Feb. 3, 1953 A. B. JONES 2,627,128

VERTICAL TROUSER PRESSING MACHINE

Filed July 26, 1950 2 SHEETS—SHEET 1

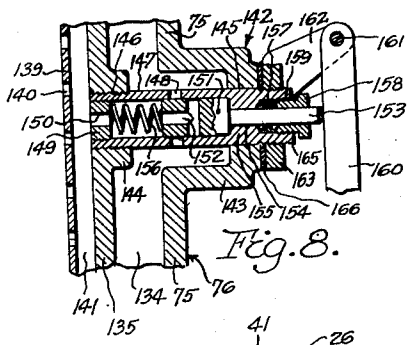


Fig. 8.

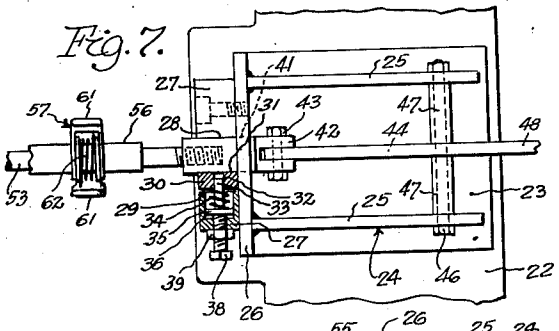


Fig. 7.

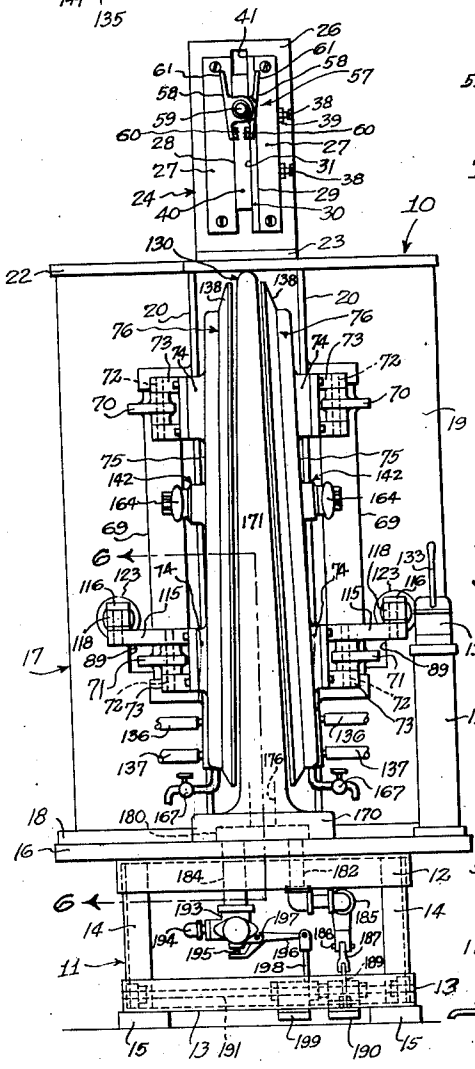


Fig. 1.

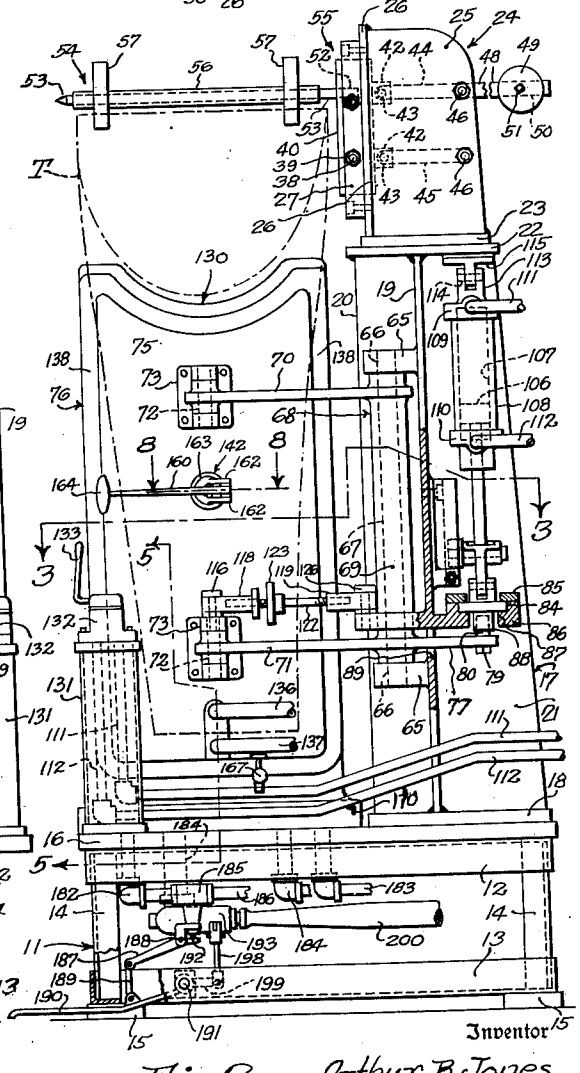


Fig. 2.

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VERTICAL TROUSER PRESSING MACHINE

Filed July 26, 1950 2 SHEETS—SHEET 2

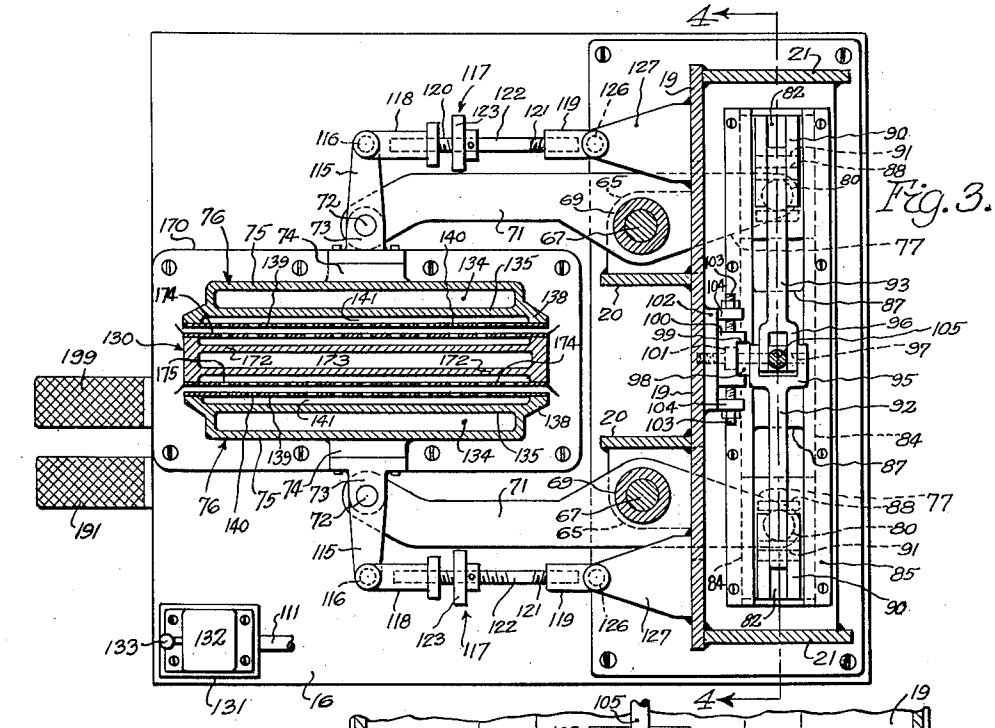


Fig. 3.

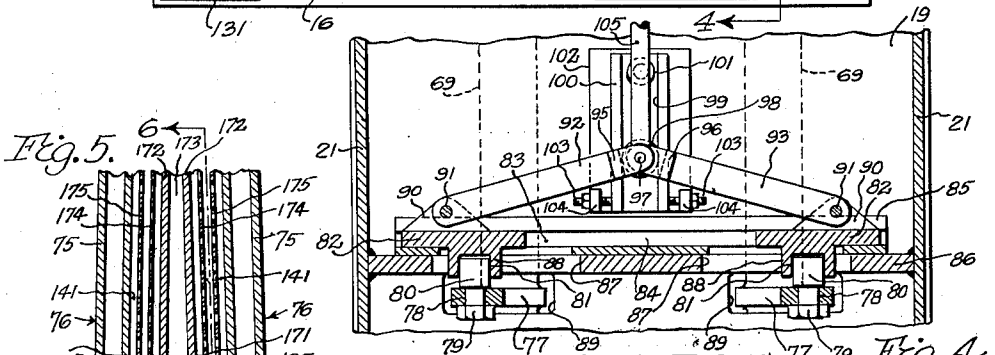


Fig. 4.

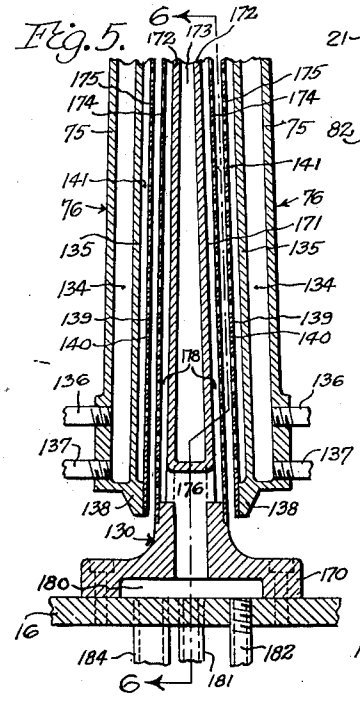


Fig. 5.

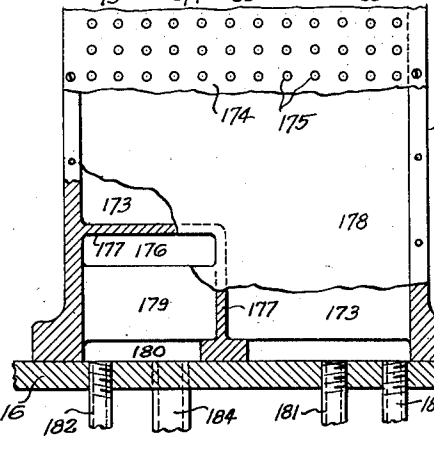


Fig. 6.

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Patented Feb. 3, 1953

2,627,128

# UNITED STATES PATENT OFFICE

2,627,128

## VERTICAL TROUSER PRESSING MACHINE

Arthur B. Jones, Detroit, Mich.

Application July 26, 1950, Serial No. 175,905

2 Claims. (Cl. 38—21)

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This invention relates to trousers pressing machines.

One object of this invention is to provide a vertical trousers pressing machine in which the trousers are held vertically while they are being pressed between vertical middle and side bucks so that both sides of both legs of the trousers are pressed simultaneously, the side bucks being swingable horizontally toward and away from the stationary middle buck by fluid pressure-operated motors which are controlled by control valves easily accessible to the operator.

Another object is to provide a vertical trousers pressing machine of the foregoing character wherein the middle buck is wedge-shaped throughout substantially its entire length, thereby enabling its covering and padding to be drawn tightly downward over it and maintained in a taut condition.

Another object is to provide a vertical trousers pressing machine of the foregoing character wherein the side bucks are opened and closed by a vertical toggle mechanism operated by a fluid pressure motor, thereby resulting in a more compact mechanism than has hitherto been provided, and economizing on the floor space occupied by the machine.

Another object is to provide a vertical trousers pressing machine of the foregoing character wherein an improved trousers carrier enables the trousers to be swung upward or downward and move inward or outward to position them properly in the machine and to adapt the machine instantly to widely different sizes of trousers.

Another object is to provide a vertical trousers pressing machine of the foregoing character having a suction device operable to forcibly withdraw the steam from the bucks after pressing, in order to more quickly dry the trousers.

In the drawings:

Figure 1 is a front elevation of a trousers pressing machine according to one form of the invention, with the buck covers and padding omitted;

Figure 2 is a side elevation of the machine shown in Figure 1 with the toggle mechanism partly in section;

Figure 3 is a horizontal section taken along the line 3—3 in Figure 2;

Figure 4 is a fragmentary vertical section taken along the line 4—4 in Figure 3; showing details of the toggle mechanism;

Figure 5 is a vertical section taken along the line 5—5 in Figure 2 showing details of the buck construction;

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Figure 6 is a fragmentary vertical section, partly in side elevation, taken along the line 6—6 in either Figure 1 or Figure 5, showing details of the middle buck construction;

Figure 7 is a top plan view, partly in horizontal section, of a portion of the trousers holder of the machine; and

Figure 8 is an enlarged horizontal section taken along the line 8—8 in Figure 2, showing the steam control valve for one of the side bucks.

*Frame and pedestal construction*

Referring to the drawings in detail, Figures 1 to 3 inclusive show a trousers pressing machine, generally designated 10, according to one form of the invention, which is an improvement over the machine disclosed and claimed in my copending application Serial No. 113,293, filed August 31, 1949, for Trousers Pressing Machine. The present machine 10 is mounted upon a sub-base structure 11 consisting of upper and lower horizontal angle members 12 and 13 respectively interconnected by vertical angle members 14, and resting upon feet or pads 15 secured to the lower horizontal members 13. The various members 12, 13, 14 and 15 are secured to one another in any suitable way, such as by welding.

Mounted on the sub-base structure 11 is the machine base 16 from the rearward portion of which rises a pedestal structure, generally designated 17. The pedestal structure 17 in turn consists of a plate-like pedestal base 18 resting upon the machine base 16. Rising from the pedestal base 18 is a vertical plate-like member 19 extending transversely of the machine 10 and forming a vertical wall near the back of the machine. This vertical wall 19 is strengthened in front by a pair of spaced vertical ribs or webs 20 (Figures 1 and 3), these being spaced not only apart from one another but also spaced inwardly from the vertical edges of the plate-like member 19. The latter is also strengthened at its outer vertical edges by vertical ribs or webs 21 extending rearwardly from the rearward side of the wall or plate-like member 19. A top member 22 in the form of a horizontal plate interconnects the vertical members 19, 20 and 21 like the bottom member or pedestal base 18, these members being secured to one another as by welding in order to form the fabricated pedestal 17.

*Trousers holder construction*

Mounted on and secured to the top member 22 of the pedestal 17 is the base 23 of a trousers holder frame 24 having plate-like parallel up-

rights 25 secured perpendicularly to a front plate-like member 26 (Figures 2 and 7) and secured as by welding to one another and to the frame base 23. Bolted or otherwise secured in parallel spaced relationship to the front plate-like member 26 is a pair of guide members 27, one of which has a vertical guide surface 28 and the other has a corresponding vertical surface 29 on the inner side of which is located a bar-like vertical pressure member 30 with an inner guide surface 31. The pressure member 30 is provided with vertically-spaced holes 32 (Figure 7) which receive the inner ends of retaining pins 33 encircled by compression springs 34. The inner ends of the compression springs 34 engage the pressure member 30 and urge it inwardly or to the left in Figure 1, whereas the outer ends of the springs 34 abut the disc-like heads 35 on the pins 33. The heads 35, pins 33 and springs 34 are housed in recesses or sockets 36 extending into the guide member 27 from the surface 29 thereof. Threaded holes 37 extend through the guide member 27 into the recesses or sockets 36 and receive adjusting screws 38, the inner ends of which engage the heads 35 of the pins 33 and compress the springs 34. In this manner, the force with which the spring 34 engages the pressure member 30 may be adjusted. Lock nuts 39 hold the screws 38 in their adjusted positions. The pins 33 are sufficiently short (Figure 7) to enter the holes 32 and permit a considerable adjustment of the springs 34 before reaching the guide surface 31.

Slidably mounted between the guide members 27 and particularly between the surfaces 28 and 31 is an elongated slide block 40 (Figures 1, 2 and 7), which extends rearwardly through a vertical slot 41 in the front plate 26 and on its rearward face is provided with vertically-spaced pairs of horizontally spaced ears 42 (Figures 2 and 7) which are bored for the passage of pivot bolts 43. Pivotally mounted on the pivot bolts 43 are the forward ends of parallel links 44 and 45, the rearward ends of which are pivotally mounted upon elongated pivot bolts 46 passing through and extending between the uprights 25 and carrying tubular spacers 47 which bear against opposite sides of the links 44 and 45. The upper link 44 is provided with a rearwardly-elongated extension 48 upon which a counterweight 49 is slidably mounted. The counterweight 49 is bored as at 50 to receive the extension 48 and is locked in its adjusted position by a set screw 51 (Figure 2).

The slide block 40 on its front side is provided with an inwardly extending threaded hole or socket 52 into which is threaded the correspondingly threaded rearward end of a rod 53 of circular cross-section. Slidably mounted on the rod 53 is a trousers carrier, generally designated 54 which forms one part of the trousers holder as a whole, generally designated 55 and including the rod 53, the slide block 40 and the parallel links 44 and 45. The trousers carrier 54 consists of a tube 56 upon which are mounted horizontally spaced clips, generally designated 57. Each clip 57 consists of a pair of lever-like members 58 (Figure 1) pivoted as at 59 to one another and having trousers gripping jaws 60 below the pivot 59 and finger grips or handles 61 above the pivot 59. A coil spring 62 urges the jaws 60 toward one another and the handles 61 away from one another so as to hold the trousers firmly between the jaws 60.

*Buck swinging mechanism*

Extending forwardly from the wall or plate-like member 19 and secured thereto and to the ribs 20 are vertically-spaced pairs of ears or lugs 65 bored as at 66 to receive vertically-disposed pivot shafts 67. Pivotally mounted on each pivot shaft 67 is an approximately U-shaped bracket structure, generally designated 68 and including a tubular hub 69 pivotally mounted on the pivot shaft 67. Extending forwardly from the hub 69 are upper and lower arms 70 and 71 respectively which are parallel to one another and at their forward ends are pivotally connected to pivot pins 72 carried by pivot brackets 73 bolted or otherwise suitably secured to bosses 74 (Figures 1 and 3) which extend outwardly from the outer walls 75 of swinging outer bucks or side bucks, generally designated 76. These are swung to and fro by the toggle mechanism described below.

Each lower arm 71 has a rearwardly projecting extension 77, the rearward end of which is drilled as at 78 (Figure 4) to receive a pivot bolt 79 on which a roller 80 is rotatably mounted. The roller 80 projects upward from the extension 77 into a cross-slot or groove 81 in a slide block 82 which reciprocates in a guideway 83 which consists of parallel grooves 84 (Figure 2) covered by retaining bars 85 bolted or otherwise suitably secured to the shelf 86 in which the grooves 84 are located. The shelf 86 extends entirely across the machine between the vertical members 21 and is secured, as by welding, to the latter and to the rearward side of the wall or plate-like member 19 (Figure 3). The shelf 86 is provided with slots or openings 87 (Figure 4) through which the bosses 88 containing the cross grooves 81 project downwardly from the slide blocks 82. The wall or plate-like member 19 is also provided with similar slots or openings 89 (Figure 4) through which the arm extensions 77 project rearwardly.

Extending upwardly from each of the slide blocks 82 is a pair of spaced ears 90 carrying a pivot pin 91. Pivotally mounted on the pivot pins 91 are the outer ends of inwardly extending links 92 and 93 (Figure 4), these having overlapping U-shaped or bifurcated portions 95 and 96 interconnected by a pivot pin 97. Also rotatably mounted on the pivot pin 97 on the forward side of the U-shaped portion 95 is a roller 98 which engages a vertically grooved guideway 99 formed in a block 100 which is pivoted by the bolt 101 to a boss 102 on the rearward side of the wall 19 (Figures 3 and 4). The pivot bolt 101 is located at the upper end of the block 100 and its lower end is adapted to be shifted to and fro by adjusting screws 103 threaded through spaced parallel ears 104 projecting rearwardly from the boss 102. Thus, by shifting the lower end of the guide block 100 slightly to one side or the other (Figure 4), the relative positions of the slide blocks 82 may be adjusted and consequently the positions to which the swinging bucks 76 are swung inward may be accurately adjusted.

Also pivotally mounted on the pivot pin 97 between the arms of the U-shaped or bifurcated portion 96 of the link 93 is the lower end of a piston rod 105 having on its upper end a piston head 106 (Figure 2) reciprocable in the bore 107 of a cylinder 108 having upper and lower cylinder heads 109 and 110 respectively served by service pipes 111 and 112 communicating with opposite ends of the cylinder bore 107. The upper cylinder head 109 is provided with spaced ears 113 carrying a pivot pin 114 mounted in a bracket

115 secured to the lower side of the pedestal top member 22. In this manner, the cylinder 108 is adapted to rock slightly to align itself with the guide groove 99 in the pivoted block 100 (Figure 4), the cross grooves 81 being provided in the slide blocks 82 in order to accommodate the mechanism to the varying radius of swing of the roller 80 on the end of each arm extension 77. As a consequence, when compressed air or other pressure fluid is admitted to the upper service pipe 111, the piston 106 is forced downward to close the side bucks 76, as explained in connection with the operation of the machine.

In order to cause the side bucks or outer bucks 76 to move approximately parallel to one another as they are swung outward by the arms 71, the lower pivot brackets 73 are provided with outwardly-extending arms 115 (Figures 1 and 3), the outer ends of which are connected by pivot pins 116 to turnbuckles, generally designated 117 and consisting of internally oppositely threaded members 118 and 119 into which are threaded the oppositely threaded ends 120 and 121 of a turnbuckle rod 122. A thumb wheel 123 is pinned or otherwise suitably secured to the rod 122 to rotate the same and thus move the members 118 and 119 toward or away from one another. Each turnbuckle member 119 is pivotally secured by the pivot pin 126 to a bracket 127 which in turn is secured to and projects forwardly from the wall or plate-like member 19 (Figure 3). By this means, the parallelism of the side bucks 76 can be adjusted relatively to the stationary middle buck 130.

Because of the limitations of space in Figure 2, the lower and upper portions of the pipes 111 and 112 are shown disconnected from one another, whereas they are, of course, actually connected to one another. The service pipes 111 and 112 of the pneumatic cylinder 108 lead upward through a tubular pedestal or stand 131 to a conventional four-way control valve 132 which is supplied with compressed air from an external source (not shown) and which also has an air vent port. The four-way valve 132 is manipulated by a handle 133 which, if shifted in one direction, admits compressed air to the upper service pipe 111 and simultaneously vents the lower service pipe 112 so as to force the piston 106 and piston rod 105 downward to close the side bucks 76. When, however, the handle 133 is shifted in the opposite direction, compressed air is supplied to the lower service pipe 112 while the upper service pipe 111 is vented, moving the piston rod 105 and piston head 106 upward to swing the side bucks 76 open and away from the middle buck 130. The four-way valve 132 is conventional and any type of four-way valve may be used for this purpose.

*Buck construction*

The side bucks 76 are of hollow elongated construction and have outer chambers 134 between their outer and inner walls 75 and 135 respectively (Figures 3 and 5). The chamber 134 is constantly supplied with steam through supply pipes 136, the condensate or exhaust steam being removed through the pipes 137. These pipes are, of course, preferably flexible in order to adapt them to the swinging of the bucks 76. The inner wall 135 of the swinging buck 76 is surrounded by a flange 138 to which a perforated wall 139 is secured, with perforations 140 for steam to pass through. The flanges 138 extend away from the inner walls 135 a sufficient distance to space the perforated wall 139 away from the inner wall 135. It will be understood that each of the side bucks 76 is covered with a layer of padding, such as felt, over the perforated wall 139, and this in turn is protected by a cloth cover. These have been omitted to simplify the drawing.

In order to supply steam to the inner chamber or space 141 between the inner wall 135 and the perforated wall 139, each side buck 76 is provided with a steam control valve, generally designated 142 (Figure 8). The outer and inner walls 75 and 135 are provided with outwardly extending bosses 143 and 144 respectively. The bosses 143 and 144 are provided with coaxial aligned bores 145 and 146 respectively, the latter being threaded to receive a tubular stationary valve sleeve 147 having ports 148 therethrough opening into the chamber 134. At its inner end, the sleeve 147 is internally threaded to receive a threaded plug 149 in which is a port 150 extending from the interior of the sleeve 147 into the inner chamber 141. Reciprocably mounted in the valve sleeve 147 is a movable valve core or member 151 having a T-shaped passageway 152 therein with its axial portion communicating with the interior of the sleeve 147 and constantly open for communication with the port 150, whereas the transverse portion is selectively communicable with the sleeve ports 148 as the valve member 151 is moved to and fro by a valve stem 153 attached thereto and extending outward through a bore 154 in the end portion 155 of the sleeve 147. A helical spring 156 constantly urges the valve member 151 outward (to the right in Figure 8) to close communication between the ports 148 and valve member passageway 152. A packing 157 and gland 158 inserted in a threaded counterbore 159 coaxial with the bore 154 prevent leakage around the valve stem 153. The latter is moved to and fro by a hand lever 160 mounted on a pivot pin 161 supported by spaced ears 162 projecting from a cap 163, the hand lever 160 carrying the knob 164 at its outer end. The cap 163 is bored and internally threaded to be screwed onto the threaded outer end portion 165 of the sleeve 147, so as to compress a gasket 166.

As a consequence, when the knob 164 is grasped by the operator and the hand lever 160 swung toward the side buck 76, the valve member 151 is moved inwardly so as to place the passageway 152 in registry with the ports 148 and admit steam from the outer chamber 134 to the inner chamber 141, as explained in the operation. The outer or side bucks 76 have approximately parallel walls 75 and 135 and 139 respectively but are tilted slightly relatively to the vertical in order to accurately engage the wedge-shaped or tapered middle buck 130. The side bucks 76 are provided with drain cocks 167 at the lower ends of their outer chambers 134 for removal of water which collects while the machine is not in use.

The middle buck 130 is provided with a base 170 which is bolted or otherwise suitably secured to the base 16 and which has the wedge-shaped buck portion 171 rising therefrom and decreasing in width in an upward direction. The middle buck 130 is provided with spaced solid inner walls 172 enclosing a central chamber 173 which is of wedge-shaped form by reason of the convergence of the walls 172 in an upward direction. Spaced away from and parallel to the inner walls 172 are outer perforated walls 174 having perforations 175 through which steam may pass from a chamber 176 enclosed by a wall 177 (Figure 6) at the lower forward corner of the middle buck 130 by way of the outer chamber 172 thereof. A pas-

sageway 179 leads upward to the outer chamber 178 from a steam supply chamber 180 in the buck base 170. Steam intake pipes 181 and 182 lead respectively from a source of steam, such as a boiler or steam generator, to the chambers 173 and 176 respectively (Figure 6), whereas exhaust or steam discharge pipes or condensate pipes 183 and 184 lead respectively out of these chambers through the machine base 16.

Connected to the steam supply pipe 182 is a steam control valve 185 (Figures 1 and 2) which in turn is connected to a steam supply pipe 186. The valve 185 is conventional and is operated by a valve lever 187 pivoted thereto as at 188 and connected by the link 189 to a foot pedal 190 pivotally mounted upon a cross rod 191 extending between opposite lower angle members 14, and operates a reciprocable valve plunger 192. The condensate pipe or exhaust pipe 184 is connected to an air-operated ejector 193 of conventional design having a compressed air supply pipe 194 (Figure 1) leading into one side thereof and controlled by a valve plunger 195 which in turn is actuated by a valve lever 196 pivoted thereto as at 197 and pivotally connected by a link 198 to a foot pedal 199 which is also pivotally mounted on the cross rod 191. The ejector 193 on its discharge side is connected to a discharge pipe 200.

*Operation*

In the operation of the invention, let it be assumed that the side bucks 76 and middle buck 130 have been provided with suitable padding and covers, as previously explained, and omitted from the drawings for simplicity of showing. Let it also be assumed that the machine is connected to a source of steam, as to a boiler or steam generator, and the air supply pipe of the valve 132 connected to a source of compressed air, such as a tank served by an air compressor. Steam passes through the pipe 183 into the chamber 173 of the middle buck 130 and condensate or exhaust steam escapes through the pipe 181, thus heating the middle buck 130. Steam also passes through the flexible pipes 136 into the outer chambers 134 of the swinging or side bucks 76 and heats the latter.

Assuming that the side bucks 76 are in their closed positions shown in the drawings, the operator shifts the handle 133 of the four-way air control valve 132 to admit compressed air to the lower service pipe 112 and vent the upper service pipe 111 to the atmosphere. This action forces the piston 106 and piston rod 105 upward, raising the inner ends of the links 92 and 93 upward (Figure 4), thereby moving the slide blocks 82 and the ends of the arm extensions 77 toward one another. This in turn swings the arms 71 and the side bucks or outer bucks 76 outward away from one another and away from the middle buck 130. The machine is then ready for the insertion of the trousers.

To press a pair of trousers T (Figure 2), the operator suspends them from the trousers holder 55 by inserting their waistband in the clips 57 of the trousers carrier 54, moving this inward or outward along the rod 53 until the trousers are properly positioned horizontally. He then moves the slide block 40 of the trousers holder 55 upward or downward, its parallelism being maintained by the parallel links 45, until the trousers legs are properly positioned vertically and inserted between the middle buck 130 and the side bucks 76 on opposite sides of the upstanding portion 171 of the middle buck 130. The pressure plate 30, impelled by the springs 34, frictionally engages the slide block 40 and holds it in its adjusted position. The counterweight 49 counterbalances the weight of the trousers T.

The operator now shifts the valve lever 133 in the opposite direction, admitting compressed air to the upper service pipe 111 and venting the lower service pipe 112, causing the piston head 106 and piston rods 105 to move downward. This action swings the slide blocks 82 and the ends of the arm extensions 77 away from one another, swinging the arms 71 and side bucks 76 toward one another into engagement with the trousers which are draped over the middle buck portion 171.

The operator then steps upon the foot pedal 190 to admit live steam to the outer chamber 178, this steam permeating the pores of the garment through the holes 175. He also grasps the knobs 164 and shifts the valve levers 160 to open the valve 142 and admit live steam from the outer chambers 134 of the side bucks 76 to the inner chambers 141 thereof. This steam escapes through the holes 140 and likewise permeates the pores of the garment. When the garment has been sufficiently pressed and steamed in this manner, the operator releases the foot pedal 190 and the knobs 164 of the hand levers 160, cutting off the flow of live steam to the garment. To dry the garment, he then steps on the foot pedal 199, simultaneously opening the condensate pipe 184 to the exhaust pipe 200 and likewise opening the air supply pipe 194 to the ejector 193. The blast of air through the ejector, according to the well-known principles of the Venturi tube and of injectors based thereon, creates a suction which in turn sucks the steam out of the outer chamber 178 of the middle buck 130 and consequently dries the garment.

The operator then shifts the air control hand lever 133 to admit compressed air to the lower service pipe 112 and vent the upper service pipe 111, swinging the side bucks 76 open in the manner previously described. The trousers may then be removed by grasping the handles 61 of the clips 57 so as to separate the jaws 60 and release them from their grip upon the waistband of the trousers T.

As the trousers carrier 54 is removable from the machine, the operator or his assistant may attach the trousers to such carriers 54 away from the machine and mount them upon a rack adjacent the machine, ready to be pressed as the operator takes them up in order. This enables a large quantity of trousers to be pressed rapidly and efficiently, with the attaching of the trousers being done by comparatively unskilled persons.

What I claim is:

1. A vertical trousers pressing machine comprising a vertically-disposed hollow elongated inner pressing member, a supporting structure, a pair of vertically-disposed hollow elongated outer pressing members disposed on opposite sides of said inner pressing member and pivotally connected to said supporting structure for motion toward and away from said inner pressing member, and heating fluid supply and discharge conduits connected to said pressing members, and a trousers holder connected to said supporting structure and overhanging said pressing members, said trousers holder having a horizontal trousers supporting elements, clamps thereon having opposed clamping elements engageable with the trousers waistband on opposite sides of the trousers for securing the trousers waistband thereto.

a vertically-movable element connected to said supporting element, and a parallel linkage pivotally mounted on said supporting structure and pivotally connected to said vertically-movable element.

2. A vertical trousers pressing machine comprising a vertically-disposed hollow elongated inner pressing member, a supporting structure, a pair of vertically-disposed hollow elongated outer pressing members disposed on opposite sides of said inner pressing member and pivotally connected to said supporting structure for motion toward and away from said inner pressing member, and heating fluid supply and discharge conduits connected to said pressing members, and a trousers holder connected to said supporting structure and overhanging said pressing members, said trousers holder having a horizontal trousers supporting element, a tubular element slidably mounted on said horizontal supporting element, clamps on said tubular element having opposed clamping elements engageable with the



trousers waistband on opposite sides of the trousers for securing the trousers waistband thereto, a vertically-movable element connected to said supporting element, and a parallel linkage pivotally mounted on said supporting structure and pivotally connected to said vertically-movable element.

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