

Oct. 23, 1951

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2,572,121

APPARATUS FOR DISPENSING TOWELS

Filed Feb. 18, 1947

3 Sheets-Sheet 1

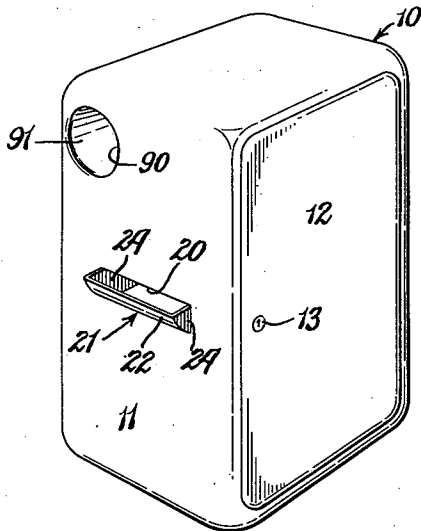
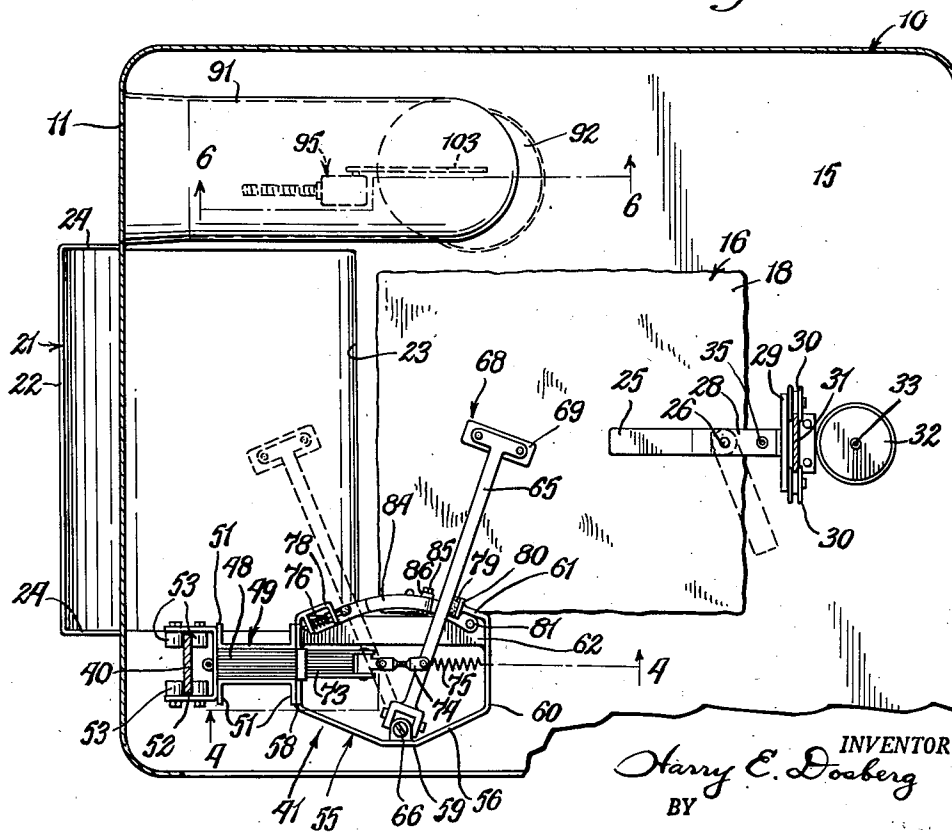


Fig. 1.



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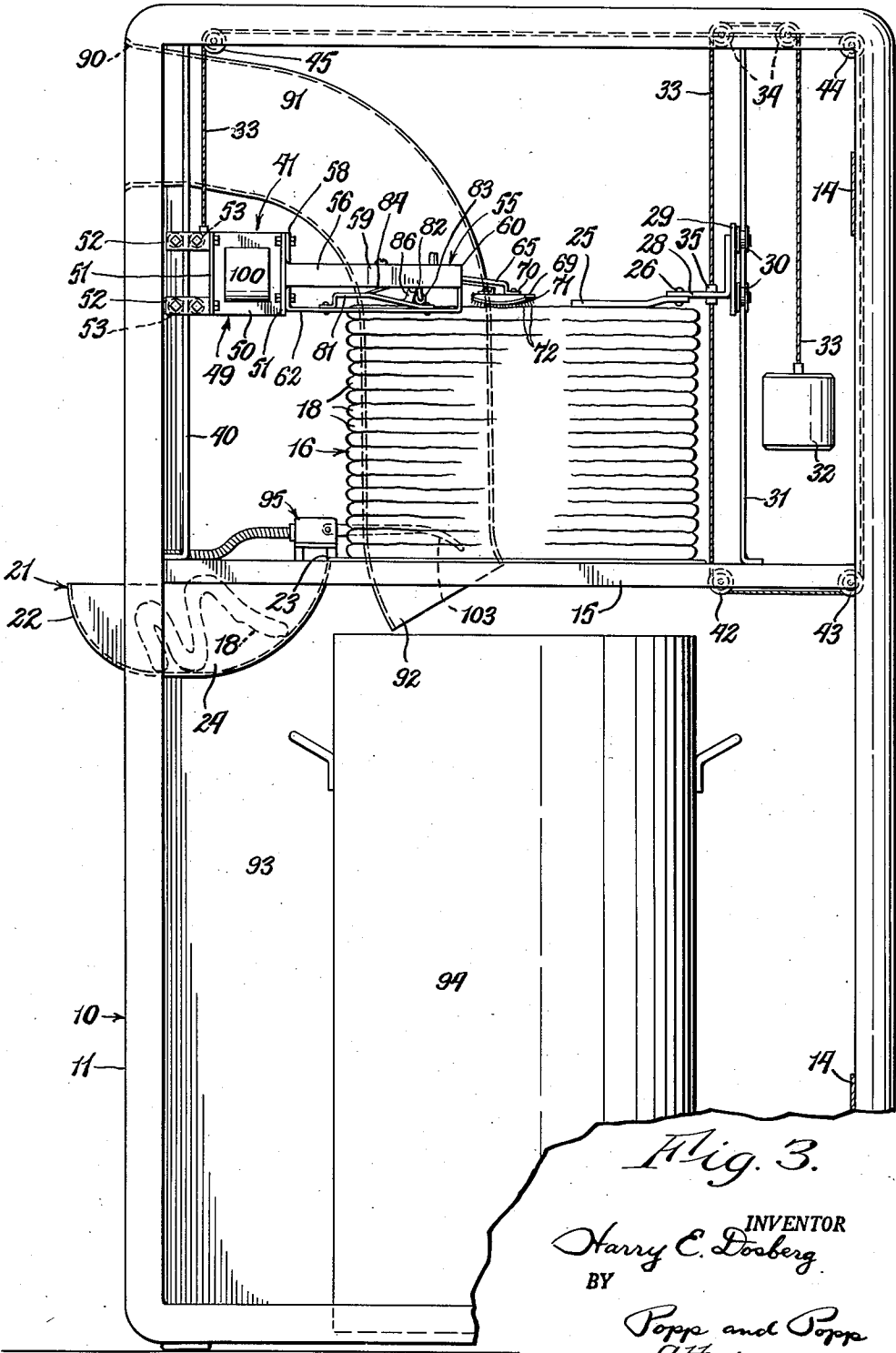
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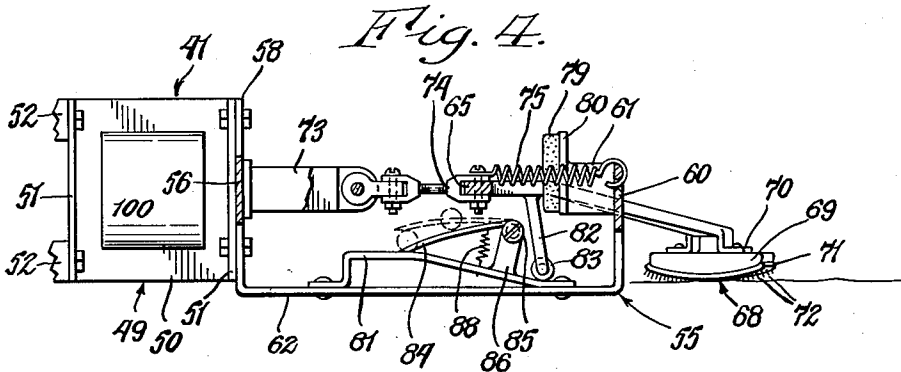


Fig. 5.

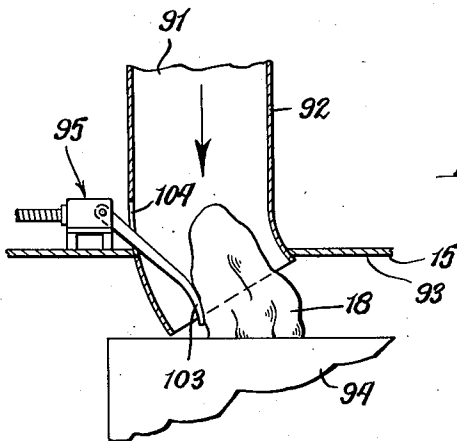
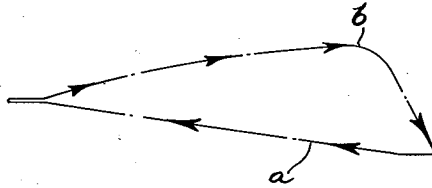
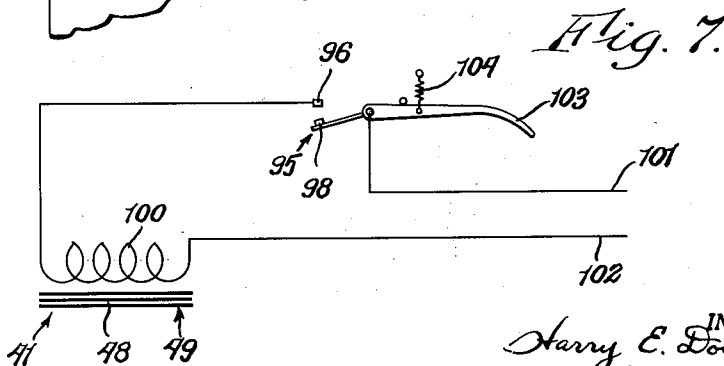


Fig. 6.



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2,572,121

APPARATUS FOR DISPENSING TOWELS

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Application February 18, 1947, Serial No. 729,376

8 Claims. (Cl. 312—55)

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This invention relates to apparatus for dispensing towels and more particularly to apparatus for dispensing individual cloth towels one at a time from the top of a pile of such towels, the dispensing apparatus being particularly applicable for use in factories where such towels are supplied to the workers.

One of the principal objects of the invention is to provide a dispensing apparatus which will operate in conjunction with a pile of individual cloth towels and which will reliably deliver one towel at a time.

Another object is to provide such dispensing apparatus which will not be affected by the condition of the towels, that is, whether the towels are new or worn, such towels being, of course, repeatedly washed in service.

Another object is to provide such a towel dispenser which operates rapidly to deliver an individual towel so that a single dispenser can be used to serve a large group of workers.

Another object is to provide such dispensing apparatus which will not injure the towels being dispensed.

Another object is to provide such an individual cloth towel dispenser which also serves as a receptacle for soiled towels and in which both the fresh and soiled towels are protected from pilferage.

Another object is to provide such a towel dispenser in which the dispenser is actuated by the return of a soiled towel, this minimizing the loss of towels.

Another object is to provide such a dispensing apparatus in which the workers are not required to handle anything but the towels themselves in actuating the same.

Another object is to provide such an individual towel dispenser which is quiet in its operation.

Another aim is to provide such an individual towel dispenser which is simple, inexpensive and rugged in construction and which will stand up under conditions of severe and constant use without getting out of order or requiring repairs.

Other objects and advantages of the invention will appear from the following description and drawings in which:

Fig. 1 is a diminutive perspective view of the cabinet housing the towel dispenser embodying the present invention.

Fig. 2 is a fragmentary horizontal section taken through the upper part of the cabinet shown in Fig. 1.

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Fig. 3 is a side elevational view of the cabinet showing the door removed to disclose the operating mechanism.

Fig. 4 is a fragmentary enlarged vertical sectional view taken generally on line 4—4, Fig. 2.

Fig. 5 is a diagram showing the path followed by the dispensing member in stripping the uppermost towel from a stack of towels and delivering the same to a receiver.

Fig. 6 is a fragmentary vertical section taken on line 6—6, Fig. 2.

Fig. 7 is a wire diagram showing the electrical connection between the electrical components of the apparatus.

The towel dispenser is shown as embodied in a casing 10 which can be of any suitable form and which encloses the operating mechanism as well as being a receiver for the soiled towels. The cabinet or casing is shown as having a front wall 11 and one side is shown as provided by a door 12 having a lock 13. This door is mounted on hinges 14 and preferably is substantially the full size of the cabinet so that when it is opened full access can be had to both the operating mechanism and the receptacle into which the soiled towels are thrown, thereby to facilitate the replenishment of the supply of fresh towels and the removal of the soiled towels or repair or adjustment of the operating mechanism.

A horizontal partition or shelf 15 is provided within the cabinet about midway of the height thereof, this shelf carrying a pile 16 of the individual cloth towels 18 which the apparatus dispenses.

Slightly below the level of the partition 15 the front wall 11 of the cabinet is provided with a horizontal opening 20 and in this opening is arranged a receiver 21. This receiver is shown as comprising a curved sheet of metal 22 which is arranged both on the interior and exterior of the cabinet, the inner extremity of this sheet of metal terminating at the inner edge of an opening 23 provided in the partition 15 at its front end. The sides of the receiver 21 are formed by sheet metal side walls 24 which are secured to the opposite curved edges of the curved metal sheet 22 and also are secured to the partition 15 adjacent the side edges of the opening 23 therein. It will be seen that a towel 18 removed from the top of the pile 16 and dropped through the opening 23 in the partition 15 will be accessible to the user, it being merely necessary for the user to reach into the receiver 21 to seize the towel.

The stack 16 of towels 18 is held in position by a presser member or foot 25 which is arranged to bear on the uppermost towel 18 of the pile 16 on the side thereof opposite from the receiver 21. This presser foot is in the form of a strip of metal pivoted, as indicated at 26, to an angle iron 28 so as to be capable of being swung from the full line fore-and-aft position shown to the dotted line position shown in Fig. 2. The angle iron 28 is carried by a vertical plate 29 having four rollers 30 which engage and ride along opposite sides of a vertical track or bar 31, this track or bar being secured at its upper end to the top of the casing 10 and at its lower end to the partition 15. The presser foot 25 is counterbalanced by a weight 32 through a cable 33, this cable passing over a pair of pulleys 34. This counterweight 32 also counterbalances the dispensing mechanism, the elevation of which is indexed by presser member 25 as hereinafter described, the angle iron 28 preferably having an adjustable connection 35 with the cable 33 for this purpose.

A vertical track or bar 40, similar to the track or bar 31, is mounted in one of the front corners of the cabinet 10, this track or rail 40 being secured at its upper end to the top of the cabinet and at its lower end to the partition 15. This rail guides the carrier 41 for the dispensing mechanism and which is supported by the cable 33. For this purpose the cable 33 passes beyond the adjustment fitting 35 for the presser foot 25, under a pair of pulleys 42, 43 carried by the partition 15 and thence over a pair of pulleys 44, 45 carried by the top of the cabinet 10, the latter pulley 45 being arranged over the carrier 41 and the end of the cable 33 being secured thereto in any suitable manner.

The carrier 41 includes the body or laminations 48 of a solenoid 49, this solenoid having vertical side plates 50, each provided with vertical flanges 51 along its front and rear edges. To the front flanges of these side plates are secured a pair of U-shaped brackets 52, these brackets being arranged one above the other and having their arms projecting forwardly to embrace opposite sides of the track or rail 40. Each of these arms of each U-shaped bracket 52 carries a pair of spaced rollers 53, each pair of rollers engaging the opposite sides of the track or rail 40 so that the carrier 41 rides freely up and down this track or rail.

The carrier 41 also includes a horizontal frame, indicated generally at 55, and comprising a C-shaped bar 56 projecting horizontally outwardly from an attaching plate 58 which is suitably secured to the rear flange 51 of that solenoid side plate 50 remote from the receiver 21. This bar extends rearwardly with a portion 59 thereof offset toward the adjacent side door 12 of the cabinet and its end 60 is bent toward the pile 16 of towels and with the extremity 61 thereof bent forwardly as best shown in Figs. 2 and 4. This bar is preferably in the form of a flat strip of metal set on edge and its end 60 is connected to the rear vertical leg of a depressed U-shaped bar 62, the front vertical leg of which is suitably secured to the rear flange 51 of that solenoid side plate 50 adjacent the receiver 21.

The frame 55 carries a sweep arm 65, one end of which is secured by a universal joint 66 to the offset part 59 of the bar 56 and the sweep extending over the depressed U-shaped bar 62 and having its upper end normally arranged above the pile 16 of towels. The upper end of this sweep

arm 65 carries a dispensing member, indicated generally at 68.

This dispensing member 68 is in the form of an elongated block 69 secured to a pair of ears 70 at the ends of the sweep arm 65 to extend transversely thereof and having a convex under face to which is secured a facing 71 having a plurality of needle-like bristles 72 projecting downwardly and slightly forwardly therefrom. These bristles are sufficiently long to interengage with the fibers of the uppermost towel 18 of the pile of towels 16 to strip this towel off the pile.

The sweep arm 65 is moved in the direction to so strip the uppermost towel 18 from the pile 16 by the solenoid 49, this solenoid having, for this purpose, a movable core 73 which is connected with the sweep arm 65 by a pivoted link 74. The return movement of the sweep arm 65 is effected by a return spring 75 connecting the sweep arm 65 with the end 60 of the frame bar 56.

Stops are provided for limiting the movement of the sweep arm 65 in both directions. In the forward direction of the sweep arm 65, this stop is provided by the cushioned head of a spring loaded bumper pin 76 which is mounted for sliding movement in the direction of impact from the sweep arm 65 in the arms of a U-shaped bracket 78 which is attached to the adjacent upstanding leg of the U-shaped bar 62. In the return direction of the sweep arm 65, this stop is provided by a resilient pad 79 fast to a bumper plate 80 fast to the extremity 61 of the frame bar 56.

A track and switch are provided for guiding the sweep arm 65 to cause the dispensing member 68 to follow the path shown in Fig. 5. To this end an arcuate track bar 81 is secured to the U-shaped bar 62 by rivets or in any other suitable manner, this track bar 81 being concentric with the vertical axis of oscillation of the sweep arm 65. As viewed in Fig. 4, the right hand end of this track bar 81 is at a low elevation and from this end the track bar inclines upwardly to its elevated left hand end. The sweep arm rests on and is guided by this track arm 81 having for this purpose a depending strut or leg 82 carried by an outboard roller 83 riding on this track bar. In riding up this track bar, this roller passes under and lifts the free end of a switch 84. This switch is supported by a pivot pin 85 projecting across the track bar 81 from a post 86 rising from one side of this track bar 81 so that the free end of this switch is normally in engagement with the elevated end of the track 81 and is capable of rising to the dotted line position shown in Fig. 4. A helical tension spring 88 yieldingly holds the free end of the switch 84 down against the elevated end of the track bar 81 as shown by full lines in Fig. 4.

A feature of the invention resides in the necessity of returning a soiled towel in order to obtain a fresh towel. To this end the front wall 11 of the cabinet 10 is provided with an opening 90 at its upper end, this opening leading to the upper end of a tubular chute 91 the upper end of which is fastened to the rear of the front wall 11 in register with the opening 90. This tubular chute 91 extends rearwardly from the opening 90 and thence curves downwardly to provide a vertical leg 92 extending through an opening provided in the shelf or partition 15, the open lower end of this tubular chute discharging into the soiled towel compartment 93 formed in the lower part of the cabinet 10 by the shelf or partition 15. In order to facilitate the removal of soiled towels from the compartment 93, a removable receptacle 94 is

preferably placed in this compartment below the vertical leg 92 of the chute 91 the soiled towels thrown into the tubular chute thereby falling into this receptacle.

An electric switch 95 is mounted on the shelf or partition adjacent the vertical leg 92 of the tubular chute 91, the contacts 96, 98 of this switch being in series with the winding 100 of the solenoid 49 and with the main power lines 101 and 102 as best shown in the wiring diagram, Fig. 7. This switch 95 is actuated by an arm 103 which projects through a vertical slot 104 in one side of the lower end 92 of the tubular chute 91 and across the interior thereof as best shown in Fig. 6. The arm 103 swings in a vertical direction and is normally held in an elevated position by a light tension spring 104. In this position the contacts 96, 98 are open. It will therefore be seen that when a soiled towel 18 is thrown into the opening 90 it travels down the tubular chute 91 and is discharged from its lower vertical leg 92 into the receptacle 94. In passing the switch arm 103 it depresses the same to close the switch contacts 96, 98 and thereby energize the solenoid 49.

In the operation of the towel dispenser the user reaches into the forwardly projecting part of the receiver 21 and removes a fresh towel therefrom. After using the towel he throws the soiled towel through the opening 90 into the tubular chute 91. The soiled towel passes into the vertical lower leg 92 of this tubular chute and falls into the receptacle 94 arranged in the soiled towel compartment 93 at the bottom of the cabinet. In passing through the tubular chute the soiled towel strikes and depresses the arm 103 (Fig. 6), moving this arm against the resistance of the spring 104 which yieldingly holds it in an elevated position. This downward movement of the arm 103 under the impact of the soiled towel closes the contacts 96, 98 thereby establishing a circuit from one side 101 of a line through these contacts and through the winding 100 of the solenoid 49 to the other side of the power line.

This energization of the solenoid 49 draws its core 73 inwardly thereby rapidly moving the sweep arm 65 from the full to the dotted line position shown in Fig. 2 and against the resistance of its return spring 75. The sweep arm 65 is at this time arranged with the bristles 72 of its dispensing member 69 in interengaging contact with the fibers of the uppermost towel 18 of the pile of fresh towels 16 and it will therefore be seen that the horizontal movement of the sweep arm 65 through power derived from the solenoid 49 effects a horizontal action of the dispensing member 65 against the uppermost towel 18, which tends to strip this uppermost towel from the pile 16 of towels. However, such stripping of the uppermost towel 18 from the top of the pile 16 also requires an upwardly inclined movement of the dispensing member 69 in traveling from the full to the dotted line position shown in Fig. 2. To effect such inclined movement the sweep arm 65 is supported by the roller 83 which rides on the track bar 81 and this track bar is inclined so that in moving from the full to the dotted line position shown in Fig. 2 the dispensing member 69 also moves upwardly. This path of movement of the dispensing member is indicated by the dot-dash line *a* in Fig. 5.

The solenoid 49, when energized, moves the sweep arm 65 at a high rate of speed in so causing the dispensing member to follow the path indicated by the dot-dash line *a* in Fig. 5. This movement is abruptly stopped by engagement of the

sweep arm 65 with the head of the spring loaded stop pin 76. This stop pin is arranged to stop the sweep arm 65 when it reaches approximately the dotted line position shown in Fig. 2 and it will be seen that in this position the dispensing member 69 is arranged over the opening 23 below which the receiver 21 is arranged. The fresh towel stripped from the top of the pile 16 is therefore swept over the receiver 21 and the abrupt stopping of the sweep arm 65 by the spring loaded stop pin 76 serves to release this towel from the bristles 72 of the dispensing member 69 so that this towel falls into the receiver 21. This towel is available for the next user, which is the condition assumed at the start of the description of the operation of the dispenser.

It is necessary to return the dispensing member 69 into engagement with the now uppermost towel 18 of the pile 16 for a repetition of its stripping operation. To this end the solenoid 49 is de-energized as soon as the soiled towel 18 has passed the switch arm 103, the return spring 104 drawing this arm 103 to its normal elevated position in which the switch contacts 96 and 98 are opened. When this occurs the return spring 75 draws the sweep arm 65 from the dotted to the full line position shown in Fig. 2. However, this sweep arm is prevented from riding down the track bar 81 by the switch 84. Instead, the roller 83 which supports this sweep arm rides up on the switch 84 and over the rear end thereof, falling into engagement with the depressed end of the track bar 81. In the reverse movement of this sweep arm 65, the dispensing member is therefore caused to follow the dot-dash line *b* shown in Fig. 5. It will be seen that in this movement the dispensing member 65 is held out of engagement with the uppermost towel 18 of the pile 16 until the very end of its return path, at which time it is dropped in a substantially vertical direction into engagement with this uppermost towel. This dropping also serves to insure interengagement of the bristles 72 thereof with the fibers of the uppermost towel so as to insure reliable stripping of this towel from the top of the pile 16 the next time a soiled towel is thrown down the tubular chute 91.

An important feature of the invention resides in the use of the presser foot 25 and its function in indexing the elevation of the dispensing mechanism supported by the carriage 41. To this end the presser member 25 is mounted for vertical movement on the vertical track bar 31 and the dispenser assembly or carriage 41 is mounted on the vertical track bar 40 and both the presser foot 25 and the carriage 41 are jointly counterbalanced by the weight 32 and supported in fixed relation to each other. Hence, when a towel 18 is stripped from the top of the pile 16, the presser foot 25 drops a proportionate distance and this permits the carriage 41 for the dispensing mechanism to drop an equal distance. It will therefore be seen that the presser foot 25 indexes the elevation of the dispensing member 65 and serves to insure that this dispensing member rests on the uppermost towel of the pile 16 with exactly that pressure required to insure interengagement of its bristles with the fibers of the uppermost towel and to insure proper stripping action by this dispensing member in following the path indicated by the dot-dash line *a* in Fig. 5.

The door 12 of the cabinet occupies substantially one entire side thereof and it will therefore be seen that opening this door permits ready access to the soiled towel compartment 93 so that

the receptacle 94 filled with soiled towels can be readily removed therefrom. It will further be seen that a stack 16 of fresh towels can readily be replaced on the shelf or partition 15, it being merely necessary to pull down the counterweight 32 so as to lift the presser foot 25 and the carriage 41 for the dispensing member to the top of the cabinet. It will further be seen that with this large door 12, the mechanism is readily accessible for inspection, adjustment or repair.

From the foregoing it will be seen that the present invention provides a very simple and sturdy mechanism for dispensing individual cloth towels which delivers the towels one at a time and rapidly so that the dispenser is capable of serving a large group of workers at the same time. It will further be seen that the operation of the dispenser requires a soiled towel to be returned to the apparatus, this feature serving to cut down the loss of towels. It will further be seen that such loss is cut down by the inherent interest provoked in operating the dispenser.

I claim:

1. Apparatus for dispensing individual cloth towels one at a time from the top of a pile of such towels, comprising means supporting said pile of towels, a receiver arranged at one side of said pile, a vertically movable presser member on a side of said pile remote from said receiver and resting on a portion of the uppermost towel on said pile remote from said receiver, a vertically movable dispensing member arranged in a normal position on said uppermost towel on said pile and interengaging the same intermediate said presser member and receiver, a plurality of short bristles projecting from the underside of said dispensing member to seize the uppermost towel, means for indexing the elevation of said dispensing member in said normal position from said presser member, means for moving said dispensing member in a generally horizontal direction toward said receiver at a high rate of speed to strip said uppermost towel from said pile and to deposit it in said receiver, and means for returning said dispensing member to said normal position.

2. Apparatus for dispensing individual cloth towels one at a time from the top of a pile of such towels, comprising means supporting said pile of towels, a receiver arranged at one side of said pile, a vertically movable presser member on a side of said pile remote from said receiver and resting on a portion of the uppermost towel on said pile remote from said receiver, a vertically movable dispensing member arranged in a normal position on said uppermost towel on said pile and interengaging the same intermediate said presser member and receiver, a plurality of short bristles projecting from the underside of said dispensing member to seize the uppermost towel, means for indexing the elevation of said dispensing member in said normal position from said presser member, a solenoid movable vertically with said dispensing member and having its movable core connected with said dispensing member for moving said dispensing member at a high rate of speed on energization of said solenoid in a generally horizontal path toward a position above said receiver, a stop suddenly arresting said dispensing member at said position to strip said uppermost towel from said pile and to fling it from said bristles into said receiver, and means movable vertically with said dispensing member for returning said dispensing member to said normal position.

3. Apparatus for dispensing individual cloth towels one at a time from the top of a pile of such towels, comprising means supporting said pile of towels, a receiver arranged to one side of said pile, a sweep arm, pivot means supporting one end of said sweep arm and permitting vertical and horizontal movement of the free end of said sweep arm, a dispensing member mounted on the free end of said sweep arm and normally arranged on the uppermost towel on said pile and interengaging the same, a plurality of short bristles projecting from the underside of said dispensing member to seize the uppermost towel, an inclined track traversed by said sweep arm and guiding said sweep arm to carry said dispensing member in an upwardly inclining direction toward a position over said receiver to strip said uppermost towel from said pile and to fling it in said receiver, a solenoid having its coil mounted in fixed relation to said track and its movable core connected with said sweep arm for moving said sweep arm along said track, and means for moving said sweep arm at a high rate of speed upwardly to return said dispensing member to its normal position on the uppermost towel of said pile.

4. Apparatus for dispensing individual cloth towels one at a time from the top of a pile of such towels, comprising a frame, means supporting said pile of towels in said frame, a receiver carried by said frame, and arranged to one side of said pile of towels, a vertically movable carrier, means on said frame for guiding said carrier for vertical movement alongside said pile, a presser member engaging said uppermost towel of said pile, means on said frame for guiding said presser member for vertical movement, means indexing the elevation of said carrier from said presser member, a sweep arm, pivot means supporting one end of said sweep arm on said carrier and permitting vertical and horizontal movement of the free end of said sweep arm, a dispensing member mounted on the free end of said sweep arm and normally arranged on the uppermost towel on said pile and interengaging the same, means on said carrier and guiding said sweep arm to carry said dispensing member in an upwardly inclining direction toward a position over said receiver to strip said uppermost towel from said pile and to deposit it in said receiver, means on said carrier for moving said sweep arm along said guiding means, and means on said carrier for moving said sweep arm to return said dispensing member to its normal position on the uppermost towel of said pile.

5. Apparatus for dispensing individual cloth towels one at a time from the top of a pile of such towels, comprising a frame, means supporting said pile of towels in said frame, a receiver carried by said frame and arranged to one side of said pile of towels, a vertically movable carrier, means on said frame for guiding said carrier for vertical movement alongside said pile, a presser member engaging said uppermost towel of said pile, means on said frame for guiding said presser member for vertical movement, means indexing the elevation of said carrier from said presser member, a sweep arm, pivot means supporting one end of said sweep arm on said carrier and permitting vertical and horizontal movement of the free end of said sweep arm, a dispensing member mounted on the free end of said sweep arm and normally arranged on the uppermost towel on said pile and interengaging the same,

means on said carrier and guiding said sweep arm to carry said dispensing member in an upwardly inclining direction toward a position over said receiver to strip said uppermost towel from said pile and to deposit it in said receiver, a solenoid on said carrier for moving said sweep arm along said guiding means, and means on said carrier for moving said sweep arm to return said dispensing member to its normal position on the uppermost towel of said pile.

6. Apparatus for dispensing individual cloth towels one at a time from the top of a pile of such towels, comprising a frame, means supporting said pile of towels in said frame, a receiver carried by said frame and arranged to one side of said pile of towels, a vertically movable carrier, means on said frame for guiding said carrier for vertical movement alongside said pile, a presser member engaging said uppermost towel of said pile, means on said frame for guiding said presser member for vertical movement, means indexing the elevation of said carrier from said presser member, a sweep arm, pivot means supporting one end of said sweep arm on said carrier and permitting vertical and horizontal movement of the free end of said sweep arm, a dispensing member mounted on the free end of said sweep arm and normally arranged on the uppermost towel on said pile and interengaging the same, means on said carrier and guiding said sweep arm to carry said dispensing member in an upwardly inclining direction toward a position over said receiver to strip said uppermost towel from said pile and toward said receiver, a solenoid on said carrier for rapidly moving said sweep arm along said guiding means, a stop on said carrier arresting said sweep arm when said dispensing member arrives at said position over said receiver to cause said dispensing member to fling said towel into said receiver, and means on said carrier for moving said sweep arm to return said dispensing member to its normal position on the uppermost towel of said pile.

7. Apparatus for dispensing individual cloth towels one at a time from the top of a pile of such towels, comprising a frame, means supporting said pile of towels in said frame, a receiver carried by said frame and arranged to one side of said pile of towels, a vertically movable carrier, means on said frame for guiding said carrier for vertical movement alongside said pile, a presser member engaging said uppermost towel of said pile, means on said frame for guiding said presser member for vertical movement, means indexing the elevation of said carrier from said presser member, a sweep arm, pivot means supporting one end of said sweep arm on said

carrier and permitting vertical and horizontal movement of the free end of said sweep arm, a dispensing member mounted on the free end of said sweep arm and normally arranged on the uppermost towel on said pile and interengaging the same, means on said carrier and guiding said sweep arm to carry said dispensing member in an upwardly inclining direction toward a position over said receiver to strip said uppermost towel from said pile and to deposit it in said receiver, means on said carrier for moving said sweep arm along said guiding means, means on said carrier for moving said sweep arm to return said dispensing member to its normal position on the uppermost towel of said pile, and means for jointly counterbalancing said presser member and carrier.

8. Apparatus for dispensing individual cloth towels one at a time from the top of a pile of such towels, comprising a casing for said pile of towels and forming a compartment for soiled towels, a receiver arranged to one side of said pile in one wall of said casing and opening to the exterior and interior thereof, an opening in said casing through which the soiled towels are thrown into said compartment, a dispensing member normally arranged on the uppermost towel of said pile and interengaging the same, electromagnetic means for moving said dispensing member in a generally horizontal direction and at a high rate of speed toward said receiver to strip the uppermost towel from said pile and to fling said towel into said receiver, means for returning said member to its normal position on the uppermost towel of said pile, an electric switch in circuit with said electromagnetic means, and means actuating said electric switch through motion derived from the soiled towel thrown through said opening into said compartment.

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