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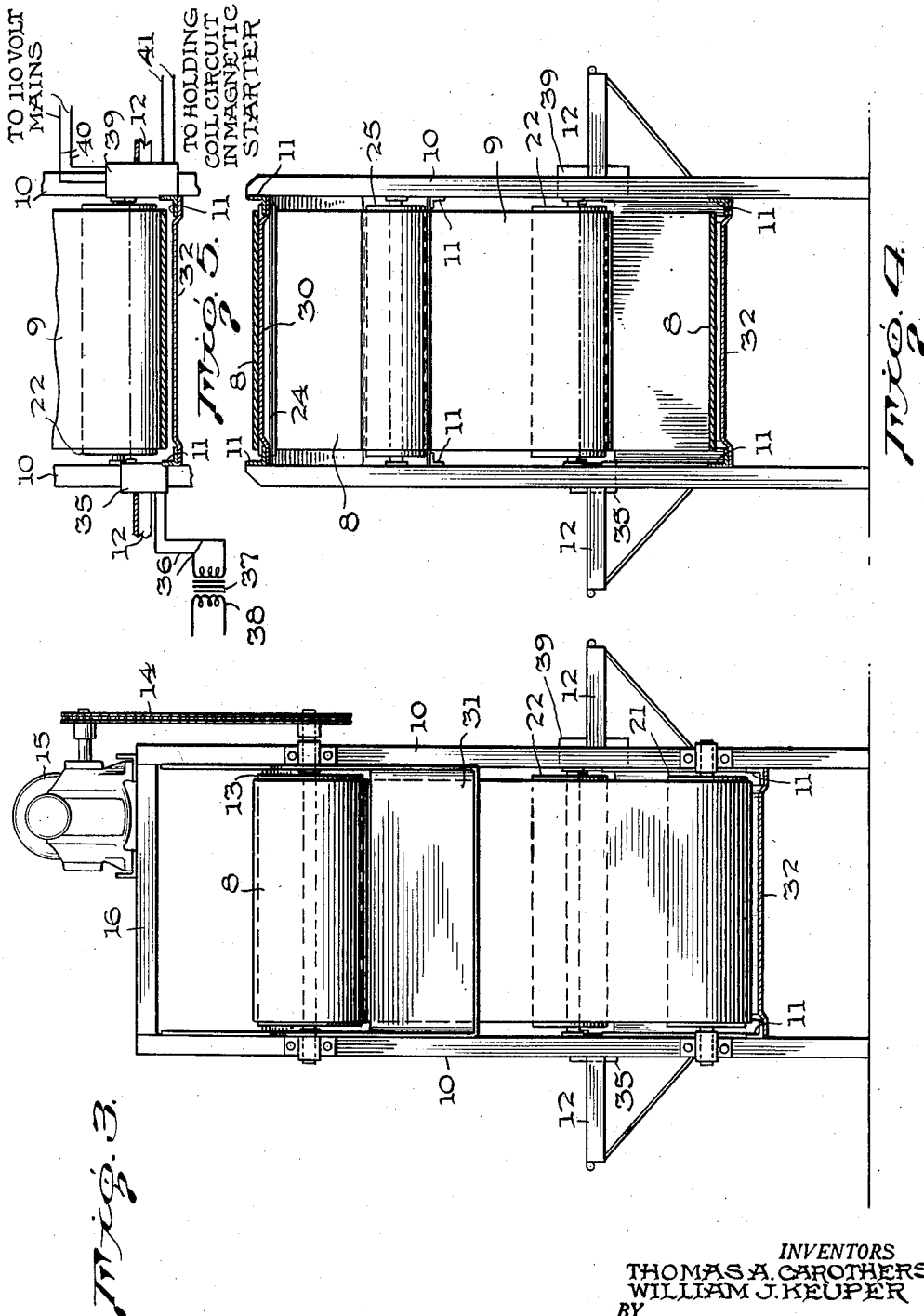
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LAUNDRY HANDLING MECHANISM

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LAUNDRY HANDLING MECHANISM

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Our invention relates to improvements in laundry handling mechanism and has to do, more particularly, with a mechanism which is useful in laundries specializing in the laundering of material such as diapers.

The principal object of our invention is to provide apparatus including a conveyor mechanism so arranged that the lower reach thereof may be used to carry laundered material alongside folding shelves, while the upper reach thereof may be used to convey rejected material to a receptacle, in which it can be taken back to the washing machines.

A further object of our invention is to provide an apparatus including a conveyor mechanism which will automatically return an excess of material, not removed from the lower reach by the operatives, to the lower reach so as to again present it to the operatives.

A further object of our invention is to provide means for automatically discontinuing the drive of the conveyor mechanism, whenever an excess of material, greater than the capacity of the automatic return device, is present on the lower reach of the belt, at one end thereof.

Further objects, and objects relating to details and economies of construction and operation, will definitely appear from the detailed description to follow. In one instance, we have accomplished the objects of our invention by the devices and means described in the following specification. Our invention is clearly defined and pointed out in the appended claims. A structure constituting a preferred embodiment of our invention is illustrated in the accompanying drawings, forming a part of this specification, in which

Fig. 1 is a plan view of mechanism embodying our invention, showing the arrangement of said mechanism with reference to the stations for the operatives and the wrapping tables.

Fig. 2 is a longitudinal, sectional view through the mechanism, taken on the line 2—2 of Fig. 1.

Fig. 3 is a vertical, sectional view of the mechanism, taken on the line 3—3 of Fig. 2.

Fig. 4 is a view of the mechanism, partly in end elevation and partly in section, taken on the line 4—4 of Fig. 2, and

Fig. 5 is a detail, vertical, sectional view, taken on the line 5—5 of Fig. 2, and showing the arrangement of the light source and photoelectric relay for automatically stopping the drive under certain conditions.

In the drawings, the same reference numerals refer to the same parts throughout the several

views and the sectional views are taken looking in the direction of the arrows at the ends of the section lines.

In general, our invention comprises a folding shelf, an endless conveyor belt and a means for driving the same, said belt being so arranged as to have a lower reach, extending alongside the shelf and inclined upwardly in the direction of movement of the lower reach, and an upper reach. The material that has been laundered, such as diapers, is placed upon the upper surface of the lower reach of the main conveyor belt and carried by it alongside the folding shelf, so that the operatives can take the material from the conveyor belt and fold it on the shelf, after which the folded diapers are placed on wrapping tables to be wrapped. Due to the inclination of the lower reach, the stretch thereof where more material is piled thereon is at a lower level, with respect to the folding shelf, than later stretches, with the result that stooping of the operatives to remove material from the belt is obviated. Rejected material, which has to be returned for further laundering, may be placed on the upper surface of the upper reach of the belt, to be delivered thence to a suitable receptacle, in which it will be taken back to the washing machines.

Our invention comprises, further, an automatic device by which material, which has not been removed by the operatives from the lower reach of the conveyor belt, will be returned and re-deposited on said lower reach, so that it will again be brought to the operatives. This automatic return device comprises an auxiliary conveyor belt, which is driven by contact between a vertical reach of the main belt and a vertical reach of the auxiliary belt, material to be returned being carried upwardly between said vertical reaches and, then, carried by the auxiliary belt to a point above the lower reach of the main belt and in uninterrupted communication therewith, where it is delivered to the latter.

Our invention comprises, further, a means for automatically discontinuing the drive of the conveyor mechanism in case there is an excess of material on the lower reach of the conveyor belt, at the point where it would be taken up by the automatic return mechanism, and which is beyond the capacity of such automatic return mechanism. This includes a light source projecting a beam across the lower reach of the main belt, slightly above the surface thereof, and a photoelectric relay acted on by said light beam and controlling a circuit to the driving motor. When this light beam is interrupted by surplus

material on the lower reach of the main belt, the relay opens, causing the holding coil circuit to the motor to open, which stops the driving motor.

Referring to the numbered parts of the drawings, our laundry handling mechanism comprises a framework made up of the vertical members 10, to which the longitudinal members 11 are connected, the sides of this frame being connected at suitable intervals by cross members. Folding shelves 12 are mounted on the side members of the frame, adjacent the lower reach of the main conveyor belt 8, as shown in Figs. 1 and 2.

A driving roller 13 is journaled in the framework, at one end thereof, and driven through a sprocket chain 14 from an electric motor 15, which is mounted on the auxiliary frame 16. This motor is provided with a magnetic starter (not shown), having a holding coil included in an electric circuit, the arrangement being such that, when the holding coil circuit is closed, the motor starts and operates, and when the holding coil circuit is opened, the motor will stop.

Guide rods 17 and 18 are mounted on the frame and extend transversely thereof. A take-up roller 19 is journaled at its ends in slidably mounted bearings on the framework and is pressed away from the driving roller 13 by the springs 20. An idler roller 21 is journaled on the framework and extends transversely thereof. At the opposite end of the frame, there are journaled the idler rollers 22 and 23, one being mounted above the other. A guide rod 24 is mounted on the frame and extends transversely thereof. The main conveyor belt 8 is endless and extends around the driving roller 13, over the guide rod 17, around the take-up roller 19, over the guide rod 18, around the idler roller 21, thence around the idler rollers 22 and 23, and over the guide rod 24, back to the driving roller 13. As shown in Fig. 2, the lower reach of this belt is inclined upwardly from the roller 21 to the roller 22 and extends alongside shelves 12, being slightly below their level adjacent roller 21 and substantially in the horizontal plane of the shelves when it reaches roller 22.

An auxiliary take-up roller 25 is journaled in bearings, slidably mounted in the framework, and extends transversely of the framework intermediate the upper and lower reaches of the main conveyor belt. The bearings for the auxiliary take-up roller 25 are pressed away from the idler roller 23 by springs 26. Transverse guide rods 27 and 28 are also mounted in the frame. An auxiliary, endless, conveyor belt 9 is provided which extends around the auxiliary take-up roller 25, thence over the guide rods 27 and 28, and around the idler rollers 22 and 23, back to the take-up roller 25. This auxiliary conveyor belt 9 has an upper reach extending between the rollers 23 and 25, and a vertical reach extending between the rollers 22 and 23, and said vertical reach is in contact with and driven by the vertical reach of the main conveyor belt 8, extending between said rollers 22 and 23. The space between roller 25 and the lower reach of belt 8 is uninterrupted, so that material discharged from belt 9 will fall on the lower reach of belt 8.

A pan 29 extends beneath the main conveyor belt, between the idler roller 23 and the guide rod 24, and a similar pan 30 extends beneath the upper reach of the main conveyor belt between the guide rod 24 and the driving roller 13. A pan 32 is mounted on the frame and extends beneath the lower reach of the main conveyor belt 8, from a

point adjacent the roller 22 to the idler roller 21, the end of said pan 32 being turned upwardly, at 33, to form a guard. A chute 31 is mounted on the frame, adjacent the driving roller 13, for directing material, carried by the upper reach of the conveyor belt over the roller 13, to a suitable receptacle. A pan 34 is mounted on the frame and extends beneath the auxiliary conveyor belt 9, between the guide rods 27 and 28.

Mounted upon the frame, adjacent one edge of the lower reach of the main conveyor belt 8, and near the idler roller 22, is a light source, as indicated at 35, for projecting a beam of light across the space above the lower reach of the belt. This light source is connected by leads 36 to the secondary of a transformer 37, the primary coil 38 of which is connected to a main source of electric current. Mounted on the frame adjacent the opposite edge of the conveyor belt, and near the idler roller 22, is a photoelectric relay 39, including a photoelectric cell acted on by the beam from the light source. Leads 40 going to the photoelectric relay 39 are connected with the 110-volt main constituting the source of electric current. Leads 41 from the photoelectric relay extend to the holding coil circuit in the magnetic starter for motor 15. When the beam of light projected from light source 35 falls upon the photoelectric cell in relay 39, the relay is in closed position causing the holding coil circuit to be closed, so that the driving motor operates to drive the conveyor mechanism. However, if there is an excess of material carried along by the lower reach of the conveyor belt 8 toward the idler roller 22, this excess of material will interrupt the beam of light, so that the relay 39 will open and the holding coil circuit will be opened, thus causing motor 15 to stop. This discontinues the drive of the main conveyor belt 8, if the excess material on the lower reach of the conveyor belt 8, as it reaches the idler roller 22, is so great that it can not be carried up safely between the vertical reaches of the belts 8 and 9, and returned by the return mechanism. This is a safety feature, which stops the conveyor mechanism and prevents too much material being carried upwardly by the automatic return device.

The operation of our laundry handling mechanism should be apparent from the preceding description. Fig. 1 shows the layout of the mechanism with reference to the operative's stations and the wrapping tables. A truck filled with laundered diapers is brought up to the point marked A (Fig. 1) and there unloaded onto the upper surface of the lower reach of the main conveyor belt 8. Due to the inclination of the lower reach of this belt, the top of the pile of laundered diapers on the conveyor belt, adjacent the receiving end, will be substantially on the level of the folding shelves 12 and, as the pile is carried along by the belt, diapers being removed from time to time by the operatives, the top of the decreasing pile of material is always kept approximately on the level of the shelves. This makes it more convenient for the workers. As the laundered diapers are carried alongside the folding shelves 12, the operatives remove diapers from the supply on the lower reach of the belt, and fold them on the folding shelves 12. The seats or stations for the operatives are indicated at 42. The folded diapers are placed on the tables 43 for wrapping. If an operator finds any diapers that are not properly laundered, they are placed on the upper surface of the upper reach of belt 8, and carried thereby toward the driving roller 13, where they are deposited in the

chute 31 and, thence, delivered into a truck B, in which they are taken back to the washing machines. In case the operatives do not have time to remove all of the laundered diapers from the lower reach of the main conveyor belt, before they reach the idler roller 22, such excess diapers are carried up between the vertical reaches of belts 8 and 9 and, then, carried on the upper reach of auxiliary conveyor belt 9 to the take-up roller 25, over which they are discharged to the upper surface of the lower reach of the main conveyor belt and thereby carried back past certain of the operatives, who may remove them and fold them. The amount of excess material, which can thus be returned by the automatic return device, is limited and, if there should be, on the lower reach of the main conveyor belt as it reaches the idler roller 22, more material than can be conveniently taken care of by the automatic return device, the height of the pile of material on the lower reach of the main belt will be such as to interrupt the beam of light from the light source 35, thus opening the holding circuit for motor 15 and causing the motor to stop. As soon as this surplus material is removed, so that the light beam can again fall upon the photoelectric cell in relay 39, the motor will start operation again and the drive of the conveyor mechanism will be resumed. The take-up rollers 19 and 25 are so mounted as to permit the deflection of the conveyor belts 8 and 9, that will be occasioned by excess material carried up between them from the idler roller 22 to the idler roller 23.

We are aware that our invention is susceptible of considerable modification and variation, without departing from the spirit of our invention, and, therefore, we claim the invention broadly as indicated by the appended claims.

What we claim is:

1. A mechanism comprising the combination of a folding shelf, an endless main conveyor belt having an upper reach, a vertical reach and a lower reach extending alongside said shelf and the latter inclining upwardly toward the lower end of said vertical reach to a point substantially in the horizontal plane of said shelf, means for driving said main belt in a direction such that material on the lower reach is carried toward the vertical reach, and an endless auxiliary conveyor belt having a vertical reach contacting with and driven by the vertical reach of said main belt, and an upper reach terminating between the upper and lower reaches of said main belt at a point having uninterrupted access to said lower reach, whereby material carried up between said vertical reaches will be returned to the lower reach of said main belt.

2. A mechanism comprising the combination of a folding shelf, an endless main conveyor belt having an upper reach, a vertical reach and a lower reach extending alongside said shelf, and means for driving said main belt in a direction such that material on the lower reach is carried toward the vertical reach, and an endless auxiliary conveyor belt having a vertical reach contacting with the vertical reach of said main belt, and an upper reach terminating between the upper and lower reaches of said main belt at a point having uninterrupted access to said lower reach, whereby material carried up between said vertical reaches will be returned to the lower reach of said main belt.

3. A mechanism comprising the combination of a folding shelf, a driving roller, means for

driving said roller, a plurality of idler rollers, a spring-pressed take-up roller, a main conveyor belt passing around said driving, idler and take-up rollers, said rollers being so located that the belt has an upper reach, a lower reach extending alongside said shelf and a vertical reach, an auxiliary spring-pressed take-up roller between the upper and lower reaches of said main belt, and an auxiliary conveyor belt passing around said auxiliary take-up roller and certain of said idler rollers, and having a vertical reach contacting with and driven by the vertical reach of said main belt, and an upper reach terminating between the upper and lower reaches of the main belt at a point having uninterrupted access to said lower reach, whereby material carried up between the vertical reaches will be returned to the lower reach of said main belt.

4. A mechanism comprising the combination of a folding shelf, a supporting frame, a driving roller journaled on said frame, means for driving said roller, a plurality of idler rollers journaled on said frame, a spring-pressed take-up roller mounted on said frame, a main conveyor belt passing around said driving, idler and take-up rollers, said rollers being so located that the belt has an upper reach, a lower reach extending alongside said shelf and a vertical reach, an auxiliary spring-pressed take-up roller mounted on the frame between the upper and lower reaches, and an auxiliary conveyor belt passing around said auxiliary take-up roller and certain of said idler rollers, and having a vertical reach contacting with and driven by the vertical reach of said main belt, and an upper reach terminating between the upper and lower reaches of the main belt at a point having uninterrupted access to said lower reach, whereby material carried up between the vertical reaches of said belts will be returned to the lower reach of said main belt.

5. A mechanism comprising the combination of a supporting frame, a folding shelf supported thereby, a driving roller journaled on said frame, an electric motor, connections between said motor and driving roller, a plurality of idler rollers journaled on said frame, a spring-pressed take-up roller mounted on said frame, a main conveyor belt passing around said driving, idler and take-up rollers, said rollers being so located that the belt has an upper reach, a lower reach extending alongside said shelf and a vertical reach, an auxiliary spring-pressed take-up roller mounted on the frame between the upper and lower reaches, an auxiliary conveyor belt passing around said auxiliary take-up roller and certain of said idler rollers, and having a vertical reach contacting with and driven by the vertical reach of said main belt, and an upper reach terminating between the upper and lower reaches of the main belt at a point having uninterrupted access to said lower reach, whereby material carried up between the vertical reaches of said belts will be returned to the lower reach of said main belt.

6. A mechanism comprising the combination of a supporting frame, a folding shelf supported thereby, a driving roller journaled on said frame, a motor, connections between said motor and driving roller, a plurality of idler rollers journaled on said frame, a spring-pressed take-up roller mounted on said frame, a main conveyor belt passing around said driving, idler and take-up rollers, said rollers being so located that the belt has an upper reach, a lower reach extending alongside said shelf and a vertical reach, and

the lower reach is inclined upwardly to the lower end of the vertical reach, an auxiliary spring-pressed take-up roller mounted on the frame between the upper and lower reaches, and an auxiliary conveyor belt passing around said auxiliary take-up roller and certain of said idler rollers, and having a vertical reach contacting with and driven by the vertical reach of said main belt, and an upper reach terminating between the upper and lower reaches of the main belt at a point having uninterrupted access to said lower reach, whereby material carried up between the vertical reaches of said belts will be returned to the lower reach of said main belt.

7. A mechanism comprising the combination of a supporting frame, a folding shelf supported thereby, a driving roller journaled on said frame, a motor, driving connections between said motor and roller, a plurality of idler rollers journaled on said frame, a spring-pressed take-up roller mounted on said frame, a main conveyor belt passing around said driving, idler and take-up rollers, said rollers being so located that the belt has an upper reach, a lower reach extending alongside said shelf, and a vertical reach, and the lower reach is inclined upwardly to the lower end of the vertical reach, an auxiliary spring-pressed take-up roller mounted on the frame between the upper and lower reaches, an auxiliary conveyor belt passing around said auxiliary take-up roller and certain of said idler rollers, and having a vertical reach contacting with and driven by the vertical reach of said main belt, and an upper reach terminating between the upper and lower reaches of the main belt at a point having uninterrupted access to said lower reach, whereby material carried up between the vertical reaches of said belts will be returned to the lower reach of said main belt, and a chute carried by said frame adjacent the delivery end of the upper reach of said main belt.

8. A mechanism comprising the combination of a folding shelf, an endless main conveyor belt having an upper reach, a vertical reach and a lower reach extending alongside said shelf, means for driving said main belt in a direction such that material on the lower reach is carried toward the vertical reach, an endless auxiliary conveyor belt having a vertical reach contacting with the vertical reach of said main belt, and an upper reach terminating between the upper and lower reaches of said main belt at a point having uninterrupted access to said lower reach, whereby material carried up between said vertical reaches will be returned to the lower reach of said main belt, and means for discontinuing the drive of said main belt when too high a pile of material is carried by said lower reach to a point adjacent the vertical reach.

9. A mechanism comprising the combination of a supporting frame, a folding shelf supported thereby, a driving roller journaled on said frame, an electric motor, connections between said motor and roller for driving the latter, a plurality of idler rollers journaled on said frame, a spring-pressed take-up roller mounted on said frame, a main conveyor belt passing around said driving, idler and take-up rollers, said rollers being so located that the belt has an upper reach, a lower reach extending alongside said shelf and a vertical reach, an auxiliary spring-pressed take-up roller mounted on the frame between the upper

and lower reaches, an auxiliary conveyor belt passing around said auxiliary take-up roller and certain of said idler rollers, and having a vertical reach contacting with and driven by the vertical reach of said main belt, and an upper reach terminating between the upper and lower reaches of the main belt at a point having uninterrupted access to said lower reach, whereby material carried up between the vertical reaches of said belts will be returned to the lower reach of said main belt, and means for discontinuing the drive of said driving roller when too high a pile of material is carried by said lower reach to a position adjacent the vertical reach.

10. A mechanism comprising the combination of a folding shelf, an endless main conveyor belt having an upper reach, a vertical reach and a lower reach extending alongside said shelf, an electric motor, connections from the motor for driving said main belt in a direction such that material on the lower reach is carried toward the vertical reach, an endless auxiliary conveyor belt having a vertical reach contacting with the vertical reach of said main belt, and an upper reach terminating between the upper and lower reaches of said main belt at a point having uninterrupted access to the lower reach of said main belt, whereby material carried up between said vertical reaches will be returned to the lower reach of said main belt, a light source adjacent one edge of said main belt and near the lower end of the vertical reach, a photoelectric cell mounted adjacent the opposite edge of said main belt, and a motor-controlling circuit controlled by said photoelectric cell, whereby too high a pile of material on the lower reach of said main belt adjacent the vertical reach will stop said driving motor.

11. A mechanism comprising the combination of a supporting frame, a folding shelf supported thereby, a driving roller journaled on said frame, an electric motor, connections between said motor and driving roller, a plurality of idler rollers journaled on said frame, a spring-pressed take-up roller mounted on said frame, a main conveyor belt passing around said driving, idler and take-up rollers, said rollers being so located that the belt has an upper reach, a lower reach extending alongside said shelf and a vertical reach, an auxiliary spring-pressed take-up roller mounted on the frame between the upper and lower reaches, an auxiliary conveyor belt passing around said auxiliary take-up roller and certain of said idler rollers, and having a vertical reach contacting with and driven by the vertical reach of said main belt, and an upper reach terminating between the upper and lower reaches of the main belt at a point having uninterrupted access to the lower reach of said main belt, whereby material carried up between the vertical reaches of said belts will be returned to the lower reach of said main belt, a light source adjacent one edge of said main belt near the lower end of the vertical reach, a photoelectric cell mounted adjacent the opposite edge of said main belt, and a motor-controlling circuit controlled by said photoelectric cell, whereby too high a pile of material on the lower reach of said main belt adjacent the vertical reach will stop said driving motor.

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