Aug. 20, 1929. P. RISSMANN 1,725,479

CUSHION CONSTRUCTION

Filed Dec. 31, 1926 3 Sheets-Sheet 1

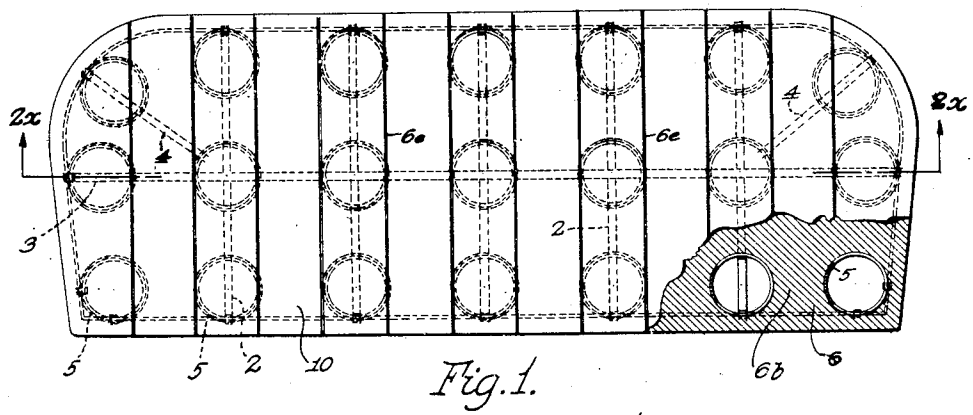


Fig. 1.

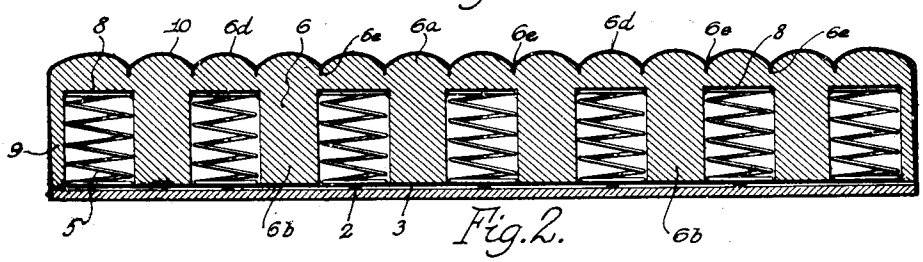


Fig. 2.

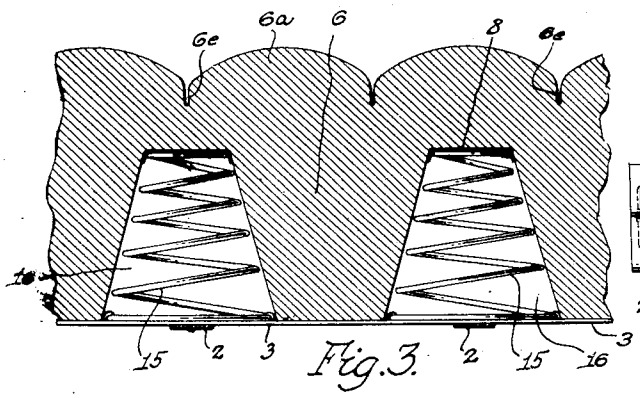


Fig. 3.

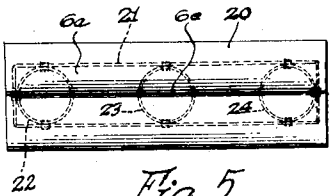


Fig. 5.

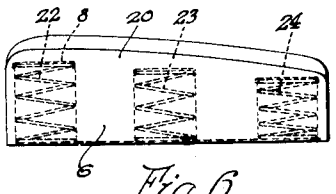


Fig. 6.

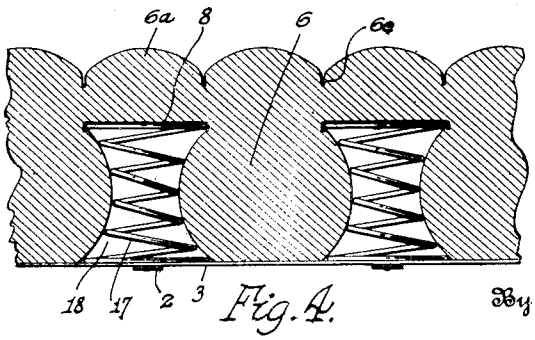


Fig. 4.

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Aug. 20, 1929. P. RISSMANN 1,725,479

CUSHION CONSTRUCTION

Filed Dec. 31, 1926 3 Sheets-Sheet 2

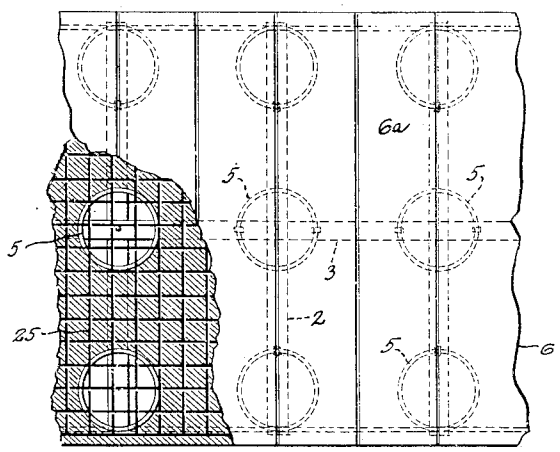


Fig. 7.

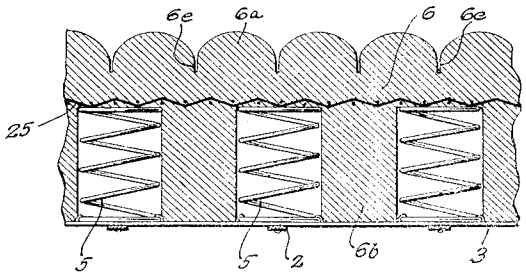


Fig. 8.

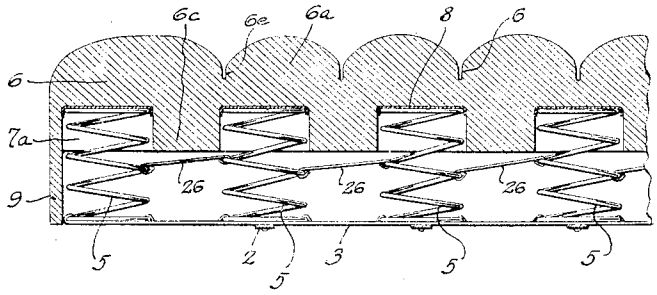


Fig. 9.

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Aug. 20, 1929. P. RISSMANN 1,725,479

CUSHION CONSTRUCTION

Filed Dec. 31, 1926 3 Sheets-Sheet 3

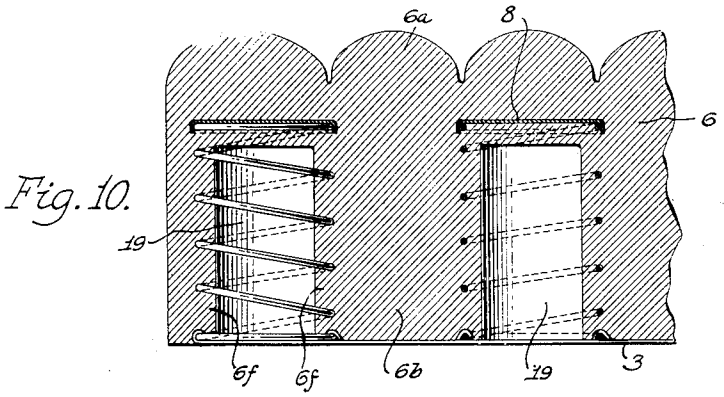


Fig. 10.

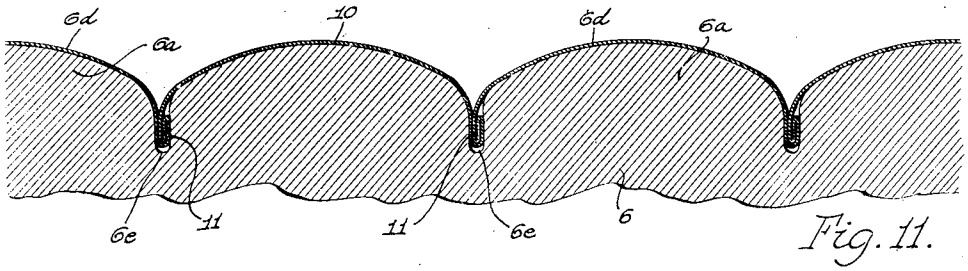


Fig. 11.

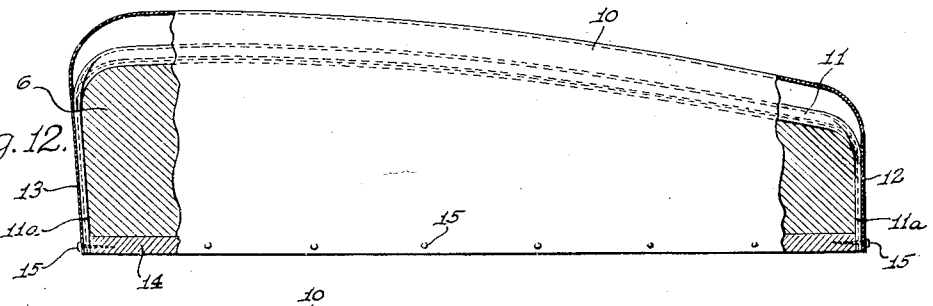


Fig. 12.

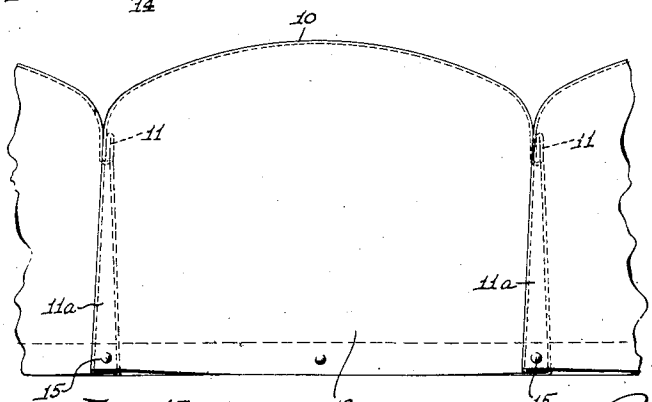


Fig. 13.

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UNITED STATES PATENT OFFICE.

PAUL RISSMANN, OF DETROIT, MICHIGAN, ASSIGNOR TO PREMIER CUSHION SPRING COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

CUSHION CONSTRUCTION.

Application filed December 31, 1926. Serial No. 158,163.

This invention relates to the art of upholstery, more particularly the construction of cushions and the cushioned frames of seats, as in automobiles, although it also lends itself to use in mattresses and similar appliances. It is described herein more especially in connection with automobile cushions and upholstering, which offer a very large field for its use, and which due to the presence of vibration and shock demand that comfort and protection of passengers against such vibration and shock shall be very effectively provided for, and also in such automobile cushions and upholstery the demands of high production with minimum costs is an important factor, and the present invention takes this into consideration and meets many of the problems which have hitherto been matters of some concern to automobile manufacturers in meeting the requirements of high production and low cost whilst maintaining efficiency, comfort and appearance in the cushioning or upholstering of cars.

The said invention has among its objects the attaining of the aforesaid desirable features and the reducing of the number of springs in such upholstery or cushion construction to a substantial extent below the number ordinarily employed, to provide a substantially equal result, and to supplement such springs with an elastic filling material so that the resilient action of the springs and of the material in their respective manner and peculiarities of operation will cooperate to produce a comfortable and efficient cushion or cushion filling which may be simply constructed.

The invention contemplates the providing of a cushion or cushion filling of a molded resilient material of the nature of sponge rubber and the housing of such springs to add their resiliency to that of the molded filling, the action of the said springs being modified by the action of the said resilient filling, and further contemplates the molding to form of the outer surface of the said molded filling, to provide a contour to substantially that of the finished surface of the upholstery or cushion over which fabric, leather, or other suitable finishing material may be laid and supported by the said filling in an attractive and desirable manner.

Still further objects subsidiary to or resulting from the aforesaid objects, or from the construction or operation of the invention as it may be carried into effect, will become apparent, as the invention is hereinafter further disclosed.

In carrying the said invention into effect, I may mount a series of vertically extending coil springs upon a suitable base frame such as that commonly employed in spring cushion construction, and surround these springs with a molded sponge rubber material which may be molded insitu about said springs whereby said springs are housed in said molded sponge rubber and at the time of molding form the surface of the rubber in corrugations or other pattern, which the outer surface of the cushion is to have. The said outer surface thus adapts itself to the application thereto of any suitable covering material such as a textile fabric which may have a pleated appearance where the shape of the rubber filling is such as to afford such appearance. Suitable guards are provided where desirable for protecting the sponge rubber cushion filling from being cut or damaged by the springs, and the springs are spaced apart to a substantial extent so that the sponge rubber filling extends therebetween, and are fewer in number than would otherwise be required where the resilient sponge rubber filling is not employed.

All of which is more particularly described hereinafter, by way of example, having reference to the accompanying drawings, wherein—

Figure 1 is a plan view, partly broken away to illustrate the interior construction of an automobile cushion constructed in accordance with this invention;

Figure 2 is a section of the same, on the line 2×—2×, Figure 1;

Figure 3 is a detail sectional view of a modified construction;

Figure 4 is a similar view of another modified construction;

Figures 5 and 6 are a plan and side elevation respectively of a sectional adaptation of the invention in which cushions of any length may be built up;

Figures 7 and 8 are a broken plan and sectional elevation respectively of a modified form of cushion construction involving a reinforcement over the springs in the resilient filler;

Figure 9 illustrates in section a further modified form of the invention;

Figure 10 illustrates in section a still further modification in which the coils of the springs are actually embedded in the material of the resilient filler;

Figure 11 is a detail sectional view illustrating a method of applying a covering material to the filler to give a pleated appearance thereto;

Figure 12 is an end elevation of a cushion, shown partly broken away and in section, illustrating further details of the method of applying the covering material; and

Figure 13 is a fragmentary front elevation of the cushion further illustrating the method of applying the fabric covering thereto.

Similar characters of reference indicate similar parts in the several Figures of the drawings.

1 is a base frame having a general outline of the plan of the cushion and provided with spring supporting members 2, 3 and 4, and 5 are coil springs mounted on said spring supporting members and suitably affixed thereto, those springs adjacent the base frame 1 being also attached to that frame in any suitable manner. The precise form of base frame and spring supporting members is not a part of this invention, and any suitable arrangement for the support of the springs may be provided.

It is a common practice in cushions such as automobile cushions to provide a very large number of such coil springs and arrange them quite close together throughout the entire cushion, and it will be noted that in the present instance a comparatively small number of springs are used, and these are substantially spaced apart from one another, a consequent reduction in the cost of this part of the structure.

6 is a filling or body of resilient material such as sponge rubber, which is molded to the general form of the cushion and has provided therein cavities 7 for the accommodation of the springs 5, and these cavities may be shallower than the normal height of the springs, so that when the springs are accommodated therein they are in a somewhat compressed condition.

I prefer to provide the upper ends of the coil springs with guards or plates 8, capping the same and nesting the upper ends of the cavities 7 to provide a wear resisting bearing for the upper ends of the said springs, so that the springs will not cut into or unduly wear the resilient material and so reduce the life of the cushion.

The resilient material, which will for the sake of brevity be hereinafter referred to as the filler, includes an upper portion 6^a which takes the place of the tufted or pleated upholstery usually provided over the springs of a spring cushion, and also a lower portion 6^b extending between the springs, and if desired, extending completely to the plane of the base frame 1 as indicated in Figure 2, or it may terminate short of such plane as indicated by 6^c in Figure 9, so that the cavities 7^a only accommodate the upper parts of the springs, and in this case a filler is preferably provided with a marginal skirt 9 surrounding the spring structure as a whole.

For the sake of appearance and utility the upper part 6^a of the filler is formed of a desirable contour such as by being provided with corrugations 6^d having deep recesses 6^e therebetween, the appearance in such case being generally that of a well known form of upholstery known to the trade as French pleats. In present day practice these French pleats are formed by making a cushion upholstery of a double layer of fabric transversely sewn to form tubular pockets which are filled with cotton batting or other material giving a corrugated appearance to the surface thereof, and by molding the resilient filler of the invention described herein in the manner referred to, the necessity of making and filling this tubular upholstery is avoided, and to provide any desirable finish or surface to the improved cushion of fabric, leather, and so forth, I simply apply such material directly over the resilient filler and draw it into conformation with the molded form thereof. Figures 11, 12 and 13 illustrate a very simple manner in which this may be accomplished.

In the said Figures 11, 12 and 13, the fabric or similar covering 10 is shown as being pleated or folded upon itself at 11, the folded portions being turned into the recesses 6^e of the resilient filler, which recesses may be sufficiently narrow that the material of the filler is caused to grip the folded portion 11 of the covering therebetween and exert pressure thereon. The said folded portions of the covering do not necessarily need to be sewn to keep them in that condition, as their restricted housing in the recesses 6^e will maintain them so folded and the portions 12 and 13 of the covering intended to extend over the front and rear of the cushion are drawn down thereover, tension being put on the pleated portions 11^a which are the extensions of the pleated portions 11 of the covering accommodated in the recesses 6^e, the covering being suitably attached to a pasteboard 14 or other suitable means as by nails 15 to maintain such tension, this tension serving to insure the proper embedding of the pleated portions 11 of the covering in the said recesses 6^e of the filler.

According to requirements, different types of springs may be used. For instance, in Figure 3 conical springs 15 are indicated entering conical cavities 16 in the filler 6, and in Figure 4 double helico-volute springs 17 are shown entering correspondingly shaped cavities 18 in the filler. Also it is not

essential that the springs be accommodated in cavities in all cases, for example where cavities are provided, they may be smaller than the springs as in Figure 10, where the springs are shown as having their coils embedded in the material of the filler, so that the said filler extends within the springs as at 6', 19 indicating cavities of smaller diameter than the springs.

Figures 5 and 6 illustrate a sectional form of the invention in which the section 20 is of the width of two pleats of corrugations and has an individual frame 21 upon which is mounted springs 22, 23 and 24, in this example, and it will be readily understood that a cushion of any length may be made up of a number of these sections placed side by side according to requirements.

In cases where heavy duty of the cushion is to be provided for, reinforcement may be resorted to such as the incorporation in the filler of wire or other fabric 25 which may extend over the tops of the springs, and in this case the plates 8 may be eliminated as shown in the said Figures 7 and 8, the wire fabric serving to resist any tendency of the upper convolutions of the springs to cut into the material of the filler and also serving to link the upper ends of the springs together, although the fabric may not necessarily be actually attached to the springs in view of its being held in relative position thereto by the material of the filler.

In the arrangement shown in Figure 9 the springs are shown as having their intermediate coils linked together by clips or links 26, this being a well known practice in cushion spring arrangements.

It will be understood that the invention resides principally in the combined use of compression springs and a resilient cushion filler, and that it admits of the incorporation therein of a wide variety of spring arrangements and filler form, wherein the strength and peculiar reactive properties of coil springs may be made use of and their action modified and subdued in some respects by the presence of the surrounding resilient material, giving a very desirable distribution of pressure applied to the cushion and a pleasing softness and adequate and sufficient support for a user, so that the arrangement is eminently adapted to use in automobiles where comfort of the passengers is of considerable importance and vibratory effects and shocks are ordinarily difficult to overcome in a completely satisfactory manner.

Herein and in the claims the term "filler" is used to designate the molded resilient component of the cushion, and is not necessarily limited to its actually being the filling of an outer casing or covering such as 10, as it will be apparent that such outer covering may be dispensed with in some cases where the outer surface of the said filler may in its natural or in any treated state present a satisfactory appearance and will lend itself satisfactorily to any particular purpose for which the cushion is to be used.

This invention may be developed within the scope of the following claims without departing from the essential features of the said invention, and it is desired that the specification and drawings be read as merely illustrative and not in a limiting sense, except as necessitated by the prior art.

What I claim is:—

1. In a cushion construction, a filler of molded resilient material having its upper surface corrugated to simulate French pleats, a covering folded upon itself at the junctions of the corrugations of said filler and drawn between said corrugations to maintain a folded condition of said covering.

2. In a cushion construction, a filler of molded resilient material having its upper surface formed with deep recesses, a covering applied over said surface and having portions drawn into said recesses and engaged between the resilient sides of said recesses.

3. In a cushion construction, a frame structure, a plurality of upwardly extending coil springs on said frame structure, said springs being linked together intermediate of their height, and a filler of molded resilient material enveloping said series of springs.

In testimony whereof I affix my signature

PAUL RISSMANN.