Feb. 11, 1941. F. A. NACHMAN ET AL 2,231,732

RESILIENT CORE FOR UPHOLSTERY UNITS

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Fig. 1.

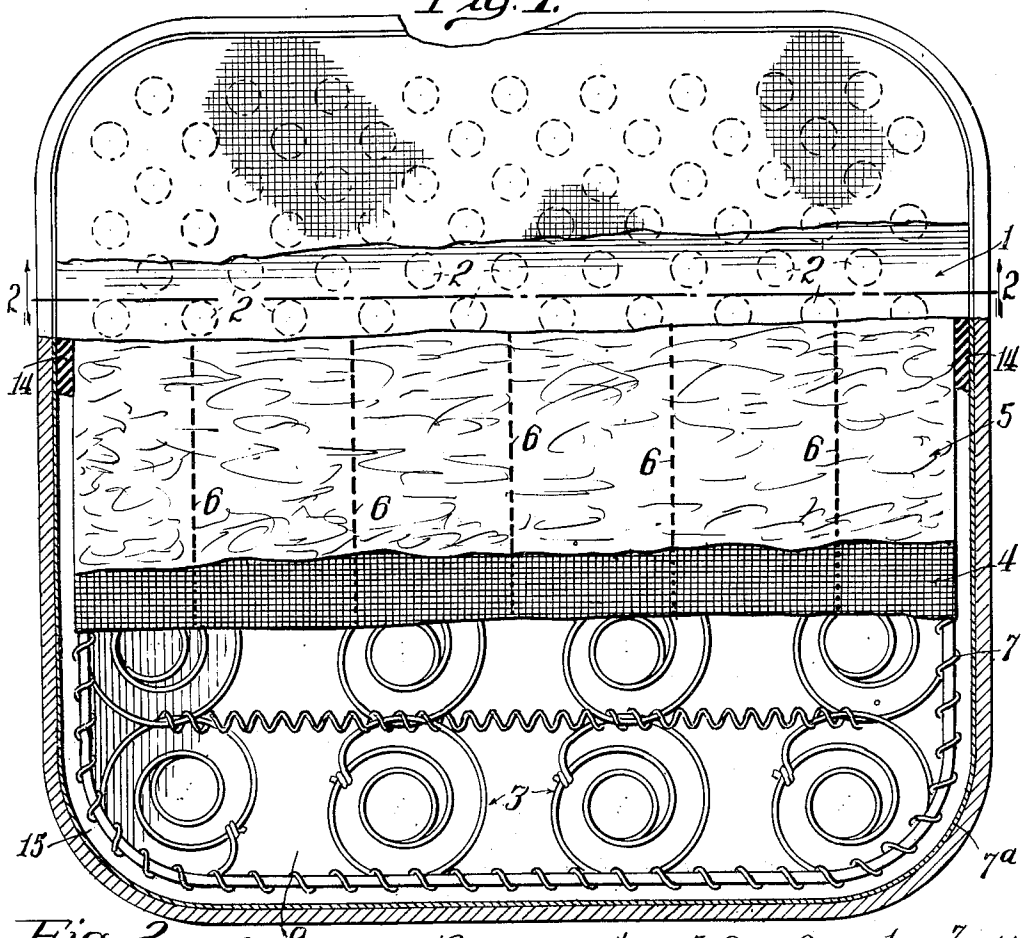
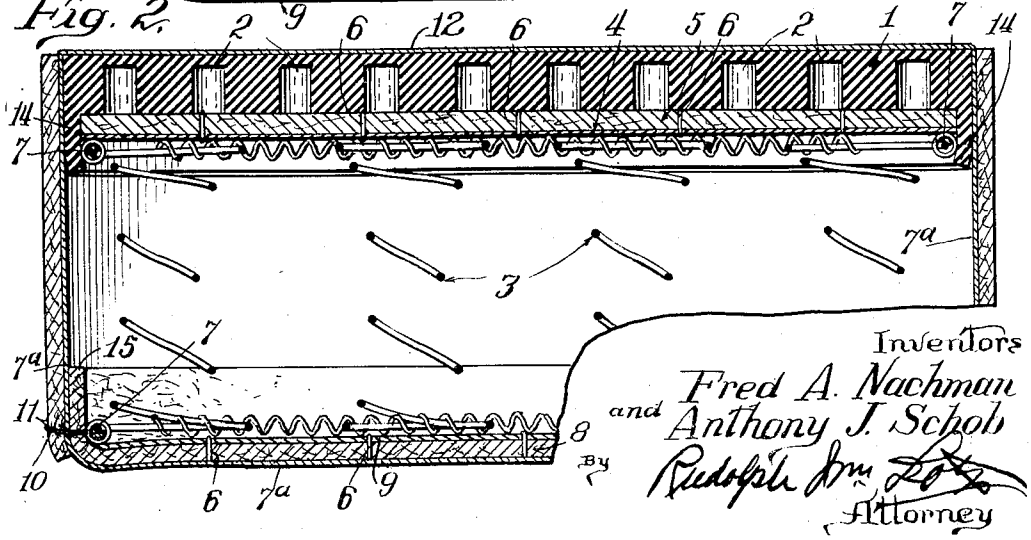


Fig. 2.



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Fig 4.

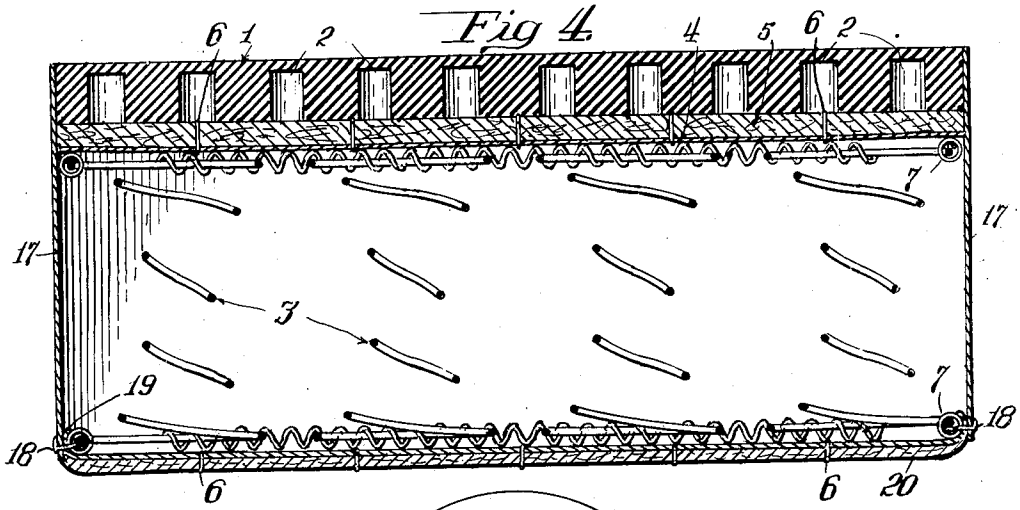


Fig. 3.

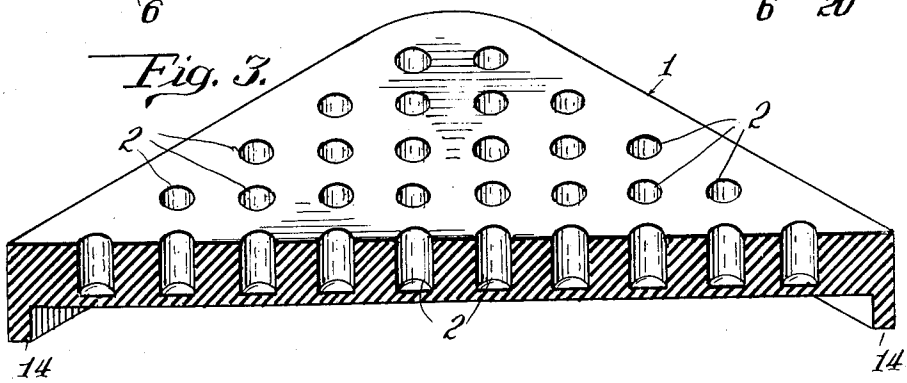
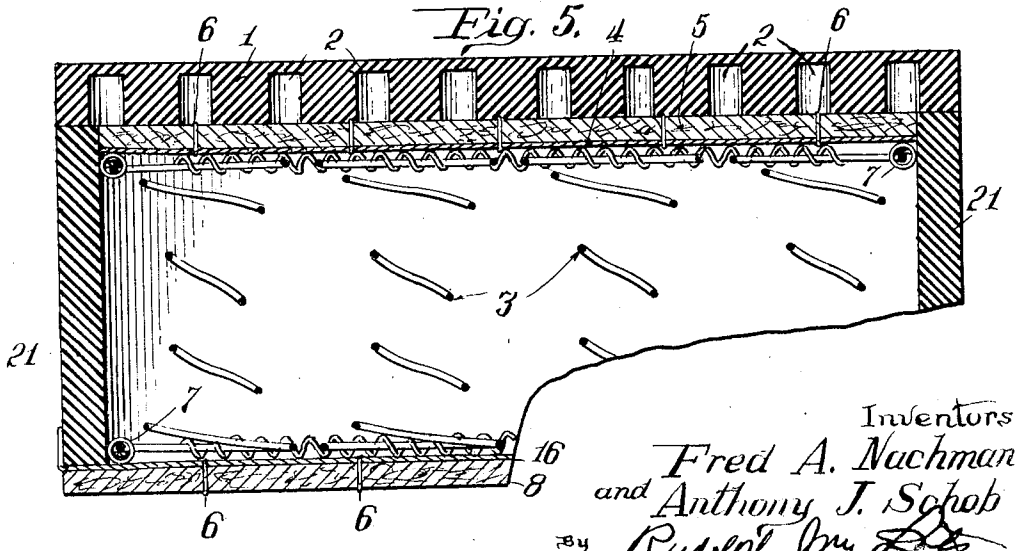


Fig. 5.



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RESILIENT CORE FOR UPHOLSTERY UNITS

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Application April 5, 1939, Serial No. 266,046

5 Claims. (Cl. 155—179)

The main object of the present invention is to provide a core, hereinafter referred to as a spring assembly, for upholstery which spring assembly possesses very advantageous characteristics, as hereinafter particularly pointed out, which relate also to the upholstery units into which said spring assemblies are incorporated.

Suitable exemplary embodiments of the invention are illustrated in the accompanying drawings, wherein,

Fig. 1 is a top plan view, with parts broken away, of a resilient core for an upholstery unit constructed in accordance with the invention.

Fig. 2 is a vertical sectional view of the same taken on the line 2—2 of Fig. 1.

Fig. 3 is a perspective view, partly in section, showing a molded pad of spongy resilient material constituting an element of the structure of Figs. 1 and 2.

Figs. 4 and 5 are views similar to Fig. 2 illustrating modified forms of construction of the device.

Recently a product commonly known as latex foam rubber, which is very similar to sponge rubber, but which possesses advantages over the latter, has come into use as a filler for upholstery units and is used quite extensively in railway car seats. The said product is expensive, in comparison with conventional spring assemblies for upholstery, in instances where depth of the filler for the upholstery unit is of consequence to assure the highest degree of comfort for occupants.

Said product is extremely resilient, but possesses very litle tensile strength. Its resilience is of such degree that it has little load supporting power per square inch or square foot, so that in order to prevent complete collapse of the same under the influence of the weight of a person occupying a chairseat filled with a cushion element composed entirely of said product, said element is required to be of relatively great depth and is thus rendered very expensive by comparison with conventional spring assemblies and padding.

It is, therefore, the main object of the present invention to combine a pad of said product with a conventional type of spring assembly in such manner as to obtain the main advantages incident to both types of structures at low cost and to great advantage in other respects.

To effect such a combination presents problems, the solution of which, as embodied in the structure of the present invention, has been the result of long and expensive experiment to produce the desired results at very low cost.

A further and important object of the invention is to so construct a spring assembly for upholstery equipped with a pad of said spongy material as to prevent crawling of the latter under conditions of use relatively to the other parts of the assembly whereby the pad is caused to bunch at some point or points and leave its supporting surface bare at another point or points.

A further important object of the invention is to so form or construct the pad with respect to depth, hollows, etc. therein and the size and spacing apart of said hollows and the resulting degree of yield of the pad per se to load and with respect to the degree of yield of the component springs of the assembly in order that a relation between the yield of the springs and that of the pad is established and maintained to render the mattress or cushion into which the structure is incorporated to be of maximum degree of comfort.

As shown in Fig. 3 of the drawings, the pad 1 of the spongy material is provided in one face thereof with a large number of spaced apart cells 2 which, while shown to be cylindrical, may be of any other suitable shape. The size and spacing apart, as well as the depth of said cells may be varied somewhat according to the exact nature of the material which can be produced in various degrees of density. The more dense the material the greater will be the total area occupied by the cells thereof determined either by the size and spacing apart of said cells or an increase in same and decrease in the spacing apart thereof. The cells are of depth preferably equal to two-thirds to four-fifths, more or less, of the thickness of the pad. The said thickness of the pad may also be varied in inverse ratio to the density of the material of which it is composed.

The cells are in the lower face of the pad, the upper face of which is generally so smooth and unbroken as to be free of more than almost microscopic voids, this being due to the fact that said face is in contact with the surface of the mold in the manufacture of the pad. This smoothness applies also to the peripheral face of said pad.

The spring assembly 3 employed, may be of substantially any of the many conventional types wherein the individual springs are so interconnected as to be capable of relative pivotal movement of a more or less universal degree, whereby the surface of the assembly supporting the load is enabled to conform itself to the contour of the surface of the load resting thereupon within the limits defined by the diameter of the end coils of the springs which, when incorporated into upholstery units, are covered by sufficient padding to render them unfelt by the occupants of said units.

The component springs of such spring assemblies are selected with respect to their yield in inches of compression per pound of load according to the nature of the unit into which the assembly is to be incorporated, stiffer springs being used for seat cushions than for mattresses, for example. The depth and nature of the fibrous padding used in the spring-filled upholstery units also varies to suit the particular types of such units and the degree of yield of the springs, as aforesaid, and also the diameters of such springs.

While the general and customary practices, as to the type and amount of fibrous padding over the load-supporting face of the spring assembly, may be adhered to for constituting a support for the spongy pad, the best results are obtained by employing a special type of support which comprises a sheet 4 of suitable fabric, preferably cotton duck, to which a thick layer or batt 5 of a long fibre material, such as sisal fibre, is firmly secured by means of stitch chains 6. The latter prevent movement of the batt relatively to the fabric base and also prevent the fibrous material from being sucked up into the cells of the spongy pad, it being obvious that during compression of said spongy pad, air is expelled from the cells 2 and also from the body of the material, so that upon release of pressure on the said pad 1, a relatively strong suction takes place which will cause loose fibre to be sucked up into the cells 2. In the case of long fibres firmly secured to a fabric base, this cannot occur and thus the initial resiliency of the pad 1 is preserved.

The surface of the pad 1 opposed to and resting upon the batt 5 presents a very porous surface which obtains a relatively strong frictional hold on the batt and thus prevents slippage of said pad 1 along the batt 5.

The sheet 4 of fabric is stretched over the spring assembly 3 and firmly secured thereto marginally in any suitable manner, thus to provide a relatively firm support for the batt 5 and prevent sagging of the latter into the hollows presented at the ends of the component springs of the assembly. However, the stretching of the fabric 5 over the spring assembly, combined with the pressure of the batt upon said fabric over said hollows, has the effect of placing stresses upon the spring assembly 3 which will cause the latter to contract longitudinally and laterally and it is, therefore, preferable to employ a type of spring assembly which will resist such contractions efficiently. The spring assembly illustrated in the drawings is equipped with a flat wire border frame 7 which most efficiently resists such contraction.

The material of the pad 1 cannot be held in place by stitching as stitches tear out very easily and also cause lumps of the material to be torn out of the pad. The latter must be held securely in position on the batt 5 of a spring assembly from the time it leaves the factory until it has been incorporated into an upholstery unit and to this end the assembly 3 is disposed in a shallow bag 7a of a suitable fabric and of a depth sufficient to cause the peripheral edge of the pad 1 to lie within the mouth portion of said bag 7a to which said pad 1 is suitably cemented.

Preferably, a batt 8 of suitable fibrous material is disposed between the bottom wall of the bag 7a and a sheet 9 of fabric stretched over and secured to the bottom face of the spring assembly to provide a padded base for the latter.

The peripheral wall of the bag 7a constitutes a boxing strip for the spring assembly 3 between which and the opposed boxing strip of the cover fabric of the completed upholstery unit a layer 10 of padding material may be interposed. Said layer may be secured to the outer face of the peripheral wall of the bag by stitching 11 as shown and thus made a part of the spring assembly per se.

In instances where the spring assembly is to be introduced into an open end or side of a cover structure of conventional type, the boxing strip of which is of less height than the full depth of the spring assembly, the bag 7a may include a top wall or apron 12 of fabric integral along one edge with a peripheral wall of the bag 7a and secured to several other upper edges of such peripheral wall and disposed over the pad 1 to provide a surface which affords far less frictional resistance to insertion into the cover structure of the upholstery unit than is presented by the exposed surface of the pad 1, as a very snug fit of the spring assembly within the cover fabric is required in order that the boxing strip of the latter may be maintained normally taut.

As the material of the pad 1 compresses very easily, the pad 1 may, as shown in Figs. 1 and 2, be provided with a relatively thin peripheral flange 14 which presents a shallow receptacle for the upper end portion of the spring assembly with batt 5 attached. This receptacle is of smaller lateral dimensions than the spring assembly, so that said flange 14 is stretched over the latter to hold the pad 1 firmly in place without dependence upon the bag 7. In such event, as shown in Figs. 1 and 2, the padding 8 for the lower face of the spring assembly is provided with a protruding peripheral edge portion 15 which is turned upwardly along the lower peripheral edge of the assembly 3 to provide an outer face portion vertically aligned with the outer face of the flange 14 and which is maintained in its upturned position by the peripheral wall of the bag 7a. The peripheral wall of the latter constitutes the equivalent of a boxing strip which, obviously, may be separate from the bag bottom and suitably secured otherwise along its lower edge to the lower edge of the assembly to perform its function.

The said flange 14 of the pad 1 may be of a depth to receive the entire spring assembly including the top and bottom batts of the latter and have its lower edge cemented to a fabric sheet 16 stretched over the lower batt of the assembly. Said flange 14 may be integral with the pad 1 or may be a separate strip of the same material cemented along its upper edge to the peripheral edge portion of the lower face of the pad 1 which, in such event, is made of sufficiently larger area than the spring assembly to provide such a peripheral lower edge portion as shown in Fig. 4.

The lower face of the pad 1 obtains such a strong hold on the fibres of the batt 5 that no part of the material resting upon the batt becomes displaced under the influence of such stresses as result from localization of load on the upholstery unit or from occupants of seating units sliding from one to another position, such sliding movements being particularly adapted to gradually effect displacement of the pad from its normal position to cause it to bunch along a part of its area and produce a corresponding void along another part. This also produces tension stress on the pad which may cause it to tear or

may cause it to become disengaged from the boxing strip shown in Figs. 2, 4 and 5.

The assembly, as illustrated in Figs. 1 and 2, may be introduced into a mattress or cushion comprising a bag open at one end, by means of the conventional mattress filling or stuffing machine wherein the said cover bag is disposed over the rectangular tube of the machine through which the spring assembly is forced against the rear wall of said cover bag and progressively skins the latter off of said tube. This machine is familiar to all upholsterers as it has been in use in the mattress making industry more than half a century.

As shown in Fig. 4, the strip 17 of fabric is cemented along its upper edge portion to the pad 1, which in this instance is devoid of the peripheral flange 14, and at its lower end is secured to the border frame of the spring assembly by means of suitable ties 18 extending through the flange 19 of the lower batt 20 of the spring assembly which is identical with the batt 8 of Fig. 2. The said strip 17 constitutes a boxing strip for the spring assembly and may be, as shown in Figs. 1 and 2, devoid of the outer padding illustarted.

As shown in Fig. 5 in place of employing a flange 14 integral with the pad 1, a strip 21 of the resilient material may be disposed peripherally of the spring assembly per se and cemented along its upper edge to the marginal lower face portion of the pad 1 and at its lower end cemented to the strip of fabric 16 to which the batt 8 is secured.

We claim as our invention:

1. A core for an upholstery unit comprising a conventional spring assembly equipped with a cover batt secured to and overlying its supporting face, and a pad of spongy resilient material disposed over said batt, and a bag enclosing said spring assembly and said batt and said pad, said bag being open at its top and of a depth equal to that of said spring assembly and pad and having its peripheral wall secured along its upper edge portion to the peripheral wall of said pad.

2. A core for an upholstery unit comprising a conventional spring assembly equipped with a cover batt secured to and overlying its supporting face, a strip of fabric secured to the periphery of said assembly and projecting along one edge above the level of said batt and a substantially honeycombed pad of a spongy resilient material having its cells open at bottom and closed at top disposed upon said batt and secured along its periphery to the projecting edge of said fabric strip.

3. A structure of the type specified comprising a conventional spring assembly equipped with cover batts of fibrous material stitched to supporting backing sheets of fabric secured along their marginal edge portions to the spring assembly at top and bottom of the latter, and a pad of spongy resilient material of larger area than said assembly overlying one face of the latter and equipped with a peripheral flange embracing the adjacent peripheral edge of said essembly and held against displacement thereby, the batt forming the other face of said assembly having a marginal edge portion turned to embrace the adjacent peripheral edge portion of the assembly, and fabric disposed peripherally of the assembly and secured along one edge portion to the peripheral wall of said pad and having its other edge portion disposed about the marginal turned edge of the last-named batt and secured to said assembly and maintaining said marginal edge portion of the last-named batt with its extreme edge opposed to the flange of said pad.

4. A structure of the kind specified comprising a bag open at the top, a bottom pad covering the bottom of said bag, a conventional spring assembly disposed within said bag with its peripheral edge embraced by the peripheral wall of said bag, said peripheral wall being of appreciably greater height than said assembly, a sheet of fabric disposed tautly over the top of said assembly secured marginally to the latter, a batt of long fibre material covering and secured to said fabric sheet by parallel stitch chains to prevent displacement of its component fibres, and a pad of resilient spongy material covering the said batt and embraced by and secured to the upper edge portion of the peripheral wall of said bag.

5. A structure of the kind specified comprising a bag open at the top, a bottom pad covering the bottom of said bag, a conventional spring assembly disposed within said bag with its peripheral edge embraced by the peripheral wall of said bag, said peripheral wall being of appreciably greater height than said assembly, a sheet of fabric disposed tautly over the top of said assembly secured marginally to the latter, a batt of long fibre material covering and secured to said fabric sheet by parallel stitch chains to prevent displacement of its component fibres, and a unitary pad of spongy resilient material equipped in one face thereof with relatively large equally spaced apart cells extending almost through the same disposed with the open ends of said cells opposed to said batt and completely covering the latter, the peripheral edge of said pad secured to the upper edge portion of the peripheral wall of said bag.

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