United States Patent

Michaels

[15] **3,685,179**

[45] **Aug. 22, 1972**

[54] GARMENT SPREADING APPARATUS

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[73] Assignee: **Levi Strauss & Co.,** San Francisco, Calif.

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[52] **U.S. Cl.**.....**38/21,** 223/2

[51] **Int. Cl.**.....**D06f 71/18,** D06f 71/40

[58] **Field of Search**.....223/2, 61, 63, 65; 38/17–21, 22, 23; 100/232; 53/116, 117

[56] **References Cited**

UNITED STATES PATENTS

2,917,211	12/1959	Silverman	223/2
3,112,847	12/1963	Brumby	223/2
3,430,368	3/1969	Wright	223/2 X

Primary Examiner—Jordan Franklin
Assistant Examiner—Geo. V. Larkin
Attorney—Oblon, Fisher & Spivak

[57] **ABSTRACT**

An apparatus for use with a garment press or the like for spreading portions of a garment prior to pressing is provided which features a pair of spreader elements adapted to receive the bottom of a trouser leg or the like thereover and being relatively movable away from each other to spread the trouser leg for pressing. The spreader elements are mounted on a platform movably disposed along a given line in response to operation of a pressing head for withdrawing them from the garment just prior to the press head coming into contact with the garment. A pressure actuated piston having a rack on one end drives a pinion carried on a shaft supporting another pinion which engages racks formed on the spreader elements for spreading these elements. Another pressure actuated piston operates to move the platform away from the trouser leg. Closing of the spreader elements may be effected by a spring biasing the shaft on which the pinions are mounted against movement by the piston or, alternatively, by a dual rack arrangement engaging the driving pinion and operatively connected with both pistons. In addition, the platform is angularly adjustable relative to the line of movement for displacing the spreader elements relative to the longitudinal axis of the press pad.

21 Claims, 11 Drawing Figures

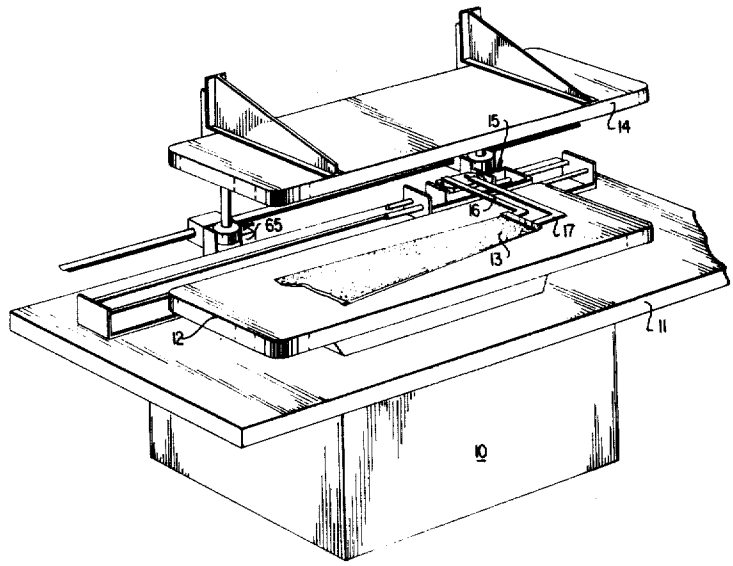


FIG. 1

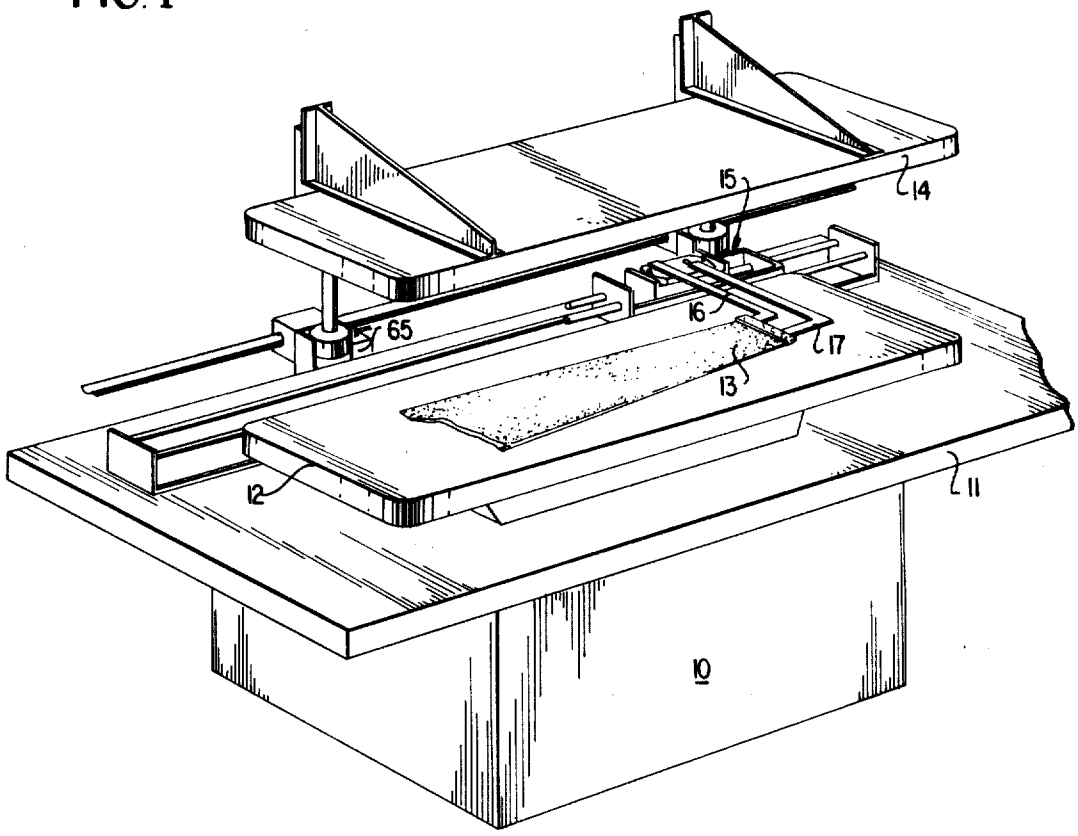
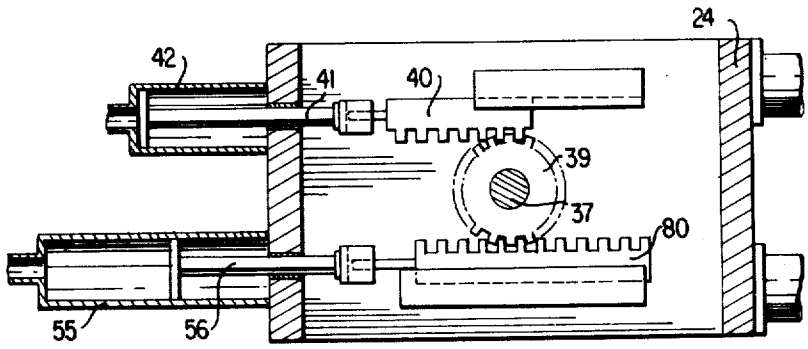


FIG. 11



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BY Olson Fisher & Spruce
ATTORNEYS

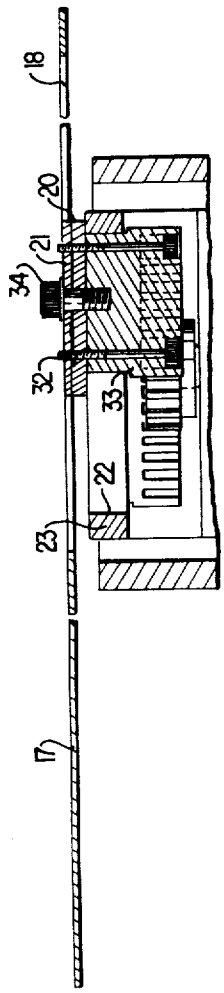


FIG. 6

FIG. 2

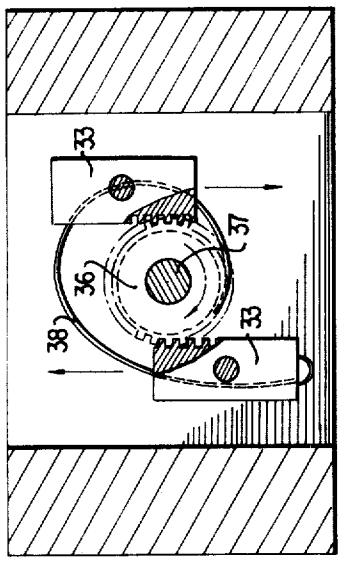


FIG. 5

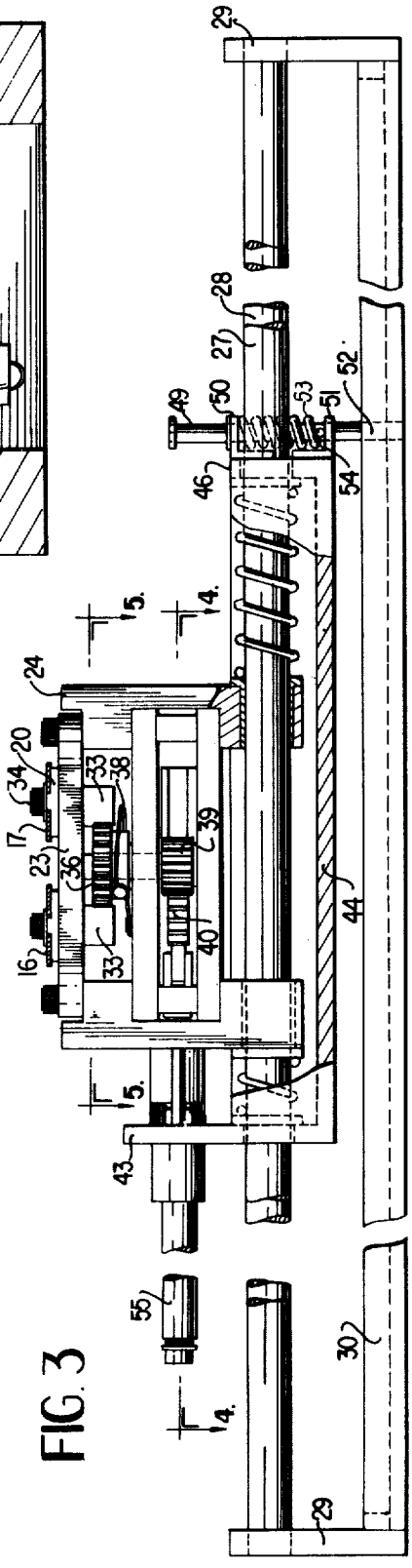


FIG. 3

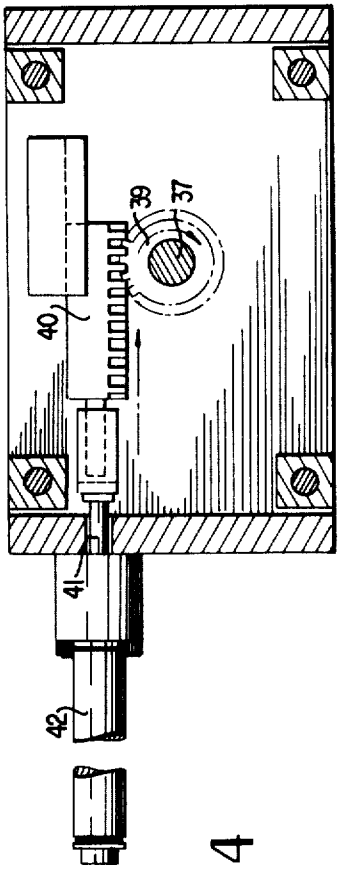
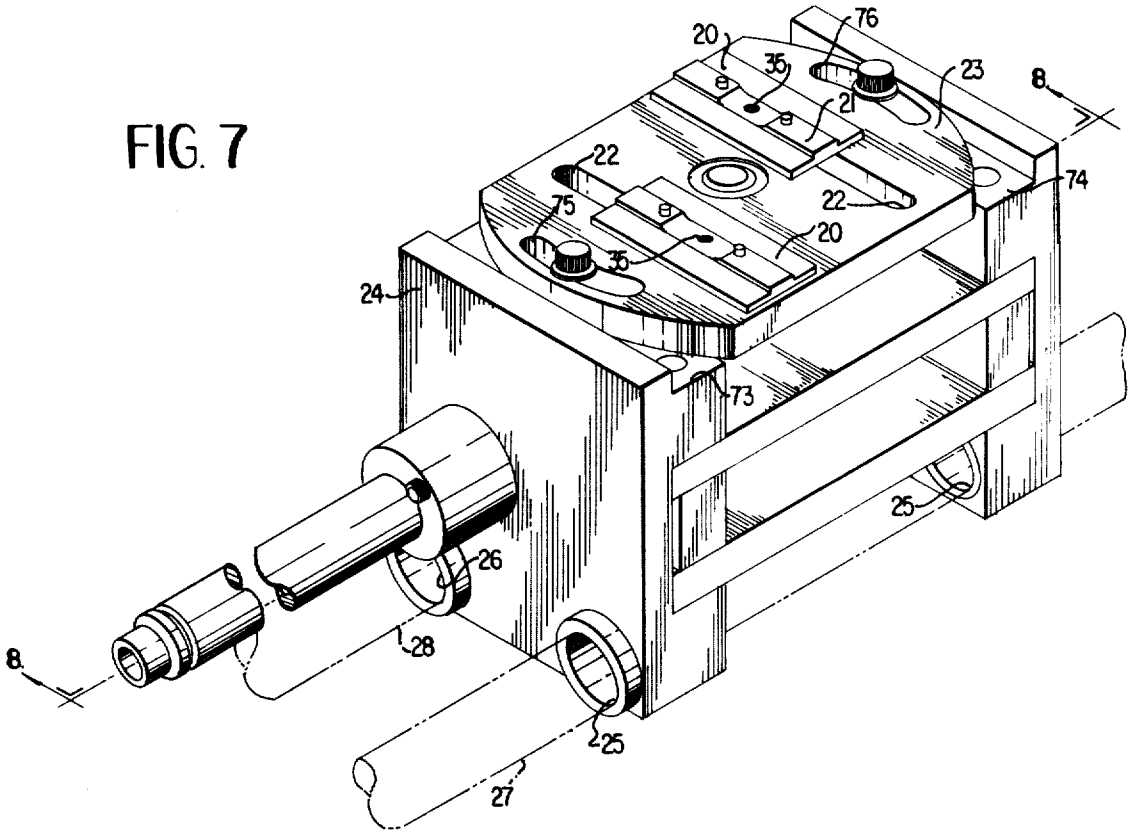


FIG. 4

FIG. 7


20
76
35
23
8
21
22
74
75
22
20
35
24
73
25
26
8
28
25
27

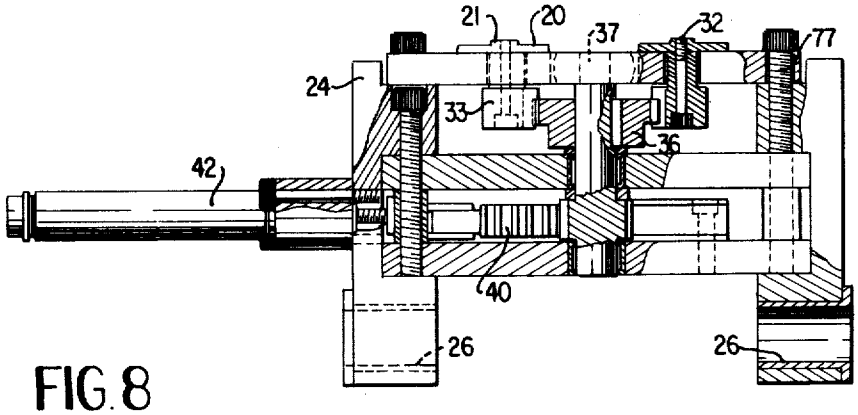

21
20
37
32
77
24
33
36
42
40
26
26

FIG. 8

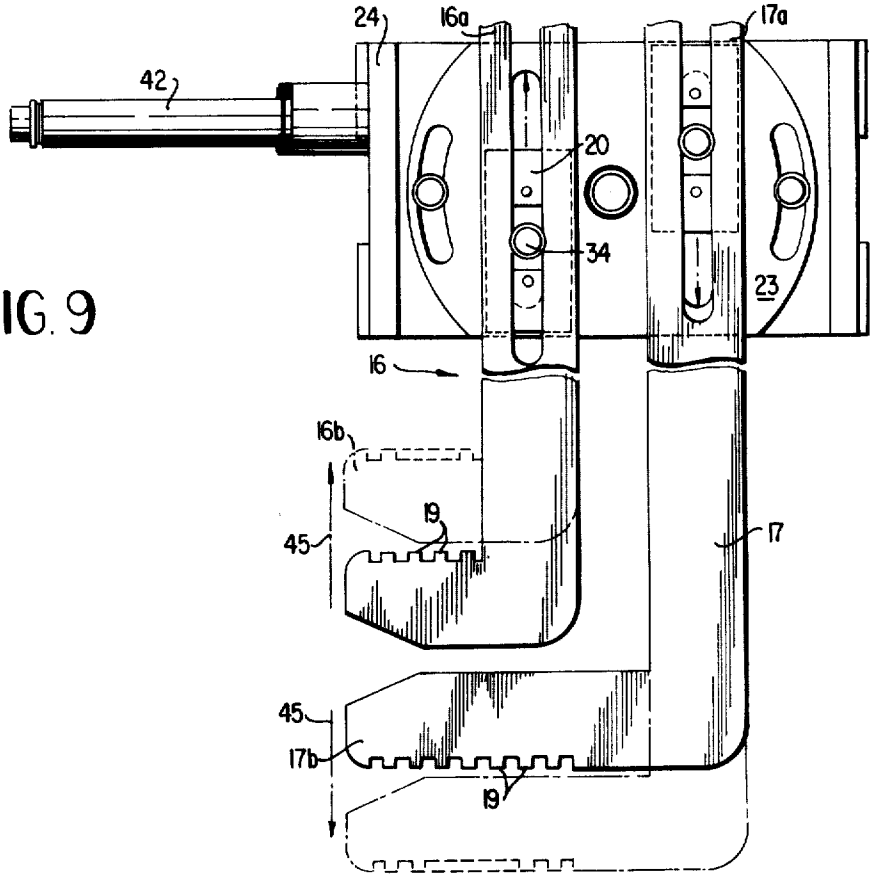

24
16a
17a
42
20
34
23
16
16b
19
45
17
45
17b
19

FIG. 9

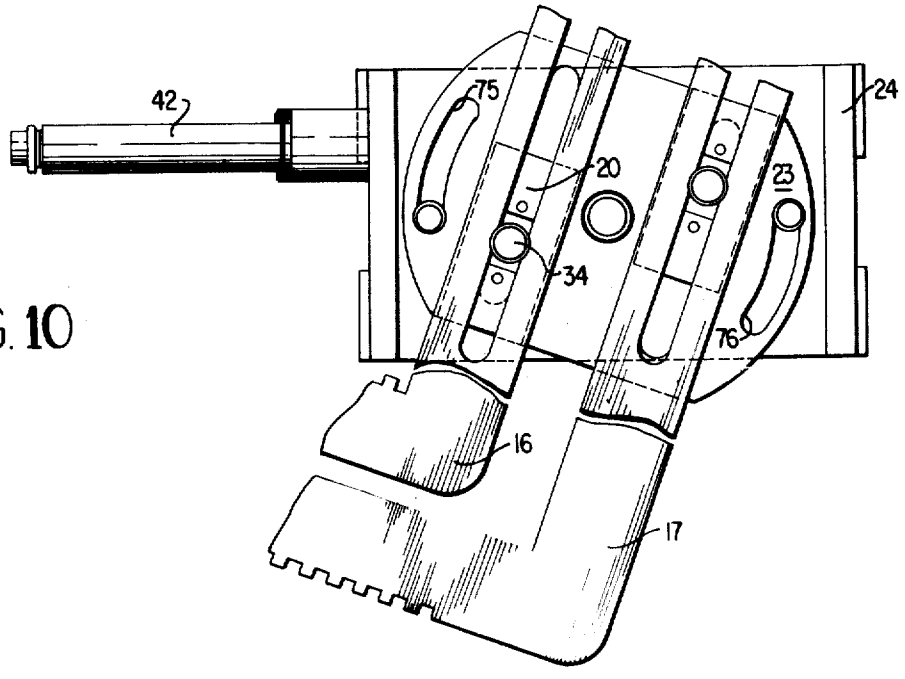

42
75
24
20
23
34
76
16
17

FIG. 10

GARMENT SPREADING APPARATUS

BACKGROUND OF THE INVENTION

This invention relates to garment pressing and more specifically to an apparatus for spreading garments during a pressing operation, particularly for spreading the cuffs or legs of trousers prior to pressing.

For many years, producers of trousers and the like, particularly of the permanent press variety, have had to pre-press the pants in order to maintain an adequate level of quality of the leg press provided therein. Recently, however, apparatus has been provided for automatically spreading the bottom of the trouser leg prior to pressing the same, whereby the one hand of the presser is free to smooth out the trouser leg during the normal pressing operation, so that this pre-pressing step has been virtually eliminated. Such an apparatus is shown in U.S. Pat. No. 3,430,368, issued Mar. 4, 1969, to Nathaniel L. Wright, Jr. The garment spreader disclosed in the aforementioned patent utilizes a pair of cuff-spreading elements which are spreadable within a trouser leg disposed thereover to tension trouser cuffs in preparation for pressing and which are adapted to be automatically withdrawn from the trouser leg just prior to contact therewith of a pressing head so that the imprint of the elements are not left on the garment after pressing.

Although the former garment spreading devices of the character described have heretofore been generally successfully operated, they nevertheless are not considered to be completely satisfactory in all respects. For example, although such devices are adjustable to accommodate various length inseams and different width bottoms, these adjustments may be effected only along a line which is parallel with the slides or track supporting the platform on which the spreading elements are disposed, such as by moving the platform therealong, and along a line substantially perpendicular thereto, such as by shifting the spreaders laterally of the platform and the track of guides slidably supporting the same.

In pressing various sizes and shapes of pants, however, the general axis of the pants is not always alignable with the longitudinal axis of the press pad. In the past, the supporting guides of the garment spreading devices are generally initially set up beside the press and aligned in parallel relation with the longitudinal axis thereof, and in order to vary the angular relation therebetween, it has been necessary to dismantle and move the entire structural supports of the device on the table of the press to alter the position of the guides, and thus the movable path of the spreader element-supporting platform defined thereby, relative to the longitudinal axis of the press pad. In most pants-producing factories, however, the garment spreader supports are installed close to the press and there is very little room for maneuverability, but besides this, it is also a very difficult operation to set up the supports in precisely the desired positions. Thus, until now, there has not been any satisfactory method provided in these devices for angularly adjusting the spreader elements relative to the supporting platform or the guides upon which the platform is displaceable, so that they may always move relative to each other when being spread apart along a line perpendicular to the axis of any trouser leg.

Another major disadvantage of the prior art devices is the frequent failure thereof due to excessive wear resulting from the manner in which the air distribution systems have operated in the past to supply and exhaust the fluid motors provided for actuating the spreader elements and moving the spreader element-supporting platform away from the trousers to prevent leaving an imprint of the spreader in the leg when it is being pressed. This occurs because, while the garment is relaxed, namely, during the entire period that the cuff spreader elements are closed for receiving a trouser leg, or reclosed for being withdrawn from the leg while it is being pressed, which condition persists until the pressed pants are removed and a new pair is readied, the cylinder of the fluid motor for operating the spreader elements remains charged. Being under this substantially constant charge, of course, causes the seals in the fluid motor to break down, which requires costly repairs and more importantly, puts the machine out of operation so that the production effort is seriously injured.

Also, in one embodiment disclosed in the aforementioned Wright patent, only one of the spreader elements is movable. In this case, when the elements are withdrawn from the garment, there is a tendency for the immovable element to tear or at least drag the garment therewith.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide an improved garment spreading device which is quickly and easily operable for spreading a garment prior to pressing, does not leave its imprint on the garment after pressing, and is readily adjustable in all directions in a given plane to suit the particular shape and size of the garment being pressed.

Another object of the present invention is to provide an improved garment spreading device, particularly suited for spreading the bottoms or cuffs of trouser legs, which is relatively inexpensive to manufacture, may be readily incorporated into both new and old presses, and is easily adjustable within its originally installed position to accommodate any size and shape of trouser leg.

Still another object of this invention is to provide a garment spreading device having an improved mechanism for operating the spreader elements thereof which provides highly effective and dependable performance and has substantially fewer wear characteristics than former devices of the character described, whereby repair and shut-down costs are minimized.

A further object of the invention is to provide a garment spreading device, particularly suited for spreading the bottoms or cuffs of trouser legs, having an improved method of operating the spreader elements which permits adjustment of the same to suit substantially all sizes and shapes of pants without dismantling the structural supports thereof and which is less subject to wear-induced breakdown than former garment spreading devices.

The foregoing and other objects are realized by the present invention which is embodied in a garment spreading apparatus comprising a pair of spreader elements adapted to receive the bottom or cuff of a

trouser leg thereover and being relatively movable away from each other to spread the trouser leg for pressing. The spreader elements are adjustably mounted on a platform which is movable along an established line in response to operation of the pressing head for withdrawing them from the garment just prior to the press head coming into contact with the garment, whereby no imprint of the elements are pressed into the garment. A pressure actuated piston having a rack formed on one end thereof cooperates with a pinion carried on a shaft supporting another axially spaced pinion which in turn engages racks formed on the spreader elements for spreading these elements to anchor the bottom of the trouser leg and spread the same. Another pressure actuated piston operates to move the platform away from the trouser leg to withdraw these spreaders. Closing of the spreader elements may be effected by a spring biasing the shaft on which the pinions are mounted against movement by the pressure actuated piston or, in another embodiment, by a dual rack arrangement engaging the one pinion and operatively connected with both of the pistons. The spreader element-supporting platform is returned to an initial trouser leg-receiving position by spring means resisting movement of the platform along the aforementioned established line.

Adjustment of the spreader elements laterally of the platform supporting the same is permitted by the provision of elongate slots in the elements which receive clamping pins threadably engaging a plate fixed to the top of the platform for securing the elements in a fixed lateral position relative thereto. By providing for rotational disposition of the plate about an axis perpendicular to the plane of the plate and passing between the elongate slots in the elements, it is possible to angularly displace the spreader elements relative to the longitudinal axis of the press pad adjacent which the garment spreading device is installed.

BRIEF DESCRIPTION OF THE DRAWINGS

Various other objects, features and attendant advantages of the present invention will be more fully appreciated as the same becomes better understood from the following detailed description when considered in connection with the accompanying drawings in which like reference numerals designate like or corresponding parts throughout the several views, and wherein:

FIG. 1 is a perspective view of a garment press incorporating one embodiment of the present invention;

FIG. 2 is an enlarged plane view of the garment spreader device included in the press of FIG. 1 with a flow control system for its actuating mechanism being schematically shown;

FIG. 3 is a side view, partly in section, of the garment spreader device shown in FIG. 2;

FIG. 4 is a cross-sectional view taken generally along lines 4—4 of FIG. 3;

FIG. 5 is a cross-sectional view taken generally along lines 5—5 of FIG. 3;

FIG. 6 is a cross-sectional view taken along lines 6—6 of FIG. 2;

FIG. 7 is an enlarged perspective view of the spreader element-supporting platform of the garment spreader device shown in FIGS. 2 – 6, particularly showing the angular adjustment mechanism of the garment spreader elements;

FIG. 8 is a cross-sectional view taken generally along lines 8—8 of FIG. 7;

FIG. 9 is a plan view of the spreader elements illustrating in solid lines the relationship of the elements when in position to receive a relaxed garment, and in dotted lines upon being spread apart for tensioning the garment just prior to pressing;

FIG. 10 is a plan view of the garment spreading elements angularly displaced relative to the longitudinal axis of the supporting platform; and,

FIG. 11 is a schematic illustration of a portion of a garment spreader device representing another embodiment of the invention.

DESCRIPTION OF THE ILLUSTRATED EMBODIMENTS

Referring now to the drawings, and more particularly to FIG. 1, there is shown for illustrative purposes only, a typical garment press including a base 10 supporting a horizontal table 11 on which there is disposed a press pad 12 of conventional design for receiving a garment, such as the leg 13 of a pair of trousers. Positioned adjacent the press pad 12 and movable relative thereto between an open or garment receiving position shown in FIG. 1 and a closed or pressing position firmly contacting the press pad for pressing the garment is a press head 14 of any conventional design, being shown here as a square type press, or one which moves vertically relative to the press pad, although the device of this invention is equally capable of being incorporated with a pivotally operating type press head.

A garment spreader device generally designated by the numeral 15 and embodying the present invention is incorporated in the pressing apparatus of FIG. 1, wherein it is shown as being mounted on the table 11 along one longitudinal side of the press pad 12 so that a pair of cuff spreader elements 16 and 17 projecting outwardly therefrom are in position to receive the bottom or cuff of the trouser leg 13 for spreading and tensioning the trouser cuff in preparation for pressing, as will be hereinafter described in detail.

Referring now more particularly to FIGS. 2 and 3, the spreader elements 16 and 17 are shown as being planar blades having elongated main body portions 16*a* and 17*a*, respectively, on the ends of which are integrally formed end arms 16*b* and 17*b* projecting at right angles from the main body portions so as to be insertable into the trouser leg 13. Each of the spreader elements 16 and 17 is provided with an elongate, or longitudinal, slot 18 in the main body portion thereof and has a serrated edge 19 on that portion of the laterally projecting arm which is adapted to engage the trouser leg for spreading and tensioning the same.

The spreader elements 16 and 17 are mounted on supports 20 having elongate keys 21 formed thereon for being received within the slots 18 in the elongate main body portions 16*a* and 17*a* of the spreader elements, and the supports 20 are slidably mounted in parallel slots 22 provided in a platform member 23 for permitting the spreader elements 16 and 17 to be mounted with the elongate main body portions 16*a* and 17*a*, respectively, thereof being disposed and maintained in parallel relation to each other. The platform 23 is adjustably supported in a manner to be described hereinbelow within a housing member 24 having parallel pairs of aligned openings 25 and 26 formed in op-

posing end walls thereof for receiving longitudinally disposed slides **27** and **28**, respectively, being mounted at their ends in spaced vertically oriented brackets **29** for slidably supporting the housing **24**. An elongate base plate **30** is disposed below the slides **27** and **28** and between the upstanding end brackets **29**, being connected to the end brackets for supporting the same, and is secured to the table **11** in any well known manner.

Disposed below each of the sliding supports **20** and secured thereto by threaded bolts **32** is a rack member **33** being generally aligned in parallel relation with the slots **22** in the platform **23**. The spreader elements **16** and **17** are secured in preselected positions on the sliding supports **20** by clamping bolt members **34** which project through the elongate slots **18** of the spreader elements and through openings **35** centrally formed in the sliding supports **20** to threadably engage their respective rack members **33**.

As shown in FIG. **3**, and in greater detail in FIG. **5**, the rack members **33** engage diametrically opposed teeth of a pinion **36** disposed therebetween and rotatably mounted on a vertical shaft **37**, so that upon rotation of the pinion **36** in either direction the rack members **33** are moved in relative opposite directions. A spring member **38** is secured at one end to the housing **24** and at the other end to the pinion **36** to normally urge rotation of the pinion **36** in a counterclockwise direction.

Positioned below the pinion **36** and secured to the same shaft **37** is a lower pinion member **39** which, as shown in FIGS. **3** and **4**, engages a rack **40**. The rack **40** is operatively engaged by a piston rod **41** of a motor shown as a fluid air motor including a cylinder **42** mounted with respect to the housing **24** through an upstanding wall **43** of an enclosure unit **44** surrounding the housing **24** and also being slidably mounted on the longitudinal slides **27** and **28**. Thus, upon application of air under pressure into the cylinder **42**, the rack **40** will be moved to the right, as shown herein, to rotate the lower pinion **39** in a clockwise direction. Rotation of the pinion **39** also rotates the shaft **37** on which it is disposed in the same direction and consequently causes the upper pinion **36** to likewise be turned in a clockwise direction. Through their engagement with the rotating pinion **36**, the racks **33** are moved in opposite directions, carrying with them the sliding supports **20** secured thereto, so that the serrated arms **16***b* and **17***b* of the spreader elements **16** and **17**, respectively, are separated for spreading the cuff of a trouser leg **13**. This spreading movement of the elements **16** and **17** for tensioning the trouser leg **13** is illustrated in FIG. **9**, wherein the spreader elements are shown in solid line form in their normal rest position for receiving the trouser leg and in dotted line form being moved in the direction of the arrows **45** for tensioning the trouser leg. Upon release of pressure from the cylinder **42**, according to a scheme to be set forth in detail hereinbelow, the spring **38** forces the return of the spreader elements to the original position shown in FIG. **9** in solid line form by rotating the upper pinion **36** in a counterclockwise direction and thereby operatively moving the spreader element-supporting racks **33** in opposite directions until the lower rack **40** being simultaneously returned by its cooperative engagement with the lower pinion **39** returns the actuator rod **41** to its normal rest position which normally includes a biasing means within the cylinder **42**, not shown.

Referring again to FIGURES **2** and **3**, the movement of the housing **24** supporting the spreader elements **16** and **17** a predetermined distance along the slides **27** and **28** for the purpose of withdrawing the spreader elements from the trouser leg immediately prior to pressing the same will now be explained. The housing **24** is mounted on the slides **27** and **28** within the enclosure frame **44** between end walls **43** and **46** thereof. Between one end of the housing **24** and the end wall **46**, coil springs **47** and **48** are disposed about the slides **27** and **28**, respectively, for normally biasing the housing **24** in the direction of the other end wall **43** of the enclosure frame **44**. To prevent movement of the enclosure frame **44** on the slides **27** and **28**, a pin member **49** is projected downward through parallel brackets **50** and **51** secured to the end wall **46** of the enclosure frame **44** and is positioned in one of a plurality of holes **52** provided in the base plate **30**. The pin **49** is maintained within the desired hole **52** by the biasing force of a coil spring **53** positioned about the pin and compressed between the upper bracket **50** and a lateral pin **54** projecting from the pin **49** and being urged against the lower bracket **51**. Another motor shown as a fluid air motor including a cylinder **55** is secured to the end wall **43** of the enclosure frame **44** and has a piston rod **56** secured to one end of a piston, not shown, slidably disposed therein. The piston rod **56** is freely movable through the wall **43** and engages the adjacent wall of the housing **24**. Thus, upon application of air under pressure to the cylinder **55**, the rod **56** is moved to the right, as shown in FIG. **2**, whereby the housing **24** is pushed along slides **27** and **28** against the biasing force of springs **47** and **48**, causing the springs **47** and **48** to be further compressed between the housing **24** and the end wall **46** of the enclosure frame **44**. In this manner, it may be seen that the spreader elements **16** and **17** supported on the platform **23** which is mounted in the housing **24** are moved generally longitudinally relative to the press pad **12** to be withdrawn from the trouser leg **13** positioned thereon. When pressure is evacuated from the cylinder **55**, the housing **24** is returned to its original position by the coil springs **47** and **48**. Smaller coil springs **57** and **58** are respectively disposed on the slides **27** and **28** between the end wall **43** of the enclosure frame **44** and the adjacent wall of the housing **24** for generally offering a slight resistance to the housing return and thereby to absorb the energy of the return and prevent damage to the apparatus.

Referring now to FIG. **2**, there is schematically illustrated an exemplary air distribution system for supplying and exhausting the fluid motor cylinders **42** and **55** during a normal pressing operation. This system includes a fluid pressure supply source **60** communicable with the fluid motor cylinders **42** and **55** through conduits **61** and **62** which, respectively, are connected with fluid switches **S1** and **S2**. The switch **S1** is a conventional switch of the type adapted to be actuated in one direction by manually depressing the same and in the other direction by an application of fluid pressure to the other end. Thus, in the illustrated position of **S1**, the cylinder **42** is being vented, and upon manually pressing the plunger **63** of switch **S1**, by hand or through a foot operated pedal, flow between the supply

source 60 and cylinder 42 is conducted through a line 64, the switch S1 and the line 61 to actuate the piston rod 41 for spreading the cuff spreader elements 16 and 17. Switch S2 is another switch of conventional type which is actuated by an arm 65 fixed to the press head 14, as shown in FIG. 1, and which in the illustrated position permits venting of both the fluid motor cylinder 55 through line 62 and the fluid pressure actuating end of the switch S1 through a line 66. When the press head 14 is lowered, the press arm switch 65 is actuated to move the switch S2 in a direction indicated by the arrow 67 for connecting the fluid supply source 60 through conduit 68, conduit 69, switch S2 and conduit 66 to the switch S1 to return the switch S1 to the shown position, whereby cylinder 42 is vented and the cuff spreader elements 16 and 17 are drawn together automatically by the force of the spring 38. Simultaneously, the supply source 60 is connected through conduit 68, conduit 70, switch S2 and line 62 to the fluid motor cylinder 55 for actuating the piston rod 56 and causing the housing 24 supporting the cuff spreader elements 16 and 17 to be longitudinally displaced along slides 27 and 28, whereby the cuff spreader elements are withdrawn from the trouser leg 13. Raising the press head 14 reactuates the press arm switch 65 causing the switch S2 to be moved in a direction indicated by the arrow 71, whereupon fluid motor cylinder 55 is permitted to be vented so that the housing 24 may be returned to its original position, shown in FIG. 2, under the action of the coil springs 47 and 48. At the same time, line 66 is again connected to vent so that the switch S1 may again be manually actuated as desired by pressing the plunger 63.

The novel adjustment features of the present invention are detailed primarily in FIGS. 8, 9, and 10, wherein it is shown that the platform 23 on which the sliding supports 20 of the spreader elements 16 and 17 are mounted is pivotally disposed in a horizontal plane of the housing 24 about a line coaxial with the shaft 37. The platform 23 is shown as being a substantially flat member having diametrically opposed arcuate edges which rest upon shoulders 73 and 74 formed in the housing 24. Arcuate slots 75 and 76 are formed along the arcuate edges of the platform 23 and threaded bolts 77 are projected freely therethrough for threadably engaging the housing 24 and thereby securing the platform 23 in a preselected angularly disposed position thereon. Both of the bolts 77 are shown having knurled head portions, but according to this invention, only one need be utilized for clamping the platform 23 in place, whereby it is only necessary to unscrew one of the bolts in order to adjust the platform. Accordingly, it is possible in this manner to threadably clamp the platform 23 in any desired angular relation relative to the housing 24 within the range of the arcuate slots 75 and 76, such as shown in FIG. 10.

A typical operation will now be described. Initially, the housing 24 is adjusted along the slides 27 and 28 to suit the inseam length of the trouser leg 13 being pressed and is secured in the desired position by locking the pin 49 in one of the holes 52 in the base plate 30. Then, the platform 23 is adjusted on the housing 24 to dispose the spreader elements 16 and 17 supported thereon at the best angle for being spread apart along a line substantially perpendicular to the axis of the trouser leg. Adjustment of the spreader elements 16 and 17 themselves on the platform 23 to determine the initial separation of the arms 16*b* and 17*b* thereof is made by loosening the threaded clamping bolts 34 to permit movement of the spreader element arms 16*a* and 17*a* along the keys 21 of the sliding supports 20 within the range of the elongate slots 18 provided in these arms, and the degree of this adjustment is determined according to the width of the cuff or bottom of the trouser leg 13 being pressed. The trouser leg is then placed on the press pad 12 and the cuff or bottom thereof is fitted over the serrated edge portions 19 of the spreader elements 16 and 17. Plunger 63 is depressed to actuate switch S1 for supplying air under pressure from supply source 60 to the fluid motor cylinder 42, thereby moving rack 40 and causing the shaft 37 and the pinion 36 secured thereon to be rotated and the racks 33 to be displaced in opposite directions for separating the spreader elements 16 and 17 and spreading and tensioning the trouser cuff into the desired position. This operation may also serve to anchor the bottom of the trouser leg so that the press operator can easily smooth out the remainder of the trouser leg without the latter creeping or moving along the press pad.

When the trouser leg has been properly positioned and spread, the press head 14 is brought downwardly toward the press pad 12 and just prior to contacting the trouser, the press arm switch 65 is actuated for moving switch S2, whereupon air is evacuated from the cylinder 42 and the spreader elements 16 and 17 are retracted under the biasing force of the spring 38. Almost simultaneously, fluid pressure is supplied to the fluid motor cylinder 55 for extending the piston rod 56 and moving the housing 24 longitudinally along the slides 27 and 28, whereby the spreader elements 16 and 17 are withdrawn from the trouser leg 13 just prior to the time when the leg is contacted by the press 14 so that no imprint of the spreader elements will be left in the pressed garment. After the trouser leg has been pressed and the press head 14 is being returned upwardly for its next operation, the press arm switch 65 is again actuated for returning switch S2 to the position shown in FIG. 2, wherein the cylinder 55 is exhausted or vented so that the housing 24 may be returned under the force of springs 47 and 48 to thereby place the spreader elements 16 and 17 in position for receiving the next trouser leg. At this point, the apparatus is maintained in the normal rest position, shown in FIG. 2, in which it is ready for receiving the next trouser leg and in which none of the fluid motors used in operating the device are pressurized.

Referring now to FIG. 11, there is shown another embodiment of the present invention which eliminates a substantial amount of wear normally encountered with spring-biased air-actuated cylinders and further eliminates the spring return mechanism 38 utilized in the former embodiment by substituting therefor a dual rack and pinion arrangement which is operated in essentially the same manner and with the same fluid pressure control circuit yet, because of its not having to overcome the resistance of high strength springs, may be operated under substantially reduced pressure levels. Thus, it may be seen in this modified version that the fluid air cylinder 42 is operative upon the applica-

tion of air under pressure from the supply source **60** through switch S1 and line **61** to move the piston rod **41** in a direction to cause the rack **40** secured to the free end thereof to rotate the pinion **39** in a clockwise direction. As in the former embodiment, the pinion **39** is secured to the lower end of a shaft **37** having disposed thereabove another pinion **36** which cooperatively engages the rack members **33** for imparting movement to the sliding supports **20**, thereby to spread apart the cuff-engaging arms of the spreader elements **16** and **17**. In this case, however, the spring **38** has been eliminated. Instead, the piston rod **56** of the fluid air motor **55** is offset from its generally central engagement with the end wall of housing **24**, being freely movable therethrough, and has secured to the free end thereof another rack member **80** which engages the pinion **39** on a diametrically opposed toothed-edge thereof. Noticeably, the stroke of the piston in the fluid air motor **55** is somewhat longer than that of the piston in the fluid air motor **42**. Because of this advantage in stroke length, when air under pressure from the supply source **60** is admitted to the air cylinder **55** through the switch S2 upon appropriate actuation thereof by the press arm switch **65**, the piston rod **56** first moves to the position shown in FIG. **11** and in the course of this movement causes rack **80** to turn pinion **39** in a counterclockwise direction, thereby moving he piston of the air cylinder **42** through the full length of its stroke, or until it bottoms at the air supply-end thereof, through its connection with the rack **40** being driven by the pinion **39**. At this point, the spreader elements **16** and **17** will have been retracted through the driving connection of the sliding supports **20**, racks **33**, upper pinion **36** and shaft **37** with the lower pinion **39**. Continued application of air under pressure to the fluid air motor **55**, however, further advances the piston rod **56** an since pinion **39** can no longer be rotated by the rack **80** because the rack **40** also engaged therewith is prevented from being further moved by the bottomed-piston secured to the end thereof, the pinion **39** and racks **40** and **80** become an immobilized integral unit within the housing **24**, and the rod **56** is thereby operative to move the housing **24** along the slides **27** and **28** and within the enclosure frame **44**, causing the springs **47** and **48** to be compressed therebetween during such movement. Thus, the spreader elements **16** and **17** are withdrawn from the cuff or bottom of the trouser leg **13** while the trouser is being pressed in order to prevent the same from being imprinted in the garment. When the press head **14** is raised following completion of the pressing operation, the press arm switch **65** is again actuated causing movement of switch S2 in the direction indicated by arrow **71** in FIG. **2** so that switch S2 is returned to the position illustrated therein and fluid air motor **55** is permitted to be exhausted or vented. Springs **47** and **48** are then operative to return the housing **24** to the position wherein spreader elements **16** and **17** supported thereon are adapted to receive another trouser leg for a succeeding pressing operation. At this stage, the piston rods **41** and **56** and the racks **40** and **80**, respectively associated therewith, occupy the positions illustrated in FIG. **11**. It may be seen, therefore, with this embodiment, that no biasing springs are required within the fluid air motors **42** and **55** for returning the pistons thereof following actuation by air under pressure, since the rack connected to each of the pistons is operative in the course of its movement to return the other. Furthermore, by providing the one fluid air motor **55** with a greater stroke than the other motor **42**, longitudinal displacement of the housing **24** for withdrawing the spreader elements from the trouser leg may be effected immediately after retraction of the spreader elements within the trouser cuff under the influence of the same driving force, namely, the piston rod **56** and the rack **80** connected thereto.

Obviously, many modifications and variations of the present invention are possible in light of the above teachings. It is therefore to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described herein.

What is claimed as new and desired to be secured by letters patent of the United States is:

1. An apparatus for use with a garment press or the like for spreading portions of a garment prior to pressing, comprising:

a frame;

a housing supported within said frame for reciprocable movement in one direction therewithin;

a pair of spreader elements for engaging opposite portions of a garment to be pressed;

means supporting said spreader elements on said housing for reciprocable movement in opposite directions relative to each other;

means for adjusting the angular relation of said spreader elements relative to said housing and said one direction of movement thereof;

first actuator means for moving said spreader elements in opposite directions to engage said opposite portions of said garment; and

second actuator means for moving said housing within said frame.

2. The apparatus set forth in claim **1**, further comprising:

means for substantially simultaneously retracting said spreader elements to release said garment and actuating said second actuator means; and

means for normally biasing said housing against movement by said second actuator means.

3. The apparatus set forth in claim **1**, wherein said supporting means for said spreader elements comprises:

a platform mounted in said housing;

a pair of supports for said spreader elements being slidably mounted on said platform for movement in parallel paths; and,

means connecting said slidable supports and said first actuator means for moving said slidable supports in opposite directions along said parallel paths jointly with said first actuator means.

4. The apparatus set forth in claim **3**, wherein said means connecting said slidable supports and said first actuator means comprises:

a rotatable shaft;

a pinion secured to said shaft being rotatable therewith;

a pair of racks respectively secured to said pair of slidable supports and engaging said pinion; and,

means for drivingly connecting said shaft with said first actuator means.

5. The apparatus set forth in claim 4, wherein said first actuator means is a fluid motor having a piston rod operable during displacement to rotate said shaft in one direction, and further comprising

means for normally urging said shaft to rotate in the opposite direction.

6. The apparatus set forth in claim 5, wherein said second actuator means is a fluid motor having a piston rod operable during displacement to move said housing in a given direction, and further comprising

means for normally urging said housing in an opposite direction within said frame.

7. The apparatus set forth in claim 6, further comprising a fluid control circuit for sequentially:

applying fluid under pressure to said first actuator fluid motor for causing said spreader elements to be spread apart for engaging said garment;

venting said first actuator fluid motor and substantially simultaneously applying fluid under pressure to said second actuator fluid motor for moving said housing in said given direction; and,

venting said second actuator fluid motor.

8. The apparatus set forth in claim 4, wherein said first actuator means is a fluid motor having a piston rod operable during displacement to rotate said shaft in one direction, and

said second actuator means is a fluid motor having a piston rod operable during displacement to rotate said shaft in an opposite direction and to move said housing in a given direction within said frame.

9. The apparatus set forth in claim 8, further comprising means for normally urging said housing in an opposite direction within said frame.

10. The apparatus set forth in claim 4, further comprising mounting means for said frame, and

means for adjustably positioning said frame in secured relation in any one of a plurality of positions along a given line in said mounting means.

11. For use in combination with a garment press having a pressing surface and a movable pressing head for pressing garments on the surface, an apparatus for spreading portions of a garment prior to pressing comprising:

a mounting member positioned generally at one side of the pressing surface and having at least one longitudinal guide element thereon;

a frame mounted on said at least one longitudinal guide element;

a housing mounted on said at least one longitudinal guide element for reciprocable movement thereon within said frame;

a pair of spreader elements projecting laterally from said housing and over the pressing surface, said spreader elements having body portions extending substantially laterally from said housing and end portions extending at an angle from said body portions for engaging opposite portions of a garment to be pressed;

means supporting said body portions of said spreader elements in parallel relation on said housing for reciprocable movement in opposite directions relative to each other for spreading apart said end garment-engaging portions of said spreader elements and for retracting said end portions to a closed garment-receiving position;

means for angularly adjusting and securing said spreader element-supporting means in said housing relative to the reciprocable path of movement thereof;

first actuator means connected with said spreader element-supporting means for causing said elements to engage said garment; and

second actuator means for moving said housing in one direction within said frame.

12. The combination set forth in claim 11, wherein said spreader element-supporting means comprises:

a platform;

a pair of supports slidably mounted in said platform; and

means adjustably securing said body portions of said spreader elements on said supports.

13. The combination set forth in claim 12, further comprising:

a rotatable shaft;

a first pinion secured to said shaft and rotatable therewith;

a pair of racks respectively secured to said slidable supports and engaging said first pinion;

a second pinion secured to said shaft and rotatable therewith;

a rack engaging said second pinion; and,

means connecting said first actuator means and said second pinion-engaging rack for turning said shaft in one direction.

14. The combination set forth in claim 13, further comprising:

another rack engaging said second pinion at a diametrically opposed point thereon; and,

means connecting said second actuator means and said another rack.

15. The combination set forth in claim 14, wherein said first and second actuator means are fluid motors, each having a piston rod connected with said second pinion-engaging racks, and

said piston rod of said second actuator means having a longer stroke than said piston rod of said first actuator means.

16. The combination set forth in claim 15, further comprising means for normally urging said housing in the opposite direction of said second actuator means.

17. The combination set forth in claim 13, further comprising means connecting said rotatable shaft and said housing for normally urging said shaft to turn in a direction opposite to that in which said shaft is turned by said first actuator means.

18. The combination set forth in claim 17, further comprising means for normally urging said housing in the opposite direction of said second actuator means.

19. The combination set forth in claim 18, further comprising a fluid control circuit for:

applying fluid under pressure to said first actuator fluid motor;

venting said first actuator fluid motor and substantially simultaneously applying fluid under pressure to said second actuator fluid motor; and,

venting said second actuator fluid motor.

20. The combination set forth in claim 19, further comprising means responsive to movement of said pressing head for causing said simultaneous venting of said first actuator fluid motor and application of fluid

to said second actuator fluid motor and for venting said second actuator fluid motor.

21. The combination set forth in claim 20, further comprising means for adjusting the position of said frame on said guide element.

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