

April 14, 1953

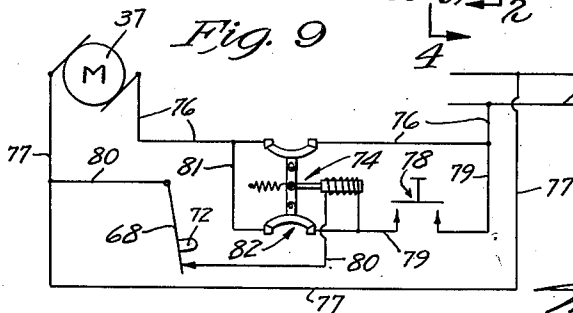
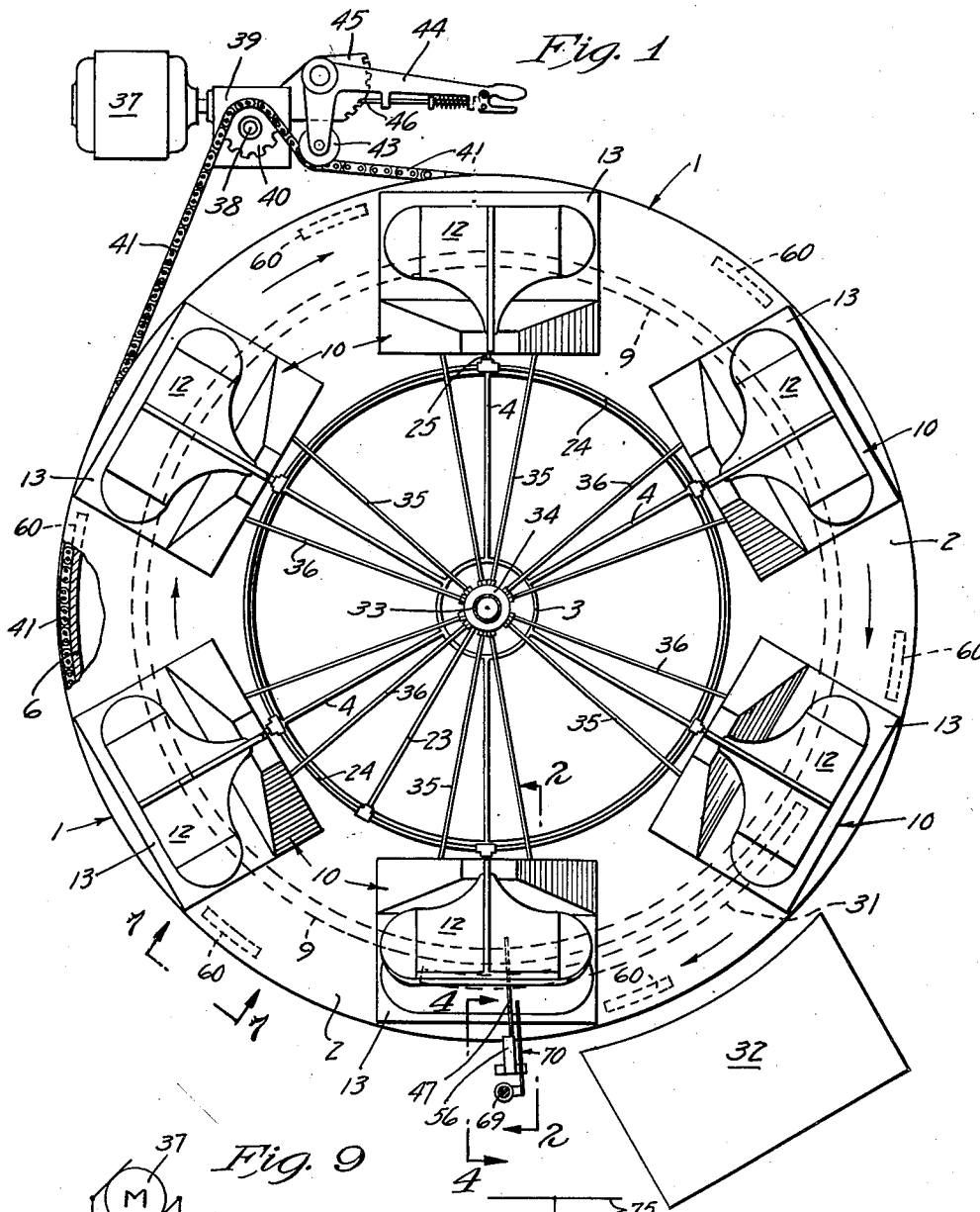
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2,634,522

SAFETY CONTROL FOR MULTIPLE IRONING MACHINES

Filed Sept. 27, 1948

3 Sheets-Sheet 1



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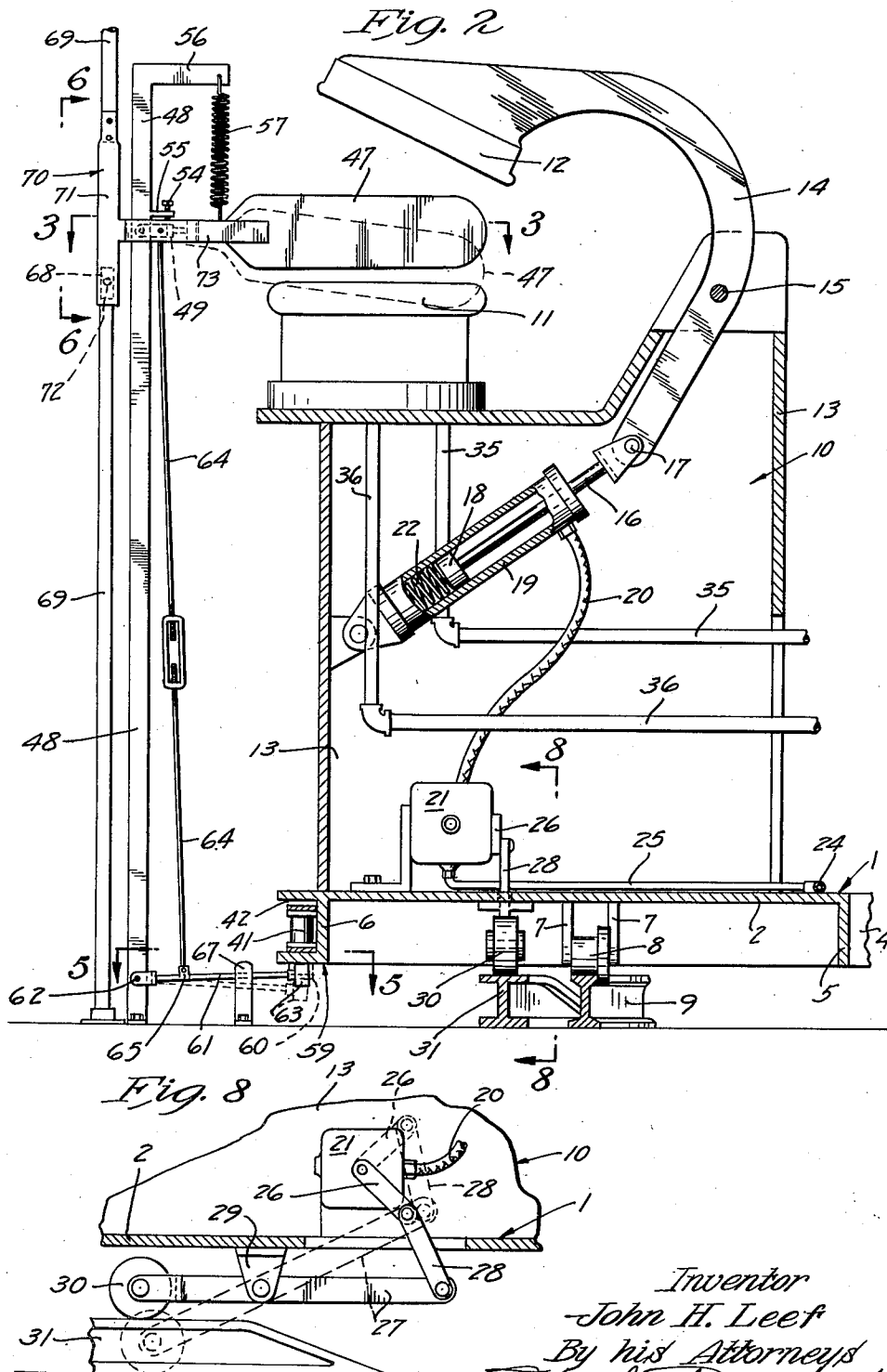
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3 Sheets-Sheet 2



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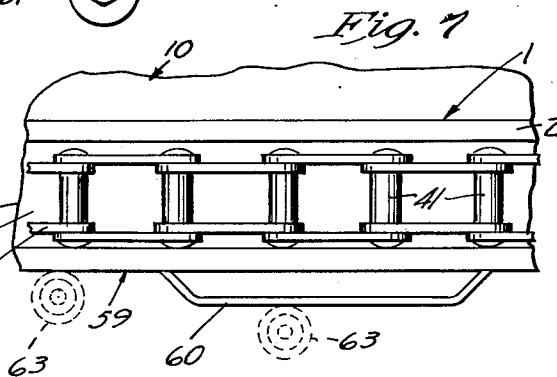
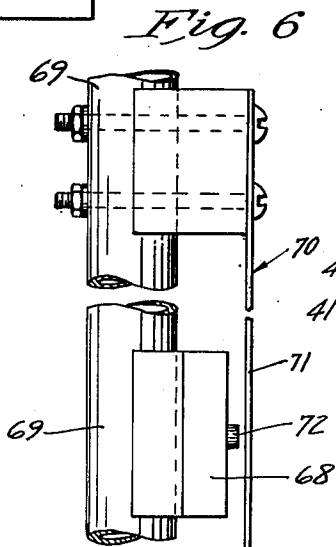
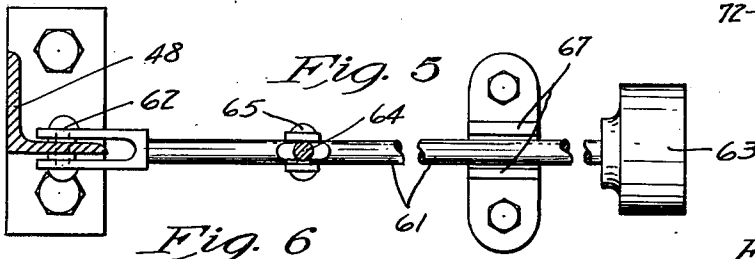
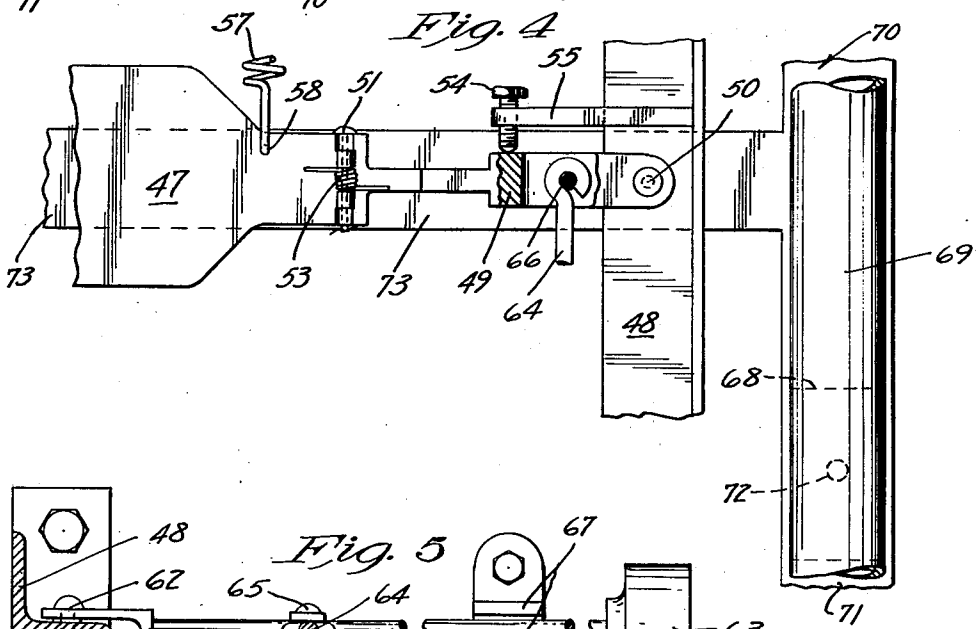
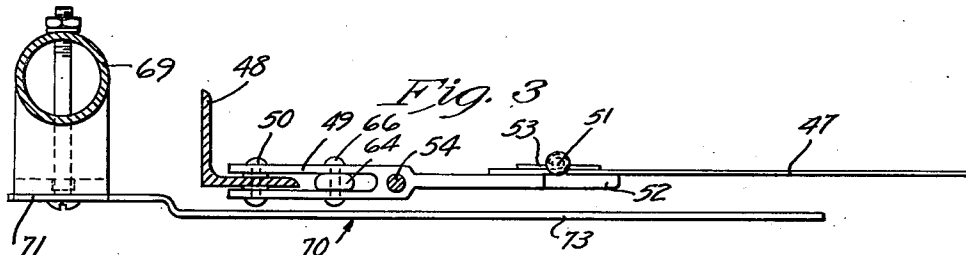
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SAFETY CONTROL FOR MULTIPLE IRONING MACHINES

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3 Sheets-Sheet 3



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SAFETY CONTROL FOR MULTIPLE IRONING MACHINES

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3 Claims. (Cl. 38—5)

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My invention relates to safety devices for garment ironers of the type having relatively fixed and relatively movable jaw-acting ironing or pressing shoes. More particularly, my present invention is adapted to be utilized in conjunction with multiple ironers of the above type which are mounted on a turntable, whereby a number of such devices may be loaded and unloaded by a single operator positioned in an operator's station closely adjacent the track upon which the turntable rotates. Such an ironing structure and the operating and heating conduits therefor are fully shown in my copending application S. N. 24,571, filed May 1, 1948, now Patent No. 2,556,477, issued June 12, 1951, and entitled "Multiple Ironing Machine."

One important object of my invention is the provision of means responsive to movement of said ironers upon the track upon which they are mounted for sweeping the space between the relatively fixed and relatively movable pressing shoes to thereby remove hands and arms of the operator immediately after the ironers are moved away from the operator's station but immediately prior to the positioning of said shoes in a closed garment-pressing position.

Another object of my invention is the provision of still further means for positively insuring that the hands or fingertips of the operator (which may have escaped the sweep) are removed from said ironers prior to closing movements of the shoes thereof.

A still further highly important object of my invention is the provision of means for positively stopping the movement of the ironers upon the track in the event that both of the above-outlined safety devices become inoperative or ineffective and the arms or other portions of the body of the operator become locked between the jaws of the pressing machine.

A still further object of my invention is the provision of devices of the type immediately above-described which are relatively foolproof in operation, durable in use, and relatively inexpensive to manufacture.

The above and still further objects and advantages of my invention will become apparent from the following detailed specification, appended claims, and attached drawings.

Referring to the drawings, wherein like characters indicate like parts throughout the several views:

Fig. 1 is a top plan view of a multiple ironing structure incorporating my novel invention;

Fig. 2 is an enlarged fragmentary section, taken substantially on the line 2—2 of Fig. 1;

Fig. 3 is a still further enlarged view, partly

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in plan and partly in section, taken substantially on the line 3—3 of Fig. 2;

Fig. 4 is an enlarged fragmentary view, partly in rear elevation and partly in section, taken on the line 4—4 of Fig. 1;

Fig. 5 is an enlarged detail partly in plan and partly in horizontal section, taken on the line 5—5 of Fig. 2, some parts being broken away;

Fig. 6 is an enlarged fragmentary detail in side elevation taken substantially on the line 6—6 of Fig. 2, some parts being broken away;

Fig. 7 is an enlarged fragmentary side elevation as seen from the line 7—7 of Fig. 1;

Fig. 8 is an enlarged fragmentary detail, partly in side elevation and partly in section, taken substantially on the line 8—8 of Fig. 2; and

Fig. 9 is a wiring diagram illustrating the electrical hook-up of my device.

Referring with greater particularity to the drawings, the numeral 1 indicates, in its entirety, a turntable comprising an annular supporting plate 2 secured to a concentric annular hub 3 by means of a plurality of radial arms 4. The plate 2 is reinforced by concentric annular flanges 5 and 6 which depend therefrom at the inner and outer circumferential edges respectively. Depending spaced flanges 7 form bearing brackets journaled wheels 8 for rotation upon an endless track 9.

Mounted fast on the annular supporting plate 2 is a plurality of circumferentially-spaced pressing or ironing devices 10 each having a relatively stationary pressing shoe 11 and a relatively movable pressing shoe 12. As shown in Fig. 2, the fixed shoes 11 are mounted on circumferentially-spaced pedestal-like bases 13. Each shoe 12 is provided with a rigid downwardly and rearwardly curved arm 14, which projects rearwardly inwardly of the turntable and is pivoted at its intermediate portion to its respective base 13, as indicated at 15. At their extreme lower ends, the arms 14 are pivotally secured to the outer ends of plunger rods 16, as indicated at 17. Each plunger rod has a piston 18 which operates within a cylinder 19 by means of fluid pressure forced thereinto and allowed to escape therefrom through any suitable means such as a conduit 20 connected to a conventional three-way valve 21. A coil compression spring 22 interposed between the piston 18 and one end of the cylinder 19 biases the piston 18 and shoe 12 in a direction to effect ironing pressure between the shoe 12 and the relatively fixed shoe 11. Fluid under pressure admitted to the cylinder 19 through the conduit 20 moves the piston 18 in a direction to remove the relatively movable shoe 12 away from the relatively fixed shoe 11. Fluid under pressure is

admitted to each of the three-way valves 21 from a source not shown through a radially-extended conduit or pipe 23, a circumferentially-extended pipe 24 connected thereto, and relatively short pipes 25 connecting the circumferentially-extended pipe 24 with each of the three-way valves 21.

The valves 21 are each provided with an arm 26 that is connected to one end of a respective lever 27 by means of a link 28. Each of the levers 27 are pivotally secured intermediate their ends to brackets 29 rigidly secured to the undersurface of the annular plate 2. At its other end, each of the levers 27 has journalled thereto a roller 30 which normally engages the floor or ground beneath the turntable 1. The roller 30 is adapted to engage and roll over a circumferentially-extended cam track 31 which is located adjacent an operator's platform or station 32. It may be assumed that, when the roller 30 engages the ground or floor below the turntable 1, the three-way valve 21 is positioned to connect the interior of the cylinder 19 to atmosphere, whereby to permit the spring 22 to move the relatively movable shoe into closed pressing engagement with the relatively fixed shoe 11. When the roller 30 rides upon the cam track 31, the valve 21 is positioned to admit fluid under pressure through the conduit 20 to the interior of the cylinder 19, whereby to move the shoe 12 away from engagement with the relatively fixed shoe 11, as indicated in Fig. 2. Thus, it will be seen, that, as each ironer 10 approaches the operator's station 32, the shoes 11 and 12 thereof will be moved to their open position so that an ironed garment may be moved therefrom and a garment to be ironed applied thereto. Upon leaving the operator's station 32, the movable shoe 12 of each ironer 10 will be moved to pressing engagement with the relatively fixed shoe 11 thereof.

Heat is supplied to the relatively fixed pressing shoes 11 from a source not shown through a supply pipe 33 and a central manifold 34, the heating medium preferably being dry steam. Inlet conduits 35 extend from the manifold 34 to the pressing shoes 11 and condensate return conduits 36 extend from the relatively fixed shoes 11 to a portion of the manifold 34 which is connected to a return pipe or conduit not shown. It will be understood, of course, that the relatively movable shoes 12 may be heated in the same manner as the relatively fixed shoes 11.

The turntable 1 is rotated at a relatively low speed by a motor 37 (see Fig. 1) which drives a shaft 38 through speed-reducing connections not shown but contained within a gear box 39. A sprocket wheel 40 is connected to the shaft 38 and positively drives a link chain 41 which extends about and is carried within a channel 42 formed by the outer peripheral portion of the annular plate 2 and the flange 6. It will be noted that the flange 6 is cross-sectionally L-shaped. The chain 41 is maintained in frictional driving contact with the flange 6 by means of an idler pulley 43 journalled to one arm of a bell crank 44, that is pivoted to a stationary quadrant 45. Pin and socket connections 46 of conventional design are utilized to maintain the idler 43 in a position to tighten the link chain 41. Obviously, moving the bell crank 44 in a counterclockwise direction with respect to Fig. 1 will loosen the link chain 41 in the channel 42. It will be observed that the turntable 1 rotates in a clockwise direction with respect to and as shown by arrows in Fig. 1.

As above indicated, my present invention re-

lates to mechanism for removing the hands and arms of the operator from between the relatively fixed and movable shoes of the ironers prior to closing movements thereof and after the operator has placed the garments to be pressed thereon. One important feature of this phase of my invention is embodied in a sweep in the nature of a paddle-shaped arm 47 which is secured to an upright supporting bracket 48 by means of a bifurcated extension 49, as indicated particularly in Fig. 3. The bifurcated extension 49 is pivoted at one end to the supporting bracket 48, as indicated at 50, for limited rocking movements in a vertical plane. At its outer end, the extension 49 is pivotally secured to the sweep 47, as indicated at 51, whereby to provide swinging movements of the sweep 47 in a horizontal plane. A portion of the bifurcated extension 49 extends beyond the pivot 51 to form a stop 52 which limits swinging movements of the sweep 47 in one direction. A torsion spring 53 biases the sweep 47 toward the outstretched position of Figs. 1, 2, and 3, in which position the sweep 47 extends transversely of the track 9 and the path of travel of the ironers 10 thereon. Rocking movements in one direction of the bifurcated extension 49 and the sweep 47 carried thereby are limited by an adjustable stop in the nature of a screw 54 having screw-threaded engagement with a bracket 55, rigidly secured by welding or the like to the supporting bracket 48. It will be seen, particularly by reference to Fig. 2, that the upper end of the supporting bracket 48 is formed to provide an arm 56 to the outer end of which is secured the upper end of a coil extension spring 57. Spring 57 has its lower end connected to the sweep 47, as indicated at 58, and biases the sweep 47 and bifurcated extension 49 toward the stop screw 54. In this position, the sweep 47 overlies the plane of the top of the pressing shoes 11 and is adapted to pass between the shoes 11 and 12 when said shoes are still in an open position as each ironer is moved beyond the operator's station but immediately prior to the shoes being moved to a closed garment-pressing position. The sweep 47 is spaced sufficiently from the relatively fixed shoes 11 to permit passage thereunder of a garment placed upon said shoe. However, should the hands of the operator still be between the shoes 11 and 12 of the ironer, they will, in all likelihood, be removed by the sweep. However, in the event that the fingers or hands of the operator should pass under the sweep, then and in that event, they will be positively removed by the mechanism now about to be disclosed. Flange 6 is in the nature of an angle iron, the outturned bottom portion 59 of which provides an annular track from which a plurality of cam elements 60 (see Fig. 7) depend, one each immediately behind each of said ironers 10. A generally horizontally-disposed lever 61 is pivotally secured to the bottom end of bracket 48, as indicated at 62, and is provided at its outer end with a cam follower in the nature of a roller 63. A rigid but adjustable link 64 is interposed between the intermediate portion of the lever 61 and the bifurcated extension 49 as indicated at 65 and 66 (see particularly Figs. 2 and 4).

Lateral movement of the lever 61 is prevented by a bifurcated guide bracket 67 secured to the ground or floor. It will be observed that coil spring 57 biases the roller 63 against the bottom of the track 59 in the path of travel of the cam elements 60. Therefore, rotation of the turntable 1 with the consequent engagement of the cam elements 60 with the roller 63 (immediately after the sweep 47 has passed between the open shoes

11 and 12 of the ironers 10 but immediately prior to the closing thereof) will impart positive movements to the sweep 47 to move the same from the full line position of Fig. 2 to the dotted line position thereof. It will be observed that, in the latter position, the sweep has been moved downwardly to intersect the plane of the fixed shoes 11, whereby it would strike the arm of the operator whose hand was still between the shoes 11 and 12. Consequent downward movement of the arm of the operator by the sweep would, of course, cause the operator's hand or fingers likewise to be forced from between the pressing shoes. This downward movement of the sweep 47 is, of course, repeated as each ironer 10 reaches the identical position on the track 9.

If, for some unforeseen reason, the hands or arms or even the clothing of the operator should become clamped between the fixed and movable pressing shoes 11 and 12 during final closing movements thereof (in spite of the above-described action of the sweep 47), then and in that event, as above indicated, I provide a still further precautionary or safety device, whereby the body of the operator, which will be tugged or dragged forwardly by the ironer in which the operator has become entangled, will be caused to impinge upon mechanism including a control switch for shutting off the electric motor 37, thereby bringing to a stop all the pressing devices 10. This mechanism includes a normally closed switch 68 mounted on a vertical supporting post 69 and engageable by an operating lever or arm 70. Preferably and as shown, the operating lever 70 comprises a vertically-disposed portion 71, the upper end of which is secured to supporting post 69 at a point above the switch 68 and forwardly offset from the plane of the switch 68 (see particularly Fig. 6). The lower end of the vertical member 71 is normally spaced from an operating switch button 72 of the switch 68 and is sufficiently resilient to engage the button 72 and operate the switch 68 when the lever 70 is flexed in the direction of movement of the ironers 10. At its intermediate portion, lever 70 is provided with a horizontally-extended portion 73 which projects generally transversely of the path of travel of the ironers 10 in forwardly-spaced parallel relationship to the sweep 47. Any portion of the operator's body coming into contact with either the portions 71 or 73 will cause the lever 70 to flex sufficiently to actuate the switch 68. The switch 68 is shown in Fig. 9 as part of a holding circuit for a relay 74 which, when energized, closes a circuit from a source of electrical power such as a power line 75 to the motor 37 through leads 76 and 77. A starting switch 78 is interposed in a lead 79 extending from lead 76 to the coil of the relay 74. The switch 68 is interposed in a lead 80 extending from the opposite end of the relay coil to lead 77. The holding circuit for the relay 74 comprises the lead 80 and switch 68, a lead 81 extending from the coil of the relay 74 to the lead 76, and holding contacts 82 in the relay 74. By this arrangement, it will be appreciated that when the switch 68 is opened, the relay 74 will become de-energized and the circuit to the motor 37 will be opened whereby to quickly stop movement of the turntable 1.

If, for any reason, the shoes 11 and 12 are caused to remain in a closed garment-pressing position when passing the operator's station, rotary movement of the turntable 1 will bring said closed shoe 12 into direct contact with the sweep 47. When the sweep 47 is engaged by a shoe 12 in a closed position, the sweep 47 will be caused to

swing on its pivot 51 against bias of the torsion spring 53 and allow the closed shoe 12 to pass thereby. When the closed shoe 12 has gone beyond the sweep 47, bias of the spring 53 will cause the sweep to return to its normal position.

My invention has been thoroughly tested and found to be completely adequate for the accomplishment of the objectives set forth; and while I have disclosed a preferred embodiment thereof, it will be understood that the same is capable of modification without departure from the spirit and scope of the invention as defined in the claims.

What I claim is:

1. In a device of the class described, a track, a garment ironer mounted on the track for traveling movements past an operator's station adjacent the track, said ironer comprising upper and lower pressing shoes mounted for relative generally vertical movements between open and closed positions, ironer operating mechanism automatically moving the ironer shoes to open position in advance of the operator's station and closing the same after the ironer has moved away from the operator's station, a non-traveling sweep extending transversely of the track and disposed between the vertically spaced planes of the working surfaces of adjacent ironer shoes when the latter are in their open positions, the sweep being located beyond the operator's station but ahead of the point at which the ironer shoes are closed, said sweep being received between the cooperating ironer shoes when the latter are in their open positions and serving to intercept an operator's hand and insure removal thereof from between the ironer shoes before closing of the ironer shoes.

2. In a device of the class described, a track, a garment ironer mounted on the track for traveling movements past an operator's station adjacent the track, said ironer comprising upper and lower pressing shoes mounted for relative generally vertical movements between open and closed positions, ironer operating mechanism automatically moving the ironer shoes to open position in advance of the operator's station and closing the same after the ironer has moved away from the operator's station, a non-traveling sweep extending transversely of the track and disposed between the vertically spaced planes of the working surfaces of adjacent ironer shoes when the latter are in their open positions, the sweep being located beyond the operator's station but ahead of the point at which the ironer shoes are closed, said sweep being normally received between the ironer shoes as the ironer is moved from the operator's station, a pivotal mounting for the sweep allowing swinging movements thereof on a generally vertical axis from its normal operative position wherein it would intercept an ironer shoe if the ironer were moved thereby with its shoes in closed position to a position outside of the path of travel of the ironer shoes when moved thereby in closed position, stop means limiting swinging movements of the sweep in the direction in which it is moved to its operative position, and yielding means biasing the sweep in the direction of said stop.

3. In a device of the class described, a track, a garment ironer mounted on the track for traveling movements past an operator's station adjacent the track, said ironer comprising upper and lower pressing shoes mounted for relative generally vertical movements between open and closed positions, ironer operating mechanism

automatically moving the ironer shoes to open position in advance of the operator's station and closing the same after the ironer has moved away from the operator's station, a non-traveling sweep extending transversely of the track and disposed between the vertically spaced planes of the working surfaces of adjacent ironer shoes when the latter are in their open positions, the sweep being located beyond the operator's station but ahead of the point at which the ironer shoes are closed, said sweep being normally received between the ironer shoes as the ironer is moved from the operator's station with the shoes in open position, means mounting and guiding the sweep for movements in a generally vertical direction from a normal position above the plane of the working surface of the lower ironer shoe when the ironer is in open position, and mechanism automatically moving the sweep in a generally vertical direction from and back to its nor-

mal position after the ironer is moved beyond the operator's station but before the ironer shoes are closed, said mechanism comprising relatively fixed and relatively movable elements, one mounted for traveling movements with the ironer and the other thereof being mounted adjacent the track, the said element which is mounted adjacent the track being located in the path of travel of its said cooperating element.

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