Sept. 11, 1962 I. E. BLACK ET AL 3,053,412

WIPING CLOTH DISPENSING MACHINE

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FIG. 2.

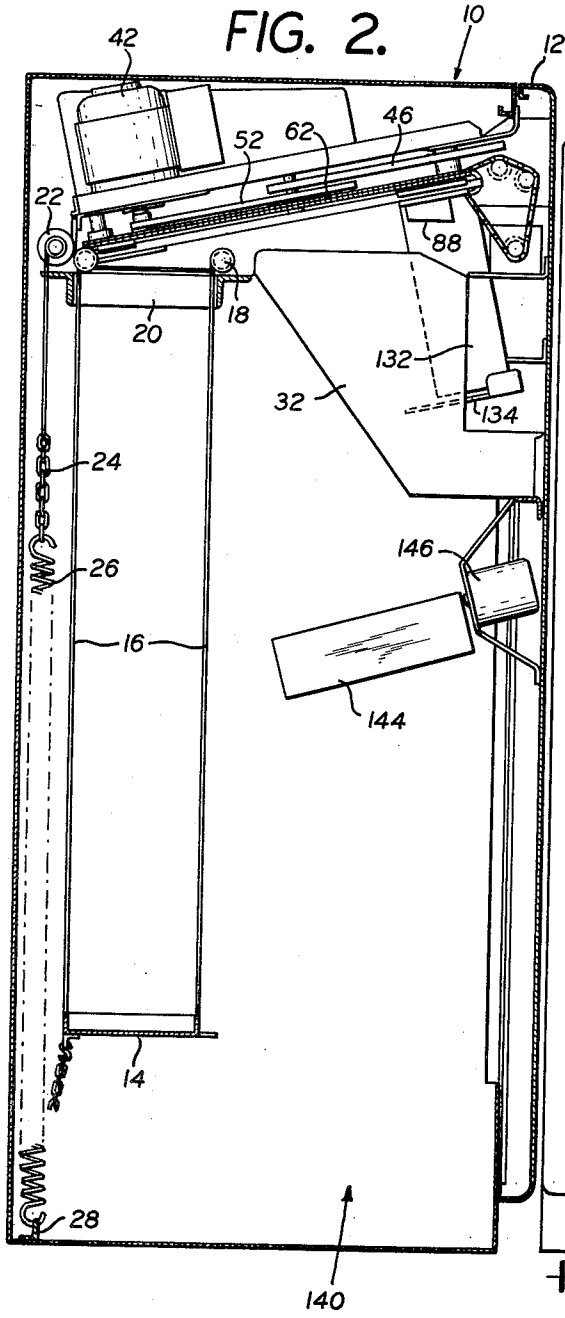
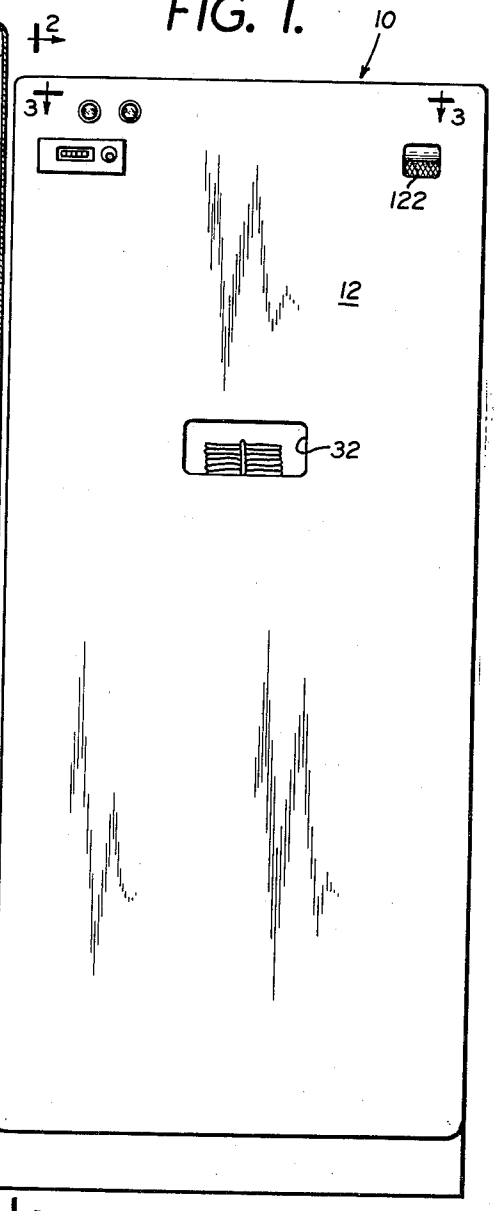


FIG. 1.



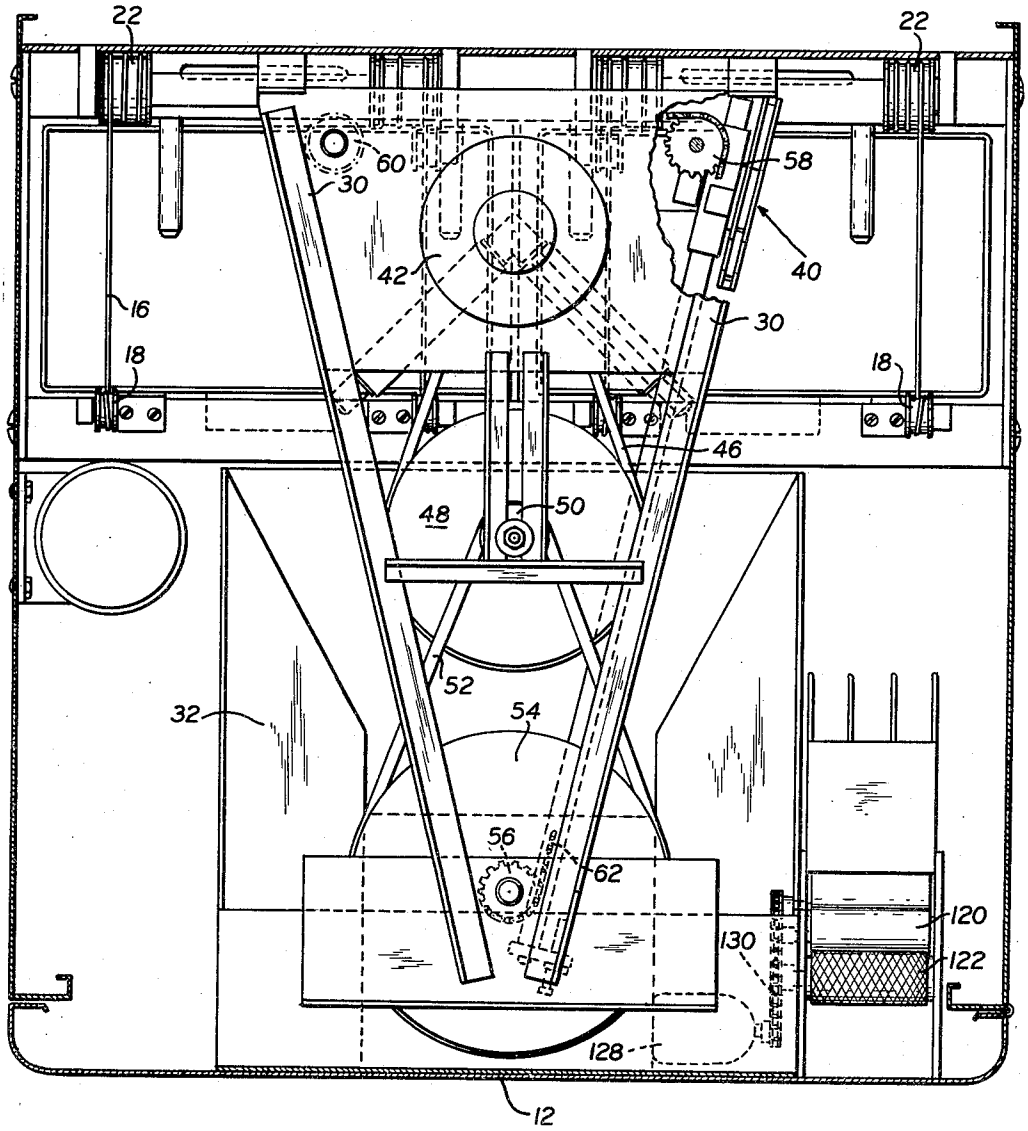
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WIPING CLOTH DISPENSING MACHINE

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FIG. 3.



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WIPING CLOTH DISPENSING MACHINE

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FIG. 4.

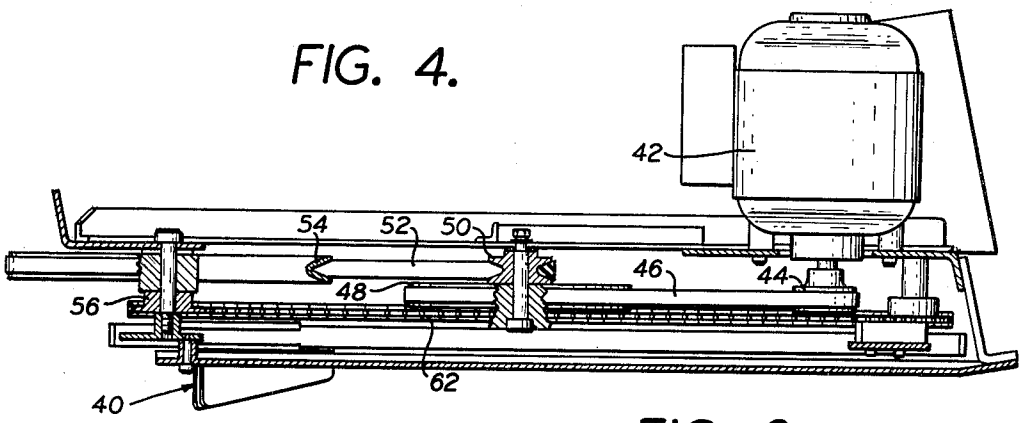


FIG. 5.

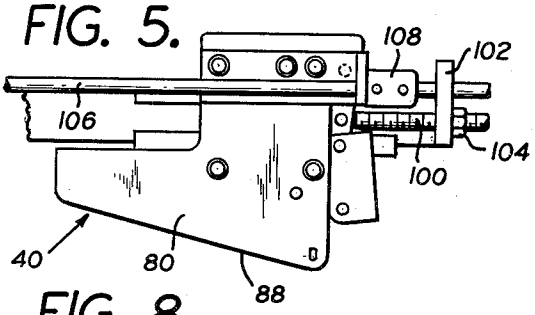


FIG. 6.

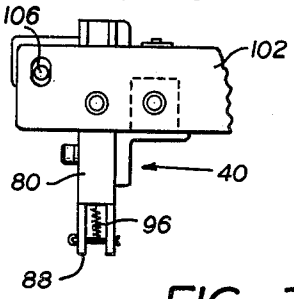


FIG. 8.

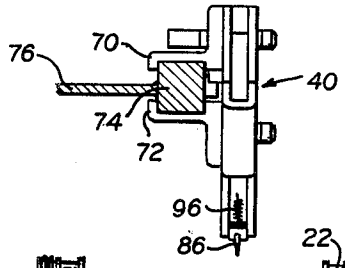


FIG. 7.

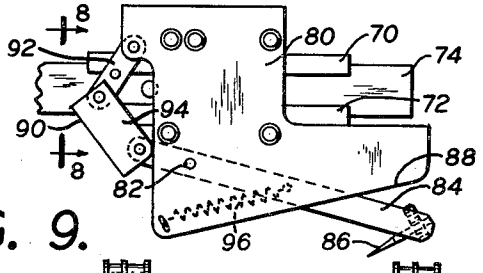
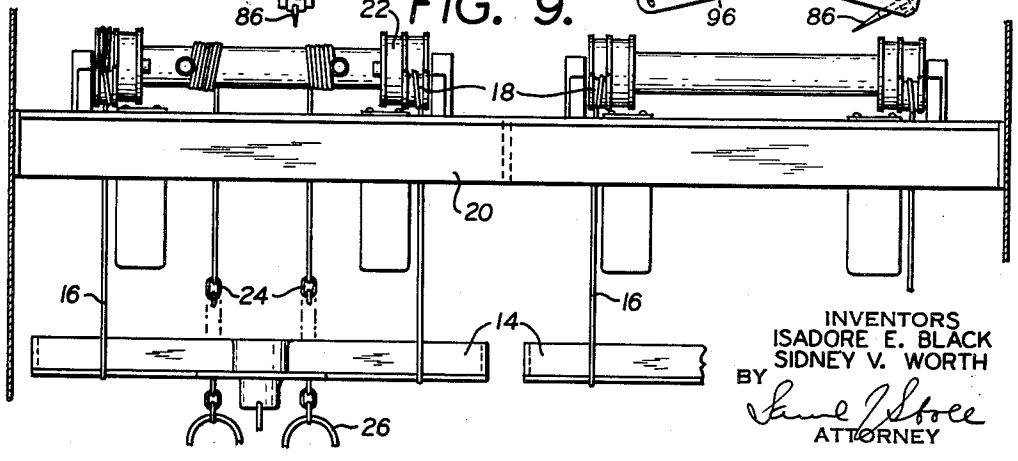


FIG. 9.



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FIG. 12.

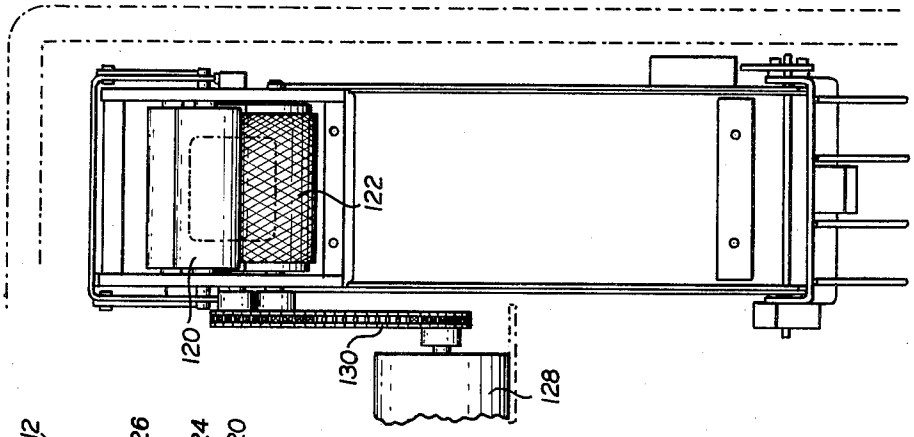


FIG. 11.

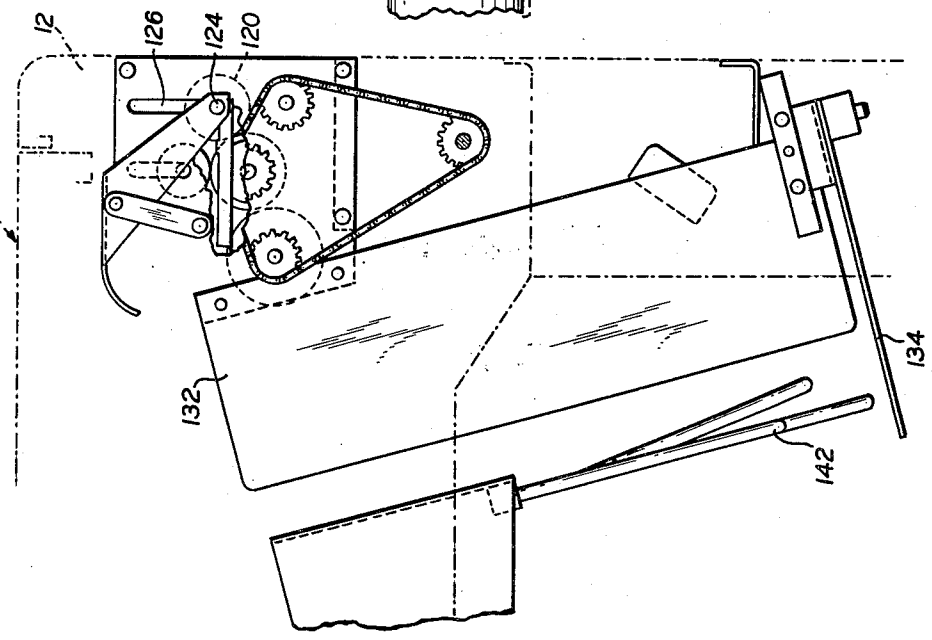
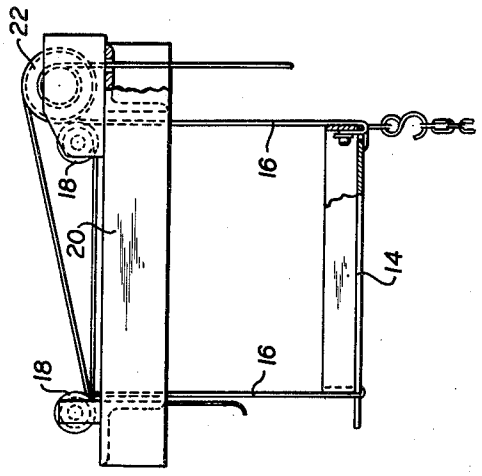


FIG. 10.



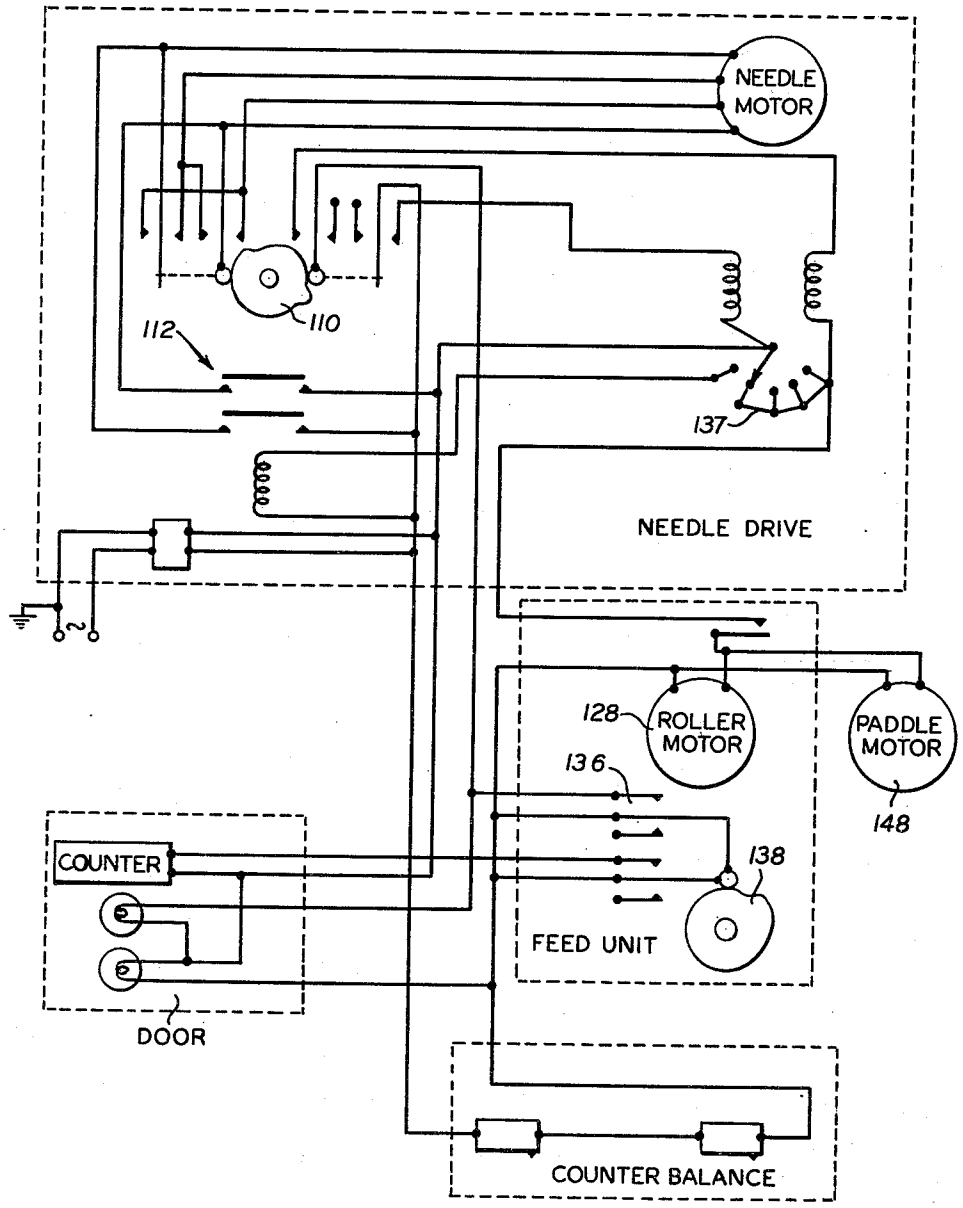
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WIPING CLOTH DISPENSING MACHINE

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FIG. 13.



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United States Patent Office 3,053,412 Patented Sept. 11, 1962

3,053,412

WIPING CLOTH DISPENSING MACHINE

Isadore E. Black, Cleburne, Tex., and Sidney V. Worth, Philadelphia, Pa.; said Worth assignor to said Black

Filed Aug. 24, 1959, Ser. No. 835,651
5 Claims. (Cl. 221—116)

This invention relates to dispensing machines for wiping cloths, towels and the like.

The present application constitutes an improvement over co-pending patent application of Isadore E. Black, Serial No. 660,172, filed May 20, 1957, now Patent No. 2,901,145. In said co-pending patent application the wiping cloths or towels are described as being stacked in several piles arranged equidistant from the vertical center of the machine. Concentrically with said vertical center of the machine is a circular track, and the several piles of towels or wiping cloths are oriented identically with respect to said track. A pick-up mechanism is mounted on a carriage which rides on the track and, as each pile is approached, the pickup mechanism dips into engagement with the uppermost towel or wiping cloth in said pile and removes it therefrom. Since the pick-up stations are widely separated, there being one such pick-up station for each pile, it becomes difficult to arrange for the dispensing of the various towels or wiping cloths through a single discharge opening. Furthermore, the pick-up head does not move in a direct path with respect to the discharge opening, and problems accordingly arise. Furthermore, the placement of several piles of towels or wiping cloths in radially disposed positions with respect to the vertical center of the machine makes for awkward and space-consuming proportions, and where floor space is at a premium and costly this constitutes a substantial disadvantage.

In the present improved dispensing machine, the towels or wiping cloths may be stacked in only two piles, arranged side by side. There are two pick-up heads instead of only one, as is the case with the machine described in said co-pending patent application. These pick-up heads are mounted on a pair of tracks, said tracks diverging in the direction of the two piles of towels or wiping cloths and converging in the direction of the discharge opening. The two pick-up heads function alternately. As one pick-up head picks up a towel or wiping cloth on its forward movement and carries it toward the discharge opening, the other pick-up head moves rearwardly away from said discharge opening and into an operative position adjacent the second pile. When the first mentioned pick-up head discharges its towel or wiping cloth and then moves rearwardly away from the discharge opening and toward the first mentioned pile, the second pick-up head picks up a towel or wiping cloth from the second pile and carries it forwardly toward the discharge opening.

It is accordingly a principal object of this invention to provide a towel or wiping cloth dispensing machine of the character described in which there is a plurality of pick-up heads functioning synchronously and in alternate relation to each other. In the preferred form of this invention, there are two pick-up heads and two piles of towels or wiping cloths, but this should be understood as being purely illustrative, and it should also be understood that a dispensing machine may be made in accordance with the principles of this invention in which there is a greater number of piles of towels or wiping cloths and a greater number of pick-up heads. What is significant is that the piles of towels or wiping cloths are arranged in side-by-side relation, and whether there are two such piles or three or more is totally immaterial. By the same token, whether there are two pick-up heads or three or a greater number is also immaterial, providing that their

respective tracks are arranged in the same relationship as the two tracks herein described and claimed. Stated differently, the several tracks would converge in the direction of the discharge opening, and they would diverge in the directions of the several piles of towels or wiping cloths. The several pick-up heads would function alternately in phase with each other, each moving toward or away from its discharge station or its pick-up station.

Another feature of this invention is the use of inclined tracks for the pick-up heads. It is essential that the towels or wiping cloths be moved both vertically and horizontally away from their respective piles or stacks. Horizontal movement alone would not suffice, since the wiping cloth or towel being removed would snag against the wiping cloth or towel immediately below. Vertical removal would avoid this difficulty, but it would not deliver the towel or wiping cloth to the operator of the machine. Moreover, vertical removal alone could not be achieved by means of pick-up heads having straight needle pick-up elements. In the present invention both horizontal and vertical movements are combined into movement in a single inclined plane. Thus the towels or wiping cloths are picked up by reason of the horizontal and vertical components of such movement and they are brought forwardly to be dispensed to the operator of the machine by reason of the horizontal component thereof.

A further feature of the invention is the provision of self-compensating or adjusting elevating means for the piles or stacks of towels or wiping cloths. These towels or wiping cloths are disposed on vertically movable platforms, which are supported by means of ropes and pulleys or the like. Springs urge the platforms into elevated positions, and the weight of the towels or wiping cloths on said platforms opposes the action of the springs. The greater the weight, the greater the resistance of the springs.

Stated differently, the springs are loaded in direct proportion to the weight of the towels or wiping cloths. The result is that the uppermost towels or wiping cloths in the piles or stacks are maintained at predetermined operative levels, irrespective of the number of towels or wiping cloths in each stack.

The invention is illustrated in the accompanying drawing, in which:

FIG. 1 is an external view of a towel or wiping cloth dispensing machine made in accordance with this invention.

FIG. 2 is a longitudinal section therethrough on the line 2—2 of FIG. 1.

FIG. 3 is an enlarged horizontal section taken on the line 3—3 of FIG. 1.

FIG. 4 is a somewhat detailed vertical section through the pick-up mechanism of the machine.

FIG. 5 is an enlarged fragmentary side view of one of the pick-up heads.

FIG. 6 is an enlarged fragmentary end view of said pick-up head.

FIG. 7 is a view similar to that of FIG. 5 but showing the pick-up needle in downwardly projecting operative position.

FIG. 8 is a cross-section on the line 8—8 of FIG. 7.

FIG. 9 is a fragmentary view of the elevating mechanism for the towel or wiping cloth supporting platforms.

FIG. 10 is an end view, partly in vertical section, of said elevating mechanism.

FIG. 11 is a side view of the towel or wiping cloth receiving mechanism through which soiled towels or wiping cloths are inserted into the machine.

FIG. 12 is a front view of said mechanism.

FIG. 13 is a circuit diagram showing the electrical apparatus which controls and operates the machine.

Referring now to the details of the invention as shown

in the drawing, it will be seen that the dispensing machine herein claimed is housed within a cabinet or similar enclosure **10**, said cabinet having a front door **12** through which access may be had to the mechanism and also to fill the platforms **14** with towels or wiping cloths, or the like. Each such platform is intended to receive and support a pile or stack of such towels or wiping cloths, each such pile or stack, when full, containing several hundred individual towels or wiping cloths. The machine may be used to dispense one towel or wiping cloth at a time or they may be packed in bundles, say of five, and the machine then would dispense one bundle at a time.

Each platform **14** is supported by means of cables or ropes **16** which extend around pulleys **18** on an elevated bracket structure **20**. The cables or ropes **16** are carried around drums or sheaves **22** and are then connected by means of chains **24** to extension coil springs **26**. These coil springs are connected at their lower ends to frame member **28** secured to the bottom wall of cabinet **10**. Frame member **28** may be a part of the frame structure of the cabinet. It will be understood that the cables are so arranged with respect to the pulleys that when platforms **14** descend, as under a load of the towels or wiping cloths, springs **26** will stretch or extend, and the lower platforms **14** go the greater will be the stretch or extension of said springs.

As has above been indicated, the springs will thereby be loaded, the extent of loading being proportional to the weight of the towels or wiping cloths on platforms **14**. The springs will, in effect, support platforms **14** and the weight of the towels or wiping cloths disposed thereon. Not only will the springs support such weight but they will also advance the towels or wiping cloths by moving them upwardly in the direction of the pick-up heads. As has also been indicated above, the uppermost towels or wiping cloths are always maintained at an operative level relative to the pick-up heads. This is the work of springs **26**.

Adjacent the top of the cabinet is a pair of inclined frame members **30** which are supported by the framework of the cabinet. These frame members **30** are inclined upwardly in the direction of the front of the cabinet, their back ends being disposed at a lower level than their forward ends. In addition to being inclined in this manner, frame members **30** are also disposed in converging relationship in forward direction and diverging relationship in rearward direction. In the illustrated form of the invention there are two towel or wiping cloth supporting platforms **14** situated side by side in the back of the cabinet. The rear ends of frame members **30** are disposed above said platforms **14**. The forwardly converging ends of said frame members **30** are situated above a dispensing chute **32** which will shortly be mentioned in connection with the operation of the machine. The pick-up mechanism consists of a pair of pick-up heads **40** and a reversible drive mechanism. The drive mechanism consists of a reversible motor **42** connected by means of a pulley **44** and a drive belt **46** to a second pulley **48**, a third pulley **50** being connected to said second pulley **48** coaxially therewith, a second belt **52** connecting said third pulley **50** to a fourth pulley **54**, three gear or sprocket wheels **56**, **58**, and **60**, respectively, and an endless chain **62** mounted on said gear or sprocket wheels. It is clear from the dimensional relationship of the several pulleys, pulley **44** being small and driving larger pulley **48**, pulley **50** being small and driving larger pulley **54**, that this is a speed-reducing drive. It will also be seen that gear wheel or sprocket **56** is secured to pulley **54**, co-axially therewith. The motor is electrically reversible. Consequently, when the motor is caused to rotate in one direction, the belt and pulley drive mechanism will cause chain **62** to move in one direction around gear wheels or sprockets **56**, **58**, and **60**; when the motor is caused to rotate in the opposite direction, said chain will similarly be driven in the opposite direction.

Connected to chain **62** at spaced intervals are the two pick-up heads **40**. These pick-up heads are so arranged on chain **62** that, when one pick-up head moves forwardly from the direction of sprocket **58** in the direction of sprocket **56**, the other will move from the direction of sprocket **56** and in the direction of sprocket **60**. Conversely, when the latter pick-up head is caused to move from sprocket **60** toward sprocket **56**, the former pick-up head will move from sprocket **56** toward sprocket **58**. It will be observed, particularly in FIG. 8, that each pick-up head is provided with a pair of spaced, facing parallel channels **70** and **72**, respectively, which serve as guide and bearing plates. These channels are slidably mounted on a bar **74** which serves as a track relative to said channels. Since there are two pick-up heads, there are two such bars or tracks **74**, each paralleling one of the frame members **30** and consequently paralleling the corresponding runs of chain **62**. These bars or tracks **74** are both supported by means of frame members **76** which, in turn, are supported by frame members **30**.

It will be understood from the foregoing that the two pick-up heads are mirror opposites of each other; that is, they are identical in structure, mechanism, and operation except that one has a left-hand support and drive while the other has a right-hand support and drive. Viewing FIG. 8 as showing a pick-up head having a right-hand support and drive, it will be understood that the mirror opposite of FIG. 8 would disclose the other pick-up head having a left-hand support and drive.

Each pick-up head includes a housing **80** to which guide and bearing channels **70** and **22** are connected. Pivotally supported on pivot **82** in said housing is a pick-up arm **84** having a removable pick-up needle **86** at one end. The lower edge **88** of housing **80** is inclined, as viewed in FIGS. 5 and 7, to compensate for the angle of inclination of frame members **30** and tracks **74**, as shown in FIG. 2. Thus, when the pick-up head is mounted in operative position as viewed in FIG. 2, its lower inclined edge **88** is substantially horizontal.

A toggle mechanism **90** is provided between housing **80** and the opposite end of pick-up arm **84** from the end to which the pick-up needle **86** is secured. This toggle mechanism consists of a pair of links **92** and **94**, respectively, link **92** being pivotally connected to link **94** and to the housing, and link **94** being of course pivotally connected to link **92** and also to said opposite end of pick-up arm **84**. When said toggle mechanism is in its FIG. 7 position with its two links angularly disposed relative to each other, the pick-up arm **84** projects angularly downwardly to bring the pick-up needle **86** into operative position. Assisting in this connection is a pull-string **96** which is attached at one end to the housing and at the other end to the pick-up arm between its said pick-up needle **86** and its said pivot **82**. When the two links **90** and **92** of the toggle mechanism are brought into alignment with each other, the pick-up arm **84** will be swung in counter-clockwise direction, as viewed in FIG. 7, to move its pick-up needle **86** out of operative position. The result is shown in FIG. 5.

Suitable means is provided to actuate the toggle mechanism and it will be understood that this is purely illustrative of the various means that may be used to move the pick-up arm into and out of operative position. In the illustrated form of the invention, an adjustable stop member **100** is provided at each end of the path of travel of each pick-up head. This stop member may be a screw-threaded element adjustably secured to a suitable support **102** and locked in place by means of a nut **104**. Said stop member may be adjusted longitudinally of itself in either direction. When the pick-up head moves rightwardly as shown in FIG. 5 and leftwardly as shown in FIG. 7, the toggle link **92** will strike one of said stop members **100** and the toggle mechanism will straighten out from its angular FIG. 7 position to its FIG. 5 position, thereby retracting the pick-up arm **84**. When the

pick-up head moves in the opposite direction, leftwardly as viewed in FIG. 5 and rightwardly as viewed in FIG. 7, toggle link **92** will encounter the other stop member **100** and the toggle mechanism will swing outwardly from its aligned FIG. 5 position to its angular FIG. 7 position, thereby swinging the pick-up arm **84** into operative position. It will be understood that this may be accomplished by other suitable means operating directly against the pick-up arm, instead of against the toggle mechanism, if this should be desired.

The pick-up head control mechanism consists of a pair of rods **106** which are slidably supported for longitudinal movement in either direction in brackets **102**, which in this case serve as bearings. Blocks **108** are adjustably mounted on said rods **106** for engagement with the pick-up head. It will be understood that these control rods **106** are connected to cams **110** which control the motor switches **112**. When the rods move in one direction and reach the end of their travel in that direction, the appropriate motor switch will close to cause a reversal of polarity and consequently a reversal of direction of rotation of the motor. When control rods **106** move in the opposite direction and reach the end of their travel, the appropriate motor switch will be actuated and a reversal of polarity will once again take place. In each case the motor comes to a complete stop before commencing to rotate in the opposite direction. The means for accomplishing this result are our invention.

The operation of the machine will now be described in connection with the foregoing mechanism and the soiled towel or wiping cloth insert mechanism: A soiled towel or wiping cloth is inserted into the machine between rollers **120** and **122**, respectively. It will be noted in FIG. 11 that the shaft **124** which supports roller **120** is vertically movable in vertical slots **126**. This spaces the two rollers from each other in order to accommodate a towel between them. Also, should a foreign object be inserted between the rollers, such as a bolt or tool concealed within a towel or wiping cloth, this freedom of movement of roller **120** will compensate for said foreign object and prevent damage to the machine. It will be observed in FIGS. 11 and 12 that a motor **128** is connected by means of a drive chain **130** and various sprockets or gear wheels to roller **122**. This roller is knurled to provide sufficient traction in connection with the towel or wiping cloth to carry it through. The soiled towel is dropped through a chute **132** and onto a finger lever **134** which is pivotally mounted at the lower end of said chute. The weight or impact of the towel causes said finger lever to pivot and to close a double switch **136** actuating a counter and stepping relay **137** as shown in the circuit diagram, FIG. 13. The actual mechanism which operates the switch is a cam **138** on the finger lever.

After the finger lever tilts under the weight or impact of the towel, said towel will drop into a collecting bin **140**. Downwardly projecting spikes or fingers **142** adjacent chute **132** and finger lever **134** prevent removal of said towel through said chute. It will now be noted in FIG. 2 that an agitator or paddle **144** is provided in the collecting bin **140** in order to distribute the soiled towels through said bin. This paddle element or agitator is rotated by means of electric motor **146** which is shown in FIG. 13 to be in circuit with the roller motor **128**.

It will now be understood that it is the finger lever **134** and its cam **138** which control operation of the machine. The pick-up mechanism will not function unless a soiled towel is dropped upon finger lever **134** causing said lever to pivot. Cam **138** operates through the stepping relay **137** to close the circuit to the main drive motor **42** in order to operate the pick-up mechanism. As each pick-up head is caused to move forwardly, its pick-up arm projects downwardly and its pick-up needle engages the uppermost towel or wiping cloth in the pile. It is then carried forwardly until the pick-up arm is caused to retract, thereby freeing the towel from the pick-up needle and discharging it through the discharge chute **32**. This process continues as long as soiled towels or wiping cloths are deposited in the machine and as long as clean towels or wiping cloths are available on platforms **14**.

The foregoing is illustrative of a preferred form of this invention and it will be understood that modifications may be incorporated therein within the basic principles of the invention and the scope of the claims.

What is claimed is:

1. A towel dispensing machine having a plurality of vertically movable towel-supporting platforms disposed in side-by-side relationship, a discharge chute disposed in front of said platforms, a plurality of tracks mounted above said platforms and discharge chute, said tracks converging in the direction of said chute and diverging in the direction of said platforms, a plurality of pick-up heads longitudinally movable on said tracks between pick-up stations above said platforms and discharge stations at said chute, and drive means including a reversible motor operatively connected to said pick-up heads causing them to move alternately in opposite directions, one head moving from its pick-up station to its discharge station while the other is moving from its discharge station to its pick-up station, a continuous chain being provided adjacent to said tracks for the pick-up heads, one run of said chain paralleling each of said tracks, said reversible motor operatively connected to said chain to drive it in either direction, and means connecting said pick-up heads to said parallel runs of the chain, whereby operating the motor in one direction causes one pick-up head to move in one direction while the other pick-up head moves in the opposite direction, and whereby reversing the direction of operation of the motor causes the pick-up heads to travel in opposite directions.

2. A towel dispensing machine having a plurality of vertically movable towel-supporting platforms disposed in side-by-side relationship, a discharge chute disposed in front of said platforms, a plurality of tracks mounted above said platforms and discharge chute, there being one such track for each platform, said tracks converging in the direction of said chute and diverging in the direction of said platforms, a plurality of pick-up heads longitudinally movable on said tracks between pick-up stations above said platforms and discharge stations at said chute, there being one such pick-up head for each track, and drive means operatively connected to said pick-up heads causing them to move alternately in opposite directions, one head moving from its pick-up station to its discharge station while the other head is moving from its discharge station to its pick-up station, each pick-up head comprising a housing, channel bearings on said housing which support the housing on the corresponding track for longitudinal movement thereon in either direction, a pick-up arm pivotally mounted on said housing, a pick-up needle attached to one end of said pick-up arm for engagement with towels mounted on the corresponding platform, and toggle means at the opposite end of said pick-up arm, said toggle means when extended causing said pick-up arm to swing in one direction about its pivot to move the pick-up needle out of engagement with the towels, said toggle means when contracted causing said pick-up arm to swing in the opposite direction about its pivot in order to move the pick-up needle into engagement with said towels.

3. A towel dispensing machine having a plurality of vertically movable towel-supporting platforms disposed in side-by-side relationship, a discharge chute disposed in front of said platforms, a plurality of tracks mounted above said platforms and discharge chute, there being one such track for each platform, said tracks converging in the direction of said chute and diverging in the direction of said platforms, a plurality of pick-up heads longitudinally movable on said tracks between pick-up stations above said platforms and discharge stations at said chute, there being one such pick-up head for each track, and

drive means operatively connected to said pick-up heads causing them to move alternately in opposite directions, one head moving from its pick-up station to its discharge station while the other head is moving from its discharge station to its pick-up station, each pick-up head comprising a housing, channel bearings on said housing which support the housing on the corresponding track for longitudinal movement thereon in either direction, a pick-up arm pivotally mounted on said housing, a pick-up needle attached to one end of said pick-up arm for engagement with towels mounted on the platform, and toggle means at the opposite end of said pick-up arm, said toggle means when extended causing said pick-up arm to swing in one direction about its pivot to move the pick-up needle out of engagement with the towels, said toggle means when contracted causing said pick-up arm to swing in the opposite direction about its pivot in order to move the pick-up needle into engagement with said towels, toggle-actuating means being provided at the pick-up and discharge stations of each pick-up head, each toggle-actuating means comprising a screw-adjustable stop member supported adjacent the track for engagement with the toggle means, the actuating means at the pick-up station being adapted to engage the toggle means to cause it to contract, thereby pivoting the pick-up arm and needle into towel-engaging position, the actuating means at the discharge station being adapted to engage the toggle means to cause it to extend, thereby pivoting the pick-up arm and needle out of towel-engaging position.

4. A towel dispensing machine having a plurality of vertically movable towel-supporting platforms disposed in side-by-side relationship, a discharge chute disposed in front of said platforms, a plurality of tracks mounted above said platforms and discharge chute, said tracks converging in the direction of said chute and diverging in the direction of said platforms, a plurality of pick-up heads longitudinally movable on said tracks between pick-up stations above said platforms and discharge stations at said chute, and drive means including a reversible motor operatively connected to said pick-up heads causing them to move alternately in opposite directions, one head moving from its pick-up station to its discharge station while the other head is moving from its discharge station to its pick-up station, a continuous chain being provided adjacent to said tracks for the pick-up heads, one run of said chain paralleling each of said tracks, said reversible motor operatively connected to said chain to drive it in either direction, and means connecting said pick-up heads to said parallel runs of the chain, whereby operating the motor in one direction causes one pick-up head to move in one direction while the other pick-up head moves in the opposite direction, and whereby reversing the direction of operation of the motor causes the pick-up heads to travel in opposite directions, polarity reversing means being provided at each of said pick-up and discharge stations for each pick-up head, said polarity reversing means being adapted to reverse the direction of rotation of said reversible motor, said polarity reversing means comprising an elongated rod paralleling its corresponding track, said rod being supported for longitudinal movement in either direction, a polarity reversing switch connected to said rod and being actuated thereby and a pair of adjustable stop members secured to said rod at said pick-up and discharge stations, the corresponding pick-up head being adapted to engage one of said stop members while moving into the pick-up station to cause movement of said rod in the same direction and thereby to actuate the polarity reversing switch, said pick-up head being adapted while moving into the discharge station to engage the other stop member and to cause movement of said rod in the opposite direction of its first mentioned movement, thereby actuating the polarity reversing switch in the opposite direction.

5. A towel dispensing machine in accordance with claim 1, wherein the tracks for the pick-up heads are inclined in upward direction from their pick-up stations to their discharge stations, the paths of movement of said pick-up heads being correspondingly inclined.

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