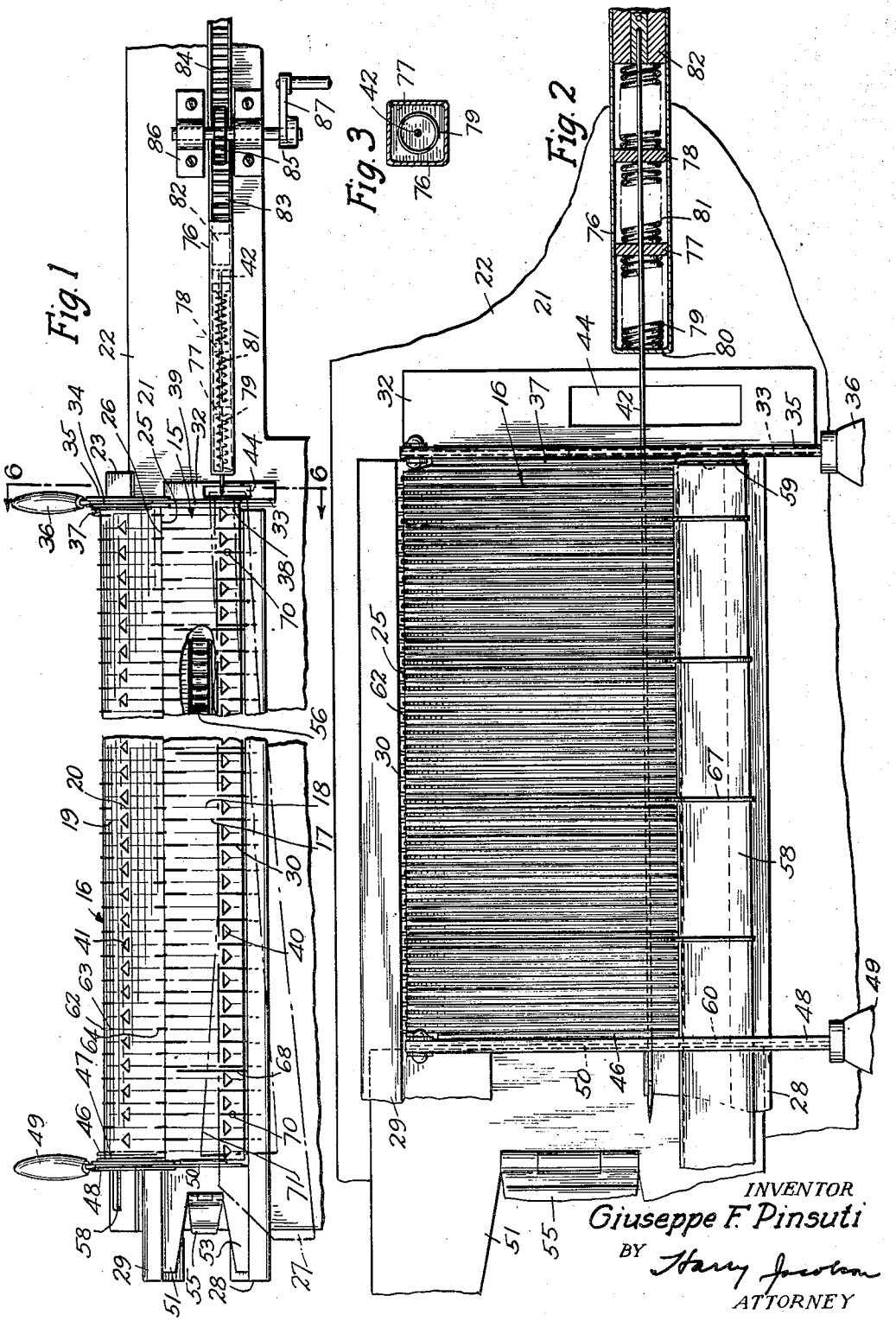
June 26, 1951 G. F. PINSUTI 2,558,196

SLIP STITCHING MACHINE

Filed June 19, 1948 3 Sheets-Sheet 1



June 26, 1951 G. F. PINSUTI 2,558,196

SLIP STITCHING MACHINE

Filed June 19, 1948 3 Sheets-Sheet 2

Fig. 5

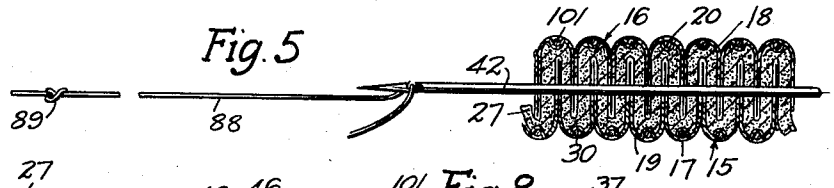


Fig. 8

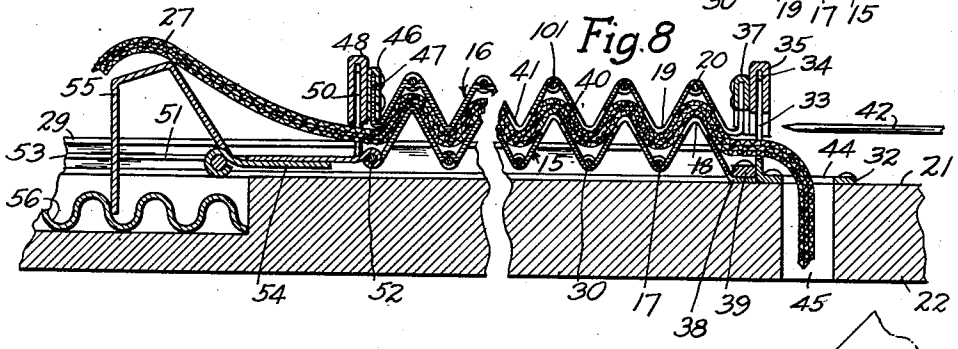


Fig. 4

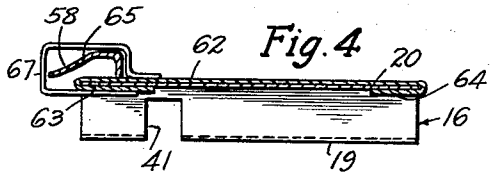


Fig. 6

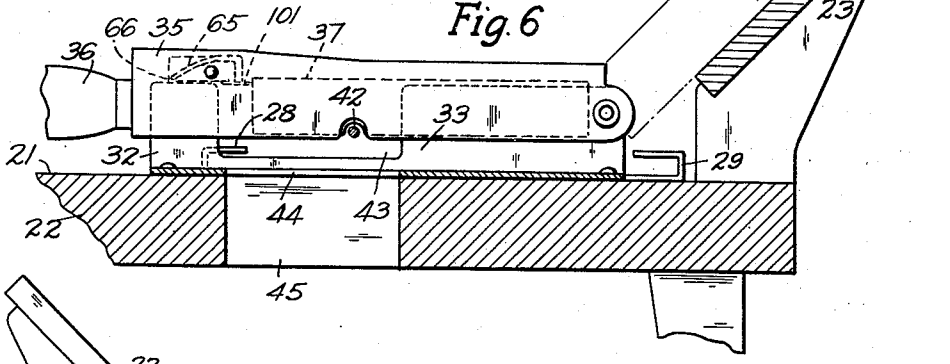
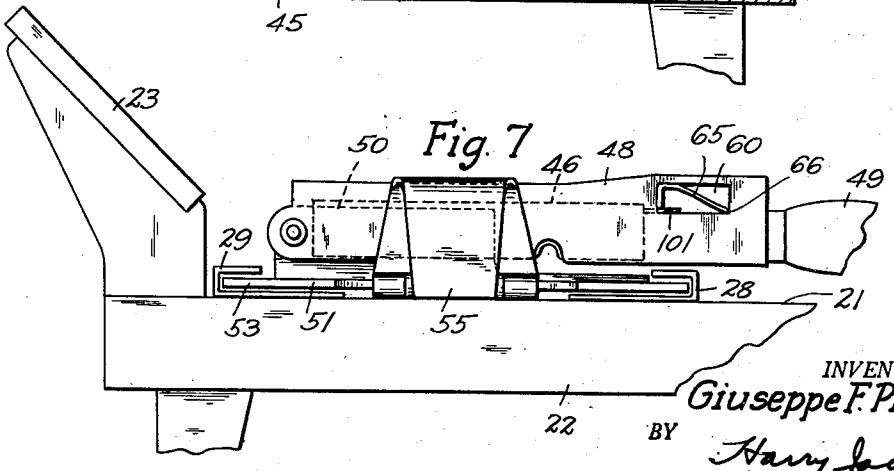


Fig. 7



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SLIP STITCHING MACHINE

Filed June 19, 1948 3 Sheets-Sheet 3

Fig.10



Fig.9

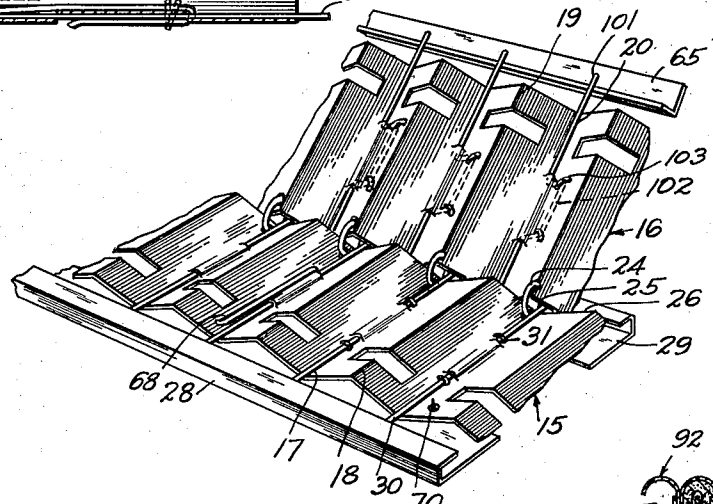


Fig.13

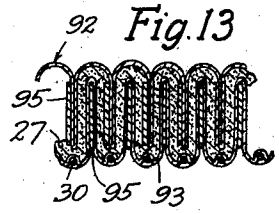


Fig.11

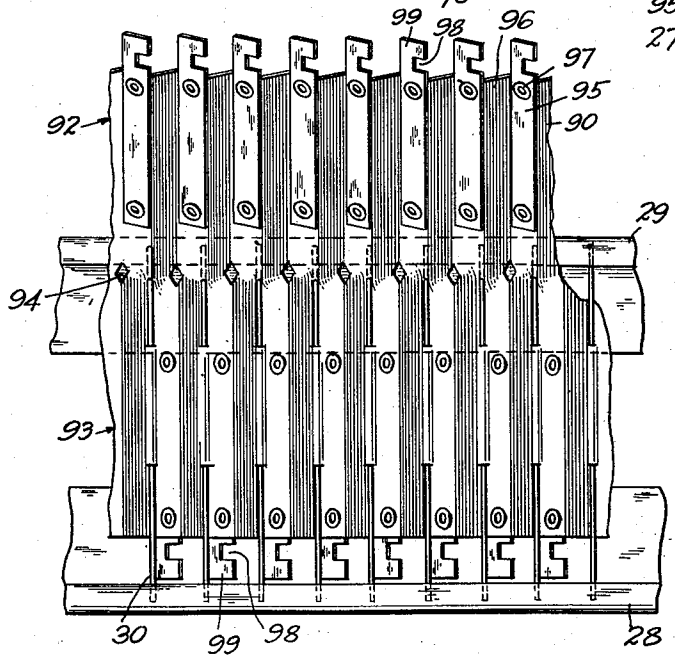
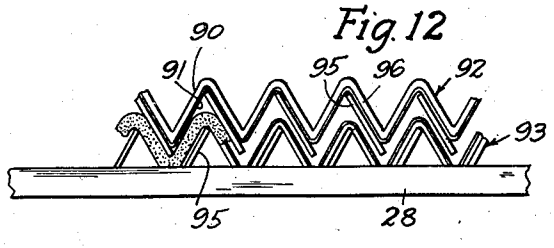


Fig.12



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UNITED STATES PATENT OFFICE

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SLIP STITCHING MACHINE

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Application June 19, 1948, Serial No. 34,059

22 Claims. (Cl. 112—174)

1

This invention relates to stitching machines and particularly to a machine designed to stitch the entire long seam in an article in one operation by slip stitching similar to basting.

Machines heretofore attempted for producing such stitching as basting or the slip stitching in necktie seams by pleating or corrugating the work, have not attained commercial success for the reason either that they require the use of excessively long needles which are quite likely to bend or break and hence are a source of trouble and annoyance, or such machines employ dies which unduly stretch the fabric, and distort and twist the work out of its proper shape.

The present invention contemplates the compact pleating or folding of the work along the entire lengths of the edges to be secured together in such a manner that little or no distorting stresses are put thereon, and while the work is retained in its pleated condition, passing a relatively short and adequately supported needle through all of the folds or pleats at one time to make the slip stitch of any desired length in one operation.

The invention further contemplates the provision of a pair of separable pre-pleated accordion-like nestable members adapted to be readily extended and contracted longitudinally and hinged together to open and close upon the work arranged between the sheets and to pleat the work when the members with the work sandwiched therebetween is pleated, together with means for reciprocating and supporting a needle to force the needle through the pleats in one simple and quick operation.

The various objects of the invention will be clear from the description which follows and from the drawings, in which

Fig. 1 is a top plan view of the machine with an intermediate part thereof broken away and showing the upper pleating member swung back to expose the lower member, both members being stretched flat preparatory to receiving the flat work such as the tie shown in dash-dot lines.

Fig. 2 is a fragmentary top plan view of the machine partly in section showing the pleating members closed and compacted and the needle passed therethrough.

Fig. 3 is a vertical sectional view of the needle guiding tube and needle guides.

Fig. 4 is a transverse vertical sectional view of the upper pleating member in its collapsed or compacted position showing the longitudinal rail for holding down the pleats.

Fig. 5 is a fragmentary longitudinal vertical

2

sectional view of the completely collapsed or contracted pleating members and of the fully pleated work sandwiched therebetween preparatory to stitching, the thicknesses of the parts being exaggerated for clarity of illustration.

Fig. 6 is a fragmentary transverse vertical sectional view, taken on the line 6—6 of Fig. 1, of the means at one end of the machine for holding, manipulating and guiding the pleating members.

Fig. 7 is an end elevational view of the holding, manipulating and guiding means for the pleating members, at the other end of the machine in the closed positions of the members.

Fig. 8 is a longitudinal vertical sectional view similar to Fig. 5, of the pleating members incompletely collapsed and showing the holding and locking means for the members.

Fig. 9 is a fragmentary perspective view of the pleating members, guides and hold-down rail shown in Figs. 5 to 8 in the open and partly extended positions of the members.

Fig. 10 is a fragmentary transverse vertical sectional view of the lower pleating member showing one of the guide pins thereof and a typical work-holding clip.

Fig. 11 is a fragmentary top plan view of another modified form of the pair of hinged pleating members in an incompletely extended state.

Fig. 12 is a fragmentary front elevational view of Fig. 11.

Fig. 13 is a fragmentary longitudinal vertical sectional view similar to Fig. 5, of the pleating members of Fig. 10 completely collapsed and with the work sandwiched therebetween.

In the practical embodiment of the invention shown in Figs. 1 to 4, each of the preformed pleating members 15 and 16 is formed preferably of a thin composite or laminated sheet of relatively stiff but strong and tough material such as paper or the like of the proper type or paper reinforced if desired with thin plastic or cloth such as buckram and capable of being folded a great number of times without material wear. The thin sheet is creased and temporarily pleated along a plurality of parallel equidistant transverse fold, crease or score lines as 17, 18 for the member 15 and 19, 20 for the member 16, to form substantially rectangular panels or pleat sides of the same size and shape, the fold lines being heavily pressed to predetermine the lines of fold. The member 15 is designed normally to rest flat on the top surface 21 of the table 22 in its extended stretched unfolded or expanded position, while the similarly extended member 16 rests in an inclined but substantially flat state

against a suitable inclined support as 23, the positions just described being the open positions of the pleating members.

Said members are hinged together at their adjacent edges in any suitable manner as by means of the hinge rings 24 (Fig. 9) each passing through the member 16 at or adjacent to a fold line 19 close to the edge 25 of said member and also passing through a fold line 17 of the member 15 close to the rear edge 26 thereof. It will be noted that in the open or relatively reversed positions of the pleating members 15 and 16 (see Fig. 1) the fold line 17 determines the bottom of a valley or trough of a corrugation or pleat, while the fold line 19 of the member 16 though aligned with the line 17 determines the top or crest of such corrugation because said member 16 has been swung about the rings 24 to a reversed position, turned about 180° from its operative or closed position in which it is superimposed upon the member 15 or on the work resting on said member. It will also be noted that when the member 16 is swung down upon the member 15, the fold lines 17 and 19 will register or coincide with each other, both determining the bottom of troughs in the respective members when said members are relieved of the stretching stresses thereon. The fold lines 18 and 20 will also register, both determining crests. On the release of the means which retains them flat and stretched, the members may be collapsed or compacted longitudinally on their pre-formed fold lines by a longitudinal movement of the free ends of the members toward the other ends which are fixed during such movement and held against movement relatively to each other by the interlocking resulting from pleating.

Means are provided for guiding the members 15 and 16 during such collapsing movement to the position shown in Fig. 2 thereby to maintain them tightly interleaved or nested with each other and also interlocked with the work such as the necktie 27 thereby to pleat said necktie. Said means comprises the parallel spaced apart channel guides 28 and 29 secured to the table top 21 and respectively receiving opposite ends of the transversely arranged guide pins 30, which are suitably secured at the fold lines 17 of the member 15. As best seen in Figs. 9 and 10, the pin 30 is forced through the sheet material of the member 15 or through at least one layer thereof so that its middle third is underneath the under surface of the sheet and its end thirds are above the upper surface of the sheet. Stitching as 31 passing around the pin and through the sheet may be employed to prevent excess displacing movement of the pin relatively to the sheet, though such displacement is improbable owing to the arrangement of the member 15 between the channel guides and the insertion of the projecting ends of the pins into the respective channel guides.

It will now be obvious that longitudinal compressive force exerted on the free end of the member 15 causes collapsing folding and pleating of said member along the creases or folds 17 and 18 into a plurality of upright folds thereby to shorten said member while incidentally increasing its effective height by making the panels of the pleats stand on edge. Since the member 16 is secured and hinged to the member 15, collapse of the latter will also collapse the former in the same manner. To insure the proper folding or pleating action, the members 15 and 16 are suitably but separably held in their closed positions

shown in Figs. 2, 6 and 8 by suitable handled means enabling the members to be manipulated safely, quickly and easily when they are to be opened, closed, collapsed and extended. Said means comprises the angle bracket 32 fixed to the table top at the right hand end of the member 15 as viewed in Figs. 1, 2 and 8 and having an upstanding flange 33 adapted to enter the groove 34 in the hinged channel 35 terminating in the handle 36. The adjacent end edge portion of the member 16 is inserted into and secured to a relatively thin channel 37 which is in turn secured to the handled channel 35 pivoted at its rear end to the upright flange 33. The end portion of the member 16 may be readily manipulated by the handle 36 and swung toward and from the member 15 to insert the flange 33 into the hinged channel 35 and to remove it therefrom. The corresponding end 38 of the member 15 is fixed in place to any convenient fixed part such as the table 21 by means of the securing strip 39.

Suitable longitudinally aligned holes 40 are made in the crests of the member 15 symmetrically about the fold lines 18 and corresponding holes 41 in the troughs of the member 16 symmetrically about the line 17 to permit the needle 42 to pass through said members and the work 27 during the stitching operation. To permit the needle to pass through the channels 35 and 37 and through the flange 33, the parts mentioned are also cut away as best seen in Figs. 6 and 8. If the stitch is not to reach the extreme end part of the work as in the case of neckties, said end part is passed through the cut-away part 43 of the flange 33 and through the slots 44 and 45 on the bracket 32 and in the table top respectively, out of the way of and below the needle.

At the other or free ends of the members 15 and 16, similar means are provided for manipulating the members. The channel 46 receives the end edge portion 47 of the member 16 and is secured to the hinged channel 48 terminating in the handle 49 and pivoted at its rear end to the upright flange 50 of the relatively wide and long sliding bracket 51. Said flange 50 is adapted to enter the groove of the channel 48, part of the flange being cut and bent around the transverse pin 52 (Fig. 8) to which the end edge part of the member 15 is secured. The edges of the horizontal flange 53 of the slide bracket 51 enter the grooves of the guide channels 28 and 29 to be guided thereby while the middle part of said flange 53 is secured to one leaf 54 of a hinge, the other leaf 55 of the hinge being bent to form a locking member adapted to engage a selected bend of the locking rack 56 when the pleating members are collapsed and to hook over the end edge of the table 22 to maintain the members in their inoperative stretched positions (Fig. 1). The rack is set into a suitable recess in the table 22 to avoid interference with the pleating movement of the parts and maintains the sliding flange 53 in the position wherein compressive pressure on the pleating members and on the work is maintained, as in Fig. 2, until the locking leaf 55 is raised off the rack.

To hold the pleats and the folds in proper horizontal alignment during the pleating movement, an elongated longitudinally disposed hold-down rail 58 is secured at one end as 59 to the hinged channel 35 and at its other end passes through the slot 60 of the hinged channel 48. The depending flange of the hold-down rail rests

by gravity on the end portions of the folded pins 62 as best seen in Fig. 4. Said pins are preferably made of flat wire resting on the outer surface of the member 16 at the fold lines 20 and held in place by the bends at the ends thereof and the doubled back end portions 63 and 64 pressing against the under surface of the member. The rail 53 loosely and adjustably connects the hinged and handled channels 35 and 48 so that by manipulating the handles 36 and 49 at the same time, the member 16 may be swung into and out of its closed position. The rail also tends to maintain the channel 48 in the position in which it is set relatively to the channel 35. This is done by bending the flange 65 thereof into a diagonal position to engage forcibly the corner 66 of the slot 60 as best seen in Figs. 6 and 7, friction tending to prevent accidental movement of the channel 48 relatively to the rail.

In the closed or nested position, the rail flange rests on the pins 62 and prevents said pins from lifting out of their proper aligned positions under the compressive force thereon when the pleating members are collapsed. Obviously, the free edge of the member 16 may be slidably connected to the hold-down rail at a number of spaced points to limit relative movement thereof to longitudinal movement only. As shown in Figs. 2 and 4, a number of spaced wire loops as 67 are secured to selected pins 62 for this purpose. Said loops project beyond the pins and encompass the rail. Means are also provided for loosely and detachably holding the work 27 to the member 15 to prevent displacement of the work during the pleating operation. As best seen in Figs. 9 and 10, said means takes the form of a number of spaced apart spring wire clips as 68 passed through the member 15 at selected fold lines 17 and held in place by the same wire or thread stitching 31 as holds the pin 30, the work being inserted under the upwardly curved free front end 69 of the upper leg of the clip. An upstanding pointed pin as 70 (Figs. 1 and 9) is also preferably secured to the member 15 near each end thereof to engage and prevent lengthwise displacement of the work relatively to said member.

It will now be understood that prior to inserting and clamping the work 27 between the pleatable pleating members 15 and 16, said members are stretched flat manually through the handle 49 and the slide 51 until the hinged locking member 55 of the slide is brought into its initial locking position wherein it is hooked over an end edge of the table. The members 15 and 16 in that position are tensioned somewhat and the member 16 rests against the inclined support 23. The tie 27 or other textile article in its usual inside out position is now placed loosely and flat on the member 15 with the raw edges to be stitched just beyond the holes 40 and flat in the dash-dot line position of Fig. 1 but without stretching. A suitable gage line corresponding to the dash-dot line mentioned may be marked on the upper surface of the member 15 to indicate where the raw edges of the tie are to be placed. The usual wool lining is then placed loosely on the tie with its rear edge 71 in the dash-dot line position shown in Fig. 1 and overlapping the edges of the tie material. Both tie and lining are pierced and held by the pins 70 and are inserted into the spaced clips 68, care being taken not to stretch either when so inserted. The handles 49 and 36 are then swung down to superimpose the member 16 on the work,

the flanges 50 and 33 entering the respective grooves of the channels 48 and 35 and the hold-down rail being carried down on to the pins 62. The pleating operation may now be performed, without danger of distorting or misshaping the work. This is done by removing the locking member 55 from the end edge of the table thereby freeing the pleating members and the work 27 from tension, then moving the handle 49 toward the handle 36 as far as it will go to form and to compact and compress the pleats in the pleating members and in the edges of the work, the ends of the pins 30 and the slide 51 sliding in the guide channels 28 and 29. The work is maintained compressed by engaging the locking member 55 with the rack 56. All of the pleats will thereby remain horizontally aligned though upright and parallel as indicated in Figs. 1 and 5 ready for the passage of the needle through the aligned holes 40 and 41.

The needle may be reciprocated by any suitable means manually or mechanically and may be of any suitable type. However, it is important for accurate stitching and for safety that the needle be so supported that it does not bend materially while in operation. For this purpose as best seen in Figs. 2 and 3, the preferably square tube 76 is secured to the table 22 and has slidably inserted thereinto the spaced sliding spring-separators 77 and 78 each having a central perforation therein for the passage of the needle. A spring as 79 surrounds the needle and is interposed between the end 80 of the tube and the separator 77, another spring 81 being arranged between the separators 77 and 78 and a third spring between the separator 78 and the slide 82. The needle is suitably secured to the slide 82 to which is also secured one end of the rack 83 slidably supported between suitable guides such as the extensions 84 of the side walls of the tube. A pinion 85 engages the rack and is suitably supported by the bearings 86 on the table, being rotated as by the crank 87. Obviously, rotation of the pinion in one direction projects the needle continuously through the aligned holes 40 and 41 against the action of the springs while rotation in the other direction retracts the needle aided by the springs to the position of Fig. 1.

The needle may be of the type to carry a thread through the work on the advance of the needle therethrough, but in order to avoid stressing the needle excessively, a needle of an easily threaded type such as a hook needle is preferred and is advanced continuously and bare through the work during the pleat piercing stroke. As shown in Fig. 5, the needle is threaded after the work is pierced, whereafter the needle is retracted with the thread held thereby to make the required slip stitch in the pleated work. The thread 88 may be pre-cut to the required length sufficient to remain in the work when the work is extended, expanded or unpleated along the thread, a suitable knot as 89 being made on the far end of the thread in the proper position to hold the stitched work properly. After retraction of the needle, the locking member 55 is released and the members 15 and 16 again stretched to their flat positions by moving the handle 49 and the slide 51 away from the handle 36 until the end of the locking member 51 drops over the end edge of the table. The handles 49 and 36 are lifted off the bracket flanges to separate the members 15 and 16 and to expose the thus stitched tie, which is then replaced by an unstitched tie and lining ready for the repetition of the operation.

It will now be understood that the specific structure of the members **15** and **16**, and of the guides and holding devices therefor may be considerably varied and may take a number of different forms. As has been indicated, the sheets may be of composite or sectional form or laminated of a multiplicity of sheets, provided that the similar rectangular pleat sections or panels be thin, of substantially the same size and hinged together to give a minimum thickness with adequate strength and durability. For example, as shown in Figs. 11 to 13, and as best seen in Fig. 12, the relatively thin creased or scored sheet **90** of paper or the like may be reinforced by the even thinner sheet **91** of thin plastic tough enough for the purpose such as cellophane or the like, or by thin cloth such as buckram, permitting the laminated sheets **92** and **93** to be hinged together by the sheet **91** at their adjacent edges without the need for the rings **24**. If so hinged together, suitable holes as **94** are preferably made in the connecting sheet **91** to permit the folding of one pleating member on the other and the pleating thereof as a unit without interference by unwanted folds or creases. Additionally if desired, the pleating members may be reinforced by strips as **95** of thin but relatively rigid plastic, metal or the like, and of slightly less width than each individual panel or pleat section **96** to leave the hinge lines or folds between the sections free to operate. Eyelets as **97** serve to secure such strips to the remainder of the sheet. Instead of cutting holes as **40** and **41** in the sheets for the passage of the needle, suitable slots as **98** may be made in the projecting end portions **99** of the strips for the same purpose. The guide pins **30** may be retained in the same form as previously described.

Or, as shown in Figs. 5 to 9, the hold-down rail may be arranged to engage the projecting ends of the hold-down pins **101** which are secured to the member **16** in about the same manner as the pins **30** to the member **15**. Said pins **101** may be provided with an intermediate offset or U-shaped portion **102** (Fig. 9) secured to the pleating member as by means of the staples or stitches **103** to prevent longitudinal displacement of the pins.

It will be seen that I have provided a relatively simple and inexpensive apparatus or machine whereby a relatively long slip stitch may be made quickly and easily in one stroke of a suitably supported needle, that the pleating preparatory to the stitching operation is accomplished without stretching, distortion or misshaping the work, because the work is loosely arranged in position for pleating between substantially flat sheets and is equally stressed if at all, on both faces, and that I have provided a means well adapted for commercial purposes and effective for the purposes intended.

Changes other than those already explained are contemplated and may obviously be made in the specific forms of the invention herein disclosed without departing from the spirit of the invention defined in the appended claims.

I claim:

1. In a slip stitching machine, a pair of similar coextensive pre-creased continuous flexible superimposable and pleatable sheets, means hinging together the corresponding side edges of the sheets, the sheets being extendable to a substantially flat form and means for locking the sheets against longitudinal movement in the pleated form and in the flat form of the sheets, the locking means comprising a slide secured to the movable end of the lower sheet and a locking member hinged to the slide and adapted to hook over a fixed part of the machine.

2. The machine of claim 1, means for fixing one end of one sheet in place, means comprising a blade member at each end of one sheet and a channel at each end of the other sheet receiving the corresponding blade member for removably securing corresponding ends of the respective sheets together and means for guiding the edges of the sheets when the other end of said one sheet is moved toward the fixed end.

3. The machine of claim 1, each of the sheets having pre-formed parallel transversely arranged fold lines therein one set of alternate fold lines in each sheet being creased in one direction and the other set of alternate fold lines in each sheet being creased in the opposite direction whereby said sheets become pleated on the relative movement of the ends thereof toward each other.

4. The machine of claim 3, manually operable interengageable members secured transversely to the respective corresponding ends of the sheets to collapse and extend the sheets as a unit and to swing one of the sheets toward and from the other sheet to superimpose and to separate said sheets only when said sheets are in their flat state.

5. In a slip stitching machine, a first elongated and transversely flexible thin continuous sheet divided along predetermined equidistant transverse parallel fold lines creased alternately in opposite directions into a series of consecutively arranged substantially rectangular and similar panels there being aligned openings in the respective panels extending from alternate fold lines more than half way across each adjacent panel, one end of the sheet being fixed and the other end being free and movable toward the fixed end to pleat the sheet, means including transverse pins piercing the sheet and extending therebeyond and fixed guide channels of lesser height than that of the pleated sheets receiving the ends of the pins, for guiding the edges of the sheet during the movement of said free end, a second sheet similar to and coextensive with said first sheet and hinged thereto along a longitudinal side edge thereof said second sheet having aligned openings therein extending from the other alternate fold lines more than half way across each adjacent panel, and means comprising separable interengaging members for removably fixing the corresponding ends of the sheets to each other in superimposed relation with the corresponding fold lines of the sheets registering with each other with the openings of the respective sheets in substantial alignment.

6. The machine of claim 5, hook means fixed to one sheet for locking the sheets in the completely pleated positions and in the unpleated positions thereof, the openings in said sheets permitting the unobstructed passage of a needle through the pleats thereof when the sheets are pleated.

7. The machine of claim 5, the distance between the fold lines and the thicknesses and the initial flat state of the sheets being such that when the sheets are pleated and interleaved with a textile article therebetween, the heights of the pleats in the article and in the sheets are equal, and the overall length of each of the pleated sheets is a minor fraction of the length of the extended unpleated sheet.

8. In a pleating and slip stitching machine, a first continuous paper or the like sheet having a

first set of transverse creases directed toward one face of the sheet and a second set of transverse creases alternating with the creases of the first set and directed toward the other face of the sheet, a table under and supporting the first sheet, means securing one end edge of the first sheet to the table, an upstanding plate-like member adjacent said means, a slide plate having an upstanding flange at the other end edge of the first sheet, a locking hook hinged to the plate, a second continuous paper or the like sheet having transverse creases therein corresponding to the creases of the first sheet, said second sheet being coextensive with the first sheet, transverse pins each piercing the first sheet at two spaced points of one set of creases and extending beyond the side edges of the first sheet, the end portions of the pins being on one side of the sheet and the midportion of the pins being on the other side of the sheet, a pair of transversely spaced side guide channels secured to the table in position slidably to receive the end portions of the pins and the edge portions of the slide plate, a hinge pivotally connecting adjacent longitudinal side edges of the first and second sheets, and means for securing the second sheet in superimposed relation to the first sheet and for manipulating the second sheet comprising a pair of handled channels one at each end edge of the second sheet and arranged in pivotal alignment with and to receive frictionally the upstanding flange of the slide plate and the plate-like member respectively, a hook hinged to the slide plate, and a rack secured to the table in predetermined longitudinal spaced relation to the sheet securing means and in the path of the hook.

9. In a pleating and slip stitching machine, a pair of flexible continuous unpleated sheets each having transverse creases thereacross directed toward one face of the sheet and alternating with similar creases directed toward the opposite face of the sheet, and means for supporting each of the sheets in position to superimpose one sheet on the other in substantially coplanar relation comprising a hinge pivotally connecting the corresponding side edge portions of the sheets, means for detachably connecting the respective end portions of one sheet to the corresponding end portions of the other sheet, means for fixing one end portion of said other sheet against movement, and means for removably locking the other end portion of said other sheet in the stretched position of said other sheet and thereby temporarily maintaining each of the sheets in a continuous substantially plane surface except for the creases thereof.

10. In a pleating and slip stitching machine, a pair of flexible continuous unpleated sheets each having transverse creases thereacross directed toward one face of the sheet and alternating with similar creases directed toward the opposite face of the sheet, means for supporting each of the sheets in position to superimpose one sheet on the other in coplanar relation including means for stretching each of the sheets into a continuous plane surface except for the creases thereof and transverse pins across the sheets at selected creases thereof each piercing the sheet at two points of the crease and projecting beyond the sheet.

11. The machine of claim 9 and means for compacting the sheets simultaneously with a textile article therebetween from a coplanar to a pleated position to raise alternate parts of the sheets and the article simultaneously after the locking means have been unlocked and to depress the other alternate parts of the sheets and the article simultaneously thereby to pleat both sheets as well as the article at the same time without stress on the article other than bending.

12. In a pleating and slip stitching machine, a pleatable support comprising a continuous sheet of tough thin flexible material resisting repeated folding on itself and having precreased parallel transverse fold lines therein, adjacent lines being creased toward opposite faces of the sheet to raise part of the sheet into a crest and to lower the remainder of the sheet into a valley when the sheet is contracted longitudinally, an upper sheet similar to the support and adapted to fit thereinto when folded and correspondingly creased and coextensive therewith, a hinge connection between adjacent longitudinal edges of the sheets, means for maintaining the sheets in a tensioned state to flatten the sheets and the creases thereof whereby the sheets become substantially coplanar when the upper sheet is superimposed on the support sheet, said means comprising a hook adapted to engage and thereby to be removably secured to a fixed object, said hook being carried by the movable end of the lower support sheet, spaced apart parallel guide members carried by and movable with the support sheet at the respective creases thereof and projecting beyond the longitudinal edges thereof, and spaced apart fixed guide channels of lesser height than that of the sheets when the sheets are pleated at the creases thereof, said channels slidably receiving the respective ends of the guide member the pleated sheets extending above the tops of the channels.

13. In a slip stitching machine, a pair of superimposable pleatable sheets each having a series of longitudinally aligned openings therein, the openings of both series being in substantial alignment when the sheets are pleated and superimposed, a needle arranged longitudinally of the sheets and adjacent thereto and means supporting the needle against bending and for longitudinal reciprocation in longitudinal alignment with and into and out of the openings comprising a tube surrounding the needle, a plurality of longitudinally spaced apart spacers slidable within the tube, a compressible spring in the tube on each side of each spacer and a needle-holding member slidable within the tube, there being openings in the spacers for the passage of the needle therethrough.

14. The machine of claim 13, the sheets being initially precreased flat and coplanar, pins secured transversely of the lower sheet and extending beyond the side edges thereof, fixed longitudinal guides beyond the side edges of the lower sheet parallel to said edges and receiving the ends of the pins, and means fixing one end of the lower sheet relatively to the guides, the sheets being collapsible longitudinally as a unit at the creases thereof.

15. The machine of claim 14, a hinged locking hook secured to the movable end of the lower sheet, and a rack fixed in the path of the locking hook and engageable thereby.

16. In a slip stitching and pleating machine, a precreased sheet having one end portion movable longitudinally toward the other end portion, a second similar sheet hinged to the first mentioned sheet along the side edges of the sheets for superimposition on the first sheet, a needle arranged longitudinally of and between the side edges of the sheets in position to reciprocate through an

article held between the sheets, means for guiding the superimposed sheets during the movement of said one end portion, transverse pins carried by the second sheet and extending therepast, a handled channel at each end of the second sheet, an upstanding member fixed at each end of the first mentioned sheet and entering the adjacent handled channel when the sheets are superimposed, and a hold-down rail passing through the channels and engaging selected pins.

17. In a pleating and slip stitching machine, a sheet having two sets of transverse creases therein directed toward opposite faces of the sheet respectively, the creases of one set alternating with the creases of the other set, a second similar sheet of the same size, means hinging adjacent side edges of the sheets together, and means locking the superimposed sheets in a selected one of two positions, one position being a stretched position wherein the sheets are substantially coplanar and the other being a compacted pleated position.

18. The machine of claim 17, and spaced parallel transverse stiffening strips secured to each sheet and having alignable notches therein for the passage of a needle therethrough in the compacted pleated position of the sheets.

19. In a pleating and slip stitching machine, a first continuous flexible sheet having a first set of transverse creases directed toward one face of the sheet and a second set of transverse creases alternating with the creases of the first set and directed toward the other face of the sheet to form transverse panels in the sheet, a table under and supporting the first sheet, means fixedly securing one end edge of the first sheet to the table, the other end of the first sheet being movable longitudinally, a second continuous flexible sheet having transverse creases therein corresponding to the creases of the first sheet and forming similar panels therein, said second sheet being coextensive with the first sheet, means hinging the sheets together at the corresponding side edges thereof, the first sheet having a series of aligned openings therein between the side edges and at alternate creases thereof, the second sheet having a similar set of aligned openings therein alignable with the openings of the first sheet when the second sheet is swung about the hinging means and superimposed on the first sheet, the openings of one set alternating with the openings of the other set, each of the openings extending from a crease part-way across each of the adjacent panels and being open at the crease end thereof and closed at the other end thereof, means removably securing the corresponding end edge portions of the sheets to each other in the superimposed positions of the sheets and a movable locking member carried by the movable end of the first sheet, and a fixed locking member on the table cooperating with the movable locking member to lock the sheets in the compressed pleated positions thereof.

20. In a pleating and slip stitching machine, a first continuous flexible sheet having a first set of transverse creases directed toward one face of the sheet and a second set of transverse creases alternating with the creases of the first set and directed toward the other face of the sheet to form transverse panels in the sheet, a table under

and supporting the first sheet, means fixedly securing one end edge of the first sheet to the table, the other end of the first sheet being movable longitudinally, a second continuous flexible sheet having transverse creases therein corresponding to the creases of the first sheet and forming similar panels therein, said second sheet being coextensive with the first sheet, means hinging the sheets together at the corresponding side edges thereof, the first sheet having a series of aligned openings therein between the side edges and at alternate creases thereof, the second sheet having a similar set of aligned openings therein alignable with the openings of the first sheet when the second sheet is swung about the hinging means and superimposed on the first sheet, the openings of one set alternating with the openings of the other set, each of the openings extending from a crease part-way across each of the adjacent panels and being open at the crease end thereof and closed at the other end thereof, the openings being in substantial alignment when the sheets are superimposed and pleated, a fixed rack member in the path of the movable end of the first sheet, and means carried by said movable end for engaging the member and adjustably locking the sheets and an article between the sheets in the pleated positions thereof.

21. In a pleating and slip stitching machine, a pair of flexible continuous sheets each having creases thereacross directed toward one face of the sheet and alternating with similar creases directed toward the opposite face of the sheet, each of the sheets having a series of openings therein extending from the first mentioned creases part-way toward the second mentioned adjacent creases, the openings in each sheet being aligned with each other and substantially aligned with the openings of the other sheet when the sheets are superimposed and pleated at the creases, means hinging the corresponding side edges of the sheets together, means for removably locking the corresponding end portions of the sheets together and means fixing only one end of the lower sheet in place to permit the other corresponding locked ends of the sheets to be moved as a unit toward said one fixed end of the lower sheet thereby to pleat the sheets and an article arranged therebetween.

22. The pleating and slip stitching machine of claim 21 and means for locking the locked movable ends of the sheets in an extended substantially flat position of the sheets and in the compacted pleated position thereof, preparatory to the passage of a needle through the openings and through the article.

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