

June 12, 1945.

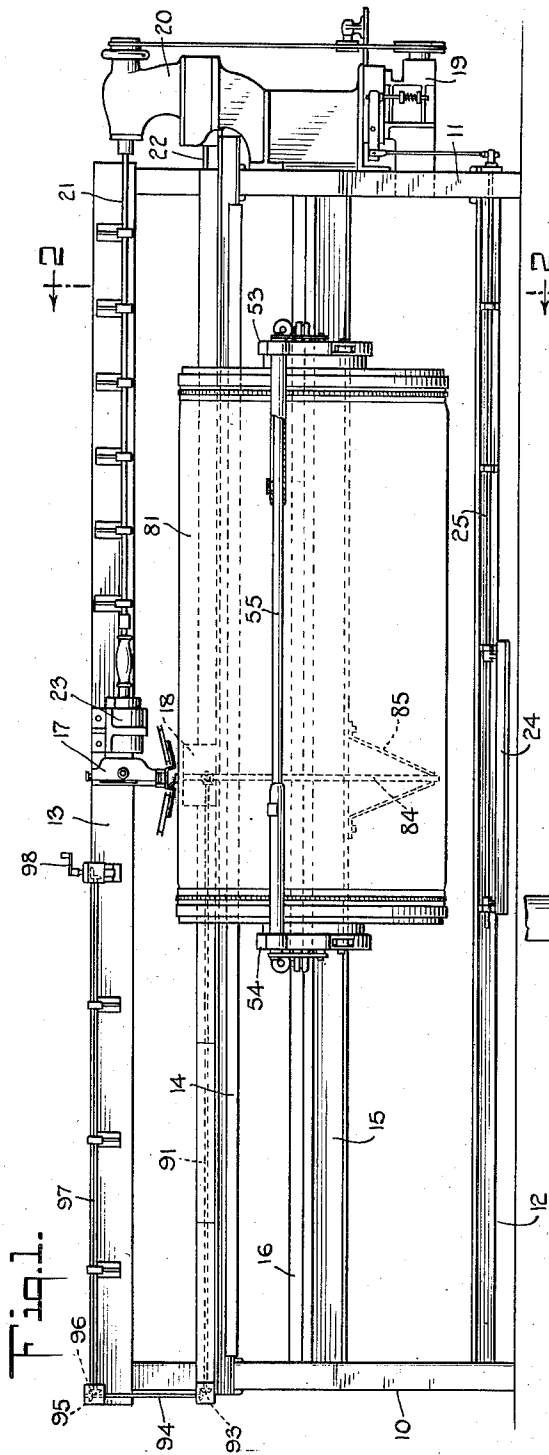
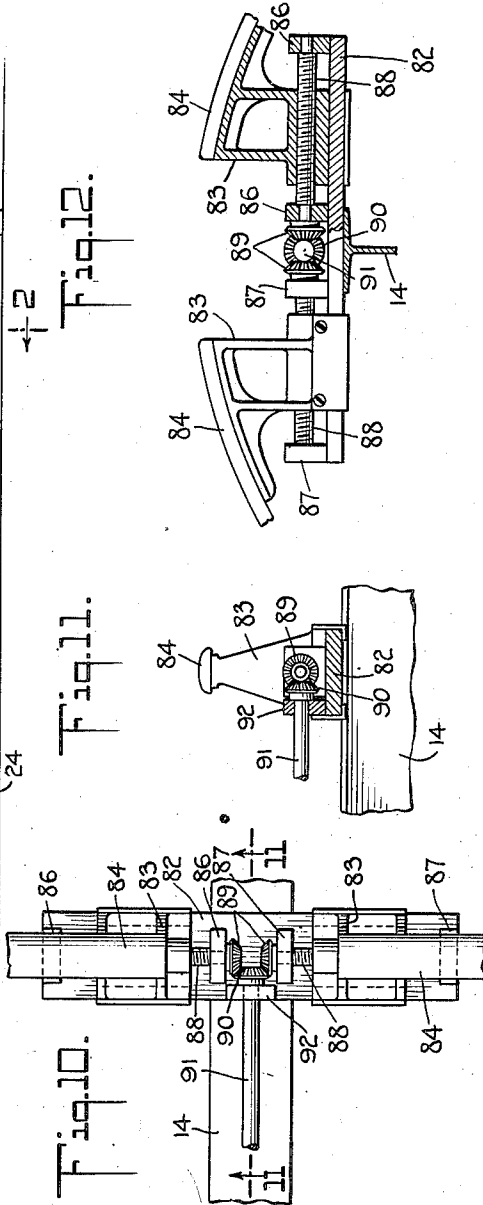
W. H. MAY

2,377,951

SEWING MACHINE

Filed Dec. 4, 1940

5 Sheets-Sheet 1



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June 12, 1945.

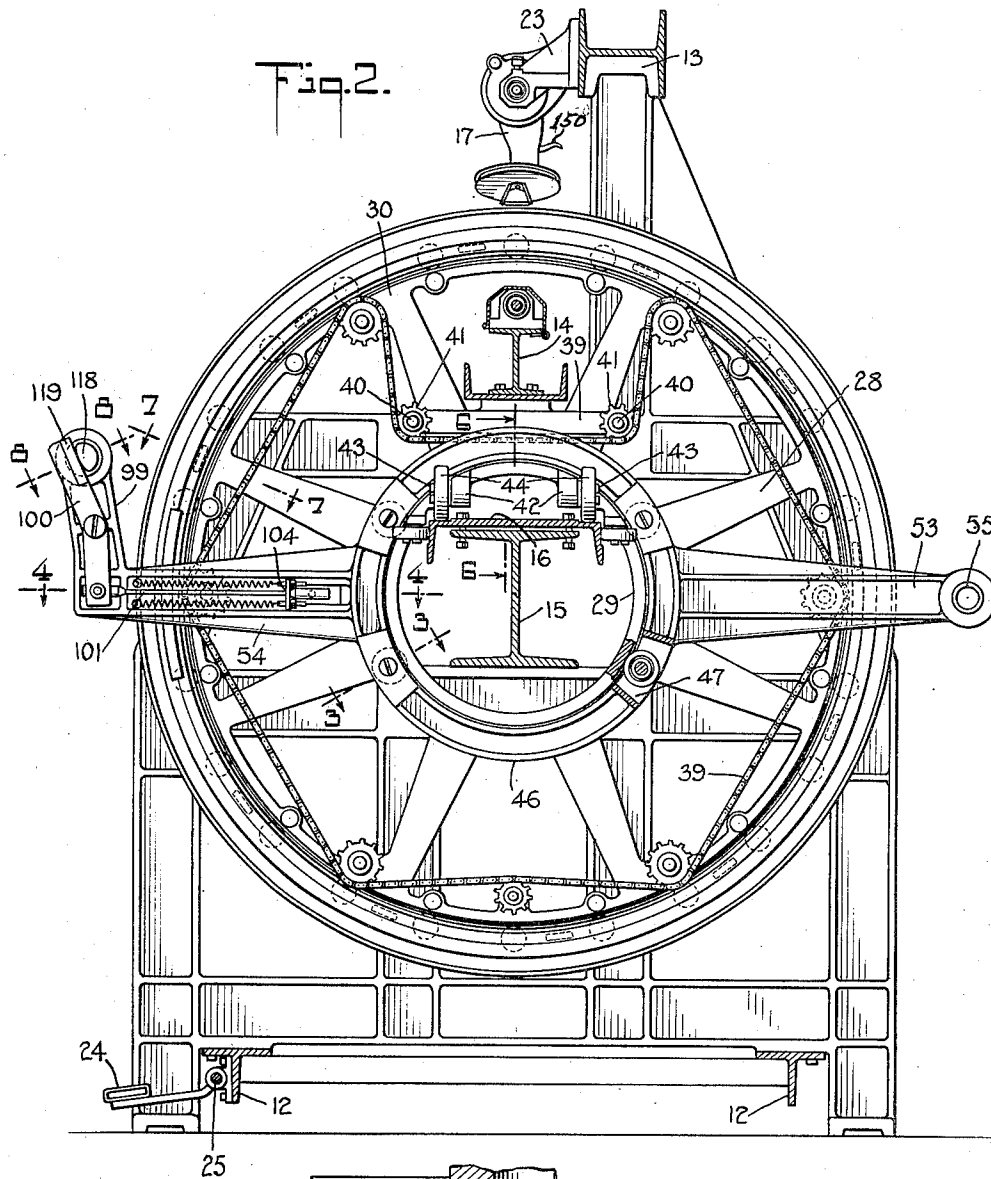
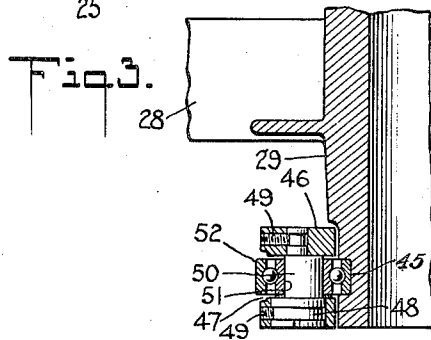
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SEWING MACHINE

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5 Sheets-Sheet 2



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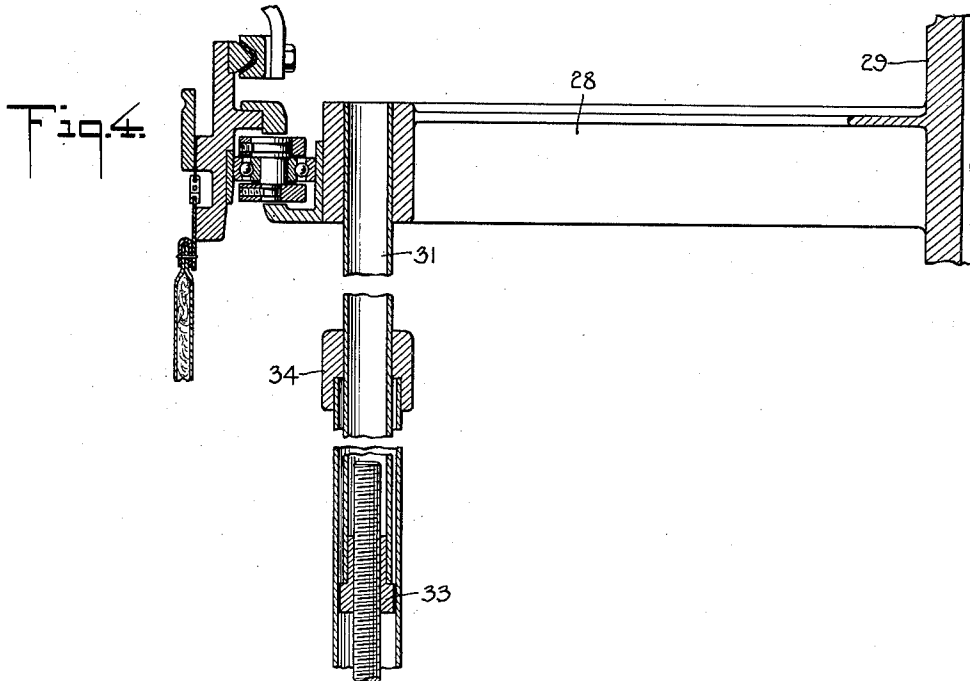
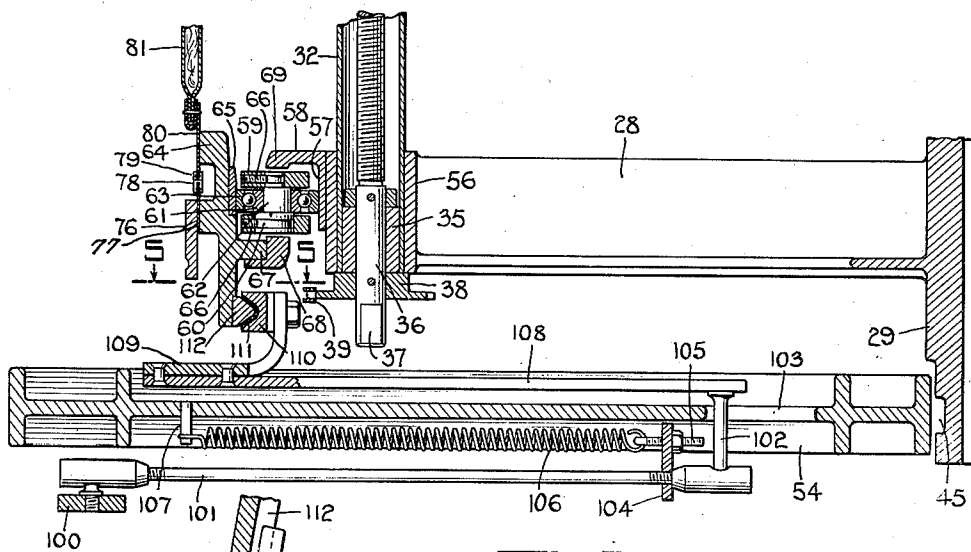
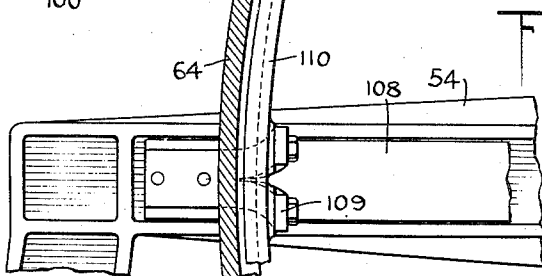
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SEWING MACHINE

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5 Sheets-Sheet 3



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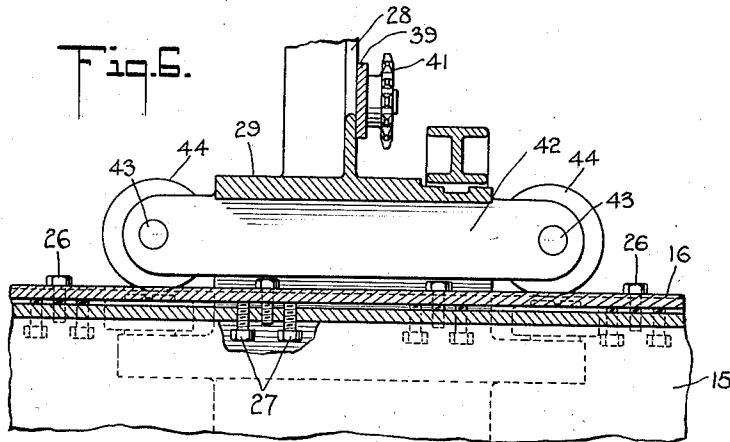
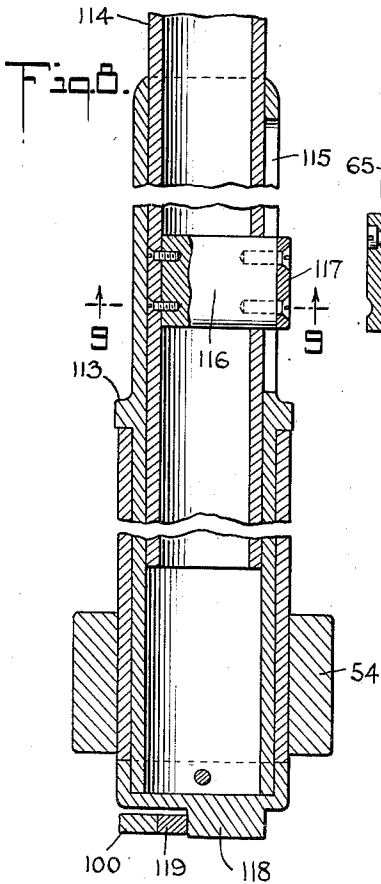
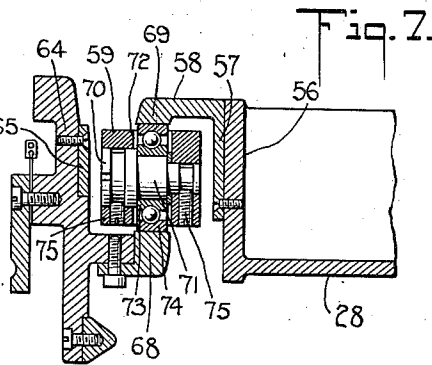
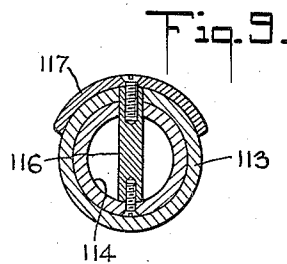
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SEWING MACHINE

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5 Sheets-Sheet 4



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2,377,951

SEWING MACHINE

Filed Dec. 4, 1940

5 Sheets-Sheet 5

Fig. 13.

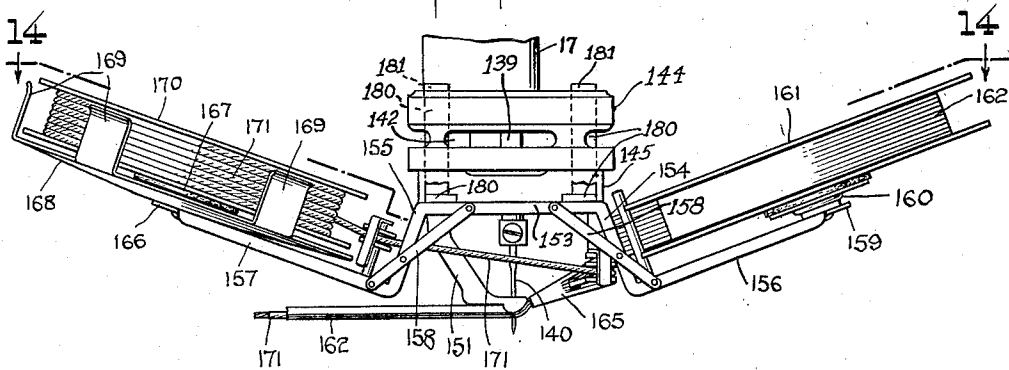


Fig. 14.

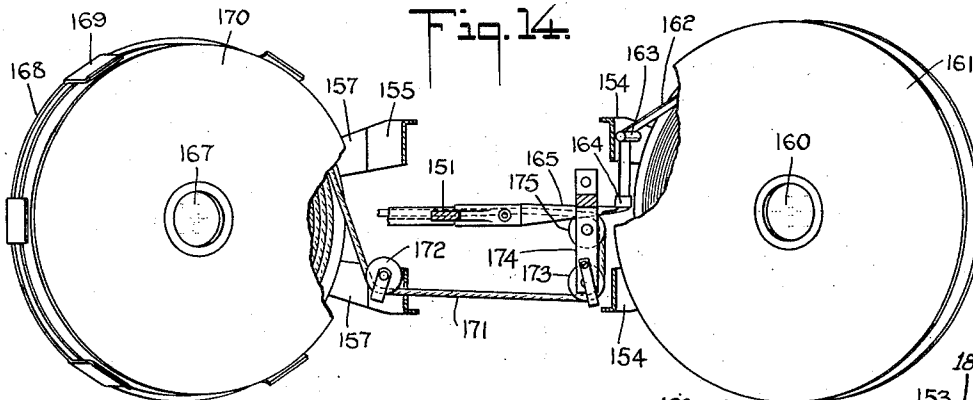


Fig. 15.

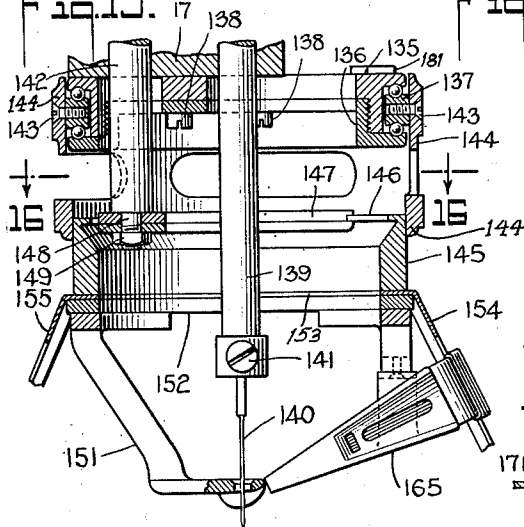


Fig. 16.

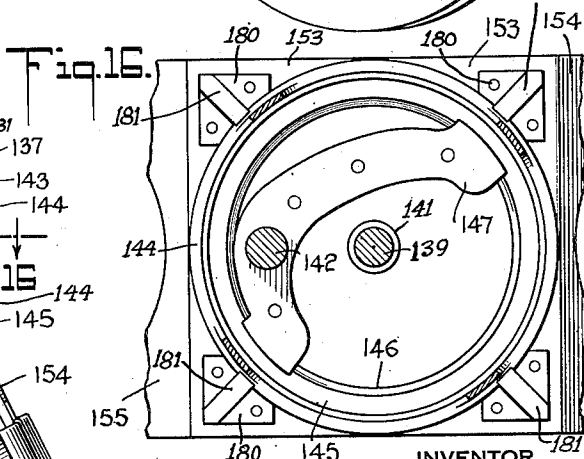
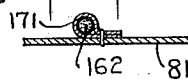


Fig. 17.



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UNITED STATES PATENT OFFICE

2,377,951

SEWING MACHINE

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Application December 4, 1940, Serial No. 368,419

7 Claims. (Cl. 112-98)

This invention relates to sewing machines and more particularly to machines for sewing irregular, intricate and fancy designs in a fabric and for applying or attaching to such fabric, cord or wire encased in a tape or similar medium.

The invention has relation to the type of machine illustrated in the patent granted to me on November 28, 1933, No. 1,937,491, and the patent granted to me on February 13, 1934, No. 1,946,868, and has specific relation to an improved sewing head for carrying the cord or wire, together with the enclosing tape or similar medium, and for feeding the same simultaneously into association with the sewing needle which applies or attaches the cord or wire encased in the tape directly onto the fabric and in conformity with the outlines of a design.

An object of the invention is an improved sewing machine of the drum type.

A novel feature of the invention is an improved freely rotatable sewing head for carrying the cord or wire and enclosing tape and for feeding the same directly to the sewing needle and into operative association with the fabric.

Another feature of the invention is an improved means for attaching the sewing head to the machine.

Other features of the invention will appear as the description thereof progresses.

In the accompanying drawings:

Fig. 1 is a side elevation of a sewing machine of the drum type showing my invention in operative position thereon;

Fig. 2 is a sectional side elevation taken on the line 2-2 of Fig. 1;

Fig. 3 is a detail section taken on the line 3-3 of Fig. 2;

Fig. 4 is a sectional plan view taken on the line 4-4 of Fig. 2;

Fig. 5 is a detail sectional view taken on the line 5-5 of Fig. 4;

Fig. 6 is a vertical sectional elevation taken on the line 6-6 of Fig. 2;

Fig. 7 is a detail section taken on the line 7-7 of Fig. 2;

Fig. 8 is a sectional plan view taken on the line 8-8 of Fig. 2;

Fig. 9 is a sectional view taken on the line 9-9 of Fig. 8;

Fig. 10 is a plan view of the operating means for the work expanding means;

Fig. 11 is a sectional elevation taken on the line 11-11 of Fig. 10;

Fig. 12 is a side elevation, partly in section, of

the structure shown in Fig. 1 and looking to the left of such figure;

Fig. 13 is an enlarged front elevation of my improved sewing head;

Fig. 14 is a plan view of the structure illustrated in Fig. 13, taken on the line 14-14 of such figure parts being broken away to more clearly show the combining means for the tape and cord or wire;

Fig. 15 is a central sectional elevation of the central portion of the sewing head;

Fig. 16 is a sectional plan view, taken on the line 16-16 of Fig. 15, and

Fig. 17 is a section through a fragment of fabric and showing a cord or wire encased in a tape which is sewed to the fabric.

Referring to the drawings, the frame of the sewing machine is composed of end members 10 and 11 spaced apart from each other at the bottom by T-shaped members 12, and at the top by a built up structural member 13. Also, extending between the end members 10 and 11 is a structural member 14, while below such structural member is a second member 15 on which is adjustably mounted a trackway 16 for a drum.

Mounted on the structural member 13 is the head 17 to which my present invention may be attached. On the structural member 14 and directly beneath the head 17 is the loop taking means including a housed bobbin 18 of the sewing machine. The head 17 and the loop taking means 18 are driven in synchronism with each other from a motor 19 which operates a control device 20, and from which control device is operated the drive shaft 21 for the head 17, and the shaft 22 of the loop taking means 18. As a matter of convenience in the operation of the machine, the head is rotatably mounted as a unit in a bracket 23, secured to the structural member 13.

The motor 19 is controlled at will by the operator through a treadle 24 secured to the rotatably mounted shaft 25 on the spacing and connecting members 12. The treadle 24 is located in front of and below the head 17 as this is the place where the operator of the machine will stand while operating the machine.

The track for the drum to be hereinafter described is designated 16, such track 16 being mounted on the I-beam 15 and adjustable thereon to level such track 16 as needed. The track 16 is provided with a plurality of threaded holes along its length and on either side thereof and through which pass threaded bolts 26, such threaded bolts 26 being threaded into holes in the I-beam 15.

Also, adjacent each of the threaded bolts 26 and in the top flange of the I-beam 15 are two holes, each threaded to receive the threaded bolts 27 which engage with the under face of the trackway 16, as clearly shown in Fig. 6.

By means of the bolts 26 and 27, the trackway 16 may be levelled regardless of whether or not the top flange of the I-beam is level, and when so levelled is maintained in such position by the bolts 27. This is important as the drum carrying the fabric in which the design is to be sewn is relatively heavy and must be easily movable to be accurately handled if the design is to be sewn accurately.

The drum comprises end spiders 28 each having a central hub 29 and an outer cylindrical rim 30. The spiders 28 are adjustably spaced apart from each other by means of telescoping members in the following manner. In one of the spiders 28 are secured a plurality of tubular members 31, symmetrically arranged and secured to the spider adjacent the periphery thereof, and extending toward the other spider 28. Secured to the other spider 28 and symmetrically arranged thereon adjacent the periphery thereof and extending toward the first said spider are a plurality of tubular members 32. This structure is clearly shown in Fig. 4, and referring to such figure it will be noted that the ends of the tubular members 31 nearest to the other spider 28 are provided with internally threaded plugs 33, of substantially the same diameter as the internal diameter of the tubular members 32.

Also it will be noted that the end of each of the tubular members 32 adjacent the first said spider is provided with a cap 34 having a bore therethrough which is equal substantially to the outer diameter of the tubular members 31. Secured in the end of each of the tubular members 32 is a plug 35 and in each such plug is rotatably mounted a shaft 36 provided with threads throughout the major portion of its length, which threads engage with the threads of the plug 33 secured in each of the tubular members 31. Each of the shafts 36 has one end 37 made non-circular to receive a wrench or other instrument by means of which the shaft 36 may be rotated. Also secured to the respective shafts 36 are sprockets 38, over which runs the sprocket chain 39.

As stated above, there are a plurality of tubular members 31 and 32, symmetrically arranged about the spiders 28 adjacent to the periphery thereof, and naturally each of the shafts 36 associated with the tubular members 32 is provided with a sprocket wheel 38. On two of the arms of the spider 28 carrying the tubular members 32 is a bracket having thereon stub shafts 40, and on such stub shafts are rotatably mounted the idler sprockets 41. The sprocket chain 39 is endless and as viewed in Fig. 2 passes over the plurality of sprockets 38 and over the sprockets 41. It will be apparent, therefore, that by placing a wrench or other instrument on the non-circular portion 37 of one of the shafts 36 that such shafts may be rotated in either direction, to thus extend the tubular members 31 and 32 with respect to each other, or telescoping the same, to thus move the spiders 28 further apart or closer together respectively. Also, it will be apparent that this expanding or contracting action of the tubular members 31 and 32 takes place simultaneously at each and all of the said tubular members.

The spiders 28 have formed integral with the hubs 29 thereof spaced bearing members 42. In the ends of the spaced bearing members 42 are

respective stub shafts 43, and on each of the stub shafts is rotatably mounted a roller 44, such roller 44 engaging with the trackway 16. By this means the spiders 28 and tubular members 31 and 32, constituting the drum, may be moved along the trackway 16 and thus be moved relative to the sewing head 17.

Formed on the outer periphery of the hub 29 of the spiders 28 is a circular track 45. Fitting over the track 45 in the hub 29 is an annular member 46 provided with spaced symmetrically arranged radially extending pockets 47 about the periphery thereof. Rotatably mounted in the annular member 46 at each of the radially extending pockets 47 is a shaft 48 adjustably secured in rotative position by the set screws 49. Formed integral with the shaft 48 and eccentrically mounted with respect to the axis of said shaft 48 is an eccentric portion 50 of shaft 48 on which is secured the inner member 51 of a ball bearing, the outer member 52 of which rolls in the track 45. By means of the shaft 48 the roller bearing above referred to may be so adjusted with respect to the track 45 that the annular ring 46 will rotate on the track 45 without appreciable play.

Formed integral with the annular members 46 and diametrically arranged with respect thereto are the arms 53 and 54 respectively. The ends of the arms 53 are connected by telescoping tubular members 55. The details of construction of the members 55 are not important. Such members resemble in some degree the members which connects the ends of the arms 54 to be later described in detail.

The rims 56 of the spiders 28 have secured thereto respective annular members 57 which are bearing race rings. Each bearing race ring 57 has an extension 58 which lies at substantially right angles thereto. Associated with each bearing race ring 57 is a ball bearing retaining ring 59. Spaced about each ball bearing retaining ring 59 and extending therethrough, parallel to the axis of the corresponding bearing race ring, are bearings, in each of which is mounted an adjustable bearing shaft 60. The ball bearing retaining rings 59, at each of the bearing shafts 60, are provided with respective radially extending slots, in which are mounted respective ball bearings 61. The inner members of the respective ball bearings 61 are mounted on respective eccentric portions 62 of the respective shafts 60, and the outer members 63 of the respective ball bearings 61 engage with the bearing race rings 57, as clearly shown in Fig. 4.

Enclosing or surrounding the ball bearing retaining rings 59 are respective drum rings 64, provided on their inner peripheries with respective bearing races 65, with which engage the outer portions 63 of the ball bearings above referred to. By properly rotating the respective bearing shafts 60, the eccentric portions 62 thereof are utilized to adjust the ball bearings, relative to the respective ball bearing race rings 57 and bearing race rings 65. When in proper adjusted position, the bearing shafts 60 are clamped in position by the set screws 66.

The drum rings 64 have respective inwardly extending rings 67 on their inner faces to which are secured respective bearing race rings 68, which lie opposite to and spaced apart from corresponding race rings 69, formed integral, respectively, with the perpendicular extensions 58 of the bearing race rings 57.

The ball bearing retaining rings 59 are provided with respective sets of spaced perforations ex-

tending radially therethrough, in each perforation of which is adjustably and rotatably mounted a bearing shaft 70, such shaft being provided intermediate its ends with an eccentric shaft portion 71, see Fig. 7. At each of the shafts 70, and extending laterally through the ball bearing retaining rings 59, are slots or openings 72, in which are housed ball bearings, the inner portions 73 of which are respectively mounted on the eccentric shaft portions 71, while the outer portions 74 of which engage with the bearing race rings 68 and 69, respectively. By properly adjusting the bearing shafts 70, the outer portions 74 of the ball bearings are adjusted relative to the bearing race rings 68 and 69. Such shafts are held in adjusted position by means of the set screws 75.

Secured to the outer peripheries of the drum rings 64 are respective clamp rings 76 which clamp respective strips of fabric 77 securely in position on the drum rings. On the free edge of each such fabric strip 77 is the "zipper" element 78 which cooperates with a like "zipper" element 79 secured to an adjacent edge of a fabric strip 80. Such fabric strips 80 are sewn to opposite edges of the fabric 81 on which it is desired to sew the designs or pattern.

After the strips of fabric 80 have been sewn to the fabric 81, the several "zipper" elements 78 and 79 are brought into engaging relation above the periphery of the drum rim 64. The shafts 36 are then rotated in the proper direction to extend the telescoping members 31 and 32 until the entire surface of the fabric 81 is stretched taut.

Mounted on the structural member 14 and extending transversely thereof is a plate 82, see Fig. 12. Slidably mounted on the plate 82 and spaced apart from each other are brackets 83. Secured to the brackets 83 are the ends of a circular ring or hoop 84 of flat metal. The ring or hoop 84 extends around the structural member 14 and the I-beam 15 and is adjustable in diameter. Secured to the under face of the I-beam is a bracket 85 to which the ring or hoop 84 is secured at its lowermost point. Pairs of bearing members 86 and 87 are mounted on the plate 82 and in each pair is rotatably mounted threaded screw shafts 88, one of such screw shafts being threaded righthanded and one lefthanded. The screw shafts 88 engage with threaded holes in the brackets 83.

To the inner ends of the screw shafts 88 are secured bevel pinions 89, which mesh with and are driven by a bevel pinion 90, secured to a shaft 91, one end of which is rotatably mounted in a bracket 92 secured to the plate 82. The shaft 91 extends along the top of the structural member 14 to a point adjacent one end thereof and is provided with a bevel gear 93 which meshes with a corresponding bevel gear secured to the lower end of a shaft 94 and which shaft has at its upper end a bevel gear 95 which meshes with a bevel gear 96 secured to one end of a shaft 97, rotatably mounted in suitable bearings attached to the spacing member 13. The shaft 97 extends inwardly to a point adjacent the sewing head 17, and is driven from a crank 98 through suitable bevel gearing, so that the operator by rotating the crank 98 may move the brackets 83 toward or away from each other to thereby expand the diameter of the ring or hoop 84 until the intermediate portion of the fabric 81 is held in position with respect to the bobbin holders and sewing head 17 of the sewing machine.

The arms 54 are each provided with a laterally extending member 99, and to each said member is pivotally mounted a lever 100. The arm of the lever 100 adjacent the arm 54 is pivotally attached to one end of a connecting rod 101. The other end of this connecting rod is pivotally attached to a rod 102, Fig. 4, which is slidably mounted in a slot 103 formed in the arm 54. Secured to the end of the connecting rod 101 adjacent the rod 102 is a plate 104 through which adjusting screws 105 pass and to each of which is connected one end of a coil spring 106. The other ends of the coil springs are attached to pins 107 affixed to the arm 54. The coil springs tend to urge the connecting rod 101 outwardly so as to rotate the lever 100 in a clockwise direction as viewed in Fig. 2.

Secured to the end of the rod 102 remote from the connecting rod 101 is a bar 108. To the outer end of the bar is secured a drum transport grab shoe slide 109. To the drum transport shoe slide 109 is secured a grab shoe 110, which is associated with a brake ring 112 secured to the inner periphery of the drum ring 64. Each of the lateral extending arms 99 on each of the arms 54 have rotatably mounted at its ends a tubular member 113. This tubular member has telescoped therein, as a sliding fit, a tubular member 114. The tubular members 113 are slotted at 115 and through said slot extends a member 116 secured to the tubular member 114. The outer end of the member 116 is covered by an arcuate plate 117, as clearly shown in Fig. 9.

The ends of the tubular members 113 are provided with cams 118 which are adapted to engage with a cam plate 119 secured to the outer arm of the levers 100. The tubular members 113 and 114 are rotatable as a unit and when thus rotated the cams 118 rotate the lever 100 so as to move the connected rods 101 radially inward, thus moving the brake shoe 110 out of engagement with brake ring 112 and allowing the elements 54 to rotate as a unit free from engagement with the drum ring 64. By again turning the tubular members 113 and 114 the cam 118 permits the springs 106 to move the bar 108 radially outward to again bring the brake shoe 110 into engagement with the brake ring 112, and connecting the drum rims 64 thereto, whereby the drum rims 64 and the elements 54 are rotatable as a unit.

There is thus provided mechanism by which a compound or any movement may be imparted to the drum rims and the fabric 81 attached thereto. The operator controls the apparatus entirely by means of the tubular members 113 and 114 in connection with the elements 54 and moves the entire assembly longitudinally along the I-beam 15 or transversely with respect to the spider 28 so as to bring the design outline on the fabric 81 into proper association with the sewing head 17. By perfectly balancing the entire apparatus and levelling where necessary, and by properly adjusting the bearings so that no play is in the various parts, the operator can accurately control the device so as to correctly sew the design in the fabric 81.

The design to be sewn on or in the fabric 81 may be marked on the fabric and the operator by proper manipulation brings each part of the design into association with the sewing device. The design may be sewn into the fabric 81 with silken or other thread and the design will be outlined by the sewn silk or other thread. In place of the silken or other thread to outline the design there may be utilized a cord, wire or other fila-

mentary material, and in such case the filamentary material is encased in a tape, which tape is sewn to the fabric 81 and follows the outline of the design which may be marked or printed on such fabric 81, or which may be followed by utilizing a template, or track, or similar device entirely separate from the fabric 81 and which controls the movement of the drum elements carrying the fabric 81.

Where it is desired to outline the design with a cord, wire or other filamentary material encased in a tape, the head as heretofore designed will be insufficient for the purpose and, therefore, in this my present invention I have devised a new form of sewing head which simultaneously prepares and associates a filamentary material and a tape and encases the filamentary material in the tape, and simultaneously feeds the same to a point where the same may be sewn directly to the fabric 81. Such a structure is illustrated in Figs. 13 to 17 inclusive, and referring to such figures there is shown a substantially circular plate 135 counterbored and internally threaded on its lower face to receive the threads of a bearing member 136. The plate 135 and member 136 form ball races for the balls of a rotary thrust bearing 137. The members 135 and 136 are screwed to the lower face of the head 17 by screws 138, as clearly shown in Fig. 15. Extending downwardly from and forming part of the head 17 is the needle bar 139 provided with a centrally arranged passage (not shown) in which is fitted the sewing needle 140, and which needle is held in position by the screw 141. This needle bar 139 is in no way disturbed by the addition to the head 17 of the structure shown in Fig. 15. However, some slight modification must be made in the construction and operation of the presser-foot bar 142.

Secured to the rotary thrust bearing 137 by screws 143 is a hollow cylindrical member 144, in the vertical bore of which is rotatably and slidably mounted a hollow cylindrical member 145. The top of the member 145 is provided with a central orifice which forms a circular track 146. Track 146 is rotatably supported by a bar 147. The bar 147 is mounted on presser-foot bar 142 and is substantially arcuate in form so that the ends of the bar form a diametrical line with the needle bar 139 as the center. The bar 147 preferably is provided with a bearing on each end (not shown) to reduce the friction of track 146.

The presser-foot bar 142, as shown in Fig. 16 may be the usual presser-foot bar with the presser-foot removed therefrom, or an entirely new presser-foot bar. In either event the lower end thereof is reduced in diameter and threaded as indicated at 148 to receive a nut 149 and such reduced end 148 passes through a perforation in the bar 147. After passing through the perforation in the bar 147 the reduced end 148 has threaded thereon the nut 149 so that the cylindrical member 145 is attached thereto and is movable vertically with respect to the plate 135, and to the cylindrical member 144, while being capable of rotary movement in the cylindrical member 144 about the needle bar 139 as a center. By use of the usual presser-foot bar operating lever 150 the presser foot bar 142, the cylindrical member 145, and all parts carried thereby are moved upward and downward so as to bring the presser-foot or modification thereof into engagement with the fabric 81, or the material to be sewed to such fabric 81, and into operative association with the bobbin operating mechanism

which is under the control of the sewing machine head 20. The cylindrical members 144 and 145 are maintained in position on the platform or plate 153 by means of uprights 180, 180, mounted on the four corners of said plate, as most clearly shown in Fig. 16, the upper ends of said uprights having inwardly extending finger portions 181, 181, engaging the upper faces or edges of the cylindrical unit 144.

Secured to the end face of the cylindrical member 145 in any usual or desired manner is a presser-foot 151, an annular plate 152 being interposed between the presser-foot 151 and the under surface of the cylindrical member 145 for a purpose to be hereinafter described. When the lever 150 is operated to move the presser-foot 151 into operative association with the bobbin mechanism and with the fabric 81, the cylindrical member 145 may be rotated in the cylindrical member 144 and about the bar 147 without disturbing the relation which exists between the needle bar 139 and the presser-foot 151 and, therefore, it will be possible for thread to be utilized as the sewing medium by the needle 140 in all positions of the presser-foot 151 with respect to the needle bar 139.

For the specific purpose for which the present invention was developed I have provided a supporting framework which carries a filamentary material, such as a cord or wire, and an enclosing material, such as tape, and associated with such framework is mechanism which encases the filamentary material in the tape and simultaneously feeds the same into a groove on the under face of the presser-foot and into operative association with respect to the needle 140. This framework consists generally of a plate 153 substantially rectangular in form, and held against the lower face of the cylindrical member 145 by the annular plate 152 and the holding device for the presser-foot 151. I preferably make the framework of relatively light material to save weight and insure a working machine which will work accurately and easily without undue fatigue to the operator.

It will be understood of course that the rectangular plate 153 is provided with a centrally arranged aperture substantially equal in extent to the aperture in the cylindrical member 145 or to the inner diameter of the annular plate 152. Formed integral with the rectangular plate 153 at opposite ends thereof and extending outwardly and downwardly are members 154 and 155 respectively. Formed integral with the members 154 and 155 respectively and extending outwardly and upwardly (see Fig. 13) therefrom are the members 156 from the members 154 and the members 157 from the members 155.

Because the material of the members 153 to 157 inclusive is relatively light I provide braces 158 as shown. The members 156 converge into a plate 159 and mounted on the upper face of such plate 159 is a rotatably mounted cylindrical holder 160 and on such holder 160 may be mounted a reel 161 carrying tape 162. The end of the tape passes around a pin 163 secured to one of the members 154 and thence through a guide 164 forming part of a folding and guiding means 165. The folding and guiding device 165 has its end terminating adjacent to the entrance of the passage on the under face of the presser-foot 151, as clearly shown in Fig. 13.

The members 157 converge into a plate 166 and on such plate and extending upwardly therefrom is a freely rotatable member 167 to which

is secured a rotatable plate 168 provided with the upwardly spaced circumferential arranged arms 169. Mounted on the centrally arranged member 167 is a reel 170 carrying cord or wire 171 thereon. The cord or wire 171 passing from the reel 170 is led around a guide wheel 172 mounted on the member 155 thence around a guide wheel 173 mounted in a frame 174 mounted on the member 154 and thence around a guide wheel 175 mounted in the same frame 173 and led into the folding and guiding means 165. The tape 162 is led around the pin 163 into the folding and guiding means 165 after which the wire or cord 171 is led from the reel 170 and around the guide wheels 172, 173 and 174 into the folding and guiding means 165, care being taken to see that the wire or cord 171 is encased in the tape 162 as clearly shown in Fig. 17. The encased cord or wire 171 together with the encasing tape 162 is fed into the groove in the under face of the presser-foot 151.

The entire structure described with reference to Figs. 13 to 17 inclusive is relatively light in weight and is so freely mounted for rotation within the cylindrical member 144 on the members 135 and 136 and so evenly balanced as to be freely rotatable in accordance with the movement of the fabric 81 which causes the presser-foot 151 to swing in accordance with the direction of movement of the line of the design to be sewn on the fabric 81 so that the wire 171 and encasing tape 162 is always fed out of the folding and guiding means 165 and through the slot in the under surface of the presser-foot 151, and always in position to have the thread or the needle 140 pass through the overlapping edges of the tape 162 as clearly shown in Fig. 17. The operator is therefore enabled to easily and accurately follow the outlines of any design that may be marked upon the fabric 81, or the device is capable of automatically following a design by means of a template and in this latter case it will be unnecessary to press the design or mark the fabric 81.

Whereas, I have described my invention by reference to specific forms thereof, it will be understood that many changes and modifications may be made without departing from the spirit of the invention.

I claim:

1. In a machine of the character described, a sewing head, a needle bar mounted for substantially vertical reciprocatory motion therein, and provided with a needle holding device at its lower end, a presser-foot bar also mounted for reciprocatory motion therein, a framework rotatably secured to the lower end of the sewing head, a second framework slidably mounted for vertical and rotary movement in the first said framework, a presser-foot secured to said second named framework, means attaching the said second framework to the presser-foot bar so that said second named framework is free to rotate within the first named framework and relative to said presser-foot bar, and means for reciprocating the presser-foot bar in the sewing head when desired and for thereby imparting a reciprocatory motion to the second said framework.

2. In a machine of the character described, a sewing head, a framework secured thereto at the lower end thereof, a second framework mounted for reciprocatory and rotary movement in said framework, a presser-foot carried by said second framework, a wire holding and a tape holding means mounted on said second framework, and

means for guiding the wire and tape into operative relation with each other and into association with the presser-foot.

3. In a machine of the character described, a sewing head, a needle bar mounted for substantially vertical reciprocatory motion therein and provided with a needle holding means at its lower end, a presser-foot bar mounted for substantially vertical reciprocatory motion in the sewing head, said presser-foot bar being mounted substantially parallel to the needle bar, means for reciprocating the said presser-foot bar as and when desired, a framework disposed at the underside of the sewing head and arranged for rotary movement about the needle bar as a center as well as for reciprocatory motion longitudinally of said needle bar and of said presser-foot bar, connecting means between said framework and the presser-foot bar, such connecting means permitting rotary movement of the framework about the needle bar as a center, and constraining the framework to reciprocate in accordance with the movements of the presser-foot bar, and a presser-foot attached to the lower end of said framework.

4. In a machine of the character described, the combination with a sewing head provided with a needle bar and presser-foot bar, of a framework disposed at the under side of the sewing head and connected to the presser-foot bar so as to be movable axially of and in association therewith, a guide mounting for the said framework permitting free rotation of the same in a plane perpendicular to the axis of the needle bar, a presser-foot carried by said framework, and holding and guiding devices carried by said framework and adapted to hold and guide sewing materials and to feed them in operative relation to each other and to the said presser-foot.

5. In a machine of the kind described, the combination of a sewing head, a needle bar mounted for reciprocatory motion therein, a presser-foot bar arranged substantially parallel to the needle bar in the sewing head and mounted for reciprocatory motion therein, a bearing member secured to the under face of the sewing head, a framework mounted for rotary movement in said bearing member and rotatable about an axis coincident with the axis of the needle bar, an auxiliary framework mounted for reciprocatory motion with respect to the first said framework and rotatable therein, means connecting said last named framework to the lower end of the presser-foot bar so that said auxiliary framework is free to rotate within the first named framework and relative to said presser-foot bar, and a presser-foot rigidly carried by the last named framework so as to be maintained in operative relation to the needle bar regardless of the angular position of the presser-foot to the needle bar.

6. In a sewing machine for sewing tapes or the like to a fabric in relatively intricate irregular designs, said machine having a sewing head, a needle bar and a presser-foot bar mounted for reciprocatory movement in said sewing head, means for reciprocating said needle bar, and means for moving said presser-foot bar back and forth along its reciprocatory path as and when desired, the combination of means carrying a presser-foot, means connecting said carrying means with said presser-foot bar so that said carrying means may rotate freely relative to said presser-foot bar but will move back and forth therewith, and holding and guiding devices carried by said carrying means and adapted to hold

said tapes or the like and guide the same to said presser-foot.

7. In a sewing machine having a sewing head, a needle bar and a presser-foot bar mounted for reciprocatory movement in said sewing head, means for reciprocating said needle bar, and means for moving said presser-foot bar back and forth along its reciprocatory path as and when desired, the combination of means carrying a presser-foot, means connecting said carrying means with said presser-foot bar so that said carrying means may rotate freely relative to said presser-foot bar but will move back and

forth therewith, a reel for holding cord or wire, a reel for holding tape, said reels being carried by said carrying means, combining means for encasing said cord or wire in said tape, means for guiding said cord or wire into said combining means, and means for guiding said tape into said combining means, said combining means and said guiding means being carried by said carrying means, and said combining means having its outlet end directed toward said presser-foot for feeding the encased cord or wire directly to said presser-foot.

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