Jan. 28, 1947. R. A. RICHARDSON 2,414,978

BOX SPRINGS AND METHOD FOR MAKING SAME

Filed Dec. 2, 1942 3 Sheets-Sheet 1

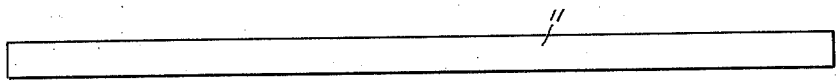


Fig. 1.

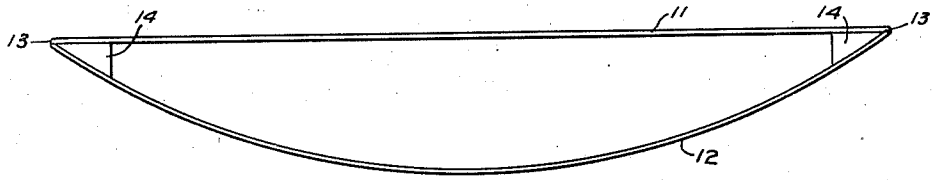


Fig. 2.

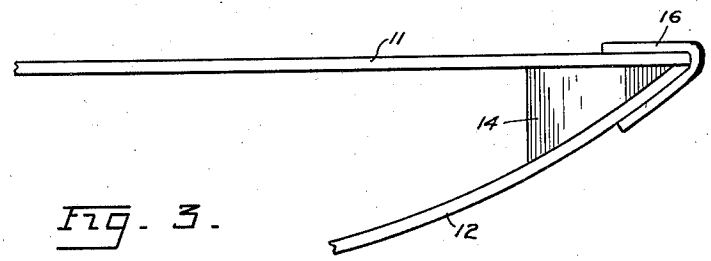


Fig. 3.

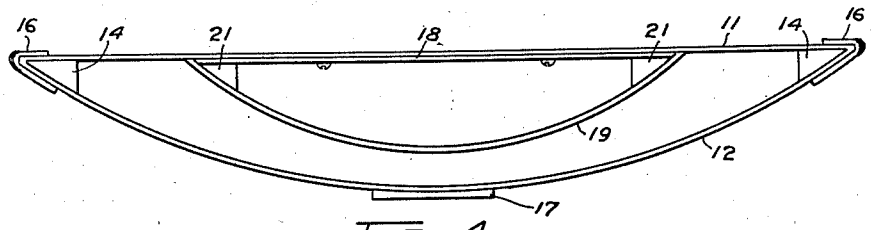


Fig. 4.

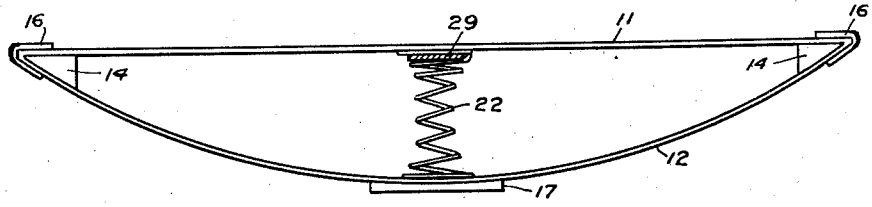


Fig. 5.

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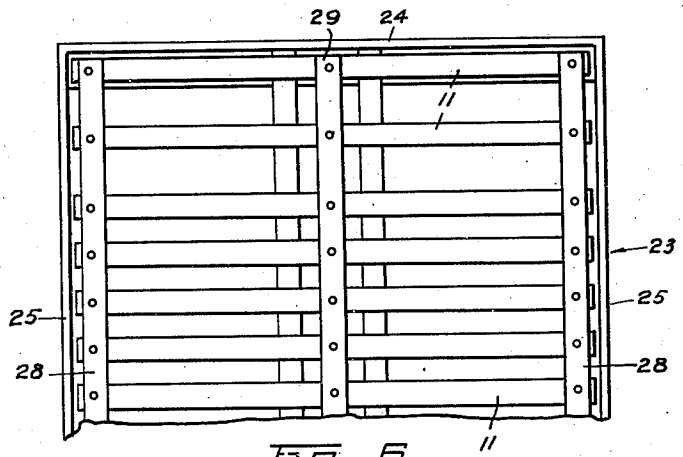


Fig. 6.

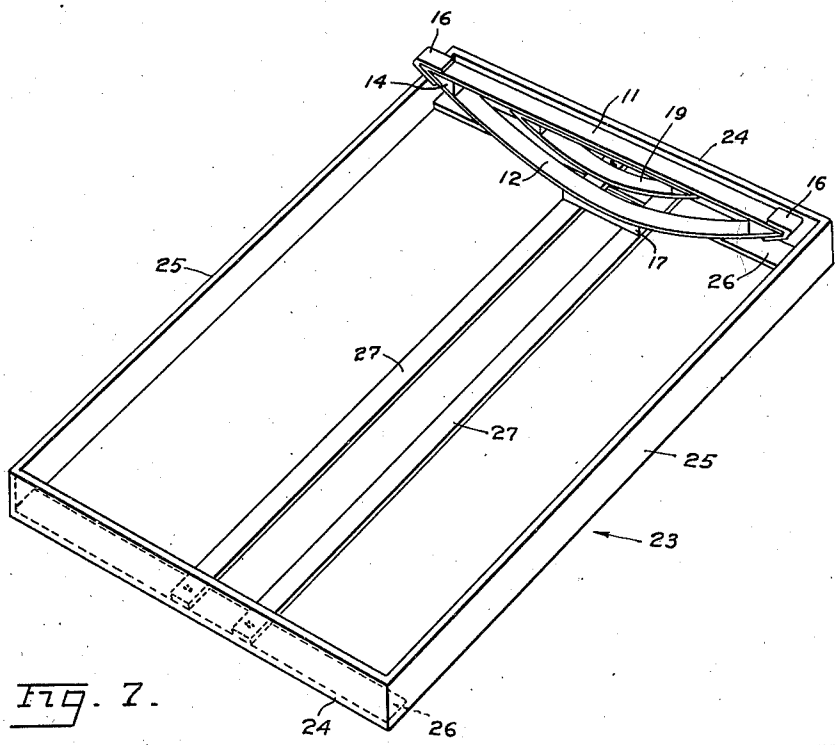


Fig. 7.

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BOX SPRINGS AND METHOD FOR MAKING SAME

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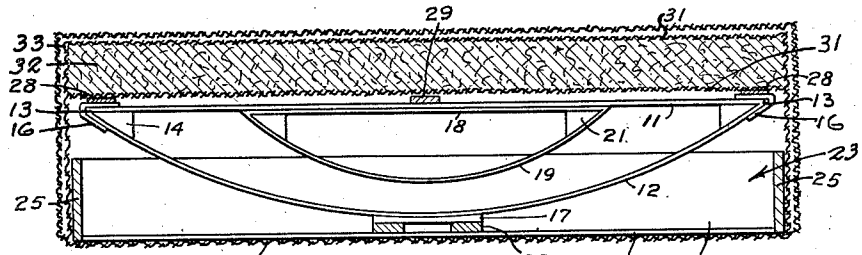


Fig. 8.

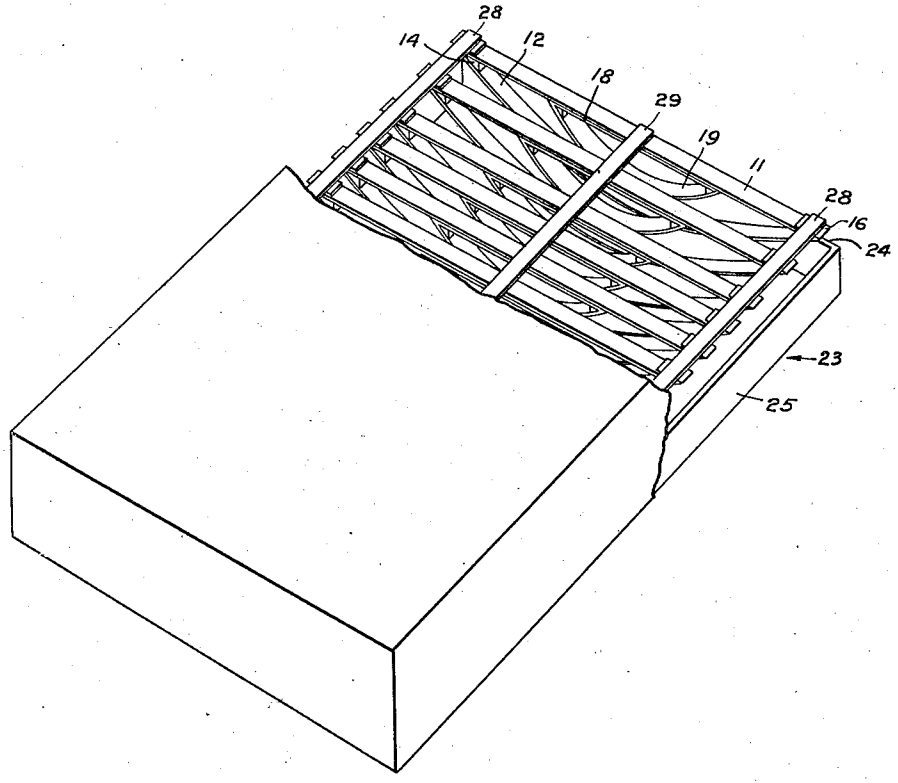


Fig. 9.

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UNITED STATES PATENT OFFICE

2,414,978

BOX SPRINGS AND METHOD FOR MAKING SAME

Robert A. Richardson, Oakland, Calif.

Application December 2, 1942, Serial No. 467,665

2 Claims. (Cl. 5—237)

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This invention relates to box springs and a method for making the same.

An object of the invention is to provide a method and device whereby box springs of the type used in mattresses, cushions and the like, can be made efficiently with a minimum of metal parts or, if necessary, entirely without metallic springs, in such a way that the box springs have the desired resiliency, both vertically and for lateral tilting toward the edges thereof.

Another object of the invention is to provide a method wherein a box spring is made of a plurality of compressible members made almost entirely of non-metallic materials and united to provide a resilient support, the parts of which do not weaken or separate in use and maintain the relative pre-set positions throughout the life of the box springs.

Another object of the invention is to provide a method for making box springs and spring units for the same which are constructed mainly of non-metallic resiliently flexible material such as strips of wood, and the elements of which are permanently connected so as to provide a constant radius of curvature for the resiliency and also a nearly integral union between the elements making up the individual spring units; the units are so spaced and connected into a box spring as to provide for vertical, as well as tilting resiliency.

Another object of this invention is to provide a box spring and a method for making the same which is highly useful and simple in construction. Convenience of arrangement, lightness and comparative inexpense of manufacture are further objects which have been borne in mind in the production and development of the invention.

Other objects of the invention together with the foregoing will be set forth in the following description of the preferred method, and the preferred embodiment of means for practicing the same, which is illustrated in the drawings accompanying and forming part of the specification. It is to be understood that I do not limit myself to the embodiment disclosed in said description and the drawings as I may adopt variations of my preferred forms within the scope of my invention.

With the foregoing and other objects in view, which will be made manifest in the following detailed description, reference is had to the accompanying drawings for the illustrative embodiment of the invention, wherein:

Fig. 1 is a plan view of one of the spring units

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at the preliminary assembly of the parts of the unit.

Fig. 2 is a side view of said spring unit showing the assembly for the predetermined radius of the bow member of the spring.

Fig. 3 is a fragmental view of one end of the spring unit showing the forming of the corners of the spring unit by the sweated sleeve thereon.

Fig. 4 is a side view of the spring unit with a secondary shock absorber bow thereon.

Fig. 5 is a side view of another form of the spring unit with a coil spring between the center of the bow and the top member.

Fig. 6 is a fragmental plan view of a box spring showing the relative spacing and arrangement of the spring units thereon.

Fig. 7 is a perspective view showing one of the spring units assembled and in position in the frame of the box spring.

Fig. 8 is a sectional view of a box spring constructed in accordance with the herein invention; and

Fig. 9 is a perspective view partly in section of the completed box spring.

In the herein illustrative embodiment of the invention a comparatively narrow strip 11 preferably made of wood or the like light material is cut to the length substantially corresponding to the width of the box spring. A bow 12 made up of a flexible strip of wood of the same width as that of the straight strip 11 is so formed that the chord between its ends 13, when the bow is bent to the desired curvature, is the same as the length of the straight strip 11. A radius block 14 also preferably made of wood is wedged into each corner where the end 13 of the bow 12 meets an end of the straight strip 11, and the meeting ends are temporarily secured on the block either by glue or by small securing staples or nails. Over this temporary assembly at each corner is sweated an angle piece 16 of wood, so that when the piece 16 shrinks on the outside of the corner it tightly presses and holds the meeting ends of the bow 12 and the strip 11 against the respective radius blocks 14. On the bottom of each bow 12 is a reinforcing rest 17, also preferably made of wood and stapled or otherwise secured to the bow 12, on which the bow rests when in place in a box spring frame.

In one form of my invention a secondary, or shock absorbing spring member is provided inside of the main spring unit in the form of a shorter straight strip 18 also made of wood with a shorter bow 19 of wood connected on smaller radius blocks 21 at each corner, said blocks be-

ing secured to strip 18 and strip 18 being secured to the under side of the larger flat strip 11 so that the center lines of the outer and inner spring units coincide. The bottom of the inner bow 19 is so spaced from the bottom of the outer bow 12 as to allow a substantial compression of the outer bow 12 before the secondary bow 19 bumps the outer bow 12. The inner bow 19 in its lowered position absorbs further shock compression of the spring unit. This prevents deterioration or breaking of the outer spring bow 12.

In the modified form shown in Fig. 5, a coil spring 22 is placed in the center of the spring unit so that one end of the coil spring 22 bears against the inside of the reinforced middle of the bow 12, and the other end of the coil spring 22 bears against the under side of the middle of the straight strip 11. If desired, suitable leaf springs may be used for the same shock absorbing action.

In both embodiments of the invention sweating or shrinking of the piece 16 is accomplished by temporarily holding the sleeve 16 in position while it dries. This is preferably performed in suitable corner jigs or holders, not shown, or by temporarily tacking the sleeve 16 in place until it dries.

In the herein illustration, the aforedescribed units are assembled and used in a box spring frame denoted in its entirety by the numeral 23. This frame has two ends 24 and two sides 25, the height of which is substantially smaller than the distance between the bottom of the bow 12 and the top strip 11. Each end 24 has an inwardly extended bottom flange 26. A pair of longitudinal strips 27 are secured on these end flanges 26 parallel with the longitudinal center line of the frame 23 so as to form the bottom of the frame on which the spring units are supported. The spacing between the bottom strips 27 of the frame 23 is such as to conform to the short reinforcing rests 17 on the bottom of the bows 12. The bottom strips 27 are so spaced from the sides 25 of the frame 23 as to leave enough space for the replacement of any damaged or broken spring unit of the type shown in Fig. 4. The broken unit can be disconnected from the top strips 28 and 29 and withdrawn endwise through the space between the strips 28 and the sides 25 of the frame 23, and a new spring unit can be inserted in its place through said space and suitably secured to said top strips. Thus the box spring can be repaired without complete dismantling, because only the dust-proof bottom cover has to be removed to permit replacement.

The spring units are positioned transversely in the frame 23, in the herein embodiment so that the spacing between the parallel units near the opposite ends of the box spring is substantially larger than the spacing between the units toward the middle of the box spring. For instance, in the present illustration, if ten of these bow spring units are used, the spacing between the center four units is substantially smaller than the spacing between the three units at each end. This arrangement provides for the graduated stiffness of the box spring according to the usual distribution of weight thereon. The parallel units are held in aligned position by longitudinal top strips 28, one at each end of the respective units, extending the full length of the box spring. It is to be noted that the strips 28 are secured over the top portions of the respective pieces on the units thus holding spring units in proper alignment. The strips 28 are preferably made of somewhat resilient material such as wood. A central longitudinal strip 29 of wood is extended across the top of all the bow spring units in the assembly. This strip 29, in the embodiment of the spring units shown in Fig. 4, is stapled or otherwise fixedly secured across the middle of the top of the straight spring strips 11. In the embodiment shown in Fig. 5, this top strip 29 is extended between the top turn and the next adjacent turn of the coil spring 22 so that the last two turns of the coil spring 22 near the straight strips 11 hold the longitudinal central strip 29 in position.

This assembly of bow spring units is then held in the frame 23 by suitable covering. In the usual manufacture of box springs, a burlap or the like cover 31 is secured over the entire top of the assembled units. Then filler or padding material 32 in the form of the usual sisal and felt or the like is placed on the burlap. Then the sides and top of the box spring are covered all around with ticking 33 which is sewn or otherwise secured around the box spring. The bottom of the frame 23 is covered by suitable dust-proof material 30. In the event of cushion units, the ribs or spring units are made of smaller dimensions and are united in the form required for the usual cushion units. Units for the inside, back and seat on divans, chairs, living room furniture, and the like, are similarly formed in suitable dimensions.

In all the forms of these assembled spring units there is a distribution of the resiliency according to the expected distribution of weight on it in use. The parts of the spring units are practically integrally united and any loosening in use of any of the joints is positively obviated. The vertical tension up and down is determined for primary and secondary resilient action respectively by the outer bow springs and by the inner bow springs in one form, and by the coil springs in the other form. In addition to this vertical tension the entire unit also provides for a rocking action, or a so-called full clipper edge toward all sides. This is accomplished by the substantial spacing of the top edges of the bow springs from the top edges of the sides of the frame 23. In other words, in case the distribution of weight on the box spring requires a tilt toward either side, rocking action is permitted to a practical suitable degree before the corner of the bow springs would abut against the top edges of the sides of the frame 23. None of the joints under tension are united by glue or adhesive or the like, which may slip or loosen under continued tension to which it is subjected in use. The units are sturdy, they are securely held in assembled position yet allow both up and down or vertical resilient action, as well as rocking action, so as to provide a fully resilient box spring without the use of the usual metallic springs to the extent to which they were necessary in the past. The wood or other resilient non-metallic materials used in these units are suitably treated and are such as to resist any deteriorating action thereon and thus the life of box springs constructed in accordance with my invention favorably compares with the metallic box springs used in the past. An additional advantage of the spring units herein described is lightness without sacrificing strength and firmness, also added flexibility to conform to the distribution of weight on the box spring, and the facility of assembling and manufacturing. Especially important advantage under present conditions is the providing of an efficient and good

box spring without the use of strategic materials such as the large number of metal springs, or steel frames, which were necessary in structures heretofore used. The steps of the method are simple, and the assembly and manufacturing of this box spring may be performed by labor ordinarily available. The finished box spring may be conveniently and easily handled and efficiently used.

I claim:

1. A spring unit for a box spring and the like, comprising a straight strip, a bow strip having its ends connected to the ends of the straight strip, a filler wedge in each corner between the meeting ends of said strips, a securing member sweated on the outside of each corner so as to fixedly hold the ends of said strips against the adjacent corner wedge, and a secondary unit inside said unit including a straight strip, a bow strip, a corner wedge to which the ends of said last strips are secured, the straight strip of said inner unit being secured to the first straight strip so that the second bow strip is within and spaced from the first bow strip, the second bow strip being smaller than the first bow strip.

2. A box spring comprising a frame, a plurality of spaced spring units positioned transversely on the frame, each of said spring units including a bottom strip formed by a resiliently flexible bow of such curvature that the ends of said bows are spaced above the top edges of said frame, a straight strip forming the top of the spring unit across said bow, means to hold said spring units in predetermined spaced relation to each other but free from the front and rear sides of the frame, supporting elements extended longitudinally in the middle of said frame and spaced from the parallel sides of the frame, and a reinforcing rest on the outside of each bow of each spring unit resting upon said supporting elements so that the portions of the bow members on each side of said rest may be depressed toward said frame, said bow spring units being spaced from each other at wider spacings nearer the ends of said frame than the spacing between the spring units near the middle of said frame.

ROBERT A. RICHARDSON.