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2,063,520

METHOD AND APPARATUS FOR THE MANUFACTURE OF MATTRESSES

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2 Sheets-Sheet 1

Fig. 1.

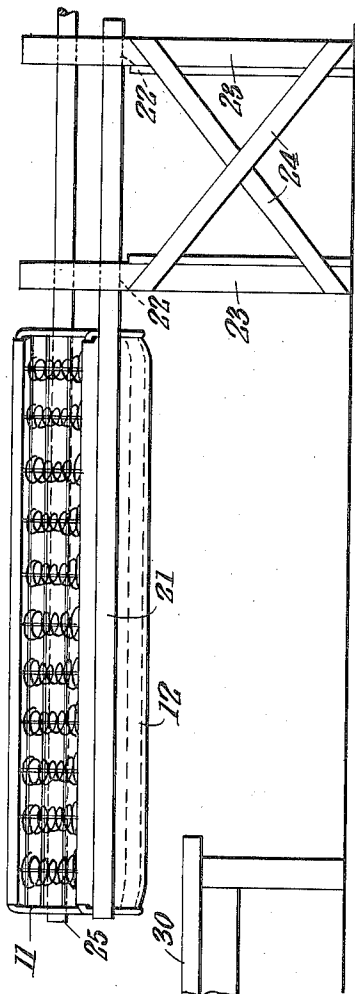
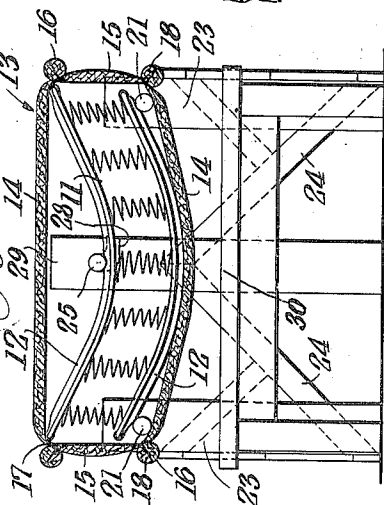
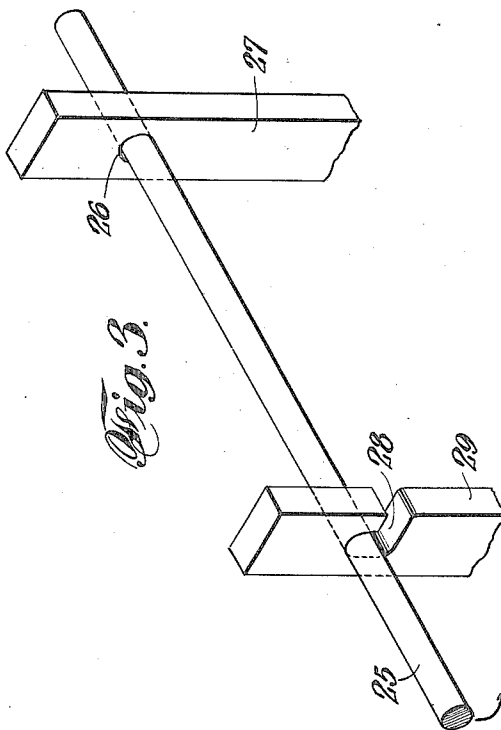


Fig. 2.



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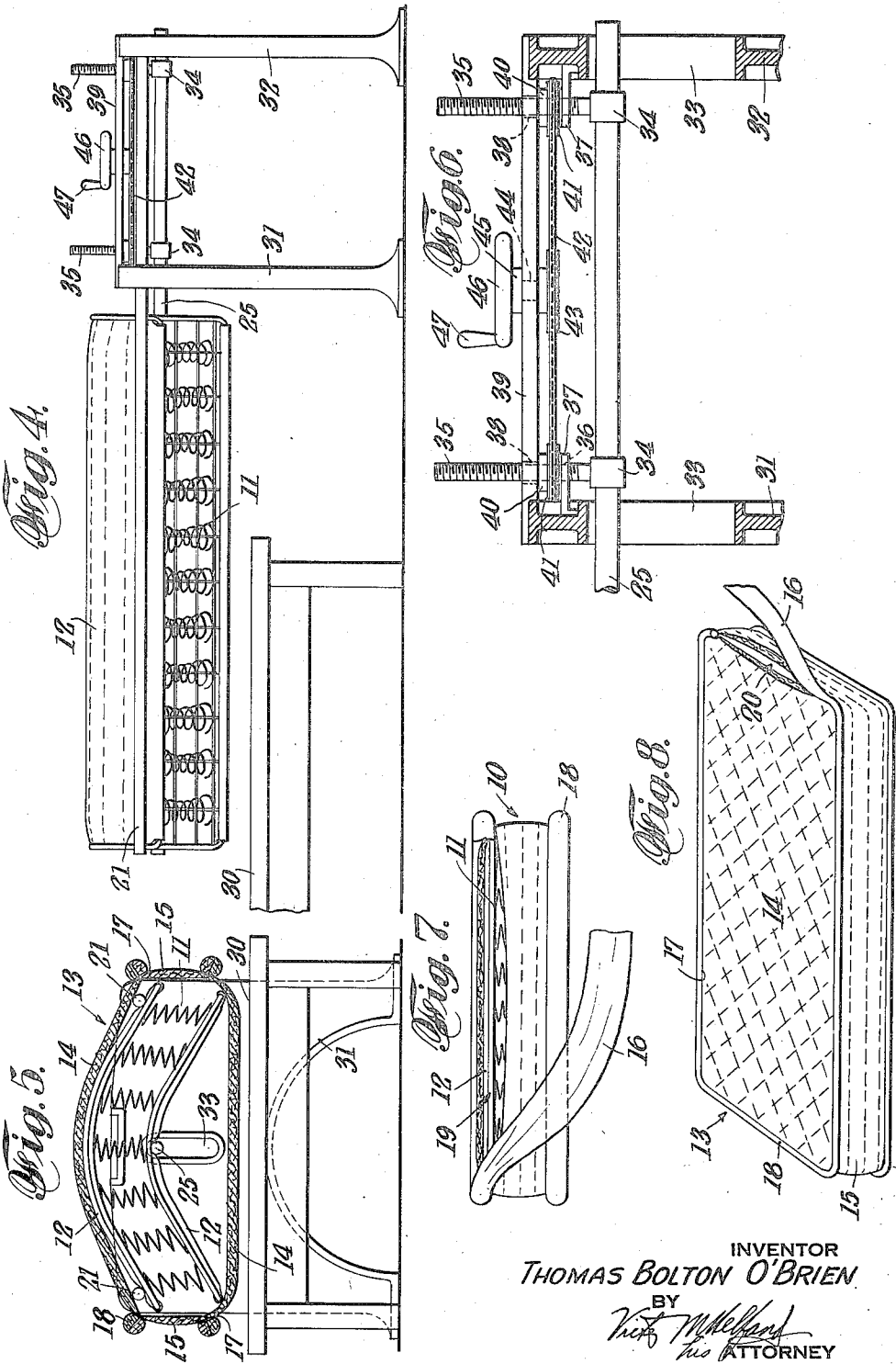
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2 Sheets-Sheet 2



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METHOD AND APPARATUS FOR THE
MANUFACTURE OF MATTRESSES

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12 Claims. (Cl. 226—43)

The present invention relates to mattresses and similar articles of the inner spring type, more particularly to such articles that are constructed of quilted portions, such as are described in my two copending applications bearing Serial No. 496,493, filed November 18, 1930, and Serial No. 594,047, filed February 19, 1932.

The present invention has for its object to devise methods for the assembly of such mattresses and the like which will overcome certain difficulties and inconveniences encountered in the practice of the methods of assembly hitherto used in the construction of such mattresses and the like. It is also an object of the present invention to provide apparatus for the effective practice of the new methods aforesaid, which apparatus is of simple construction, space and labor saving and of great efficiency for their purpose.

Mattresses of the type to which the present invention relates and which are fully described in my copending applications aforesaid have hitherto been made by fastening quilted pads to the faces of an assembled inner spring unit, by pre-sewing an outer quilted envelope out of quilted boxing and two quilted outer face pads, leaving one end of the quilted envelope open for the insertion of the pad covered inner spring unit, inserting the inner spring unit into the envelope, and closing the same. The actual practice of the methods thus generally described presented three major difficulties, which made them cumbersome and costly, because of the time and labor required in carrying them through.

One difficulty encountered was in inserting the pad covered inner spring unit into a snugly fitting envelope having a fabric inner lining. The frictional resistance, when such operation was done by hand, was found to be very great and was greatly enhanced by the size of the objects being handled. The conventional apparatus used for the assembly of ordinary inner spring mattresses where the envelope is of a single thickness of fabric were found to be ineffective because of the thickness of the outer quilted envelope of the mattress of the present invention.

It was further found that the side seams of the outer quilted envelope were usually forced open during the insertion of the padded inner spring unit. And, finally, it was discovered that, after the padded inner spring unit was inserted into the outer quilted envelope, and the envelope was filled out, it was impossible to close the open end of the envelope properly and to make it of uniform appearance with the other ends of the

mattress. The reason for this last difficulty was the impossibility of forming the corners of the mattress by sewing machine in a manner continuous and uniform with the presewn edges and corners of the envelope, as the sewing machine will not go around the corner of the filled envelope in a proper and effective manner.

All the above difficulties are readily overcome by the practice of the methods of assembly and the use of the apparatus of the present invention, which, in addition, result in great economies, as by their means it is possible for one person, alone, to perform the entire process of assembly, in one place, in a minimum of time and without any waste of effort.

In the accompanying drawings, illustrating the methods and apparatus of the present invention,

Fig. 1 is a view in side elevation of a hand operated embodiment of the apparatus, with a pad covered inner spring unit mounted thereon;

Fig. 2 is an end view of the same with the envelope shown in cross section;

Fig. 3 is a detailed view of the movable member of the apparatus shown in Figs. 1 and 2;

Fig. 4 is a side elevational view of a mechanically operated embodiment of the apparatus of the present invention showing the assembled mattress mounted thereon;

Fig. 5 is an end view of the same with the envelope shown in cross section;

Fig. 6 is a view in sectional detail of the operating mechanism of the apparatus shown in Figs. 4 and 5;

Fig. 7 is an end view of the assembled mattress, showing the open edge of the outer envelope; and

Fig. 8 is a view in perspective of the same.

Referring more specifically to the accompanying drawings, the numeral 10, generally indicates a mattress of the present invention, which comprises an inner spring unit 11, which may consist of a plurality of spring coils arranged in rows, or otherwise, and joined together in any manner well known to the art, a pair of quilted pads 12, covering the faces of the inner spring unit 11, and secured by their edges to the edges of such spring unit in any suitable manner, such as by stapling, and an outer quilted envelope, hereinafter referred to as an envelope and generally designated as 13, enclosing the inner spring 11 and its attached pads 12.

The inner pads 12 may be made in any suitable manner, such as by enclosing a layer of padding material of suitable thickness between

two layers of fabric or by superimposing such padding material over a layer of fabric and quilting the padding and fabric together, preferably by gang stitching.

5 The envelope 13 may comprise a pair of quilted outer face pads 14, with the quilting stitching arranged in decorative design, and quilted boxing 15, to form the sides and ends of the envelope. The boxing 15 may be of separate portions for the sides and ends. I prefer, however, 10 to have it one continuous piece, as illustrated in the drawings.

In my co-pending applications I have described several methods of constructing the envelope; the preferred method being of placing 15 the edges of the continuous boxing 15, of sufficient length to form all of the sides and ends of the envelope, against the edges of the face pads 14, the inner fabric layer of each facing 20 one another and the edges pointing outwardly, folding the width of a continuous tape, 16, over the double edge thus formed and enfolding it, and passing a line of stitching 17, through the edges of the tape 16 and the enfolded double 25 edge of padding, thus forming an envelope and simultaneously giving it a taped bead or roll edge, 18.

To permit the subsequent insertion of the padded inner spring unit, one entire end of the 30 envelope may be left unfinished, with the necessary length of boxing and tape left loose for subsequent sealing, or only one edge of one end, as shown in the drawings, where such open edge is designated as 19, may be left open. In order 35 to avoid the separating of the boxing and face pads during the insertion of the inner spring unit and at the same time to avoid the difficulty of forming the corners 20 of the open edge 19, or of all of the four corners, if the entire end be left open, in uniformity with all of the other 40 corners and by means of a sewing machine, I pre-sew such corners at the time of pre-sewing the envelope, leaving only the straight portion of the edge or edges, 19, open.

45 The method of pre-sewing the corners of the open end or edge of the envelope before inserting the inner spring unit, would, ordinarily, make the assembly of the mattress impossible, due to the reduced size of the opening thus left, 50 which must be too small to permit the insertion of the inner spring unit; and this is more particularly true when only one edge is left unfinished. I have invented a new and novel method of assembly of inner spring unit and 55 envelope which makes this method of preparing the envelope not only possible, but practicable and desirable. My new method of assembly consists in bending or folding the inner spring unit with its attached pads, to such an extent 60 as may be desirable, but within the limits of its resiliency so that it occupies a smaller compass, and slipping the envelope over it while it is in such folded state. The envelope may be thus readily slipped on, in spite of the fact that the 65 opening, 20, is narrower than the normal width of the inner spring unit, and without disturbing the envelope stitching, and with the elimination of all or nearly all of the frictional resistance ordinarily encountered in the process. All that 70 thereafter remains to be done is to shake the assembled mattress several times so that that inner spring unit is shaken into exact position, its edges fitting into the edges of the envelope. The unfinished edge or edges of the envelope 75 may then be sewed up uniformly with and in

the same manner as the other edges, by means of a sewing machine, which may readily and neatly operate along a straight edge, even if the envelope is filled.

The operation of bending or folding the inner 5 spring unit may be attempted by hand, one or more persons holding it in that state while one or more other persons slip the envelope over it. However, while by this method some of the friction between the inner spring pads 10 and the envelope is eliminated, such friction is not satisfactorily eliminated, for the reason that such portion of inner spring unit that is inserted into the envelope tends to unfold, and the fabric of the pads covering it tends to come 15 into contact with the envelope lining to some extent. For it is impracticable to keep that part of the spring unit which has passed inside of the envelope, evenly and uniformly bent or folded, by hand, and to prevent its unfolding. In 20 order to eliminate entirely the friction element and at the same time to attain the economy of eliminating the labor of one or more persons required to hold and fold the cumbersome, large and quite heavy pad covered inner spring unit, 25 I have devised the apparatus which I shall now proceed to describe.

The apparatus of the present invention may be hand operated, as shown in Figs. 1, 2, and 3. Such apparatus comprises a pair of spaced parallel supports or bars, 21, in the form of rounded bars or hollow pipes, preferably horizontally disposed, each of the bars 21 having one end fixed in position in any suitable manner, such as by 35 having it pass through openings 22, in a pair of aligned, spaced standard posts 23, which may be set up in the ground or floor or on a common base, and which may be reinforced by the cross bars 24. The parallel bars 21 may be spaced 40 sufficiently apart to support an inner spring unit even in a folded state.

There is also provided a movable bar 25, which may be somewhat longer than the fixed bars 21, and which may be pivoted in an opening 26, in a post, 27, positioned midway between the rear 45 posts 23, and which rod may be caught in a trap 28, in another post 29, positioned midway between the two forward posts 23, so that such movable bar may be held in a position substantially parallel to the bars 21.

To operate the apparatus described, the movable bar 25 is freed from the trap 28, and its free end raised. A pad covered inner spring unit is placed on the fixed bars 21 and the movable bar 25 is then grasped, preferably by its free end 55 which may project forward of the inner spring unit, and pressed downwardly over the center of the inner spring unit, causing it to fold, until the bar 25 may be snapped into the trap 28, thus fixing the inner spring unit in a folded state. 60 The projecting end of the movable bar 25 may then be pushed back evenly with the edge of the inner spring unit, and the envelope may be slipped over the inner spring unit and its supporting and folding bars. The movable bar, 25, 65 may then be either entirely withdrawn, by pulling it out through the opening, 26, or merely snapped out of the trap, 28, so that pressure on the inner spring unit is entirely released or partly removed. The inner spring unit will then 70 tend to straighten out and fill the envelope. The assembled mattress is then pulled off the bars on which it remains suspended, unto a work table, 33, which may be provided to receive it.

It may here be stated that the apparatus may 75

be so set up that the padded inner unit may be placed below the supporting bars, 21, the movable bar, 25, then is so placed that it is moved upwardly from below the inner spring unit to produce the requisite folding.

It may here also be stated that the movable bar, 25, may be pivoted in the forward middle post, 29, the trap, 28, being placed in the rear middle post, so that the folding pressure may be applied by raising the rear end of the bar 25 until it is snapped into the trap. The forward end of the bar, 25, may then be made somewhat shorter than the length of the inner spring unit, so as to interfere less with the straightening of the inner spring unit when pressure is relieved.

It may here also be stated that provision may be made for the use of the apparatus for the assembly of narrower and wider mattresses by providing means which may be readily apparent to any skilled mechanic, for the adjusting of the position of the anchor posts, 23, with respect to the middle posts, 27 and 29, or for adjusting the position of the supporting bars, 21, within the anchor posts, to bring them nearer to or further from the middle posts.

It is readily apparent that by the use of the apparatus described, which keeps the inner spring unit folded during the entire process of covering it with the envelope, friction is maintained at a minimum during all that time, and the process may be carried out with the least effort by one person.

The efficiency and ease of operation of the apparatus of the present invention may be further increased by providing mechanical means to apply the folding pressure required, as shown in Figs. 3, 4, and 5 of the drawings, wherein the supporting bars, 21, are anchored in two spaced frame standards, a forward one, 31, and a rear one, 32. The movable bar, 25, may operate within a pair of vertical slots, 33, one in the center of each of the anchorages, midway between the supporting bars. The movable bar, may be carried by a pair of hubs, 34, suspended between the two anchorages, 31 and 32, one adjacent each of them, to give steadiness.

Each of the hubs, 34, is carried at the end of a vertically positioned threaded screw, 35, which passes through an opening, 36, in a bracket, 37, projecting perpendicularly from each of the standards, and through an opening, 38, in a cross bar, 39, the ends of which rest on and are fixed to the tops of the standards. Each of the said threaded screws, 35, is also engaged in the threaded hub, 40, of sprocket wheels, 41, resting between the bracket, 37, and the cross bar, 39. The sprocket wheels, 41, may engage an endless chain, 42, passing over both of them, which chain may be actuated by another sprocket wheel, 43, engaging it, which is mounted at one end of a shaft, 44, and in the thrust bearings, 45, one on each side of the cross bar, 39, and through the said bar at about its center. The other end of the shaft, 44, may be provided with an operating wheel, 46, having a manipulating handle, 47.

It will be readily apparent that as the operating wheel, 46, is turned in one direction, the chain, 42, is actuated and the sprocket wheels are turned, causing the threaded screws, 35, and the movable rod, 25, carried by them, to move downwardly, and that by reversing the direction of the operating wheel, the movable rod, 25, may be caused to move upwardly.

The mechanically operated assembly appara-

tus thus described may be operated in the same manner as the hand apparatus previously described, with the advantages that one person may do all of the work involved with very little physical exertion.

It may here be stated that the form of standards in which the rods are to be fixed is immaterial for the purposes of the present invention and that the particular motive power for the movable bar, 25, need not necessarily be hand operable, but may just as effectively be foot operable, or may be connected in any suitable manner to power mechanism, electrical or otherwise, with great advantage.

This completes the description of the methods and apparatus of the present invention. It is to be understood that I do not wish to be limited to the methods and apparatus thus described, as obviously variations thereof and changes in them may readily be made without the exercise of the inventive faculties and within the spirit and scope of the present invention as previously described and as set out in the claims hereto appended.

What I claim as my invention is:

1. Apparatus for assembling mattresses, comprising a pair of spaced members adapted to contact one face of a mattress inner spring, said members being fixed in position by one of their corresponding ends and having their other ends free, a movable member pivoted toward one end substantially midway between the said fixed members and having its other end free and being adapted to press the other face of the mattress inner spring and to bend it between the said fixed members, and means to anchor the said movable member in position.

2. Apparatus for assembling mattresses, comprising a pair of spaced parallel members adapted to contact one face of a mattress inner spring, said members being fixed in position by one of their corresponding ends and having their other ends free, a movable member pivoted toward one end substantially midway between the said fixed members and having its other end free and being adapted to press the other face of the mattress inner spring and to bend it between the said fixed members, and means to anchor the said movable member in position.

3. Apparatus for assembling mattresses, comprising a pair of spaced, horizontal parallel members adapted to contact one face of a mattress inner spring, said members being fixed in position by one of their corresponding ends and having their other ends free, a movable member pivoted toward one end substantially midway between the said fixed members and having its other end free and being adapted to press the other face of the mattress inner spring and to bend it between the said fixed members, and means to anchor the said movable member in position.

4. Apparatus for assembling mattresses comprising two spaced parallel rows of spaced standard posts, a pair of parallel members adapted to contact one face of a mattress inner spring each fixed by a corresponding end in one of the said rows of standard posts, their other ends being free, a movable member, pivoted intermediate of said fixed members and having one end free, adapted to press the other face of the mattress inner spring and to bend it between the said fixed members, and means to anchor the said movable member in position.

5. Apparatus for assembling mattresses com-

prising two spaced parallel rows of spaced standard posts, a pair of parallel members adapted to contact one face of a mattress inner spring each fixed by a corresponding end in one of the said rows of standard posts, their other ends being free, a pair of standard posts positioned intermediate of the said parallel rows of standard posts, a movable member, adapted to press the other face of the mattress inner spring and to bend it between the said fixed members, pivoted toward one end on one of the said intermediate standard posts and having its other end free and means on the other intermediate standard posts to anchor the said movable member in position.

6. Apparatus for assembling mattresses comprising two spaced parallel rows of spaced standard posts, a pair of parallel members, adapted to contact one face of a mattress inner spring, each horizontally fixed by a corresponding end in one of the said rows of standard posts, and having its other end free, a movable member, pivoted toward one end intermediate of said fixed members, and having its other end free, and adapted to press the other face of the mattress inner spring and to bend it between the said fixed members, and means to anchor the said movable member in position, with the corresponding ends of the parallel members and the movable members free.

7. Apparatus for assembling mattresses comprising two spaced parallel rows of spaced standard posts, a pair of parallel members adapted to contact one face of a mattress inner spring each horizontally fixed toward a corresponding end in one of the said rows of standard posts, and having its other end free, a pair of standard posts positioned intermediate of the said parallel rows of standard posts, a movable member, adapted to press the other face of the mattress inner spring and to bend it between the said fixed members, pivoted toward one end on one of the said intermediate standard post and having its other end free and means on the other intermediate standard post to anchor the said movable member in position with its end free and unsupported.

8. Apparatus for assembling mattresses, comprising a pair of spaced means, having corresponding free ends, adapted to contact one face of a mattress inner spring, means having a free end corresponding to the free ends of said spaced means and adapted to contact the other face of the mattress inner spring along its center, the means contacting the opposite faces of the mattress inner spring being movable with respect to one another and adapted to bend and hold the mattress inner spring between them, but so that it may be withdrawn over their free ends.

9. Apparatus for assembling mattresses com-

prising a pair of spaced parallel members fixed in horizontal position and having corresponding free ends adapted to contact one face of a mattress inner spring, a third member parallel to and between the said fixed members and movable toward or away from their plane, adapted to contact the other face of its inner spring and to bend the mattress between the said fixed members and means to actuate said third member, corresponding ends of the fixed and movable members being free.

10. Apparatus for assembling mattresses comprising a pair of spaced frame standards, a pair of spaced members fixed by corresponding ends in the said frame standards, their other ends being extended free and parallel and adapted to contact one face of a mattress inner spring, each of said frame standards being slotted vertically substantially intermediate the ends of the fixed members and a movable member reciprocable within the said slots and having an extended free end and adapted to contact the other face of the mattress inner spring and to bend it between the said fixed and movable members, and means to reciprocate such movable member.

11. Apparatus for assembling mattresses comprising a pair of spaced frame standards, a pair of spaced members fixed by corresponding ends in the said frame standards, their other ends being extended free and parallel and adapted to contact one face of the mattress inner spring each of said frame standards being slotted vertically intermediate the ends of the fixed members, a movable member reciprocable within the said slots and having an extended free end and adapted to contact the other face of the mattress inner spring and to bend it between the said fixed and movable members, means mounted on the said frame standard and engaging the said reciprocating member to operate the same.

12. The method of constructing a mattress, which comprises the steps of preparing a padded mattress envelope having completed, rounded corners and being entirely closed except at one edge seam between the corners, preparing a complete, independent, inner spring unit, equal to the capacity of the envelope, embodying helically coiled springs interconnected at their ends and surrounded by continuous, resilient, wire loops, bending the spring unit, within the range of its resiliency, longitudinally through its whole length, completely inserting it, while held so bent by force applied directly to it, through the open end edge seam, allowing the spring unit to flatten out through its own resiliency, progressively from its inner end outward, and then permanently closing the seam in the end of the mattress envelope.

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