May 14, 1940. T. E. CARROLL 2,200,327

APPARATUS FOR MAKING DECORATIVE FABRIC

Filed Dec. 15, 1937 2 Sheets-Sheet 1

Fig. 1.

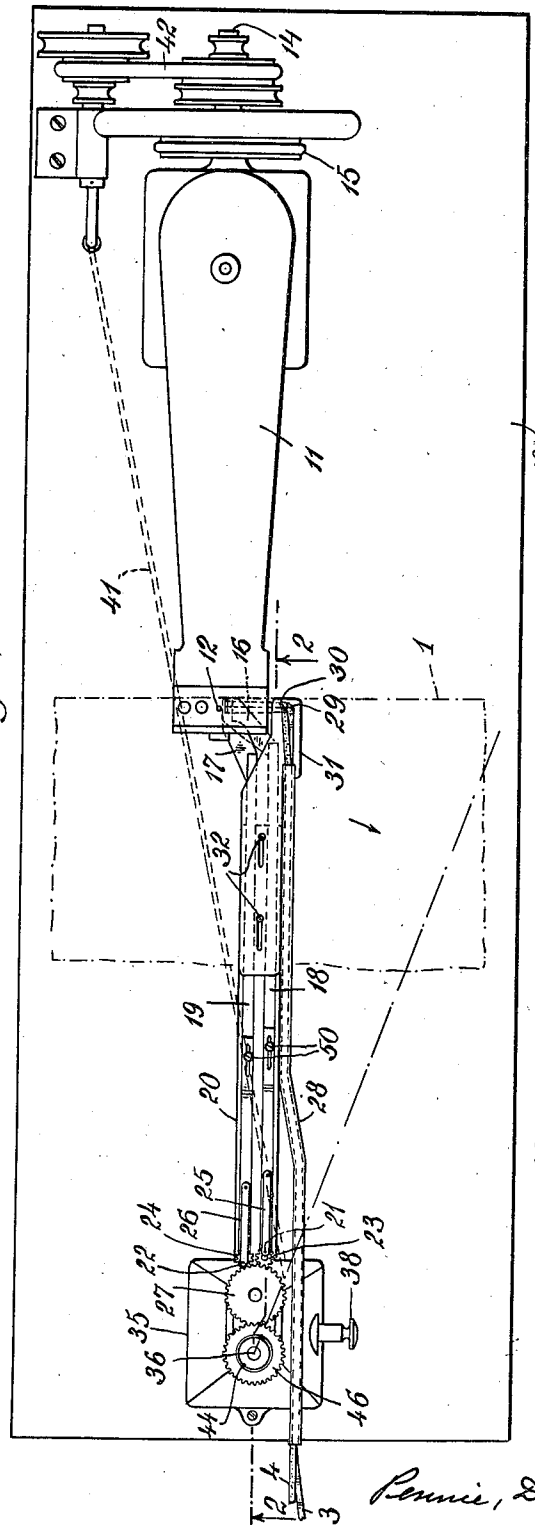
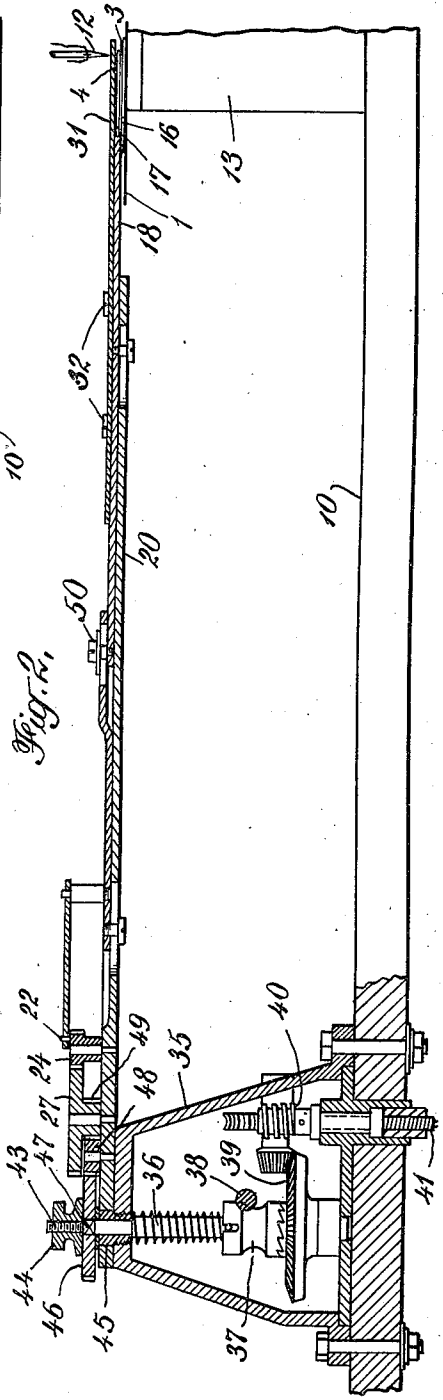


Fig. 2.

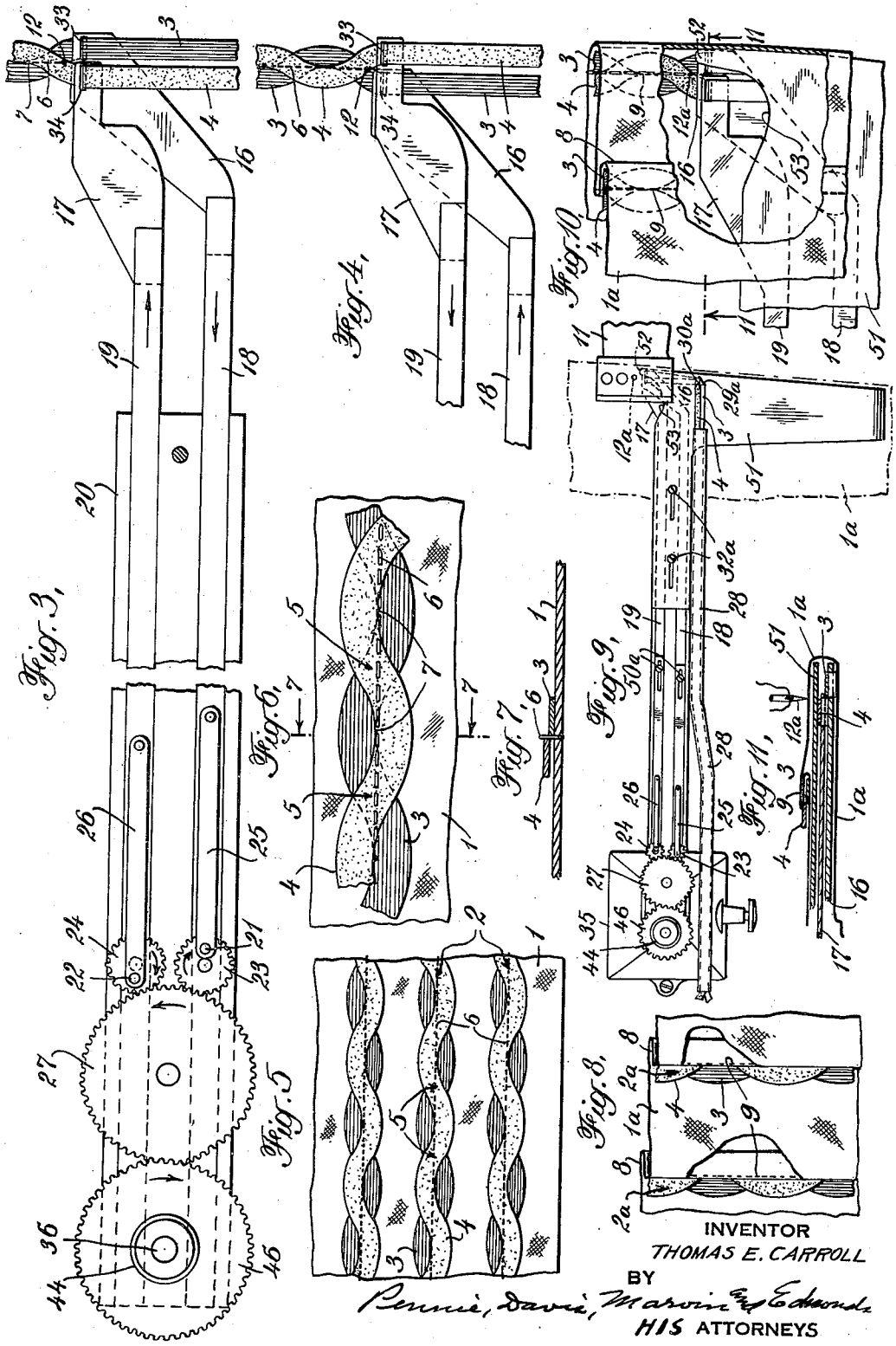


INVENTOR
THOMAS E. CARROLL
BY
Pennie, Davis, Marvin and Edmonds
HIS ATTORNEYS

May 14, 1940. T. E. CARROLL 2,200,327

APPARATUS FOR MAKING DECORATIVE FABRIC

Filed Dec. 15, 1937 2 Sheets-Sheet 2



INVENTOR
THOMAS E. CARROLL
BY
Pennie, Davis, Marvin & Edmonds
HIS ATTORNEYS

Patented May 14, 1940 2,200,327

UNITED STATES PATENT OFFICE

2,200,327

APPARATUS FOR MAKING DECORATIVE FABRIC

Thomas E. Carroll, New York, N. Y.

Application December 15, 1937, Serial No. 179,901

9 Claims. (Cl. 112—2)

This invention relates to decorative fabrics and apparatus for making the same. More particularly the product of my invention is an improved dress goods material, that is, a material of novel construction for use in whole or in part in making ladies' dresses, coats and the like.

In accordance with the invention, my improved dress goods material comprises a suitable textile fabric, preferably woven fabric, upon one surface of which there are secured spaced parallel rows of tape, braid, or the like, each of these rows being made up of two strips of tape superimposed one upon the other in crossed and substantially sinusoidal form. These rows of tape are each secured to the textile material by means of a single line of stitching which extends medially of the superposed sinusoidal strips. The concave portions of these sinusoidal strips touch one another intermediate the regions where the strips cross one another, so that each of the sinusoidal strips is secured substantially throughout its entire length to the textile material by the line of stitching.

Dress goods made in this way not only possesses a pleasing decorative appearance, but is easily made up into coats, dresses and the like, or used with other materials in making such garments, in as much as the presence of the rows of tape on the surface of the textile material does not substantially affect the resiliency or stretchability of the textile material in spite of the fact that the rows of tape are secured to the material continuously throughout their length.

In accordance with a modified form of my invention a tucked fabric is produced having the rows of superimposed sinusoidal tape strips secured within the tucks, the medial line of stitching for securing each row of sinusoidal strips also being employed to form the tucks. One half of each row of the sinusoidal tapes is concealed within each tuck, leaving the other half exposed. By employing tapes of suitable colors attractive dress goods is thus produced, and by employing one tape of the same color as the textile material, the other tape being of a contrasting color, a dress goods which closely simulates in appearance the so-called "moon cloth" is produced.

The apparatus of my present invention is intended for making the dress goods above described conveniently and rapidly, and the apparatus consists of an attachment for use with commercial sewing machines, the object being to produce the dress goods by methods of operation with which the operators of such machines are familiar so that they can readily learn how to make the improved material.

Another object of the invention is to provide an attachment comprising a sinusoidal tape guiding mechanism which can be instantly swung into or out of operating position on the sewing machine and which when swung out of position does not encumber the operation of the sewing machine.

A further object of the invention is to provide a sinusoidal tape guiding mechanism which is readily attachable to and detachable from the sewing machine, and which, if desired, can be used interchangeably with the graduated tuck-making device of United States Patent 2,043,735, granted June 9, 1936 to Thomas E. Carroll and Frederick J. Meyers.

My present invention both in its aspect as a new article or product comprising the dress goods above described and in its aspect as an apparatus for producing this material, will be better understood from a consideration of the accompanying drawings, and the following additional description from which additional features of the invention will be apparent. These drawings illustrate by way of example the best embodiment of the dress goods and of the apparatus.

In these drawings:

Fig. 1 is a plan view of a sewing machine with the apparatus of my invention applied thereto;

Fig. 2 is an enlarged vertical section taken on line 2—2 of Fig. 1;

Fig. 3 is a still further enlarged plan view of a portion of the mechanism shown in Fig. 1 with certain parts removed;

Fig. 4 is a fragmentary plan view of the shifting tape guides shown in the opposite position from that of Fig. 3;

Fig. 5 is a plan view illustrating a fragment of my improved dress goods material;

Fig. 6 is an enlarged plan view of a small portion of the fabric of Fig. 5 illustrating the details of its construction;

Fig. 7 is a vertical transverse section taken on line 7—7 of Fig. 6;

Fig. 8 is a plan view of a fragment of the modified form of my improved fabric in which the base fabric is tucked and the sinusoidal tapes are stitched between the tucks and partially concealed thereby;

Fig. 9 is a view similar to the left-hand portion of Fig. 1 of a modified form of apparatus for producing the modified tucked fabric;

Fig. 10 is an enlarged fragmentary plan view

illustrating the operation of the mechanism in making the tucked fabric, and;

Fig. 11 is a vertical section taken on line 11—11 of Fig. 10.

Referring now to the accompanying figures and first to Figs. 5 and 6, my improved dress goods material comprises a base fabric 1 of suitable textile material on the outer surface of which parallel rows 2 of decorative tapes are secured. Each of the rows 2 comprises at least two strips being disposed in sinusoidal form and strip 4 being superimposed upon strip 3 in such manner that the strips cross one another at intervals, as indicated, for example, at 5.

The two strips are secured to each other and to the base fabric 1 by means of a single continuous line of stitching indicated by reference numeral 6. At the regions 7 intermediate the points where the strips cross one another the concave edges of the two strips preferably just touch each other so that the maximum widths of the rows 2 are the sum of the width of the tape strips 3 and 4, and at the same time the single line of stitching 6 secures both of the tapes to the base fabric substantially continuously throughout the entire length of the rows 2.

The strips 3 and 4 may be of any appropriate width and of the same, or contrasting, colors to suit the taste of the designer. As shown, the sinusoidal, or wavey, forms of the two strips 3 and 4 are preferably arranged so that the crests of one strip come opposite the valleys of the other strip, or, in technical language, the phases of the two wave forms are 180° apart, but any desired modification of this arrangement may be made.

In the modified form of dress goods illustrated in Figs. 8 and 11, the base fabric 1_a is provided with tucks 8 and the rows 2_a of sinusoidal tapes are sewed into the tucks in such a manner that a portion of each row of sinusoidal tapes is concealed within the tuck, leaving the other portion exposed and providing a decorative effect along the edges of the tucks. The rows 2_a of sinusoidal strips are held in place by means of the same lines of stitching 9 which hold the folds of the base material 1_a which form the tucks.

Referring now to Fig. 1 of the drawings, there is here illustrated a sewing machine having a table 10 mounted at the right hand end of which is the usual overhanging arm 11 which supports at its left hand end the mechanism for actuating the needle 12 of the stitch-forming mechanism. The shuttle and other parts of the stitch-forming mechanism including the feeding mechanism for feeding the material to the stitch-forming mechanism, none of which are shown in the drawings, are contained within a housing 13 (see Fig. 2) which is supported upon the table 10, and thereby elevates the stitching or sewing level above the top of table 10. The various shafts, cams, etc., for actuating the stitch-forming mechanism, including the feeding mechanism, are contained in the housing 13 and the overhanging arm 11, and are driven by means of a shaft 14 shown at the right of Fig. 1. Power for driving this shaft is applied by means of a small belt 15 to a suitable pulley mounted upon shaft 14.

The mechanism for guiding the tapes 3 and 4 and properly presenting them to the needle 12 of the stitch-forming mechanism in order that they may be secured to the base fabric 1 by the line of stitching 7 (see Fig. 3) comprise a pair of shifting, or reciprocating, guide plates 16 and 17 which are secured to the right-hand ends of a pair of parallel slide bars 18 and 19. These bars slide in a pair of parallel grooves in a supporting arm 20. The slide bars 18 and 19 are reciprocated in appropriately timed relation with respect to each other by means of crank pins 21 and 22, respectively, arranged in the faces of a pair of small crank pinions 23 and 24. The crank pins 21 and 22 are connected to the slide bars 18 and 19, respectively, by means of connecting rods 25 and 26.

These crank pinions 23 and 24 are driven from a common driving gear 27, and, as illustrated, are so meshed with this gear as to place the crank pins 21 and 22 180° apart so that as the base material 1 and the tape strips 3 and 4 are simultaneously fed to the needle 12 and feeding mechanism of the stitch-forming mechanism, the two tapes will be applied in crossed sinusoidal form, as shown for example in Fig. 4 which shows the guide plates 16 and 17 in the positions which they occupy when crank pins 21 and 22 have rotated one half a revolution. In other words, in Fig. 4 the shifting of the guide plates 16 and 17 has caused the tapes 3 and 4 to be shifted respectively to the opposite sides of needle 12 from that which they occupy in Fig. 3. This causes the tapes to be applied to the base fabric in the form of two sine waves directly out of phase with one another.

The two tapes 3 and 4 are fed to the needle 12 through a horizontal tube 28 which is mounted on the edge of the supporting arm 20 nearest the operator, and passing out of the right-hand end of this tube the tapes pass through two guiding slots 29 and 30 which are placed at an angle of 45° to the tube 28, thereby changing the direction of feed of the two tapes into parallel relation with the feed of the base fabric 1 which, it will be understood, is fed to the stitching mechanism manually by the operator. Guide slots 29 and 30 are positioned in a thin metal plate 31 which is mounted in the upper side of supporting arm 20 and projects beyond the right-hand end thereof and serving as a guard for the base fabric 1 to prevent it from becoming entangled with the tape shifters 16 and 17 and the slide bars 18 and 19. Plate 31 is mounted in adjustable position on arm 20 by means of two screws 32 which engage suitable slots in the plate and in this way the position of guide slots 29 and 30 can be accurately adjusted with respect to the needle 12

It will be observed from Fig. 2 that the tape-shifting plates 16 and 17 are made of metal which is as thin as possible and still provide the necessary rigidity to properly shift the tapes back and forth, and also that the two tape-guiding slots 33 and 34 are vertical so that the tapes pass downwardly through these slots and are delivered thereby closely adjacent the surface of the base fabric 1. This permits the guide slots 33 and 34 to be placed closely adjacent to the needle 12 and shortens the movement of the tapes between delivery from these slots and the point of stitching. It also enables the tapes to be delivered through the guide slots into frictional contact with the surface of the base fabric. All of these factors assist in the desired end of placing the tapes accurately in position on the base fabric.

The arm 20 which carries the tape-shifting mechanism is supported on a housing 35 which is fixed to the sewing machine table 10 near its left-hand end, and the height of which is substantially equal to that of the housing 13. Arm 20 is constructed so as to be interchangeable with the tucking blade controlling arm 15 of the aforementioned patent of Messrs. Carroll and Meyers in order that when a sewing machine is once

equipped with housing 35 and its associated mechanism, arm 20 of the present application can be placed upon a housing when it is desired to make the improved fabric described herein, and this arm can be replaced by arm 15 of the patent when it is desired to make graduated tucks upon the sewing machine in accordance with the provisions of the patent.

Accordingly, housing 15 and its associated mechanism are identical with the corresponding housing 14 and its associated mechanism of the aforesaid patent. This mechanism will therefore be described only briefly herein, reference being made to the specification of the patent for the details. Vertical shaft 36 which corresponds to shaft 29 of the patent is driven through a jaw clutch 37 which is releasable by a horizontally slidable pin 38 by means of a reducing bevelled gearing 39 and a reducing helical gearing 40 by means of a flexible shaft 41. This flexible shaft is driven by means of a belt 42 and stepped pulleys for speed adjustment from the right-hand end of shaft 14 of the sewing machine.

The upper end of vertical shaft 36 projects through the top of housing 35 and terminates in a threaded portion 43 upon which is a knurled nut 44, or equivalent means for removably positioning the arm upon vertical shaft 36. When it is desired to change over the sewing machine from making graduated tucks, for example, to making the fabric of the present invention, knurled nut 44 is removed and a straight bushing 45 is inserted in place of the shouldered bushing 16 of the patent. Arm 20 is then placed upon bushing 45 and gear 46 upon the slabbed portion 47 of the upper end of shaft 36 and knurled nut 44 is then replaced upon the top of the shaft to hold the parts in place.

The reducing gearing comprising worm gear 40 and bevelled gears 39 is provided within housing 35 for the purpose of operating shafts 36 at the proper speed to actuate the graduated tucking mechanism of the aforesaid patent. The tape shifters 16 and 17 of the present mechanism, however, must be reciprocated at a comparatively high rate with respect to the speed of the stitch-forming mechanism. Consequently the crank pinions have a small number of teeth in comparison to their driving gear 27, and the speed at which the crank pinions are operated is still further increased by means of gear 46 which drive gear 27 through two small pinions 48 and 49. It will be understood that the distance between crests of the sinusoidal tapes can be varied for a given setting of the sewing machine feed mechanism by shifting belt 42 upon its stepped pulleys, thereby changing the number of reciprocations of the tape shifters 16 and 17 for a given number of revolutions of the sewing machine shaft 14 or, what amounts to the same thing, for a given number of stitches.

My improved tape guiding mechanism is unusually convenient for the operator to use, inasmuch as the arm 20 can be swung toward the operator, as indicated by the arrow and dot-and-dash lines in Fig. 1, to facilitate the threading of the sewing machine or the manipulation of the base fabric and tapes. The arm may be swung about bushing 45 as a pivot to any desired position, that is, it can be swung only a short distance away from operating position, as indicated by the dot-and-dash line just referred to, or it can be swung into a position 180° or more from the operating position if desired, in order, for example, to use the machine temporarily for plain stitching.

The tape-shifting mechanism is also convenient to set up for operation. The manner of mounting arm 20 upon shaft 36 of support 35 has been described above and requires only a few seconds time. In addition, however, to mounting arm 20 in its operating position, the tape shifters 16 and 17 must be adjusted to cause the tape-guiding slots 33 and 34 to reciprocate equal distances on opposite sides of the needle 12 and line of stitching 7. To facilitate this adjustment the slide bars 18 and 19 which actuate the tape shifters 16 and 17 are each made in two sections connected to one another by means of the screw and slot connections 50. By this means the positions of the tape-guiding slots 33 and 34 can be quickly adjusted.

Referring now to Figs. 9 to 11, inclusive, there is here illustrated a modification of the tape-shifting mechanism above described by means of which the modified form of fabric shown in Fig. 8 is produced. By means of this mechanism the base material 1_a is tucked and the crossed sinusoidal tape strips are simultaneously sewed into the tuck and secured therein by the same line of stitching 9 which forms the tuck.

The modified form of tape-shifting mechanism of Fig. 9 is similar to that previously described except that metal guard plate 31 is removed and in its place there is provided a guiding blade 51 of thin sheet metal. Tape guiding slots 29_a and 30_a are provided in this blade in line with the right hand end of tape-feeding tube 28 for changing the direction of feed of the tapes 3 and 4 into the line of feed of the base material 1_a to the needle 12_a.

Referring more particularly to Fig. 10, in operating this mechanism the base material 1_a is folded around the right-hand edge of blade 51 and carried beneath this blade, the position of the right-hand edge of the blade having been adjusted by means of screws 32_a to the proper distance from the needle 12_a to give the desired width of tuck. The tape shifters 16 and 17 are also adjusted by means of the screws 50_a to cause their tape guiding slots to reciprocate equal distances on opposite sides of the needle. The sewing machine is then started and the base material 1_a is fed by hand around the tucking blade 51 to the stitch-forming mechanism by the operator in the usual way. This causes the two plies of the material 1_a on the upper and lower sides of tucking blade 51 to be stitched together by the line of stitching 9 and simultaneously therewith the two tape strips 3 and 4 are automatically placed in position between these two plies of fabric by means of the tape shifters 16 and 17. As shown in Fig. 10, a previous tuck has been made, and this serves as a guide for the operator in making the tuck just described.

It will be observed that tucking blade 51 is provided with a finger 52 which guides the fold of the tuck up substantially opposite the needle 12_a so that there is no opportunity for the material to shift out of position after leaving the tucking blade. Also the blade is provided with a recess 53 just to the left of the finger 52, as viewed in Fig. 10 so as to facilitate the adjusting of the tape shifters 16 and 17 independently of the adjustment of tucking blade 51, and also to facilitate the threading of the tapes 3 and 4 through the tape guide slots in the tape shifters.

It will be understood that changes may be made both in the improved product and the im-

proved apparatus of my invention without departing from the spirit thereof, the scope of the invention being defined in the appended claims.

I claim:

1. In a tape sewing machine having stitch-forming mechanism including feeding mechanism, a pair of tape guides for delivering tape to a sheet of material to cause said mechanism to secure said tapes to said material, an arm for supporting said guides pivoted at one side of the line of feed of said material to the stitching mechanism, means carried by said arm for actuating said guides to cause the tapes to be fed to said stitching mechanism and secured to said material in substantially sinusoidal form, a support for said arm at one side of the line of feed of said material, means for pivoting said arm to said support to permit the end of the arm carrying said tape guides to be swung away from the stitch forming mechanism, and means on said support for operating said guide-actuating means.

2. In a tape sewing machine having stitch-forming mechanism including feeding mechanism, a pair of tape guides for delivering tape to a sheet of material to cause said mechanism to secure said tapes to said material, an arm for supporting said guides pivoted at one side of the line of feed of said material to the stitching mechanism, a pair of cranks carried by said arm for actuating said guides to cause the tapes to be fed to said stitching mechanism and secured to said material in substantially sinusoidal form, a support for said arm at one side of the line of feed of said material, means for pivoting said arm to said support to permit the end of the arm carrying said tape guides to be swung away from the stitch forming mechanism, and means on said support for operating said cranks.

3. In a tuck-making machine having stitch-forming mechanism including feeding mechanism, a blade for guiding thereto the material in which the tucks are to be formed, and an arm for supporting said blade, said arm being pivoted on a vertical axis disposed at one side of the path of feed of the material to said stitch-forming mechanism and swingable on such pivot to carry said blade into and out of operative position with respect to said stitch-forming mechanism, a pair of tape guides carried by said arm for delivering tape to said stitch-forming mechanism between the folds of a tuck being formed, and means for reciprocating said guides to cause said tapes to be fed to the stitch-forming mechanism in substantially sinusoidal form.

4. In a tuck-making machine having stitch-forming mechanism and a blade for guiding thereto the material in which the tucks are to be formed, a pair of tape guides beneath said blade for delivering tapes to the stitch-forming mechanism to cause the tapes to be stitched thereby between the folds of the tuck being formed, and means for reciprocating said guides to cause the tapes to be applied in a decorative formation.

5. In a tuck-making machine having stitch-forming mechanism, a blade for guiding thereto the material in which the tucks are to be formed, said blade having a recess in the rear edge thereof, a pair of thin flexible tape guides beneath said blade opposite said recess and means for reciprocating said guides.

6. In a tape sewing machine having stitch-forming mechanism, a pair of tape guides for delivering tape to a sheet of material at the stitch-forming mechanism to cause said mechanism to secure said tapes to said material, an arm for supporting said guides disposed at substantially right angles to the line of feed of said material to the stitching mechanism, tape-supplying means carried by said arm for carrying said tapes in substantially parallel relation thereto toward the stitching mechanism, and an adjustable plate carried by said arm and having guiding means for said tapes to change the direction of feed thereof and cause the tapes to be fed to the stitching mechanism in a direction parallel with the said line of feed, and means on said arm for reciprocating said tape guides to cause the tapes to be applied to said material in decorative form.

7. In a tape sewing machine having stitch-forming mechanism, a pair of tape guides for delivering tape to a sheet of material to cause said mechanism to secure the tapes to said material, means for reciprocating said guides to cause said tapes to be applied in a decorative form, said tape guides each comprising a metal plate having a substantially vertical tape slot therein for delivering the tape downwardly onto the surface of said material.

8. In a tape sewing machine having stitch-forming mechanism, a pair of tape guides for delivering tape to a sheet of material to cause said mechanism to secure the tapes to said material, means for reciprocating said guides to cause said tapes to be applied in a decorative form, said tape guides each comprising a thin flexible metal plate having a tape guiding slot therein extending from the top to the bottom for delivering the tape downwardly onto the surface of said material.

9. In a tape sewing machine having stitch-forming mechanism, a pair of tape guides for delivering tape to a sheet of material to cause said mechanism to secure the tapes to said material, means for reciprocating said guides to cause said tapes to be applied in a decorative form, said tape guides each comprising a flexible metal plate having a tape guide slot therein extending from the top to the bottom for delivering the tape downwardly onto the surface of said material, and each being sufficiently thin to be received partially beneath the presser foot of the stitch-forming mechanism and depressed thereby so as to deliver the tapes as close as possible to the needle of the stitch-forming mechanism.

THOMAS E. CARROLL.