Sept. 12, 1939. F. G. STEINER ET AL 2,172,482

TOWEL DISPENSING APPARATUS

Original Filed Sept. 12, 1935 4 Sheets-Sheet 1

FIG. 1

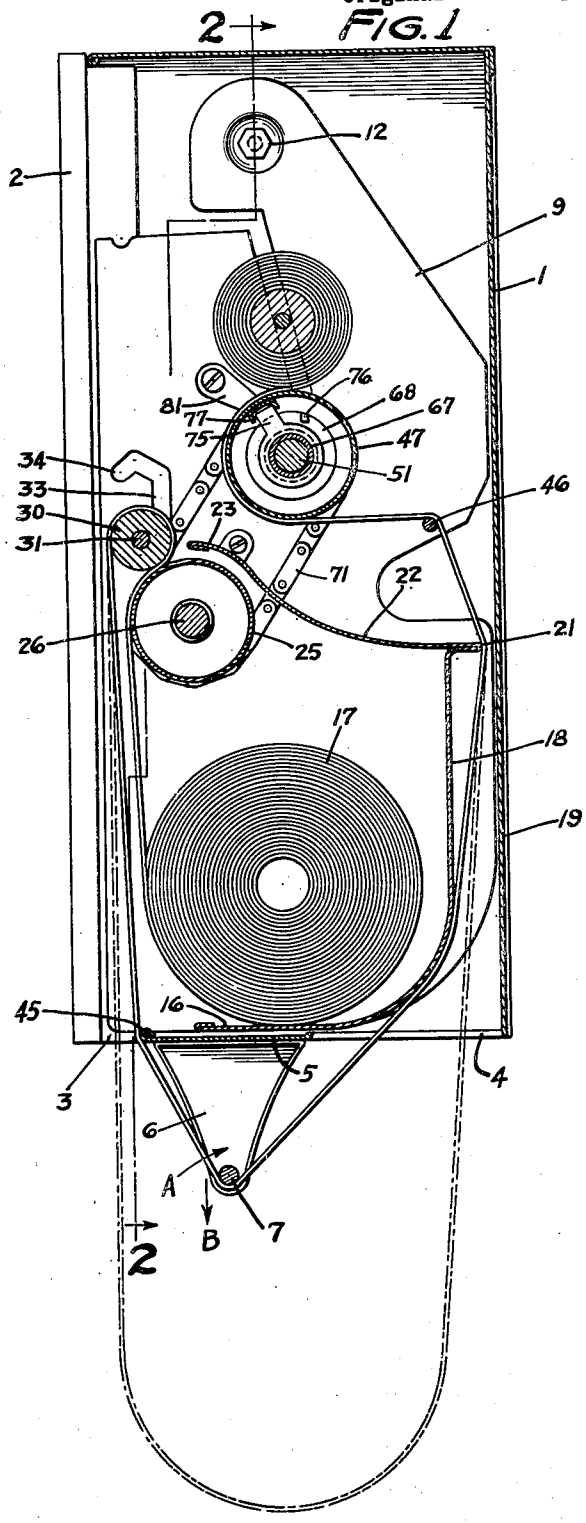


FIG. 9

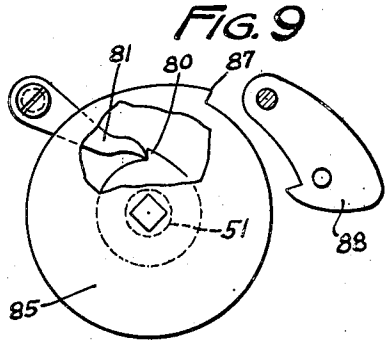


FIG. 10

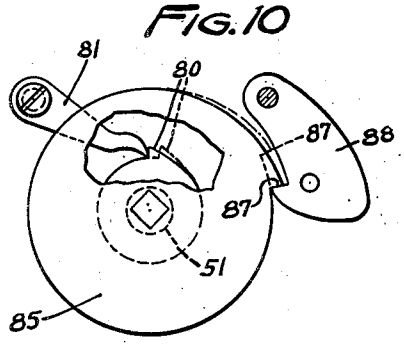
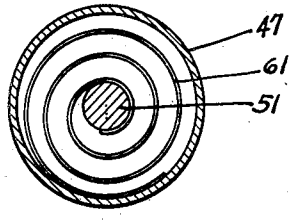


FIG. 11



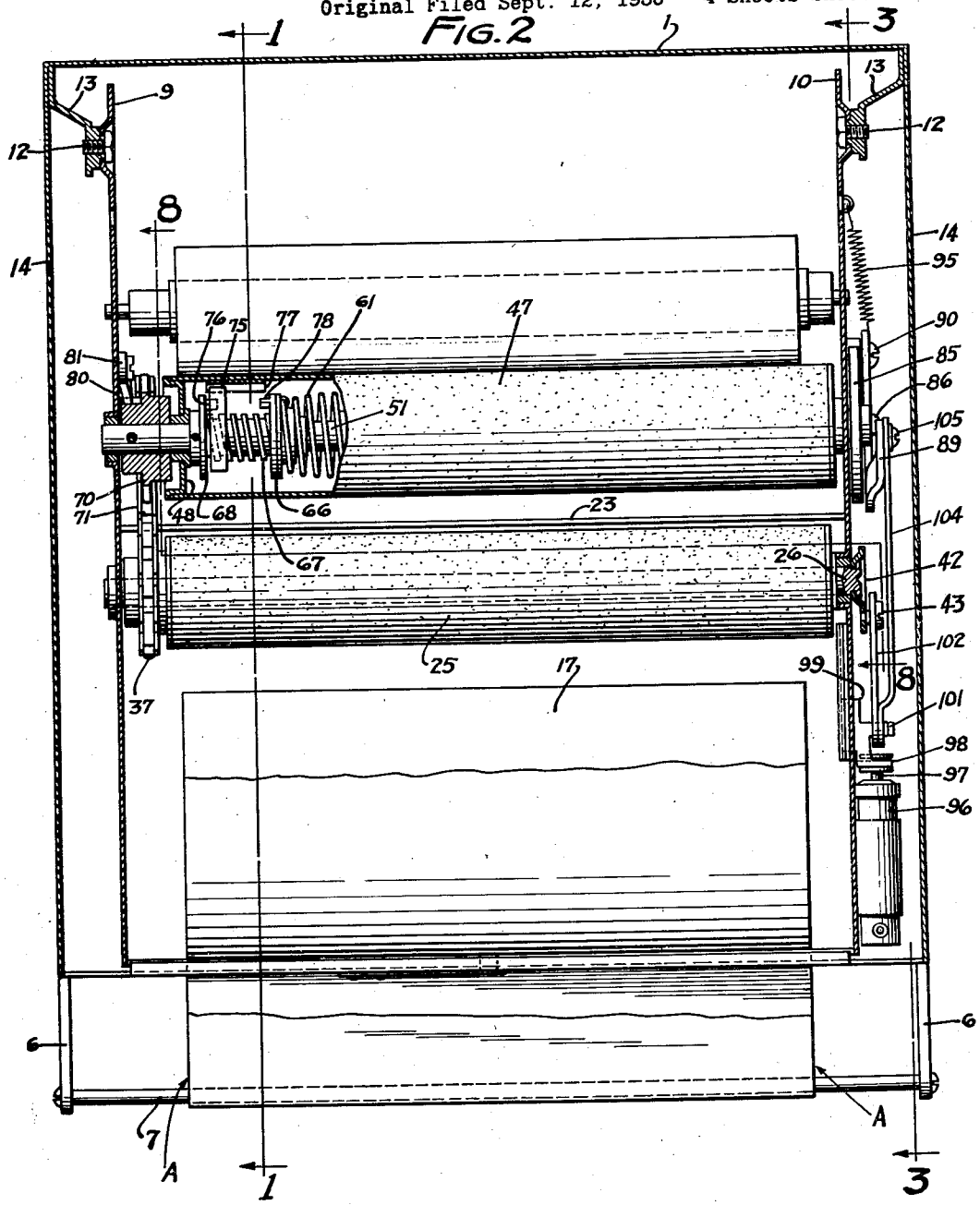
Inventors
FRANK G. STEINER
RUDOLPH G. BIRR
By Paul, Paul & Moore
ATTORNEYS

Sept. 12, 1939. F. G. STEINER ET AL 2,172,482

TOWEL DISPENSING APPARATUS

Original Filed Sept. 12, 1935 4 Sheets-Sheet 2

FIG. 2



Inventors
FRANK G. STEINER
RUDOLPH G. BIRR
By Paul, Paul & Moore
ATTORNEYS

Sept. 12, 1939. F. G. STEINER ET AL 2,172,482

TOWEL DISPENSING APPARATUS

Original Filed Sept. 12, 1935 4 Sheets-Sheet 3

FIG. 3

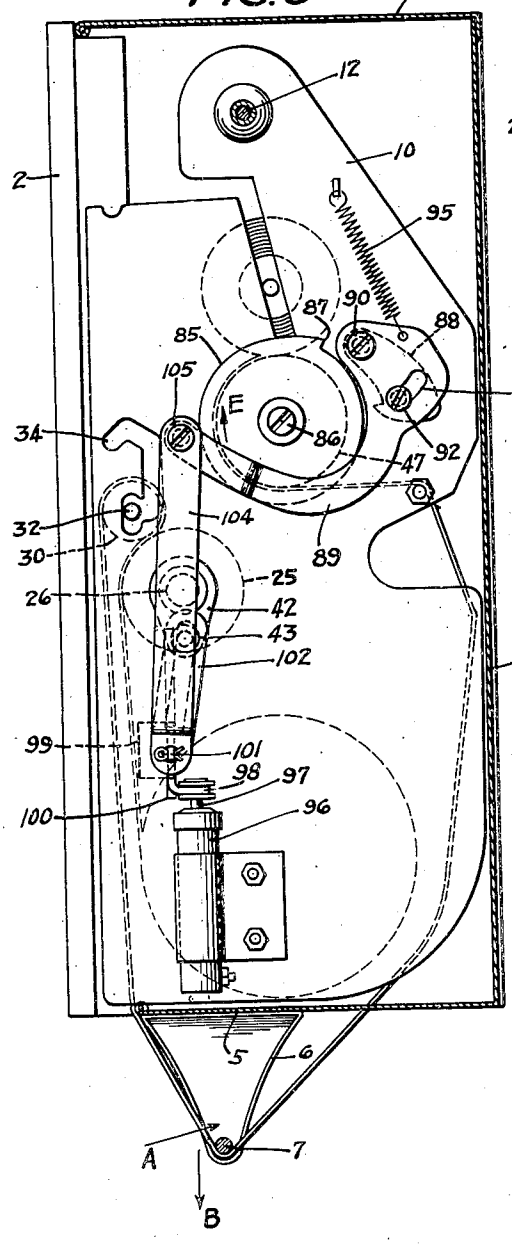
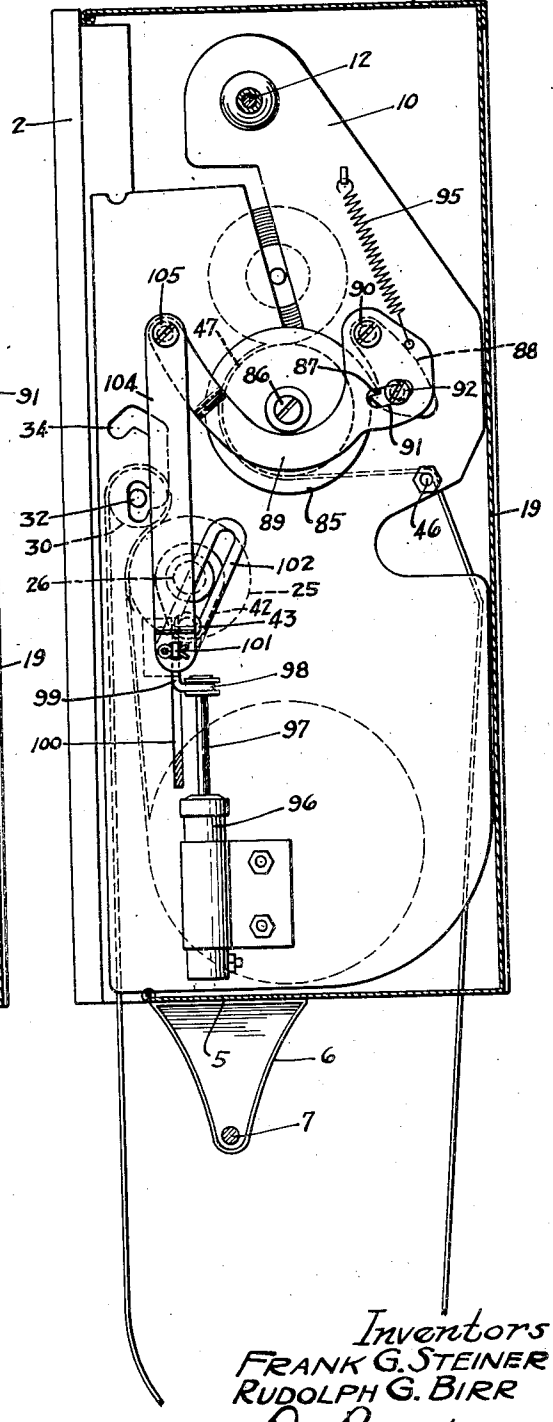


FIG. 4



Inventors
FRANK G. STEINER
RUDOLPH G. BIRR
By Paul, Paul & Moore
ATTORNEYS

Sept. 12, 1939. F. G. STEINER ET AL 2,172,482

TOWEL DISPENSING APPARATUS

Original Filed Sept. 12, 1935 4 Sheets-Sheet 4

FIG. 5

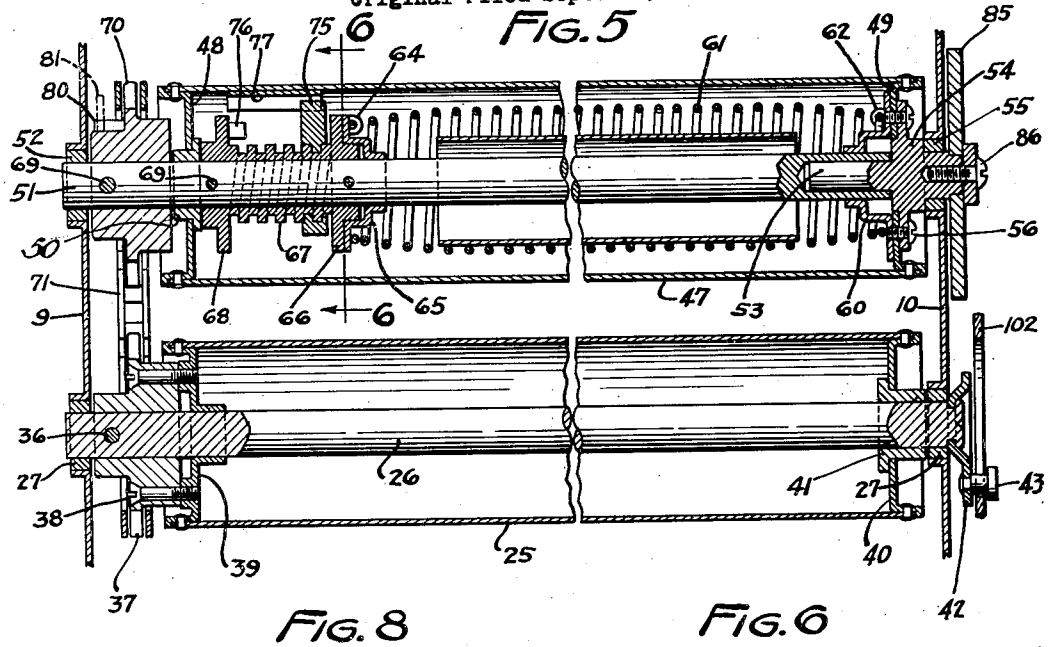


FIG. 8

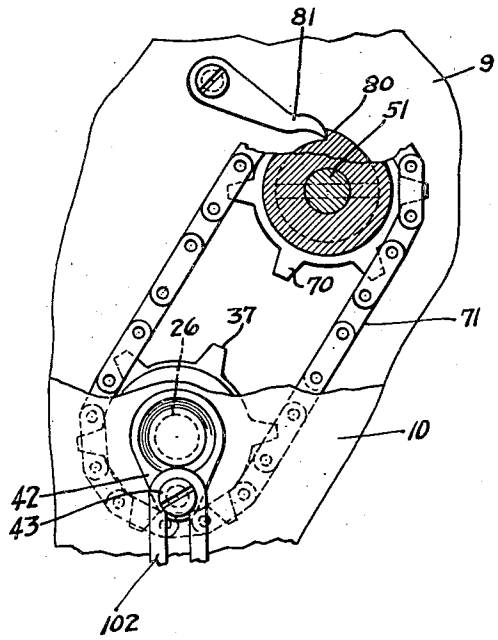


FIG. 6

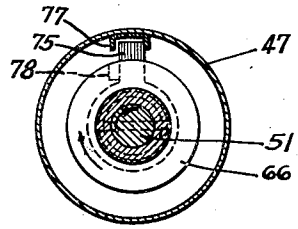
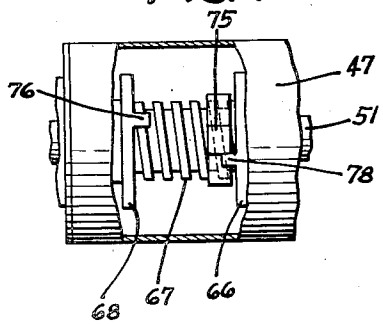


FIG. 7



Inventors
FRANK G. STEINER
RUDOLPH G. BIRR
By Paul, Paul & Moore
ATTORNEYS

Patented Sept. 12, 1939

2,172,482

UNITED STATES PATENT OFFICE

2,172,482

TOWEL DISPENSING APPARATUS

Frank G. Steiner, Chicago, and Rudolph G. Birr, Lombard, Ill., assignors to Steiner Sales Company, Salt Lake City, Utah, a corporation of Utah

Application September 12, 1935, Serial No. 40,284
Renewed February 4, 1939

11 Claims. (Cl. 312—38)

This invention relates to improvements in towel dispensing apparatus and has for its principal object to provide means operable by a user for obtaining successive lengths of clean toweling, in combination with means controlled by the aforementioned means for causing each length to be taken up after use.

The invention is applied to a type of cabinet in which a loop of toweling is formed at the outside of the cabinet, in this embodiment at a point below the cabinet. In previous devices, this loop was a long loop which hung a substantial distance below the cabinet. In these earlier devices, the soiled toweling remained in view. This, in some instances, was objectionable and it is therefore an object of this invention to cause the soiled toweling to be whisked immediately out of view.

In some prior devices, weighted bars are used, which exert tension on the toweling so that the user must hold on to the toweling to prevent its being drawn away. This sometimes is rather inconvenient and unpleasant because the towel is whisked away when momentarily released while seeking an unused area. In the present device, after the towel has been drawn out, the loop hangs freely without any tension whatever.

In the present device only a predetermined length of toweling can be withdrawn and thereafter this length hangs freely only for a predetermined length of time, at the end of which it is promptly drawn up. It is obvious that some persons will use the toweling longer than others, and therefore the time period is selected to allow plenty of time for use, before the soiled toweling is automatically drawn up.

For the above purpose of obliterating the loop after each use, energy storing means is provided which is operated during each clean towel dispensing operation to store energy, and means is provided to automatically release this energy immediately following the period of use, a timer being set for action during the clean towel dispensing operation and simultaneously with the energy storing operation.

The invention differs in principle from previous inventions in that each length of soiled toweling is whisked out of sight immediately.

Features of the invention include: the means for causing each length of soiled toweling to be promptly taken up after use; the use generally of any type of energy storing means for the purpose herein set forth and its control by the user; specifically the use of a spring associated with the takeup roll as means for storing energy for promptly operating the roll for the purposes herein set forth; the specific construction of the stop device for winding the spring and limiting withdrawal of the clean toweling; the use of a timer for controlling release of energy for taking up each length after use; all details of construction disclosed, and all new ideas of means inherent in the disclosure as a whole.

Objects, features and advantages of the invention will be set forth in the description of the drawings forming a part of this application, and in said drawings

Figure 1 is a vertical transverse section through a towel cabinet showing one embodiment of the invention, and with the mechanism positioned as when the soiled toweling is taken up;

Figure 2 is a vertical longitudinal section taken approximately on line 2—2 of Figure 1;

Figure 3 is a vertical transverse section taken approximately on line 3—3 of Figure 2 showing the timing and latch mechanisms positioned as after tripping of the latch;

Figure 4 is a section corresponding to Figure 3 but with the mechanism set as at the beginning of the timing period, which corresponds to the beginning of the period of use of clean toweling;

Figure 5 is a detailed vertical longitudinal section through the rolls with the parts positioned in correspondence to those of Figure 4;

Figure 6 is a cross-section on line 6—6 of Figure 5;

Figure 7 is a fragmentary plan broken away to show the relation of the traveling lug to its stops;

Figure 8 is a vertical section taken approximately on line 8—8 of Figure 2 with the parts positioned in correspondence to Figure 3, and with the takeup roll holding pawl in holding position;

Figure 9 is a diagrammatic view showing the relative positions of the takeup roll holding devices, with their respective pawls positioned after soiled towel takeup;

Figure 10 is a diagrammatic view similar to Figure 9 showing both pawls in holding position as at the beginning of timing; and

Figure 11 is a diagrammatic cross-section, showing the relations of the spring to the takeup shaft and its roll.

This invention is shown embodied in a wall type of towel dispensing cabinet but the invention of course may be applied in other environments. Referring first to Figure 1: Numeral 1 indicates the outer casing of the cabinet. This casing is

provided with a suitable door 2. The cabinet has in its bottom an opening 3, at the front, downwardly through which the clean toweling passes, and also has an opening 4 at the rear upwardly through which the soiled toweling passes to a soiled towel takeup roll.

Attached to the bottom 5 of the cabinet are two brackets 6 connected by a cross bar 7 around the bottom of which the toweling passes. The width of the toweling (see Figure 2) is less than the distance between the brackets, to allow introduction of the hands for grasping the toweling at opposite margins. Initially the toweling occupies the position shown in Figure 1 being drawn tautly against the bar 7.

Within the casing 1 is a structure referred to herein as a swing-housing. This swing-housing is composed of two plates 9—10, each pivoted as at 12 to a bracket 13, each bracket being secured to an end wall 14 of the casing 1. These plates are parallel with and spaced from the end walls 14, as best shown in Figure 2. The plates 9 and 10 are cross-connected, see Figure 1, by a bent sheet metal element including a horizontal bottom portion 16 forming a support for a roll of clean toweling 17. A vertical portion 18 is spaced from the rear wall 19 of the cabinet 1 to provide a throat upwardly through which the soiled portion of the toweling passes. At the top of the vertical element 18 a rearwardly extending portion is provided, the sheet metal being bent upon itself, as shown to provide a rounded edge 21. There is further provided a substantially horizontal, but slightly upwardly curving portion 22 ending in a reversely curved portion 23 which overhangs and is spaced upwardly from a clean toweling measuring or dispensing roll 25.

This roll 25 is mounted upon a shaft 26, see Figure 5. The shaft 26 is journalled at opposite ends in suitable bushings 27 carried by plates 9 and 10. Arranged above the measuring or dispensing roll 25 and outwardly therefrom toward the front of the cabinet, see Figures 1 and 3, is a pinch roll 30 having a shaft 31, the ends 32 of which are operatively associated with the lower ends of the slots 33. Each slot is provided at its upper end with a pocket 34 by which the shaft is supported after the roll has been raised: this, for the purpose of threading the toweling through the machine.

Referring to Figure 5: The hub of a sprocket wheel 37 is pinned as at 36 to the shaft 26, and the roll is connected to this hub by means of screws 38. For this purpose the roll is provided with a head 39 with which the screws are engaged. At the opposite end the roll is provided with a head 40 engaged with a bushing 41 of the shaft 26. The shaft 26 projects outwardly beyond the plate 10 and has secured thereto a crank arm 42 having a crank pin 43. This crank as herebelow described functions to control a slide, which in turn operates a latch and a timing device.

The toweling is brought upwardly from the supply roll 17 and is passed between the roll 25 and the pinch roll 30, thence downwardly against a rolled-forward edge 45 of the bottom 5, thence around the bar 7, thence upwardly against a curved portion of the plate 16, against the edge 21, thence around bar 46 to the takeup roll 47.

The takeup roll and the means for operating it to quickly take up soiled toweling at or near the end of the period of use is a very important feature of the invention. For this purpose, means is provided for storing energy, by which this roll is operated for takeup purposes, and means is provided for controlling a timed release of this energy to promptly obtain soiled towel takeup, at the end of a timed period which corresponds substantially to the time occupied by the user in drying the hands or face.

Referring to Figure 5: It is seen that the takeup roll 47 has suitably secured heads 48 and 49. The head 48 carries a bushing 50 which is loose on a shaft 51. This shaft is journaled at one end in a bushing 52 of the plate 9 and journaled at the opposite end on a pin or stub shaft 53 projecting from hub 54 in turn journaled in suitable bushing 55 of the plate 10 and secured by screws 56 to the head 49 of roll 47. These screws also secure a sleeve 60 to the head 49. One end of a coil spring 61 is secured as at 62 to the sleeve 60. The other end of the spring is secured as at 64 to a sleeve 65 in turn secured to a head 66 integral with screws 67, in this instance a right hand screw. This screw surrounds shaft 51 and has at its opposite end a second head 68. Pins 69 passing through the heads non-rotatively secure the screw to the shaft 51. Also secured to the shaft 51 by pin 69 passing through its hub is a sprocket wheel 70 which is connected by a suitable sprocket chain 71 to sprocket wheel 37 of clean towel roll shaft 26.

Referring to Figures 1 and 2: In using the device, the index fingers are inserted behind the front portion and from opposite edges of the toweling at points indicated by the arrows A, just above the bar 7 and then while pinching the towel at these two points between the index finger and the thumb, the towel is pulled downwardly in direction B. When this is done the measuring or dispensing roll 25 is rotated in clockwise direction and at the same time the shaft 51 is also rotated in clockwise direction, by means of the sprocket chain system.

Reverting to the screw 67 and associated parts, see Figures 2, 5, 6 and 7: The function of this structure is to limit the degree of clean towel withdrawal by limiting the number of rotations which can be given to the shaft 26. To this extent, this structure functions as a toweling-length determining and limiting mechanism.

In threaded relation with the screw is a traveling stop 75 which initially occupies the position shown in Figure 2 in the path of a lug 76 carried by the head 68 of the screw 67. Figure 1 shows that the arm 75 is backed away from the lug 76. This stop 75 is in splined or sliding relation with the roll 47 by means of channel element 77, see also Figure 6, which causes the traveling lug to always rotate with the takeup roll 47, but permits the stop (urged by the screw 67) to travel to the right from its position of Figure 2 to engage with a lug 78 carried by the opposite head 66 of the screw 67. When this engagement takes place no more toweling can be pulled out for the time being.

In assembly the spring is given an initial tension and at the end of this tensioning period the traveling stop is engaged with a lug 76 to hold the spring in tensioned condition.

On the hub of the sprocket wheel 70, see Figure 8, is a shoulder 80 engageable by a pawl 81 to limit reverse or counter-clockwise rotation of the shaft by action of the spring at the end of the dispensing or clean towel pulling operation, it being understood that during towel dispensing operation, the shaft 51 moves in clockwise direction to move the shoulder away from the pawl. After the user stops pulling, a short reverse ro-

tation of the shaft under action of the spring takes place and the shoulder 80 engages the pawl 81, as shown in Figure 8. The shoulder 80 assumes the dot-and-dash line position of Figure 10, at the end of the pulling out operation. See also Figures 9 and 10, the former of which represents the position of the shoulder 80 and pawl 81 before clean toweling is pulled and Figure 10 represents the position of these elements at the end of the towel pulling operation and at the beginning of the timing period, which period, as before stated, is of a duration corresponding approximately to the time of use of the toweling.

By reference to Figures 2, 5 and 7, it will be noted that as the shaft 26 is rotated in clockwise direction from its initial position in Figure 1, the traveling stop 75 is moved by the screw from the position of Figure 2 to the positions of Figures 5, 6 and 7, that is, it is disengaged from the lug 76 and is moved into engagement with lug 78. During this movement of the traveling stop, the spring is put under additional tension, that is energy is stored.

In order to prevent rotation of the roll 47 in clockwise or soiled towel takeup direction following the clean toweling pulling out operation and during the period of use of the toweling, timer controlled latching means is provided which includes a disk 85 (see Figures 2, 3, 4, 9 and 10) secured by screw 86 to hub 54. This disk has a shoulder 87 with which a gravity-acting pawl 88 engages. This pawl is controlled, see Figures 3 and 4, by an arm 89 pivoted on screw 90, which screw also forms the pivot for the pawl 88. This arm 89 is slotted as at 91 and loosely through this slot extends a pin 92 threaded into the pawl 88. Normally the pawl is disengaged from the shoulder 87 as a result of engagement of the end of the slot with the screw 92, as shown in Figure 3. When the arm is moved in direction of the arrow E to the position shown in Figure 4, the pawl is allowed to fall by gravity to latching position. The arm 89 is normally held in pawl-disengaging position by spring 95.

When the dispensing pull on the toweling ceases, the spring 61 acts to reverse the direction of rotation of the shaft 51 and roll, but this is prevented by the shoulder 80 coming in contact with its respective pawl 81. The spring is now under increased and sufficient tension to rapidly take up the loop, from the dot-and-dash line position of Figure 1 to the full line position thereof when the latch 88 is tripped by a timer, herebelow described.

On original assembly of the parts of the cabinet the spring 61 is pre-wound and engagement of the stop arm 75 with a lug 76 of the shaft 51 temporarily prevents unwinding or clockwise or takeup motion of the takeup roll 47 under the action of the spring 61. In servicing the cabinet the attendant, after bringing the toweling around the bar 7 and upwardly over the bar 46, rotates the takeup roll in counter-clockwise direction and against the action of the spring 61 and then engages the toweling with the friction surface of the roll 47. Thereafter the spring tends to move the roll 47 in takeup direction to keep the toweling tight or taut and against the bar 7. As toweling is pulled out, stop arm 75 moves axially out of the path of the stop lug 76, and into the path of stop lug 78. The lug 76, therefore, merely acts to prevent unwinding of the spring when there is no toweling in the cabinet and, as before stated, in servicing, the attendant merely moves the roll 47 in slightly counterclockwise direction to back-off the arm 75 from the lug 76, so that spring action keeps the loop obliterated and tight against the bar 7.

It is an important feature of this invention to maintain the latched position of the pawl for a period corresponding to the period of use, and at the end of that period to move the pawl from latching position to allow the spring 61 to act to move the takeup roll to rapidly take up the soiled toweling from the position shown in dot-and-dash lines in Figure 1 to the full line position of that figure.

To the above end, a timing mechanism is provided which includes a well known dashpot type of timer generally indicated at 96. This timer includes a piston, not shown, having a stem 97 connected as at 98, see Figure 2, to a suitable slide 99 operating in a slot 100, see Figures 3 and 4. The slide 99 has pivotally connected thereto as at 101, a slotted link 102 through the slot of which the crank pin 43 of the crank arm 42 of shaft 26 loosely passes. Also pivoted as at 101 to the slide 99 is a link 104, in turn pivoted as at 105 to the outer end of the latch control arm 89.

When the roll shaft 26 is rotated by its roll as a result of pulling out of clean toweling, the link 102 controlled by the crank 42 sets the timer by an upward movement to the position shown in Figure 4, and at the same time the link 104 moves the arm 89 to the position of Figure 4 against the action of the spring 95, allowing the pawl 88 to assume latched position.

It will be noted that when the traveling stop 75 reaches the position of Figures 5 and 6, that clockwise motion of the shaft 51 under pulling action of the toweling is stopped, in other words lug 78 acts to limit the amount of toweling which can be withdrawn. That this is so will be evident from an inspection of Figure 6 and of the arrow representing direction of rotation of the head 66. Referring to Figure 10, the parts are so proportioned and arranged that the shoulder 80 assumes the dot-and-dash line position of Figure 10 at the end of the pulling operation, and then reverses its movement slightly to assume the position shown in Figure 10, as soon as the user sufficiently reduces the tension on the toweling.

Operation

With the mechanism positioned as shown in Figures 1, 2, 3 and 9, the user engages the index fingers, or the index and middle fingers of each hand with the clean toweling and pulls downwardly. The degree of downward pull is limited by stop mechanism above described, that is by the distance of travel of the stop 75 from the lug 76 to the lug 78. The pitch of the screw and the distance between the heads 68, 66 determines the number of revolutions which the rolls may make.

At the end of this travel, the spring shaft has been properly rotated and the shoulder 80 has assumed the dot-and-dash line position shown in Figure 10. During this downward pull the crank 42 acting through the link 102 has raised the timer plunger to the position of Figure 4, setting the timer. At the same time the lever 89 has been moved to the position of Figure 4, allowing the latch 88 to assume the latched position shown.

While the towel is being used, the timer is operating and at the end of a timed period, which substantially corresponds to the period of use,

the timer has moved to the position of Figure 3 and has pulled the lever 89 again to the position of this figure, thus releasing the latch or pawl and holding it out. On release of the latch, the spring energy is released and the roll acts to promptly draw up the soiled toweling to the position shown in Figure 1.

In certain previous devices, the mechanism is so operated that a length of soiled toweling was always visible during intervals between use. In this device, the soiled toweling is automatically whisked out of view immediately following each period of use. For this purpose, energy storing means is provided which is operated during each clean toweling dispensing operation to store energy, and the energy is released at or near the end of the period of use by a timer which is, in this embodiment, set for action during the clean toweling dispensing operation and while the energy storing operation is taking place.

We claim as our invention:

1. A towel dispensing cabinet having, a clean towel measuring roll, a soiled towel takeup roll having a driving spring operably connected thereto, means by which said measuring roll operates the spring to wind the same, means for holding the takeup roll during and after winding of the spring, a stop mechanism operated by and controlling the measuring roll to limit the amount of clean toweling withdrawn, a timer and means by which it is set for automatic timing during the dispensing motion of said measuring roll, and means controlled by said timer to operate the takeup roll holding means to release the stored energy of said spring to operate the takeup roll, said release occurring at the end of a time period which substantially corresponds to the usual period of use of the clean toweling.

2. A device of the class described comprising, a shaft having a soiled towel takeup roll rotatable thereon, a spring connected to the takeup roll and which is wound by the shaft, a feed roll and means by which it drives the shaft, toweling which connects with the feed and takeup rolls, and operates the feed roll when it is pulled, a stop mechanism which limits the degree of rotation of the rolls and which is operably associated with the shaft, means for releasably holding the takeup roll while the spring is wound, an automatic timer which is set by the feed roll as said roll is moved by the toweling, and means operated by the timer at the end of a time period which substantially corresponds to the period of use of clean toweling to cause the holding means to release said takeup roll, whereby the spring acts to obtain takeup motion of the takeup roll.

3. A device of the class described comprising, a shaft having a soiled towel takeup roll rotatable thereon, a spring connected to the takeup roll and which is wound by the shaft, a feed roll and means by which it drives the shaft, toweling which connects with the feed and takeup rolls and operates the feed roll when pulled, a stop mechanism which limits the degree of rotation of the rolls and which is operably associated with the shaft and which is within the soiled towel takeup roll, means for releasably holding the takeup roll while the spring is being wound, an automatic timer which is set by the feed roll as said roll is moved by the toweling, and means operated by the timer, at the end of a time period which substantially corresponds to the period of use of clean toweling, to cause the holding means to release the takeup roll, whereby the spring acts to obtain takeup motion of the takeup roll.

4. A device of the class described, having a dispensing roll, a shaft, a hollow soiled towel takeup roll rotatable about said shaft, means by which the dispensing roll during dispensing moves the shaft, means for holding the takeup roll when the shaft moves as the result of dispensing, a stop mechanism within said takeup roll including parts connecting the shaft with the roll one of which parts is adapted to move from an initial to a final stopping position during operation of the shaft as a result of dispensing, and means controlled by the dispensing roll for operating the holding means respectively to cause it to hold the takeup roll while dispensing occurs and to release the takeup roll after dispensing occurs.

5. A device of the class described having a dispensing roll, a timer and means by which the dispensing roll during dispensing operates the timer to set it and release it for independent timing action, a shaft, a soiled towel takeup roll rotatable about said shaft, a spring connecting the shaft and roll and adapted to be wound when the shaft is turned, means by which the dispensing roll during dispensing moves the shaft to wind the spring, means for holding the takeup roll during winding motion of the shaft, and means controlled by the timer for operating said holding means respectively to cause it to hold the takeup roll while dispensing occurs and to release said roll at the end of the timing operation of the timer.

6. A device of the class described, having a dispensing roll, a soiled towel takeup roll, releasable means for holding the takeup roll against takeup motion, a spring and means by which it is connected to the takeup roll to drive the roll in takeup direction, means by which the dispensing roll winds the spring, and means controlled by the measuring roll for operating said holding means respectively to cause it to hold said takeup roll while dispensing action of the dispensing roll occurs and to release the takeup roll after such dispensing action has occurred.

7. A device of the class described, having a dispensing roll, a shaft, a hollow soiled towel takeup roll rotatable about the shaft, a spring connecting the shaft and roll to wind the spring when the shaft is rotated, means by which dispensing action of the dispensing roll rotates the shaft, a stop mechanism within said takeup roll, including a screw on the shaft, a member in threaded relation with the screw, and a splined connection between said member and said roll, means for holding the takeup roll against takeup motion while the spring is being wound, and means controlled by the measuring roll for operating said holding means respectively to cause it to hold said takeup roll while dispensing action of the dispensing roll occurs, and to release the takeup roll after dispensing action has occurred.

8. A device of the class described comprising a shaft having a soiled towel takeup roll rotatable thereon, a spring within the roll connected to said roll and which is wound by the shaft and which when wound drives the roll, a feed roll and means by which it drives the shaft, a stop mechanism which limits the degree of rotation of the shaft as driven by the feed roll, said stop mechanism being within the takeup roll and including a member which moves axially of the shaft toward stopping position, means releasably holding the takeup roll while the spring is wound, an automatic timer and means by which it is set by the feed roll as said roll is moved for dispensing, and means op-

erated by the timer for causing the holding means to assume holding position while said timer is being set, said last mentioned means also acting to release the holding means when timer action is completed.

9. A device of the class described having a dispensing roll, a timer and means by which the dispensing roll during dispensing operates the timer to set it and release it for independent timing action, a shaft, a hollow soiled towel takeup roll rotatable about said shaft, a spring connecting the shaft and takeup roll and adapted to be wound when the shaft is turned, means by which the dispensing roll during dispensing moves the shaft to wind the spring, means for holding the takeup roll during winding motion of the shaft, means controlled by the timer for operating said holding means respectively to cause it to hold the roll when dispensing occurs and to release the roll at the end of the timing operation of the timer, and a stop mechanism within said takeup roll, including parts connecting the shaft with the roll one of which parts is adapted to move from initial to final stopping position during operation of the shaft when winding said spring.

10. A dispensing cabinet having a bar accessible to the user, a dispensing roll operated by a pull on the toweling, a timer and means by which the dispensing roll during dispensing operates the timer to set it and release it for independent timing action, a shaft, a soiled towel takeup roll rotatable about said shaft, a spring connecting the shaft and roll and adapted to be additionally wound when the shaft is turned, a toweling supply, part of which forms a loop extending from the dispensing roll around the bar, thence around the takeup roll, said spring normally operating the takeup roll to hold the toweling stretched and against the bar, means by which the dispensing roll during dispensing moves the shaft to additionally wind the spring, means for holding the takeup roll during winding motion of the shaft, and means controlled by the timer for operating said holding means to cause it to hold the takeup roll while dispensing occurs and to release said roll at the end of the timing operation of the timer.

11. A device of the class described, having a dispensing roll, a shaft, a soiled towel takeup roll rotatable about the shaft, a spring connecting the shaft and roll and adapted to be wound when the shaft is turned, means by which the dispensing roll during dispensing moves the shaft to wind the spring, means for holding the takeup roll during winding motion of the shaft, and means controlled by the measuring roll for operating said holding means respectively to cause it to hold the takeup roll while dispensing occurs and to release the roll after dispensing has occurred.

FRANK G. STEINER.
RUDOLPH G. BIRR.