Sept. 4, 1934. W. B. FOSTER 1,972,397

SPRING CUSHION CONSTRUCTION

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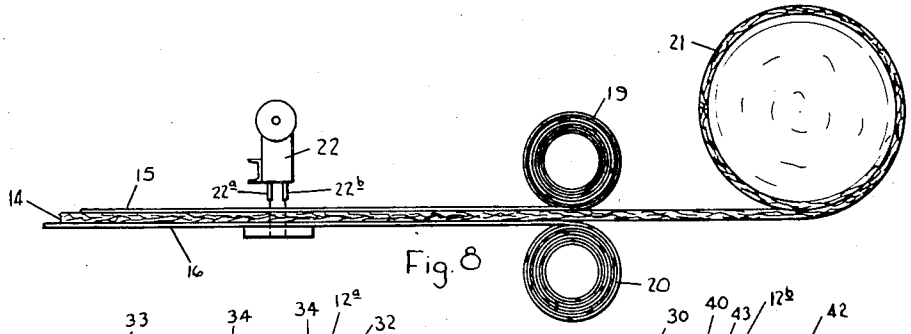


Fig. 8

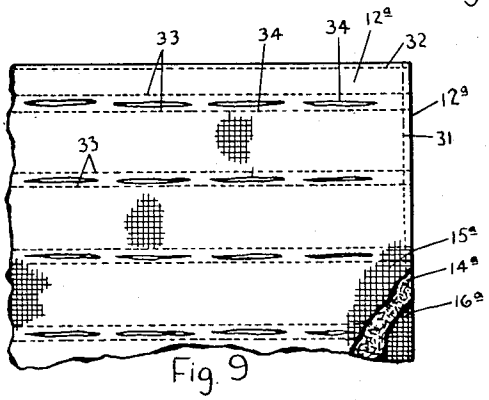


Fig. 9

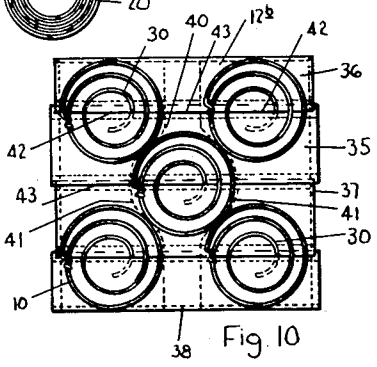


Fig. 10

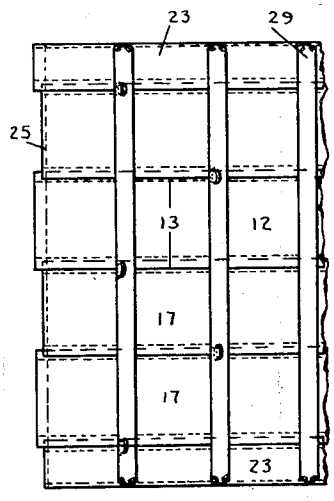


Fig. 3

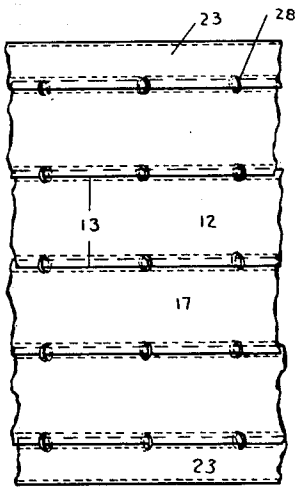


Fig. 2

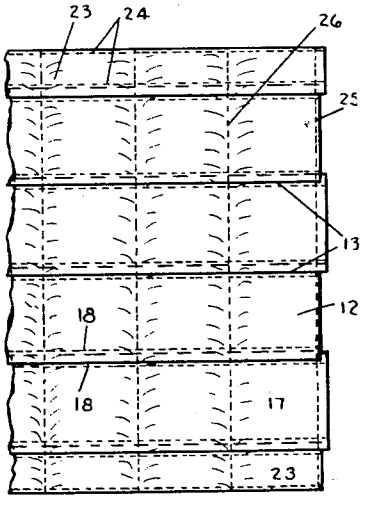


Fig. 1

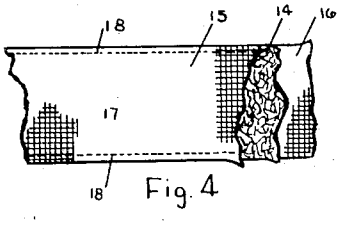


Fig. 4

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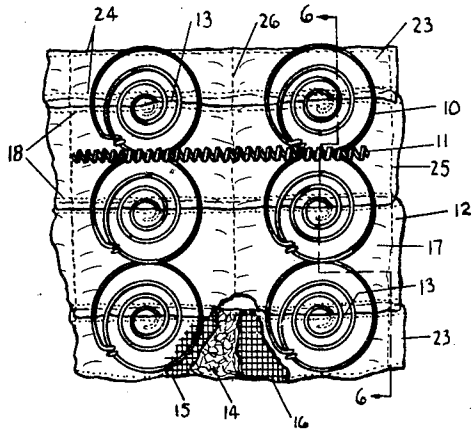


Fig. 5

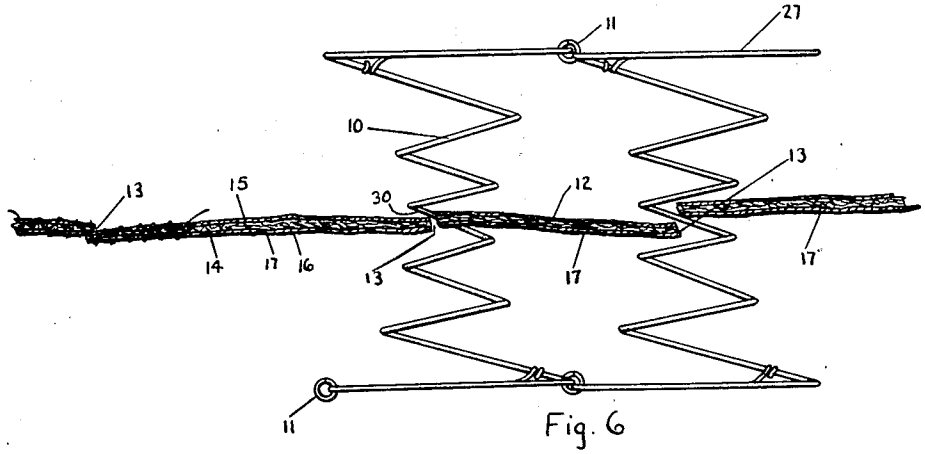


Fig. 6

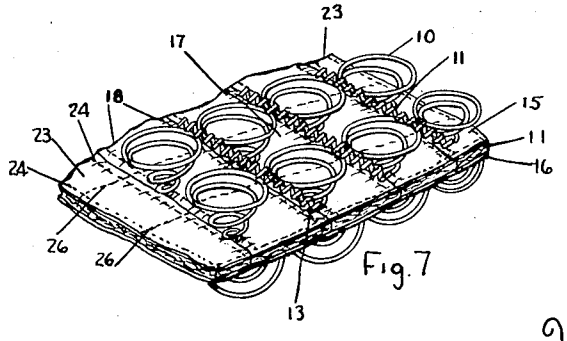


Fig. 7

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Patented Sept. 4, 1934 1,972,397

UNITED STATES PATENT OFFICE

1,972,397

SPRING CUSHION CONSTRUCTION

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Application October 9, 1933, Serial No. 692,722

4 Claims. (Cl. 5—309)

This invention relates to a spring cushion construction and particularly to a spring cushion having a silencer pad mounted on the springs intermediate their ends and to the silencer pad therefor and to the process of making the pad and mounting it on a set of springs to form a complete construction.

The purposes of my present invention are to provide a new and improved spring cushion construction and one that can be easily and economically manufactured or assembled and that is effective in eliminating noise from the metal springs and remains noiseless after long use; to provide a new and improved form of silencing pad especially adapted to be readily mounted upon a set of springs and to remain in position therein without the use of further fastening means and generally to point out the process of making such a spring cushion construction and the silencing pad therefor.

Further objects and advantages will appear from the specification and claims herein.

Figs. 1, 2 and 3 are plan views of the top or bottom of parts of three forms of silencing pads that may be used in constructions embodying this invention.

Fig. 4 is a plan view of part of a silencing strip especially adapted to be used to make such silencing pads, parts of the top layer of fabric and of the fibrous filling being removed to more clearly show the construction.

Fig. 5 is a top view (with parts broken away) of a portion of a spring cushion construction embodying my invention, the pad shown being of the form illustrated in Fig. 1.

Fig. 6 is a transverse sectional view on line 6—6 of Fig. 5 but on an enlarged scale.

Fig. 7 is a perspective view of part of such a cushion.

Fig. 8 is a diagrammatic view in side elevation of a device for forming the silencing strips.

Fig. 9 is a plan view similar to Fig. 1 of a modified form of pad.

Fig. 10 is a plan view of a construction embodying my invention adapted to a chair seat or the like where the springs are not arranged in regular longitudinal and transverse rows.

Referring to the drawings in a more particular description it will be seen that a spring cushion construction embodying this invention comprises a set of springs 10 arranged in rows longitudinally and also preferably transversely with means 11 connecting the end coils of adjacent springs and a silencing or sound-deadening pad 12 arranged midway the length of, or intermediate the ends of, the springs 10.

The silencing pad 12 is of the length and width of the spring cushion and is mounted upon the springs and loosely but securely held in place intermediate the length of the springs by being provided with slits 13 extending completely through the pad, one of said slits being provided for each spring in the spring cushion and said slits being arranged in rows longitudinally and usually transversely of the pad so that each slit will be positioned substantially diametrically of the circle of its spring.

My preferred form of pad and my preferred method of making such slitted silencing pad is to build up a complete pad out of a plurality of silencing strips 17 with said strips arranged side by side and with the adjacent strips fastened together at spaced intervals, leaving between said fastenings the said slits. Conveniently and preferably also the said silencing strips are composite, being formed of a layer of fibrous packing secured between two layers of fabric. This practice allows of forming the silencing strips out of cheap material such as a filling or packing of fibrous material 14 secured between two layers of fabric as layers 15 and 16 of cloth.

Between the upper fabric layer 15 and the lower fabric layer 16 is placed a length of the fibrous filling 14 such as cotton or the like and these three layers are suitably fastened together near the two side edges as by seams 18 of stitches. There is thus formed a silencing strip 17 as shown in Fig. 4. Fig. 8 shows a diagrammatic view in side elevation of a convenient device for forming these silencing strips 17 in long lengths by drawing cloth from upper cloth roll 19 and from lower cloth roll 20 and fibrous filling from a large roll 21. As the three layers are drawn forward with the fibrous filling between the two layers of fabric the sewing machine 22 with its two needles 22^a and 22^b makes the edge seams 18 of stitches connecting all three layers. This long strip is then cut transversely into suitable lengths to make the silencing strip 17. In the same or an equivalent way half width silencing strips 23 are made having their three layers of material fastened together by rows of stitches 24 near the opposite side edges.

A silencing pad 12 is made up by taking the proper number of full width silencing strips 17 of a proper length for the set of springs to be used and two of the half width silencing strips 23. In Fig. 1 is shown one end of a silencing pad intended to be used with a set of springs having

five longitudinal rows of springs. It will be seen that this pad is formed of four of the full width silencing strips 17 and two of the half width silencing strips 23. This set of strips is placed side by side with the narrow strips at the side edges of the structure as shown in Fig. 1 and preferably with the adjoining edges of the adjacent strips overlapping slightly. Then the strips 17 and 24 are fastened together at the end of the set and at spaced intervals longitudinally of the set by suitable fastening means securing the adjoining or overlapping parts of the several strips. In the construction shown in Fig. 1 this fastening means consists of transversely extending rows of stitches 25 at the opposite ends of the pad and transversely extending rows of stitches 26 preferably extending from side to side of the pad at the proper intervals. The interval between the end seams 25 and the adjacent regular cross seams 26 or between any two of the cross seams 26 is large enough to allow the largest coil which will ordinarily be either end coil 27 of spring 10 to be passed through the slit 13 left between the adjoining edges of any two adjacent silencing strips. In practice as appears in Fig. 5 this space between the transverse seams will be the same as the distance between centers of the adjoining springs in the longitudinal rows. Therefore, this distance may vary according to the construction of the spring filling in that the longitudinal rows may have their springs even slightly overlap or may be just apart or may be appreciably apart as shown in Fig. 5. In the structure shown in Fig. 1 the transverse seams 25 and 26 extend entirely across the structure and so not only fasten adjacent strips together on those lines but strengthen the structure by having the seams 25 and 26 extend crosswise of the strips and so strengthen the pad and make it less liable to be distorted.

In the form of pad shown in Fig. 2 the same number of full width strips 17 are used and of course the two half width strips 23. In this structure also preferably but not necessarily the adjoining strips overlap. The fastening means in this structure are wire or metal ring clips 28 of the type often used in connecting coiled strips and consisting of a U-shaped loop the ends of which are passed through the adjoining strips and then by a proper tool having the ends brought together and usually overlap forming a ring clip. It will be seen that these clips 28 hold the strips assembled in the pad at the necessary points on adjoining strips but do not directly otherwise strengthen the general structure of the pad. It will be understood that the rings 28 will extend in a row across both ends of the pad and also will extend in transverse rows across the pad as shown in Fig. 2 assuming that the springs are arranged in transverse rows as suggested in Fig. 5.

Fig. 3 shows a further modified form of holding the proper number of strips assembled into a silencing pad. In this construction narrow but strong bands 29 of cloth are arranged transversely of the set of strips, one band 29 at spaced intervals similar to the intermediate transverse rows of stitches 26 in Fig. 1. The end bands are fastened as by sewing or clips to each silencing strip and the intermediate bands are fastened to the edge or narrow half width silencing strips 23 and to more or less of the intervening middle strips preferably at adjoining edges thereof according to the requirements of the structure. In other words, by fastening these bands of cloth to the silencing strips at each meeting point of the bands a very strong structure will be obtained especially as it will be understood that the bands 29 are in pairs, one of each pair being at the top of the structure and one at the bottom. For some structures it is found that it is not necessary to fasten together the two bands of a pair at every intersection of adjoining edges of the silencing strips.

In all forms of the pad it will be seen that slits 13 are left along each adjoining pair of silencing strips between adjoining and transverse seams or other transverse fastening members. There will be a slit for each coiled spring 10 of the set of spring filling. In the structure shown in Fig. 5 the slits 13 will be somewhat longer than the diameter of the largest coil of the spring which will ordinarily be either end coil of the spring. In the structure shown in Figs. 1 and 2 the slits are shown as only about the length of the diameter of the springs. It will be understood that the slits 13 are of a length sufficient to allow the largest coil of the half of the proper spring to be passed therethrough. The slit may be somewhat less than the diameter of the spring, but still allow the largest coil of the spring to be passed therethrough either by temporarily stretching the fabric slightly or by distorting temporarily the end coil of the spring. It will be understood that the pad is mounted upon the set of springs by so passing the largest coil or end coil 27 of the spring through the slit 13 and then working the pad down onto the spring until it reaches about the middle of the vertical or longitudinal height of the coiled spring more or less as shown in Fig. 6. In practice the set of coiled springs 10 are arranged in rows longitudinally and also usually in rows transversely and are then fastened together at one surface of the set say the bottom surface by suitable means 11 connecting the adjoining springs in each longitudinal row and the adjoining springs in transverse rows. In the structure shown in Figs. 5 and 6 the fastening means 11 consists of a spiral wire which is of a proper diameter in its coil to be screwed about two springs opposite each other in the transverse row and then to extend on to be screwed through two similarly adjoining springs in the next transverse row of springs but farther along in the two longitudinal rows. This spiral wire accordingly answers both purposes of fastening in adjoining springs in transverse rows and also connecting the springs in longitudinal rows. It will be understood, however, that the means of fastening the springs in longitudinal and transverse rows may vary and any particular means is not essential to this invention.

Assuming the set of springs to be so fastened together at one surface, say the bottom surface, and with the end coils 27 at the other or top surface of the set of springs to be still unconnected, the pad 12 will be placed on top of the set of springs and the pad then worked down half way through the vertical height of the springs by temporarily and successively opening up the respective slits so as to pass the top half of each spring up through its open slit. After the top or larger coil has been passed through its slit the pad may be more easily worked down into its permanent position about midway the vertical height of the spring. After all parts of the pad have thus been located about midway of the height of the set of springs it will be seen that the pad will re-adjust itself more or less evenly into its original position but with a coiled spring extending through each slit and that each

spring will have a portion of the silencing pad located substantially horizontally of the cushion midway the height of the spring. At the point where the pad is so located upon the middle of the spring one of the middle coils as 30 will pass through the slit at that spot slightly distorting the even arrangement of the two adjacent silencing strips. Beyond this passing point, however, one-half of the said middle coil 30 will be immediately above the one silencing strip and the other part of the coil will be immediately below the other silencing strip forming the slit. It will be thus seen that whichever surface of the cushion is turned up there will be a supporting coil of the spring to hold the pad in place. This holding of the pad in place will be further regulated and strengthened by the fact that any great distortion or slipping of any part of the silencing pad is prevented by the rest of the pad through its engagement with other coil springs tending to hold it in place. After the silencing pad is thus mounted upon the set of springs the other or upper surfaces of the springs are fastened together by suitable fastening means 11 connecting adjoining springs in the transverse rows and connecting adjoining springs in the longitudinal rows. In the construction shown in Fig. 5 the fastening means consists of the spiral wire already mentioned. After the set of springs have thus had their other surface connected the silencing pad cannot be removed without destroying the pad or removing one set of fastening means of the set of springs. On the other hand, it will be seen that no separate fastening means have to be provided to hold the pad in position upon the springs.

It will be understood that in these spring cushion constructions it is very common to use coiled springs of the "hour-glass" type, partly because such springs give a soft yielding action to both surfaces of the cushion followed by greater strength as the intermediate smaller coils are brought into play and partly because the decreasing spiral form of each half of the spring prevents adjacent coils touching each other and making a noise as they are pressed towards or into line with each other. But even with this "hour-glass" type of spring there is a grating noise of metal upon metal as coils of similar size in the opposite halves of the spring are pressed against each other during extreme compression of the cushion as often happens in cushions or mattresses. It will be seen that my silencing pad being located between the opposite halves of the several coiled springs of the cushion prevents this direct noise-producing contact of similar sized coils of opposite halves of the respective springs. In fact, my construction prevents direct contact of any coil of one half of a spring with any coil of the other half of the same spring or with any coil of an adjacent spring on the other side of the pad both of which classes of contacts may happen when the springs are subjected to lateral distortion as well as compression.

My pad provides not only a sufficient body of fibrous filling or packing to hold the coils from noisy engagement but also provides a fabric covering on each surface of the packing to hold the packing securely and permanently in place and take the initial contact of the coils of the springs which would otherwise tend to soon push the fibrous filling away from the engaging points.

The seams of stitches in the pad at opposite sides of each slit and extending lengthwise of the silencing strips aided by the crosswise stitches or other fastening means used at the ends of the slits operate to permanently hold the filling in place in the pad.

Fig. 9 is a top or bottom view of a modified form of silencing pad. This pad 12^a is formed of three layers of material, viz: two layers of fabric enclosing a filling of fibrous material but the sheets of fabric 15^a and 16^a and the sheets of fibrous filling 14^a are the full size of the ultimate pad 12^a. Besides the end seams 31 and the side seams 32, there are as many pairs of longitudinally extending rows of stitches 33 as there are longitudinal rows of springs in the cushion and a pair of these closely arranged seams 33 are located to be opposite the vertical center of each longitudinal row of springs. These various rows of stitches securely fasten together the three layers of the pad. Then slits 34 are cut between the rows of stitches 33 of each pair of these rows to correspond with each spring of the cushion, such slits extending entirely through the thickness of the pad.

Fig. 10 shows a further modification of the pad. This pad 12^b is adapted for use upon a chair seat or a sofa seat where the springs are more or less staggered, that is not arranged in regular longitudinal and transverse rows but interfitted. Fig. 10 is a plan view of a pad 12^b of a size for use with a chair seat wherein the set of five springs are arranged one in each corner and the fifth in the middle of the seat and not in a longitudinal row nor a transverse row with any of the other four springs. This pad is formed of two silencing strips 35 having a width of about two-thirds the diameter of the springs and two side silencing strips 36 having a width of slightly more than half the diameter of the springs. In addition to the end seams 37 and the side seams 38, there are two transverse seams 39. These seams 39, however, do not extend straight across but are reversely curved first at 40 to go around the inner sides of the corner springs and then at 41 to go around the two outer sides of the inside spring. This forms nine slits in all between the adjacent edges of adjoining strips but only the five slits 42 corresponding to the five springs are used and the four shorter slits 43, one at the middle of each side, are not occupied by a spring.

What I claim as new and desire to secure by Letters Patent is:

1. In combination a set of coiled springs arranged side by side in rows and having their adjacent end coils connected and a silencer pad comprising strips of sound-deadening material arranged intermediate the length of the springs and the separate strips extending from the middle of the springs of one row to the middle of the springs of an adjacent row, means fastening the edges of adjacent silencer strips together between adjacent springs of each row and at the ends of the strips whereby slits between adjacent strips are left for each spring whereby an intermediate coil of each spring may project through its slit and the material of the silencer strip on one side of the slit will be above the said intermediate coil and the strip on the other side of the slit will be below said coil.

2. In combination a set of coiled springs arranged side by side in rows and having their adjacent end coils connected and a silencer pad comprising strips of fibrous packing secured between fabric layers arranged intermediate the length of the springs and the separate strips extending from the middle of the springs of one row to the middle of the springs of an adjacent row, means fastening the edges of adjacent silencer strips

together between adjacent springs of each row and at the ends of the strips whereby slits between adjacent strips are left for each spring whereby an intermediate coil of each spring may project through its slit and the material of the silencer strip on one side of the slit will be above the said intermediate coil and the strip on the other side of the slit will be below said coil.

3. A silencer pad for use with a set of cushion springs arranged in rows and to be placed intermediate the ends of the springs, consisting of a plurality of strips of sound-deadening material arranged side by side, the main strips being of a width to reach from the center of the springs of one row to the center of the springs of an adjacent row and half-width strips at the sides of the pad and means holding said strips loosely side by side but leaving an open slit for each spring between adjacent strips through which slit an end of a spring may be inserted.

4. A silencer pad for use with a set of cushion springs arranged in rows and to be placed intermediate the ends of the springs, consisting of a plurality of strips of fibrous padding secured between fabric layers and arranged side by side, the main strips being of a width to reach from the center of the springs of one row to the center of the springs of an adjacent row and half-width strips at the sides of the pad and means holding said strips loosely side by side but leaving an open slit for each spring, between adjacent strips through which slit an end of a spring may be inserted.

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