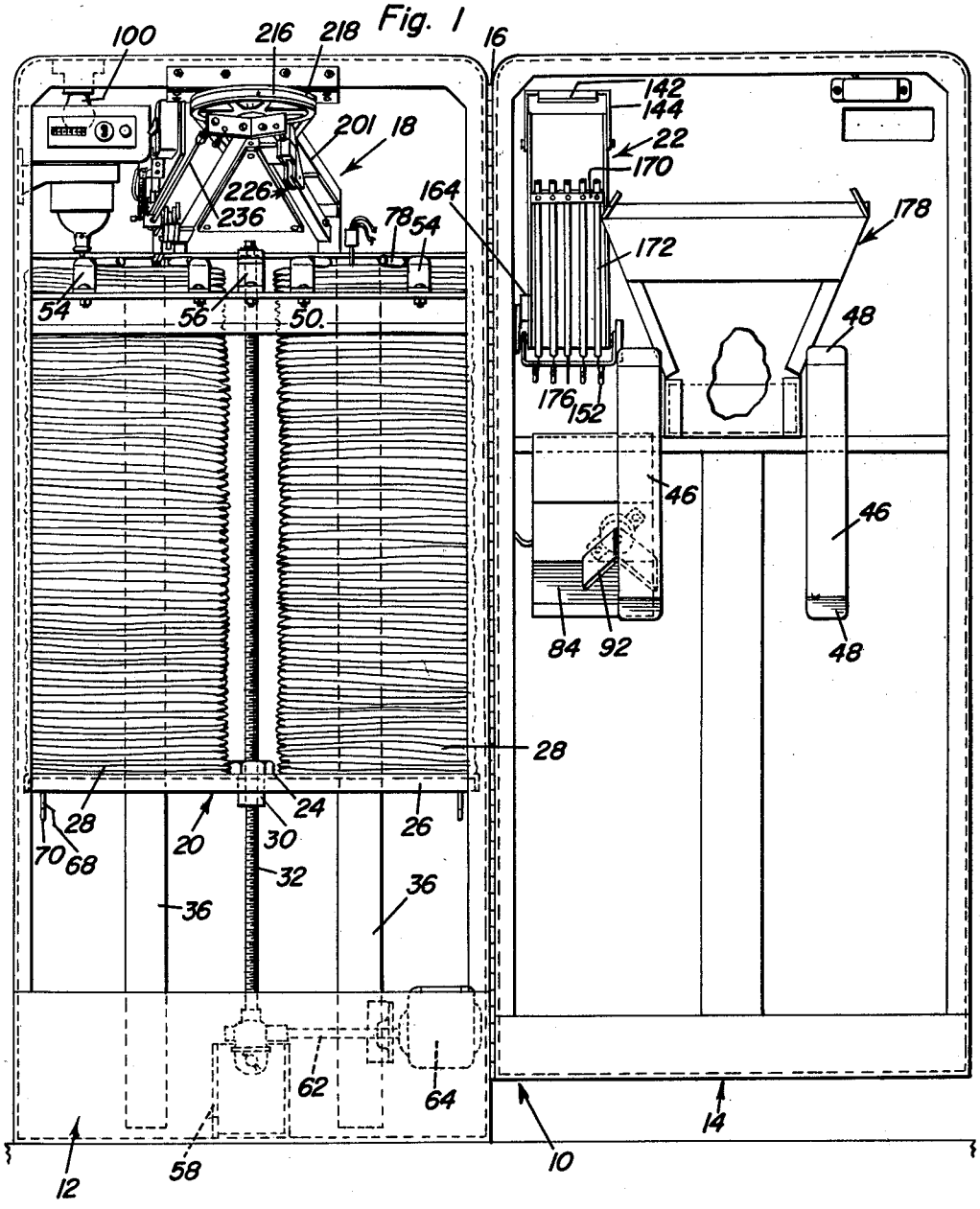
July 6, 1965 W. H. DUDENHOFFER 3,193,070

AUTOMATIC SHOP TOWEL DISPENSER

Filed July 11, 1960 4 Sheets-Sheet 1

Fig. 1



William H. Dudenhoffer
INVENTOR.

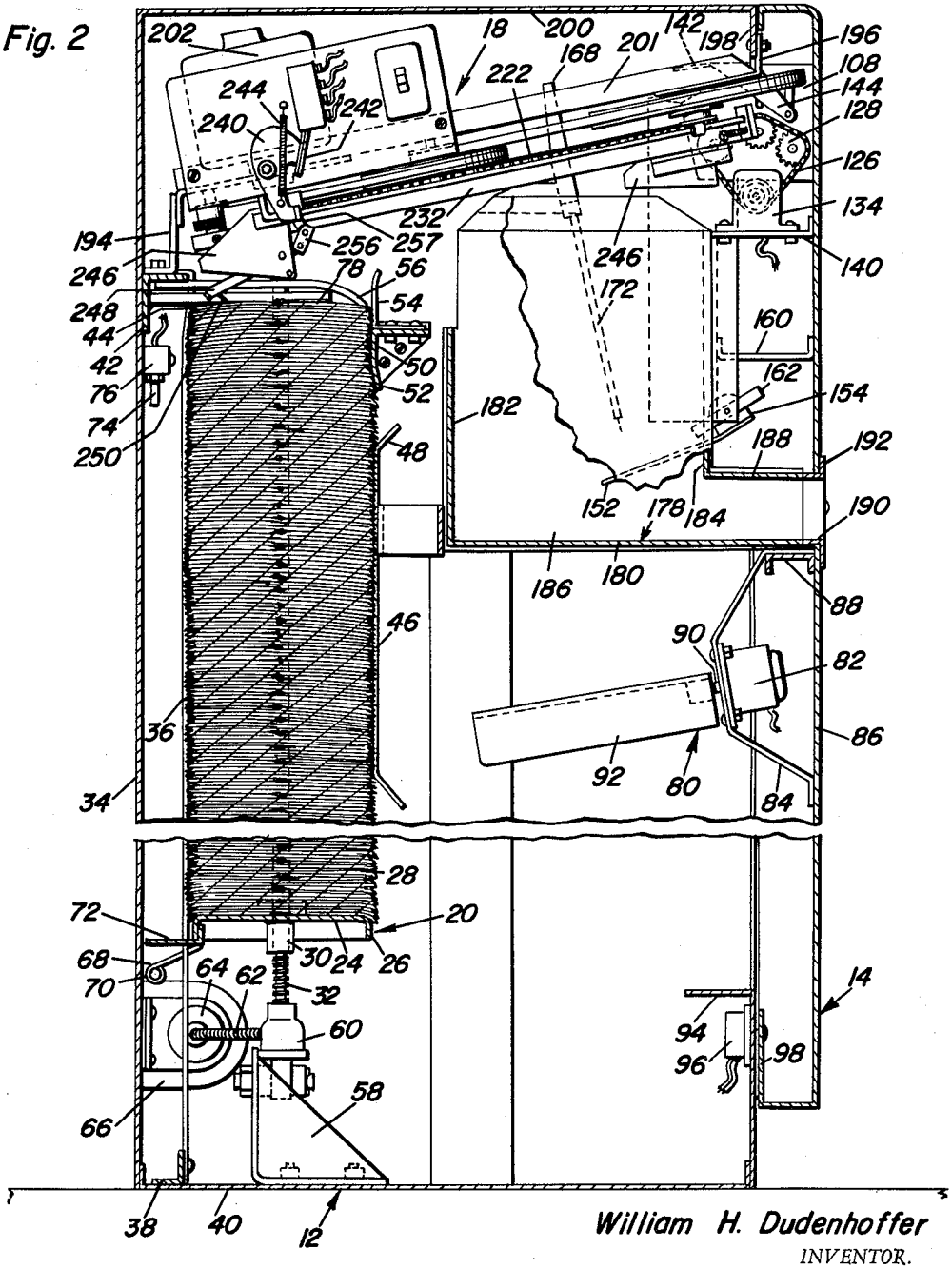
BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

July 6, 1965 W. H. DUDENHOFFER 3,193,070

AUTOMATIC SHOP TOWEL DISPENSER

Filed July 11, 1960 4 Sheets-Sheet 2

Fig. 2



William H. Dudenhoffer
INVENTOR.

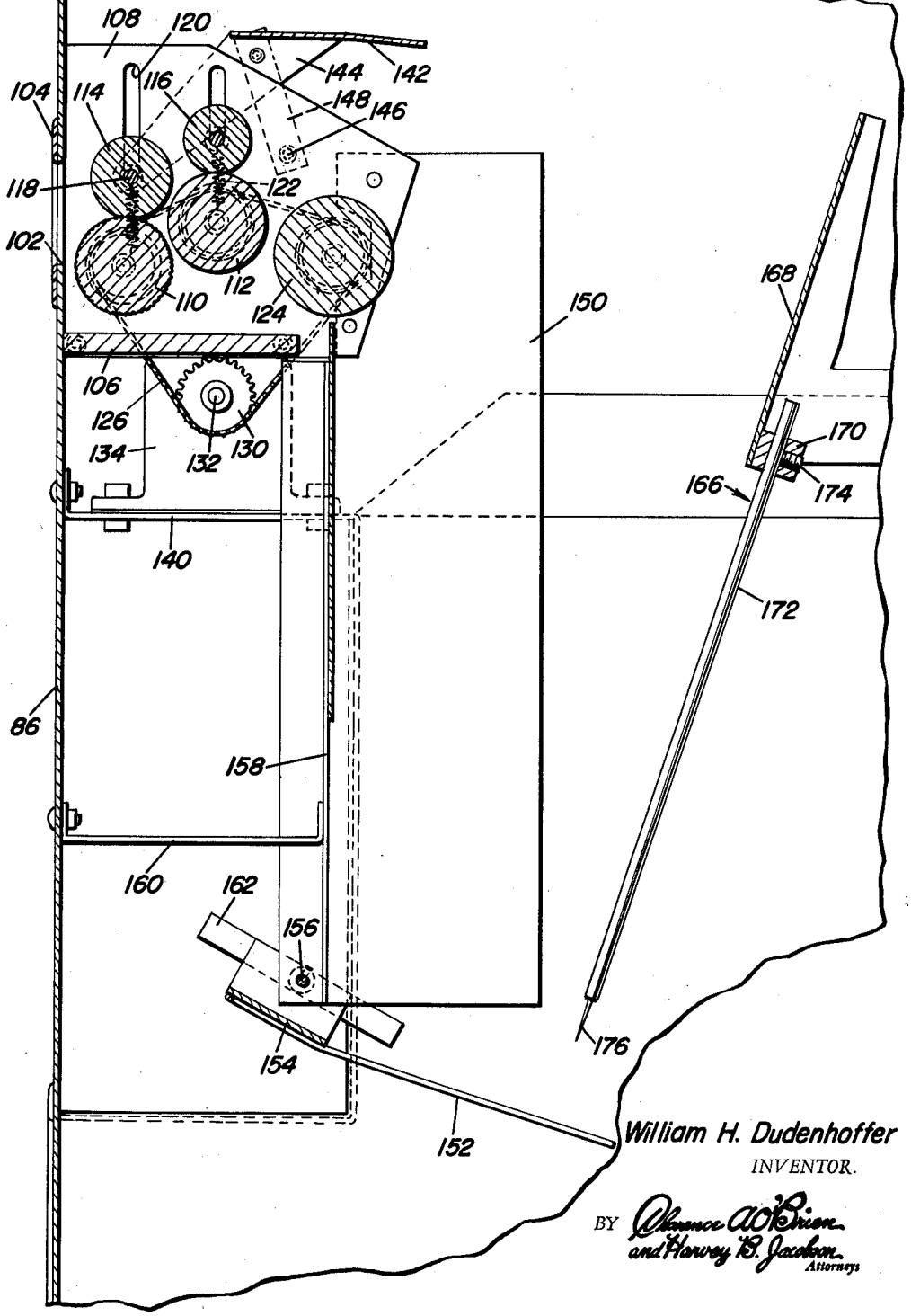
BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

July 6, 1965 W. H. DUDENHOFFER 3,193,070

AUTOMATIC SHOP TOWEL DISPENSER

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Fig. 3



William H. Dudenhoffer
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

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AUTOMATIC SHOP TOWEL DISPENSER

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Fig. 4

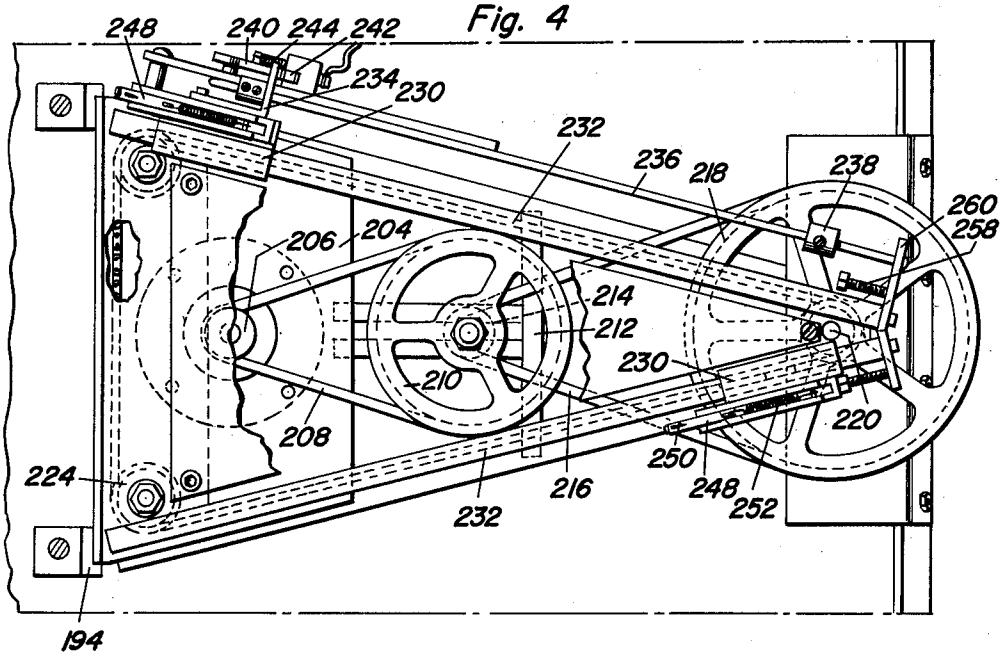


Fig. 5

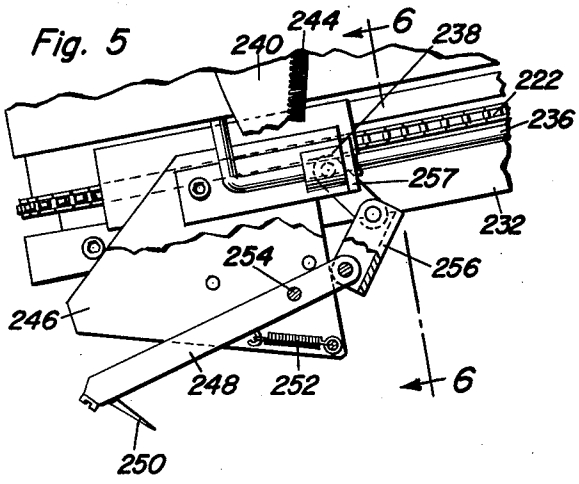


Fig. 6

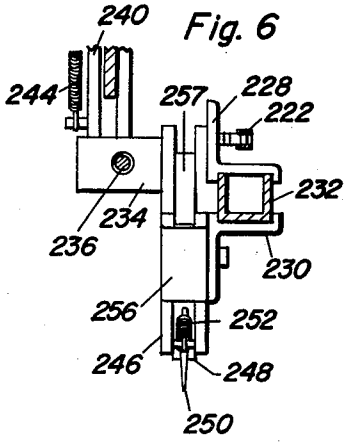
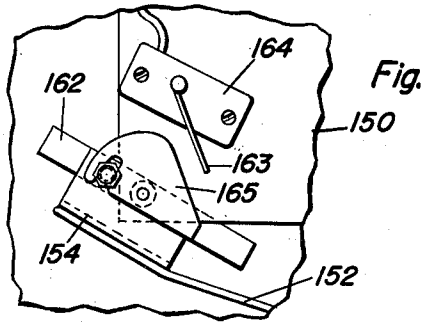


Fig. 7



William H. Dudenhoffer

INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

United States Patent Office

3,193,070

Patented July 6, 1965

3,193,070

AUTOMATIC SHOP TOWEL DISPENSER

William H. Dudenhoffer, % Crystal Industrial Services, Inc., Box 427, Jonesboro, Ind.

Filed July 11, 1960, Ser. No. 41,909
8 Claims. (Cl. 194—4)

The present invention generally relates to a dispenser mechanism and more particularly to a shop towel dispenser which will automatically dispense a predetermined number of towels upon insertion or deposit of the same number of soiled towels.

As is well known, wiping towels or shop towels are employed by many employees in various industries and the distribution of these towels to the employees has been rather haphazard in nature which quite often results in a serious loss of the shop towels since employees do not always return the same number of towels that they receive. There previously have been machines attempting to overcome this problem and these machines have worked in certain instances to a certain degree. However, all of the machines have certain objections and shortcomings and it is the primary object of the present invention to provide an improved and novel structural arrangement for dispensing a predetermined number of clean towels upon insertion of a predetermined number of soiled towels.

It is another object of the present invention to provide an automatic shop towel dispenser which is compact in construction and will not take up an excessive floor space with the components of the dispenser being substantially maintenance free.

A further object of the present invention is to provide a shop towel dispenser incorporating features which will prevent persons from inserting foreign objects such as a screwdriver, wrench or the like into the machine for causing the machine to operate to discharge a clean towel or towels.

A further object of the present invention is to provide a shop towel dispenser including a mechanism to prevent a soiled towel to be started into the machine for registering the machine or otherwise indicating that the towel has been placed therein after which the towel is pulled back through the entrance slot thereby assuring that shop towels are dispensed only when the same number of soiled shop towels are deposited.

Another very important feature is the provision of a shop towel dispenser having a vertically elevatable platform disposed therein having two stacks of clean shop towels thereon together with a discharge or dispensing assembly including a pair of needles movable in a reciprocatory manner along two sides of a generally triangular chain member for alternately picking up towels from the stacks and depositing them into a discharge area.

A feature ancillary to the immediately preceding object is the provision of a mechanism to move the platform upwardly for each increment of discharge movement of the discharge assembly or dispenser thereby maintaining the stop towels against pressure fingers for retaining the shop towels in position until picked up by the dispensing mechanism.

Still further objects reside in the over-all simplicity of the structure, dependability, ease of service and repair, adaptation of many possible arrangements into a compact structure together with a relativley low manufacturing cost as well as maintenance cost.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a front elevational view of the automatic shop towel dispenser of the present invention with the front of the cabinet being shown in open position for revealing the details of the shop towel dispensing mechanism and other features;

FIGURE 2 is a vertical sectional view of the dispenser with portions broken away to show details substantially upon a plane passing through the center of the machine;

FIGURE 3 is a detailed sectional view of the soiled towel receiving mechanism;

FIGURE 4 is a detailed bottom plan view, with portions broken away, of the dispensing or discharge assembly for picking up the shop towels and discharging them into a deposit chute;

FIGURE 5 is a detailed side elevation with portions broken away illustrating the construction of the pick-up needles;

FIGURE 6 is a detailed sectional view taken substantially upon a plane passing along section line 6—6 of FIGURE 5 illustrating further structural details of the pick-up mechanism; and

FIGURE 7 is a detailed view illustrating the sensing mechanism for sensing the discharge of soiled towels into the machine for operation of the machine automatically when a predetermined number of towels has been inserted.

Referring now specifically to the drawings, the numeral 10 generally designates the automatic shop towel dispenser of the present invention which includes a vertically disposed cabinet structure genearlly designated by the numeral 12 having a hingedly attached front door generally designated by the numeral 14 connected to the front open end of the cabinet 12 by a vertically disposed hinge 16 at one edge thereof. The hinge 16 may be of the piano type hinge or any other suitable type hinge for securely supporting the door 14 in position. The shape and size of the cabinet and door may vary but preferably, the cabinet is of rectangular configuration and the door is provided with a suitable lock mechanism for retaining the door in closed position so that only authorized service personnel may have access to the interior thereof.

The shop towel dispenser of the present invention includes a shop towel dispensing mechanism generally designated by the numeral 18, a mechanism for supplying towels to the dispensing mechanism generally designated by the numeral 20 and a mechanism for receiving soiled towels generally designated by the numeral 22.

The mechanism for supplying clean shop towels which is generally designated by the numeral 20 includes a flat shelf or platform 24 having depending peripheral flanges 26 on which there is positioned two stacks of clean shop towels 28. The center of the platform 24 is provided with a threaded sleeve or bushing 30 rigid therewith for mounting on a vertically disposed screw threaded rod 32.

For guiding the stacks of shop towels 28, the rear wall 34 of the cabinet 12 is provided with a vertical guide member 36 spaced inwardly therefrom with there being a vertical guide member 36 for engaging the rear center of each stack of towels 28. The lower end of the vertical guide members 36 are supported by a transverse structural member 38 attached to the bottom 40 of the cabinet and the upper end of the vertical guide members 38 are supported by an L-shaped bracket 42 carried by the rear wall 34 of the cabinet. The upper ends of the guide members 36 are inclined slightly forwardly as indicated by the numeral 44 so that as the towels reach the upper

end of their movement, they are biased slightly towards the front of the cabinet.

The door 14 is provided with a pair of guide members 46 spaced inwardly therefrom which are shorter than the guide members 36 and engage only the center portion of the stacks of towels with the upper and lower ends of the guide members 46 being inclined away from the towels as indicated by the numeral 48. This will provide a guide mechanism for the towels substantially throughout the vertical length thereof. Disposed above the guide member 46 is a transverse guide member 50 having an outwardly inclined lower edge 52 together with a plurality of upstanding spring fingers 54 mounted thereon which flare slightly outwardly in opposition to the inclined portion 44 of the guide members 36. Thus, as the towels proceed up between the member 50 and the inclined portion 44 and also the fingers 54 and the inclined member 44, they will be more or less gripped at the end edges for securely retaining the towels in position.

The vertically disposed screw threaded rod 32 which has relatively coarse threads thereon is supported at the top by a bracket 56 extending inwardly from the transverse member 50. At the lower end, the threaded rod 32 is supported by a bracket 58 attached to the bottom 40 and the bracket 58 also supports a gear box or gear transfer mechanism 60 which receives a power input from a power shaft 62 driven by an electric motor 64 supported on the rear wall 34 by brackets 66. The motor 64 will operate to cause rotation of the shaft 62 and also rotation of the threaded rod 32 thereby elevating the platform 24 and the towels 28 thereon. The rear flange 26 of the platform 24 is provided with a rearwardly extending guide finger adjacent each rear corner thereof as designated by the numeral 68 with the finger 68 terminating in loops 70 to prevent any tilting or canting of the platform. Also, there is a rearwardly extending finger 72 on the platform which extends horizontally and is adapted to engage the feeler plunger 74 of a micro-switch 76 mounted on the rear wall 34 of the cabinet so that the upward movement of the platform 24 will be stopped when the finger 72 engages the micro-switch plunger 74 thereby preventing the platform 24 from being elevated too high when the towels 28 are all removed from the platform. The motor 64 is energized each time the dispensing mechanism 18 is energized for elevating the platform 24 a predetermined increment of movement thereby retaining the upper towels of the stack of towels 28 frictionally biased against a plurality of projecting rods or fingers 78 which extend forwardly from the transverse bracket 42 and terminate rearwardly of the forward edge of the towels but which engage the towels to provide frictional resistance to movement of the towels. The fingers 78 are inclined towards the center of the cabinet and the pick-up needles of the dispensing mechanism move between the pairs of fingers 78 in a manner described hereinafter.

As illustrated in FIGURE 2, the stacks of towels 28 are disposed towards the rear of the cabinet thus leaving the front bottom portion of the cabinet empty for receiving soiled towels. A mechanism generally designated by the numeral 80 is provided for distributing the soiled towels evenly around the interior of the front of the cabinet and this mechanism 80 includes an electric drive motor 82 carried by a shielding bracket 84. The bracket 84 is attached to the front wall panel 86 of the door 14 at the lower edge thereof and to a transverse structural member 88 at the upper end thereof. The motor 82 is provided with a downwardly and inwardly inclined output shaft 90 which extends through the bracket 84 and attached to the shaft 90 is an elongated inverted V-shaped plate 92 which receives the output shaft 90 within the crotch thereof. As the motor 82 is operated, the V-shaped plate 82 will be rotated thus causing the soiled towels deposited into the cabinet to be distributed throughout the front area thereof so that the cabinet may contain a supply of

soiled towels equal in number to the number of clean towels that it will hold. Also, the soiled towels will be disposed adjacent the front of the cabinet so that when the door 14 is opened, the soiled towels will be readily available to a service person thereby enabling the soiled towels to be easily removed. Adjacent the bottom of the cabinet there is provided an inwardly extending ledge 94 disposed over a switch mechanism 96 having a plunger adapted to be engaged by an upturned edge 98 of the door 14 for energizing an illuminating light 100 when the door is opened thereby illuminating the interior of the cabinet for the convenience of the person servicing the machine.

Disposed above the bracket 84 and adjacent the upper corner of the door, the soiled towel receiving mechanism is disposed. This mechanism includes an opening 102 in the front panel 86 of the door and the details thereof are illustrated in FIGURE 3. The opening 102 is provided with a surrounding facing member 104 on the outer surface thereof. Disposed inwardly of the opening 102 is a horizontal mounting plate 106 having upstanding side plates 108 rigid therewith. Extending between the side plates is a pair of lower rollers 110 and 112 disposed closely adjacent each other but with the roller 112 being slightly above the roller 110 which is nearer the opening 102. Spaced above and in rolling contact with the rollers 110 and 112 is a pair of rollers 114 and 116 respectively which are provided with shafts 118 movably received in vertical slots 120 in the end plates 108 whereby the rollers 114 and 116 may move apart from the rollers 110 and 112. The rollers 114 and 116 are spring biased towards the rollers 110 and 112 respectively by virtue of springs 122. Disposed inwardly of the roller 112 and below the roller 112 is a roller 124 mounted between the end plates 108. All of the rollers 110, 112 and 124 are driven by virtue of a sprocket chain 126 engaging sprocket gears 128 on the ends of the rollers 110, 112 and 124 respectively and also engaging a drive sprocket gear 130 carried by the output shaft 132 of a combined electric motor and speed reduction mechanism 134. The combined electric motor and speed reduction unit is supported on a bracket 140 carried by the front wall 86 of the door.

Also mounted on the end plates 108 is a protector plate 142 extending parallel to the rollers and including a pair of mounting plates 144 extending inwardly along the outer surface of the end plates 108 and pivotally supported thereon by a pivot bolt 146 and a pair of attaching brackets 148 that are pivoted to the mounting plates 144 thus pivotally attaching the mounting plates 144 and protecting plate 142 from the pivot point 146. The plate 142, the mounting plates 144 and the brackets 148 are all rigid with each other and the end of the mounting plates 144 remote from the protective plate 142 is connected with the movable shaft 118 of the roller 114.

The plate 142 is to prevent insertion of rigid elongated objects such as screwdrivers, wrench handles and the like. When a relatively thick object is inserted between the rollers 110 and 114, the roller 114 will necessarily move upwardly thus pivoting the plate 142 down behind the rollers 112 and 116 thereby preventing complete insertion of said rigid articles in an attempt to operate the dispensing mechanism without first inserting soiled towels. The rollers 110 and 112 are driven in the same direction so that any tendency of the towels to wrap around the roller 110 will be prevented due to the upward movement of that portion of the roller 112 adjacent the inner edge of the roller 110. Also, the roller 110 is larger than the roller 114 whereby the tendency of the towel will be to wrap around the roller 110 rather than the roller 114. This wrapping around will be prevented by the movement of the roller 112. Also, the roller 112 is larger than the roller 116 so that the towel will follow the roller 112 and be picked up in turn by the larger roller 124 which also turns in the same direction. As the shop towels proceed through the receiving mechanism, the roller 124 will dis-

charge the shop towels into a chute 150 which is vertically disposed and is generally in alignment with the bracket 84 although disposed generally at the inner limit of the bracket 84. Disposed at the bottom of the chute 150 is a plurality of sensing fingers 152 pivotally carried by a bracket 154 supported on a shaft 156 that in turn is supported by the side walls of the chute 150 behind a front wall 158 thereof which is supported by brackets 160. The outer end of the rod 156 is provided with a laterally extending arm 162 having an adjustable cam 165 thereon for engagement with the actuating arm 163 of a micro-switch 164 whereby each towel deposited into the towel receiving mechanism 22 will engage the fingers 152 and cause them to move downwardly for operating the micro-switch one time. The fingers 152 are either gravity urged to their normal position or spring biased to their normal position with a light spring so that the weight of the soiled towel will cause downward movement thereof thus causing the micro-switch to temporarily close while the towel is sliding off of the fingers 152. Due to the rotational speed of the rollers and the fact that the towels have to be inserted singly, the sensing fingers 152 will be moved by each succeeding towel thereby closing the micro-switch 164 each time a towel is deposited thereby registering the number of towels deposited into the cabinet.

A mechanism is provided for preventing withdrawal of the towels which mechanism is generally designated by the numeral 166 and which includes a transverse bracket 168 carrying a transversely extending mounting member 170 at the lower end thereof for receiving a plurality of downwardly extending parallel rods 172 therein. Set-screws 174 are employed for securing the rods 172 in position and the lower ends of the rods 172 are provided with pointed needles 176 which extend towards and are disposed closely adjacent to the fingers 152. The needles 176 are for engaging a towel to prevent its withdrawal after the towel has engaged with and actuated the fingers 152. This will prevent a person from inserting a towel or tying two towels together and inserting them so that the fingers 152 may be operated after which the towels may be withdrawn by pulling back on the portion of the towel still disposed exteriorly of the cabinet. The needles 176 will engage such towels and prevent their withdrawal thereby assuring that the towels cannot be retrieved once they have dropped down and operated the fingers 152. The entire receiving mechanism is mounted on the door and is movable therewith and the orientation thereof is shown in FIGURE 1 and the details of construction thereof shown in FIGURE 3.

Mounted centrally in the door 14 is a discharge chute generally designated by the numeral 178 which includes a generally horizontal bottom wall 180, a generally vertical rear wall 182 and a generally vertical front wall 184 and vertical side walls 186. The front wall 184 is spaced rearwardly from the front panel 86 of the door and includes a horizontal top wall 188 connected thereto whereby the top wall 188, the bottom wall 180 and the side walls 186 extend through an opening 190 in the panel having a peripheral flange 192 for removing the clean towels therefrom. The clean towels may be retrieved by inserting the hand partially into the opening or tunnel formed by the walls but the generally L-shaped configuration of the discharge chute or assembly 178 is such that a person cannot reach up over the side walls thereof and engage the tripping fingers 152 nor can a person use a tool or the like for accomplishing this purpose since the side walls 186 extend substantially above the plane of the opening 190. Thus, the device is relatively fool-proof in that persons cannot obtain clean shop towels unless they actually deposit an equal number of soiled shop towels into the receiving mechanism.

The dispensing mechanism is shown in detail in FIGURES 4–7 and the orientation thereof is shown in FIGURE 1. The dispensing mechanism 18 runs from the rear to the front of the cabinet and picks up towels alternately from the top of the stacks of towels 28 and discharges them into the discharge chute 178. The dispensing mechanism is generally inclined upwardly and forwardly and is substantially triangular in shape with the rear end thereof being supported by a bracket 194 extending transversely and supported from bracket 42 and the forward end thereof being supported by a bracket 196 connected to a depending flange 198 carried by the top wall 200 of the cabinet.

The dispensing mechanism 18 includes a supporting frame 201 carrying an electric motor 202 on a transverse plate 204. The electric motor is provided with a power output pulley 206 engaged with a V-belt 208. The V-belt 208 is engaged with a large V-belt pulley 210 supported by brackets 212 with there being a smaller power pulley 214 rigid with and disposed above the pulley 210 thereby providing a speed reduction unit. The power pulley 214 is engaged with a V-belt 216 which in turn encircles a large V-belt pulley 218 disposed at the forward end of the triangular frame 201.

The center shaft 220 of the V-belt pulley 218 is provided with a drive sprocket rigid therewith for driving a sprocket chain 222 which is endless in nature and which also extends over sprocket gears 224 at the rear corners of the frame 201. Thus, the sprocket gears and sprocket chain define generally a triangular path and the motor 202 is reversible so that the portions of the chain forming the sides of the isoceles triangle defined by the sprocket gears will move in a reciprocating manner towards the front and rear of the cabinet. When the chain on one portion of the triangle is moving forwardly, the chain on the other portion will be moving rearwardly and vice versa.

Mounted on each portion of the chain between a sprocket 224 and the drive sprocket carried by the pulley 218 is a needle carrier generally designated by the numeral 226. The needle carrier is attached to the chain 222 by bracket members 228 and the needle carrier includes guides 230 slidably engaging a channel shaped guideway 232. The needle carrier 226 also includes an outwardly extending flange 234 slidably engaging a rod 236 and for engagement with a stop member 238 carried by the rod 236. The stop member 238, when engaged, will operate a reversing cam 240 so that the reversing switch mechanism 242 of the electric motor 202 will be operated whereby the motor will be alternately operated in opposite rotational directions. Each time the needle carrier 226 moves forwardly and rearwardly, the reversing switch will be operated to assure that the motor will be alternately driven in opposite directions. A spring 244 is connected to the reversing cam 240 to assure its return to a normal operating condition.

The needle carrier 226 includes a pair of vertically disposed plates 246 pivotally supporting a needle arm 248 therebetween which has a pointed needle 250 removably attached to the end thereof and which is disposed in acute angular relation to the arm 248. A spring 252 urges the needle arm 248 towards an operative or depending position for engagement with the uppermost shop towel 28. The arm 248 is pivoted to the plates 246 by pivot pin 254 and the arm 248 is operated by an abutment plate 256 pivotally connected to arm 248 and to a link 257 pivoted to plates 246. The plate 156 is disposed at the leading edge of the carrier 226 for engagement with an adjustable stop mechanism such as bolt 258 carried by outwardly extending brackets 260 at the forward end of the frame which also support the rod 236. Thus, as the needle carrier proceeds towards the front of the frame, the needle 250 will be retracted above the lower edge of the plates 246 for assuring discharge of the shop towel into the discharge chute 178.

As will be apparent from the drawings, the needle carriers 226 move parallel to the projecting fingers 78 so that the needles will engage the shop towels 28 inter-

mediate the fingers 78 for assuring firm engagement of the needle with the shop towel.

Also, it is pointed out that the details of the electrical control mechanism are not illustrated herein in that it may be set up with conventional component parts. It is only necessary that the electrical system provide an arrangement whereby the number of times of depression of the sifting fingers 152 are counted and upon a certain number of actuations of such fingers, the dispensing mechanism will be operated for a similar number of reciprocations of the needles for discharging the same number of towels. For each operation of the dispensing mechanism, the elevatable platform will be elevated one increment of movement. The mechanism of the movable needle carriers 226 will operate the reversing mechanism for the motor to assure alternate movement thereof and suitable safety devices are provided for preventing overrunning of the platform on the threaded rod and the electrical circuitry also includes a mechanism for energizing the soiled towel scattering mechanism upon insertion of soiled towels into the machine. Also there may be provided a counter mechanism for counting the number of reciprocations of the needle carriers and thus counting the number of towels dispensed so that a control check may be made on the number of towels dispensed and the number of soiled towels in the cabinet. A fire extinguisher may also be provided in the upper interior of the cabinet which will auotmatically be operated in the event of a rise in temperature within the cabinet such as would occur if any of the electrical apparatus or the towels caught on fire.

While the device has been specifically disclosed as being useful in dispensing shop towels, it is pointed out that the device may be quite easily converted for the dispensing of mill type gloves such as those normally employed in various industries. The need for the dispensing of gloves is very similar to shop towels. In most cases, the gloves are owned by the industry and sent out to service organizations to be cleaned and repaired. Therefore, it is very advantageous to the industry that they get back all of the soiled gloves in order to have them cleaned and repaired. Gloves can generally be reclaimed for for about one third of the cost of a new pair and functionally, the reclaimed gloves are as good or better than a new pair.

In converting the device to a glove dispenser, it is only necessary to change a very few components. Platform 24 is replaced with a platform of the proper size to accommodate the type of glove being dispensed. This is also true of the fingers 78 thus adapting this portion of the mechanism to receive and engage gloves respectively. The guide members 46 are removed and a vertical guide member is added to the extreme right end and one to the extreme left end of the platform 24 to accommodate the type of glove being dispensed.

In FIGURE 2, the screw 32, transverse guide member 50, support 58 and gear box 60 all must be relocated to accommodate the type of glove being dispensed. Additional vertical guide members will be added and will extend from the transverse guide member 50 to the bottom of the cabinet 40 which replace the function of the guide members 46 which were removed.

The delivery mechanism will deliver in the same manner as set forth previously upon the insertion of each glove, and will alternate from side to side in the same manner as the towels. All left handed gloves will be stacked on one side of the platform and all right handed gloves on the opposite side so that a pair of gloves will be dispensed each time two soiled gloves are inserted into the machine. In the event reversible gloves are employed, then the stacking procedure is of no significance.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A shop towel dispenser comprising a hollow cabinet, an openable closure for said cabinet for providing access to the interior thereof, an elevatable platform disposed in the cabinet for carrying a stack of clean shop towels, said cabinet adapted to receive means adjacent the upper end thereof for picking up the top towel from a stack of towels and discharging it exteriorly of the cabinet, and means mounted adjacent the upper end of the cabinet and communicating with the exterior thereof for receiving soiled shop towels and counting the number of soiled shop towels inserted into the cabinet, and means operatively connected to the soiled towel receiving and counting means for energizing the discharge means once for each soiled towel counted for discharging a number of towels equal to the number of soiled towels inserted into the cabinet, and guide means on the cabinet and on the closure for engaging opposite edges of the stack of towels for guiding the towels and preventing them from buckling sideways.

2. A shop towel dispenser comprising a hollow cabinet, an openable closure for said cabinet for providing access to the interior thereof, an elevatable platform disposed in the cabinet for carrying a stack of clean shop towels, said cabinet adapted to receive means adjacent the upper end thereof for picking up the top towel from a stack of towels and discharging it exteriorly of the cabinet, and means mounted adjacent the upper end of the cabinet and communicating with the exterior thereof for receiving soiled shop towels and counting the number of soiled shop towels inserted into the cabinet, and means operatively connected to the soiled towel receiving and counting means for energizing the discharge means once for each soiled towel counted for discharging a number of towels equal to the number of soiled towels inserted into the cabinet, the upper end of the stack of towels being received between guide members, and horizontally disposed pressure fingers mounted on the cabinet and engaging the top of the stack of towels for retaining the towels frictionally in position for engagement by the discharge means.

3. A mechanism for receiving flexible items comprising a hollow cabinet having an opening therein through which said opening items may be inserted, chute means carried by the cabinet and extending downwardly from the opening interiorly of the cabinet for guiding the items, sensing fingers carried by the cabinet and extending into the path of movement of the items for sensing the passage of such items, switch means connected with the sensing fingers for actuation thereof upon each engagement of an item with the sensing fingers for registering the number of items passing the sensing fingers, a plurality of pairs of rollers carried by the cabinet and disposed inwardly of the cabinet with the crotch formed between the adjacent rollers of the first pair of rollers being in alignment with the opening for receiving an item therebetween, means powering said rollers for pulling the item inwardly therethrough and depositing the item into the chute, plate means movably carried by the cabinet for movement between a position remote from the area disposed inwardly of the pairs of rollers and a position closing the area inwardly of the second pair of rollers, each of said pair of rollers including a movable roller biased towards the other roller, the movable roller in the first pair of rollers being operatively connected with the plate means for moving the plate means to close the area inwardly of the rollers when the first movable roller is moved away from the other roller in the first pair a distance greater than necessary to receive a flexible item thereby preventing a rigid element from being inserted between the rollers and forcing them apart a greater dis-

tance than normally required for a flexible item for preventing actuation of the sensing fingers and switch means by inserting a rigid element through the rollers.

4. The structure as defined in claim 3 wherein said cabinet includes a deflector mechanism mounted below the chute means for scattering the items discharged from the chute means, said deflector means including an angular plate rotatable about an axis, and power means for rotating said plate about its axis for scattering the items in the cabinet below the deflector means.

5. The structure as defined in claim 4 together with a plurality of downwardly extending pointed elements disposed in overlying spaced relation to the sensing fingers with the pointed end directed towards the sensing fingers for engagement with an item engaging the sensing fingers in the event the item is moved upwardly in the chute means after initial engagement with the fingers thereby preventing an item from being inserted into the chute means, actuating the sensing fingers and then being withdrawn from the chute means.

6. The structure as defined in claim 5 wherein each of said movable rollers includes means spring biasing the rollers toward the other of the rollers in each pair thereby providing frictional gripping of the items, said cabinet having an openable closure door thereon, said receiving mechanism being mounted on the interior of the door with the opening being formed in said door.

7. The structure as defined in claim 6 wherein said cabinet includes a platform vertically disposed therein for receiving a stack of flexible items, means adjacent the upper end of the cabinet for pressure engaging the uppermost item in the stack for retaining the items in the stack, guide means carried by said cabinet and engaging opposed side surfaces of the stack of items for preventing lateral buckling of the stack of items, an elongated screw

threaded rod journaled in said cabinet and in threaded engagement with the platform, said platform being non-rotatively retained within the cabinet whereby rotation of the rod will cause elevational movement of said platform and stack of items, and power means for rotating said rod.

8. The structure as defined in claim 7 wherein said closure door is also provided with a discharge outlet for flexible items, and means adjacent the upper end of the cabinet for picking up the uppermost item from the stack of items and discharging it exteriorly of the cabinet for access by a person using such items, said discharging means for the items being operated in response to the number of items inserted into the receiving mechanism.

References Cited by the Examiner

UNITED STATES PATENTS

1,067,805	7/13	Diescher	198—127
1,328,035	1/20	Cutler	221—251 X
1,516,677	11/24	Markel	221—216
1,530 570	3/25	Moores	169—2
2,018,089	10/35	Quarnstrom	198—127
2,522,033	9/50	Graham	221—251 X
2,572,121	10/51	Dosberg	194—4
2,635,025	4/53	Ziska	221—216
2,871,676	2/59	Miller	62—264
2,901,145	8/59	Black	194—4
2,960,377	11/60	Simjian	194—4 X
3,053,412	9/62	Black et al.	194—4 X
3,097,760	7/63	Short	194—4 X
3,107,770	10/63	Short	194—4

M. HENSON WOOD, JR., *Primary Examiner.*

LOUIS J. DEMBO, LAVERNE D. GEIGER, *Examiners.*