

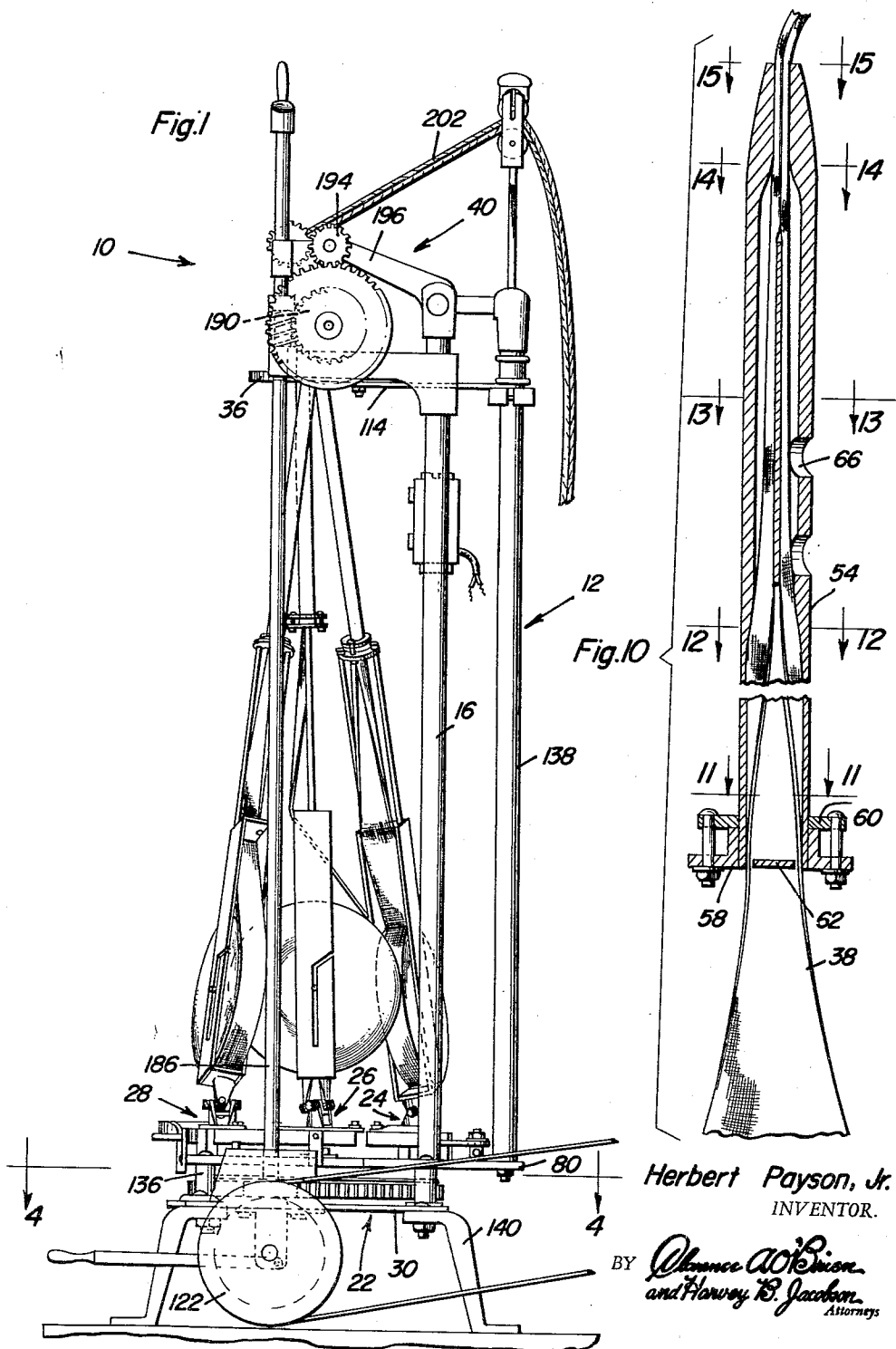
Sept. 11, 1962

H. PAYSON, JR
BRAIDING MACHINE

3,053,133

Filed Jan. 10, 1961

8 Sheets-Sheet 1



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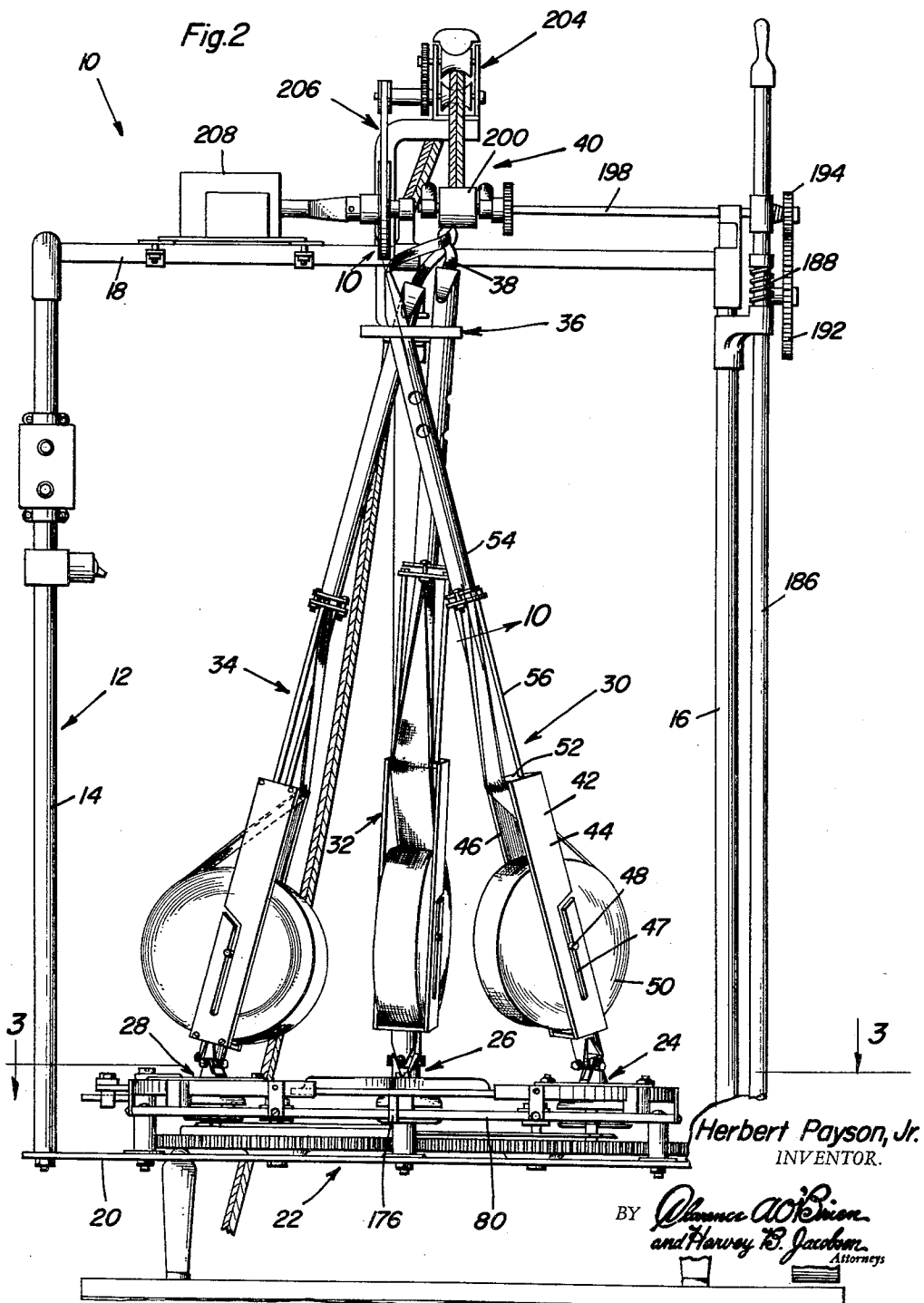
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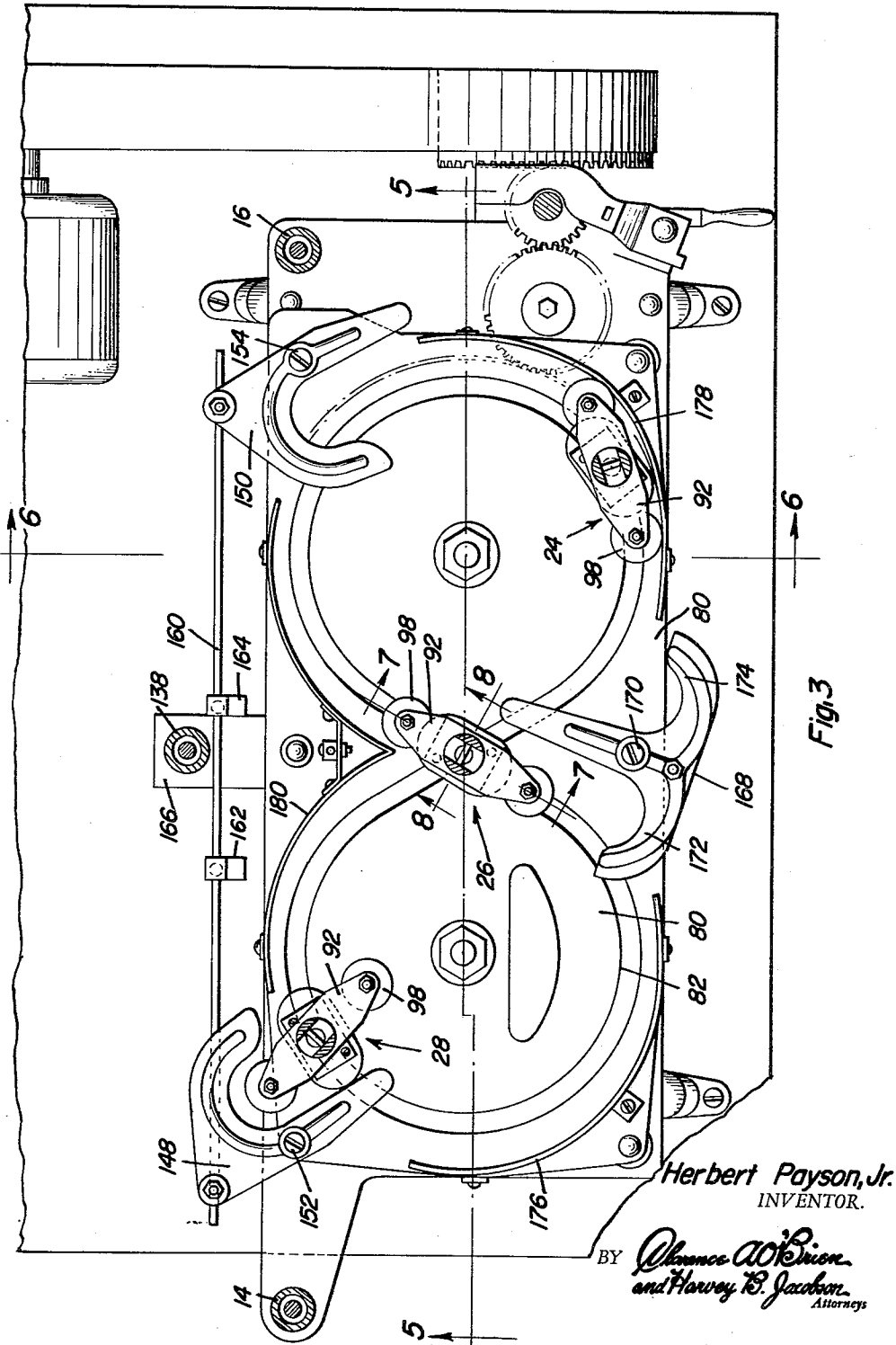
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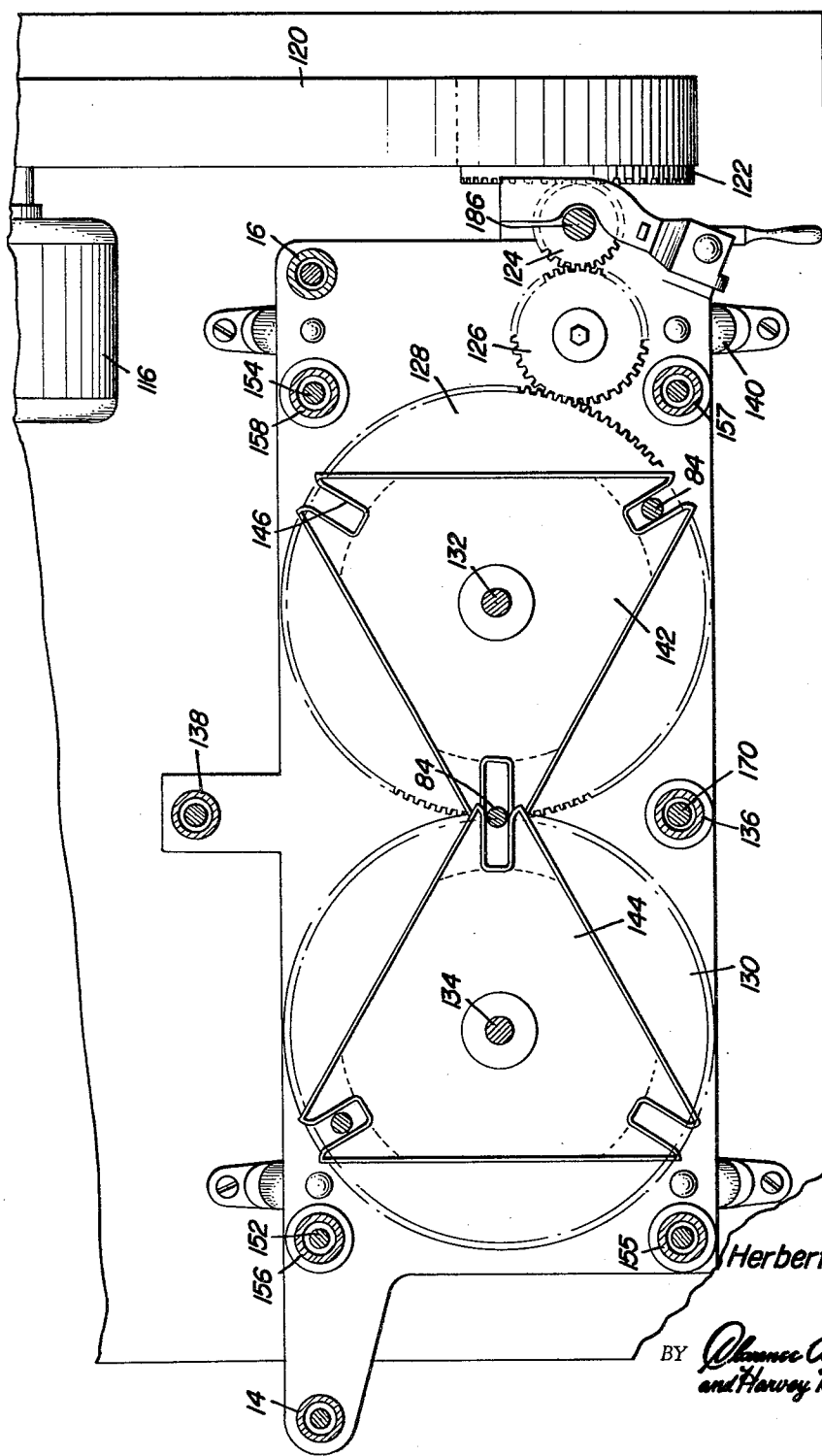


Fig. 4

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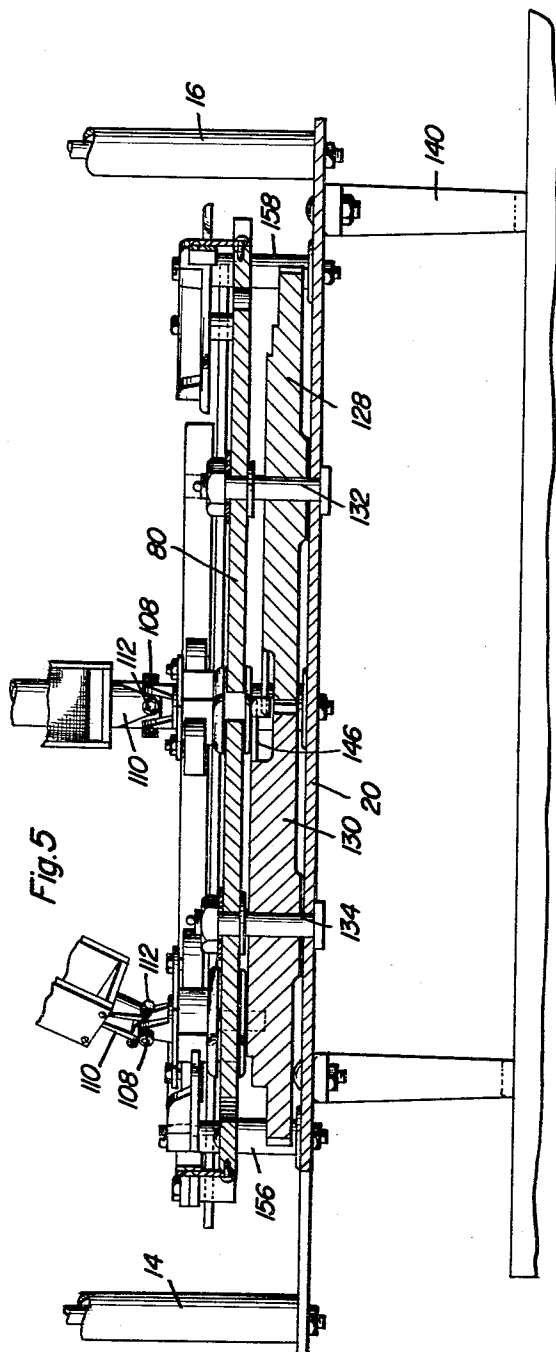
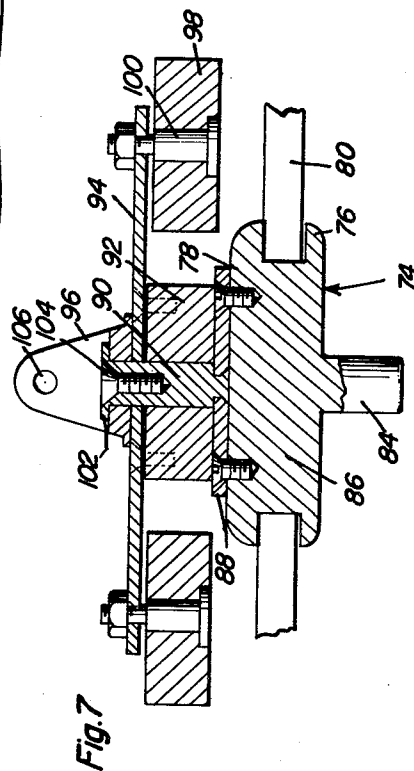
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8 Sheets-Sheet 5



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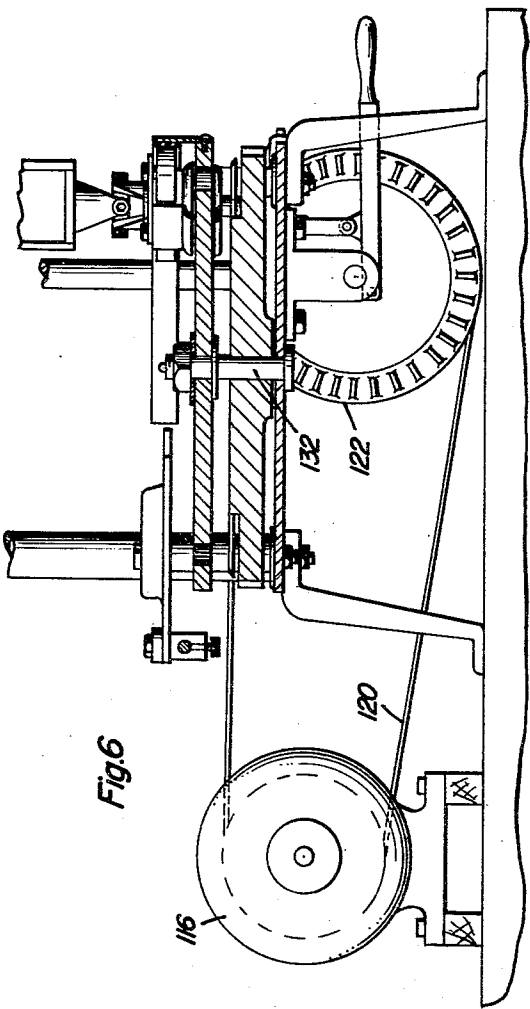
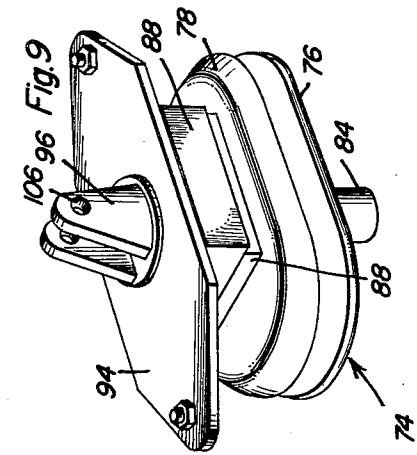
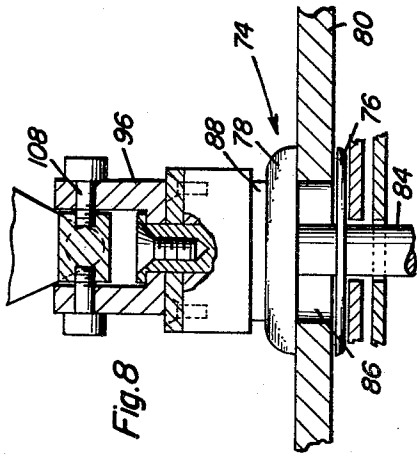
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8 Sheets-Sheet 6



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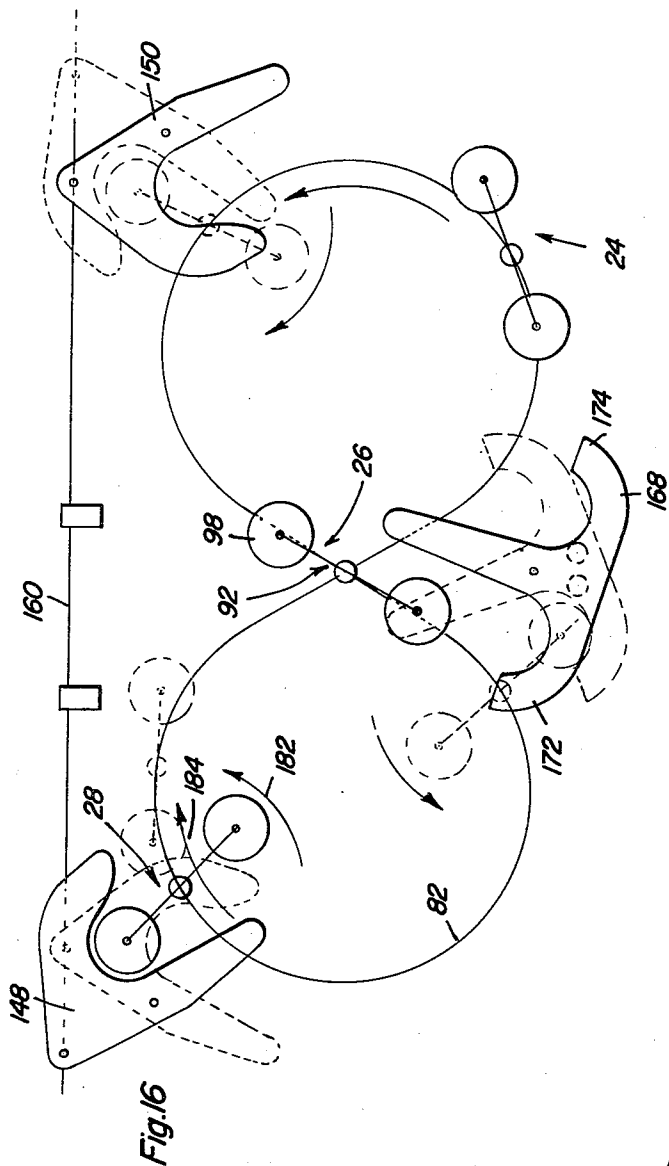
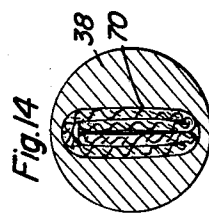
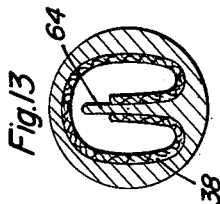
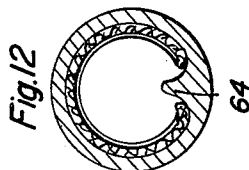
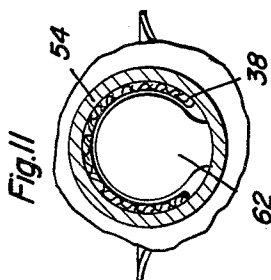
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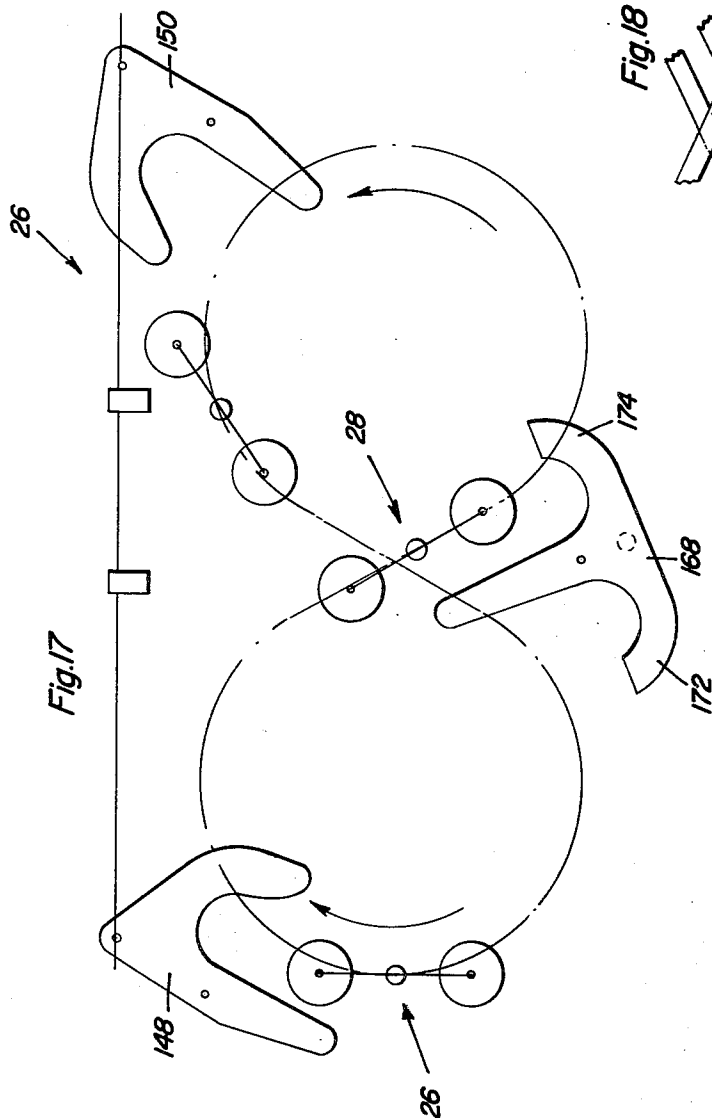
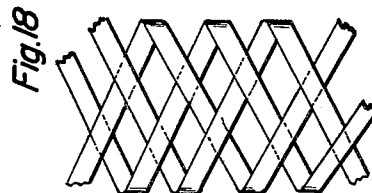
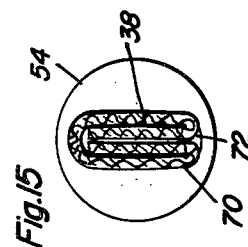
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BRAIDING MACHINE

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8 Sheets-Sheet 8



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3,053,133

BRAIDING MACHINE

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Filed Jan. 10, 1961, Ser. No. 81,723

20 Claims. (Cl. 87—33)

This invention relates to braiding apparatus and in particular to a machine for producing a uniform braid by folding and braiding fabric for use in rug making or the like.

The present invention is concerned with the system of braiding material from a plurality of rolls of strip fabric which has heretofore been manually folded and braided. Previous machines have been devised for mechanizing the folding and braiding aforementioned, but are unable to perform the braiding procedure so as to produce a uniform braid. The machine of the present invention furthermore is characterized by the folding of the fabric into strands and subsequent braiding thereof with the open side of the fold always on the same side so as to leave no visible edges after stitching of the braided strands and to reduce and simplify the stitching operation.

It is therefore a primary object of the present invention to provide a machine which will automatically fold and braid strands of material in a more efficient and uniform manner.

Another object of this invention is to provide a braiding machine which features a twist control mechanism whereby the folded strands may be braided in such a manner as to produce a more uniform braid and leave no exposed open edges of the folded strands. Items such as rugs may therefore be formed by the braid, both sides of which are identical rendering the rug reversible.

An additional object of this invention is to provide a braiding machine providing a more positive guiding action for the fabric strands as the fabric is withdrawn from the supply rolls for subsequent folding and braiding.

The braiding machine of this invention includes a base portion mounting a figure eight type track defining a continuous circuitous path for a plurality of carrier members. The carrier members are driven in the figure eight path by a Geneva movement so that each of the carriers will travel in the prescribed path in equally spaced relation to each other. Hingedly mounted on each of the carriers above the base portion are elongated members the bottom portion of which removably mounts a fabric roll. The elongated members include upper folding tube portions through which the fabric strands are withdrawn for folding from two to four times as the fabric passes there-through. The upper portions of the folding tubes are confined within a braiding guide ring so that the folded strands of fabric being withdrawn from the upper ends of the folding tubes will braid with respect to each other in response to relative movement between the carriers to which the folding tubes are hingedly connected. A powered pressure roller engages the strands just as they are braided for withdrawing and delivering the braided strands. Inasmuch as movement of the folding tubes by the carrier members would twist the fabric strands as they are being braided, mechanism is provided for reversing the twist so that a uniform and superior braid is produced. Furthermore, by reversing the twist, the open end of the folded strands will always be in the same direction with respect to the braid and hence may thereby avoid exposed open ends on the outer edges of the braid facilitating and reducing stitching. The twist control mechanism functions therefore, to periodically impart a half turn or 180° rotation to the folding tubes through the carriers to which they are connected.

These together with other objects and advantages which will become subsequently apparent reside in the details

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of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

5 FIGURE 1 is a side elevational view of the braiding machine made in accordance with this invention.

FIGURE 2 is a front elevational view of the braiding machine illustrated in FIGURE 1.

FIGURE 3 is a partial sectional view taken through a plane indicated by section line 3—3 in FIGURE 2.

FIGURE 4 is a partial sectional view taken through a plane indicated by section line 4—4 in FIGURE 1.

FIGURE 5 is a sectional view taken through a plane indicated by section line 5—5 in FIGURE 3.

FIGURE 6 is a sectional view taken through a plane indicated by section line 6—6 in FIGURE 3.

FIGURE 7 is a sectional view taken through a plane indicated by section line 7—7 in FIGURE 3.

FIGURE 8 is a sectional view taken through a plane indicated by section line 8—8 in FIGURE 3.

FIGURE 9 is a perspective view of a carrier member.

FIGURE 10 is a sectional view taken substantially through a plane indicated by section line 10—10 in FIGURE 2.

FIGURES 11, 12, 13, 14 and 15 are cross-sectional views taken through corresponding section lines in FIGURE 10 and illustrating the fabric folding procedure.

FIGURES 16 and 17 are schematic phase diagrams illustrating the action between the strand carrier members and the twist control mechanism.

FIGURE 18 is a diagrammatic view of the braid formation.

Referring now to the drawings in detail, the braiding machine generally referred to by reference numeral 10 is most completely illustrated in FIGURES 1 and 2. The frame for the machine generally indicated by reference numeral 12 may take any suitable form but as illustrated is made up of a plurality of vertical tubular pipe members including the main vertical support members 14 and 16 which are interconnected at the top by a pipe member 18 and at the bottom by a base plate 20 forming part of a base portion 22. A plurality of carrier assemblies 24, 26 and 28 are mounted in the base portion 22 and extend thereabove, said carrier assemblies being movable in a continuous circuitous path so as to carry the material supply and folding assemblies 30, 32 and 34 respectively in such a manner that the upper ends of the assemblies 30, 32 and 34 confined by the braiding guiding ring 36 will braid the folded strands 38 which issue from the top of the material supply and folding assemblies withdrawn by the braid delivery mechanism 40. As will be explained in greater detail, the braiding delivery mechanism 40 is drivingly connected to a power source which also drives the Geneva drive mechanism for the carrier assemblies which drive mechanism imparts the required movement to the carrier assemblies for braiding purposes.

As was previously indicated, the machine mounts the strip fabric in roll form and prior to braiding of the fabric folds the fabric into narrower braiding strands. The fabric supply and folding functions are provided for by each of the material supply and folding assemblies 30, 32 and 34, each of said assemblies being identical in construction. Referring therefore to FIGURES 2 and 10 through 15, it will be observed that each of the assemblies includes a lower portion 42 which comprises a pair of parallel members 44 and 46 which are interconnected at the top and bottom and also include a pair of slots 47 within which the mounting shaft 48 of a roll of flat fabric 50 is disposed. It will therefore be apparent that the roll 50 is removable from its support portion 42. The flat material is therefore withdrawn from the roll 50 upwardly against a forward guide edge on the top connecting mem-

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ber 52 of the lower portion 42, for reception within the folding guide tube 54. The tube 54 is mounted in spaced relation above the lower portion 42 of the assembly by means of a pair of support rods 56 which are connected to flange member 58 bolted to or otherwise secured to the lower portion of the folding tube 54 by a flange member 60. The lower end of the folding tube 54 as more clearly seen in FIGURE 11 is circular and has a circular guide element 62 attached so that the flat strand material 38 withdrawn from the supply roll 50 is initially formed into a circular cross-section. An internal folding guide rib member 64 is disposed spaced above the lower portion shown in FIGURE 11 and projects inwardly as seen in FIGURE 12 to begin folding the ends of the strand material 38 inwardly. Continuing upwardly the rib projects further inwardly to continue folding the material 38 as more clearly seen in FIGURE 13. The ends of the strand material 38 are therefore further pushed inwardly as the material is drawn upwardly through the folding tube 54. The inner cross-sectional shape of the folding guide tube also narrows as seen in FIGURE 13 progressing upwardly to thereby fold both sides of the material 38. The material is then drawn through a fold finishing portion section 70 of the folding tube 54 as seen in FIGURES 14 and 15 to finally produce a strand folded four times with one end 72 being open. Finger-receiving holes 66 are provided in the sides of the tubes 54, to enable manual adjustment of the material 38 should malfunctioning occur in the folding tubes because of material irregularities, for example.

As hereinbefore indicated, each of the material supply and folding assemblies are mounted on a carrier assembly. Referring therefore to FIGURES 1-3, 5 and 7-9, it will be observed that each of the carrier assemblies 24, 26 and 28 are identical in construction. Each carrier assembly includes a base portion 74 which includes a lower plate member 76 and an upper plate member 78 disposed respectively below and above a guide plate member 80 fixed to the base plate 20 of the base portion 22. As seen in FIGURE 3, the base plate member 80 has formed therein a figure eight track slot 82 by means of which movement of the carrier assemblies is guided. Connected to the plate members 76 and 78 is a shaft member 84 which also interconnects the upper and lower plate members 76 and 78. Also, interconnecting the upper and lower plate members are circular spacer elements 86 by means of which the base portion 74 of the carrier assembly is guided in tangential relationship to the curvature of the track slot 82. A plate member 88 is connected to the upper plate member 78 and also projects above the plate member 80. Swivelly mounted by the plate member 88 for rotation about a vertical axis through a stub shaft member 90 is a block member 92 which is connected by suitable fasteners to an elongated plate member 94. Also connected to the plate member 94 and disposed in axial alignment with the axis therethrough is a hinge bracket 96. The plate member 94 projects beyond the ends of the base portion 74 and has mounted in spaced relation thereabove a pair of guide rollers 98. Pivot bolt members 100 are therefore connected to the ends of the plate member 94 for mounting the guide rollers 98. Also, the stub shaft member 90 is fastened at its lower end to the plate member 88 for assembly onto the base portion 74 while the washer member 102 connected to the top of the stub shaft member 90 by the screw fastener 104 maintains the plate member 94 and pivot bracket 96 connected thereto in assembled relation on the base portion 74 of the carrier assembly. It will therefore be apparent that the plate member 94 and bracket 96 connected thereto may be positioned on the base portion 74 of the carrier assembly by means of the guide rollers 98. It will also be observed that the pivot bracket 96 is provided with aligned apertures 106 through which a pair of pivot bolts 108 hingedly connect a pivot bracket 110 connected to the bottom of each of the material supply and folding

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assemblies for pivotal movement thereof about a horizontal axis. The pivot bracket 110 connected to the assembly 30, 32 or 34 is also pivotally connected to the pivot bolt members 108 for pivotal movement about an axis perpendicular to the axis through the pivot bolts 108 by means of the pivot bolts 112 as more clearly seen in FIGURE 5. Accordingly, the material supply and folding assemblies are pivotally movable with respect to the carrier assembly on which they are mounted. As a result thereof movement of the carrier assemblies in the figure eight circuitous path as seen in FIGURE 3 will carry the upper ends of the folding tubes 54 in a corresponding path guided by the braiding guide ring 36 which is connected to the frame assembly 12 by means of the mounting plate member 114 as seen in FIGURE 2. The hinged connection about two perpendicular axes between the folding tube assemblies and the carrier assemblies permit the upper ends of the folding tubes to twist the strands withdrawn therefrom in order to form the braid.

It will be appreciated from the foregoing, that the carrier assemblies must be continuously moved in spaced relation to each other through the track slot 82 in order to perform the braiding function. Accordingly, a drive motor 116 as more clearly seen in FIGURES 4 and 6 is provided in order to impart drive to the carrier assemblies. A drive belt 120 connects the motor 116 with a face drive gear member 122 which is rotatably mounted at one side of the machine frame. The face gear is in mesh with a gear member 124 which in turn meshes with a gear 126 which in turn drives a Geneva drive gear 128. The gear member 128 meshes with an equal size gear 130. The gears 128 and 130 are rotatably mounted by a pair of spindle members 132 and 134 which interconnect the base plate member 20 and the track plate member 80. Additional spacer sleeves 155 and 157 space the base plate and the track plate members. The base plate 20 also has connected thereto projecting from the rear, a tubular frame member 138 providing support for the mounting plate 114 of the braiding ring 36 and for the braid delivery mechanism 40. It will also be observed that the base plate 20 is supported on a plurality of feet members 140 to support the base portion 22 in spaced relation above the floor and accommodate a journal mounting for the driving face gear 122 below the base plate 20 as more clearly seen in FIGURE 1.

Referring now to FIGURES 4 and 5 in particular it will be observed that integrally connected to each of the large gear members 128 and 130 are Geneva gear formations 142 and 144. The formations 142 and 144 have a plurality of slots 146 formed therein, three being shown in the exemplary illustration. The surfaces of the formations 142 and 144 are beveled for more efficiently engaging the shaft formation 84 depending below the base portion 74 (FIG. 7) of each of the carrier assemblies whereby the carrier assemblies are moved along the figure eight track formation 82. Accordingly, the slots 146 are so arranged on the gear members 128 and 130 that they overlap as shown in FIGURE 4 to cause a downwardly depending shaft portion 84 to be engaged and carried from one Geneva gear formation to another in order to move along the figure eight track in a manner well known to those skilled in the art.

As previously indicated, each of the carriers when traversing the figure eight path would ordinarily cause the strand material 38 to be twisted when braiding. Accordingly, twist control mechanism is provided for reversing the normal tendency for the material to be twisted while being braided. As a result thereof, a more uniform braid is produced and the open end of the strand fold is disposed on the inside of the braid for more easier stitching. The twist control mechanism (FIGURE 3) includes a pair of outside corner hook levers 148 and 150 which are pivotally mounted by bolt members 152 and 154 respectively between the base plate 20 and the track plate 80 of the base portion 22. Spacer sleeve

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members 156 and 158 are accordingly provided about the bolt members 152 and 154 as more clearly seen in FIGURE 5 to appropriately mount the corner hook levers 148 and 150 as more clearly seen in FIGURE 3. The hook lever members 148 and 150 are also interconnected by a rod member 160 which causes the members 148 and 150 to be pivotally displaced simultaneously and in the same direction. Also, a pair of stop members 162 and 164 are adjustably fixed to the rod member 160 and coact with a rear projection 166 which also supports the vertical post member 138 in order to limit pivotal movement of the corner hook levers 148 and 150. A center hook lever member 168 is pivotally mounted on the base portion by a bolt member 170 which extends through the spacer sleeve 136 in the front of the base portion. The hook lever member 168 has a pair of hook arms 172 and 174 and its pivotal movement is limited by means of a stop member 176 which depends therebelow and abuts against the front edge of the track plate member 80 for such purpose as more clearly seen in FIGURES 2 and 3.

It will therefore become apparent that the roller guide members 98 of each of the carrier assemblies when engaging the hook members 148, 150 and 168 will cause the plate member 94 to which the folding tube assemblies are hingedly connected to rotate for repositioning thereof in order to untwist the strands drawn from the upper end of the folding tube. In order to control the position of the plate members 94 of the carrier assemblies, front side cam strips 176 and 178 are mounted on the track plate member 80 whereby the roller members 98 at each end of a carrier plate member 94 may be engaged thereby to position the rolls 50 at the bottom of the folding tube assemblies on the carrier members. Also a rear central cam member 180 is fixedly mounted on top of the track plate member 80 for controlling the position of the carrier assemblies between the crossover of the figure eight track 82 and the flipping lever members 148 and 150. It will therefore be apparent that the track cam members 176, 178 and 180 will guide the carrier plate members and position them for transitional movement between flip levers on the track formation 82 while the flip levers 148 and 150 will alternately cause 180° displacement of a carrier plate member 94 when engaged by the guide roller 98 thereof. The flipping lever 168 on the other hand will alternately flip a carrier plate member 92 as it crosses over the crossover point of the figure eight track slot 82.

In order to explain more fully the foregoing switch control action of the flip levers and its affect on the material supply and folding assemblies, attention is invited to FIGURES 16 and 17 in particular. In FIGURE 16, it will be observed that the carrier assembly 28 has just been flipped over in a counter-clockwise direction as indicated by arrow 182 while the assembly 28 is being moved along the figure eight track 82 in a clockwise direction as indicated by arrow 184. The position of of the flip lever 148 is shown in dotted line just prior to the pivotal displacement of the assembly 28 thereby. The other assemblies 24 and 26 are illustrated in FIGURE 16 in their position at the same time that assembly 28 is being rotated 180°. It will be observed therefore, that assembly 24 is moving in a counter-clockwise direction toward the trip lever 150 which has been positioned in readiness therefor as indicated by solid line by virtue of its connection through rod 160 to the flip lever 148. The assembly 26 on the other hand is at the crossover point of the figure eight track 82 and is moving in a direction to shortly engage the arm 172 of the flip lever 168 as shown in solid line. After engagement with the arm 172, the lever member 168 will be in a position illustrated by dotted line in readiness for the assembly 28 when it crosses over the crossover point of the figure eight track. Attention is accordingly invited toward FIGURE 17 showing the aforementioned

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subsequent positioning of the assemblies 28, 24 and 26. It will therefore be appreciated that the carrier assemblies as they carry the upper ends of the folding tubes 54 within the braiding guide ring 36, the half turn rotation imparted to the folding tubes 54 by the flip levers will serve two functions, to avoid interference between the upper ends of the folding tubes as they pass each other and to cause reversal of the open side of the folded braiding strand as the strand is brought back across to form the braid. The braid formed by the three assemblies moving in the figure eight path is more clearly seen in FIGURE 18.

Referring now to FIGURES 1 and 2, it will be observed that the braiding delivery mechanism 40 is provided for the purpose of withdrawing the strands 38 from the upper ends of the folding tubes 54 as they are being braided and must accordingly be drivingly interrelated to the movement of the carrier assemblies in order to withdraw the braid with the proper tension. It will therefore be observed that the intermediate gear member 124 which meshes with the driving face gear 122 has a drive shaft 186 connected thereto. The drive shaft extends upwardly and has a worm 188 fixed thereto for mesh with a worm wheel 190 as more clearly seen in FIGURE 1. Connected to the worm wheel 190 is a gear 192 which meshes with a gear 194 disposed thereabove rotatably mounted by the arm 196. The gear 194 is connected to a drive shaft 198 which in turn is drivingly connected to a pressure roller mechanism 200 through which the braided strands 38 are fed upwardly. The braid 202 is received between the rollers of a second roller guide mechanism 204 which is also driven by means of a belt take-off drive 206 drivingly connected to the drive shaft 198 and projecting from the other side of the mechanism 40. The drive shaft 198 is also connected to a counter mechanism 208.

From the foregoing description, operation and utility of the braiding machine of this invention will be apparent. Summarizing however the essential operations thereof, it will be recalled that the base portion 22 of the machine mounts a figure eight drive mechanism by means of which the carrier assemblies 24, 26 and 28 are driven in spaced relation to each other along a continuous figure eight track. Material supply and folding assemblies including the folding tubes 54 drawing flat strips of fabric from the rolls 50 mounted therebelow fold the material into narrow strands issuing from the top ends thereof. The upper ends of the folding tubes guided by the ring 36 accordingly braid the strands in response to movement of the carrier assemblies on which they are mounted in the figure eight track. In order to prevent twisting of the strands so that the open sides thereof will be facing in the same inward direction with respect to the braid being formed, twist control mechanism is provided on the base portion 22 which involves the flip levers 148, 150 and 168 which periodically cause the folding tubes 54 as they carry strands around within the ring 36 to be rotated 180° when the carrier assemblies traverse rear corners of the figure eight track and also when the carrier assemblies cross over the figure eight track at the crossover point. The mechanism 40 receives the braided strand and engages it for feeding thereof at the proper related speed so as to apply the proper tension for withdrawing the strands from the folding tubes 54 as they are being braided.

From the foregoing, the construction and operation of the device will be readily understood and further explanation is believed to be unnecessary. However, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

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What is claimed as new is as follows:

1. In a braiding machine, the combination of base means, carrier means guidingly mounted by the base means for continuous movement in a circuitous path, material supply means mounted on the carrier means, strand folding means connected to and operatively driven by the supply means for receiving material from the supply means and issuing a flat folded strand therefrom, braiding guide means engaging the strand folding means, drive means operatively connected to said carrier means for causing movement thereof in said circuitous path, and twist control means operatively connected to the base means and said carrier means and operative to reverse twist the strand issuing from the folding means to produce a flat uniform braid.

2. In a braiding machine, the combination of base means, a plurality of carrier means guidingly mounted by the base means for continuous movement in a circuitous path, material supply means mounted on each carrier means, strand folding means directly mounted on and carried by each supply means for receiving material therefrom and issuing flat folded strands, braiding guide means engageable with the folding means for confining movement of the folding means to effect braiding of the strands, drive means operatively connected to said carrier means for causing crisscrossing movement thereof in spaced relation to each other, twist control means operatively mounted on the base means and engageable with the carrier means to vary the positions of said folding means on the carrier means in response to movement of the carrier means, and braid delivery means drivingly connected to the drive means for withdrawing the braiding strands from the folding means.

3. The combination of claim 1, wherein said carrier means includes plate means rotatably mounted by the drive means about a vertical axis movable in a track formed in the base means defining said circuitous path.

4. The combination of claim 3, wherein said material supply means and folding means are directly connected to each other and are both hingedly connected to said carrier means by universal joint means.

5. In a braiding machine, the combination of base means, carrier means guidingly mounted by the base means for continuous movement in a circuitous path, material supply means mounted on the carrier means, strand folding means operatively mounted on the supply means for receiving material from the supply means and issuing a flat folded strand therefrom, braiding guide means engageable with the strand folding means, drive means operatively connected to said carrier means for movement thereof in said circuitous path, twist control means operatively connected to the base means and said carrier means and operative to reverse twist the strand issuing from the folding means to produce a flat uniform braid, said carrier means including plate means rotatably mounted by the drive means about a vertical axis movable in a track formed in the base means defining said circuitous path, said material supply means and folding means being hingedly connected to said carrier means about two axes perpendicular to each other, said twist control means including flip means movably mounted on the base means in the path of said circuitous path of movement to periodically rotate said carrier means 180°, and cam means mounted on the base means and engageable with the plate means for determining the position of the plate means between engagement by the flip means.

6. The combination of claim 5, wherein said material supply means comprises, material roll supporting means removably mounting rolls of strand material.

7. The combination of claim 6, wherein said strand folding means comprises elongated tube means mounted above the roll supporting means, and axially aligned therewith, fold forming means disposed within said tube means, and fold finishing means formed at an upper end of the tube means from which the folded strand is withdrawn.

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8. The combination of claim 7, wherein said flip means comprise a plurality of interconnected hook levers simultaneously displaced in the same direction and a path crossing lever member, and stop means for adjustably limiting displacement of the levers and lever member.

9. The combination of claim 1, wherein said twist control means includes flip means movably mounted on the base means in the path of said circuitous path of movement to periodically contact and rotate each of said carrier means 180°, and cam guide means mounted on the base means and engageable with the plate means for determining the position of the plate means between engagement by the flip means.

10. In a braiding machine, the combination of base means, carrier means guidingly mounted by the base means for continuous movement in a circuitous path, material supply means mounted on the carrier means, strand folding means operatively mounted on the supply means for receiving material from the supply means and issuing a flat folded strand therefrom, braiding guide means engageable with the strand folding means, drive means operatively connected to said carrier means for movement thereof in said circuitous path, twist control means operatively connected to the base means and said carrier means and operative to reverse twist the strand issuing from the folding means to produce a flat uniform braid, said twist control means including flip means movably mounted on the base means in the path of said circuitous path of movement to periodically rotate one of said carrier means 180°, and cam means mounted on the base means and engageable with the plate means for determining the position of the plate means between engagement by the flip means, said flip means comprising a plurality of interconnected hook levers simultaneously displaced in the same direction and a path crossing lever member, and stop means for adjustably limiting displacement of the levers and lever member.

11. The combination of claim 1, wherein said strand folding means comprises elongated tube means mounted on the material supply means, fold forming means disposed within said tube means and fold finishing means formed at an upper end of the tube means from which the folded strand is withdrawn.

12. The combination of claim 2, wherein said carrier means includes plate means rotatably mounted by the drive means about a vertical axis movable in a track formed in the base means defining said circuitous path.

13. The combination of claim 12, wherein said twist control means includes flip means movably mounted on the base means in the path of said circuitous path of movement to periodically rotate said carrier means 180°, and cam means mounted on the base means and engageable with the plate means for determining the position of the plate means between engagement by the flip means.

14. The combination of claim 13, wherein said flip means comprise a plurality of interconnected hook levers simultaneously displaced in the same direction and a path crossing lever member, and stop means for adjustably limiting displacement of the levers and lever member.

15. In a braiding machine, the combination of a stationary support including guide means, a plurality of carrier members on said support and connected to said guide means so as to move on said support in a circuitous crisscrossing path, braiding material supply means, braiding material folding means, both said supply means and folding means being mounted on the same carrier members, means adjacent said folding means for extracting and guiding material from said supply means and folding means, and driving means connected to said carrier members so as to move them along said path.

16. The combination of claim 15 wherein said path is of figure 8 shape, anti-twist means mounted on said support adjacent said path, said anti-twist means rotating each of said carrier members two complete revolutions during each movement over said path.

17. The combination of claim 16 wherein said anti-twist means include hook shaped levers pivoted to said support adjacent said path and a guide rail means parallel to said path between said levers.

18. The combination of claim 15 wherein said support includes a flat plate having a groove therein, said groove defining said path, each of said carrier members including a circular portion guided in said groove.

19. The combination of claim 18 wherein said driving means includes two members rotatable on spaced parallel axes, the edges of said members overlapping and having recesses therein adapted to alternately receive a driving lug on each of said members.

20. The combination of claim 15 wherein said folding means includes a tube connected at one end by a universal joint to each of said carrier members, the other end of each tube extending through a ring connected to said support.

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