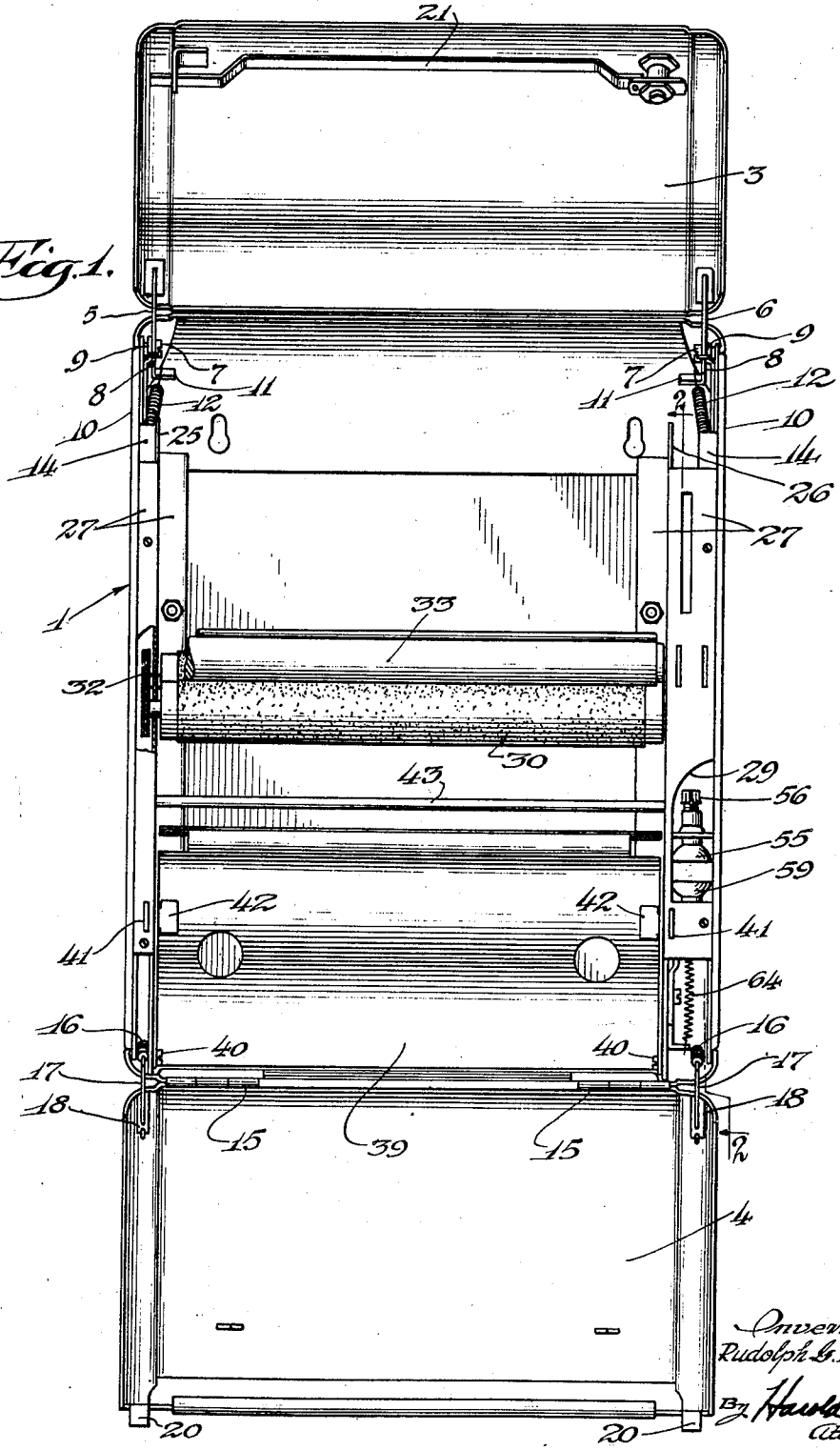
June 1, 1943. R. G. BIRR 2,320,453

STOP MECHANISM, AND CABINET IN COMBINATION WITH SUCH STOP MECHANISM

Filed May 12, 1941

4 Sheets-Sheet 1

Fig. 1.



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4 Sheets-Sheet 2

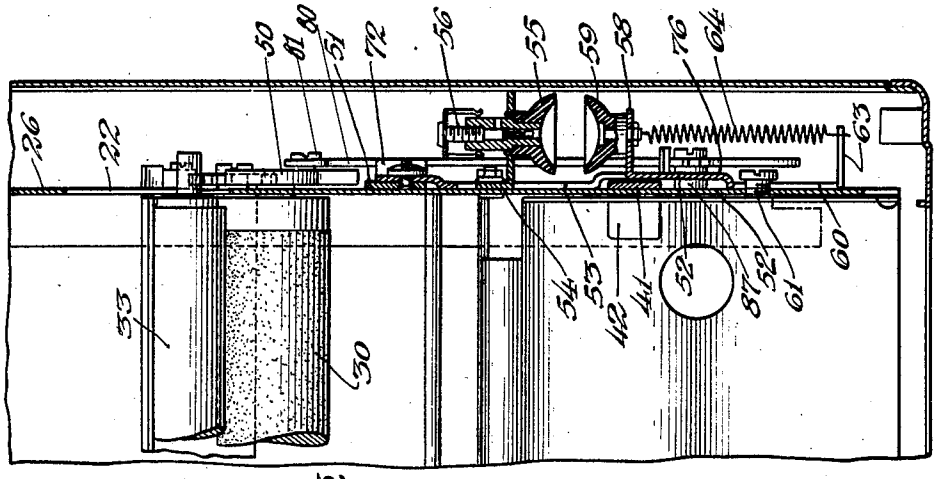


Fig. 3.

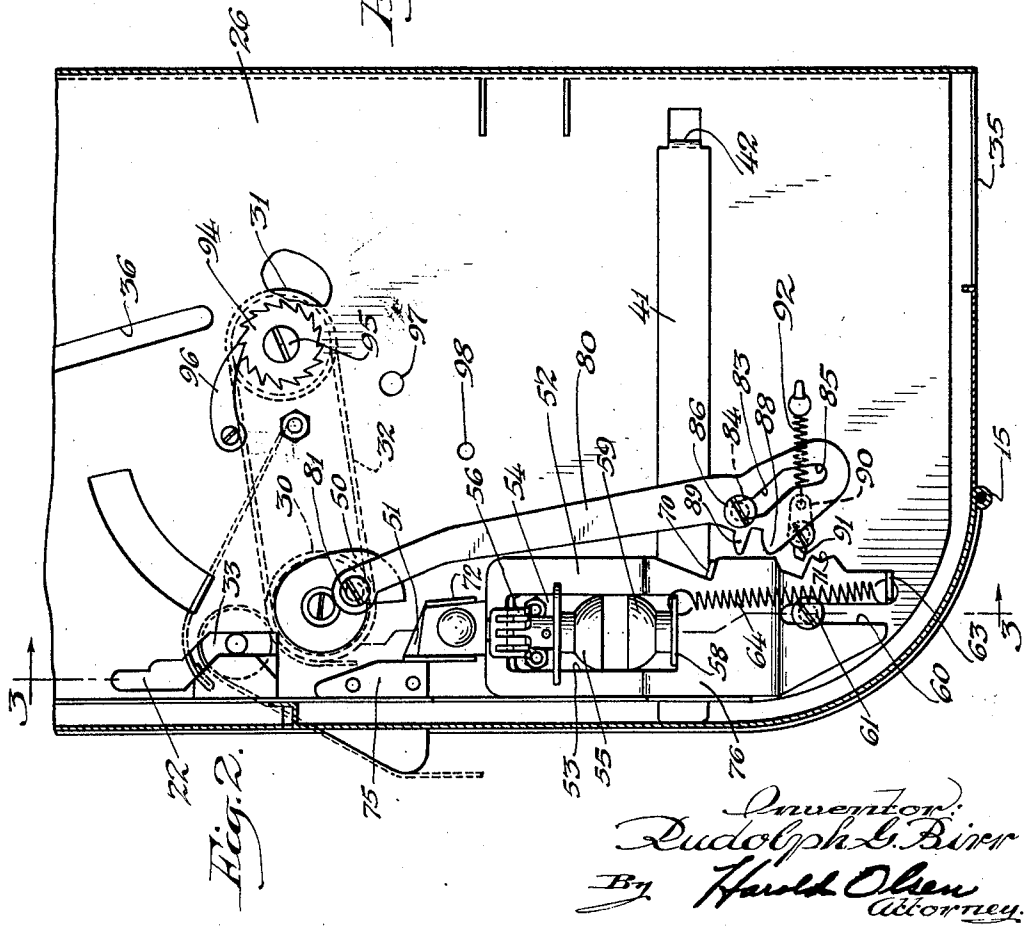


Fig. 2.

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STOP MECHANISM, AND CABINET IN COMBINATION WITH SUCH STOP MECHANISM

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4 Sheets-Sheet 3

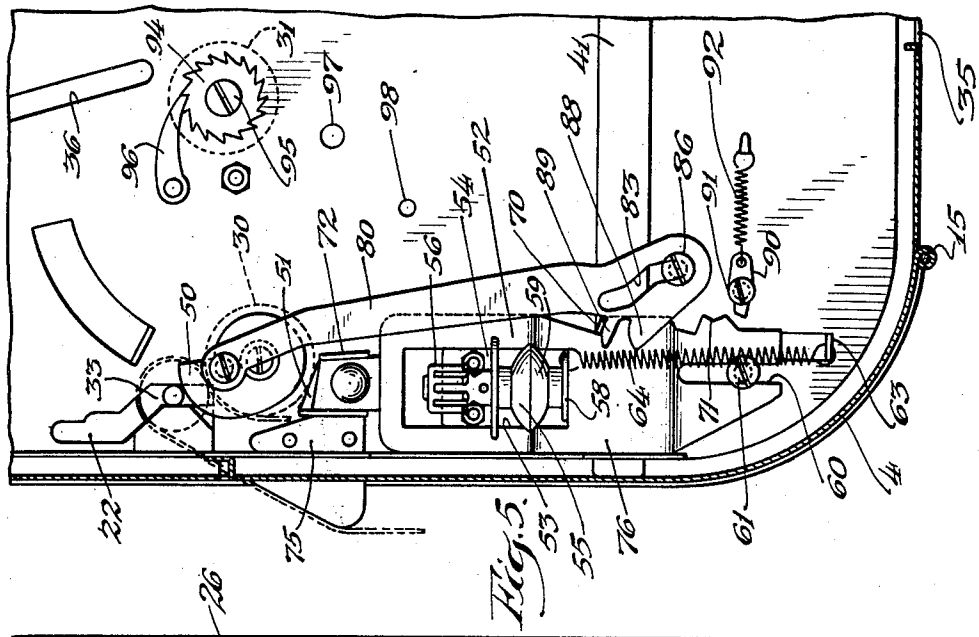


Fig. 5.

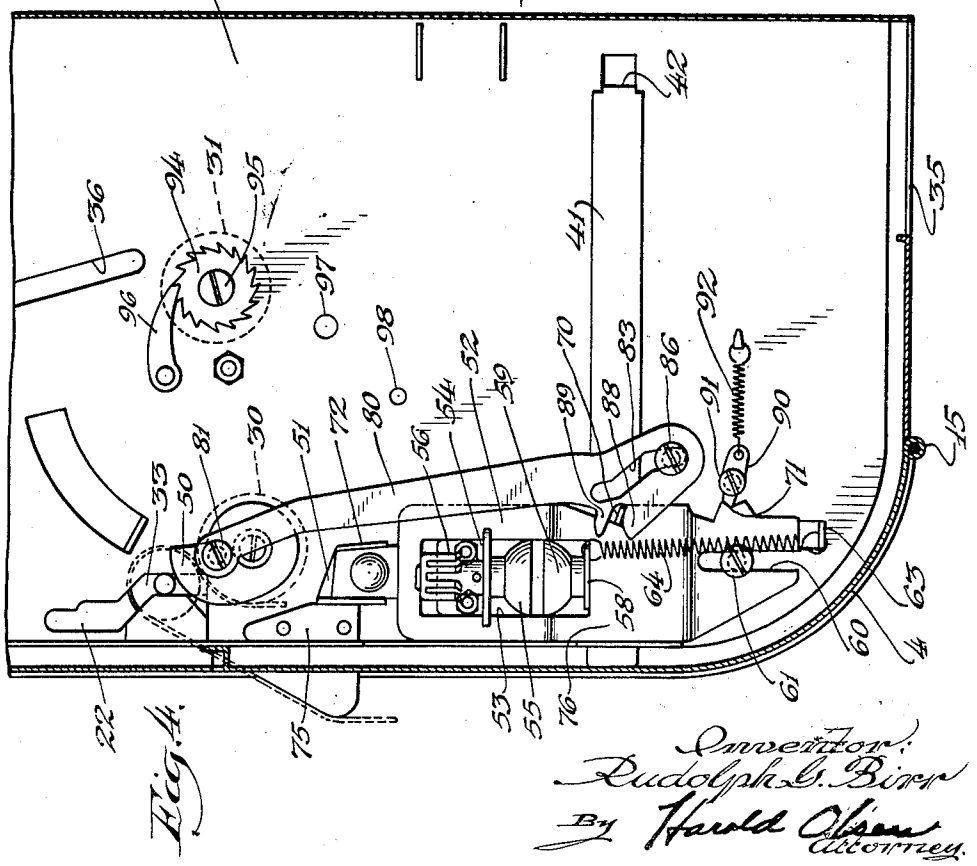


Fig. 4.

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STOP MECHANISM, AND CABINET IN COMBINATION WITH SUCH STOP MECHANISM

Filed May 12, 1941

4 Sheets-Sheet 4

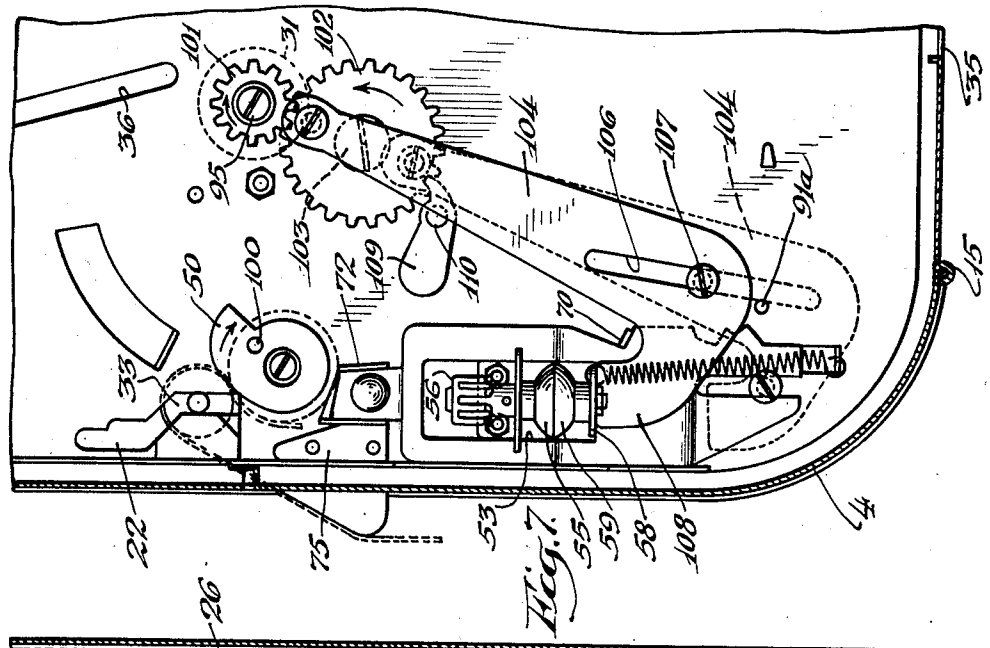


Fig. 7.

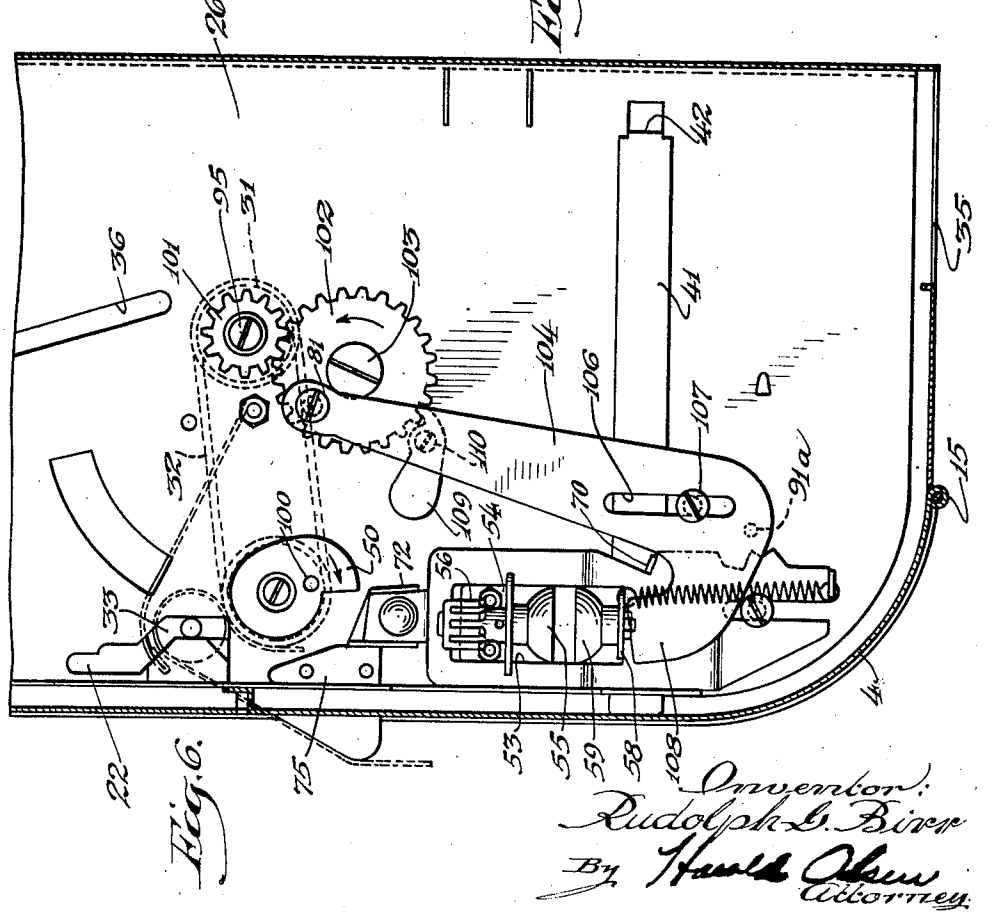


Fig. 6.

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Patented June 1, 1943

2,320,453

UNITED STATES PATENT OFFICE

2,320,453

STOP MECHANISM, AND CABINET IN COMBINATION WITH SUCH STOP MECHANISM

Rudolph G. Birr, Lombard, Ill., assignor to Steiner Sales Company, Salt Lake City, Utah, a corporation of Utah

Application May 12, 1941, Serial No. 393,126

25 Claims. (Cl. 271—2.3)

This invention relates to improvements in dispensing cabinets and has for an important object to increase the capacity of a standard, all-metal cabinet at small expense.

Another object is to provide a new type of stop-operating mechanism which is operated from a rotatable element by more than one revolution of said element.

Another object is to provide means by which a stop mechanism can be operated from one or the other of two rotatable elements which are driven in unison.

Another and general object of this invention is to obtain reduction in diameters of both the feed and take-up rolls, thus saving material and reducing weight, in addition to gaining space to accommodate supply and take-up rolls of greater diameter.

Another object is to provide a stop mechanism which is set by step-by-step movement toward stopping position.

Another object is to operate the stop-setting means directly from one of the rolls, either from the measuring roll or from the take-up drive roll; in the first instance, directly as a result of more than one revolution, or at least two revolutions, of the measuring roll to move the stop to stop position by a step-by-step motion, and second to set the stop by means other than step-by-step motion.

Features of the invention relate to the various details of construction; the use of a support for the part of a timer as a shoulder against which part of a stop-control means operated as a result of dispensing engages to move the stop to stopping position; the use of a struck-out spring-anchoring projection as means to limit the movement of the stop away from stop position; the use of an irregular slot in the crank link for moving fingers of a link for sequential engagement with part of a stop to move that stop into stopping position; and the provision of automatically releasable means for temporarily holding the top at an intermediate nonstopping position.

Regarding that phase of the invention by which an increase of capacity is obtained.

The owner of a large number of cabinets of the type herein often contracts with a laundry company to furnish toweling for the cabinets and to wash the toweling when soiled and to return the clean toweling in roll form. For example, the owner may contract for fifty yards of toweling for each cabinet and for the washing of that toweling. During washing a certain amount of shrinkage occurs, and the cheaper the grade of toweling the greater the amount of shrinkage. For repeated washings this shrinkage is considerable and the owner notes that he is not getting back the full amount of yardage contracted for and forthwith complains. Where the total yardage of his total number of cabinets is relatively large the amount of shrinkage in the aggregate is quite large and the yardage is substantially reduced.

The problem is, how to compensate for shrinkage without changing the overall height of the cabinets. For example, cabinets of the type herein may be designed to hold or handle fifty yards of washable fabric toweling. There is a constant demand for cabinets of minimum size and vertical height so that it is not desirable to increase the size of the cabinets. The cabinets are made of metal by a die-stamping process, and any change in size or in vertical height means an expensive change in dies, not only for the outer casing and the doors, but for the removable unit and other elements within the cabinet. Changes of these kinds are relatively very expensive.

In order to compensate for shrinkage, a better, thicker, more expensive grade of toweling may be used, but a fifty-yard roll of such toweling (because of the increased thickness) will be too large for the cabinet, that is, the diameter of the roll will be too great. On the other hand, if a larger amount of a cheaper grade of toweling is used, the diameter will also be too large. In either case, more cabinet room is needed because the diameter of the fifty-yard roll (or any other size of roll) will be increased either by using thicker material or by using a longer length of thinner material.

It is much less expensive, therefore, to change the diameter of the rolls, but when their diameters are changed sufficiently to give the needed added room the rolls have to rotate more than once in order to operate the standard stop mechanism which is designed to be operated by one revolution of the roll or rolls. The problem then is to operate or set a standard stop mechanism without changing its dimensions or substantially changing it in any way. Applicant has solved these problems by equipping the cabinets of this given height and having standard stop mechanisms with rolls of substantially smaller diameter, and by providing means to operate the standard stop mechanism as a result of more than one revolution, or by two or more revolutions of these feed rolls. Thus, by making in the standard construction such relatively slight modifications of

these hundreds of cainets already in use, added capacity may be had at a minimum of cost and by a minimum of change. Moreover, no changes in dies are necessary for making any of the standard parts. Thus, neither the manufacture of new cabinets nor the change in the existing cabinets involves any substantial additional expense, and some reduction in weight of the cabinet per se is obtained.

Although one phase of this invention has to do with obtaining more toweling capacity, the constructions per se of the stop control mechanisms are believed to be new. The step-by-step movement scheme may be useful for other purposes than that of operating a stop mechanism from a measuring or take-up roll in a cabinet of the particular type herein and for the purpose of increasing clean towel handling capacity without change in the overall height of the cabinet.

Another feature of the invention relates to the manner in which the slide-stop is arranged, and also to the use of a stop-operating or control means which is entirely separate from the stop, that is, is not connected directly to it but moves toward the stop, raises it and then moves laterally or away from the stop to a position spaced therefrom and in a manner to leave the stop entirely free for automatic movement away from stop position.

Objects, features and advantages of the invention will be pointed out in the description of the drawings, and in said drawings—

Figure 1 is a front elevation illustrating a particular type of cabinet in which the stop-operating mechanism is advantageously applied, and showing the cabinet with the doors open;

Figure 2 is a vertical section with the doors of the cabinet closed, taken approximately on line 2—2 of Figure 1, with the marginal inturned flange of the side of the outer casing omitted, and with the parts positioned as when the stop is in fully retracted position;

Figure 3 is a vertical transverse section taken approximately on line 3—3 of Figure 2;

Figure 4 is a view similar to Figure 2 but showing the parts positioned as after about the first half of the first revolution of the roll and with the timer unset;

Figure 5 is a view similar to Figure 2 with the parts positioned as after about one and one-half revolutions of the roll, and with the stop and timer set;

Figure 6 is a view of a modification of the invention showing the parts positioned as when the stop is fully retracted; and

Figure 7 is a view similar to Figure 6 but with the parts positioned as after slightly more than one and one-half revolutions of the measuring roll, and showing in dotted lines the fully retracted position of the link, which position is intermediate of its positions in Figures 6 and 7.

Now referring to the drawings, and first to Figure 1. The numeral 1 generally indicates an outer casing of stamped metal having upper and lower stamped metal doors 3 and 4 cooperative to form a delivery opening.

The top door is hinged by a pair of arcuate members 5, 6, each rigidly connected to the door 3. Each member is pivoted as at 7 to the outer casing 1, and each has a stop 8 which engages a corresponding stop 9 on the corresponding side wall 10 of the cabinet to limit upward motion of the door. Each one of these hinge members has a lateral extension 11 to which one end of a spring 12 is attached, and the other end of the spring is attached to an anchoring finger (not shown) which is attached to the back of a corresponding flange 14 which extends inwardly from the forward edge of the side 10 of the outer casing 1.

The bottom door is hinged as at 15 to the bottom wall of the cabinet. See also Figure 2. The door is adapted to be held in upright position at a point below the cabinet to be used as a means for measuring the loop of clean toweling during servicing. This is accomplished by the use of springs 16, one on each side, the rear ends of the springs suitably detachably secured to the rear wall of the cabinet, the forward end of the spring being attached to one end of an arcuate link 17. The opposite end of the link is hooked through the end of an outstanding extension 18 of the lower door. The arcuate links have their concave sides facing the hinging line of the door and are so related that the door will not be moved by the springs except after it is moved upwardly far enough for the extensions 18 to be brought to a position some little distance above a horizontal plane which passes through the hinging point.

The upper end of the lower door has extensions 20 which, when both doors are closed, are overlapped by the upper door. A locking device on the upper door generally indicated at 21 cooperates with the pinch roll slots 22 (see Figure 2) to hold the upper door in closed position. This locking device forms no part of the present invention.

The type of cabinet herein is designed to dispense washable fabric toweling, and the supply is furnished in roll form. The type is like that shown in the copending application of Birr and Grunwald, Serial No. 225,398, filed August 17, 1938.

Within the cabinet is a dispensing unit which includes two plates 25, 26 spaced transversely of the cabinet. Each plate is suitably secured to the back wall of the outer casing and each plate has at its forward edge an outturned flange 27 overlapping the inturned flange 14. The flanges have openings which register to receive screws. One of the flanges 27, in this instance at the right, is cut out as at 29 to give access for adjustment of the stop mechanism.

Mounted between and upon the plates 25 and 26 are two rolls respectively herein designated as a measuring roll 30 and a soiled towel take-up drive roll 31. These rolls are of the same diameter and are herein of a smaller diameter than is usual in cabinets of this class. They are connected by a chain and sprocket 32 to move in unison and each is covered with suitable friction material. Associated with the measuring roll resting by gravity thereon is what is known as the pinch roll 33 journaled in slots 22. The rolls are arranged in substantially the same horizontal plane.

The cabinet is divided by two rolls, one a measuring roll and the other a soiled towel take-up drive roll, into upper and lower chambers of substantially equal height and of substantially equal cubical capacity. The lower chamber receives the clean towel roll. The loop is formed by passing the toweling first between the measuring and pinch rolls, thence to a point outside the cabinet, then downwardly and rearwardly around the lower edge of the open lower door to form a loop, and then upwardly through opening 35 to be attached to a soiled towel take-up roll not

shown, but the shaft of which rides in slots **36** (see Figure 2).

All of the parts of this cabinet are made of metal formed by dies, and it is a particular object to increase the capacity of this cabinet without changing any part of the cabinet which is die-made, and also to use a standard stop mechanism without any substantial modification of it. Portions of this stop mechanism are also made from dies by a stamping operation.

A space-making and smoother plate **39** is pivoted as at **40** to the plates **25** and **26**. Slidable elements **41** are connected with this plate at **42** and project at the front of the cabinet and are engageable by the lower door to be pushed inwardly to correspondingly move the plate rearwardly to smoothing relation with smoother bar **43**. This bar and a second bar not shown cross-connect the plates **25**, **26** and rigidly secure them in spaced relation.

The general construction and operation of the parts previously described are well known. The use of the small rolls is new for the purpose herein. I will now describe a stop and a stop-operating mechanism adapted to set the stop as a result of more than one revolution of either the measuring roll or the take-up drive roll.

Now referring to Figure 2. Attached in this instance to the shaft or trunnion of the measuring roll is an arm **50** which has been referred to herein as the first stop. This stop is engageable with a second stop **51** as a channel-shaped element embracing an upper extension of a slidable plate **52**. The plate and its extension may be considered to be a slide stop. The second stop need not necessarily be a slide stop for some phases of the invention, nor for some phases need the first stop be rotatable. This slide stop is generally of the type shown in Grunwald application Serial No. 374,367, and the stop per se is not claimed herein, although certain modifications of it are herein claimed.

This slide stop comprises the plate **52** which lies against the outer face of the upright plate **26** of the inner unit. The slide has a guide opening **53** and one of the guides comprises a bracket **54** secured in the opening by suitable fastening devices to plate **26**. This bracket has a shelf upon which is mounted one cup element **55** of a vacuum cup timer and also an adjusting device **56** for varying the air inlet to the cups to annul the vacuum. The slide has a struck-out portion as a shelf **58** which carries the other cup **59** of the timer.

The lower end of the slide has a slot **60** extending inwardly from its lower end in direction of reciprocation of the slide and a screw **61** passes through this slot and forms a guide. The metal of the side plate **26** of the inner unit (see Figure 3) is struck out to provide a projection **63** having an opening therein and through this opening is hooked the lower end of a stop-retracting spring **64**, the upper end of which is hooked in an opening of the shelf or shoulder **58** which supports the lower cup **59** of the timer. When the slide stop is in fully retracted position its lower end engages this struck-out portion **63** as a stop. The upper edge of the bracket **54** may also act as a stop.

Near the lower part of the slide two shoulders are provided, respectively lettered **70**, **71**. The upper shoulder is struck out from the edge of the plate to extend at right angles to the outer face of the slide. The channel **51** is a facing and spacing element which provides a flange **72** slightly inclined to the vertical and with which the arm **50** of the measuring roll engages to stop rotation of said roll. At the opposite side of this channel is a flange which is engaged with the edge of a metal insert **75**, which insert acts as an impact-taking member as the stops are forcibly engaged. The slide is arched as at **76** so that the slidable element **41** which engages the space-maker plate **39** is free for translation behind the stop plate.

As shown in Figure 2, the second or slide stop is in its initial, fully retracted position as after release by the timer. The means for operating this stop from one or the other of the measuring or take-up drive rolls is an important feature of this invention, both of itself and in relation to small sized rolls in a cabinet of this type in which the dispensing and take-up rolls divide the cabinet into upper and lower chambers of equal capacity. In this instance the second stop is moved (to stopping position where it is held by the timer) by a step-by-step movement. The completion of this step-by-step movement occurs as a result of more than one revolution of the measuring roll, in this instance as a result of two complete revolutions of the measuring roll. I believe the use of a step-by-step motion is broadly new and do not intend to entirely limit the invention to the particular means for obtaining it.

The step-by-step motion is obtained in this embodiment by the use of a link **80**, the upper end of which is pivoted as at **81** to the first stop or arm **50**, but the link may be operated by the roll in other manners. A crank connection is thus formed. The lower end of this link has an irregular shaped slot which in this instance has a centrally located upwardly, forwardly slanted portion **83** merging into a more vertical portion **84** at the top and also merging into a more vertical portion **85** at the bottom. Passing through this slot and suitably attached to the side plate **26** of the inner unit is a screw **86** which also passes through a spacer element **87**. Free play is left between the head of the screw and the spacer. It is noted that the link normally lies laterally, in this case rearwardly, of the slide stop, and that the faces of greatest area of the link and stop lie in planes parallel with the face of the plate or mount provided by the inner unit.

On that side of the link nearest the slide stop and near the bottom of the link are provided two fingers **88**, **89**, lower and upper. In the operation (see Figures 2, 4 and 5) the lower finger **88** first engages the shoulder **70** and raises the slide to a position just short of vacuum attachment of the cups as in Figure 4, and then the second or upper finger **89** engages this shoulder **70** and completes the movement of the stop to its final stopping position in the path of the arm as in Figure 5, and to a position whereat the cups are brought into vacuum attached relation. In this particular embodiment the cups may be under considerable compression as the slide reaches its final stopping position, but this, of course, is not necessary. All that is necessary is that the cups be brought to that position whereat they are vacuum attached.

To hold the slide at an intermediate nonstopping position detent means is provided to cooperate with the shoulder **71**. This means herein comprises a pawl **90** pivoted as at **91**, and yieldably held by a spring **92**, initially as shown in Figures 2 and 5. When the slide arrives at its position of Figure 4 the pawl engages the shoulder **71** as shown, to hold the slide at an intermediate position, while the finger **88** moves away from shoulder **70** and until the finger **89** engages shoul-

der 70. The screw 91 is threaded into an opening 91a (see Figures 5 and 6). In Figures 5 and 6 the pawl or detent has been removed conformably to the substitution of another form of link which is operated from the take-up drive roll.

The operation of the first form of the invention is as follows: Referring to Figure 2. The lower part of the link is positioned laterally of the slide, and the upper end 84 of the cam slot is engaged with the pin. At the end of the first one-half revolution of the measuring roll the cam slot portion 83 has caused the lower end of the link to swing toward the slide and the link has been raised so that its lower finger has engaged the projection 70 and has raised the stop to the position of Figure 4. As rotation of the roll continues for a full rotation from its position in Figure 4, the second or upper finger 89 engages the shoulder 70 and the stop is raised so that the timer cups become vacuum attached. During the balance of the rotative movement of the roll and until the stops are engaged (see Figures 5 and 2) the link again moves to its lateral position so that both fingers are out of the path of the projection of the stop, thus permitting the stop to move automatically away from stop position, either by gravity or under the action of the spring as shown, it being understood that this movement occurs at the end of a time interval as determined by the adjustment of air intake between the cups.

The spring-controlled pawl is considered broadly as means for temporarily holding the slide.

Reverse movement of the rolls is prevented by a ratchet wheel 94 removably held on the end of the shaft or trunnion of roll 31 by screw 95. A gear wheel may be substituted for the ratchet wheel as herebelow described. A pawl 96 cooperates with wheel 94.

Openings 97 and 98 are provided in plate 26 to allow mounting of a spur-gear to mesh with the substitute gear above mentioned, and for the mounting of a pawl to cooperate with the spur-gear.

In Figures 6 and 7 a modification of the invention is shown in which, as in the first form, the stop-setting mechanism is set as a result of more than one rotation of the rolls, so that the rolls can be made smaller and so that the standard stop mechanism may be properly operated as a result of plural rotation of such smaller rolls. In this case the link is not operated directly from the first stop 50, but this stop is as in the first case provided with an opening 100 by which a link of the type of link 80 (see Figure 2) can be attached.

A cabinet equipped with the type of stop of Figures 6 and 7 may be a separate manufacture. It is contemplated, however, that a single cabinet be made which permits of alternate use of either of the forms of link shown herein and this is a feature of the invention. It is assumed, for example, that the gear 101 of Figure 6 has been substituted for the ratchet wheel 94 of Figure 2, this substitute gear being held by the screw 95. A large spur gear 102 meshes with the gear 101 and is held by a screw 103 which enters the opening 97 (see Figure 2). Attached to this gear 102 is the top of a link 104, the attachment being made by means of a screw 81 (see Figure 2), this screw having been transferred from the opening 100 to an opening (not shown) of the gear 102. By means of the screw 80 a crank connection of the link with the gear is obtained. The link has a slot 106 traversed by the screw 86 and the link further has a finger 108 which is adapted to engage the shelf 58 to raise the stop from the position of Figure 6 to that of Figure 7. A pawl 109 engages the teeth of the gear 102 to prevent reverse motion of the gear, and this pawl is held by a screw 110 engaging an opening 98 (see Figure 2).

It will be understood, of course, that the link 104 might be operated directly from roll 30. In any event, there is no intention to limit the broader aspects of the invention by operating the link from any particular roll, as long as it is operated from one of the rolls or from a roll, or from a rotatable element, or from any suitable element which will have the proper motion.

With the parts positioned as in Figure 6 and on operation of the measuring roll by pulling out of the toweling the link is first moved downwardly from its position to the approximate position shown in dotted lines in Figure 7. The link assumes this dotted line position after the first stop has made more than a half, but less than three-quarters of a revolution. By the time the first stop has completed its first revolution the link has been moved upwardly to a position at which its end is just short of engagement with the shelf 58 which supports the lower vacuum cup 59. During the next more than half but less than three-quarters of a revolution the stop is brought to the position shown in Figure 7 and the cups are set in vacuum attached relation. During the remainder of the second revolution the first stop engages the second and the link again assumes the position substantially like that shown in Figure 6 so that the bottom of the shelf 58 is spaced upwardly sufficiently from the top of the finger 108 to allow full retraction of the stop to nonstopping position.

Applicant has shown two forms of the invention and has shown two ways in which the advantages of increased towel roll capacity without increased height of the cabinet can be obtained. In both instances the smaller sized feed rolls must make more than one rotation, and in this embodiment makes two rotations. In the first form there is a direct crank connection between one of the rolls and the link, and in the second form the crank connection for the link is made on a gear which is in mesh with another gear on or driven by the roll and the gear ratio is such that the larger gear by which the crank motion is obtained rotates once for every two rotations of the roll.

Heretofore the diameter of the feed rolls has been from two to two and one-quarter inches. By the use of this invention the diameter of the rolls, when covered with the usual friction material, may be about one and seven-sixteenths of an inch, which is a gain of about three-quarters of an inch. A gain of this magnitude increases the yardage considerably when it is considered that the diameter of a full roll is about six and three-quarters inches, and that the gain of three-quarters of an inch divided between the toweling in the upper and lower compartments or between the clean and the soiled toweling is a three-eighths of an inch gain for each roll, which is equal to about ten layers of cloth, or about 180 inches gain.

The overall inside height of a cabinet having a dispensing capacity of fifty yards is about seventeen inches. The supply of toweling rests on the bottom wall of the cabinet and the distance from the bottom wall to the level of the measuring and take-up rolls is about one-half

of the total height of the cabinet, or about eight and one-half inches. As shown in the drawings, the axes of the rolls are not exactly in the same horizontal plane but they are substantially so.

Aside from the advantage of the present stop-setting device in relation to the use of smaller rolls, the stop itself is unique in the manner of its incremental operation and setting of the stop, and it may have other valuable uses. The same is true for the second.

It will be noted that the take-up drive roll operates the feed roll by friction of the toweling, the journal of the take-up roll being arranged in slots so that the axis of the roll may rise as the amount of toweling thereon increases. The cubical capacity above and below the rolls is substantially equal.

I claim as my invention:

1. A dispensing apparatus comprising a feeding means including a roll, a first stop operated by said roll, a second stop, means controlled by the roll and adapted to move a second stop into the path of the first stop and adapted to complete such movement as a result of more than one revolution of the feed roll, said means including a link operated by the roll, said link having means cooperative with means on said second stop adapted to move said second stop by step-by-step movement toward and into stopping position, the means on the link including a pair of fingers and the means on the second stop having a projection with which the fingers successively engage.

2. In a type of dispensing cabinet wherein a pair of rolls of substantially equal diameter divides the cabinet horizontally into upper and lower chambers, and wherein one chamber serves to house a roll of clean toweling of a given diameter and the other chamber serves to house in roll form an amount of soiled toweling equal to that of the clean toweling, a stop mechanism, and means operated by one of the rolls for setting the stop mechanism in stopping position as a result of more than one revolution of that roll.

3. In a type of dispensing cabinet wherein a pair of rolls of substantially equal diameter divides the cabinet horizontally into upper and lower chambers, one roll being a clean towel measuring roll and the other a soiled towel take-up drive roll, and wherein one chamber serves to house a roll of clean toweling of a given diameter and the other chamber serves to house in roll form an amount of soiled toweling equal to that of the clean toweling, a stop mechanism including a second stop movable into the path of a first stop, and means operated by one of the rolls for moving said second stop from nonstopping position to stopping position as a result of more than one revolution of that roll.

4. In a type of dispensing cabinet wherein two rolls of substantially the same diameter are arranged in a plane which is substantially at the vertical middle of the cabinet, to provide upper and lower chambers of substantially equal height, and wherein one chamber serves to house a roll of clean toweling of a given diameter and the other chamber serves to house in roll form an amount of soiled toweling equal to that of the clean toweling, a stop mechanism for said rolls including a second stop movable into the path of a first stop, which first stop is operated by one of the rolls, and means operated from one of the rolls for moving said second stop into stopping position, and thereafter releasing said second stop for independent movement away from stopping position, and timer means which holds the stop in stopping position and automatically releases it at the end of a time period, said means for moving the second stop acting as a result of more than one revolution of both rolls to move said stop in the manner mentioned.

5. A stop mechanism operated by an element rotatable on a support and comprising a first stop movable by said rotatable element, a second stop movable into the path of the first stop, a link having a crank connection with the first stop and having a slot traversed by a pin which is held in the support, said second stop having first and second shoulders, means engageable with the first shoulder to hold the stop at nonstopping intermediate position against motion away from stopping position, means for holding the second stop in stopping position for a predetermined time interval and then automatically releasing said second stop, shoulder-engaging means on the link adapted to engage the second shoulder to move the second stop into stopping position, the slot of said link being so shaped as to cause the shoulder-engaging means of the link to engage the second shoulder in a manner to move the second stop by a step-by-step motion toward and into stopping position.

6. A stop mechanism operated by an element rotatable on a support and comprising a first stop movable by said rotatable element, a second stop movable into the path of the first stop, a link operated by the rotatable element and having a slot traversed by a pin which is held in the support, said second stop having first and second shoulders, means engageable with the first shoulder to hold the stop at nonstopping intermediate position against motion away from stopping position, means for holding the second stop in stopping position for a predetermined time interval and then automatically releasing said stop, shoulder-engaging means on the link adapted to engage the second shoulder to move the second stop into stopping position, the slot of said link being so shaped that as operated by the rotatable element the shoulder-engaging means is caused to engage the second shoulder in a manner to move the second stop by a step-by-step motion toward and into stopping position.

7. A stop mechanism operated by an element rotatable on a support and comprising a first stop movable by said rotatable element, a second stop as a slide movable into the path of the first stop, a link having a crank connection with the first stop and having a slot traversed by a pin which is held in the support, said slide-stop having first and second shoulders, a pawl engageable with the first shoulder to hold the stop at nonstopping intermediate position against motion away from stopping position, means for holding the slide-stop in stopping position for a predetermined time interval and then automatically releasing said slipe-stop, a pair of fingers on the link, the slot of said link being so shaped as to cause the link to swing and cause said fingers to sequentially engage said second shoulder in a manner to move the second stop by a step-by-step motion toward and into stopping position.

8. A stop mechanism comprising a first stop, a second stop movable into the path of the first stop, and a rotatable element and means operated thereby and adapted to move the second stop from nonstopping into stopping position as a result of two revolutions of said rotatable ele-

ment said means including an automatically releasable pawl which temporarily holds the second stop at a nonstopping intermediate position, and a link operated by said rotatable element to advance the second stop by a step-by-step motion into stopping position.

9. A stop mechanism comprising a rotatable element, a first stop, a second stop movable into the path of the first stop, a timing device which acts to hold the second stop in stopping position and to release it at the end of a timed period, said second stop having a projection which carries a part of said timer, and means operated by said rotatable element and adapted to engage said projection to move the second stop into stopping position and then release the same for independent motion away from said position.

10. A stop mechanism comprising a rotatable element, a first stop, a second stop movable into the path of the first stop, a timing device which acts to hold the second stop in stopping position and to release it at the end of a timing period, said second stop having a projection, and means operated by said rotatable element and adapted to move the second stop into stopping position and then release the same for independent movement away from said position, including a link having means adapted to engage the projection to move said second stop, said projection having the form of a horizontal shelf which supports a vacuum cup as one element of the timing device.

11. A stop mechanism comprising a second stop movable into and out of the path of a first stop, and means controlled by the first stop and adapted to obtain a step-by-step motion of the second stop into the path of the first, including a link pivoted at one end to the first stop and guided at the opposite end in a manner to swing toward and away from the first stop, said link having shoulders sequentially engageable with a shoulder on said second stop.

12. A stop mechanism operated by an element rotatable on a support and comprising a first stop movable by said rotatable element, a second stop movable into the path of the first stop, a link having a crank connection with the first stop, guide means by which the link is held to the support, said second stop having a shoulder, shoulder-engaging means on the link adapted to engage the shoulder and advance the second stop into stopping position, said guide means being so shaped as to cause the link to be swung from a point laterally of the second stop toward said second stop to cause the shoulder-engaging means to engage the shoulder of said second stop in a manner to move the second stop in a step-by-step motion toward and into stopping position, and automatically releasable means for temporarily holding the second stop in an intermediate nonstopping position.

13. A stop mechanism operated by an element rotatable on a support, a second rotatable element and means by which it is operated by said first rotatable element, a first stop operated by one of said rotatable elements, a second stop movable into the path of the first stop, a link having a crank connection operated by one of said rotatable elements, said link having a slot traversed by a pin, said second stop having first and second shoulders, a pawl engageable with the first shoulder to hold the stop at a nonstopping intermediate position against motion away from stopping position, means for holding the second stop in stopping position for a predetermined time interval and then automatically releasing said second stop, a pair of fingers on the link, the slot of said link being so shaped as to cause said fingers to sequentially engage said second shoulder in a manner to move the second stop by step-by-step motion toward and into stopping position.

14. A stop mechanism operated by an element rotatable on a support, a second rotatable element and means by which it is operated by said first rotatable element, a first stop operated by one of said rotatable elements, a rotatable gear operated by one of the rotatable elements, a second stop movable into the path of the first stop and having a shoulder, a link having a crank connection with the gear and having a slot traversed by a pin, and means for holding the second stop in stopping position for a predetermined time interval and then automatically releasing said second stop, said link having means engageable with said shoulder and said shoulder acting as a support for holding a part of said means which holds the second stop in stopping position for said predetermined time interval.

15. A dispensing apparatus comprising feeding means including a roll, a first stop operated by the feeding means, a second stop movable into and out of the path of the first stop, a link and means connecting it to means controlled by the roll and adapted to move the second stop into the path of the first and adapted to complete such movement as a result of more than one revolution of the roll.

16. A dispensing cabinet comprising measuring and take-up rolls operable in unison, a first stop operated by the measuring roll, a second stop movable into the path of the first stop, means for holding the second stop in the path of the first stop for a predetermined time and then releasing the second stop for movement out of the path of the first stop, a spur gear operated from the take-up roll, a link pivoted to the spur gear, a slot in the link, a pin traversing the slot, and means on said link engageable with said second stop and adapted when the rolls are operated to move the stop into stopping position and then release said stop for independent movement away from that position.

17. A stop mechanism comprising, a first stop, a second stop movable into the path of the first stop, a rotatable element, a link pivoted to said element, a slot in the link, a guiding pin traversing the slot, said link having means engageable with the second stop and adapted to move the second stop into stopping path of the first stop on rotation of said rotatable element and thereafter move to such a position as to free the second stop for independent movement out of the stopping path of the first stop, said rotatable element being a driven spur gear.

18. A dispensing apparatus comprising feeding means including a roll, a first stop operated by the feeding means, a second stop movable into and out of the path of the first stop and having a projection, a link having a slot and a pin traversing the slot, means by which the feeding means reciprocates and rocks the link about the pin, and means on the link engageable with means on the second stop to move said stop by a step-by-step motion into the path of the first stop and to complete that movement as a result of more than one revolution of the roll.

19. A dispensing apparatus comprising a

measuring roll and a soiled towel take-up drive roll, said rolls being of equal diameter, means operating the rolls in unison at the same rate of rotation, one of the rolls having a first stop, a second slide stop vertically movable into and out of the path of the first stop and having a projection, a link having a slot and a pin traversing the slot to secure the link to rock and reciprocate, means by which one of the rolls reciprocates and rocks the link about the pin, means on the link engageable with the projection of the second stop to move said stop into the path of the first stop, said means comprising a pair of projections adapted to successively engage the projection of the second stop.

20. A dispensing apparatus comprising feeding means operating a first stop, a second stop vertically movable into and out of the path of the first stop and having a projection, symmetrically arranged with reference to a midline of the second stop which extends in direction of reciprocation, a link having a slot and a pin traversing the slot to secure the link to rock and reciprocate, means by which the feeding means reciprocates and rocks the link about the pin, and means on the link for applying force to the bottom side of the projection in an upward direction and in a direction substantially along said midline to move said second stop into the path of the first stop and then release the second stop for independent movement out of the path of the first stop.

21. A convertible device having first and second rolls journaled in a support, and means for driving the rolls in unison, a first stop driven by the first roll and having a first threaded opening, a gear operated by the second roll and journaled to said support and having a second threaded opening, a first screw to fit either of the threaded openings, first and second links adapted to be alternately used and each having an opening through which said first screw can pass to pivot the first link to the stop or to pivot the second link to the gear, a second stop movable into and out of the path of the first stop, a threaded opening in said support, a second screw for said opening, said first link having a slot through which said second screw is adapted to pass to secure the link to the support to rock and reciprocate means on said first link adapted to cooperate with means on said second stop to cause the stop to be advanced by a step-by-step motion into the stopping path of the first stop, means detachably secured to the base and cooperable with the second stop to hold it from retrograde movement during step-by-step advance, said second link also having a slot through which said second screw is adapted to pass to secure it in the manner of the first link, and said second link having means engageable with means on the second stop for moving the second stop by a continuous non-step-by-step motion into the stopping path of the first stop.

22. A convertible device having a measuring roll and a soiled towel take-up drive roll journaled in a support, and means for driving the rolls in unison, a first stop driven by said measuring roll and having a first threaded opening, a gear operated by the take-up drive roll and journaled to said support and having a second threaded opening, a first screw to fit either of the threaded openings, first and second links adapted to be alternately used, and each having an opening through which said first screw can pass to pivot the first link to the stop or to pivot the second link to the gear, a second stop movable into and out of the path of the first stop, a threaded opening in said support, a second screw for said opening, said first link having a slot through which said second screw is adapted to pass to secure the link to the support to rock and reciprocate, means on said first link adapted to cooperate with means on said second stop to cause the stop to be advanced by a step-by-step motion into the stopping path of the first stop, means detachably secured to the base and cooperable with the second stop to hold it from retrograde movement during step-by-step advance, said second link also having a slot through which said second screw is adapted to pass to secure it in the manner of the first link, and said second link having means engageable with means on the second stop for moving the second stop by a continuous non-step-by-step motion into the stopping path of the first stop.

23. A convertible device having a measuring roll and a soiled towel take-up drive roll journaled in a support, and means for driving the rolls in unison, a first stop driven by said measuring roll and having a first threaded opening, a gear operated by the take-up drive roll and journaled to said support and having a second threaded opening, a first screw to fit either of the threaded openings, first and second links adapted to be alternately used and having an opening through which said first screw can pass to pivot the first link to the stop, or to pivot the second link to the gear, a second stop movable into and out of the path of the first stop, a threaded opening in said support, a second screw for said opening, said first link having a slot through which said second screw is adapted to pass to secure the link to the support to rock and reciprocate, means on said first link adapted to cooperate with means on said second stop to cause the stop to be advanced by a step-by-step motion into the stopping path of the first stop, means detachably secured to the base and cooperable with the second stop to hold it from retrograde movement during step-by-step advance, said second link also having a slot through which said second screw is adapted to pass to secure it in the manner of the first link, said second link having means engageable with means on the second stop for moving the second stop by a continuous non-step-by-step motion into the stopping path of the first stop, the arrangement and proportion of the parts being such that each link accomplishes its stop-setting purpose as a result of more than one revolution of the rolls.

24. A device of the class described including an upright plate, a roll journaled in the plate and having a first stop, a plate-like second stop and means translatably attaching it to the face of the upright plate to move into and out of the path of the first stop, a link and means attaching it to the upright plate laterally of and in the same plane as that of the second stop so that it may rock and reciprocate, means by which the roll rocks and reciprocates the link, and means including elements respectively on the slide cooperable as a result of such rocking and reciprocation to move the second stop into the path of the first and then release said second stop for independent movement out of said path.

25. A device of the class described including an upright plate, a roll journaled in the plate having a first stop, a plate-like second stop and means attaching it to the face of the upright plate to move vertically into and out of the path of the first stop, a link and means attaching it to the

upright plate laterally of and in the same plane as that of the slide so that it may rock and reciprocate, means by which the roll rocks and reciprocates the link, means operable as a result of such rocking and reciprocation to move the second stop into the path of the first and then release said second stop for independent movement out of said path, including a projection on the slide and fingers on the link, and means cooperable with the slide to temporarily hold it against retrograde movement and capable of automatic release after said second stop is in the path of the first stop to permit the second stop to move out of said path.

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