

May 4, 1954

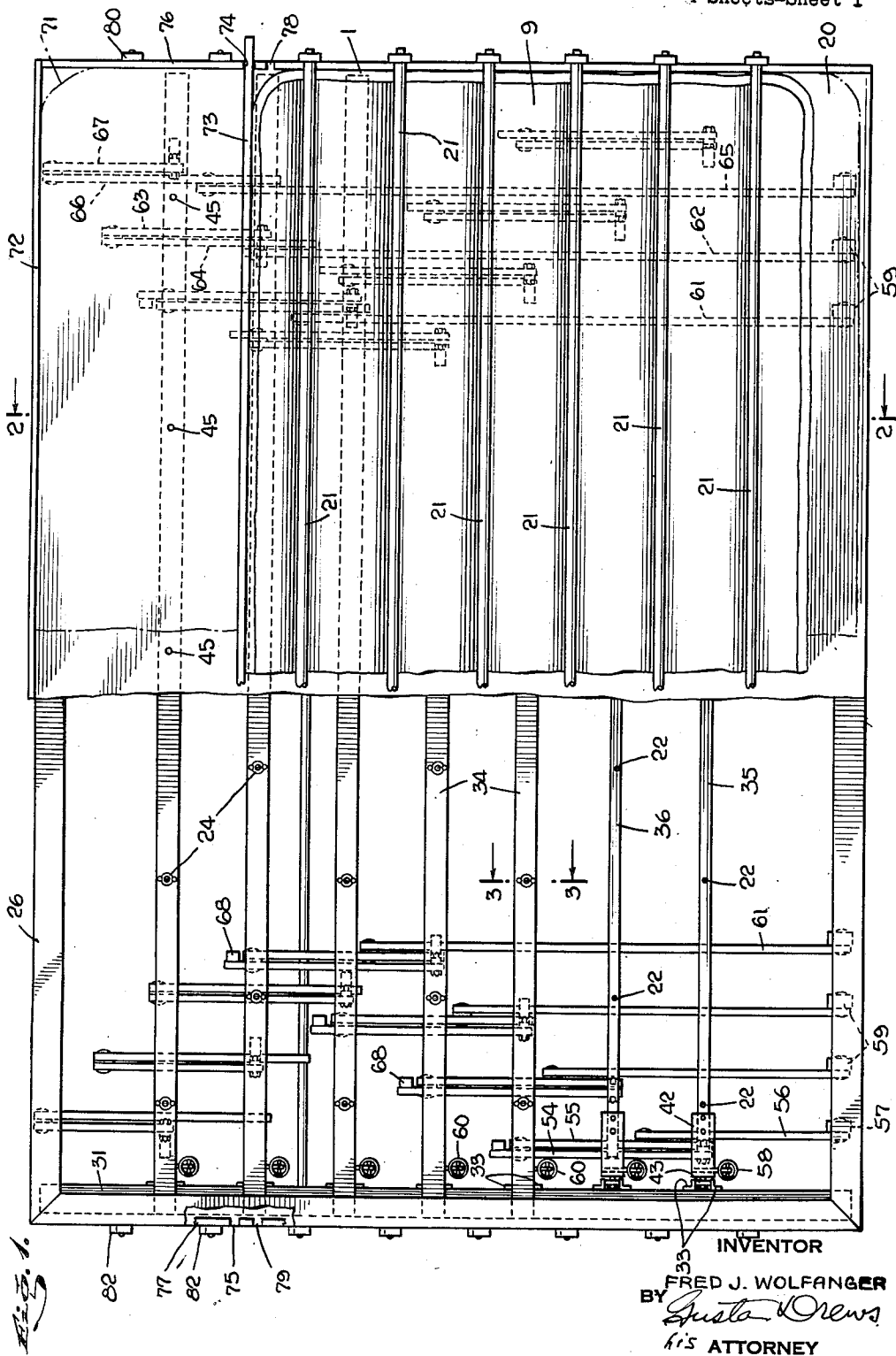
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2,677,138

MATTRESS, METHOD AND MACHINE FOR MAKING THE SAME

Filed Feb. 4, 1950

4 Sheets-Sheet 1



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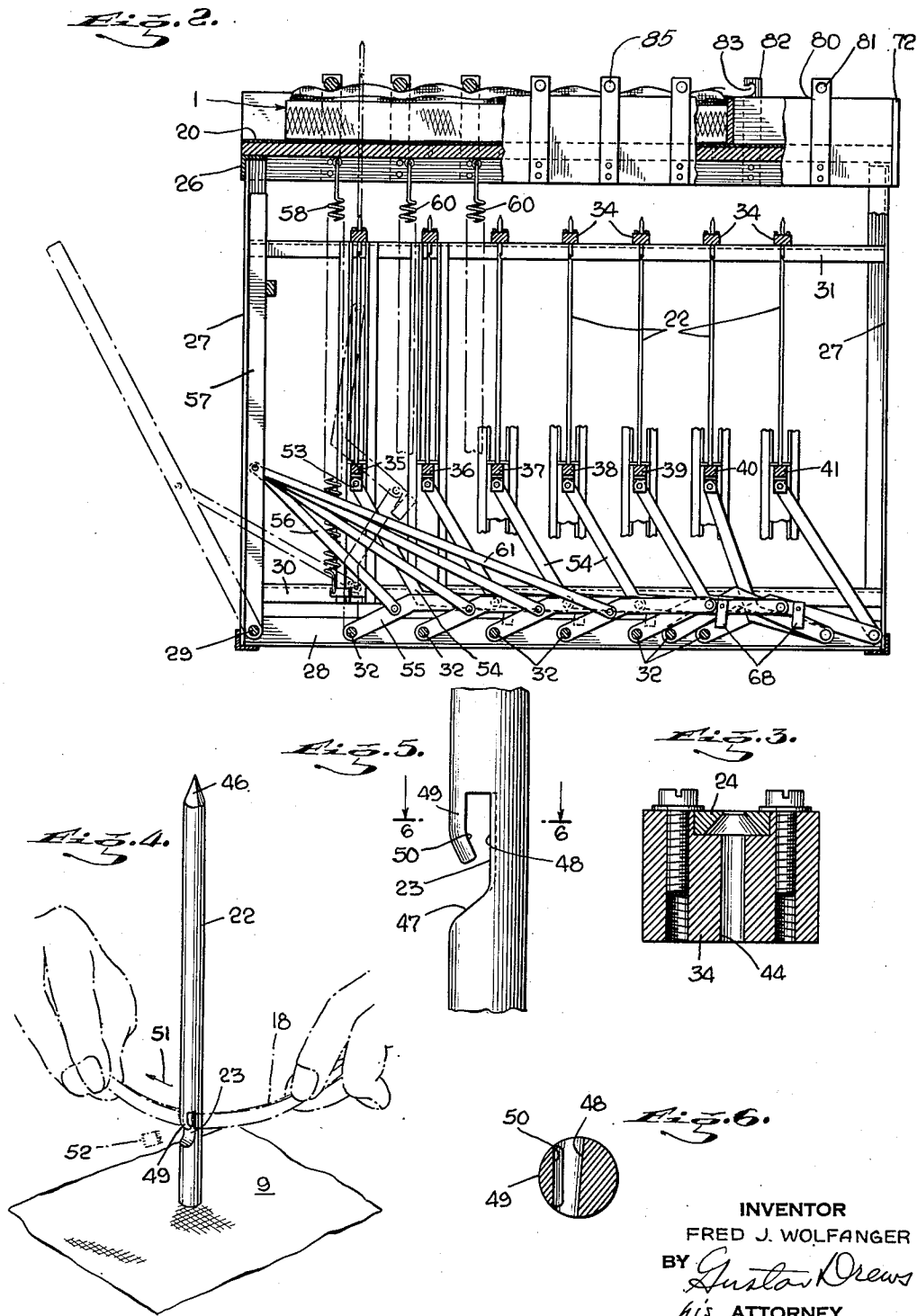
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MATTRESS, METHOD AND MACHINE FOR MAKING THE SAME

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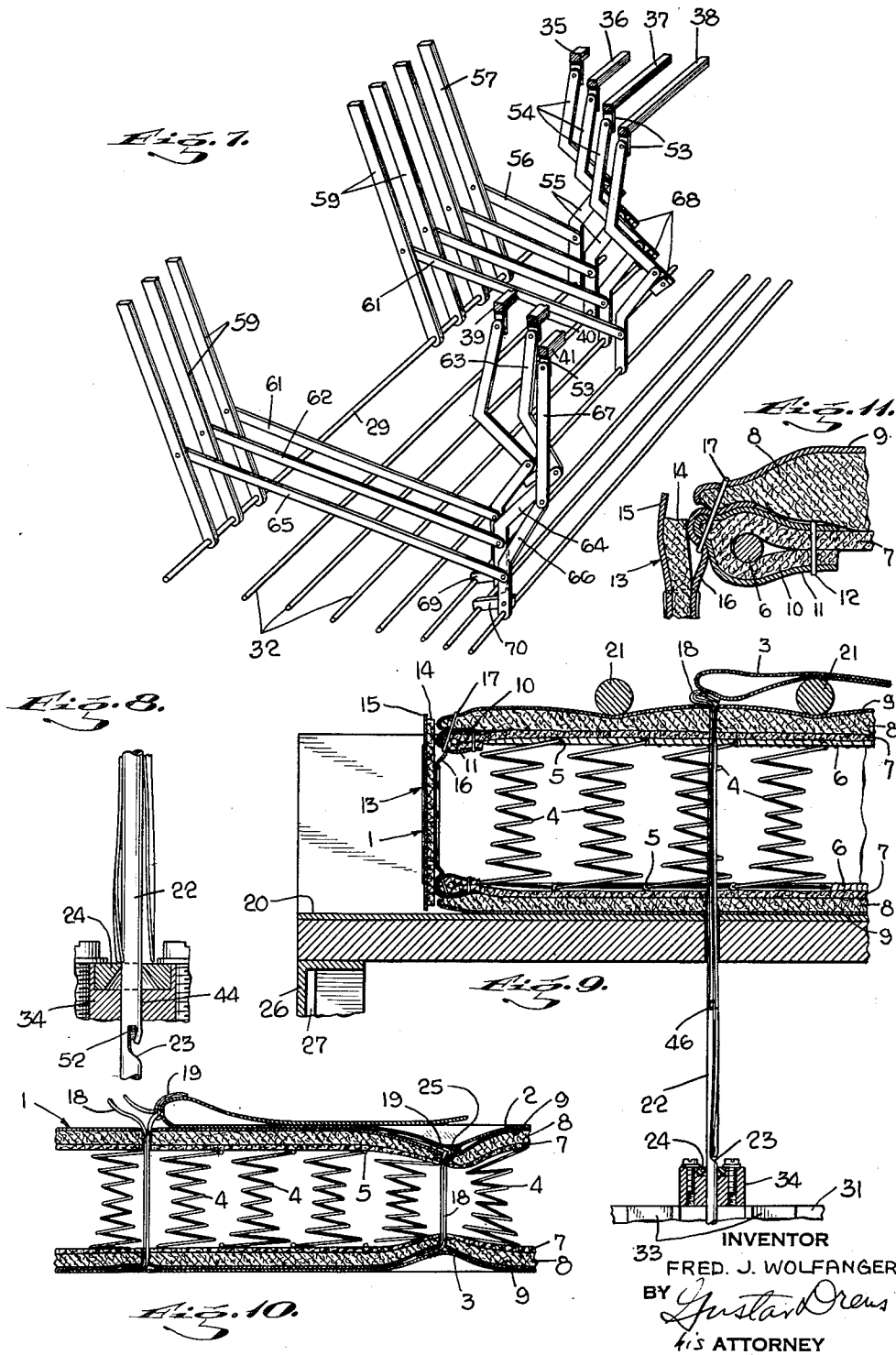
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MATTRESS, METHOD AND MACHINE FOR MAKING THE SAME

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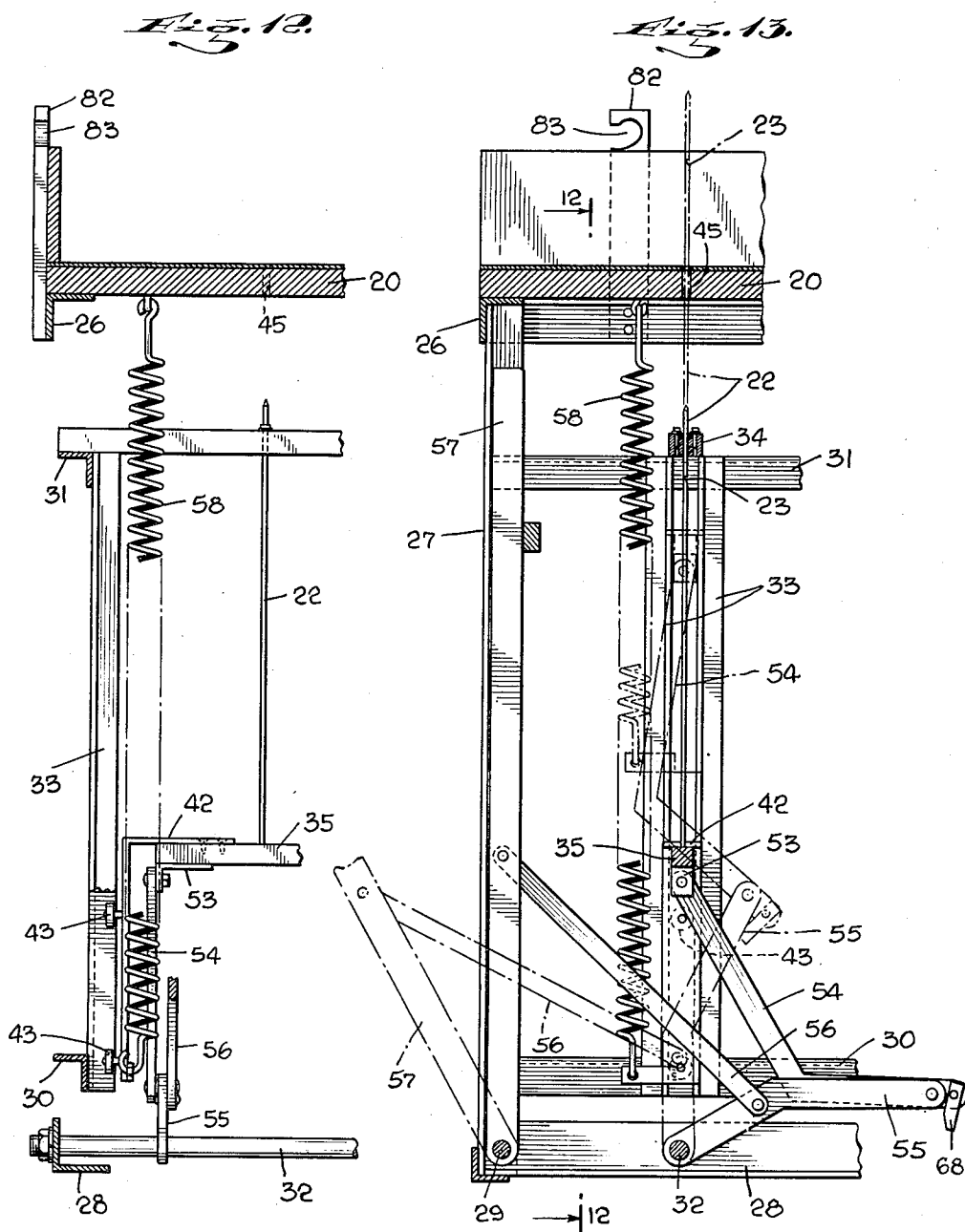
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MATTRESS, METHOD AND MACHINE FOR MAKING THE SAME

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MATTRESS, METHOD AND MACHINE FOR
MAKING THE SAME

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6 Claims. (Cl. 5—356)

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This invention relates to an improved machine for drawing the tufting threads through a mattress preparatory to tufting, to the improved method for tufting a mattress made possible by such improved machine, and to the improved mattress produced by such method.

Among the objects of the present invention, it is aimed to provide an improved machine whereby the locations for the tufting threads or cords, and therefore of the tufts, will be spaced a predetermined and/or uniform distance from one another so that the tufts will all be spaced predetermined and/or uniform distances from one another without the necessity of using a pattern or previously marking the unit to be tufted to locate the position of the tufts.

It is another object of the present invention to provide an improved machine whereby a plurality of tufting threads or cords secured to a first sheet of ticking for one face of a mattress unit to form a plurality of tufts may be simultaneously drawn at predetermined locations through such mattress unit, preparatory to securing such threads or cords to other threads or cords secured to a second sheet of ticking to form the other face of the mattress unit.

It is a further object of the present invention to provide an improved method for tufting a mattress unit consisting in attaching a plurality of long threads or cords at predetermined positions to a first sheet of ticking for one face of a mattress unit, attaching a plurality of shorter threads to a second sheet of ticking for the other face of the mattress unit at predetermined positions corresponding to predetermined positions of the long threads on the first sheet of ticking, thereupon simultaneously drawing a plurality of said long threads or cords through the mattress unit, cutting the free ends of such threads after exposing the same, and thereupon attaching such exposed ends of the long threads to the shorter threads on the second sheet of ticking and simultaneously compressing the adjacent portions of the mattress unit to effect the conventional tufting depressions.

It is still another object of the present invention to provide an improved mattress consisting of a mattress unit either of the type having an inner spring or of the type only having an inner filling, a first sheet of ticking for one face of said mattress unit having long threads or cords secured thereto at predetermined locations thereon, a second sheet of ticking for the other face of the mattress unit having shorter threads secured thereto at positions corresponding to the locations of the long threads on said first sheet of ticking, the long threads of said first sheet of ticking extending through such mattress unit and secured to the shorter threads on said second sheet of ticking to effect the conventional tufting depressions.

These and other features, capabilities and ad-

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vantages of the present invention consisting of the improved machine, method and mattress will appear from the subjoined detailed description of one specific embodiment of the improved machine and mattress illustrated in the accompanying drawings, in which

Fig. 1 is a plan view partly broken away of the improved machine.

Fig. 2 is a section on the line 2—2 of Fig. 1.

Fig. 3 is a section on the line 3—3 of Fig. 1.

Fig. 4 is an enlarged perspective partly broken away showing a needle being threaded.

Fig. 5 is an enlarged fragmental portion of the needle particularly showing the eye of the needle.

Fig. 6 is a section on the line 6—6 of Fig. 5.

Fig. 7 is a perspective broken away of the mechanism for actuating the cord or thread positioning needles.

Fig. 8 is an enlarged fragmental view of the needle as it passes through the thread cutter.

Fig. 9 is an enlarged fragmental section of a mattress unit positioned on the machine after a row of threads or cords has been drawn through the mattress unit.

Fig. 10 is a fragmental section of a mattress unit on a smaller scale than that illustrated in Fig. 9 showing the mattress unit after it has been turned to illustrate the position when the long threads or cords are being attached to the shorter threads or cords.

Fig. 11 is an enlarged fragmental detail of a corner of the mattress unit shown in Fig. 9.

Fig. 12 is an enlarged fragmental front view partly in section on the line 12—12 of Fig. 13.

Fig. 13 is an enlarged fragmental side view of the part of the mechanism shown in Fig. 12.

According to the present invention, a new method of tufting a mattress unit is made possible, resulting in an improved mattress. If the mattress unit to be tufted is an inner spring mattress unit as illustrated in Figs. 9 and 10, then the inner spring unit 1 is first assembled without the sheets of ticking 2 and 3. It will be obvious from the description to follow, however, that the mattress unit need not be of the inner spring type but might also consist mainly of filling without an inner spring.

This inner spring unit 1 as illustrated consists essentially of a plurality of rows of coil springs 4, the outer ends of which are connected to one another by lengths of helical spring connectors 5 and rectangular wire frames 6 connected to the outer edges of the outermost coil springs 4, all in the conventional way. Upon the outer faces of the coil spring unit consisting of the coil springs 4 there is first positioned a layer or pad 7 composed either of sisal, felt, hair or the like. Upon this pad 7 there is then placed a layer of felt or hair 8. Preferably the pads 7 are about one-half inch in thickness and the layers 8 about two inches in thickness. On the outer faces of the

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layers 8 there are then placed sheets of muslin 9, one for each layer 8. The ends of the pads 7 are wrapped around the wire frame 6 to form the loops 10, see Fig. 11. Narrow strips of muslin 11 are then wrapped around the loops 10 and secured in place by staples 12.

Built-up borders 13 consisting of a filler 14 having an outer ticking sheet 15 and an inner layer of muslin or buckram 16 are then secured in place by any suitable means, such as the staples 17, extending through the outer muslin 9, corner of the felt layer 8, free end of the muslin 16, loop 10 of the layer 7, and intermediate free portion of muslin 16. The free ends of the muslin 16, see particularly Fig. 11, are positioned between the outer ends of the layers 8 and muslin strips 11 before the staples 17 are secured in place.

The present invention is primarily directed to securing the ticking sheets 2 and 3 to a mattress unit, such as the mattress unit 1, and simultaneously producing the conventional tufting effect. According to the present invention this tufting effect is produced by securing to one sheet of ticking, as an instance the ticking 3, see Fig. 10, a plurality of long loops 18 of tufting cord or thread, and securing to the other ticking sheet, such as the ticking sheet 2, a plurality of short loops 19 of tufting cord or thread.

The positions of the loops 18 and 19 are of course predetermined and preferably, see Fig. 1, in rows staggered relative to one another with the positions of the loops 18 in the sheet 3 registering with the positions of the loops 19 in the sheet 2.

Thereupon the mattress unit 1 is placed upon the platform 20 of the machine illustrated in Figs. 1, 2 and 4 without the ticking sheet 2 between the platform 20 and the muslin sheet 9. Thereupon the bars 21, preferably composed of iron, are placed upon the muslin layer 9 of the mattress unit, see Fig. 9, in predetermined positions. Thereupon the ticking sheet 3, with the loops 18 exposed, is folded over so that one row of loops 18 registers with the space between the first two bars 21, 21, see Fig. 9. A plurality of rows of needles 22 are positioned so that at least one row of needles at a time may be actuated to pass through the mattress unit 1 between a pair of bars 21, 21, as shown in Fig. 9. After the needles are so actuated through the mattress unit 1, and the eyes 23 of the needles 22 of such row clear the outer faces of muslin 9, the first row of loops 18 of the ticking 3 are threaded or looped into the eyes 23, see Fig. 4. When all of the loops 18 of a row are so threaded in such row of needles 22, such row of needles 22 is returned to position, the position shown in full lines in Fig. 2, when the needles 22 carry the loops 18 down through the mattress unit and into cutting engagement with the cutting washers 24, see Fig. 8, when the ends of the loops will be cut upon the eyes 23 passing through the cutting washers 24.

After one row of loops 18 of the ticking sheet 3 has so been drawn through the mattress unit 1, a further portion of the ticking 3 is folded over onto the muslin sheet 9 and the next row of loops is attached to a second row of needles 22 and drawn through the mattress unit 1 and cut. This procedure continues until all of the loops 18 of the ticking sheet 3 are drawn through the mattress unit 1.

Thereupon the mattress unit 1 with the long loops 18 drawn through the same is turned over into the position shown in Fig. 10 where the ticking sheet 3 now rests on the platform 20 and

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the muslin sheet 9 of the other face of the mattress unit 1 is exposed. Thereupon the ticking sheet 2 is positioned so that one of its outer rows of loops 19 registers with a row of loops 18. Thereupon one of the cut ends of the loop 18, see Fig. 10, is drawn through a loop 19 registering with the same, the mattress unit 1 depressed and the two free ends of the loop 18 tied together to form the tuft, see the tuft 25 in Fig. 10. After the first row of short loops 19 has so been secured to the long loops 18, then the ticking sheet 2 is folded over onto the muslin 9 so that the next row of loops 19 is positioned adjacent to the free ends of the next row of long loops 18, and this row of short loops then secured in place just as was the case with the first row of short loops 19. This procedure in turn will continue until all of the rows of short loops 19 on the ticking sheet 2 have been secured in place to form tufts 25 for the entire mattress unit 1.

The machine for actuating the needles 22 will now be described. This machine is illustrated in Figs. 1 to 9, inclusive, and Figs. 12 and 13.

Briefly the machine is provided mainly initially to support the mattress unit 1 with its muslin layer 9 engaging the platform 20 to position the same for receiving one row after another of needles in turn to receive the long tufting cords 18 and draw them through the mattress unit 1 as shown in Fig. 9. Incidentally, advantage is also taken of the platform 20 thereupon to receive the mattress with the ticking sheet 3 engaging the platform 20 to enable the short tufting loops 19 to be attached to the long tufting cords 18.

The needles 22 are arranged in the present instance in seven rows, the first, third, fifth and seventh rows, see Fig. 1, being aligned with one another and consisting of five needles to a row, see Fig. 1, in the present instance, and the second, fourth and sixth rows of needles consisting of four needles to a row in alignment with one another but staggered relative to the needles in the odd rows, in the present instance. For the purpose of the present invention, the first row of needles nearest the front or lower end of the machine shown in Fig. 1 is first actuated. When the associated operations necessary for effecting the passage of the first row of long tufting cords 18 through the mattress unit 1 has been effected, then the second row of needles is actuated, and this procedure continued until all of the long threads attached to the ticking sheet 3 are drawn through the mattress unit 1.

The mechanism for actuating the needles is mounted in the frame consisting primarily of the platform 20 mounted on the rectangular angle iron frame 26 connected to the four angle iron uprights 27 at the corners thereof. The lower ends of the uprights 27 at the sides thereof are connected to one another by the cross bars 28 extending from front to rear, and the two front uprights 27 are connected to one another by the round bar 29.

In addition to the cross bars 28, the uprights 27 at the sides are also connected to one another by the angle irons 30 directly above the cross bars 28 and the angle iron 31 near the upper ends thereof at a level below the platform 20. The cross bars 28 are provided to form abutments or supports from the seven bars 32. The inner faces of the angle irons 30 and 31, see Fig. 1, are each provided with seven pairs of angle iron rails 33 to form slideways.

The two upper angle irons 31 form supports for the seven guide bars 34. The first row of needles

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22 are all fixed at their lower ends to the bar 35. The second to seventh rows of needles in turn are fixedly secured at their lower ends to the bars 36, 37, 38, 39, 40 and 41, respectively, see Fig. 2. In Fig. 1 only the bars 35 and 36 are shown, the guide bars 34 concealing the remaining slidable bars 37 to 41, inclusive. Since the actuating mechanism for the bars 35 to 41 is substantially identical, it is believed sufficient merely to describe the mechanism for actuating the bar 35. The bar 35 is secured at its ends to the brackets 42 which have rollers 43 at the ends thereof slidably mounted in the slideways formed by the pairs of angle irons 33, 33. The guide bars 34, see Fig. 3, have openings 44 therein slidably to receive the needles 22. The upper ends of the openings 44 are provided with the cutting washers 24 as shown in Fig. 6. Registering with the openings 44 in the guide bar 34, there are openings 45 formed in the platform 20. Consequently as the horizontally extending bar 35 is moved up and down, the registering openings in the guide bar 34 and platform 20 will maintain the needles in vertical alinement.

The needles 22, see particularly Fig. 4, are pointed at their upper ends 46 and have the eyes 23 positioned a distance below the pointed ends 46. Excellent results have been achieved when this distance was about three inches. Each eye 23, see Fig. 5, has a cam face 47 and an inclined vertical face 48 opposite the finger 49 which is bent inwardly toward the face 48 at its free end as shown in Fig. 5. Preferably as shown in Fig. 6, the face 48 is inclined relative to the inner face 50 of the finger 49 so that the opening in a lateral direction is tapered, being larger at its left hand end in the present instance than at its right hand end. This tapered formation is provided so that when the intact loop of a long tufting cord 18 is threaded into the same, see Fig. 4, it will preferably be moved in the direction of the arrow 51 to clear the opening beneath the finger 49 of the portion 52 of a preceding cord 18 that had been cut off in a preceding operation by the cutter 24. In other words, after the tufting cord 18 has been threaded in the eye 23 and drawn down through the mattress unit 1 when the eye passes the cutting washer 24 shown in Fig. 6, it will cut the loop 18 at two places leaving the intervening portion, such as the portion 52, in the eye 23.

The bar 35 has secured to the lower face thereof two pivotal supports 53 for the upper free ends of the bent links 54. The lower free ends of the bent links 54 are in turn pivotally connected to one of the free ends of the bent links 55, the other free ends of such bent links 55 being pivotally mounted on the first bar 32 nearest the front of the machine and directly below the bar 35. The lower arm portion of one of the bent links 55 are shown in Figs. 2 and 7 is connected by the link 56 to the lever 57 pivotally mounted on the bar 29.

For aiding the operator in swinging the lever 57 into the outer position, that shown in Fig. 7, where all of the needles 22 on the bar 35 are driven up through the mattress unit 1, there is provided the tension spring 58, connected at its upper end to the platform 20, and at its lower end to the lower end of the bracket 42.

As will appear from Figs. 2 and 7, all of the remaining control levers 59 for the remaining slide bars 36 to 41, inclusive, are all pivotally mounted at their lower ends on the bar 29. It will also appear that each of the other cross

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bars 36 to 41, inclusive, also are provided with a spring 60, such as the spring 58. The links 61 for the first four succeeding bars 36, 37, 38 and 39 will be successively longer than the link 56 for the bar 35. The links corresponding to the links 54 and 55 will be substantially the same in length and conformation.

The links 62 for the slidable cross bar 40 will in turn be longer than the link 61 for the slidable cross bar 39, but the links 63 and 64 corresponding to the links 54 and 55, respectively, will differ slightly in conformation. In turn, the link 65 for the slidable cross bar 41 will in turn be longer than the link 62 for the slidable cross bar 40, and while the link 66 corresponding to the link 64, although bent, will differ slightly in conformation, the link 67 corresponding to the link 63 will be straight.

To serve as limiting stops for the upward movement of the cross bars 35 to 39, inclusive, the links 54 are provided with projections 68 to engage the lower links 55 in their uppermost position.

The limiting stops for the slide bars 40 and 41, however, consist in the projections 69 and 70 formed on the links 64 and 66, respectively, for engaging the rods 32.

Preferably as shown, the platform 20 is wide enough to accommodate mattresses of different widths, such as a single mattress approximating three feet in width, a twin mattress approximating three feet, two inches in width, and a double bed mattress approximating four feet, five inches in width.

For a double width mattress, the mattress unit, see the dash and dot line 71, when placed on the platform 20, is positioned so that it will engage the rear upwardly extending board 72. When it is desired to tuft a twin size mattress a removable board 73 is used which is positioned in the openings 74 and 75 of the side boards 76 and 77, respectively. In turn, the side boards 76 and 77 may have a number of registering openings, such for instance as the openings 78 and 79, to receive the board 73 for a single width mattress.

Secured to the outer face of the board 76 there are provided the uprights 80 having the openings 81 disposed immediately above the upper edge of the side board 76. Secured to the outer face of the side board 77, on the other hand, are provided the uprights 82 having the slots 83 formed therein. Each upright 80 has registering therewith an upright 82. Each pair of uprights 80 and 82 is provided to receive an anchoring bar 21. Each anchoring bar 21 has diminished ends 85. When a mattress unit 1 is positioned on the platform 20 for a perforating operation, in order to hold the mattress unit in position while the needles 22 are driven up through the same, the anchoring bars 21 are first secured in position, the diminished end 85 of one end of each bar first being positioned in an opening 81 of an upright 80 and then the other diminished end 85 positioned in the recess 83 of the complementary upright 82. The right hand side of Fig. 1 shows six anchoring bars 21 secured to a mattress unit 1 before the ticking sheet 3 has been secured thereto, see also Fig. 2.

The bars 21 when being secured to the anchoring uprights 80 and 82 are pressed into the mattress unit 1 and thereupon when secured in the anchoring uprights 80 and 82 function to anchor the mattress unit 1 against movement during operation.

From the foregoing it will appear that this in-

vention is directed to mattresses tufted solely by looped tufting cords or threads without the use of the conventional buttons or cotton tufts.

It is obvious that the long loops 18 and short loops 19 may be secured to the ticking sheets 3 and 2, respectively, by any suitable means, such for instance as the conventional bartack stitching or the like, without departing from the general spirit of the invention.

It is obvious that various changes and modifications may be made to the details of construction of the machine and mattress and also in the steps of the method without departing from the general spirit of the invention as set forth in the appended claims.

I claim:

1. In a tufted mattress having a mattress body, a first ticking sheet for one face of said mattress body and a second ticking sheet for the other face of said mattress body, the combination of a plurality of pairs of long tufting cords with one of their ends free, a first bar stitch securing the other ends of each pair of long tufting cords to the inner face of said first ticking sheet and positioned at predetermined tufting locations, a plurality of short tufting cords, a second bar stitch securing the ends of each short tufting cord folded on itself to the inner face of said second ticking sheet to form a loop, the loops being positioned at tufting locations registering with the tufting locations of the long tufting cords on said first ticking sheet, the long tufting cords of each pair on said first ticking sheet extending through said mattress body and connected to the loop of a short cord of said second ticking sheet registering in position with said pair of long tufting cords.

2. The method of tufting a mattress consisting in securing the ends of a plurality of long tufting cords folded on themselves to form loops at predetermined tufting locations on the inner face of a first ticking sheet, securing the ends of a plurality of short tufting cords folded on themselves to form loops to the inner face of a second ticking sheet in position corresponding to the location of the long tufting cords on the first ticking sheet, drawing the loops of the long tufting cords of the first ticking sheet through a mattress unit, cutting the loops of said long tufting cords into two free ends after drawing the same through the mattress body and tying the free ends of said long cords so cut to the loops of the short tufting cords on the second ticking sheet registering in position with similarly positioned long tufting cords on the first ticking sheet.

3. In a machine for threading tufting cords through a mattress body, the combination of a plurality of needles, a frame, a platform secured to said frame for supporting a mattress body and having a plurality of openings registering with predetermined tufting positions in the mattress body, guides for receiving the needles and secured to said frame below said platform and in alignment with said openings, actuating means operatively connected to said frame below said guides for actuating said needles up through the mattress body to expose their eyes on the far side of the mattress body to enable tufting cords to be connected to the needles, said actuating means also actuating the needles back down out of the mattress body after having received the tufting cords to draw the tufting cords through the mattress body, said needles being arranged in rows, a plurality of cross bars vertically slidable in said frame below said guides, each row of needles con-

nected to one of said cross bars, a lever for each cross bar and pivotally connected to said frame, and linkage connecting each cross bar to one of said levers to enable actuation of said cross bars by said levers.

4. The combination as set forth in claim 3 in which the eye of each needle is adapted to receive a tufting cord and the cord is in the form of a loop after passing through the mattress, the needles have piercing free ends and the eyes are spaced from said free ends and the tufting cords are in the form of loops threaded through such eyes of the needles after passing through the mattress, the main body of said needles being circular in cross section, and a cylindrical cutting die secured to each guide just clearing each needle through which each needle passes as it returns downward with a loop of the tufting cord threaded thereto to cooperate with its needle to cut the loop of the long tufting cord carried by it into two free ends as it passes through the die.

5. The combination as set forth in claim 3 in which the eye of each needle is adapted to receive a tufting cord and the cord is in the form of a loop after passing through the mattress, the needles have piercing free ends and the eyes are spaced from said piercing ends and the tufting cords are in the form of loops and threaded through the eyes of the needles after passing through the mattress, the main body of each needle being circular in cross section, and a rounded cutting washer secured to each guide surrounding and just clearing each needle to cooperate with said needle to cut the loop of the long tufting cord carried by it into two free ends when said needle returns downward with its tufting cord and as it passes through the washer.

6. In a machine for threading tufting cords through a mattress body, the combination of a plurality of needles, a frame, a platform secured to said frame for positioning a mattress body and having a plurality of openings registering with predetermined tufting positions in the mattress body, guides secured to said frame adjacent said platform in alignment with said openings for receiving and guiding the needles through said openings, actuating means operatively connecting said frame to said needles for actuating said needles through the mattress body to expose their eyes on the far side of the mattress body to enable tufting cords to be connected to the needles, said actuating means also actuating the needles back out of the mattress body after having received the tufting cords to draw the tufting cords through the mattress body, said needles being arranged in rows, a plurality of supports secured to said needles, one support for each row of said needles, and said actuating means consisting of a plurality of levers pivotally connected to said frame, one lever for each support, and linkage connecting each support to its associated lever to enable said levers to actuate said supports.

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