

May 3, 1955

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2,707,446

MACHINE FOR SEWING ORNAMENTAL DESIGN IN FABRIC BASE

Filed April 23, 1952

4 Sheets-Sheet 1

FIG. 1.

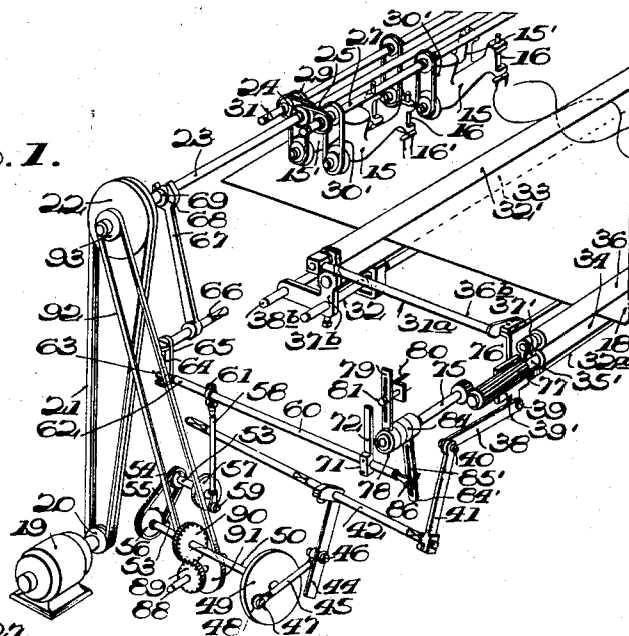
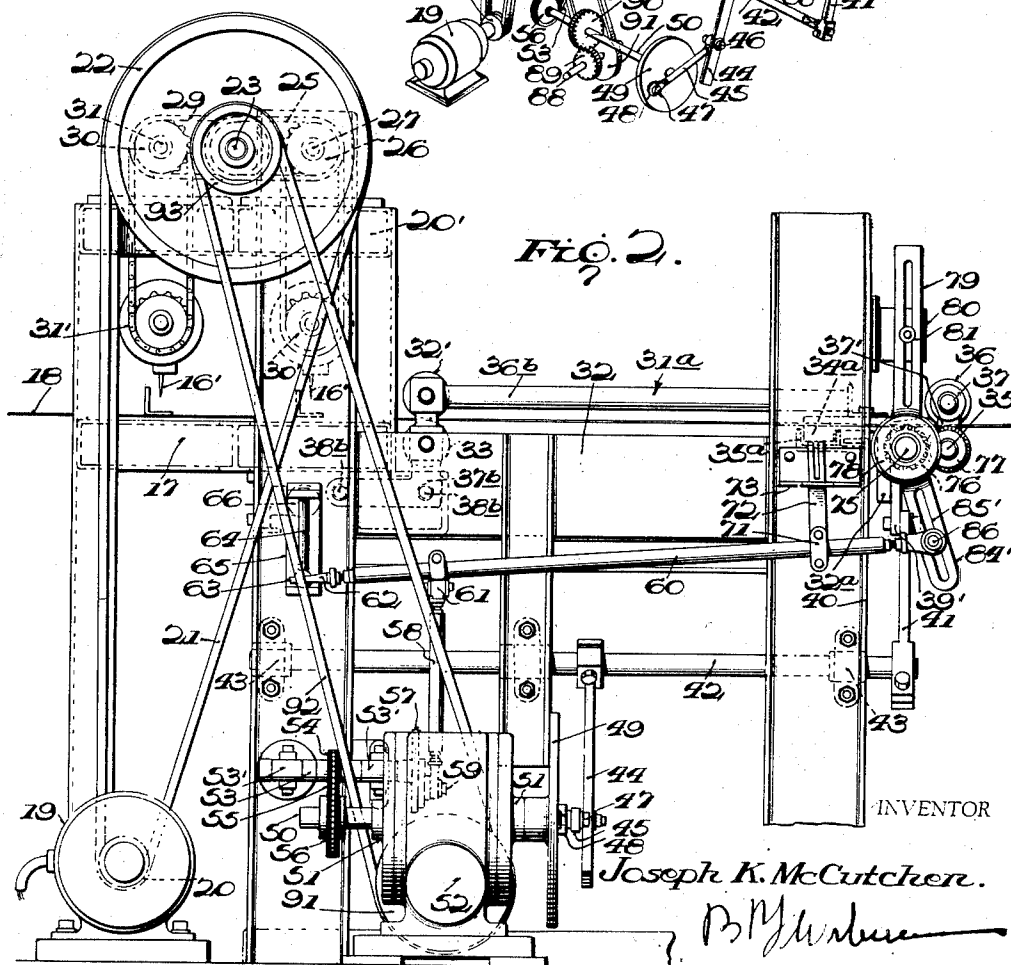


FIG. 2.



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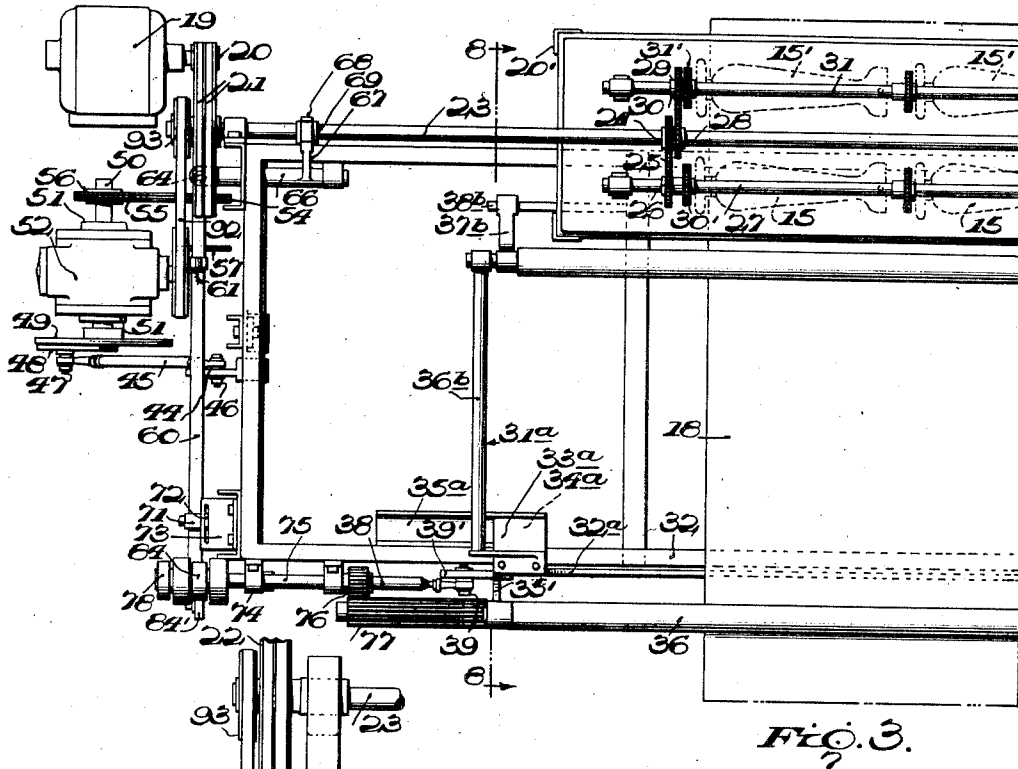
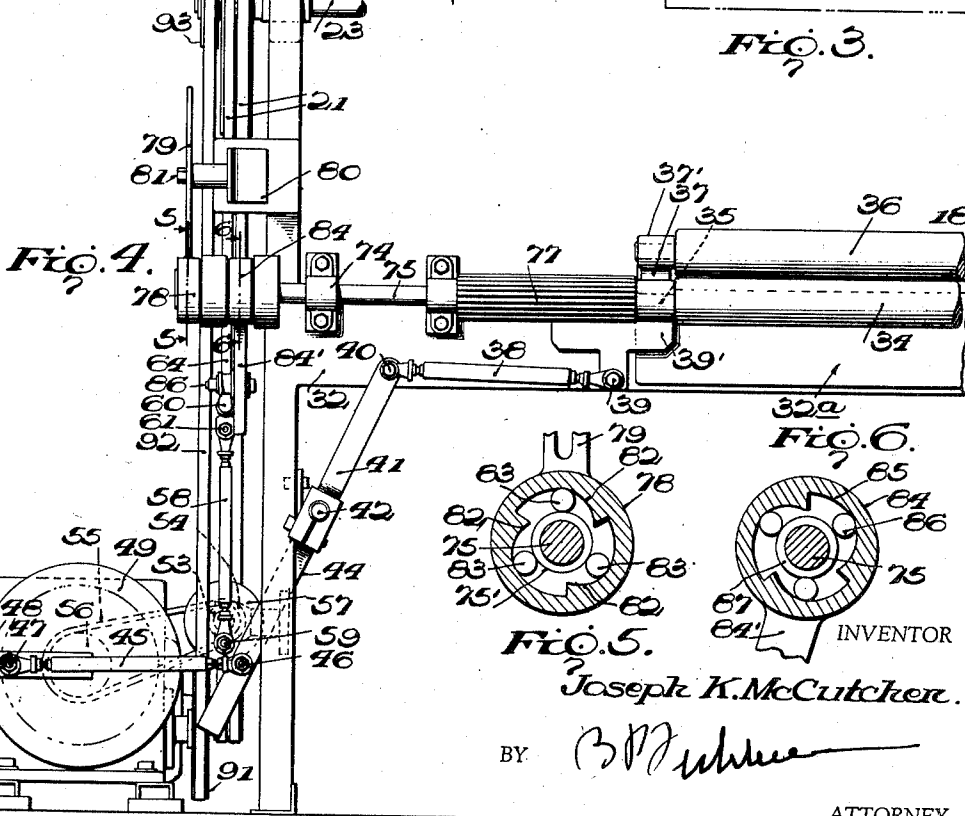
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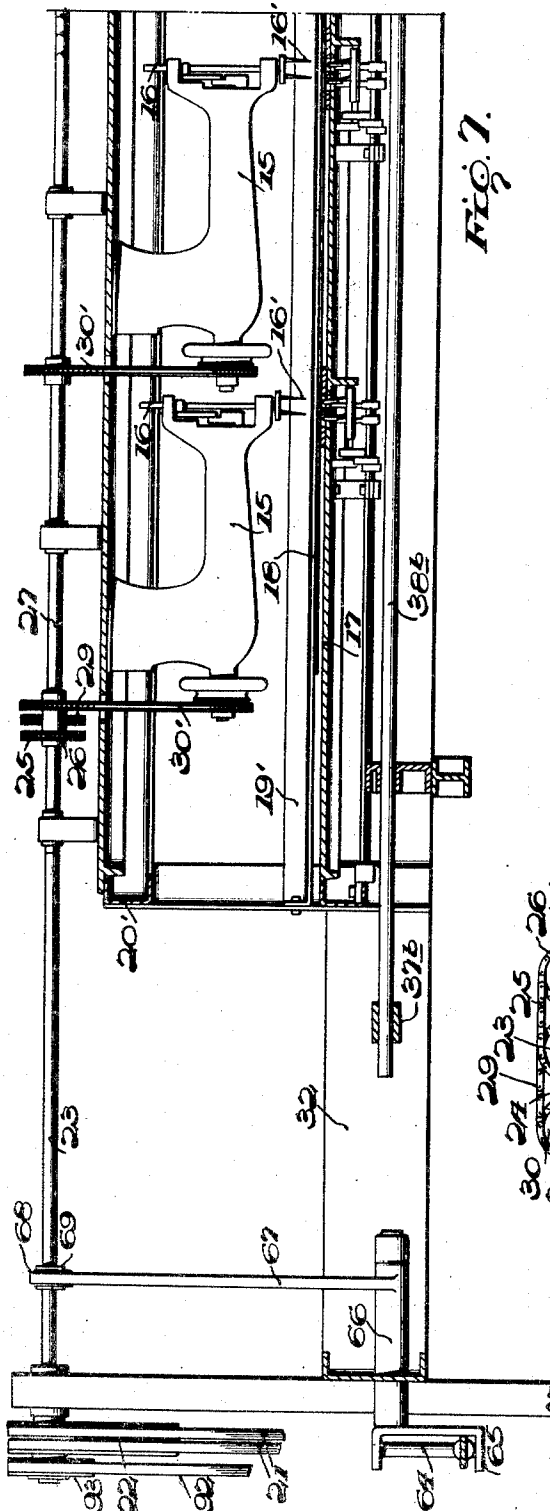


FIG. 7.

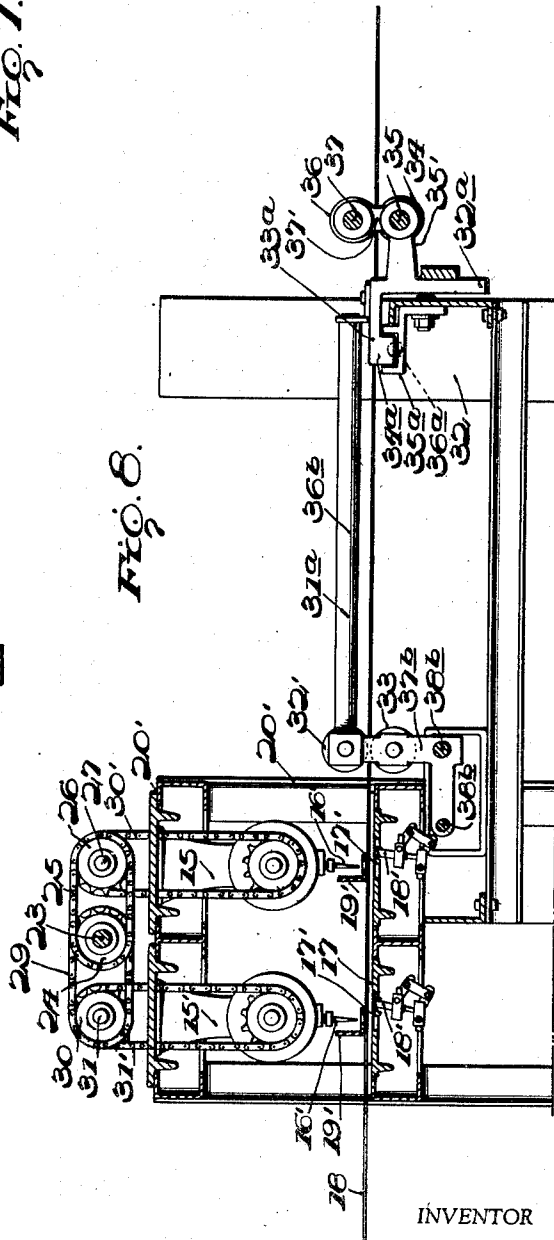


FIG. 8.

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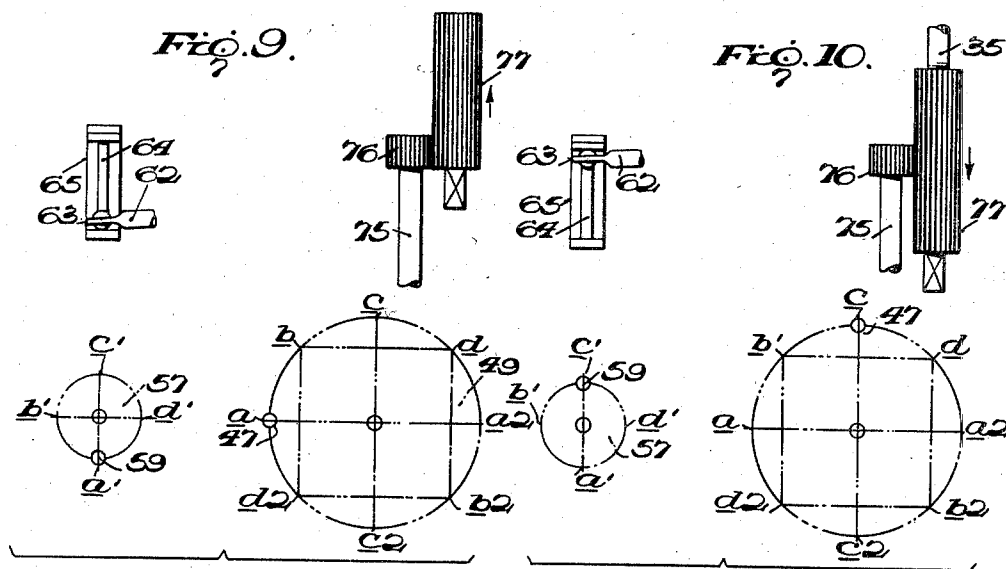
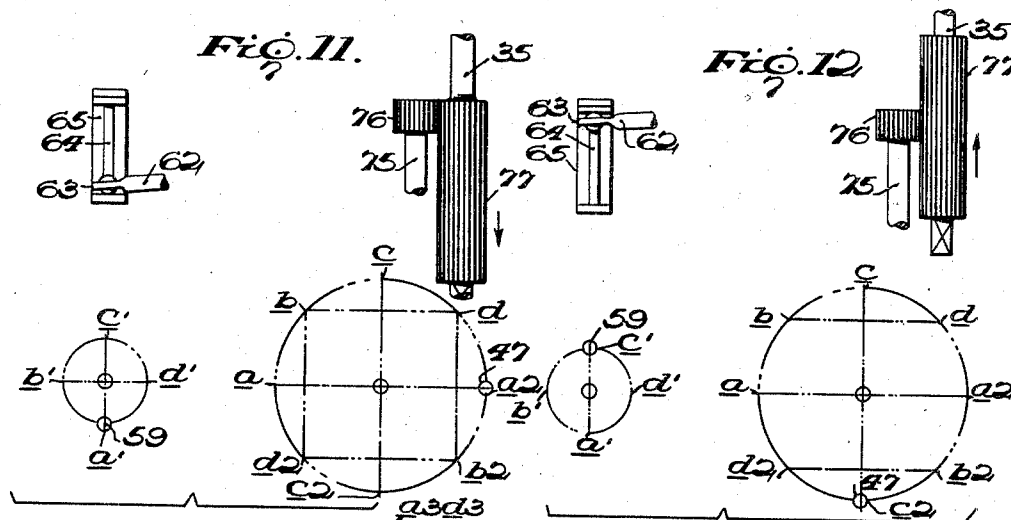
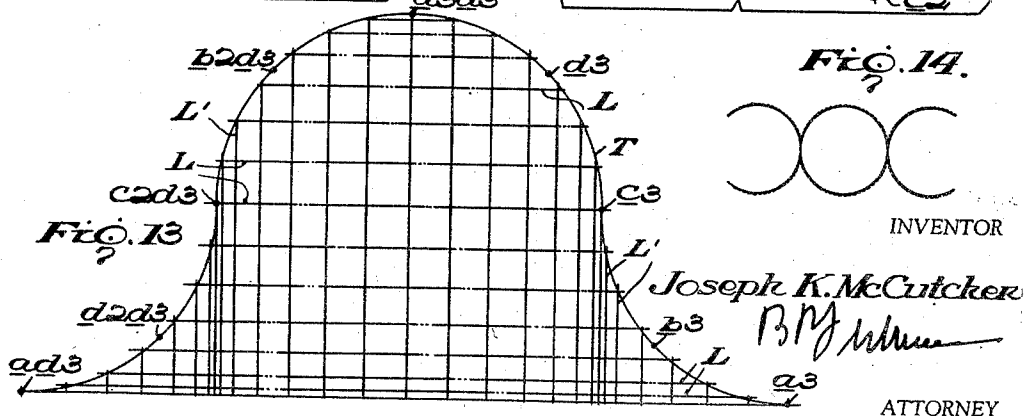
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4 Sheets-Sheet 4



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2,707,446

MACHINE FOR SEWING ORNAMENTAL DESIGN IN FABRIC BASE

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Application April 23, 1952, Serial No. 283,815

13 Claims. (Cl. 112—79)

My invention relates to a machine for sewing an ornamental design in a base fabric.

An important object of the invention is to provide a means to feed the base fabric longitudinally and transversely with respect to the tufting means, in a manner for producing substantially circularly curved design portions.

A further object of the invention is to provide variable speed work feed means for feeding the fabric base longitudinally, and variable speed shifting means for shifting the fabric base transversely, simultaneously with the longitudinal feed and in a pre-determined correlated manner, while the tufting means is held against shifting movement.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this application and in which like numerals are employed to designate like parts throughout same,

Figure 1 is a perspective view of the work feed means and work shifting means, parts of the tufting means being shown, and parts broken away,

Figure 2 is a side elevation of the work feed means and work shifting means,

Figure 3 is a plan view of the work feed means and work shifting means, parts of the tufting means being shown and parts broken away,

Figure 4 is an end elevation of the work feed means and work shifting means, the tufting means being omitted,

Figure 5 is a transverse section taken on line 5—5 of Figure 4,

Figure 6 is a similar view taken on line 6—6 of Figure 4,

Figure 7 is a side elevation, partly diagrammatic, of the tufting means,

Figure 8 is an end elevation, partly diagrammatic, of the tufting means, taken on line 8—8 of Figure 3,

Figure 9 is a diagrammatic view, showing the fabric base shifted to the innermost position, and showing the starting point of sewing in the curved design,

Figure 10 is a similar view, showing the fabric base in the intermediate position for sewing in the first half of one side of the curved design,

Figure 11 is a similar view showing the fabric base shifted to the outer position, for sewing in the second half of the same side of the design,

Figure 12 is a similar view showing the fabric base shifted to the intermediate inner position for sewing in the first half of the opposite side of the curved design,

Figure 13 is a diagrammatic view showing the extent of movement of the longitudinal feed, during each cycle of operation of the tufting means, and the extent of movement of the transverse shifting of the fabric base, during each cycle of operation of the tufting means,

Figure 14 is a diagrammatic view showing the complete design produced by the leading and trailing tufting machines.

In the drawings, where for the purpose of illustration is shown a preferred embodiment of my invention, the nu-

merals 15 and 15' designate pairs of leading and trailing tufting machines, two pairs being shown for the purpose of illustration, but the machine preferably embodies four pairs. This group of tufting machines extend transversely of a fabric base to be described. These tufting machines are inverted and are identical with the tufting machines shown in my co-pending application for Apparatus for Producing a Tufted Design, filed Dec. 1, 1950, Serial Number 198,563, now Patent No. 2,682,841. The tufting machines include vertical reciprocatory needle bars 16 carrying needles 16'. The needle bars in each longitudinal pair of tufting machines are spaced longitudinally of the fabric base, for affording leading and trailing needles. Arranged beneath the fabric base are loopers 17' and blades 18', Figure 8. When each needle passes downwardly through the fabric base, the looper 17' enters the loop, and when the needle reaches the high point, the blade 18' severs the loop, leaving one or more unsevered loops upon the looper, as is well-known in the art, and is clearly shown in Patent 2,143,679. The loopers in each transverse row of tufting machines move simultaneously and are timed in operation with respect to the needles, and the blades are timed in operation with respect to the loopers and blades. The loopers and blades are operated by substantially the same means shown in said Patent 2,682,841. Each transverse group of tufting machines has a continuous presser foot 19' provided with suitable openings for the passage of the needles, as shown in said Patent 2,682,841. It is thus apparent that each tufting machine is of substantially the conventional type, except that the body portion of the tufting machine is inverted, and the tufting machines in each transverse row operate in timed order, and the tufting machines in one transverse row operate in timed order with respect to the tufting machines in the other transverse row, so that all needles move to the lowermost and uppermost positions at the same time. The tufting machines 15 and 15' are suspended from a stationary frame 20' and the presser foot 19' are also secured to this stationary frame. In the present application, the tufting machines remain fixed, while in my co-pending application 198,563, the tufting machines are shifted transversely of the fabric base. The tufting machines also include a stationary base 17, secured to the frame 20', and having openings for the passage of the needles, and the fabric base 18 travels over the base 17.

Drive means for tufting machines

The means which drives the tufting machines comprises a motor 19, driving a grooved pulley 20, engaged by a belt 21, engaging a grooved pulley 22. This grooved pulley is rigidly mounted upon a horizontal shaft 23, extending transversely of the line of feed of the fabric base, and is mounted in suitable bearings. The shaft 23, Figure 3, drives each longitudinal pair of tufting machines, and carries a sprocket wheel 24, engaged by a sprocket chain 25, engaging a sprocket wheel 26, mounted upon the drive shaft 27 for the leading tufting machines 15. The shaft 23 also carries a sprocket wheel 28, engaged by a sprocket chain 29, engaging a sprocket wheel 30, rigidly mounted upon the drive shaft 31 for the trailing tufting machines 15'. Leading and trailing are used with respect to the direction of the line of feed of the fabric base 18. The shaft 27 is connected with the drive shaft of each leading tufting machine 15 by means of gearing 30' and the shaft 31 is connected with the drive shaft of each trailing tufting machine 15' by means of gearing 31'. Each gearing includes sprocket wheels and sprocket chains as shown. It is thus seen that all tufting machines are driven in the same direction and at the same speed, since the motor 19 is a constant speed motor, and all tufting machines are timed to operate in unison. The tufting machines shown and

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described will produce severed tufts, but it is intended to cover tufting machines for producing severed or unsevered tufts, and when the claims recite "tufting machines" broadly, it is intended to cover tufting machines for producing severed or unsevered tufts, and when the claims recite "tufts" or "tufting" broadly, it is intended to cover severed or unsevered tufts and severed or unsevered tufting.

Roll carrying frame

Mounted forwardly of the transverse groups of tufting machines is a horizontal frame 31a, mounted to reciprocate upon a stationary frame 32. This frame 31a includes a horizontal transverse rail 32a, having an L-shaped bracket 33a rigidly secured thereto at each end, and the bracket has a head 34a, sliding in a stationary guide 35a and bearing balls 36a may be arranged between these parts. It is thus seen that the rail 32a is mounted to reciprocate transversely of the line of feed of the fabric base. The frame further comprises a horizontal bar 36b, arranged at each end of the rail 32a and rigidly secured to the bracket 33a. The bar 36b is rigidly secured to an upstanding L-shaped bracket 37b, slidable upon the stationary rods 38b. Suitably mounted upon the brackets 37b at the opposite ends of the frame 31a are upper and lower rolls 32' and 33, arranged near and in advance of the leading tufting machine. If desired, a pair of these rolls 32' and 33 may be arranged near and at the rear of the trailing tufting machine 15', to be reciprocated with the rollers 32' and 33. The guide rolls 32' and 33 have soft compressible peripheries formed of sponge rubber or the like and these peripheries are preferably corrugated, so that they properly grip the fabric to shift it positively transversely of the line of feed, when the frame 31a is reciprocated. The rolls 32' and 33 are free to rotate but are not power driven and turn by the feed of the fabric base 18.

Feed mechanism for fabric base

The feed mechanism for the fabric base comprises a lower roll 34, driven by a shaft 35 rigidly secured thereto. This shaft is journaled in a suitable bearing 35' rigidly secured to each end of the rail 32a. The shaft 35 cannot move longitudinally within the bearings. The roll 34 is beneath the fabric base 18 and a co-acting roll 36 is arranged above the fabric base and is carried by a shaft 37 journaled in a suitable bearing 37' rigidly secured to each end of the rail 32a. The roll 36 is not power driven and is turned by the feed of the fabric base 18 and serves to clamp the fabric base against the roll 34, so that rotation of the lower roll 34 will feed the fabric base. These rolls 34 and 36 may have their peripheries covered with a compressible material, such as relatively stiff rubber, so that the rolls will positively grip and feed the fabric base when the rolls are turned.

Feed roll shifting means

The variable speed means which shifts the frame 31a and feed rolls 34 and 36 transversely of the line of feed of the fabric base comprises a link 38, pivotally connected at 39 with a bracket 39', rigidly attached to the bracket 33a although it may be rigidly attached to the rail 32a. This link has its opposite end pivoted at 40 with a vertically swinging crank 41 rigidly secured to a horizontal shaft 42, extending longitudinally of the line of feed of the fabric base. This shaft 42 is journaled in stationary bearings 43. Rigidly secured to the shaft 42 is a depending crank 44, having a connecting rod 45 pivoted thereto at 46. This connecting rod 45 is pivotally connected with a pin 47, Figures 1 to 5 inclusive, and this pin is adjustably mounted in a guide 48, rigidly secured to a vertical disc 49. The guide 48 extends radially of the disc 49 and the pin 47 may therefore be adjusted radially of the disc 49 and locked to the disc in the selected adjusted position, thus regulating the throw of the connecting rod 45. The disc 49 is rigidly mount-

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ed upon a horizontal shaft 50, journaled in stationary bearings 51, carried by a support or housing 52, Figure 2. The shaft 50 extends longitudinally of the line of feed of the fabric base.

Variable speed drive means for feed roll

Arranged above the shaft 50 and parallel thereto is an upper horizontal shaft 53, journaled in fixed bearings 53' and this upper shaft is provided with a grooved pulley 54, engaged by a belt 55, extending downwardly to engage a grooved pulley 56, rigidly mounted upon the shaft 50. Rigidly mounted upon the leading end of the shaft 53 is a vertical disc 57. The pulley 56 has a diameter twice as great as the diameter of the pulley 54, and when the disc 49 is turned for a complete revolution, disc 57 has made two complete revolutions. A connecting rod 58 has a universal connection with the disc 57 at 59, near the circumference of the disc. The upper end of the connecting rod has a universal connection with a horizontal connecting rod 60, as shown at 61, and this connecting rod 60 extends longitudinally of the line of feed of the fabric base. The connecting rod 60 has its trailing end rigidly connected with a coupling 62, Figures 1 and 2, carrying a ring 63, slidably receiving a rod 64 rigidly secured to a crank 65 and extending longitudinally of the crank. This crank is rigidly mounted upon a transverse shaft 66, mounted in suitable fixed bearings. The rock shaft 66 has an upstanding crank 67 rigidly secured thereto, and this crank is provided at its upper end with a fork 68, receiving an eccentric 69, rigidly secured to the shaft 23. The connecting rod 58 which is operated by disc 57 serves to raise and lower the trailing end of the connecting rod 60, and hence vary the distance between the ring 63 and the shaft 66, whereby the movement of the crank 65 will vary the longitudinal throw of the connecting rod 60. The leading end portion of the connecting rod 60 is slidably mounted in a bearing 71, carried by an upstanding guide arm 72, held within an elongated slot formed in a fixed bracket 73. The guide arm prevents undue lateral movement of the connecting rod 60 in a horizontal direction, but the guide arm 72 may rise and fall and swing in a vertical plane, so that the connecting rod 60 may properly move.

The numeral 74 designates a fixed bearing, Figures 3 and 4, for receiving a horizontal transverse shaft 75, held against longitudinal movement. This shaft has a gear 76 rigidly secured to its inner end, in permanent mesh with an elongated gear 77, rigidly mounted upon the shaft 35. The shaft 75 extends through a stationary clutch head 78, Figures 4 and 5, carried by a stationary arm 79, vertically adjustably clamped to a fixed part 80, by a bolt 81. The clutch head is included in an over-run clutch having cam faces 82, Figure 5, to engage balls 83, arranged to engage a ring 75', rigidly mounted upon the shaft 75. The arrangement is such that when the shaft 75 turns counter-clockwise, the balls 83 will release it for turning movement, but these balls will lock the shaft 75 against clockwise movement, Figure 5. Arranged upon the shaft 75 is a clutch head 84 of an over-run clutch, which may turn clockwise upon the shaft 75, Figure 6. This clutch head has cam faces 85 to engage balls 86, engaging a ring 87, rigidly secured to the shaft 75. When the clutch head 84 is turned counter-clockwise, Figure 6, the balls 86 lock the clutch head with the shaft so that the shaft 75 is turned counter-clockwise, and when the clutch head 84 turns clockwise, the balls 86 free the clutch head from locking engagement with the shaft 75. The clutch head 84 has a depending crank 84', rigidly secured thereto, and this crank has an elongated slot 85', receiving a bolt 86 to be clamped to the crank 84' in a selected adjusted position. This bolt pivotally connects the crank 84' with the free end of the connecting rod 60.

Driving means

Mounted within the gear box 52 is a worm drive in-

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cluding a shaft 88, having a gear 89 rigidly mounted thereon, engaging a gear 90, rigidly mounted upon the shaft 50. The shaft 88 is driven by a grooved pulley 91, engaged by a belt 92, extending upwardly and engaging a grooved pulley 93, rigidly mounted upon the drive shaft 23. It is thus seen that the shaft 50 is driven at a suitable speed from the shaft 23 and the shaft 53 is driven twice as fast as the shaft 50. The disc 57 therefore turns for a complete revolution when the disc 49 is turned for one-half of a revolution.

Operation

The operation of the machine in the practice of the method is as follows:

In Figure 9, the pin 47 is at the outermost horizontal position a and the gear 77 has been shifted to the innermost position and the fabric base 18 is in the innermost position. When the pin 47 is in the position a , pin 59 is at the lowermost position a' and the coupling 62 is at the lower end of the crank 65. The pin 47 is now traveling toward the point b . When the pin 47 was at the point a , the needle of each leading tufting machine was at the point a^3 of the base fabric 18. Since the pin 47 traveling from point a to point b is moving in a vertical direction, the outward lateral shifting movement of the fabric base 18 is slow, and the distance that the fabric base travels during each cycle of operation of the tufting machine is short and this distance gradually increases as the pin 47 approaches the point b and further increases as the pin 47 travels from point b to point c . This gradual increase of the outward movement of the fabric base 18 for each cycle of operation of the tufting machine is indicated by the horizontal lines L , Figure 13, and points b^3 and c^3 correspond to the points b and c . For each cycle of operation of the tufting machine, the crank 65 is moved forwardly and returned to the rear position, and the roll 34 is turned a step to feed the fabric base 18 longitudinally and forwardly. The vertical lines L' designate the extent of longitudinal movement of the fabric base for each cycle of operation of the tufting machine. When the pin 47 is at the point a , pin 59 is at the point a' and the coupling 62 is at the lower end of the crank 65, and this crank will therefore impart the maximum longitudinal movement to the connecting rod. Hence when the pin 59 is traveling from point a' to point b' , the space between the vertical lines L' is long and this space gradually decreases as the pin 59 moves upwardly and the lines L' are closer together. The distance between the vertical lines decreases gradually as the pin 59 travels from point a' to point c' . When the pin 47 travels from point a to point c , the curved line of tufting T has been sewed from point a^3 to point c^3 , and the outward lateral shifting of the fabric base 18 gradually increases, and at the same time, the forward longitudinal feed of the fabric base was correspondingly fast and then decreases as the pin 59 approaches the point c' . It must be kept in mind that when the pin 47 travels from point a to point c , pin 59 travels from point a' to point c' . Figure 10 shows the pin 47 at point c and pin 59 at point c' . The pin 47 is now moving toward point d , and the fabric base 18 is being shifted laterally outwardly. When the pin 47 is at the point c , the fabric base 18 is in the intermediate lateral outer position. The horizontal lines L are now spaced for a greater distance and gradually decrease as the pin 47 moves from point c to point d and from point d to point a^2 . When the pin 59 is in the top position c' , the vertical feed lines are close and gradually become farther apart as the pin 59 moves toward the point d' and from the point d' to the point a' . During this operation, the line of tufting T has been sewed from the point c^3 to the point d^3 and then to the point a^2d^3 . It is thus seen that the lateral outward feed of the fabric has gradually decreased while the longitudinal feed of the fabric has correspondingly increased.

In Figure 11, the pin 47 is in the a^2 position and pin

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59 in the a' position. When the pin 47 is in the a^2 position, the fabric base is in the outer lateral position and the pin 59 is in the a' position. As pin 47 travels toward b^2 position, the horizontal lines L are close and gradually become farther apart until pin 47 reaches c^2 position. Pin 59 is now at a' position and is traveling toward b' position and the vertical feed lines L' are far apart and gradually decrease in distance as pin 59 travels from a' position to b' position and then to c' position. When the pin 47 travels from a^2 position to b^2 position, the needle sews to b^2d^3 position and when the pin 47 travels to c^2 position, the needle sews to c^2d^3 position, and the tufting is completed from position a^2d^3 to c^2d^3 . During this sewing, the fabric base is shifted laterally inwardly, gradually increasing the distance between the lines L toward the point c^2d^3 and at the same time, the fabric is shifted longitudinally gradually decreasing the distance between the lines L' .

In Figure 12, the pin 47 is in the position c^2 and the pin 59 is in the position c' , and the fabric base is being shifted laterally inwardly while pin 47 is traveling from point c^2 to point d^2 . The lateral inward shifting movement of the fabric base is now fast and the lines are far apart and decrease as the pin 47 passes from point c^2 to point a . The pin 59 now being in the raised position at point c' feeds the fabric slowly and the feed lines L' are close together and gradually increase as the pin 59 approaches the point a' . When the pin 47 reaches the point a , the needle has sewed the tufting to the points d^2d^3 and to the point ad^3 . It is thus seen that the inward shifting of the fabric base gradually decreases while the longitudinal feed of the fabric gradually increases. When the pin 47 reaches the point a , the parts are in the relative position as shown in Figure 9. The cycle of operation is then repeated.

While the fabric base is shifted transversely at a variable speed and fed longitudinally at a variable speed, the length of the individual tufts remain constant. The result is that a tufted design is produced including continuous substantially circularly curved portions which face in opposite directions, Figure 14. The trailing tufting machine produces the same design and the two designs cross each other producing a complete design embodying connected circles, Figure 14.

It is to be understood that the form of the apparatus herewith shown and described is to be taken as a preferred embodiment of my invention and that various changes in the shape, size, and arrangement of parts may be resorted to, without departing from the spirit of my invention or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. A machine for tufting a curved design in a fabric base, comprising a support, a relatively stationary tufting machine mounted upon the support and including a reciprocatory needle bar, means for holding the fabric base in a position so that the tufting machine can sew the design in the fabric base and to also shift the fabric base transversely of the line of feed of the fabric base, said means including variable speed means to shift the holding means transversely of the line of feed, feed mechanism engaging the fabric to feed it longitudinally in one direction only, a member to turn about a fixed point, means to turn the member, means to drive the feed mechanism including a longitudinally reciprocatory connecting element connected with said member, and automatic means to shift a part of the connecting element toward and from the turning point of the member while said member is turning.

2. A machine for tufting a curved design in a fabric base, comprising a support, a relatively stationary tufting machine mounted upon the support and including a reciprocatory needle bar, means for holding the fabric base in a position so that the tufting machine can sew the design in the fabric base and to also shift the fabric base transversely of the line of feed of the fabric base, said

means including variable speed means to shift the holding means transversely of the line of feed including a rotary element, feed mechanism engaging the fabric to feed it longitudinally in one direction only, a member to turn about a fixed point, means to turn the member, means to drive the feed mechanism including a longitudinally reciprocatory connecting element connected with said member, automatic means to shift a part of the connecting element toward and from the turning point of the member while said member is turning including a rotary element, and means to drive the rotary elements and moving the second-named rotary element faster than the first-named rotary element.

3. A machine for tufting a curved design in a fabric base, comprising a support, a relatively stationary tufting machine mounted upon the support and including a reciprocatory needle bar, means for holding the fabric base in a position so that the tufting machine can sew the design in the fabric base and to also shift the fabric base transversely of the line of feed of the fabric base, a rotary element including an eccentric pin, driving connecting means between the eccentric pin and the holding means, feed mechanism engaging the fabric to feed it longitudinally, a member to turn about a fixed point, means to turn the member, means to drive the feed mechanism including a connecting element connected with the turning member, a second rotary element including an eccentric pin, means connecting the second-named eccentric pin with the connecting element for shifting the connecting element toward and from the turning point of said member, and means to drive the rotary elements.

4. A machine for tufting a design in a fabric base, comprising a support, a relatively stationary tufting machine mounted upon the support and including a reciprocatory needle bar, means for holding the fabric base in a position so that the tufting machine can sew the design in the fabric base and to also shift the fabric base transversely of the line of feed of the fabric base, said means including means to shift the holding means transversely of the line of feed, feed mechanism engaging the fabric to feed it longitudinally, a member to turn about a point, means to turn the member, means to drive the feed mechanism including a connecting rod connected with the turning member to move longitudinally of the turning member toward and from the turning point of such member, and means to shift the connecting rod toward and from said turning point.

5. A machine for tufting a design in a fabric base comprising a support, a relatively stationary tufting machine mounted upon the support and including a reciprocatory needle bar, feeding and shifting mechanism for the fabric base including a pair of feed rollers engaging the fabric base, driving means for the tufting machine, an element to turn about a point and connected with said driving means and turned thereby, means to turn the feed rollers in one direction including a reciprocatory connecting element connected with said element which turns about said point and shiftable toward and from said turning point of the turning element, and automatic means including a rotary member connected with the connecting element for shifting the connecting element toward and from the turning point of the turning element while said turning element is turning.

6. A machine for tufting a design in a fabric base comprising a support, a relatively stationary tufting machine mounted upon the support and including a reciprocatory needle bar, means for holding the fabric base in position so that the tufting machine can sew the design in the fabric base and to also shift the fabric base transversely of the line of feed of the fabric base, said means including variable speed means to shift the holding means transversely of the line of feed of the fabric base, feed mechanism engaging the fabric base to feed it longitudinally in one direction, a member to turn about a fixed point, means connected with the member to turn it,

a connecting element movably connected with the turning member and shiftable toward and from the turning point of the member so that the turning member may impart to the connecting element a variable stroke, means including a rotary eccentric device for shifting the connecting element toward and from the turning point of the member, and mechanism connected with the connecting element and with said feed mechanism to drive the latter in response to shifting of the connecting element by said turning member.

7. A machine for tufting a curved design in a fabric base comprising a support, a relatively stationary tufting machine mounted upon the support and including a reciprocatory needle bar, means for holding the fabric base in position so that the tufting machine can sew the design in the fabric base and to also shift the fabric base transversely of the line of feed of the fabric base, a pair of feed rollers engaging the fabric base to feed it longitudinally in one direction, a relatively long gear connected with one feed roller for imparting rotation in one direction to the same, a relatively short gear meshing with the long gear for driving the same and adapted to engage the long gear throughout its length upon shifting of the long gear axially when the holding means are shifted transversely of the line of feed of the fabric base, mechanism including a rockable member connected with the holding means for shifting the same transversely of the line of feed of the fabric base with said long gear, and variable speed mechanism connected with said short gear to drive the same with a variable speed simultaneously with the transverse shifting of the holding means and long gear.

8. A machine for tufting a curved design in a fabric base comprising a support, a relatively stationary tufting machine mounted upon the support and including a reciprocatory needle bar, means for holding the fabric base in position so that the tufting machine can sew the design in the fabric base and to also shift the fabric base transversely of the line of feed of the fabric base, a relatively large rotary element, said means including a rockable member connected with the holding means for shifting the same transversely of the line of feed of the fabric base, means connected with the rockable member and with said relatively large rotary element near its periphery for rocking said rockable member, a pair of feed rollers engaging the fabric base to feed it longitudinally in one direction, a member to turn about a fixed point, means to turn the member, a connecting element movably connected with the turning member and shiftable toward and from the turning point thereof so that the turning member may shift the connecting element with a variable stroke, means to shift the connecting element toward and from the turning point of the turning member including a relatively small rotary element, driving connecting means between said connecting element and feed rollers, and means to drive the relatively large and relatively small rotary elements in unison.

9. A machine for tufting a curved design in a fabric base comprising a support, a relatively stationary tufting machine mounted upon the support and including a reciprocatory needle bar, means for holding the fabric base in a position so that the tufting machine can sew the design in the fabric base and to also shift the fabric base transversely of the line of feed of the fabric base, a relatively large rotary element including an eccentric part, driving connecting means between the eccentric part and the holding means, feed mechanism engaging the fabric to feed it longitudinally, a member to turn about a fixed point, means to turn the member, means to drive the feed mechanism including a longitudinally reciprocatory connecting element having a part adjustably connected with the turning member for movement toward and from the turning point of said member, a relatively small rotary element including an eccentric part, means connecting the last-named eccentric part with the connecting element

for shifting said part of the connecting element toward and from the turning point of said member, and means to drive the rotary elements.

10. A machine for tufting a curved design in a fabric base comprising a support, a relatively stationary tufting machine mounted upon the support and including a reciprocatory needle bar, means for holding the fabric base in a position so that the tufting machine can sew the design in the fabric base and to also shift the fabric base transversely of the line of feed of the fabric base, a rotary element including an eccentric part, driving connecting means between the eccentric part and the holding means, a pair of feed rollers engaging the fabric base to feed it longitudinally in one direction, a member to turn about a fixed point, means to turn the member, means to drive one of said feed rollers, including a longitudinally reciprocatory connecting element having a part adjustably connected with the turning member so that said part is shiftable toward and from the turning point of said member, a second rotary element including an eccentric part, means connecting the last named eccentric part with the connecting element for shifting said part of the connecting element toward and from the turning point of said member, and means to drive the rotary elements.

11. A machine for tufting a design in a fabric base comprising a support, a relatively stationary tufting machine mounted upon the support and including a reciprocatory needle bar, means for holding the fabric base in a position so that the tufting machine can sew the design in the fabric base and to also shift the fabric base transversely of the line of feed of the fabric base, said means including means to shift the holding means transversely of the line of feed, a pair of feed rollers engaging the fabric base to feed it longitudinally in one direction, a member to turn about a fixed point, means to turn the member, a connecting element movably connected with the turning member to be shifted thereby and movable toward and from the turning point of said member, means to shift the connecting element toward and from said turning point, and a clutch device connected with said connecting element and one of said feed rollers, whereby shifting of the connecting element by said turning member causes rotation of the feed roller in one direction.

12. A machine for tufting a design in a fabric base comprising a support, a relatively stationary tufting machine mounted upon the support and including a reciprocatory needle bar, a carriage for supporting the fabric base in position so that the tufting machine can sew the design in the fabric base and to also shift the fabric base transversely of the line of feed of the fabric base, said

means including a rock shaft, a linkage connecting the carriage and rock shaft so that turning of the rock shaft causes the carriage to shift transversely of the line of feed of the fabric base, means including a rotary element having an eccentric part connected with the rock shaft to turn it, a second rotary element connected with the first named rotary element and turning in unison therewith, a pair of feed rollers mounted upon the carriage and engaging the fabric base to advance the same longitudinally in one direction relative to the tufting machine, driving means connected with one feed roller to turn it and automatic means connected with the second rotary element to be driven thereby and varying the speed of said driving means while said driving means is operating.

13. A machine for tufting a curved design in a fabric base comprising a support, a relatively stationary tufting machine mounted upon the support and including a reciprocatory needle bar, means for holding the fabric base in position so that the tufting machine can sew the design in the fabric base and to also shift the fabric base transversely of the line of feed of the fabric base, said means including a rock shaft, mechanism connecting the rock shaft and holding means for shifting the holding means transversely of the line of feed of the fabric base when the rock shaft turns, a first rotary element including an eccentric part, mechanism connecting the rock shaft and eccentric part of the rotary element, a first member to turn about a fixed point, rotary driving means for the tufting machine including an eccentric part, driving connecting means between the last named eccentric part and said first member, feed mechanism engaging the fabric base to feed it longitudinally in one direction including a rotary member, means connected with the rotary member to turn the same, a connecting element adjustably connected with said first member and shiftable toward and from said fixed point said connecting element being also connected with said last named means, a second rotary element including an eccentric part, means connecting the last named eccentric part and said connecting element for shifting the connecting element toward and from the turning point of said member, and means for turning said first and second rotary elements in unison with different rotational speeds.

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