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M. GOLDBERG

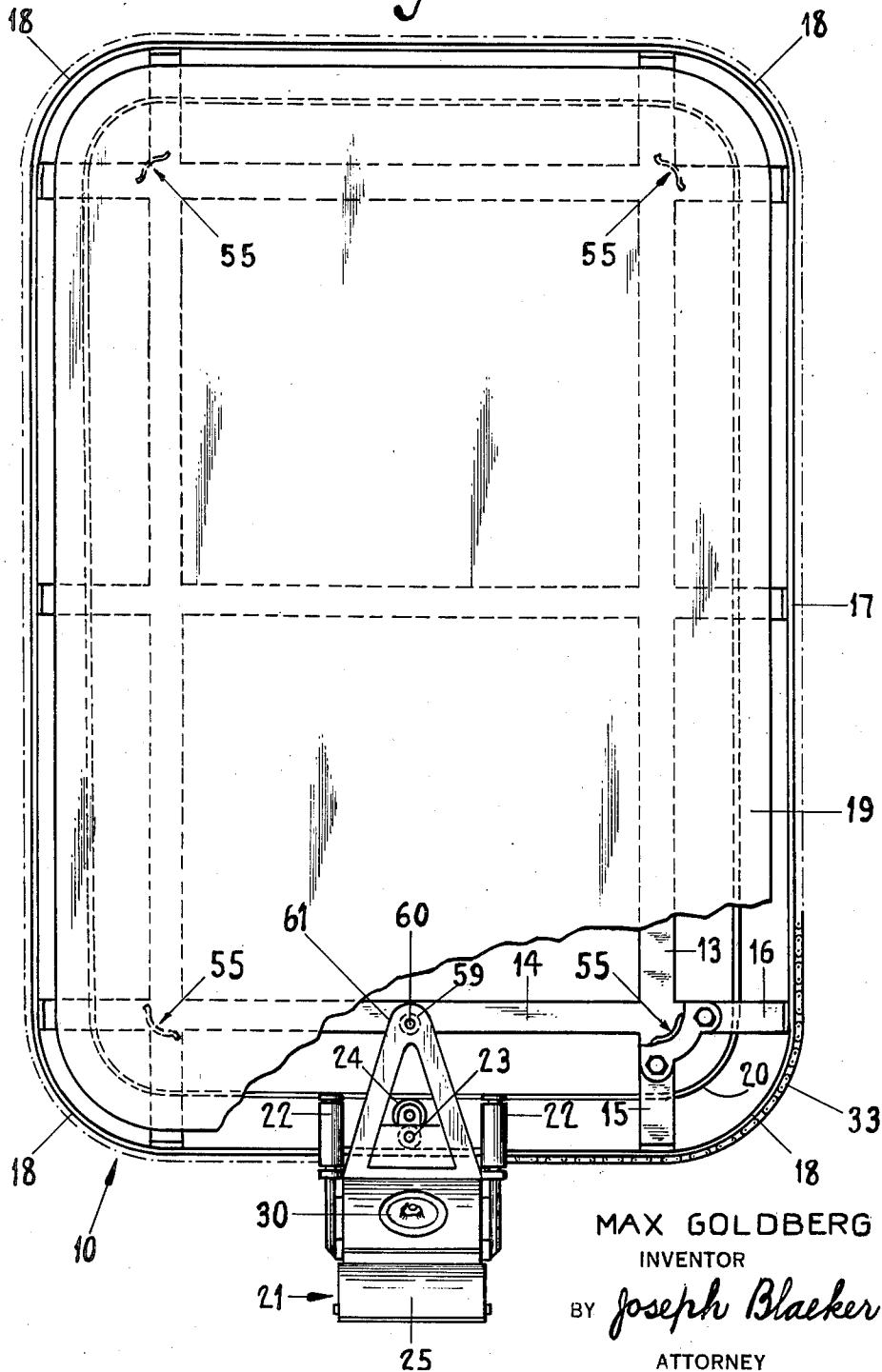
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APPARATUS FOR SEWING MATTRESSES

Filed Nov. 17, 1937

5 Sheets-Sheet 1

Fig. 1



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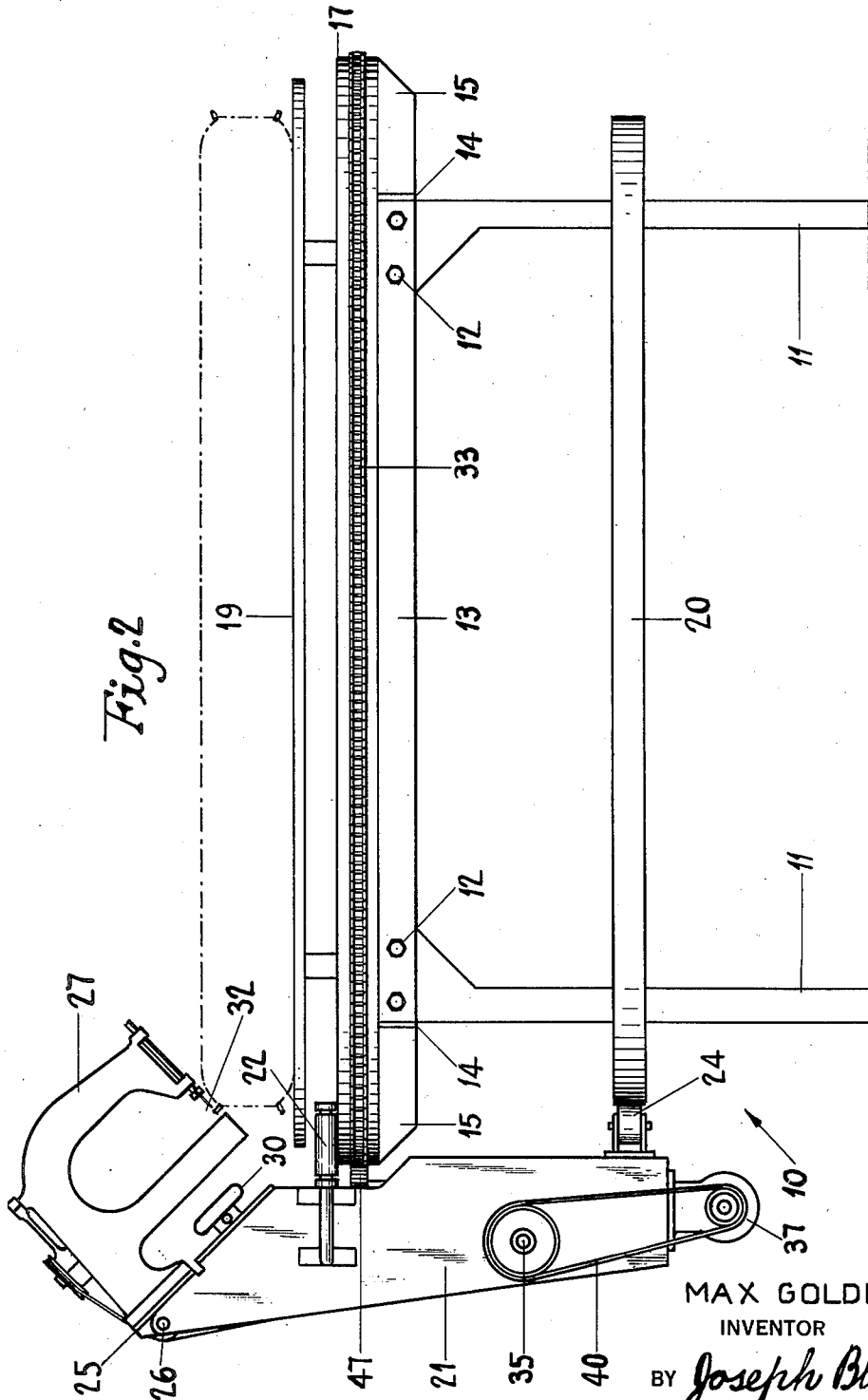
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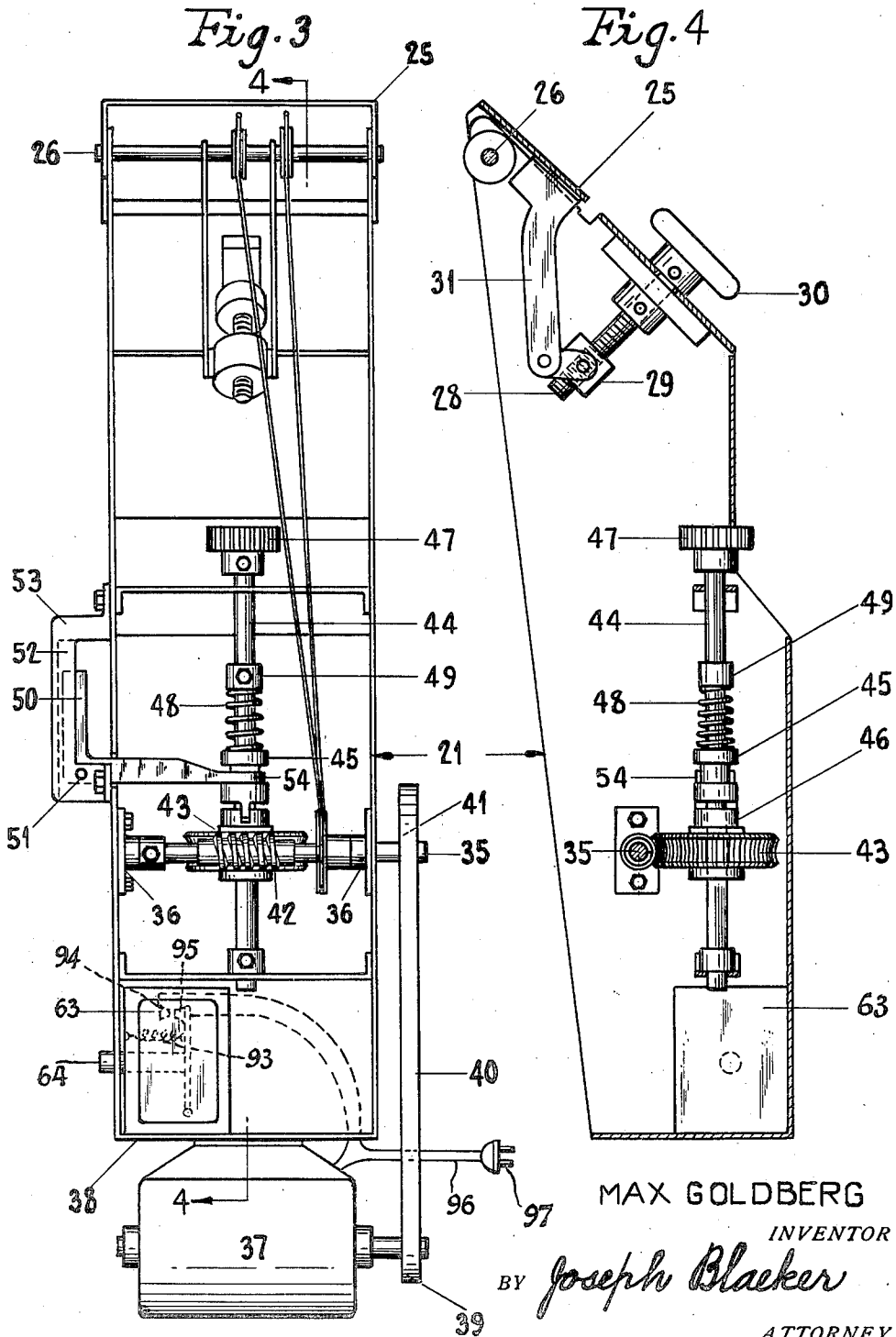
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APPARATUS FOR SEWING MATTRESSES

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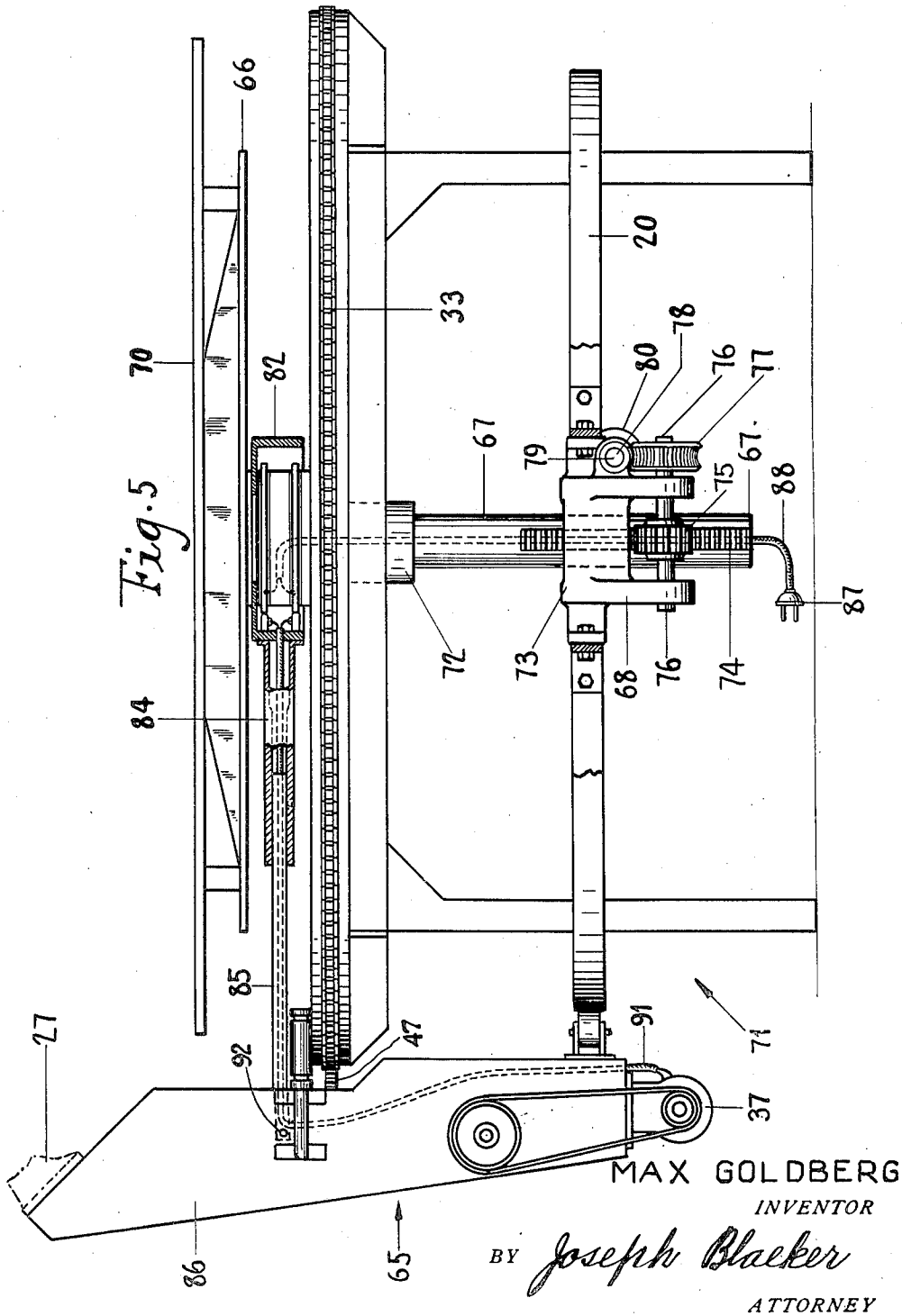
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Fig 6

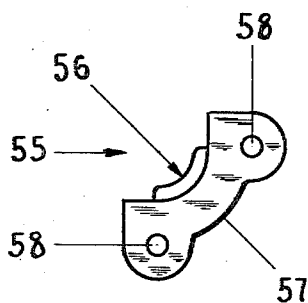
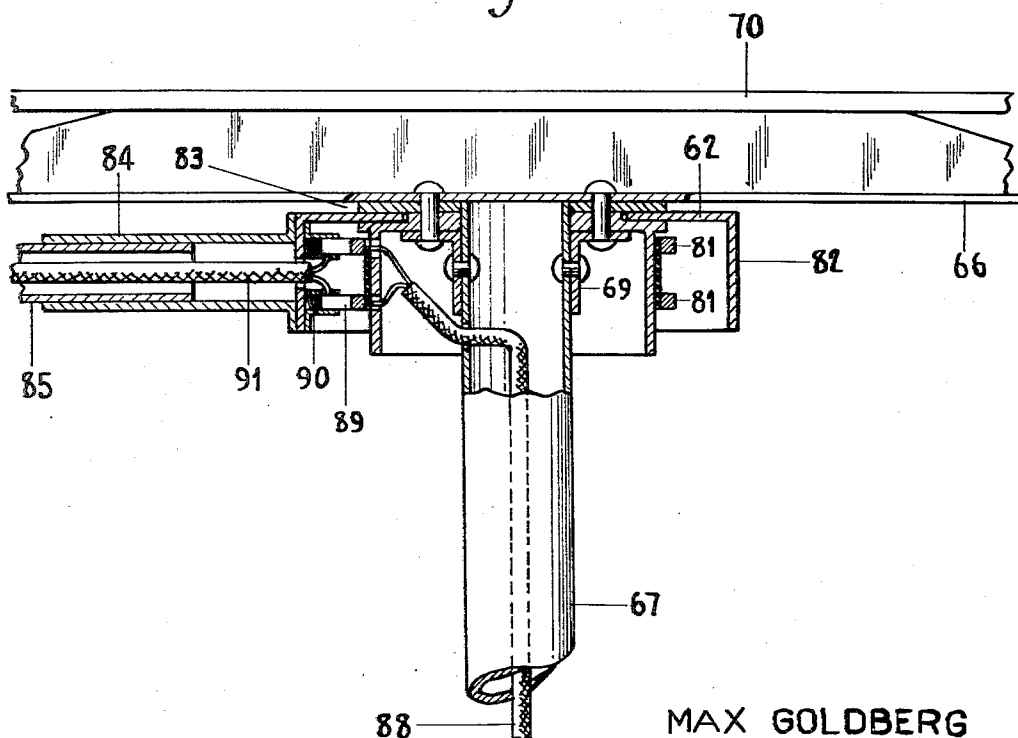


Fig. 7



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UNITED STATES PATENT OFFICE

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APPARATUS FOR SEWING MATTRESSES

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7 Claims. (Cl. 112—3)

This invention relates to mechanism for sewing mattresses, and more particularly to mechanism for stitching the edge portions of the top and bottom covering sheets of ticking material to the border strip of ticking material.

The main object of this invention is to provide mechanism comprising mattress supporting means of the class described whereby a sewing machine may be mounted so that it may be continuously propelled around the outside of the mattress supporting means and actuated to stitch the ticking sections together.

Another object of this invention is to provide the mattress supporting means with a rectangular track having arcuate corners and having fixed pivotal members at the centers of said arcs for retaining the working center of said sewing machine in concentric relation with the working centers of the said corners.

Another object of this invention is to mount the mattress supporting means or table on a circular base and to mount an insulated cylindrical member of a material adapted to conduct an electric current around said base to form an electrically charged track, and to provide means for transmitting current from said track to an electric motor serving to propel the sewing machine around the table and for operating the sewing machine.

Another object of this invention resides also in the simplified structural features of the invention resulting in economy of production.

With the above and other objects in view, the invention will be hereinafter more particularly described, and the combination and arrangement of parts will be shown in the accompanying drawings and pointed out in the claims which form part of this specification.

Reference will now be had to the drawings, wherein like numerals of reference designate corresponding parts throughout the several views, in which:

Figure 1 is a plan view of the machine with the mattress supporting table partly broken away to show a fixed pivotal member for retaining the working center of a sewing machine in concentric relation with the working center of the arcuate corner of the table.

Figure 2 is a side elevation of the machine.

Figure 3 is a front elevation, on an enlarged scale, of a carriage upon which a sewing machine is mounted for propelling the sewing machine around the outside of the table.

Figure 4 is a cross-sectional view of the car-

riage, the section being taken as on line 4—4 in Figure 3.

Figure 5 is a cross-sectional view of the table mounted on a circular base around which is an electrically charged circular track.

Figure 6 is an enlarged plan view of a pivotal member.

Figure 7 is an enlarged fragmentary central cross-sectional view of the upper portion of the apparatus shown in Figure 5.

Figure 8 is a wiring diagram showing means for slowing down the carriage motor at the arcuate corners of the mattress supporting means.

In the illustrated embodiment of the invention, the numeral 10 indicates a substantially rectangular supporting frame having supporting legs 11 at each corner. Secured to the upper portions of the legs 11, such as by bolts 12, are cross-members 13 and 14 which are positioned in perpendicular horizontal frame making relation. Cantilever extensions 15 and 16 from the frame 10 support an endless track rail 17. The rail 17 circumscribes the frame 10 and has arcuate corners 18.

A table 19 has been mounted on top of the frame 10. The table 19 is preferably shaped to correspond with the shape of a mattress, which is rectangular, and is preferably provided with rounded corners.

Secured to the legs 11 at an elevation below the track rail 17 is a track rail 20 which is similar to the rail 17 but of smaller dimensions. As shown in Figure 2, the lower rail or track 20 has been made of smaller dimensions than the track 17 to maintain the carriage 21, which is overbalanced in weight on the rollers 22, in a substantially vertical operable position. In this position, the sewing machine is properly set to operate at the proper angle on the edge of a mattress.

A carriage 21 of channel-shaped cross-section has been mounted in an upright position in slidable relation around the table 19 by means of upper rollers 22 resting on the upper surface of the track 17, a roller 23 rotatably mounted against the upright inner surface of the track 17 and a lower roller 24 rotatably mounted against the upright outer surface of the lower rail 20.

The carriage 21 is provided with an upwardly inclined shelf 25 hinged on a pivot 26. A sewing machine head 27 is secured to the shelf 25 as shown in Figure 2. The sewing machine head is preferably disposed at an angle of 45 degrees to the vertical and horizontal, which angle facilitates the stitching together of a pair of sheets of material, one of which is disposed in a vertical

plane and the other of which is disposed in a horizontal plane. A threaded member 28 secured at its upper elevation to the upper surface of the housing 21 has a nut 29 in threaded engagement at its lower end and a hand wheel 30 at its upper end. By means of a lever arrangement 31 in engagement with the adjustable shelf 25, it is possible, by rotating the hand wheel 30 to raise and lower the shelf 25 and the attached sewing machine head 27.

The lowering and raising mechanism, as shown, for the sewing machine head may be taken as representing any suitable mechanism for performing the same function, that is, for varying the distance between the mattress supporting plane or table 19 and the stitching plane as defined by the needle 32 of the sewing machine head 27.

It is to be noted that the roller 23 is in contacting relation with the upper track 17 and the axis of the roller 23 lies in a plane perpendicular to the upper track and passing through the line of the direction of reciprocation of the needle 32. This arrangement causes the needle to follow a path concentric with the arcuate mattress corners.

An endless rack 33 preferably made of a sprocket chain is secured to the outer surface of the track rail 17 in any suitable manner. The rack 33 extends all around the rail 17.

The means for driving the carriage 21 and sewing machine 27 around the frame 10 and table 19 includes a main driving shaft 35 which is rotatably mounted in bearings 36 provided in the housing. A power unit, preferably an electric motor 37 is secured to the lower face 38 of the housing and has a pulley 39 thereon connected by a belt 40 to a pulley 41 secured to the main driving shaft for driving said shaft.

A worm 42 is secured to the shaft 35 intermediate the bearings 36 and meshes with a worm gear 43 which is rotatably mounted on an upright shaft 44. The shaft 44 is provided with a coupling member 45 which is keyed to the shaft against rotation but so as to permit axial movement thereof. A second coupling member 46 is secured to the worm gear 43 and rotatably mounted on the shaft 44 in cooperative relation with the slidable coupling member 45 and a pinion gear 47 is secured to the upper end of the shaft 44.

The sprocket pinion gear 47 meshes with the rack 33. The pinion remains in mesh with the rack throughout the travel of the carriage 21 around the frame. When the motor 37 is energized, the shaft 35 is rotated, and the pinion being normally operatively connected to the shaft through the agency of the coupling members causes the housing and sewing machine to be propelled around the frame 10 and table 19. A spring 48 interposed between the coupling member 45 and a collar 49 fixed to the shaft 44 serves to normally hold the coupling member in operative engagement.

The coupling member 45 may be disengaged from the coupling member 46 by means of a lever 50 pivoted at 51 and is held in an upright position in a slot 52 formed in a handle 53 which is integral with the housing 21. The lever 50 has a forked end 54 which embraces a portion of the coupling member 45.

It will be seen that by swinging the upper end of the lever 50, the forked end will be swung upwardly so as to move the coupling member 45 upwardly and out of engagement with the coupling member 46 against action of the spring 48.

When the coupling members are disengaged, as above described, the carriage 21 and the sewing machine 27 may be manually moved along the periphery of the table 19 independently of the driving mechanism.

A normally closed switch 63 is mounted at the lower portion of the carriage 21 and has a push button 64 for operating the switch. The switch serves to transmit current to the motor 37 at all times except when the operator pushes the normally closed push button 64 to cut off the current.

The push button 64 is normally urged outwardly by a spring 93. The push button 64 carries an electrical contact 94 contacting an electrical contact 95. Electric wiring 96 terminating in an electric plug 97 is arranged to form an electric circuit between the switch 63 and the motor 37. When the operator forces the push button 64 inwardly, electric current through the contacts 94, 95, to the electric motor 37 is interrupted.

As shown in Figure 1, I have provided a pivotal member 55 best shown in Figure 6, at the center of each arcuate corner 18. Each pivoted member 55 has an upright wall 56 of arcuate form defined by a quadrant of a circle with its center in superposed relation over the center of one of the arcuate corners 18. Each pivotal member 55 is formed with an integral horizontal flange 57 having holes 58 used for bolting or riveting the members rigidly to the top of the frame 10.

The circular cross-section of the walls 56 is made to correspond to the outer circumference of a roller 59 rotatably mounted on a vertical axis 60 at the free end of a frame 61 extending horizontally from the carriage 21. The axis 60 is positioned so as to come successively into alignment with the centers of the upright walls 56 of the four pivotal members 55. This alignment permits rolling contact between the roller 59 and the walls 56. The pivotal members 55 come into play when the carriage 21 and the roller 59 reach the end of travel of the straight portions of the circumscribing tracks.

The apparatus 10 thus comprises a rigidly fixed pivotal member at each of the four corners of the circumscribing track 33, whereby the sewing machine propelled around the table is constrained to move in a working orbit in exact concentric relation with said arcuate corners.

As shown in Figure 5, I have provided a modified apparatus 65 for sewing mattresses, comprising a vertically movable steel supporting table 66 having a hollow upright column 67 secured centrally thereof below its lower surface. The steel plate 66 is secured by means of a flange 69, shown in enlarged view in Figure 7, to the column 67. A wooden table-top 70 is placed on the supporting table 66. A frame 71 similar to the frame 10 is provided with bearings 72, 73 secured in vertical alignment centrally of said frame. The bearings are adapted to receive the column in slidable relation. The column may be raised and lowered together with the supporting table 66 and the table-top 70 by any suitable means which may comprise a rack 74 positioned longitudinally on the outer surface of the column. A gear 75 rotatably mounted in extensions 68 of the lower bearing and in engagement with the rack 74 actuates the table up and down. The shaft 76 to which the gear 75 is secured has a worm gear 77 fixed thereon and a worm 78 in intermeshing relation with the worm gear 77 actuates said raising and lowering mechanism. The worm shaft 79 may extend to opposite sides of the frame 71 and may have hand wheels 80 at each end by

means of which the said mechanism may be actuated with ease. As shown in Figure 5, the worm and the worm gear provide a large reduction in their relative motions. This reduction makes it possible to provide a fine vertical adjustment as well as a powerful irreversible mechanism when the table is loaded.

Electric current is supplied to the motor 37 in all positions which the motor assumes with respect to the frame 71 by means comprising two insulated collector rings 81, 81, mounted in concentric relation with the tubular column 67 between the supporting table 66 and the frame 71. An annular member 82 preferably having an apertured disk 82, has been rotatably mounted at the upper portion of the column 67 above the collector rings 81, 81, and seats in an annular groove 83 in the outer periphery of the column. The annular member 82 extends downwardly below the collector rings a distance sufficient to cover and totally enclose said rings. The member 82 forms a protecting housing which circumscribes the collector rings. A flanged tubular member 84 is secured to the annular member 82 and receives a tube 85 in slidable telescoping relation. The tube 85 extends into the carriage 86. The tube 85 may be secured to the carriage 86 in any suitable manner such as by a pin 92.

An electric plug 87 is secured to an electric cord 88 which passes up through the column 67 and is connected to the collector rings and supplies electric current to the collector rings. Electric brushes 89, 89 pressed into contact with the collector rings by springs 90 are connected to an electric cord 91 which passes through the tubular members 84, 85 downward in the housing 86 and connects with the motor 37.

It will thus be seen that when the carriage 86 and motor 37 move around the frame 71, that the telescoping tubes 84, 85, will cause rotation of the annular housing 82 around the collector rings and that electric current will at all times pass through the collector rings and through the brushes to the electric motor 37. It is obvious that the tube 85 will be connected to the carriage 86 in any suitable manner (not shown).

The apparatus 65 thus described is self-contained and portable and it is a very simple matter for the entire apparatus to be moved to different parts of the mattress making plant and quickly set it up for operation by merely making electrical connection with the plug 87.

While I have shown the sewing machine as propelled around the track at constant speed, I may provide means for operating the motor at high speed on straight portions of the track, and at low speed on curved portions of the track, such as by changing the voltage across the motor terminals.

In accordance with the patent statutes I have described and illustrated two preferred embodiments of my invention, but it will be understood that various changes and modifications can be made therein without departing from the scope of the invention as defined by the appended claims.

I claim:

1. In a mechanism of the class described, the combination with a supporting table for a mattress, a frame for said table having a substantially rectangular endless upright track at its upper elevation, an endless sprocket chain secured in circumscribing relation to said track, said track having arcuate corners, fixed pivotal members mounted respectively at the centers of

said arcs, said pivotal members being of arcuate form defined by a quadrant of a circle, a carriage comprising two elongated rollers having horizontal axes and being positioned in spaced relation and resting on said upper track, said carriage being supported by said rollers and being thereby freely movably mounted to travel around said track, a sewing machine secured to said carriage, sprocket means mounted on said housing and being in intermeshing engagement with said sprocket chain, means for actuating said sprocket means and propelling said sewing machine around said table for effecting stitching of a mattress on said table, and means on said carriage for successively engaging said pivotal members to cause said sewing machine to be automatically moved in concentric relation with said corners.

2. In a mechanism of the class described, the combination with a supporting table for a mattress, a frame for said table having an endless upright track at its upper elevation, an endless rack secured in circumscribing relation to said track, said track having arcuate corners, fixed pivotal members secured to said frame at the centers of said arcs, said pivotal members being of arcuate form defined by a quadrant of a circle, an endless upright track secured to said frame at a lower elevation and being in circumscribing relation with said frame, a carriage comprising two elongated rollers having horizontal axes and being positioned in spaced relation and resting on said upper track, said carriage being supported by said rollers and being thereby freely movably mounted to travel around said tracks, a sewing machine secured to said carriage, sprocket means mounted on said carriage and being in intermeshing engagement with said rack, means for actuating said sprocket means and propelling said sewing machine around said table for effecting stitching of a mattress on said table, and means on said carriage for successively engaging said pivotal members to cause said sewing machine to be automatically moved in concentric relation with said arcuate corners.

3. In a mechanism of the class described, the combination with a supporting table for a mattress, a frame for said table having an endless upright track at its upper elevation, an endless rack secured in circumscribing relation to said track, said track having arcuate corners, fixed pivotal members secured to said frame at the centers of said arcs, said pivotal members being of arcuate form defined by a quadrant of a circle, an endless upright track secured to said frame at a lower elevation and being in circumscribing relation with said frame, a carriage comprising two elongated rollers having horizontal axes and being positioned in spaced relation and resting on said upper track, said carriage being supported by said rollers and being thereby freely movably mounted to travel around said tracks, a sewing machine secured to said carriage, gear means mounted on said carriage and being in intermeshing engagement with said rack, an electric motor for actuating said gear and propelling said sewing machine around said table for effecting stitching of a mattress on said table, an electrically energized track below said table, means contacting said track for supplying current to said motor, and means on said carriage for successively engaging said pivotal members to cause said sewing machine to be automatically moved in concentric relation with said arcuate corners.

4. In a mechanism of the class described, the

combination with a supporting table for a mattress, a frame for said table having an endless track at its upper elevation, an endless rack secured in circumscribing relation to said track, said track having arcuate corners, fixed pivotal members secured to said frame at the centers of said arcs, an endless track secured to said frame at a lower elevation and being in circumscribing relation with said frame, a carriage comprising two elongated rollers having horizontal axes and being positioned in spaced relation on said upper track, said carriage being supported by said rollers and being thereby freely movably mounted to travel around said tracks, a sewing machine secured to said carriage, gear means mounted on said housing and being in intermeshing engagement with said rack, an electric motor for actuating said gear and propelling said sewing machine around said table for effecting stitching of a mattress on said table, an electrically energized endless track between said table and said frame, an annular housing circumscribing and covering said track, means on said carriage for contacting said track and supplying current to said motor, and means on said carriage for successively engaging said pivotal members to cause said sewing machine to be automatically moved in concentric relation with said arcuate corners.

5. A mattress stitching machine adapted for operating on mattresses of various sizes comprising a mattress supporting table, said table having an upright column supported centrally thereof below its lower surface, a frame for said table having bearings adapted to receive said column in supporting relation, means for raising and lowering said table, endless tracks secured in circumscribing relation with said frame, a carriage slidably mounted to move around said tracks, a sewing machine secured to said carriage, an endless rack secured in circumscribing relation to one of said tracks, gear means mounted on said carriage and in engagement with said rack, an electric motor for actuating said sewing machine and said gear for propelling said sewing machine around said table and effecting stitching of a mattress on said table, collector rings insulated and secured to said column intermediate said table and said frame, and means contacting with said collector rings and electrically connecting said rings and said motor, the contour of said tracks being disposed at varying distances from said collector rings, said electrically connecting means having sections slidable over one another and being thereby adapted to lengthen and shorten according to the varying distances of the outer contour of said tracks from said collector rings.

6. In a mechanism of the class described, the combination with a supporting table for a mattress having rounded corners, a frame for said table having a substantially rectangular endless upright track at its upper elevation, an endless sprocket

chain secured in circumscribing relation to said track, said track having arcuate corners, fixed pivotal members mounted respectively at the centers of said arcs, said pivotal members being defined by a quadrant of a circle, a carriage comprising two elongated rollers having horizontal axes and being positioned in spaced relation and resting on said upper track, said carriage being supported by said rollers and being thereby freely movably mounted to travel around said track, a sewing machine secured to said carriage, sprocket means mounted on said carriage and being in intermeshing engagement with said sprocket chain, means for actuating said sprocket means and propelling said sewing machine around said table for effecting stitching of a mattress on said table, means on said carriage for successively engaging said pivotal members to cause said sewing machine to be automatically moved in concentric relation with said rounded mattress corners, and means positioned centrally of said table for raising and lowering said table to variable vertical adjustments.

7. In a mechanism of the class described, the combination with a supporting table for a mattress having rounded corners, a frame for said table having a substantially rectangular endless upright track at its upper elevation, an endless rack secured in circumscribing relation to said track, said track having arcuate corners, fixed pivotal members mounted respectively at the centers of said arcs, said pivotal members being defined by a quadrant of a circle, a carriage comprising two elongated rollers having horizontal axes and being positioned in spaced relation and resting on said upper track, said carriage being supported by said rollers and being thereby freely movably mounted to travel around said track, a sewing machine secured to said carriage, said carriage being overbalanced on said elongated rollers and said lower track being of smaller dimensions than said upper track to maintain said carriage in a substantially vertical position, a roller on said carriage in contacting relation with said upper track, the axis of said roller lying in the plane perpendicular to said track and passing through the line of the direction of reciprocation of the needle to cause said needle to follow a path concentric with said arcuate mattress corners, gear means mounted on said carriage and being in intermeshing engagement with said rack, means for actuating said gear means and propelling said sewing machine around said table for effecting stitching of a mattress on said table, means on said carriage for successively engaging said pivotal members to cause said sewing machine to be automatically moved in concentric relation with said rounded mattress corners, and means positioned centrally of said table for raising and lowering said table to variable vertical adjustments.

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