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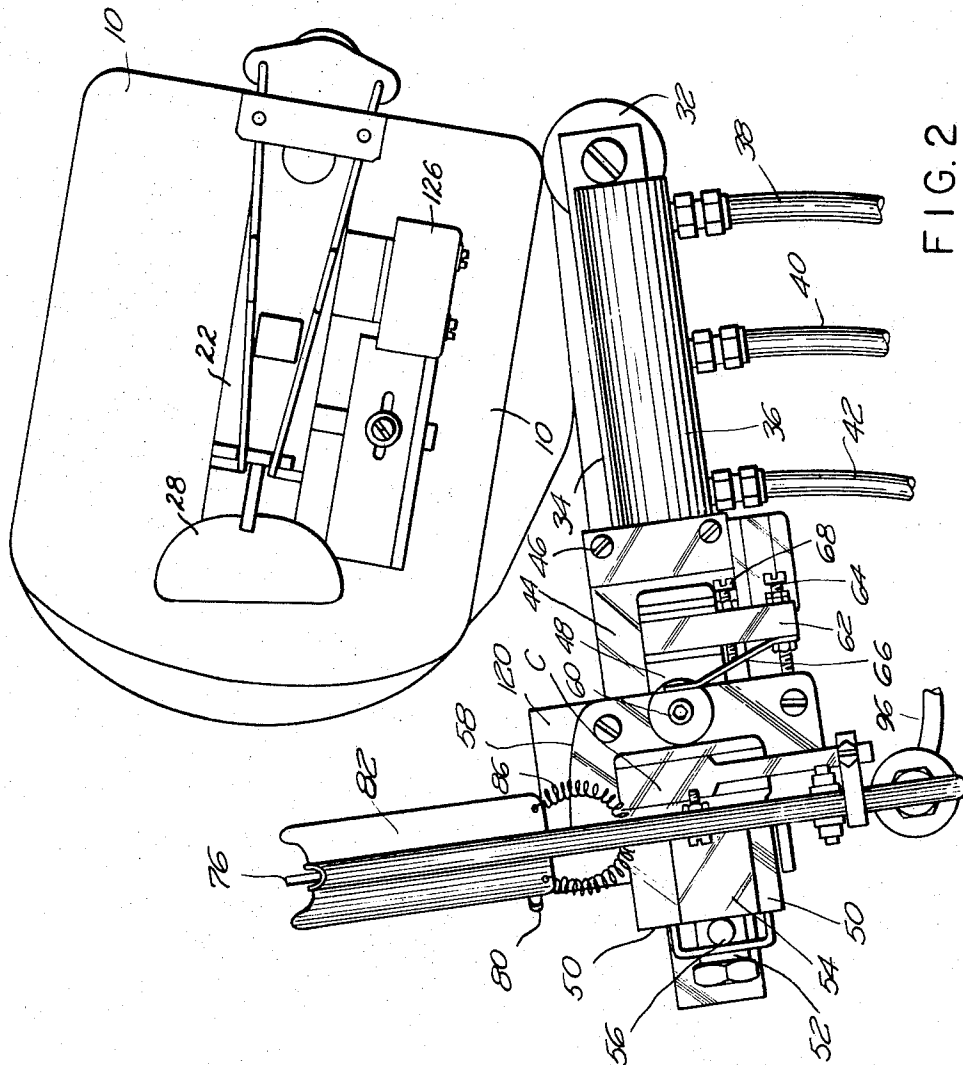
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3,331,345

PLEATING ATTACHMENT FOR A SEWING MACHINE

Filed April 6, 1965

5 Sheets-Sheet 2



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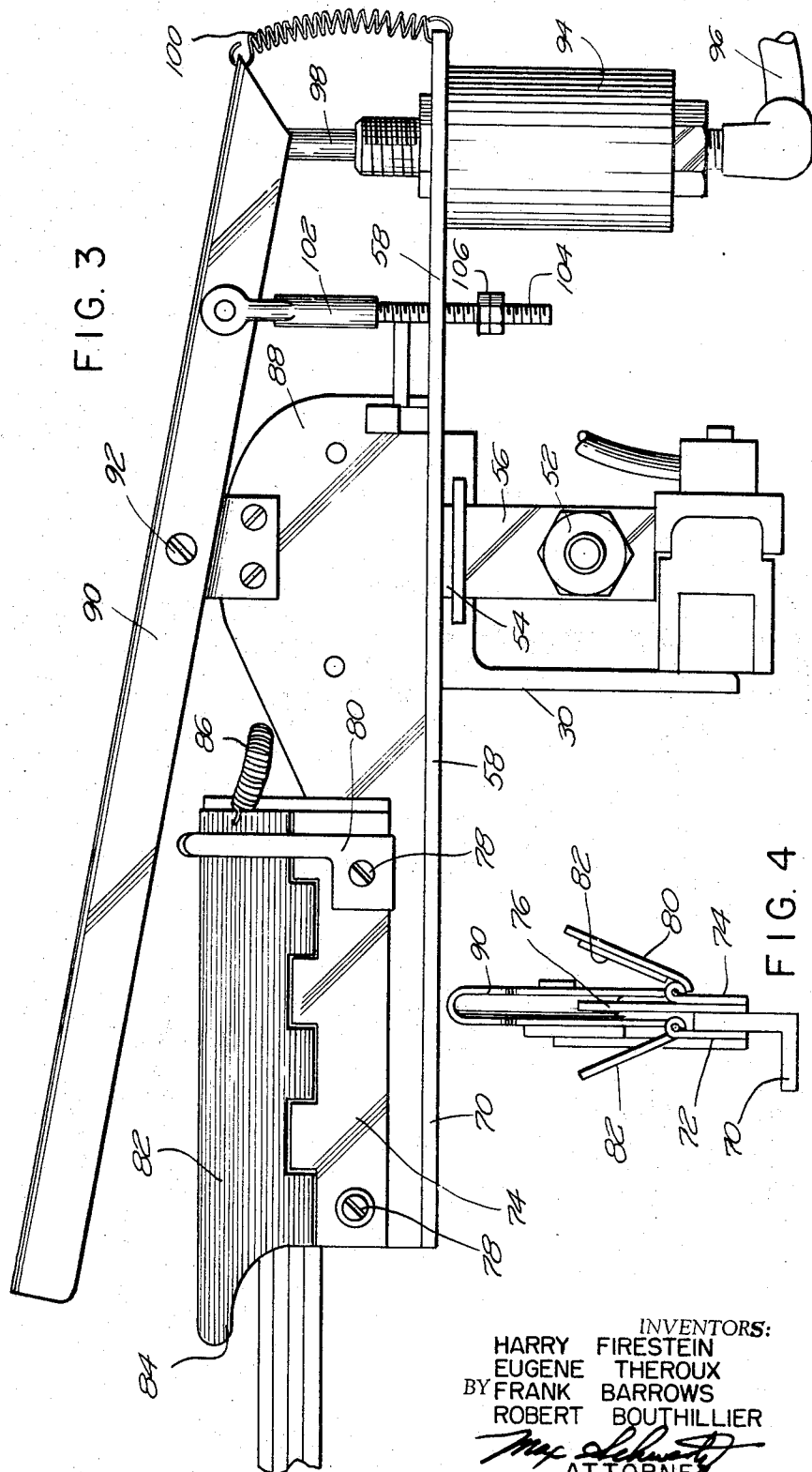
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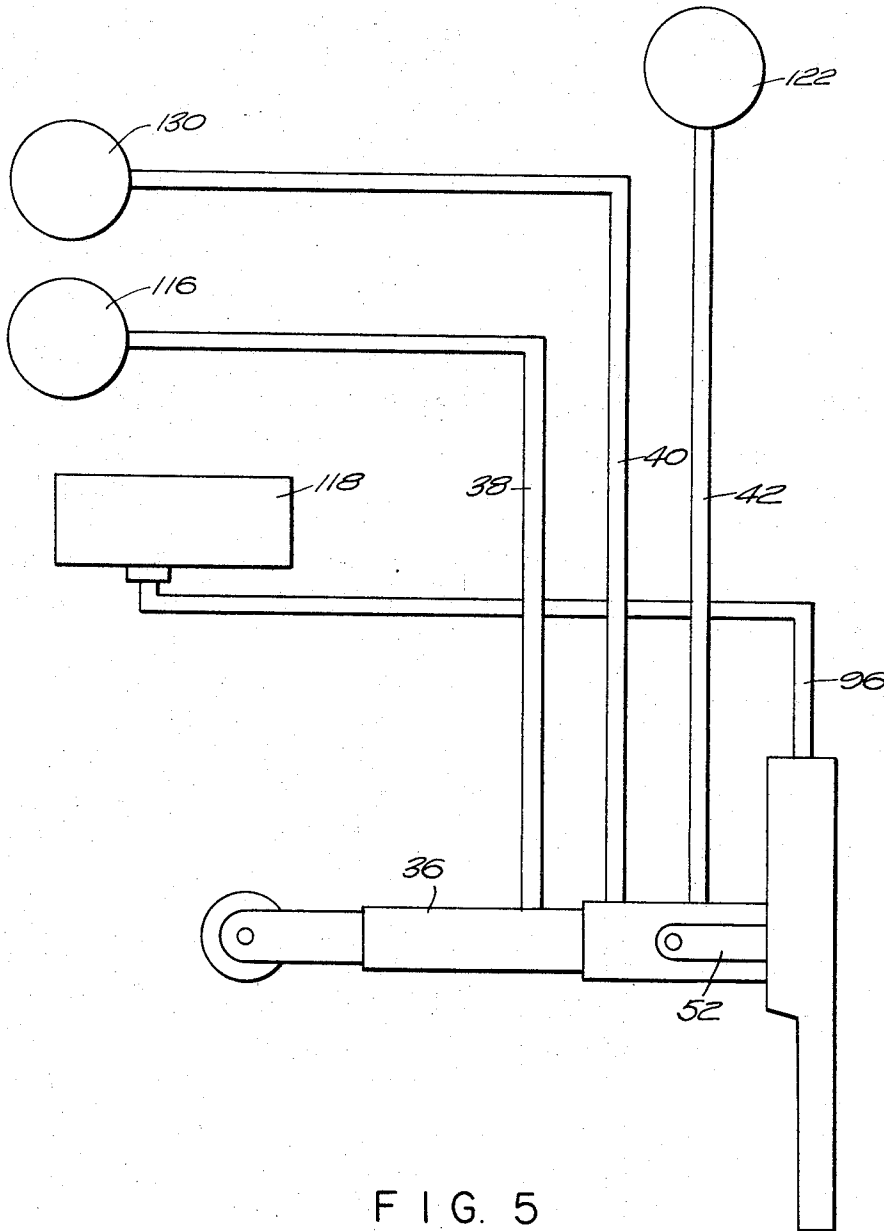


FIG. 5

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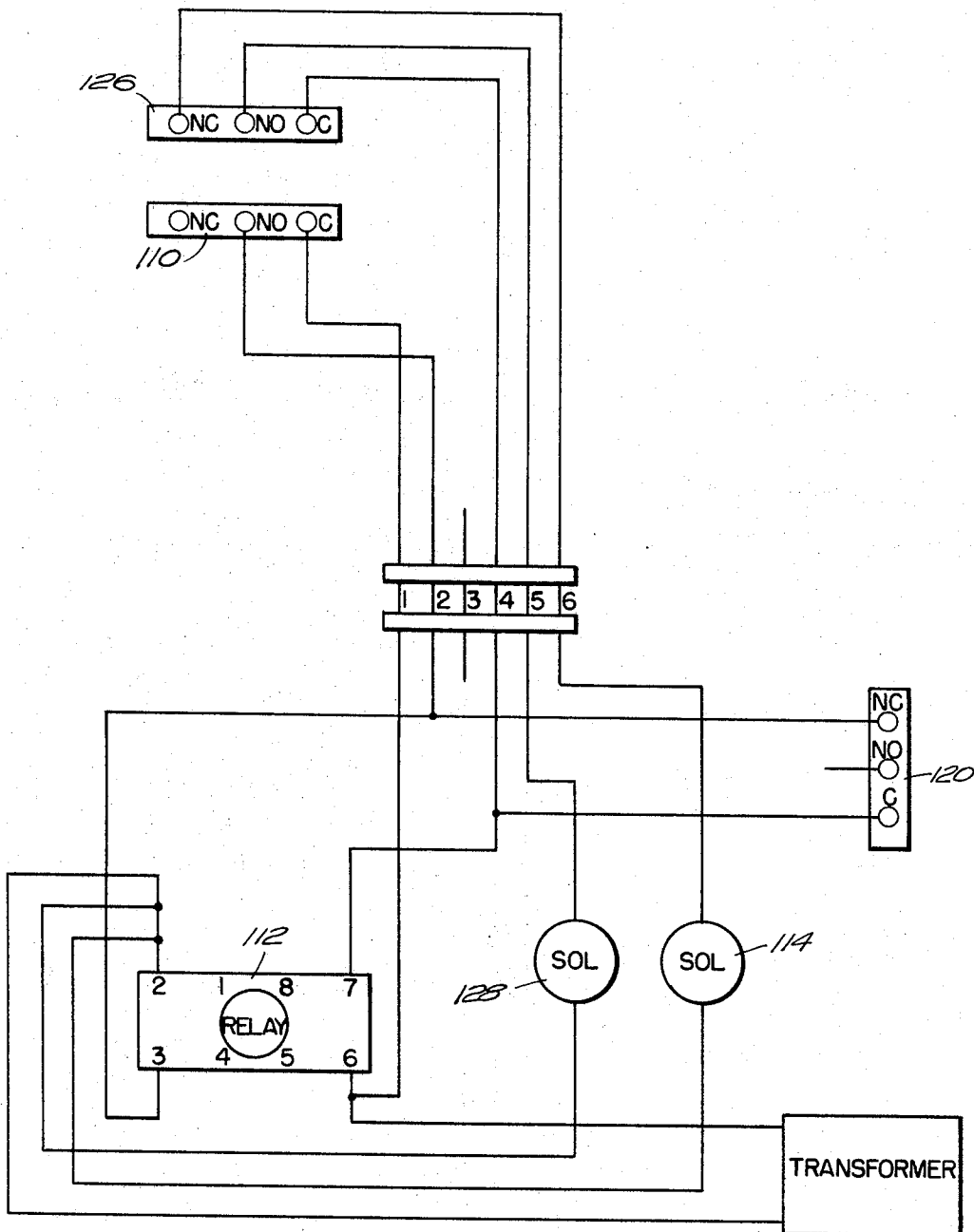


FIG. 6

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PLEATING ATTACHMENT FOR A SEWING MACHINE

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20 Claims. (Cl. 112-134)

Our present invention relates to sewing machine attachments and more particularly to a novel pleating attachment.

The principal object of the present invention is to provide an attachment for a sewing machine which will automatically form pleats along a length of curtain or drapery material.

Another object of the present invention is to provide a pleating attachment for a sewing machine which will form the desired pleats a predetermined distance apart from each other.

A further object of the present invention is to provide a pleating attachment for a sewing machine which will automatically form the first pleat a shorter distance from the edge than the distances between the pleats.

Another object of the present invention is to provide a sewing machine attachment for forming pleats which is completely automatic in operation utilizing electrical and pneumatic means for operating the attachment.

Another object of the present invention is to provide a pleating attachment for a sewing machine which is comparatively simple in construction and easy and economical to manufacture and assemble.

With the above and other objects and advantageous features in view, our invention consists of a novel arrangement of parts more fully disclosed in the detailed description following in conjunction with the accompanying drawings and more particularly defined in the appended claims.

In the drawings,

FIG. 1 is a side elevation of a portion of a sewing machine for pleating showing the location of the switches.

FIG. 2 is a top plan view of the sewing machine and pleating attachment with the sewing machine head removed.

FIG. 3 is an enlarged side elevation of the pleating device.

FIG. 4 is an end view thereof.

FIG. 5 is a diagrammatic view of the pneumatic valve hookup.

FIG. 6 is a diagram of the electrical hookup.

In the manufacture of curtains and draperies it is customary to provide the upper edge of the material with a stiffening such as buckram. The upper edge with the stiffening material is then run through a device which scores the material along fold lines to form pleats. These pleats must of course be positioned in an equal distance apart depending upon the particular design required. Normally, at each side edge, the first pleat is a shorter distance from the edge than the effective distance between the pleats. The operator uses a sewing machine which is equipped with an attachment for sewing pleats. This attachment swings the material laterally first one way and then the other way to provide a double stitching along the pleats. The operator folds the material into the pleat as previously scored and places it under the foot of the machine which then proceeds with the sewing operation. The operator then picks up the material, takes the next pleat, folds it and again places it under the needle of the machine. It is obvious that this is a slow and tedious and costly process. Not only must the material first be scored,

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but the operator is required to handle each pleat individually and individually fold the pleat before placing beneath the needle. The present invention is designed to eliminate much of this labor and to provide automatic means for folding the material ready to be placed under the needle by the operator. The scoring or preliminary preparation of the material is eliminated. The device of the present invention can be adjusted to provide for different spacing of the pleats. Furthermore the device of the present invention compensates for the fact that the first pleat must be closer to the edge than the distance between the pleats.

Referring to the drawings illustrating our invention, the sewing machine illustrated in FIGS. 1 and 2 for sewing the pleats is of a conventional type. The machine is mounted on the base or table 10 having the usual vertical post 12, horizontal portion 14 and sewing head 16 with the needle 18 depending vertically from the sewing head 16 as is shown in FIG. 1. Now viewing FIG. 1, the conventional pleating machine is provided with the apparatus mounted within and beneath the sewing head. A vertical leg 20 extends inwardly of and parallel to the vertical sewing head portion 12 and is provided with a horizontal portion 22 extending beneath the sewing machine portion 14 and terminating in the front with a vertical portion 24. Depending from the portion 24 is an arm 26 extending forwardly and downwardly and supporting a flat frame 28. The usual mechanism for operating the arm 26 and frame 28 is mounted across the frame 20, 22, 24 and is tied into the cam drive of the sewing machine in a conventional manner. The operator pushes a lever and the frame 28 is raised to permit the placing of the material or pleat beneath the frame. The operator then allows the frame 28 to drop on to and hold the material. Actually this replaces the standard presser foot of a sewing machine. Now when the operator pushes the treadle and starts the sewing operation, the frame 28 and arm 26 is moved laterally in an arc substantially at right angles to the front of the machine first in one direction and then in the opposite direction to provide a double superimposed row of stitches. All of the above is of substantially conventional construction. The present invention is particularly concerned with the formation of the pleat that the operator places under the frame 28 and the formation of the next pleat at the proper predetermined distance along the edge of the material.

Now extending laterally from the rear side edge of the machine is an angle iron 30 on which a pivot post 32 is mounted. Extending from the post 32 at an acute angle to the side edge of the base 10 as shown in FIG. 2, is an elongated support 34 on which is mounted a pneumatic cylinder 36. Operation of the cylinder 36 and its associated piston is controlled, in a manner hereinafter described, through the air hose 38 adjacent one end, the air hose 40 positioned intermediate the ends and the air hose 42 adjacent the other end. Mounted at the front top edge of the cylinder 36 is an elongated rectangular plate 44 fixed to the cylinder at the rear at bolts 46. The plate 44 is slotted and open in the center at 48 terminating at the front end at two spaced legs 50. The piston rod 52 extends from the cylinder 36 beneath the plate 44 and beyond the front edge of the plate. A cover plate 54 is mounted on the top of the piston 52 at 56 and reciprocates beneath the slotted portion 48 of the plate 44.

Mounted transversely of the plate 44 is a plate 58 pivoted at 60 to the piston 52 through the slotted portion 48 of the plate 44. With this arrangement in and out movement of the piston 52 will carry the pivoted plate 58. Extending from the piston 52 rearwardly of the plate 58 is a bar 62 parallel to the rear edge of the plate 58. The outer end of the bar 62 is provided with an adjustable

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set screw 64 which bears against one end of the plate 58. Extending from the set screw 64 is a leaf spring 66 having its free end bearing against the intermediate portion of the plate 58 adjacent its pivot 60. A second adjustable set screw 68 extends through the bar 62 and bears against the leaf spring 66 to permit adjustment of the tension thereof. With this arrangement the plate 58 cannot be pivoted counterclockwise, the limit of its swing counterclockwise being governed by the adjustable set screw 64. However, the plate 58 can be pivoted clockwise but such motion will be against the action of the leaf spring 66 and upon release of turning pressure the spring 66 will tend to move the plate 58 back into the position shown in FIG. 2.

Now viewing FIG. 3, an L-shaped support 70 extends to the left of the plate 58. Mounted on one side of the vertical leg of the L-shaped support is an elongated rectangular hinge plate 72 with the hinge portion turned inwardly over the top of the vertical leg of the support 70. Mounted on the opposite side of the vertical leg of the support 70 is a similar hinge plate 74 with the hinge portion turned away from the L-shaped support 70. Between the plate 74 and the vertical leg of the L-shaped support 70 is a flat rectangular tongue or plate 76. The plates 72 and 74 are mounted by means of bolts 78 which may be positioned in vertical slots for adjusting the vertical position of the hinge plates. Furthermore, an arm 80 may be mounted outside one of the plates to act as a stop for the pivotal motion of the wing sections 82 pivoted to the plates 72 and 74. The wing sections 82 are elongated generally rectangular members having forwardly extending fingers 84 and designed to hingedly extend outwardly from the central tongue or plate 76 as shown in FIG. 4. The rear ends of the wing sections 82 are connected by a coil spring 86 to resiliently retain the sections in proper position.

Now mounted transversely on the plate 58 is a vertical supporting plate 88 upon which the pleating arm 90 is pivotally mounted at 92. The pleating arm 90 is an inverted U-shaped member, see FIG. 4, with the long free end extending over the vertical tongue or plate 76 between the wings 82 as shown in FIGS. 2 and 4. Pivotal movement of the pleating arm or lever 90 is controlled by an air cylinder 94 mounted beneath and to the left of the plate 58 as shown in FIG. 3 having an air hose connection 96 and a piston 98 bearing against the rear end of the arm 90. A coil spring 100 connects the outer edge of the plate 58 with the back end of the arm 90 to resiliently retain the arm in raised position as shown in FIG. 3. Between the piston 98 and the pivot point 92 the arm 90 is provided with a pivotally depending internally threaded member 102. An adjustment screw 104 extends through an opening in the plate 58 and into the member 102. The screw 104 carries adjustable nuts 106. It is obvious that upward movement of the rear end of the arm 90 is limited by the distance between the nuts 106 and the bottom of the plate 58. Therefore, the downward stroke of the free outer end of arm 90 is limited by the adjustment of the nuts 106 along the bolt 104.

With the above described arrangement, if a length of material is inserted across the top of the wings 82 beneath the arm 90 and then the arm 90 brought sharply downwardly, the arms of the inverted U-shaped arm 90 will push the material downwardly on each side of the central plate or tongue 76, to allow the material to move downwardly on each side of the plate 76 the wings 82 will be swung inwardly on their pivots to produce the necessary slack. A sharp triple fold is thus formed, the material moving over the top of one wing upwardly along one side of the tongue 76 into the U-shaped portion of the arm 90 around the top of the tongue 76 downwardly and then up over the other wing. With buckram or other stiffening material inserted in the curtain, an even three fold pleat is thus formed. Now if the operator grasps the material with the fingers of both hands straddling the downwardly positioned arm 90, a sliding motion to the

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left in FIG. 3 will slide the pleat outwardly from the device and leave the pleat firmly within the fingers of the operator. The operator can then lift the frame 28 by means of the usual foot pedal and insert the pleat under the needle ready for sewing.

The complete cycle of operation includes not only the formation of the pleat, but actual measurement between pleats and between the last pleat and the edge. The operation is as follows:

The operator presses a foot pedal to lift the frame 28. This action trips a switch which energizes a main relay and the entire electrical system. One of the valves, energized by the system, normally moves the piston from the cylinder 36 to the left a distance of one inch. The mounting of the pleating device shown in FIG. 3 is adjustable along the length of the piston 52 to position the pleating device a predetermined distance from the needle which measures the spacing between the pleats. The operator now inserts the edge of the material and allows it to be clamped beneath the frame 28. Now the operator starts the machine with the conventional treadle and as the needle is sewing and the material is swung downwardly in FIG. 2 but actually, facing the machine, to the right towards the pleating device the operator holds the material and allows it to slip under the arm 90 and over the wings 82 in the position shown in FIG. 3. At this point a mechanical cam on the sewing machine operates a valve which directs air to the hose 96 and cylinder 94 and operates the pleating device to form the pleat in the manner hereinabove described. As the pleater comes down and the material begins to swing in the opposite direction the operator slips the finished pleat out from under the arm 90 and is left with three folds in the hand. But at the same time, the movement of the pleating arm 90 operates a switch which deenergizes the original valve which moved the cylinder out one inch and allows a smaller air pressure to gradually return the cylinder to its original position. This causes a slack in the material as the pleating arm 90 and the wings 82 are moved inwardly towards the sewing machine and allows the operator to more readily remove the finished pleat. Additional slack can be provided by the operator by turning the device clockwise towards the sewing machine against the action of the spring 66. This completes the cycle of operation. The edge of the material has been stitched and the next pleat has been formed a predetermined distance along the material measured by the movement of the cylinder away from the needle area and clamp 28.

Now the operator again lifts the frame 28 with the foot pedal again energizing the system and moving the cylinder 36 and its piston 52 out one inch. However, now the operator positions a completely folded pleat beneath the frame 28. Such pleats contain three folds of material and are much thicker than the edge of the material. The insertion of the finished pleat energizes another switch which now moves the piston out three inches. This takes care of the spacing between the pleats as distinguished from the spacing between the first pleat and the edge of the material which is much less. Again the operation of the sewing machine operates the pleater which in turn cuts off the air and allows the piston to return to normal and leaves sufficient slack in the material for the operator to remove the next pleat. As each cycle is performed, one pleat is being sewn while the next one is being formed a measured distance away, the entire operation being automatic.

The above described cycles of operation are controlled by the pneumatic system illustrated in FIG. 5 and the electrical system illustrated in FIG. 6. Now at the start of the cycle as the operator pushes a foot pedal to lift the frame 28, an arm 108 trips a microswitch 110. This energizes the relay 112 and operates a solenoid 114 which controls a valve 116. This directs the air pressure through the hose 38 to the cylinder 36 and moves the piston 52

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carrying the arm 90 and the associated pleating mechanism a distance of one inch. Now the operation of the machine mechanically, by means of a cam, operates the valve 118 which directs the air through the hose 96 into the cylinder 94 and allows its piston 98 to operate the pleater arm 90. Movement of the pleater arm 90 trips a microswitch 120 which deenergizes the relay and the solenoid 114 and its associated valve 116 and allows the smaller air pressure from the air reduction valve 122 to enter the hose 42 and return the piston to its original position. This completes the first cycle. Now when the operator lifts the frame 28 and again energizes the system and move the cylinder out one inch, a completed pleat is now inserted and this lifts the arm 124 of a microswitch 126, see FIG. 1. The switch 126 energizes the solenoid 128 which operates its associated valve 130 directing the air through the hose 40 and moving the piston out three inches. The rest of the cycle of operation is similar to that for the one inch movement.

With the illustrated hookup, microswitch 110 turns on the entire system, the relay 112 and the solenoid 114 and valve 116 which are normally on when the system is turned on by the switch 110. Now when the switch 126 is operated, this switch moves from a normally closed position to normally open position. This closes solenoid 114 and valve 116 and opens solenoid 128 and its valve 130. The entire electrical and pneumatic hookup is thus extremely simple and easy to install. A single relay and a single cylinder and piston arrangement is all that is needed to operate the cycle. The transverse position of the arm 90 and its wings 82 for operating the pleater as illustrated in FIG. 2, is adjustable along the length of the piston 52. This controls the distance between pleats. The differential in the movement of the piston between the first cycle and the second cycle, a difference of two inches, controls the fact that the first pleat is closer to the edge than the difference between subsequent pleats. Also, by adjusting the height of the hinge plates 72 and 74 relative to the central tongue 76 and allowing the arm 90 to move further downwardly by adjusting the nuts 106 along the bolt 104, the depth and size of the pleats can be controlled. Of course with an extremely stiff buckram material deep pleats are more difficult to make.

It should be noted that the arm 124 which operates the switch 126 is so positioned that when the single fold of material is inserted beneath the frame 28 it lifts the arm 124 a distance which is insufficient to operate the switch. Only when the multiple folds of material are inserted beneath the arm 124 will the arm move a sufficient distance upwardly to operate the switch 126. Also, the switch 110 operated at the rear of the machine can easily be mounted adjacent the switch 126 so that it can be directly operated by the movement of the frame 28 and its associated arm 26.

The above mechanism attached to a sewing machine rigged for sewing pleats, completely eliminates the preliminary handling and folding and completely eliminates the necessity of measuring. The operator moves swiftly along secure in the fact that the device will accurately position each pleat the correct distance from the preceding pleat. Note that the angle of the cylinder 36 to the side of the machine is of extreme importance. It is essential that when the frame 28 moves the edge of the material towards the side of the machine which faces the cylinder 36 the edge of the material must be exactly parallel to the pleating attachment so that the pleat is formed at right angles to the material. When the operator is removing the pleat and requires the slack, the device can be swung against the action of the spring 66 as hereinabove described. Other advantages of the present invention will be readily apparent to a person skilled in the art.

We claim:

1. In a pleat sewing machine having a clamping frame for transversely reciprocating the material beneath a vertically reciprocating sewing needle, a pleating attachment comprising an elongated base pivotally mounted at one

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end adjacent one side edge of the sewing machine, a pneumatic cylinder mounted on said base, a piston extending from said cylinder beyond the front end of the sewing machine, a pleating device mounted on said piston transversely thereof, the material being pleated extending from the sewing needle to said pleating device, and means for operating said pleating device to form a folded pleat on the material when said material is in a predetermined position under the sewing needle.

2. In a pleat sewing machine having a clamping frame for transversely reciprocating the material beneath a vertically reciprocating sewing needle, a pleating attachment comprising an elongated base pivotally mounted at one end adjacent one side edge of the sewing machine, a pneumatic cylinder mounted on said base, a piston extending from said cylinder beyond the front end of the sewing machine, a pleating device mounted on said piston transversely thereof, the material being pleated extending from the sewing needle to said pleating device, and means for operating said pleating device to form a folded pleat on the material when said material is in a predetermined position under the sewing needle, said pleating device being adjustably mounted on said piston for adjusting the predetermined spacing between the pleats.

3. In a pleat sewing machine having a clamping frame for transversely reciprocating the material beneath a vertically reciprocating sewing needle, a pleating attachment comprising an elongated base pivotally mounted at one end adjacent one side edge of the sewing machine, a pneumatic cylinder mounted on said base, a piston extending from said cylinder beyond the front end of the sewing machine, a pleating device mounted on said piston transversely thereof, the material being pleated extending from the sewing needle to said pleating device, and means for operating said pleating device to form a folded pleat on the material when said material is in a predetermined position under the sewing needle, said operating means including actuating means for said piston moving said pleating device a predetermined distance when a single fold of material is positioned under the clamping frame and a longer distance when a folded pleat is positioned under the clamping frame.

4. In a pleat sewing machine having a clamping frame for transversely reciprocating the material beneath a vertically reciprocating sewing needle, a pleating attachment comprising an elongated base pivotally mounted at one end adjacent one side edge of the sewing machine, a pneumatic cylinder mounted on said base, a piston extending from said cylinder beyond the front end of the sewing machine, a pleating device mounted on said piston transversely thereof, the material being pleated extending from the sewing needle to said pleating device, and means for operating said pleating device to form a folded pleat on the material when said material is in a predetermined position under the sewing needle, said pleating device being adjustably mounted on said piston for adjusting the predetermined spacing between the pleats, said operating means including actuating means for said piston moving said pleating device a predetermined distance when a single fold of material is positioned under the clamping frame and a longer distance when a folded pleat is positioned under the clamping frame.

5. In a pleat sewing machine having a clamping frame for transversely reciprocating the material beneath a vertically reciprocating sewing needle, a pleating attachment comprising an elongated base pivotally mounted at one end adjacent one side edge of the sewing machine, a pneumatic cylinder mounted on said base, a piston extending from said cylinder beyond the front end of the sewing machine, a pleating device mounted on said piston transversely thereof, the material being pleated extending from the sewing needle to said pleating device, and means for operating said pleating device to form a folded pleat on the material when said material is in a predetermined position under the sewing needle, said pleating device in-

predetermined position under the sewing needle, said pleating device comprising a central tongue plate, a hinge plate mounted on each side of said tongue, a wing plate hinged to each of said hinge plates, an elongated inverted U-shaped arm pivotally mounted over said tongue, said operating means including pneumatic means for pivoting said arm to swing between said wing plates and over said tongue, said pleating device being adjustably mounted on said piston for adjusting the predetermined spacing between the pleats, said operating means further including actuating means for said piston moving said pleating device a predetermined distance when a single fold of material is positioned under the clamping frame and a longer distance when a folded pleat is positioned under the clamping frame.

13. In a pleat sewing machine having a clamping frame for transversely reciprocating the material beneath a vertically reciprocating sewing needle, a pleating attachment comprising an elongated base pivotally mounted at one end adjacent one side edge of the sewing machine, a pneumatic cylinder mounted on said base, a piston extending from said cylinder beyond the front end of the sewing machine, a pleating device mounted on said piston transversely thereof, the material being pleated extending from the sewing needle to said pleating device, and means for operating said pleating device to form a folded pleat on the material when said material is in a predetermined position under the sewing needle, said operating means including actuating means for said piston moving said pleating device a predetermined distance when a single fold of material is positioned under the clamping frame and a longer distance when a folded pleat is positioned under the clamping frame, said actuating means including a microswitch mounted on the sewing machine base and having a sensing arm extending adjacent the clamping frame, said microswitch becoming operative only on the positioning of a folded pleat of material under the clamping frame to move said piston the longer distance.

14. In a pleat sewing machine having a clamping frame for transversely reciprocating the material beneath a vertically reciprocating sewing needle, a pleating attachment comprising an elongated base pivotally mounted at one end adjacent one side edge of the sewing machine, a pneumatic cylinder mounted on said base, a piston extending from said cylinder beyond the front end of the sewing machine, a pleating device mounted on said piston transversely thereof, the material being pleated extending from the sewing needle to said pleating device, and means for operating said pleating device to form a folded pleat on the material when said material is in a predetermined position under the sewing needle, said pleating device being adjustably mounted on said piston for adjusting the predetermined spacing between the pleats, said operating means including actuating means for said piston moving said pleating device a predetermined distance when a single fold of material is positioned under the clamping frame and a longer distance when a folded pleat is positioned under the clamping frame, said actuating means including a microswitch mounted on the sewing machine base and having a sensing arm extending adjacent the clamping frame, said microswitch becoming operative only on the positioning of a folded pleat of material under the clamping frame to move said piston the longer distance.

15. In a pleat sewing machine having a clamping frame for transversely reciprocating the material beneath a vertically reciprocating sewing needle, a pleating attachment comprising an elongated base pivotally mounted at one end adjacent one side edge of the sewing machine, a pneumatic cylinder mounted on said base, a piston extending from said cylinder beyond the front end of the sewing machine, a pleating device mounted on said piston transversely thereof, the material being pleated extending from the sewing needle to said pleating device, and means for operating said pleating device to form a folded pleat on the material when said material is in a predetermined po-

sition under the sewing needle, said pleating device including a central tongue, an inverted U-shaped arm pivotally mounted over said tongue, said operating means including means for pivoting said arm over said tongue to clamp the material over said tongue to form a folded pleat, said operating means including actuating means for said piston moving said pleating device a predetermined distance when a single fold of material is positioned under the clamping frame and a longer distance when a folded pleat is positioned under the clamping frame, a microswitch mounted on the sewing machine base and having a sensing arm extending adjacent the clamping frame, said actuating means including said microswitch becoming operative only on the positioning of a folded pleat of material under the clamping frame to move said piston the longer distance.

16. In a pleat sewing machine having a clamping frame for transversely reciprocating the material beneath a vertically reciprocating sewing needle, a pleating attachment comprising an elongated base pivotally mounted at one end adjacent one side edge of the sewing machine, a pneumatic cylinder mounted on said base, a piston extending from said cylinder beyond the front end of the sewing machine, a pleating device mounted on said piston transversely thereof, the material being pleated extending from the sewing needle to said pleating device, and means for operating said pleating device to form a folded pleat on the material when said material is in a predetermined position under the sewing needle, said pleating device including a central tongue, an inverted U-shaped arm pivotally mounted over said tongue, said operating means including means for pivoting said arm over said tongue to clamp the material over said tongue to form a folded pleat, said pleating device being adjustably mounted on said piston for adjusting the predetermined spacing between the pleats, said operating means including actuating means for said piston moving said pleating device a predetermined distance when a single fold of material is positioned under the clamping frame and a longer distance when a folded pleat is positioned under the clamping frame, said actuating means including a microswitch mounted on the sewing machine base and having a sensing arm extending adjacent the clamping frame, said microswitch becoming operative only on the positioning of a folded pleat of material under the clamping frame to move said piston the longer distance.

17. In a pleat sewing machine having a clamping frame for transversely reciprocating the material beneath a vertically reciprocating sewing needle, a pleating attachment comprising an elongated base pivotally mounted at one end adjacent one side edge of the sewing machine, a pneumatic cylinder mounted on said base, a piston extending from said cylinder beyond the front end of the sewing machine, a pleating device mounted on said piston transversely thereof, the material being pleated extending from the sewing needle to said pleating device, and means for operating said pleating device to form a folded pleat on the material when said material is in a predetermined position under the sewing needle, said pleating device comprising a central tongue plate, a hinge plate mounted on each side of said tongue, a wing plate hinged to each of said hinge plates, an elongated inverted U-shaped arm pivotally mounted over said tongue, said operating means including pneumatic means for pivoting said arm to swing between said wing plates and over said tongue, said operating means including actuating means for said piston moving said pleating device a predetermined distance when a single fold of material is positioned under the clamping frame and a longer distance when a folded pleat is positioned under the clamping frame, said actuating means including a microswitch mounted on the sewing machine base and having a sensing arm extending adjacent the clamping frame, said microswitch becoming operative only on the positioning of a folded pleat of material under the clamping frame to move said piston the longer distance.

18. In a pleat sewing machine having a clamping frame for transversely reciprocating the material beneath a vertically reciprocating sewing needle, a pleating attachment comprising an elongated base pivotally mounted at one end adjacent one side edge of the sewing machine, a pneumatic cylinder mounted on said base, a piston extending from said cylinder beyond the front end of the sewing machine, a pleating device mounted on said piston transversely thereof, the material being pleated extending from the sewing needle to said pleating device, and means for operating said pleating device to form a folded pleat on the material when said material is in a predetermined position under the sewing needle, said pleating device comprising a central tongue plate, a hinge plate mounted on each side of said tongue, a wing plate hinged to each of said hinge plates, an elongated inverted U-shaped arm pivotally mounted over said tongue, said operating means including pneumatic means for pivoting said arm to swing between said wing plates and over said tongue, said pleating device being adjustably mounted on said piston for adjusting the predetermined spacing between the pleats, said operating means including actuating means for said piston moving said pleating device a predetermined distance when a single fold of material is positioned under the clamping frame and a longer distance when a folded pleat is positioned under the clamping frame, said actuating means including a microswitch mounted on the sewing machine base and having a sensing arm extending adjacent the clamping frame, said microswitch becoming operative only on the positioning of a folded pleat of material under the clamping frame to move said piston the longer distance.

19. In a pleat sewing machine having a clamping frame for transversely reciprocating the material beneath a vertically reciprocating sewing needle, a pleating attachment comprising an elongated base pivotally mounted at one end adjacent one side edge of the sewing machine, a pneumatic cylinder mounted on said base, a piston extending from said cylinder beyond the front end of the sewing machine, a pleating device mounted on said piston transversely thereof, the material being pleated extending from the sewing needle to said pleating device, and means for operating said pleating device to form a folded pleat on the material when said material is in a predetermined position under the sewing needle, said operating means

including a plurality of solenoid operated valves for regulating the pneumatic pressure to said cylinder, a cam operated pneumatic valve for operating said pleating device, a relay for controlling the valve system, and a microswitch operated by the lifting of the clamping frame for energizing said relay and control systems.

20. In a pleat sewing machine having a clamping frame for transversely reciprocating the material beneath a vertically reciprocating sewing needle, a pleating attachment comprising an elongated base pivotally mounted at one end adjacent one side edge of the sewing machine, a pneumatic cylinder mounted on said base, a piston extending from said cylinder beyond the front end of the sewing machine, a pleating device mounted on said piston transversely thereof, the material being pleated extending from the sewing needle to said pleating device, and means for operating said pleating device to form a folded pleat on the material when said material is in a predetermined position under the sewing needle, said pleating device being adjustably mounted on said piston for adjusting the predetermined spacing between the pleats, said operating means including actuating means for said piston moving said pleating device a predetermined distance when a single fold of material is positioned under the clamping frame and a longer distance when a folded pleat is positioned under the clamping frame, said operating means further including a plurality of solenoid operated valves for regulating the pneumatic pressure to said cylinder, a cam operated pneumatic valve for operating said pleating device, a relay for controlling the valve system, and a microswitch operated by the lifting of the clamping frame for energizing said relay and control systems.

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