Oct. 22, 1963 J. T. SHORT 3,107,770

MACHINE FOR DISPENSING TOWELS AND THE LIKE

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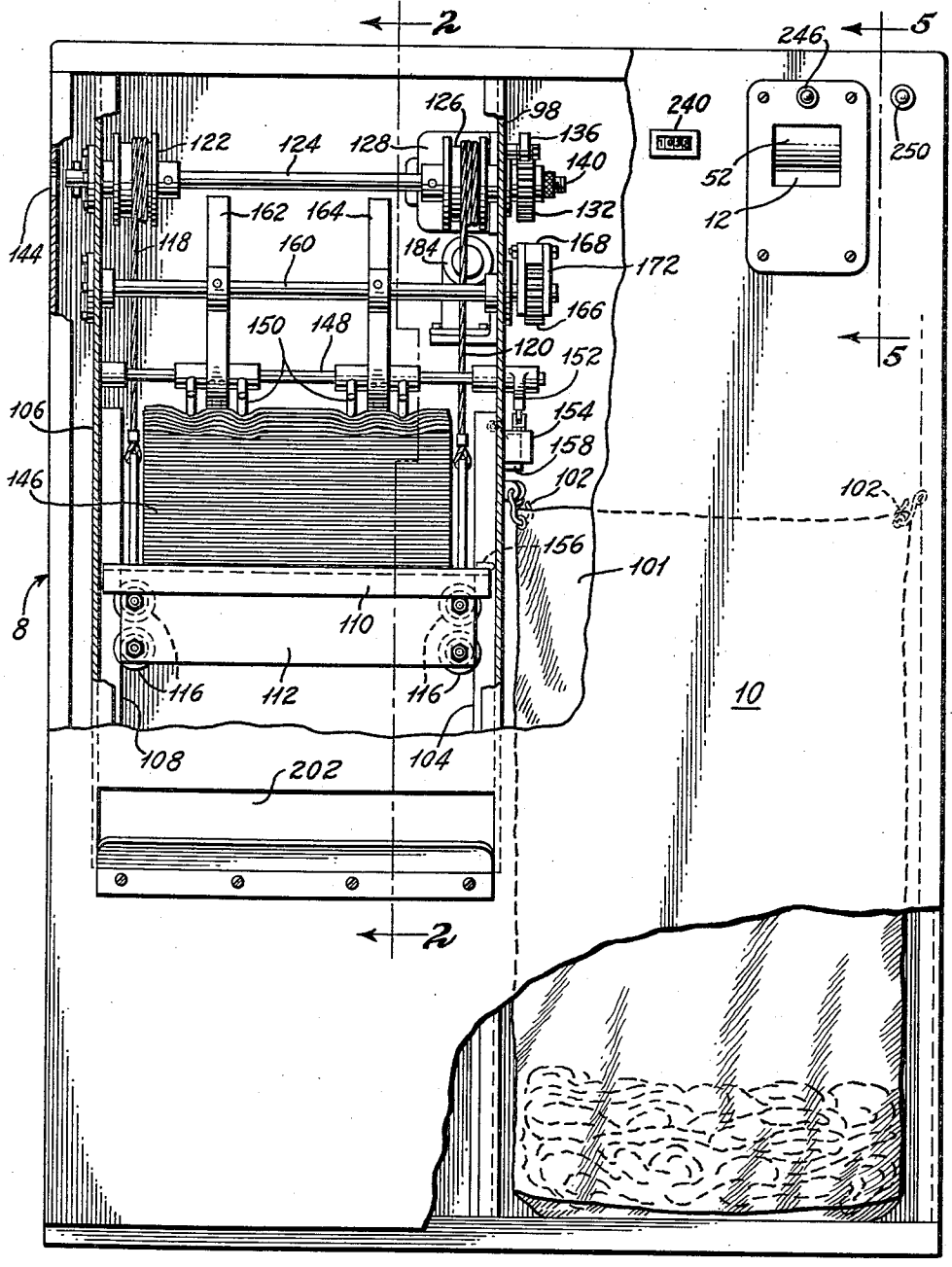


Fig. 1.

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MACHINE FOR DISPENSING TOWELS AND THE LIKE

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Fig. 2.

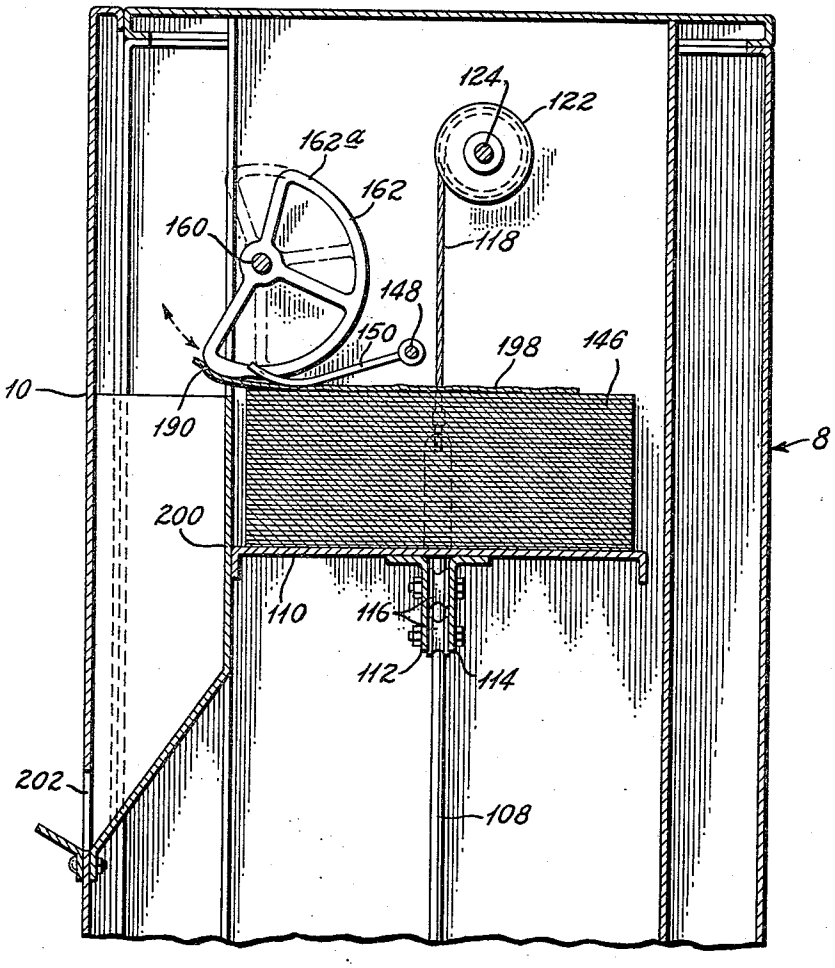
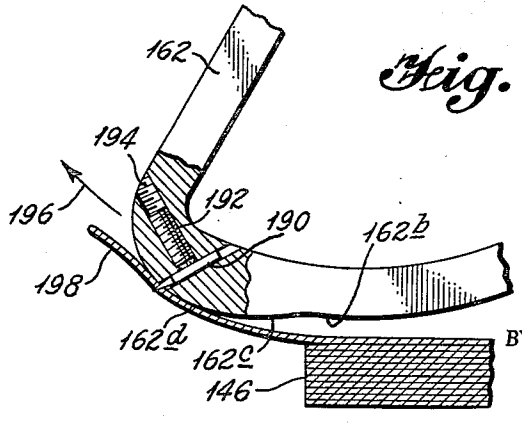


Fig. 4.



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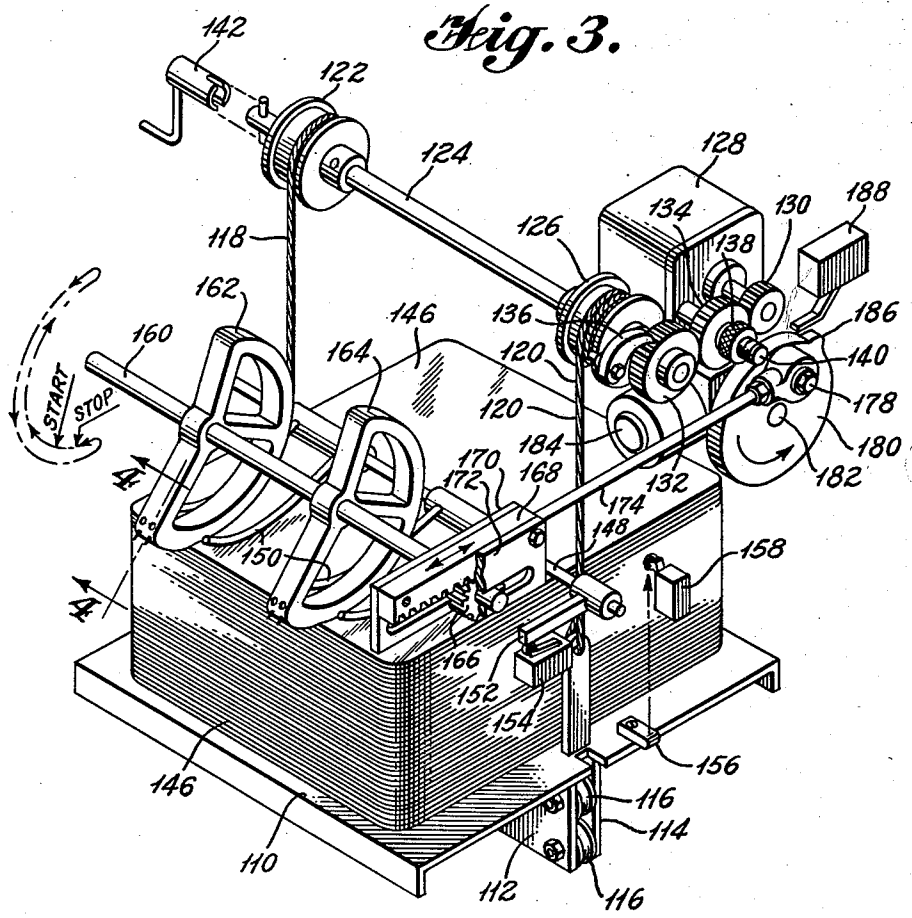
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MACHINE FOR DISPENSING TOWELS AND THE LIKE

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Fig. 3.



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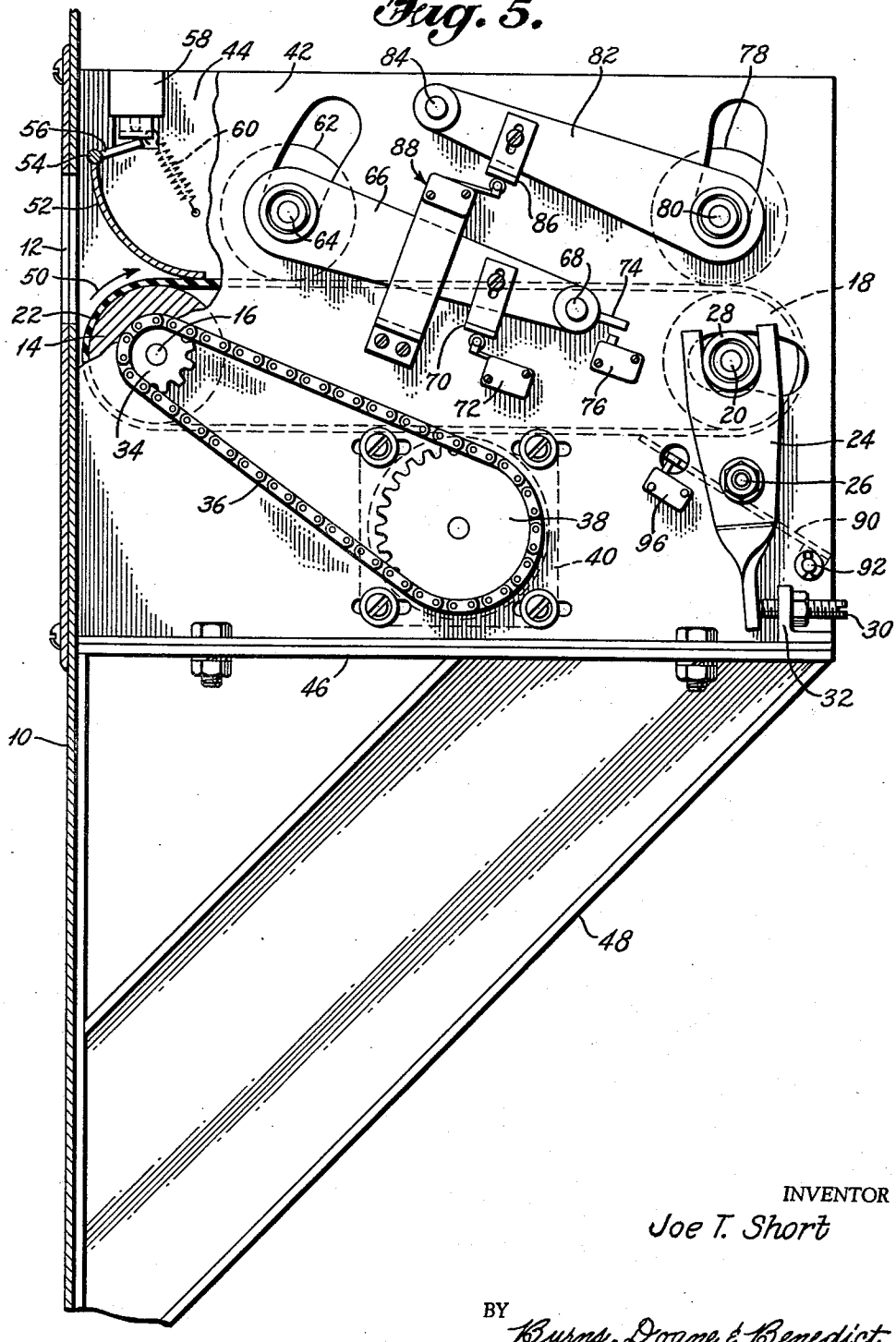
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MACHINE FOR DISPENSING TOWELS AND THE LIKE

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Fig. 5.



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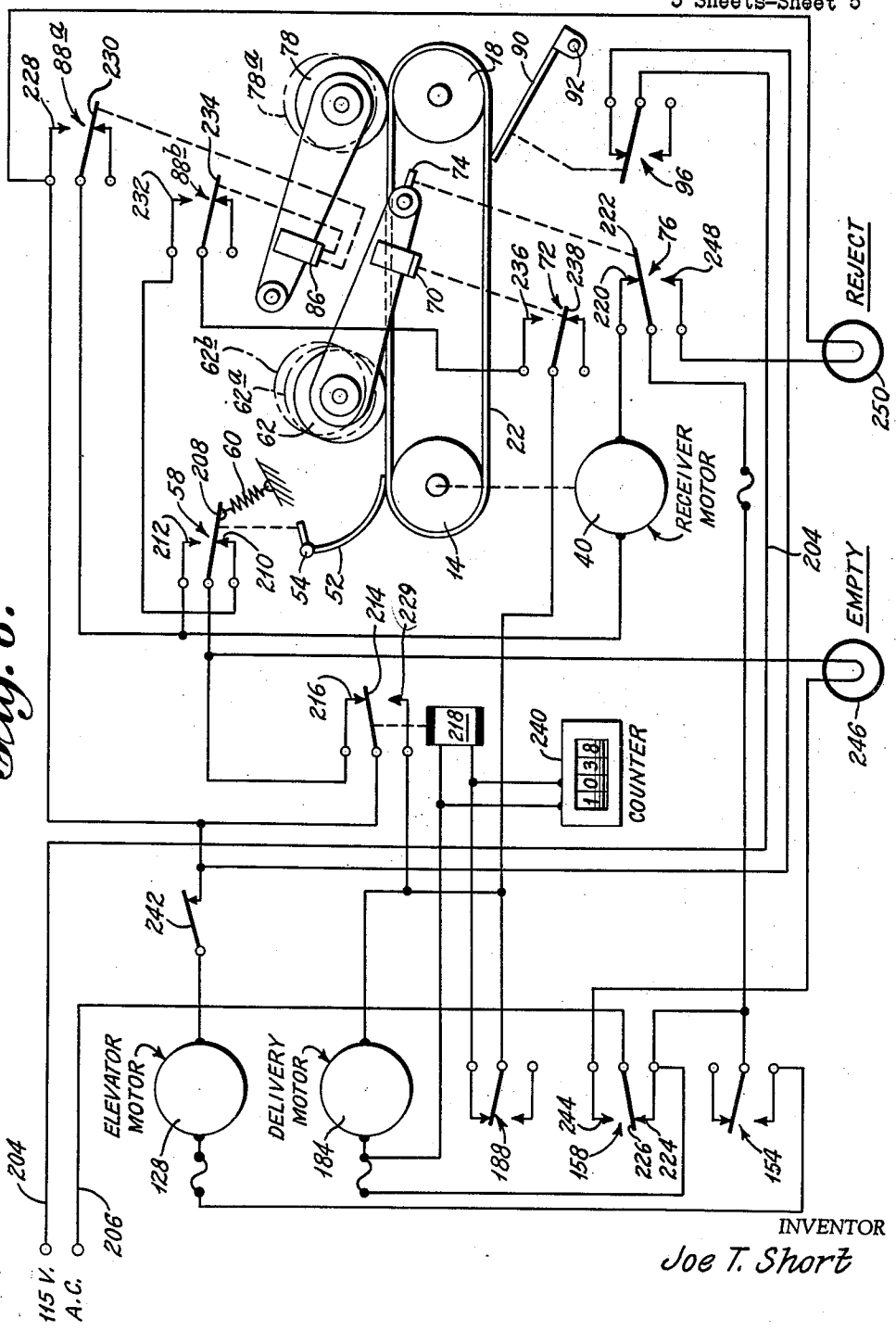


Fig. 6.

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3,107,770

MACHINE FOR DISPENSING TOWELS AND THE LIKE

Joe T. Short, West Point, Ga., assignor to Callaway Mills Company, La Grange, Ga., a corporation of Georgia

Filed June 6, 1960, Ser. No. 34,339
14 Claims. (Cl. 194—4)

The present invention relates to a machine for dispensing clean towels in exchange for soiled towels deposited therein. This application is a continuation-in-part of my copending application, Serial No. 751,049, filed July 25, 1958.

It is common practice in shops and factories to make wiping towels available to workmen for use in wiping machinery, equipment, work in progress and finished items. The disappearance of such towels through loss or theft has been a serious economic consideration and has been a major factor in the cost of making such towels available. Machines have heretofore been developed which which were designed to operate on the principle of supplying clean towels in exchange for soiled towels deposited in the machines. So far as I am aware, such prior machines have not gone into widespread use in spite of the obvious economic advantages which would be possessed by satisfactory machines for such purpose. It appears that one defect in prior machines has been that the mechanisms for receiving the soiled towels have not been sufficiently certain and selective in their operation to reasonably assure that clean towels would be dispensed only in exchange for soiled towels of comparable dimensions. It also appears that prior machines for this purpose have not had clean towel dispensing mechanisms which were reasonably certain to dispense a single clean towel for each soiled towel deposited in the machine and without risk of tearing or otherwise injuring the clean towel.

The machine of the present invention overcomes the primary deficiencies which have been found to exist in prior towel dispensing machines known to me. The mechanism includes a power driven conveyor over which soiled towels are conveyed. A pair of switch actuating arms are longitudinally spaced along the conveyor to be deflected by a towel passing along the conveyor. If the soiled towel passing along the conveyor has been properly inserted into the machine and has sufficient minimum dimensions to assure that both switch actuating arms are held deflected at the same time, an accepting circuit is energized to cause the machine to dispense one clean towel. If a fragment of a towel or some article other than a towel is inserted in the machine, the two switch actuating arms will not be held deflected at the same time and the accepting circuit is not energized. The towel receiving mechanism is so constructed that a soiled towel cannot be withdrawn from the machine after it has entered the machine sufficiently to cause energization of the accepting circuit. Provision is also made to stop the conveyor to permit withdrawal from the machine of a towel which has been improperly inserted, such as by rolling up the towel or wadding it in such a manner that it will not properly hold both of the switch actuating arms deflected at the same time. The towel receiving mechanism also includes means for rendering the machine inoperative when an excessive number of soiled towels has accumulated in the machine.

The clean towel dispensing mechanism includes an elevator for holding a stack of flat towels thereon. An oscillatable shaft is positioned above the stack of towels on the elevator. A pair of arcuate dispensing members are fixed to this shaft and are provided with pointed pins projecting therefrom. Means are provided for automatically maintaining the top towel on the stack at the proper elevation to be stripped from the stack by the

pointed pins on turning of the shaft in one direction. The towel stripped from the stack is moved upwardly and laterally to be suspended above a towel discharge chute. The shaft then turns in the opposite direction and the suspended towel is lowered into the chute and stripped from the pointed pins. The oscillation of the shaft is controlled by the accepting circuit discussed above.

The primary object of the invention is to provide an improved machine for accurately dispensing one clean towel in exchange for one soiled towel deposited therein.

A further object of the invention is to provide a towel dispensing machine of the type described which will dispense a clean towel only in exchange for a soiled towel of certain minimum dimensions.

Another object of the invention is to provide a towel dispensing machine which can be easily and quickly loaded with a supply of clean towels.

A further object of the invention is to provide a towel dispensing machine having a soiled towel accepting mechanism which will accept soiled towels of certain minimum dimensions and will exchange a clean towel therefor, irrespective of variations in the weight of the soiled towel which might be caused by differences in the amount or character of the contaminants thereon.

Still another object of the invention is to provide a machine of the type described which will permit a legitimate soiled towel which has been improperly inserted to be retrieved from the machine for proper reinsertion therein.

A further object of the invention is to provide a towel dispensing machine of the type described which will become automatically inoperative when an excessive number of soiled towels has accumulated therein.

The foregoing and other objects and advantages of the invention will be more fully understood from the following detailed description which has reference to the accompanying drawings wherein:

FIGURE 1 is a front elevational view of a machine embodying the invention, with portions of the door shown broken away;

FIGURE 2 is a vertical sectional view of a portion of the clean towel dispensing mechanism, taken along the line 2—2 of FIGURE 1;

FIGURE 3 is a perspective view of portions of the clean towel dispensing mechanism;

FIGURE 4 is an enlarged fragmentary view illustrating a portion of one of the arcuate towel dispensing members and its relationship to a stack of clean towels;

FIGURE 5 is a side elevational view of the soiled towel receiving mechanism with a portion of one wall broken away, and taken generally along the line 5—5 of FIGURE 1; and

FIGURE 6 is a wiring diagram of the machine.

Description of the Soiled Towel Receiving Mechanism

The machine includes a cabinet designated generally by the reference numeral **8** and provided with a hinged front door **10**. The door **10** is provided with a soiled towel receiving opening **12**. A conveyor roller **14** is fixed to a shaft **16** which is mounted in suitable bearings to position the roller **14** immediately inwardly of the soiled towel receiving opening, as best illustrated in FIGURE 5. A similar conveyor roller **18** is mounted on a shaft **20**. A conveyor belt **22** is mounted on the rollers **14** and **18**. Suitable tension may be applied to the conveyor belt **22** by means of a pair of rocker arms, one of which is shown in the drawing and designated by the reference numeral **24**. Arm **24** is pivoted at **26** and is bifurcated at its upper end to receive bearing **28** on the shaft **20**. A screw **30** is threadedly received in a stationary bracket **32** and engages the lower end of the rocker arm **24**. It will be understood that a similar mech-

anism is provided at the opposite end of the shaft 20 and that by appropriate adjustment of the screws 30, the tension on the conveyor belt 22 may be regulated. Roller 14 is driven by a sprocket 34 fixed to the shaft 16. The sprocket 34 is driven by a chain 36 from a motor sprocket 38 and an electric receiver motor 40. The mechanism described above is suitably supported by horizontally spaced, vertical side plates 42 and 44 supported by a horizontal base plate 46 and a bracket 48 suitably secured to the door 10.

The conveyor belt 22 is driven in the direction of the arrow 50 by the receiver motor 40 when that motor is energized. The manner of energizing receiver motor 40 is hereinafter more fully described but is initiated by movement of a gate 52 just inside the soiled towel receiving opening 12. The gate 52 is pivoted on side plates 42 and 44 by a pivot pin 54 and carries a switch actuating arm 56 for actuating a switch 58. The gate 52 is moved toward closed position by a tension spring member 60 secured to a movable contact of the switch 58.

A switch actuating roller 62 is mounted on a shaft 64 carried by arms 66 (only one being shown in the drawings) which are pivotally mounted at 68. The arm 66 is provided with a switch actuating member 70 for actuating a switch 72 on upward deflection of the roller 62 by passage of an appropriately inserted towel thereunder. The arm 66 is also provided with a switch actuating member 74 which actuates a switch 76 upon excessive upward deflection of the roller 62 in the manner hereinafter described. A second switch actuating roller 78 is positioned along the conveyor belt 22 rearwardly of the roller 62. The roller 78 is mounted on a shaft 80 carried by rocker arms 82 (only one being shown in the drawings) which are pivotally mounted on a shaft 84. The rocker arm 82 is provided with a switch actuating member 86 for simultaneously operating a double switch arrangement designated generally by the reference numeral 88 when a soiled towel passes along the conveyor belt 22 beneath the roller 78.

A plate 90 is pivotally mounted between the side plates 42 and 44 by means of a pivot pin 92. The plate 90 extends upwardly and forwardly and its free end is held adjacent the lower run of the conveyor belt 22 by the movable element of a switch 96. The switch 96 will be actuated when one or more towels seek to follow the lower run of the conveyor belt 22 in the manner hereinafter described.

Description of the Clean Towel Dispensing Mechanism

The cabinet 8 is provided with a central vertical wall 98 which cooperates with one side wall of the cabinet to provide a soiled towel storage compartment in which a bag 100 may be suspended by hooks 102. A vertical track 104 is fixed to the opposite face of the wall 98. A second vertical wall 106 carries a vertical track 108. An elevator platform 110 has spaced plates 112 and 114 extending downwardly therefrom. The plates 112 and 114 carry grooved rollers 116 which engage the tracks 104 and 108 to guide the elevator platform in its vertical movement.

The elevator platform 110 is supported by a pair of cables 118 and 120. The cable 118 is wound on a drum 122 fixed to a horizontal shaft 124. The shaft 124 is mounted in suitable bearings in the walls 98 and 106. The cable 120 is similarly wound on a drum 126 fixed to the shaft 124. An elevator motor 128 is provided with a gear 130 which drives gear 132 fixed to the shaft 124 by means of an idler gear 134. A pawl 136 engages the gear 132 to prevent unintentional lowering of the elevator platform 110 from the position to which it has been elevated by the elevator motor 128.

The elevator platform 110 may be manually lowered to receive a stack of clean towels. This lowering of the elevator is accomplished by loosening a knurled nut 138 on the shaft 140 on which the idler gear 134 is mounted. This permits movement of the idler gear 134 longitudinally along its shaft to disengage that gear from the gears 130 and 132. A manual crank 142 can then be inserted through an opening 144 in the cabinet to engage the opposite end of the shaft 124. The pawl 136 can be released manually and the elevator platform 110 lowered by rotating the crank 142 in the direction to unwind the cables 118 and 120 from their respective drums.

The elevator motor 128 is automatically energized to maintain the top towel of the stack of towels 146 in appropriate dispensing position by means which will now be described. A horizontal shaft 148 is mounted in suitable bearings in the walls 98 and 106. A plurality of feeler fingers 150 are fixed to the shaft 148 and extend forwardly therefrom. Also fixed to the shaft 148 is a switch actuating member 152. The feeler fingers 150 rest on the top towel of the stack 146. When that top towel is at an elevation too low for proper dispensing, the feeler fingers turn the shaft 148 and the switch actuating member 152 actuates a switch 154 to energize the elevator motor 128 in the manner hereinafter described. The elevator motor stops when the feeler fingers have been raised. The elevator platform 110 carries a switch actuating member 156 which actuates an elevator limit switch 158 secured to the wall 98. The elevator limit switch prevents excessive upward travel of the elevator platform 110 in the manner more fully described below.

A horizontal shaft 160 is mounted in suitable bearings in the walls 98 and 106. The shaft 160 has secured thereto a pair of similar, arcuate, towel dispensing members 162 and 164 which are more fully described below. Also fixed to the shaft 160 is a gear 166 which cooperates with a reciprocating rack 168. The rack 168 is secured between side plates 170 and 172 which are provided with slots for receiving the shaft 160. The rack 168 is given reciprocatory motion by connecting rod 174 which is rigidly connected to the rack. The opposite end of the connecting rod is pivotally connected to a pin 178 mounted eccentrically on a crank plate 180. Crank plate 180 is secured to shaft 182 of a delivery motor 184. The crank plate 180 is provided with a protuberance 186 on its periphery for actuating a switch 188 to stop the delivery motor 184 after one revolution thereof in a manner hereinafter described.

The specific construction and configuration of the similar, arcuate, towel dispensing members 162 and 164 can be seen best in FIGURES 2 and 4 in which the arcuate member 162 is shown. The distance from the shaft 160 of the arcuate portion thereof gradually increases from the point 162*a* to the point 162*b*. The distance from the shaft 160 then increases rather rapidly at 162*c* and is followed by a rounded portion 162*d*. A pair of pointed pins 190 project through openings in the rounded portion 162*d* of the member 162. Pins 190 are retained in position by set screws 192 threaded in sockets 194. The pins project from the surface of portion 162*d* by the thickness of one of the towels to be dispensed. These pins do not extend radially from the shaft 160 but have their points inclined forwardly in the direction of movement indicated by the arrow 196 in FIGURE 4. The towel dispensing member 164 is in all respects similar to the member 162.

FIGURE 2 illustrates the arcuate towel dispensing member 162 in the position in which it has stopped by virtue of de-energization of the delivery motor 184 by the switch 188. Prior to stopping in the full line position shown in FIGURE 2, the arcuate member 162 will have moved counter-clockwise to the dotted line position shown in that figure. Pins 190 will have picked up the forward edge of the top towel 198 from the stack 146. The pins 190 will hold that towel in the position illustrated in FIGURES 2 and 4 until another towel is to be dispensed. One complete revolution of the delivery motor 184 will first cause clockwise movement of the arcuate members 162 and 164 to strip the towel 198 from

the stack 146 and suspend that towel above a towel discharge chute 200 carried on the rear of the door 10. The chute 200 is open at its lower end to a towel discharge opening 202 in the door 10. The arcuate members 162 and 164 will then move in counter-clockwise direction and the suspended towel will be lowered into the chute 200. Further counter-clockwise movement of the arcuate members 162 and 164 to about the position shown in full lines in FIGURE 2 causes the chute 200 to strip towel 198 from the arcuate members. The arcuate members 162 and 164 will then continue counter-clockwise rotation to the position shown in dotted lines in FIGURE 2, will pick up the next towel from the stack, return to the full line position shown in FIGURE 2 and will then stop until another towel is to be dispensed. The portion 162*c* of the arcuate members assures that the portions 162*d* of those members will be smoothly cammed onto the top of the stack of towels during counter-clockwise movement to the dotted line position shown in FIGURE 2. It will be seen by reference to FIGURES 2 and 4 that from the point 162*a* to the point 162*b* the arcuate members have clearance above the stack of towels so that there is a slight lifting action of the towel 198 as it is being stripped from the stack. This lifting action reduces friction between the top towel 198 and the towel below it in the stack during the stripping operation.

Operation of the Machine

Power is supplied to the machine through power lines 204 and 206. A workman desiring to exchange a soiled towel for a clean one inserts one corner of the soiled towel through the soiled towel receiving opening 12 to move the gate 52. Movement of the gate 52 causes the movable contact 208 of switch 58 to move out of engagement with contact 210 and into engagement with contact 212. The receiver motor 40 is thus energized to drive the conveyor 22 to advance the soiled towel into the machine. Power to receiver motor 40 is supplied from the line 204 through switch 96, through engaged contacts 214 and 216 of an as yet de-energized relay 218, through contacts 208 and 212 of switch 58, to the motor 40 and through contacts 220 and 222 of switch 76, and contacts 224 and 226 of switch 158 to power line 206. The soiled towel advances in a somewhat elongated condition along the conveyor 22 until it deflects both rollers 62 and 78 to their elevated, dotted line positions 62*a* and 78*a*, respectively. The gate 52 closes while rollers 62 and 78 are thus elevated. The receiver motor 40 remains energized, however, from power line 204, switch 96, contacts 228 and 230 of switch 88*a* (which forms one component of switch 88 described above), to the receiver motor, through contacts 220 and 222 of switch 76, and through contacts 224 and 226 of switch 158 to power line 206. The soiled towel is thus conveyed to the soiled towel storage compartment.

The simultaneous condition of the gate 52 being closed and the rollers 62 and 78 being in their elevated positions 62*a* and 78*a* readies the machine for delivery of a clean towel. The relay 218 is now energized from power line 204, switch 96, contacts 214 and 216 of relay 218, contacts 208 and 210 of switch 58, contacts 232 and 234 of switch 88*b* (which forms the other component of switch 88 described above), contacts 236 and 238 of switch 72, switch 188, the coil of relay 218, and contacts 224 and 226 of switch 158 to power line 206. The closing of relay 218 supplies power to delivery motor 184 from line 204, switch 96, contacts 214 and 229 of relay 218, to the delivery motor 184, and through contacts 224 and 226 of switch 158 to power line 206. The delivery motor 184 turns one revolution to dispense a clean towel as described above and is then stopped by the opening of switch 188, which de-energizes the relay 218. A towel counter 240 is preferably connected in parallel to the relay 218 and counts one towel each time the relay is energized.

The elevator motor 128 is energized when the elevation of the top towel on the stack 146 is too low for dispensing. The feeler fingers 150 then descend to close the elevator switch 154. Current is then supplied from line 204, switch 96 and normally closed manual switch 242 to elevator motor 184 and through switches 154 and 158 to line 206. The elevator motor is stopped as soon as switch 154 is opened by elevation of feeler fingers 150.

It will be seen from the above description that line 206 is connected in the circuit only through switch 158, which is controlled by the switch actuating member 156 on the elevator platform 110. When the towels in the stack 146 have become exhausted, the contact 226 of switch 158 breaks engagement with contact 224 and engages contact 244. An "empty" signal lamp 246 is then illuminated, but all other power to the machine is cut off.

The foregoing description relates to the normal operation of the machine. A workman may attempt to use some unauthorized object to dishonestly operate the machine. It is futile to push a stick or other narrow object through the towel receiving opening 12 and to attempt to hold the rollers 62 and 78 elevated because the acceptance circuit cannot be completed until the gate 52 has closed, as described above. The workmen are instructed to insert towels through the towel receiving opening 12 by one corner, but in spite of such instructions a workman will occasionally roll up or wad a towel and insert it in the machine. A towel in such condition could not elevate both rollers 62 and 78 at the same time and a clean towel would not be dispensed. The machine permits the workman to retrieve such a towel and to reinsert it properly. The rolled or wadded towel will elevate the roller 62 to a greater extent than normal, until it assumes the dotted line position 62*b*. The switch actuating member 74 on the arm 66 then moves contact 222 of switch 76 out of engagement with contact 220 and into engagement with contact 248. The power to receiver motor 40 is thus interrupted and the conveyor belt 22 stops while the improperly inserted towel can still be reached and withdrawn through the opening 12 for proper reinsertion. Engagement of contact 222 of switch 76 with contact 248 causes illumination of a "reject" lamp 250 which is on the door 10 and which is preferably positioned adjacent printed instructions for proper insertion of the towel.

It sometimes happens that an excessive number of soiled towels is permitted to accumulate in the soiled towel storage compartment. When this occurs, some of the towels may be pulled along the lower run of the conveyor belt 22 and tend to collect to such an extent as to cause the machine to become jammed. Such a condition deflects the switch actuating member 90 to open the switch 96 and to thereby cut off all power to the machine until the situation is remedied.

I have illustrated and described what I regard as the preferred embodiment of the invention. It will be apparent that various alterations and modifications may be used without departing from the broader scope of the invention which is defined by the claims.

Having thus described my invention, I claim:

1. In apparatus for dispensing clean towels in exchange for soiled towels deposited therein: a cabinet having a soiled towel receiving opening and a soiled towel storage compartment therein; a conveyor to convey towels from said receiving opening into said cabinet; an electric conveyor motor for driving said conveyor; a first switch for energizing said conveyor motor; switch actuating means at said receiving opening for actuating said first switch to energize said conveyor motor upon insertion of a towel through said opening; a pair of switch actuating means including elements, said elements being longitudinally spaced along said conveyor to be deflected by a towel moving along the conveyor; switch means actuated by the last-mentioned switch actuating means upon deflection of

each of said elements; an electric circuit including said switch means in series connection to thereby close said circuit when a towel of sufficient dimensions to hold both said elements deflected at the same time passes along said conveyor; a second switch for de-energizing said conveyor motor; and means responsive to excessive deflection of one of said elements to actuate said second switch to de-energize the conveyor motor.

2. In apparatus for dispensing clean towels in exchange for soiled towels deposited therein: a cabinet having a soiled towel receiving opening and a soiled towel storage compartment therein; a source of electric power for the apparatus; a conveyor to convey towels from said receiving opening into said cabinet; an electric conveyor motor for driving said conveyor; a first switch for energizing said conveyor motor; switch actuating means at said receiving opening for actuating said first switch to energize said conveyor motor upon insertion of a towel through said opening; a pair of switch actuating means including elements, said elements being longitudinally spaced along said conveyor to be deflected by a towel moving along said conveyor; switch means actuated by the last-mentioned switch actuating means upon deflection of each of said elements; an electric circuit controlling a relay, said circuit including said switch means in series connection to thereby close said circuit when a towel of sufficient dimensions to hold both said elements deflected at the same time passes along the conveyor; a second switch for de-energizing said conveyor motor; means responsive to excessive deflection of one of said elements to actuate said second switch to de-energize the conveyor motor; a third switch for interrupting said source of electric power; and means responsive to accumulation of excessive towels in said storage compartment to actuate said third switch to interrupt said source of electric power.

3. In apparatus for dispensing clean towels in exchange for soiled towels deposited therein: a cabinet having a soiled towel receiving opening and a soiled towel storage compartment therein; a source of electric power for the apparatus; a conveyor to convey towels from said receiving opening into said cabinet; an electric conveyor motor for driving said conveyor; a first switch for energizing said conveyor motor; switch actuating means at said receiving opening for actuating said first switch to energize said conveyor motor upon insertion of a towel through said opening; a pair of switch actuating means including elements, said elements being longitudinally spaced along said conveyor to be deflected by a towel moving along said conveyor; switch means actuated by the last-mentioned switch actuating means upon deflection of each of said elements; an electric circuit including said switch means in series connection to thereby close said circuit when a towel of sufficient dimensions to hold both said elements deflected at the same time passes along the conveyor; a second switch for interrupting said source of electric power; and means responsive to accumulation of excessive towels in said storage compartment to actuate said second switch to interrupt said source of electric power.

4. In apparatus for dispensing clean towels in exchange for soiled towels deposited therein: a cabinet having a soiled towel receiving opening and a soiled towel storage compartment therein; a conveyor to convey towels from said receiving opening into said cabinet; an electric conveyor motor for driving said conveyor; a double throw first switch for energizing said conveyor motor in one position of such switch; a movable door biased toward closed position at said receiving opening for actuating said first switch to said one position thereof to energize said conveyor motor upon insertion of a towel through said opening and to actuate said switch to a second position thereof upon closing of said door; a pair of switch actuating means including elements, said elements being longitudinally spaced along said conveyor to be deflected by a towel moving along the conveyor; switch means actuated by the last-mentioned switch actuating means upon deflection of each of said elements; an electric circuit including in series connection said switch means and said double throw first switch in said second position thereof to thereby close said circuit when a towel of sufficient dimensions to hold both said elements deflected at the same time passes along said conveyor and said movable door has closed after passage of the towel completely through said receiving opening.

5. In apparatus for dispensing clean cloth towels in exchange for soiled cloth towels deposited therein: a cabinet having a soiled towel receiving opening and a soiled towel storage compartment therein, carrier means for moving towels from said receiving opening toward said storage compartment, a motor for driving said carrier means, means for energizing said motor, said carrier means having a towel support surface movable through a path, a pair of plate means mounted on opposite sides of said path and being spaced apart sufficiently to permit the passage therebetween of a towel supported by said carrier means in elongated condition with a corner portion of the towel leading in the direction of movement of the support surface, first towel sensing means mounted for movement about an axis and including a member extending exteriorly of the space between said plate means and also including a towel contacting portion movable with said member but being disposed within the space between said plate means in overlying relation to said support surface of said carrier means at a first point along said path inwardly of said towel receiving opening in position to be contacted and deflected by a towel carried by said carrier means, at least one other towel sensing means mounted for movement about an axis and including a member extending exteriorly of the space between said plate means and also including a towel contacting portion movable with such member but being disposed within the space between said plate means in overlying relation to said support surface of said carrier means at a point along said path spaced from said first point in the direction of movement of said support surface in position to be contacted and deflected by a towel carried by said carrier means, switch means mounted exteriorly of the space between said plate means and being actuated by said members in response to said towel contacting portions concurrently occupying deflected positions, and an electric circuit including said switch means to thereby respond when a towel of sufficient dimensions longitudinally to hold said towel contacting portions concurrently in deflected positions is moved along said path by said carrier means.

6. In apparatus for dispensing clean cloth towels in exchange for soiled cloth towels deposited therein: a cabinet having a soiled towel receiving opening and a soiled towel storage compartment therein, carrier means for moving towels from said receiving opening toward said storage compartment, a motor for driving said carrier means, means for energizing said motor, said carrier means having a towel support surface movable through a path, first towel sensing means including a towel contacting element overlying said support surface of said carrier means at a first point along said path inwardly of said towel receiving opening, at least one other towel sensing means including a towel contacting element overlying said support surface of said carrier means at a point along said path spaced from said first point in the direction of movement of said support surface, each of said towel contacting elements having an inclined towel contacting surface extending toward said support surface in the direction of movement of said surface, each of said towel contacting elements being mounted for deflection of the towel contacting surface thereof away from said support surface in response to the passage of a towel between said support surface and such towel contacting surface, switch means actuated in response to said towel contacting surfaces concurrently occupying deflected positions, and an electric circuit including said switch means to thereby respond when a towel of sufficient dimensions longitudinally to hold said

towel contacting surfaces concurrently in deflected positions is moved along said path by said carrier means.

7. In apparatus for dispensing clean cloth towels in exchange for soiled cloth towels deposited therein: a cabinet having a soiled towel receiving opening and a soiled towel storage compartment therein; carrier means for moving towels from said receiving opening toward said storage compartment, a motor for driving said carrier means, a switch for energizing said motor, switch actuating means at said receiving opening for actuating said switch to energize said motor upon insertion of a towel through said opening, said carrier means having a towel support surface movable through a path, a pair of plate means mounted on opposite sides of said path and being spaced apart sufficiently to permit the passage therebetween of a towel supported by said carrier means in elongated condition with a corner portion of the towel leading in the direction of movement of the support surface, first towel sensing means mounted for movement about an axis and including a member extending exteriorly of the space between said plate means and also including a towel contacting portion movable with said member but being disposed within the space between said plate means in overlying relation to said support surface of said carrier means at a first point along said path inwardly of said towel receiving opening in position to be contacted and deflected by a towel carried by said carrier means, at least one other towel sensing means mounted for movement about an axis and including a member extending exteriorly of the space between said plate means and also including a towel contacting portion movable with such member but being disposed within the space between said plate means in overlying relation to said support surface of said carrier means at a point along said path spaced from said first point in the direction of movement of said support surface in position to be contacted and deflected by a towel carried by said carrier means, switch means mounted exteriorly of the space between said plate means and being actuated by said members in response to said towel contacting portions concurrently occupying deflected positions, and an electric circuit including said switch means to thereby respond when a towel of sufficient dimensions longitudinally to hold said towel contacting portions concurrently in deflected positions is moved along said path by said carrier means.

8. In apparatus for dispensing clean cloth towels in exchange for soiled cloth towels deposited therein: a cabinet having a soiled towel receiving opening and a soiled towel storage compartment therein, carrier means for moving towels from said receiving opening toward said storage compartment, a motor for driving said carrier means, a first circuit for energizing said motor, said carrier means having a towel support surface movable through a path, a pair of plate means mounted on opposite sides of said path and being spaced apart sufficiently to permit the passage therebetween of a towel supported by said carrier means in elongated condition with a corner portion of the towel leading in the direction of movement of the support surface, first towel sensing means mounted for movement about an axis and including a member extending exteriorly of the space between said plate means and also including a towel contacting portion movable with said member but being disposed within the space between said plate means in overlying relation to said support surface of said carrier means at a first point along said path inwardly of said towel receiving opening in position to be contacted and deflected by a towel carried by said carrier means, at least one other towel sensing means mounted for movement about an axis and including a member extending exteriorly of the space between said plate means and also including a towel contacting portion movable with such member but being disposed within the space between said plate means in overlying relation to said support surface of said carrier means at a point along said path spaced from said first point in the direction of movement of said support surface in position to be contacted and deflected by a towel carried by said carrier means, switch means mounted exteriorly of the space between said plate means and being actuated by said members in response to said towel contacting portions concurrently occupying deflected positions, a second electric circuit including said switch means to thereby respond when a towel of sufficient dimensions longitudinally to hold said towel contacting portions concurrently in deflected positions is moved along said path by said carrier means, and means for opening said first circuit to de-energize said motor after said carrier means has moved through a towel-moving cycle.

9. In apparatus for dispensing clean cloth towels in exchange for soiled cloth towels deposited therein: a cabinet having a soiled towel receiving opening and a soiled towel storage compartment therein, carrier means for moving towels from said receiving opening toward said storage compartment, a motor for driving said carrier means, means for energizing said motor, said carrier means having a surface movable through an endless path for supporting a towel along a portion of said path, a pair of plate means mounted on opposite sides of said path and being spaced apart sufficiently to permit the passage therebetween of a towel supported by said carrier means in elongated condition with a corner portion of the towel leading in the direction of movement of the support surface, first towel sensing means mounted for movement about an axis and including a member extending exteriorly of the space between said plate means and also including a towel contacting portion movable with said member but being disposed within the space between said plate means in overlying relation to said surface of said carrier means at a first point along said portion of said path inwardly of said towel receiving opening in position to be contacted and deflected by a towel carried by said carrier means, at least one other towel sensing means mounted for movement about an axis and including a member extending exteriorly of the space between said plate means and also including a towel contacting portion movable with such member but being disposed within the space between said plate means in overlying relation to said surface of said carrier means at a point along said portion of said path spaced from said first point in the direction of movement of said support surface in position to be contacted and deflected by a towel carried by said carrier means, switch means mounted exteriorly of the space between said plate means and being actuated by said members in response to said towel contacting portions concurrently occupying deflected positions, and an electric circuit controlling a relay, said circuit including said switch means to thereby actuate said relay when a towel of sufficient dimensions longitudinally to hold said towel contacting portions concurrently in deflected positions is moved along said path by said carrier means.

10. In apparatus for dispensing clean cloth towels in exchange for soiled cloth towels deposited therein: a cabinet having a soiled towel receiving opening and a soiled towel storage compartment therein, carrier means for moving towels from said receiving opening toward said storage compartment, a motor for driving said carrier means, means for energizing said motor, said carrier means having a towel support surface movable through a path, first towel sensing means including a towel contacting portion overlying said support surface of said carrier means at a first point along said path inwardly of said towel receiving opening, at least one other towel sensing means including a towel contacting portion overlying said support surface of said carrier means at a point along said path spaced from said first point in the direction of movemen of said support surface, each of said towel contacting portions being mounted for deflection along an inclined path extending away from and in the direction of movement of said support surface in response to the passage of a towel between said support surface and such towel con-

tacting portion, switch means actuated in response to said towel contacting portions concurrently occupying deflected positions, an electric circuit including said switch means to thereby respond when a towel of sufficient dimensions lonigtudinally to hold said towel contacting portions concurrently in deflected positions is moved along said path by said carrier means, additional switch means for interrupting the supply of electric power to said motor and to said circuit, and means responsive to accumulation of excessive towels in said storage compartment to actuate the last-mentioned switch means.

11. In apparatus for dispensing clean cloth towels in exchange for soiled cloth towels deposited therein: a cabinet having a soiled towel receiving opening and a soiled towel storage compartment therein, carrier means for moving towels from said receiving opening toward said storage compartment, a motor for driving said carrier means, means for energizing said motor, means movably mounted adjacent said receiving opening for movement away from its normal position as a towel is being moved through said opening and for return movement to its normal position after the towel has passed completely through said opening, first switch means operatively connected to said movably mounted means for actuation when said movably mounted means is in the normal position thereof, said carrier means having a towel support surface movable through a path, first towel sensing means including a towel contacting portion overlying said support surface of said carrier means at a first point along said path inwardly of said towel receiving opening, at least one other towel sensing means including a towel contacting portion overlying said support surface of said carrier means at a point along said path spaced from said first point in the direction of movement of said support surface, each of said towel contacting portions being mounted for deflection along an inclined path extending away from and in the direction of movement of said support surface in response to the passage of a towel between said support surface and such towel contacting portion, second switch means actuated in response to said towel contacting portions concurrently occupying deflected positions, and an electric circuit including said first and second switch means in series connection to thereby respond when a towel of sufficient dimensions longitudinally to hold said towel contacting portions concurrently in deflected positions is moved along said path by said carrier means and said movably mounted means has returned to its normal position after passage of the towel completely through said opening.

12. In apparatus for dispensing clean cloth towels in exchange for soiled cloth towels deposited therein: a cabinet having a soiled towel receiving opening and a soiled towel storage compartment therein; carrier means for moving a towel from said receiving opening toward said storage compartment; means movably mounted adjacent said receiving opening in the path of the towel for movement away from its normal position as a towel is being moved through said opening and for return movement to its normal position after the towel has passed completely through said opening; a plurality of towel contacting elements in longitudinally spaced relationship along the path of the towel carried by said carrier means to be deflected by a towel moving past said elements; switch means actuated in response to the concurrent disposition of said movably mounted means in its normal position and of said elements in their deflected positions; and an electric circuit controlling a relay, said circuit including said switch means to thereby actuate said relay when a towel of sufficient dimensions longitudinally to hold said elements concurrently in deflected positions is moved along said path by said carrier means and said movably mounted means has returned to its normal position after passage of the towel completely through said opening.

13. In apparatus for dispensing clean cloth towels in exchange for soiled cloth towels deposited therein: a cabinet having a soiled towel receiving opening and a soiled towel storage compartment therein, carrier means for moving towels from said receiving opening toward said storage compartment, a motor for driving said carrier means, means for energizing said motor, said carrier means having a towel support surface movable through a path, a pair of plate means mounted on opposite sides of said path and being spaced apart sufficiently to permit the passage therebetween of a towel supported by said carrier means in elongated condition with a corner portion of the towel leading in the direction of movement of the support surface, first towel sensing means mounted for movement about an axis and including a member extending exteriorly of the space between said plate means and also including a towel contacting portion movable with said member but being disposed within the space between said plate means in overlying relation to said support surface of said carrier means at a first point along said path inwardly of said towel receiving opening in position to be contacted and deflected by a towel carried by said carrier means, at least one other towel sensing means mounted for movement about an axis and including a member extending exteriorly of the space between said plate means and also including a towel contacting portion movable with such member but being disposed within the space between said plate means in overlying relation to said support surface of said carrier means at a point along said path spaced from said first point in the direction of movement of said support surface in position to be contacted and deflected by a towel carried by said carrier means, switch means mounted exteriorly of the space between said plate means and being actuated by said members in response to said towel contacting portions concurrently occupying deflected positions, an electric circuit including said switch means to thereby respond when a towel of sufficient dimensions longitudinally to hold said towel contacting portions concurrently in deflected positions is moved along said path by said carrier means, and additional switch means responsive to excessive deflection of one of said towel contacting portions.

14. In apparatus for dispensing clean cloth towels in exchange for soiled cloth towels deposited therein: a cabinet having a soiled towel receiving opening and a soiled towel storage compartment therein; carrier means to move towels from said receiving opening into said cabinet; a motor for driving said carrier means; means for energizing said motor to move a towel from said soiled towel receiving opening toward said storage compartment; a switch for de-energizing said motor; a plurality of towel contacting elements movably mounted in longitudinally spaced relationship along the path of the towel carried by said carrier means to be deflected by a towel moving past said elements; means responsive to excessive deflection of one of said towel contacting elements to actuate said switch to de-energize said motor; additional switch means actuated in response to said elements concurrently occupying deflected positions; and an electric circuit controlling a relay, said circuit including said additional switch means to thereby actuate said relay when a towel of sufficient dimensions longitudinally to hold said elements concurrently in deflected positions is moved along said path by said carrier means.

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