

June 20, 1939.

M. BRETH

2,162,879

END GRIPPER FOR CLOTH LAYING MACHINES

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3 Sheets-Sheet 1

Fig. 2.

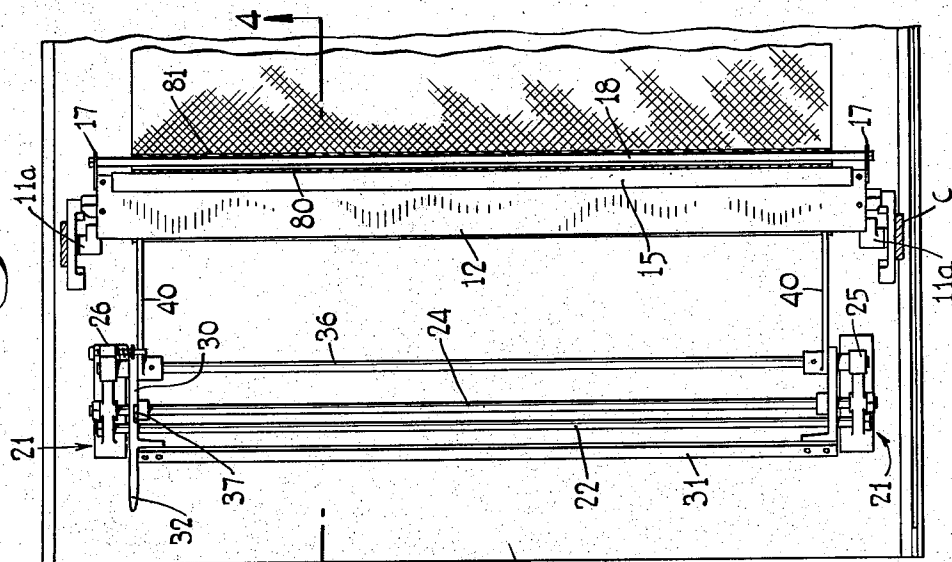
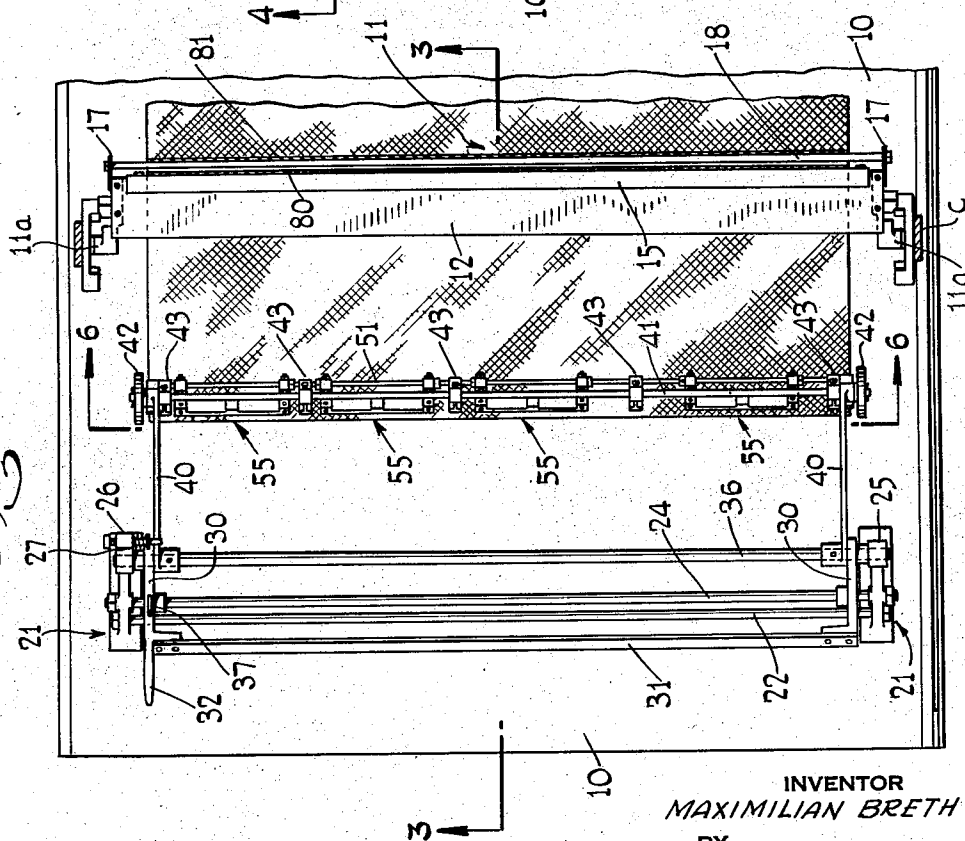


Fig. 1.



INVENTOR
MAXIMILIAN BRETH
BY
J. B. Felshin
ATTORNEY

June 20, 1939.

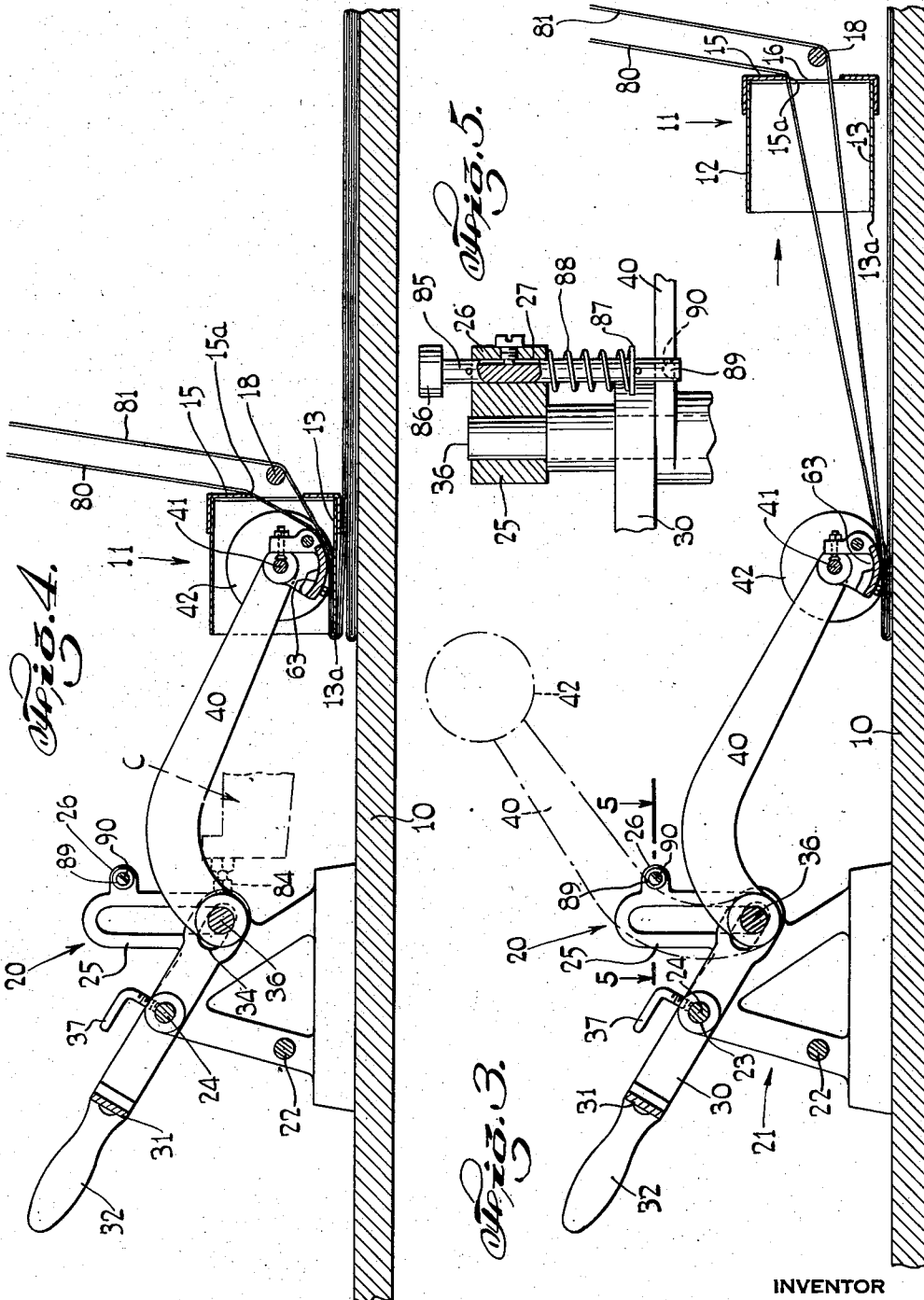
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3 Sheets-Sheet 2



INVENTOR
MAXIMILIAN BRETH
BY
J. B. Felstein
ATTORNEY

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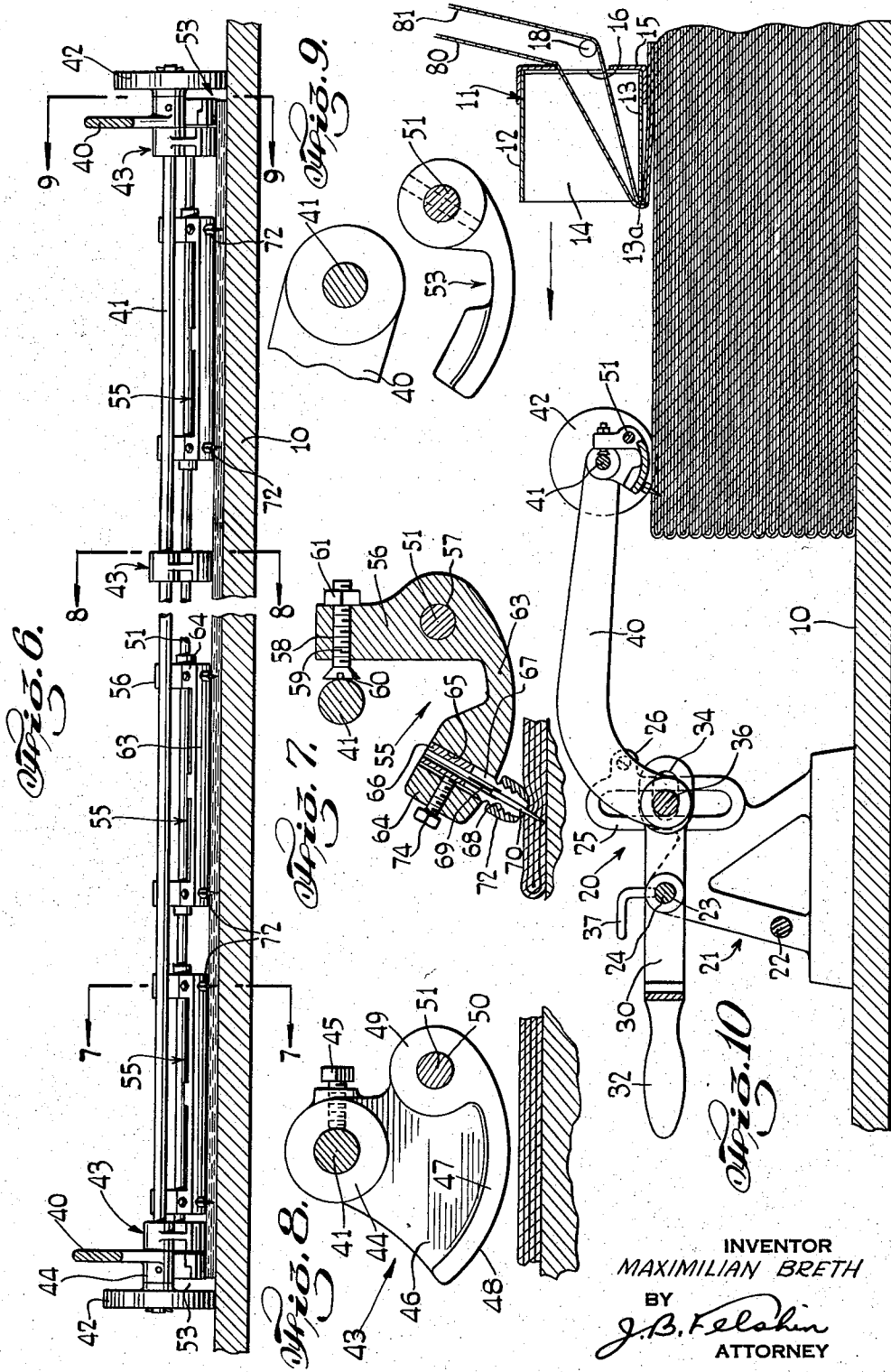
M. BRETH

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3 Sheets-Sheet 3



INVENTOR
MAXIMILIAN BRETH
BY
J. B. Felahin
ATTORNEY

UNITED STATES PATENT OFFICE

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END GRIPPER FOR CLOTH LAYING
MACHINES

Maximilian Breth, Ozone Park, N. Y.

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23 Claims. (Cl. 270—30)

This invention relates to end grippers for cloth laying machines.

An object of this invention is to provide an end gripper of the character described, provided with pins adapted to penetrate a plurality of layers of cloth, and in which the pins are adjustable to accommodate various numbers of layers of various thickness.

A further object of this invention is to provide an end gripper of the character described which may be used with a cloth laying machine, laying two kinds of cloth at once, for example, linings and interlinings.

Yet another object of this invention is to provide in end grippers of the character described, means for adjusting the position of the penetrating pins relative to the leader blades on the cloth folding bar.

A still further object of this invention is to provide in an end gripper of the character described, means for holding the gripper in disengaging position away from the cloth.

Still another object of this invention is to provide an end gripper of the character described including a pivoted member carrying the penetrating pins and means for changing the fulcrum of said pivot member as the cloth piles up to accommodate relatively thick piles of cloth.

Yet another object of this invention is to provide a strong, rugged and durable device of the character described which shall be relatively inexpensive to manufacture, easy to manipulate and adjust, and yet practical and efficient to a high degree in use.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts which will be exemplified in the construction hereinafter described, and of which the scope of application will be indicated in the following claims.

In the accompanying drawings, in which is shown one of the various possible illustrative embodiments of this invention,

Fig. 1 is a top plan view of a portion of a cutting table and illustrating a usual cloth folding bar, forming part of a cloth laying machine, and an end gripper for the cloth, embodying the invention.

Fig. 2 is a view similar to Fig. 1 with the gripping members received between the leader blades of the folding bar.

Fig. 3 is an enlarged cross-sectional view taken on line 3—3 of Fig. 1.

Fig. 4 is an enlarged cross-sectional view taken on line 4—4 of Fig. 2.

Fig. 5 is an enlarged top plan view of the mechanism for holding the grippers out of engagement with respect to the cloth.

Fig. 6 is an enlarged cross-sectional view taken on line 6—6 of Fig. 1.

Fig. 7 is a cross-sectional view taken on line 7—7 of Fig. 6.

Fig. 8 is a cross-sectional view taken on line 8—8 of Fig. 6.

Fig. 9 is a cross-sectional view taken on line 9—9 of Fig. 6.

Fig. 10 is a view similar to Fig. 3, but showing the cloth piled up, and the fulcrum for the pivotal pin-carrier raised, and also showing the cloth folding bar in raised position.

Referring now in detail to the drawings, 10 designates a cutting table on which the cloth is to be laid. On the table is a reciprocating cloth laying carriage C of usual construction. The only portion of the machine illustrated in the drawings, is the cloth folding bar 11, likewise of usual construction and comprising generally of top and bottom leader blades 12 and 13, interconnected at their ends by end walls 14 provided with trunnions 11a to permit rotation of the bar from the position shown in Fig. 10 in a counter-clockwise direction through an angle of 180°. Interconnecting the leader blades is a rear wall 15, formed with a longitudinal slot 16. End walls 14 have extensions 17 carrying a rod 18 parallel to, and adjacent slot 16. Any suitable usual means (not shown) may be provided for raising the cloth folding bar 11 as the cloth piles up during the cloth laying operation. In the usual cloth laying machine, the carriage moves back and forth on the cutting table to lay the cloth in a pile or in layers.

The present invention is for improved end grippers to engage the folded ends of the cloth as the carriage reciprocates back and forth on the cutting table. The end grippers are located at the ends of the table and the carriage reciprocates between the end grippers. In the drawing there is illustrated one end gripper 20 embodying the invention, it being understood that in the usual cloth laying machine, two such end grippers are provided disposed symmetrically to one another at the opposite ends of the table.

The end gripper 20 comprises a pair of parallel, symmetrically disposed stanchions 21, located adjacent the side edges of the table 19 and near one end of the table. The stanchions 21 are interconnected by a horizontal rod 22. Said stanchions

are formed with aligned openings 23 receiving therethrough a horizontal rod 24, disposed above the connecting rod 22. Said stanchions are furthermore formed with integral aligned, vertical slotted guides 25. One of the guides is formed with an ear 26 having a horizontal aperture 27 for the purpose hereinafter appearing.

Fixed to the rod 24 inside of the stanchions 21 is a pair of parallel levers 30, interconnected by a horizontal connecting rod 31 so as to move together. One of the levers 30 is formed with a handle extension 32. The levers 30 are furthermore formed with aligned slots 34, and extending through said slots are the ends of a horizontal rod 36. The outer ends of said rod 36 also pass through the vertical slots in the guides 25 of the stanchions 21.

It will now be understood that as the handle 32 is worked up and down, the rod 36 will be lowered and lifted. A set screw 37 on one of the stanchions 21 is adapted to engage the rod 24 to retain the levers 30 in their various adjusted positions.

Pivoted on the rod 36 adjacent the levers 30 are a pair of similar arms 40, the outer ends whereof are interconnected by a horizontal rod 41. Rotatably mounted on the outer end of the rod 41 are wheels 42 adapted to roll on table 10 before the cloth piles up sufficiently to lift said wheels off the table, as will appear hereinafter. It will now be understood that when the rod 41 is raised the arms 40 will pivot about the rod 36 which serves as a fulcrum for such pivotal movement.

As shown in Fig. 8 of the drawings, there is mounted on rod 41 a plurality of members 43, each comprising a collar or sleeve 44, through which the rod 41 passes. Set-screws 45, extending through the collars 44, serve to fix the rod 41 to the members 43. Extending from each collar 44 is a web portion 46 carrying a shoe 47, the outer or bottom curved surface 48 whereof, is concentric with respect to the axis of rod 41 and has a radius of curvature somewhat less than the radius of curvature of wheels 42. The shoes 48 are formed with aligned bosses 49, formed with openings 50, receiving therethrough a horizontal rod 51, disposed at a lower level than the rod 41.

Any suitable number of members 43 may be provided in spaced relation to each other, five such members being shown in the drawings for the purpose of illustration.

As shown in Figs. 6 and 9 of the drawings, there is fixed to the outer ends of the rod 51 a pair of shoes 53 similar to the shoes 47 of the members 43. The members 43, 53 are adapted to rest on the cloth adjacent the folded end thereof as the cloth piles up.

Pivoted on the rod 51 are a plurality of pin-carriers 55, disposed between the members 43. Any suitable number of pin-carriers may be provided, four being shown in the drawings for the purpose of illustration only. Each pin carrier has at the ends thereof, a pair of upstanding arms 56, formed with horizontal through openings 57, through which the rod 51 passes. The arms 56 are provided with horizontal openings 58, disposed longitudinally of the table 10 and at the right of the rod 41.

Screwed within said openings 48 are screws 59, the heads 60 whereof are adapted to contact rod 41. Said screws may be adjusted within the openings 58 and fixed in adjusted position by nuts 61.

Each pair of upstanding arms 56 is intercon-

nected by a shoe portion 63, having a transverse cross-section, substantially similar to the shoes 47 and 53. Each shoe 63 is thickened at the opposite ends thereof, as at 64, the thickened portions 64, being formed with inclined through openings 65. The openings 65 are inclined downwardly and toward the adjacent end of the table 10. Slidably and non-rotatably received within each opening 65 is a tubular chuck 66, the lower end whereof is formed with a plurality of radial slits 67. The lower slitted portion of the chuck 66, tapers toward the bottom and is formed with external screw threads 68.

Extending within the axial openings 69 in the chuck, is a pin 70 the lower pointed end of which projects below the bottom end of the chuck. Nut 72, screwed on the threads 68, serves to press together the slitted portions of the chuck to clamp the pin 70. By loosening the nut 72, the pin may be released for adjustment longitudinally of the chuck or for replacement. Set-screw 74 serves to hold the chuck 66 against rotation.

The operation of my improved end gripper will now be described: The end gripper may be used in conjunction with a cloth laying machine which lays two different kinds of cloths at the same time, for example, lining and interlining. As shown in Figs. 3 and 4 of the drawings, the cloth laying operation is begun with the lever handle 32, raised up, and with the fulcrum rod 36 in its lowermost position, with the ends thereof at the lower ends of the slotted guides 25. The wheels 42, carried on the rod 41, engage the table, and the shoes 47, 53 and 63 are disposed somewhat above the table. Two layers of cloth 80 and 81 coming from bolts of cloth on the carriage pass through the folding bar 11, one layer passing through the slot 16 and engaging the lower edge 15a of the back wall 15 formed by said slot, and the other layer 81 passing beneath the rod 18, and through said slot. As shown in Fig. 4, both layers pass around the lower leader blade 1, in engagement with the forward edge 13a thereof. As the carriage, together with the cloth folding bar 11, move to the left toward the gripper, the wheels 42 will ride up on the lower leader blade and enter between the blades 12 and 13. Shoes 47, 53 and the pin carriers 55 will also move into the cloth folding bar 11 and between the blades 12 and 13. The pins 70 will slide over the folded cloth and will pierce the two layers of cloth disposed directly above the lower leader blade 13. Fig. 4 shows the extreme position of the cloth folding bar 11 at the left end of the stroke. In such position any suitable, adjustable stop member 84 on the carriage C may strike one of the slotted guides 25.

When the stop 84 strikes the slot guide 25, the carriage C is moved to the right, or in an opposite direction. The pins 70, however, being engaged with the layers 80 and 81 hold the cloth at the fold as the folding bar 11 moves to the right, away from the gripper. As the carriage moves to the right the pins 70 penetrate further into the cloth. The folding bar 11 is then rotated through an angle of 180 deg. in any suitable manner about the trunnions 11a in a counter-clockwise direction so that the leader blade 12 is at the bottom and the folding bar opens on the right to receive a similar end gripper at the other end of the table. In this manner the carriage C moves back and forth and at the end of each stroke the cloth is gripped by the pins 70 at the fold. As the cloth piles up, the pile engages the bottom surfaces of the shoes 47, 53

and 63, to lift the rod 41 and the arms 40, causing pivotal movement of said arms about the fulcrum rod 36. As the cloth piles up, the folding bar is also raised in the usual manner.

- 5 When the cloth has piled up a certain amount, the set screw 37 may be loosened and the handle 32 moves to horizontal position, as shown in Fig. 10 of the drawings, to raise the fulcrum 36 for the pivoted arms 40. When the cloth has piled up a still greater amount, the handle 32 may be pushed down to the bottom to raise the rod 36 to the top of the slotted guides 25. With such construction the gripper may be used with relatively thick piles of cloth.
- 15 The pins 70 may be adjusted in the chucks 66 to penetrate four thicknesses of cloth or even more. The position of the pin 70 relative to the leader blades 13 may be adjusted by properly manipulating the screws 59.
- 20 Means is provided to hold the cloth grippers up in cloth disengaging position. To this end, there is slidably mounted within the opening 27 of the ear 26, a pin 85 having a head 86 at one end. On the pin 85 is a collar 87. A coil compression spring 88 is interposed between the collar and the ear 26. One end 89 of the pin 85 projects into the path of the adjacent arm 40. The under surface of the pin 89 may be bevelled, as at 90, to permit the arm 40 to be raised about the pivot 36 to the dot-dash line position of Fig. 3, in which position the pin 85 snaps beneath the arm 40 to hold the gripper up, out of engagement with respect to the cloth. By pulling outwardly on the head 86, the arm 40 is released to permit the grippers to fall into operative position.

It will thus be seen that there is provided a device in which the several objects of this invention are achieved, and which is well adapted to meet the conditions of practical use.

- 40 As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiments above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

- 50 1. An end gripper comprising a pivoted member, means on said member to engage one or more layers of cloth, means for vertically adjusting the height of the fulcrum of said pivoted member, and means for fixing the fulcrum of said lever at various heights, said pivoted member being free to swing about its fulcrum without moving said fulcrum, in the various positions of said fulcrum.

- 60 2. An end gripper comprising a pivoted member, means on said member to engage one or more layers of cloth, means for vertically adjusting the height of the fulcrum of said pivoted member, means for fixing the fulcrum of said lever at various heights, said pivoted member being free to swing about its fulcrum without moving said fulcrum, in the various positions of said fulcrum, and means for holding said pivoted member in inoperative position with said engaging means raised upwardly away from the cloth.

- 70 3. An end gripper of the character described comprising a horizontal rod, a pair of arms pivoted about the axis of said rod, the outer ends of said arms being interconnected by a shaft, means on said shaft carrying pins for penetrating

cloth, means for raising and lowering said horizontal rod, and means for retaining said rod in various vertically adjusted positions.

4. In combination with a table, a support on said table, a horizontal bar carried by said support, a member pivoted to said bar and provided with a handle, a vertical slotted guide on said support, a second horizontal bar projecting into said guide, said pivoted member having a portion engaging said second bar for lifting the same within said guide, a second member pivoted to said second bar, and means on said second pivoted member for gripping cloth laid on said table.

5. In combination with a table, a support on said table, a horizontal bar carried by said support, a member pivoted to said bar and provided with a handle, a vertical slotted guide on said support, a second horizontal bar projecting into said guide, said pivoted member having a portion engaging said second bar for lifting the same within said guide, a second member pivoted to said second bar, means on said second pivoted member for gripping cloth laid on said table, and means for fixing said first pivoted member against rotation in various angular positions thereof.

6. In combination with a table, a support thereon, a lever pivoted on said support, a member pivoted to said lever, means on said pivoted member for gripping cloth laid on said table, and means for pivotally moving said lever to various angular positions, for adjusting the height of the fulcrum for the pivoted member without changing the height of the gripping means.

7. In combination with a table, a support thereon, a lever pivoted on said support, a member pivoted to said lever, and being otherwise unconnected to said support and free to swing about its pivot, and means on said pivoted member for gripping cloth laid on said table, said pivoted member being adapted to be swung upwardly by its fulcrum for bringing said gripping means out of engagement with respect to said cloth, and means for retaining said pivoted member in raised position.

8. An end gripper for a cloth laying machine comprising a horizontal bar, a pair of similar arms pivoted to said bar, said pivoted arms being interconnected by a shaft, a pair of wheels on said shaft, a plurality of members fixed to said shaft and having curved under-surfaces concentric with respect to the peripheries of said wheels, and of less radius than said wheels, a second horizontal shaft interconnecting said members, a holder pivoted on said second shaft, a pin carried by said holder, and a screw on said holder adapted to engage said first shaft.

9. An end gripper for a cloth laying machine comprising a table, a support on the table, a horizontal bar carried on said support, a member pivoted at one end to said bar, a pair of parallel, horizontal shafts supported by said pivoted member, a holder pivoted to one of said horizontal shafts and carrying a pin adapted to penetrate layers of cloth on said table, and an adjustable member on said holder adapted to contact said other shaft.

10. An end gripper for a cloth laying machine comprising a table, a support on said table, a member pivoted to said support, a pair of parallel shafts carried by said pivoted member, a holder pivoted to one of said shafts, means on said holder to engage the other of said shafts, a chuck car-

ried on said holder, and a pin carried within said chuck, said chuck having means to clamp said pin in various longitudinally adjusted positions of said pin relative to said chuck.

11. An end gripper for a cloth laying machine comprising a table, a support on said table, a member pivoted to said support, a pair of parallel shafts carried by said pivoted member, a holder pivoted to one of said shafts, a chuck carried on said holder, a pin carried within said chuck, and means on said holder and engaging said other shaft to adjust the angular position of said holder on said first shaft.

12. An end gripper for a cloth laying machine comprising a table, a support on said table, a member pivoted to said support, a pair of parallel shafts carried by said pivoted member, a holder pivoted to one of said shafts, a chuck carried on said holder, a pin carried within said chuck, means on said holder and engaging said other shaft to adjust the angular position of said holder on said first shaft, and means for adjusting the vertical position of the fulcrum for said pivoted member.

13. In combination, a cutting table, a pair of spaced, parallel supports on said table, a horizontal shaft carried by said supports and disposed above said table, a member pivoted on said shaft and comprising a pair of parallel, aligned interconnected levers, a handle on said member, said levers being formed with slotted portions, a horizontal shaft carried by the slotted portions of said levers, a pair of vertical, slotted, aligned, guides on said supports, said second shaft passing through said slotted guides, a pair of spaced arms pivoted to said second shaft, a third horizontal shaft interconnecting the outer ends of said pivoted arms, a pair of shoes on said last mentioned shaft, a fourth horizontal shaft carried by said shoes, a plurality of holders pivoted to said fourth shaft, screws on said holders engaging said third shaft to vary the angular positions of said holders with respect to said fourth shaft, said holders being formed with downwardly inclined openings, chucks within said openings, and pins adapted to penetrate layers of cloth on said table, adjustably fixed within said chucks.

14. In combination, a cutting table, a pair of spaced, parallel supports on said table, a horizontal shaft carried by said supports and disposed above said table, a member pivoted on said shaft and comprising a pair of parallel, aligned interconnected levers, a handle on said member, said levers being formed with slotted portions, a horizontal shaft carried by the slotted portions of said levers, a pair of vertical, slotted, aligned, guides on said supports, said second shaft passing through said slotted guides, a pair of spaced arms pivoted to said second shaft, a third horizontal shaft interconnecting the outer ends of said pivoted arms, a pair of shoes on said last mentioned shaft, a fourth horizontal shaft carried by said shoes, a plurality of holders pivoted to said fourth shaft, screws on said holders engaging said third shaft to vary the angular positions of said holders with respect to said fourth shaft, said holders being formed with downwardly inclined openings, chucks within said openings, pins adapted to penetrate layers of cloth on said table, adjustably fixed within said chucks, and a pair of wheels carried by said third shaft.

15. In combination, a cutting table, a pair of spaced, parallel supports on said table, a horizontal shaft carried by said supports and disposed above said table, a member pivoted on said

shaft and comprising a pair of parallel, aligned interconnected levers, a handle on said member, said levers being formed with slotted portions, a horizontal shaft carried by the slotted portions of said levers, a pair of vertical, slotted, aligned, guides on said supports, said second shaft passing through said slotted guides, a pair of spaced arms pivoted to said second shaft, a third horizontal shaft interconnecting the outer ends of said pivoted arms, a pair of shoes on said last mentioned shaft, a fourth horizontal shaft carried by said shoes, a plurality of holders pivoted to said fourth shaft, screws on said holders engaging said third shaft to vary the angular positions of said holders with respect to said fourth shaft, said holders being formed with downwardly inclined openings, chucks within said openings, pins adapted to penetrate layers of cloth on said table, adjustably fixed within said chucks, a pair of wheels carried by said third shaft, and a plurality of shoes having curved under-surfaces, on said fourth shaft.

16. An end gripper for a cloth laying machine, comprising a pivoted member, a holder pivoted relative to said member, a pin adapted to penetrate layers of cloth mounted on said holder for longitudinal sliding movement, means for fixing said pin in various longitudinally adjusted positions, means for varying the angular position of said holder relative to said pivoted member, and means for varying the vertical height of the fulcrum for said pivoted member.

17. An end gripper for a cloth laying machine, comprising a pivoted member, a holder pivoted relative to said member, a pin adapted to penetrate layers of cloth, means on said holder for supporting said pin for longitudinal sliding movement, means for fixing said pin in various longitudinally adjusted positions, and means for varying the vertical height of the fulcrum of said pivoted member.

18. An end gripper for a cloth laying machine, comprising a member having an opening, a tubular chuck slidably mounted longitudinally within said opening, means for fixing said chuck to said member in longitudinally adjusted position, a pin slidably mounted longitudinally in said chuck, said chuck comprising means for fixing said pin thereto in longitudinally adjusted position.

19. An end gripper for a cloth laying machine, comprising a member pivoted about a horizontal axis, a second member pivoted to said member about a horizontal axis and being free to rotate in one direction about its axis, means to adjustably limit rotation of said second member in an opposite direction, said second member being formed with a downwardly inclined opening, a tubular chuck slidably mounted within said opening, and a pin slidably mounted within said chuck, said chuck being provided with means to grip said pin in various longitudinal positions of said pin relative to said chuck.

20. An end gripper for a cloth laying machine, comprising a member pivoted about a horizontal axis, a second member pivoted to said member about a horizontal axis and being free to rotate in one direction about its axis, means to adjustably limit rotation of said second member in an opposite direction, said second member being formed with a downwardly inclined opening, a tubular chuck slidably mounted within said opening, a pin slidably mounted within said chuck, said chuck being provided with means to grip said pin in various longitudinal positions

of said pin relative to said chuck, and means to vertically adjust the fulcrum for said first pivoted member.

21. An end gripper for a cloth laying machine, 5 comprising a member, a holder pivoted to said member about a horizontal axis, means for limiting rotation of said holder about its axis in one direction, a tubular chuck mounted on said holder for longitudinal sliding movement, means 10 for fixing said chuck to said holder in various longitudinally adjusted positions, a pin within said chuck, said chuck having means to grip said pin in various longitudinally adjusted positions.

22. An end gripper for a cloth laying machine comprising a lever pivoted about a horizontal axis, a pointed pin on said lever adapted to penetrate a plurality of layers of cloth, and means for adjusting the vertical height of the fulcrum 5 for said lever.

23. An end gripper for cloth laying machines comprising a table, a lever pivoted to the table about a horizontal axis, a holder pivoted to said lever, a pointed pin on the holder adapted to 10 penetrate layers of cloth, and means to vertically adjust the fulcrum for said lever.

MAXIMILIAN BRETH.