

[54] CLOTH TRANSFER DEVICE

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[58] Field of Search **112/2, 121.11, 121.15, 121.29, 112/203, 262, 10; 271/63-70, 1; 214/1 B, 1 BB, 1 BC, 1 Q, 1 QA; 83/83-91**

[56]

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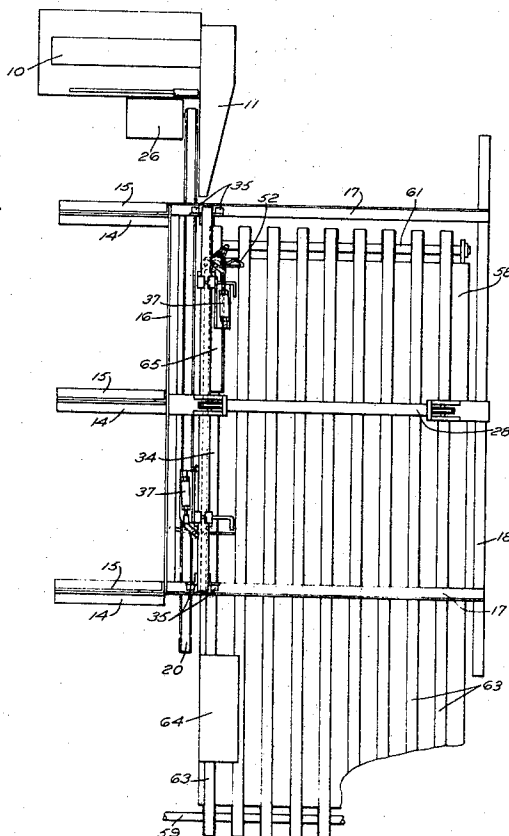
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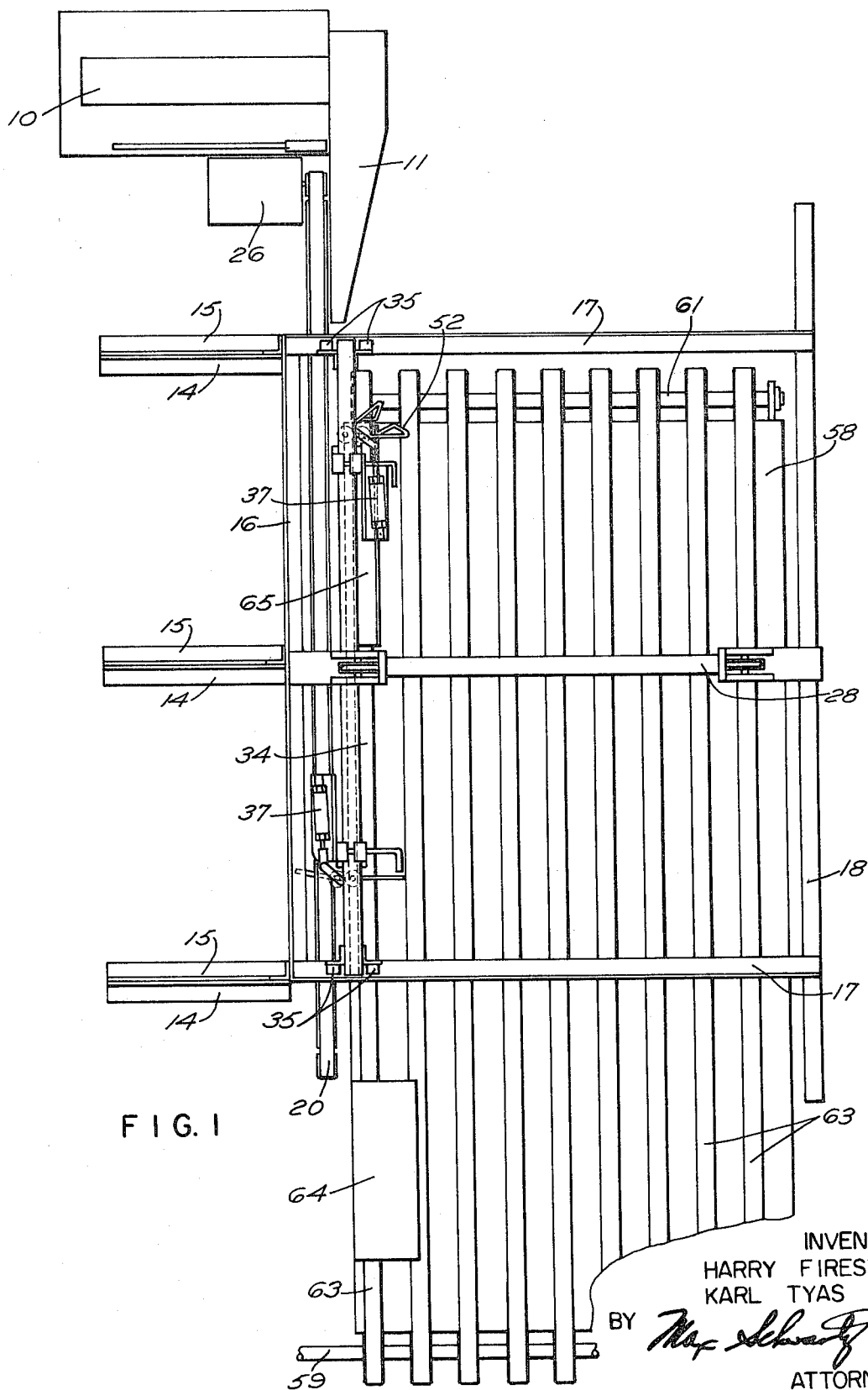
ABSTRACT

In the manufacture of curtains, draperies, and similar textile items, it is often necessary to perform separate sewing opera-

tions on opposite seams of a piece of cloth. The operator turns a small hem and passes the edge of the cloth beneath the needle of a sewing machine. It may then be necessary to perform a similar operation on the opposite hem or even to attach a piece of buckram to the opposite hem. The apparatus of the present invention is designed to transfer the cloth from one operation to the next operation to minimize handling and to permit a single operator to perform the necessary sewing operations on both hems. The device grasps the length of cloth coming from the first sewing machine, turns it over to place the finished edge remotely from the line of travel and then feeds the opposite unsewed edge to a second machine which again hems the device or sews a piece of buckram thereto. Essentially, the carrying device comprises a pair of endless belts operating in contiguous relationship and driven from a common source. The endless belts are driven so that the cloth coming from the first sewing machine passes between them and is carried along the belts until a tripping bar is reached. At this point a pair of movable fingers grasp the side edges of the cloth. These fingers are mounted on a bar slidable on a frame at right angles to the movement of the cloth. The bar and fingers move at right angles along the frame and lay the cloth horizontally flat on a moving conveyor. The cloth has now been laid with the finished edge away from the original moving belts and the unfinished edge closest to them. Movement is parallel to but spaced from the original endless belts and the cloth is fed to an automatic device having an edge guider, of conventional design, which now proceeds with the second operation. A single operator is thus able to perform a sewing operation on opposite edges of the same piece of cloth without additional handling.

6 Claims, 4 Drawing Figures





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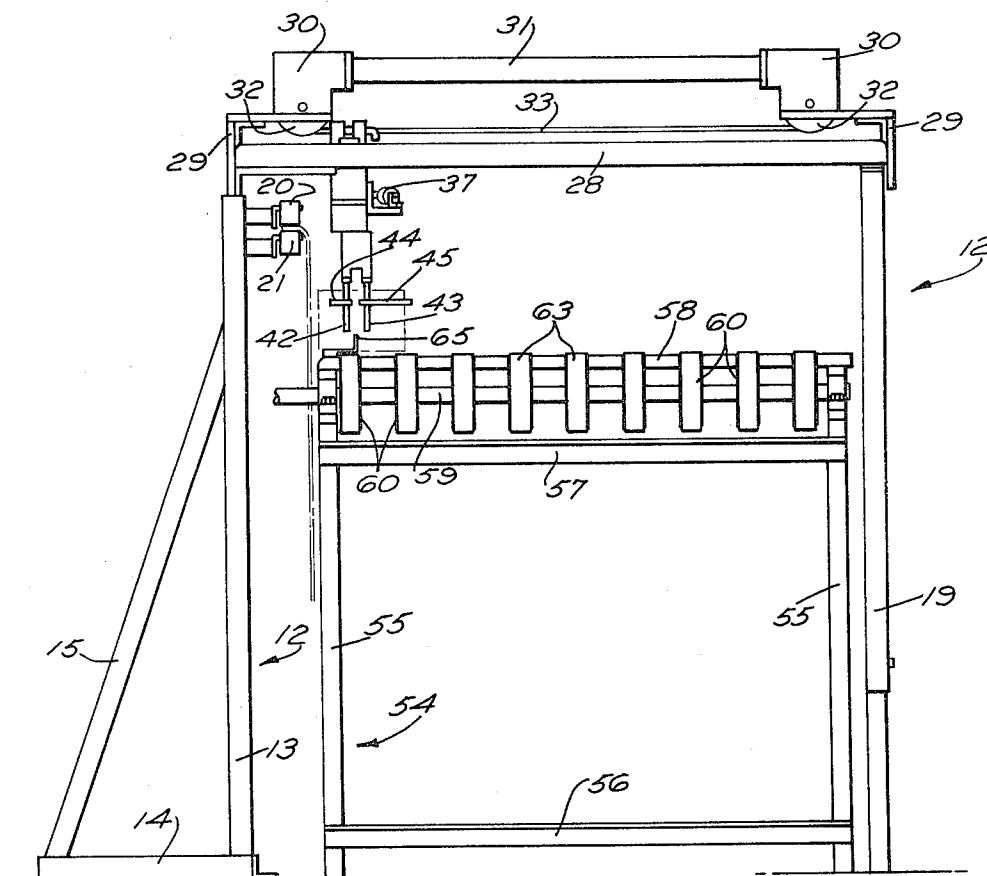


FIG. 2

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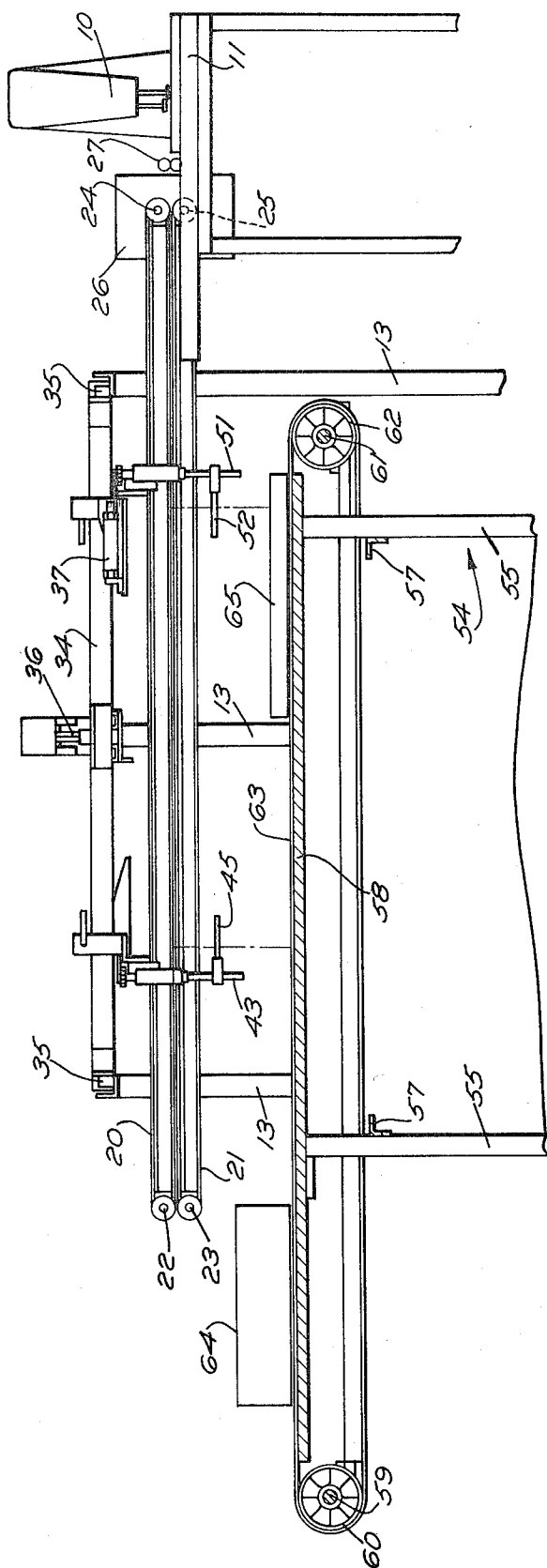


FIG. 3

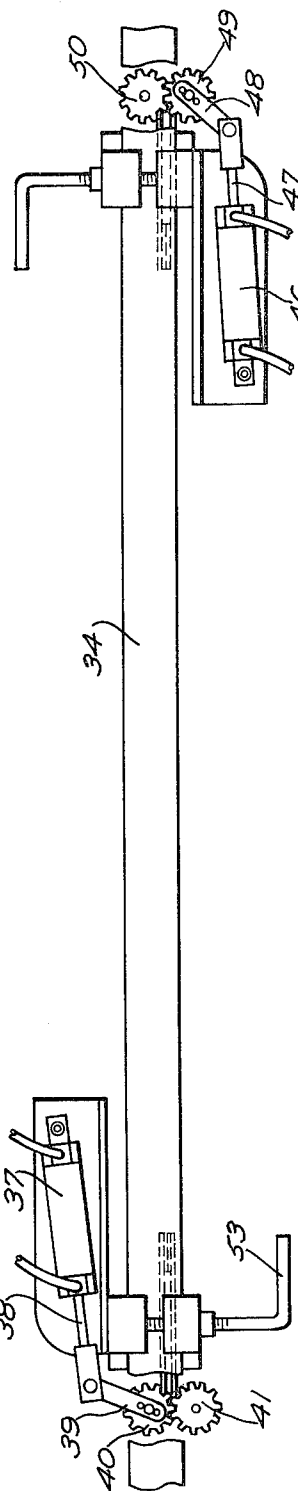


FIG. 4

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CLOTH TRANSFER DEVICE

Our present invention relates to a cloth transfer device and more particularly to means for transferring cloth from one sewing operation to another.

The principal object of the present invention is to provide a device for automatically transferring a piece of cloth issuing from one sewing machine to a second sewing machine operating on the opposite edge.

Another object of the present invention is to provide a device for automatically removing a piece of cloth issuing from a sewing machine and transferring it in proper position to a second sewing machine for another sewing operation.

A further object of the present invention is to provide a transfer device which can be readily mounted adjacent a sewing machine for removing the length of cloth after one edge has been sewed, and transferring the opposite edge of the cloth to a second sewing machine for a second sewing operation.

Another object of the present invention is to provide a cloth transfer device for a sewing machine which permits a multiplicity of controlled operations to be performed on the same piece of cloth by a single operator.

A further object of the present invention is to provide a cloth transfer device 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 top plan view of a cloth transfer device embodying our present invention.

Fig. 2 is an end view of the device shown in FIG. 1.

FIG. 3 is a longitudinal section of the device shown in FIG. 1.

Fig. 4 is an enlarged top plan view showing the control device for the cloth grasping mechanism.

In the manufacture of many cloth articles, such as curtains and draperies, it is required that a plurality of sewing operations be performed on a single piece of cloth. It is therefore necessary to transfer the cloth from one sewing machine to another. If the item is a regular piece such as a rectangular piece of curtain or drapery material, it lends itself to automatic handling and transfer. The present invention is designed to provide a device for transferring a regular cloth article from one sewing machine operation to another. Furthermore, the device of the present invention turns the cloth so that where the first machine has provided a hem or other sewing operation along one edge, the transfer device now moves the opposite edge to the second sewing operation.

Essentially, the device of the present invention has two distinct parts. The first part receives the cloth from the sewing machine and transfers it to a mechanism which is movable at right angles to the original path of movement. The second portion of the machine receives the cloth from the first part and carries it to the second sewing operation. The two portions of the device are thus complementary to each other.

Referring more in detail to the drawings, the sewing machine 10 may be of any conventional type and designed to sew a seam or hem on a piece of cloth traveling beneath the needle at the right end of the machine shown in FIG. 1. The sewing machine 10 is mounted on a table 11 and the transfer device is positioned directly behind the table as shown in FIGS. 1, 2 and 3. The transfer device comprises a rectangular frame 12 preferably formed of angle iron or channel stock. The frame comprises three spaced vertical posts 13 in alignment with the rear of the sewing machine. Each post 13 is braced by a short horizontal portion 14 at the lower end and an angular bracing portion 15 extending from the end of the portion 14 upwardly to a point adjacent the top of the vertical posts 13. The frame also comprises a horizontal member 16 extending across the top of the posts 13, two side members 17

extending from each end of the member 16 at right angles thereto and a member 18 at the end of the side members 17. The horizontal member 18 is longer than the spacing between the side members 17 and is supported at each end by vertical adjustable posts 19. The length of the member 18 permits it to straddle the transfer device positioned beneath it as hereinafter will be described.

Mounted on the frame 12, and in direct alignment with the rear of the sewing machine 10, are a pair of endless belts 20 and 21 in superimposed relationship, the belt 20 being above the belt 21 and actually touching each other. The belt 20 passes around a pulley wheel 22 and the belt 21 passes around the pulley wheel 23 at the left end of the machine as shown in FIG. 3. At the other end, behind the sewing machine 10 the upper belt passes around a wheel 24 and the lower belt passes around a wheel 25. The wheels 24 and 25 are driven by a common source 26.

The material of the belts 20 and 21 are such that they will frictionally abut each other and grasp the cloth as it passes from the machine. Viewing FIG. 3, the piece of material passes from right to left and it will move from the machine through a conventional thread cutting attachment 27 and between the belts 20 and 21 as they pass around the pulley wheels 24 and 25. From there it will pass between the two belts 20 and 21 which will exert sufficient contiguous pressure to hold the cloth shown in dotted lines in FIGS. 2 and 3. The cloth will be carried along the belts 20 and 21 until approximately the center of the belt is reached, at which point further movement will be taken over by the grasping and carrying mechanism hereinafter described.

The frame 12 is provided with a central bar 28 extending parallel to the side bars 17 from the front bar 16 to the rear bar 18. A pair of angle irons 29 extend inwardly from each end of the bar 28 in spaced relation above it. The angle irons 29 support a holder 30 at each end connected by a pipe 31 horizontally positioned in spaced parallel relation above the bar 28. The holders 30 are provided with pulley wheels 32 and the driving belt 33 extends around the pulley and passes through the pipe 31. The lower segment of the belt 33 is therefore positioned slightly above the central bar 28. We now provide a movable carrier bar 34 having spaced rollers 35 at each end resting on the flat horizontal portions of the angle irons 17, see FIG. 1. The bar 34 can therefore ride along the angle irons 17 from a position adjacent the front bar 16, as shown in FIG. 1, to the right to a point adjacent the rear 18. The top of the carrier bar 34 is provided with a unit 36 which attaches to the belt 33. Reciprocation of the belt 33 will therefore move the bar 34 backwardly and forwardly between the horizontal crossbars 16 and 18 at the front and rear of the machine.

Mounted on the bar 34, spaced from the left end as viewed in FIGS. 3 and 4, is an air cylinder 37 having a reciprocating piston 38 pivotally linked at 39 to a flat gear 40. The gear 40 matches with a similar gear 41 so that movement of the gear 40 clockwise causes counterclockwise motion of the gear 41 and vice versa. Now viewing FIG. 2, the gears 40 and 41 are mounted on top of vertical rods 42 and 43. The rod 42 carries a horizontal finger 44 and the rod 43 carries a horizontal finger 45. Operation of the unit is thus simple, when the piston 37 reciprocates in one direction the gears 40 and 41 will rotate and turn the rods 42 and 43 in position so that the fingers 44 and 45 will turn towards each other in touching position. When the piston 37 is reciprocated in the opposite direction turning movement of the gears 40 and 41 of the rods 42 and 43 will cause the fingers 44 and 45 to pivot into the open position shown in FIGS. 1 and 2.

A similar mechanism is mounted adjacent the other end of the rod 34 and spaced therefrom. A cylinder 46 is provided with the reciprocating piston 47 linked at 48 to a gear 49 which meshes with a similar gear 50. As in the previous assembly, the gears 49 and 50 are provided with vertical rods 51 on which the fingers 52 are horizontally pivoted. It should be noted that the fingers 52 are of rectangular design. Now viewing FIGS. 1 and 2, the horizontal carrier bar 34 will be posi-

tioned at the extreme left as shown in FIG. 1. In FIG. 2 it has been moved slightly forwardly to permit a better view of the belts 20 and 21 and the cloth they are carrying. Now as the cloth moves along the belts 20 and 21 into the position shown in FIGS. 1 and 3, the leading edge of the cloth will contact a lever arm 53 extending from the unit mounted at the left end of the device as shown in FIG. 4. The lever arm 53 trips a microswitch which results in the reciprocation of the piston 38 in the cylinder 37 and the piston 47 in the cylinder 46. The fingers 44 and 45 swing towards each other and grasp the leading edge of the material shown in dotted lines in FIG. 3. Simultaneously, the fingers 52 swing towards each other and grasp the rear edge of the material as shown in FIG. 4. The material is now firmly grasped at each side edge between the fingers 44 and 45 at one edge and 52 at the other edge adjacent the finished top edge of the material.

The belt 33 is now activated and moves the carrier bar 34 along the channel irons 17. The first initial movement gently pulls the cloth from between the belts 20 and 21. The cloth is then carried away at right angles to the belts until a position is reached where the cylinders 37 and 46 are again activated and the pistons 38 and 47 reciprocate so that the fingers open to release the cloth. At this point, further movement of the cloth is taken over by the second portion of the transfer mechanism hereinafter described. It should be noted that the position of the finger engaging assemblies hereinabove described on the carrier bar 34 are adjustable for different widths of cloth. The lengths of the fingers 44 and 45 and of the fingers 52 are such that a few inches in length need not be compensated for as they will be grasped by the fingers. However, longer variations in the width of the cloth will have to be compensated for by changing the position of the finger grasping assemblies.

The foregoing describes the first part of the transfer device. The second part of the device is designed to receive the material and move it to the machine for performing the second sewing operation. Referring to FIGS. 1, 2, and 3, we provide a generally rectangular table 54 constructed mainly of angle iron stock. The table 54 comprises four vertical legs 55 a lower transverse horizontal brace 56 at the ends and an upper horizontal transverse brace 57 below the tops of the vertical legs 55. Mounted on the top of the vertical legs 55 is an elongated rectangular flat table 58 which extends from a point short of the upper crossbar 17, see FIG. 1, to a point beyond the lower crossbar 17. The width of the table 58 is such that it will fit easily between the end bars 16 and 18 of the transfer device hereinabove described.

Now viewing FIG. 3, mounted adjacent the left end of the table 58 is a shaft 59 having a plurality of spaced idler rollers 60. At the opposite end, the table 58 is provided with a shaft 61 having a plurality of spaced wheels 62 mounted thereon and fixed thereto. The shaft 61 is power driven by a source not shown. We now provide a plurality of endless belts or tapes 63 passing around the spaced wheels 62 at the right and around the spaced wheels 60 on the left as shown in FIGS. 1 and 3. As can be seen in FIG. 1, the top portion of the tapes or belts 63 rest on the table top 58 and on rotation of the wheels 60 and 62 the belts 63 will move along the top of the table 58 downwardly in FIG. 1 and from right to left in FIG. 3. It should also be noted, viewing FIGS. 1 and 3, that the table 58 and belts 63 extend a considerable distance past the ends of the belts 20 and 21 and their end pulley wheels 22 and 23. Beyond the ends of the belts 20 and 21 and to the left in FIGS. 1 and 3, we provide a device 64 adapted to perform the second operation on the cloth coming from the machine 10.

The device 64 may be of any conventional design having an edge guider which will receive the cloth moving along the belts 63 and will automatically form a hemming or other type of sewing operation including the addition of a strip of buckram. This automatic operation and edge guider is of conventional design and readily available on the market. It is merely necessary that the edge of the cloth enter the device 64 at a close approximation to where it is to be picked up by the device and the operation to be performed thereon. To accom-

plish this the carrier device hereinabove described lays the cloth on the moving belts 63 in a manner hereinafter described.

As can be seen in FIG. 2, the cloth, shown in dotted lines is caught between the belts 20 and 21 and hangs downwardly, the upper edge having been hemmed or sewed by the machine 10 and the lower edge hanging below being still in an unsewed state. Now as the cloth is grasped by the fingers 44, 45 and 52, the cloth will be moved from the position shown in FIG. 2 to the right. This movement will pull the cloth into a horizontal position across the belts or tapes 63. Note that as the carriage or transfer bar 34 moves to the right it is pulling the sewed edge of the cloth and leaving the unsewed end behind it. The length of the stroke of the carriage 36 carrying the bar 34 is adjusted to coincide with the length of the material suspended between the belts 20 and 21. A guide angle iron bar 65 is positioned parallel to the belts 20 and 21 and along the edge of the tapes or belts 63 so that as the unsewed edge of the cloth is laid down on the belts it should roughly abut the edge of the guide 65. Now when the fingers 44 and 45 and 52 release the cloth it will be gently laid on the belts 63 and carried downwardly in FIG. 1 towards the operational device 64. If the rear unsewed edge of the cloth has been aligned with the guide 65 it will pass in the right spot into the device 64 where the edge guider will pick up the cloth for performing the necessary sewing operations.

Viewing FIG. 1, it is therefore obvious that the cloth will pass from the sewing machine 10 along the belts 20 and 21 in a downward position along the belts until it reaches the point shown in FIG. 1. It will then move at right angles to the right until the rear edge is aligned with the member 65. At this point the fingers will release the cloth into a flat position on the belts 63 which will carry it further downwardly through the device 64. This completes the transfer of the cloth. Thus a single operation, beginning at the sewing machine 10 can finish both opposite hems of the cloth, the operator guiding the first hem through the machine 10 and the transfer device turning the cloth over and guiding the other hem through the device 64. It should again be noted that the device 64 will pick up the cloth and with an edge guider will pass it through any type of desired operation including sewing machines, buckram devices and hemming machines. Thus a different width of hem can be sewed on the cloth at 64 than was initially sewed at the machine 10.

The device of the present invention thus obviates multiple handling and sewing so that the single operator can handle both hems upper and lower of a piece of cloth. The device is simple in construction and easy and economical to manufacture and assemble. Other advantages of the present invention will be readily apparent to a person skilled in the art.

We claim:

1. A transfer device for textile material issuing from a sewing machine comprising a pair of endless belts oppositely driven from a common source in contiguous horizontal position, the material being frictionally retained and carried adjacent one edge between said belts, said belts carrying the material to a predetermined position, means for grasping opposite side edges of the material, said grasping means being movable at right angles to said belts to pull the material from said belts at right angles thereto, a conveyor adjacent said belts, said grasping means releasing the textile material onto said conveyor, and means for receiving and working on said material on said conveyor.
2. A device as in claim 1, wherein said grasping means lays the textile material from a vertical position to a horizontal position on said conveyor.
3. A device as in claim 1, wherein said conveyor comprises an elongated rectangular table, a plurality of spaced wheels rotatably mounted at one end of said table, a complementary set of wheels rotatably mounted at the other end of said table, a plurality of endless belts in spaced relation extending across the top of said table and around said wheels, and means for driving one set of said wheels.

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4. A device as in claim 1, wherein said grasping means comprises a horizontal frame, a carriage reciprocally mounted on said frame, an elongated carrier rod mounted on said carriage, and two spaced pairs of movable fingers adjustably mounted on said carrier rod.

5. A device as in claim 2, wherein said receiving and working means comprises a sewing machine, and an automatic edge guider for feeding the edge of the material through said

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sewing machine.

6. A device as in claim 3, wherein said grasping means comprises a horizontal frame, a carriage reciprocally mounted on said frame, an elongated carrier rod mounted on said carriage, and two spaced pairs of movable fingers adjustably mounted on said carrier rod.

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