Oct. 28, 1941. L. A. YOUNG 2,260,815

SEAT CONSTRUCTION

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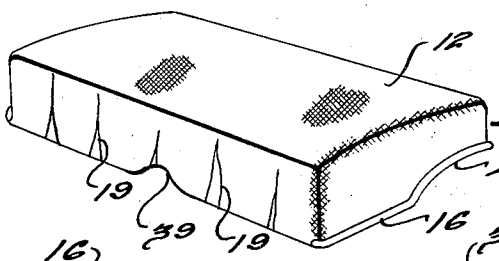


FIG. 1.

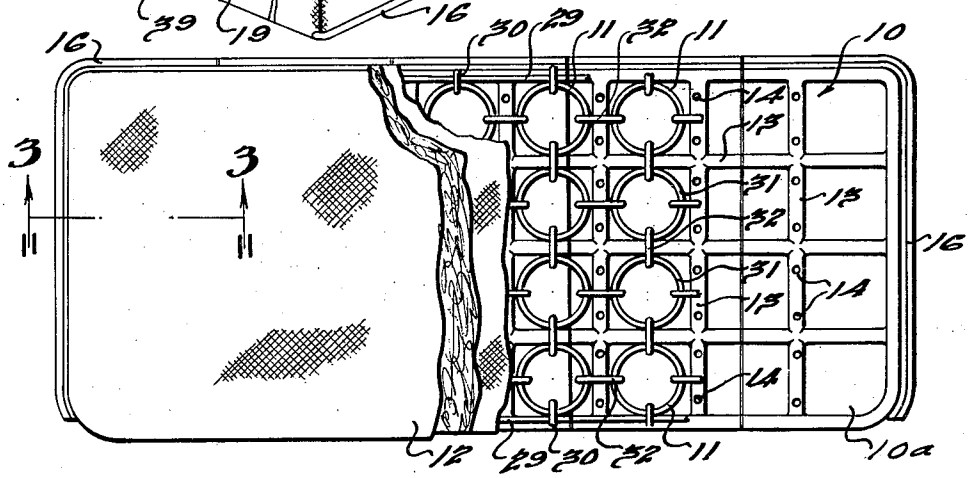


FIG. 2.

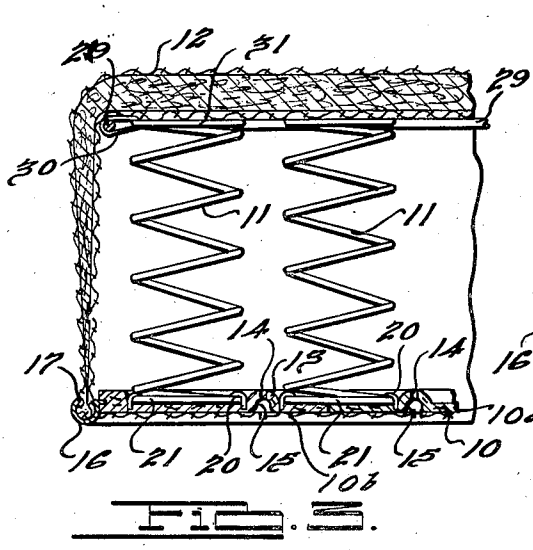


FIG. 3.

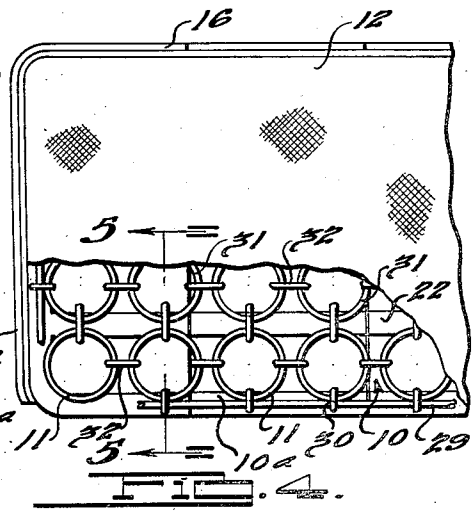


FIG. 4.

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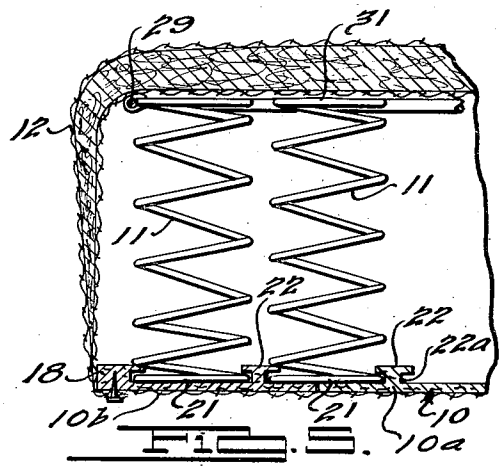


FIG. 5.

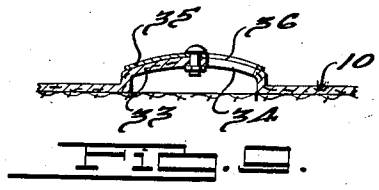


FIG. 6.

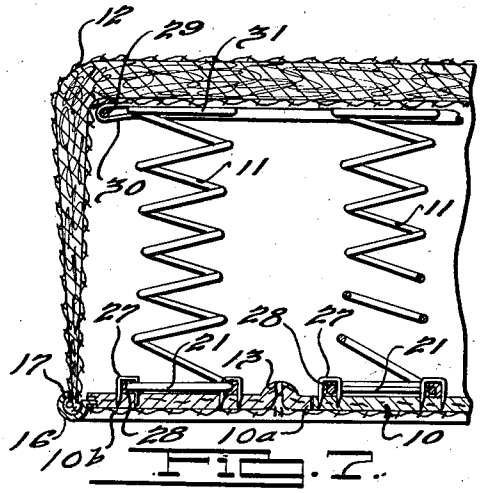


FIG. 7.

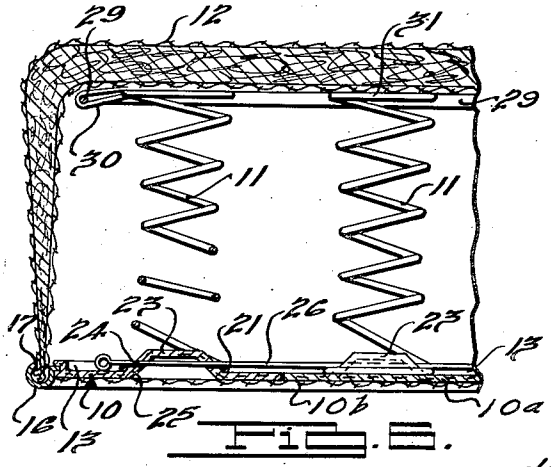


FIG. 8.

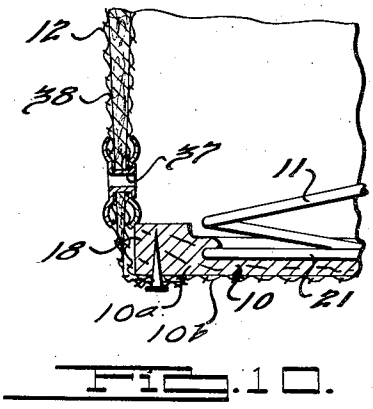


FIG. 10.

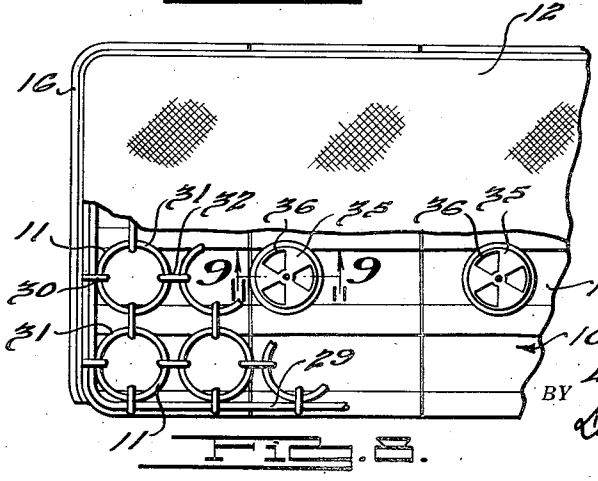


FIG. 9.

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SEAT CONSTRUCTION

Leonard A. Young, Detroit, Mich.

Application December 3, 1938, Serial No. 243,783

3 Claims. (Cl. 155—179)

The present invention relates to improvements in a resilient seat construction, and more particularly to seat constructions of the type which may be used in vehicle bodies. Many of the features of the invention herein disclosed may also be utilized to advantage in the formation of bed springs, resilient spring upholstery units, and for the like or similar uses, it being understood that all of said uses are comprehended by the term "resilient seat construction" as used herein.

This application is related to co-pending application Serial No. 237,805.

It is an object of the present invention to provide an improved resilient seat construction in which the improved qualities insure greater comfort to the user.

It is another object of the invention to provide an improved resilient seat construction in which air pressures within the seat are utilized to control the resiliency of the seat construction.

Another object of the invention is to provide an improved resilient seat construction in which an integrated resilient base member is formed of a plurality of segments, each formed from a sheet of plastic material and which are joined to provide a common support for the individual spring units employed in the construction.

A further object of the invention is to provide a resilient seat construction having improved retaining means for fastening the base portions of the springs to the base member.

Another object of the invention is to provide an improved resilient seat construction having adjustable ventilating means in its base and/or side wall portions which render it possible to regulate the resiliency of the cushion by regulating the rate at which the air is exhausted from the interior of the seat.

A still further object of the invention is to provide an improved resilient seat construction in which a shaped base member of a predetermined contour is provided and thus provides a seat construction which closely fits the seat opening, such for example as that provided in a vehicle body.

Other objects of this invention will appear in the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

Fig. 1 is a view in perspective of an upholstered resilient seat embodying the present invention.

Fig. 2 is a plan view of the seat construction shown in Fig. 1 with parts thereof broken away.

Fig. 3 is a sectional view taken substantially on the line 3—3 of Fig. 2, looking in the direction of the arrows.

Fig. 4 is a plan view of a portion of the seat construction embodying the present invention with parts thereof broken away, the seat being similar to that shown in Figs. 1 to 3 but having a modified form of spring retaining means.

Fig. 5 is a sectional view taken substantially on the line 5—5 of Fig. 4, looking in the direction of the arrows.

Fig. 6 is a sectional view similar to Fig. 3, but showing a modified form of retaining means.

Fig. 7 is a sectional view similar to that of Fig. 6, but showing still another form of retaining means.

Fig. 8 is a plan view, with parts broken away, of the seat construction shown in Figs. 4 and 5, but with adjustable ventilating means provided in the base portion thereof.

Fig. 9 is a sectional view taken substantially on the line 9—9 of Fig. 8, looking in the direction of the arrows.

Fig. 10 is a sectional view similar to Fig. 5, but showing ventilating means in the side wall of the upholstered portion of the seat.

Before explaining in detail the present invention it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation, and it is not intended to limit the invention claimed herein beyond the requirements of the prior art.

While the seat shown in the accompanying drawings is particularly adapted to provide an upholstered resilient seat construction for use in motor vehicles, it is to be definitely understood that the invention is not thereby limited to this use, although many of the features of the present invention make the invention particularly adaptable for use in this field.

Referring to the drawings, a resilient seat construction embodying the present invention consists essentially of a base member 10, a plurality of resilient spring units 11, and a cover 12 of upholstering material. The base member 10 is preferably formed from a plurality of joined sections 10a, each of which is formed from yielding imperforate material, such for example as a molded plastic material or the like and which possesses a resilient quality which permits it to yield under the loads imposed thereon and to return to its normal condition upon release of such loads. The sections 10a are formed to provide a continuous sheet in one direction and to resiliently oppose the loads imposed thereon by the spring units by yielding to the forces transmitted thereto. In the other direction, the sections 10a are joined together by a suitable adhesive or the like. The entire

bottom surface may, if desired, be secured to a continuous sheet 10*b* of fabric, heavy paper, or the like. The entire base 10 thus is fabricated from the separate sections 10*a* as desired and tends to entrap air within the seat construction and the air cushion thus formed checks, modifies and supplements the resiliency of the springs 11. Thus the action of the spring units is not only modified by the entrapped air within the seat, but also is modified by the resilient yielding of the base member which prevents the complete collapse of the spring units under normal load conditions.

In the construction here shown the sections 10*a* are preferably formed of a continuous sheet of a molded plastic substance which preferably is provided with a plurality of reinforcing ridges 13 which may extend either transversely or longitudinally of the seat. If desired, however, the ridges 13 may extend both longitudinally and transversely of the seat, as shown in Fig. 2, to provide a series of separate pockets which space and hold the base portions of the springs 11.

Either all or some of the reinforcing ridges have a plurality of ports 14 formed therein which provide communication between the interior of the cushion and the grooves 15 formed beneath the reinforcing ridges. The grooves 15 are open to the atmosphere and act as ducts for conveying air to or from the interior of the cushion. Thus the ports 14 and the grooves 15 provide a duct system which permits a predetermined controlled exhausting of the air from the cushion and a controlled intake of air into the cushion, which is effected by regulating the number and size of the ports 14 and the size of the grooves or hollowed-out portions 15.

In the embodiments of the invention here shown, a metal rim 16 which originally is of substantially U-shape is molded into the two sides and back portion of the base members 10*a* and provides a member which may be deformed to clamp the side and back marginal edges of the upholstering material and cover 12. As shown in Fig. 3, the edge portion of the upholstering material 12 is preferably folded as at 17 and forced into the channel in the rim 16. The rim 16 is then bent, thus changing the shape of the channel and clamping the edge of the upholstering material securely therein. It is to be understood, however, that any desired type of upholstery securing devices may be used instead of the rim 16, as for example spaced clips, clamps, prongs, or the like.

Extending along the front edge of the base 10 is a tacking rim or strip 18 which, as shown in Fig. 5, is molded as an integral part of the base member 10. This tacking strip is so formed as to permit the driving of upholstery tacks thereinto and to hold such tacks against removal. However, the tacking rim may be dispensed with in the event that it is desired to secure the upholstery material directly to a structural part of the vehicle body.

In forming the base member 10 of a molded plastic sheet, the tacking rim 18, if provided, preferably has a lesser density than the body portion of the member 10. Such a construction will result by subjecting the rim portion 18 to lesser pressure during the molding operation than that to which the other portions of the base 10 are subjected. In the event however that it is not desired to form the tacking strip as an integral part of the base member 10, a strip of any suitable tacking material, such for example as wood, compressed paper, plastic, or the like, may be secured to the base 10 in any desired manner.

In view of the fact that in the conventional type of construction the front edge of the upholstering material and cover 12 is preferably provided with pleated portions 19, it is desirable that at least the front portion of the base 10 be provided with the tacking rim required to accommodate the tacking of the forward edge of the upholstering material and cover thereto if the seat is designed to be removable as a unit relative to the vehicle. It is not necessary to provide such a strip if the seat is not intended to be removable from the vehicle. It is to be understood, however, that the tacking rim similar to the tacking rim 18, if desired, may be provided on all four sides of the bottom and that the upholstering material and cover may be secured to the tacking rim on all four sides of the base 10. It is also to be understood that in certain types of seat constructions the rim 16 or other types of upholstery securing devices may be provided around all four sides of the base 10 and the upholstering material 12 may thus be secured to all four sides of the seat without the use of tacks or tacking strips.

In the construction here shown the resilient spring units are of the coil spring type and are attached to the base 10 in any desired manner, as for example by means of clips 20 connected with the base or lowermost coil 21 of the springs and secured to the base member 10 (see Fig. 3). The clips 20 are preferably metal inserts molded in the sections 10*a* of the base 10 and bent over the base portions 21 of the spring units in order to hold the springs against movement relative to the base or relative to each other.

Other methods of fastening the coil springs to the assembled base 10 are shown in Figs. 5, 6 and 7. Thus in Fig. 5 the base 10 is provided with longitudinally extending raised portions or ridges 22 which are formed to provide longitudinal grooves 22*a* in which the lowermost coil or base portion 21 of the spring elements 11 may be sprung to retain the same in the desired position. In Fig. 6 spaced bosses 23 are provided which are of such size as to fit within the lowermost coils 21 of the springs and are spaced in such a manner as to retain the springs in their correct vertical position between the base 10 and the cover 12 of the seat. To prevent accidental displacement of the springs 11 each boss 23 is provided with aligned apertures 24 in its sloping side walls 25, through which a pin 26 of sufficient length to reach from one end of the seat to the other may be inserted, thus locking all of the spring bosses in each row to the base member. As shown in Fig. 7, spring assemblies in which the springs are clamped in their positions in a channel member 28 formed of sheet metal or the like, and the channel members 28 are secured to the base as by staples 27.

If desired, the ridges 22 in the construction shown in Figs. 4 and 5 may extend transversely of the seat, or both longitudinally and transversely, although the provision of both longitudinal and transverse ridges is not as desirable as using either kind alone in view of the greater difficulty in inserting the base portions 21 of the springs in the surrounding grooves and the decrease in the resilient action of the base member when thus reinforced in both directions. In any case, however, the ridges 22 should preferably be spaced sufficiently close together to

cause a slight compression on the lowest coil of each spring, when it is inserted in the grooves formed therein.

It should also be understood that separate pins may be inserted through each of the bosses **23** instead of using the long pin shown in Fig. 6, although the use of a pin extending from end to end of the seat is preferred because of the reduction in the number of assembling operations required.

The top portions of the spring units **11** are connected by means of a top rim **29**, which is secured to the springs as by clips **30** or in any other desired manner. In addition, the tops of the springs **31** may be united with one another through a plurality of connecting links **32** which may be either plain wire or small coil springs so that the yielding of any single spring **11** to a force imposed thereon is partially transmitted to adjacent springs so that the load is carried in each instance by a plurality of springs and is transmitted by such plurality of springs to the base member **10**. Due to the yielding nature of the base member **10**, complete collapse of the springs **11** due to the imposition of a sudden and extreme load thereon is largely prevented.

As will be seen from the constructions described, air is entrapped in the seat by the base member **10** and the upholstered covering **12**. Any compression of the springs **11** is therefore cushioned by such entrapped air. As the air is compressed, it will be forced out of the seat chiefly through the ports **14** and the grooves **15**, or other duct system provided, and partly through the upholstering material **12**. This exhausting of the air will occur at a controlled rate which is relatively slow so that the seat has all the cushioning effect of an air cushion. In the construction shown in Figs. 2 and 3, for example, the rate of exhaustion of the air is controlled by the number and sizes of the ports **14** and ridges **15** and the perforate nature of the upholstering material and cover **12**. However, if the rate of exhaustion of the air through the upholstered covering is sufficiently high, it may not be necessary to use the ports **14** to exhaust the air through the base member **10**.

In some instances it may be desirable to provide ventilating apertures in the base of the seat which may be adjusted to control the amount of air flowing to or from the interior of the cushion. A suitable means for accomplishing this is shown in Figs. 8 and 9 which show a seat construction having a plurality of spaced bosses or raised portions **33** similar to the bosses **23** shown in Fig. 6. The bosses **33**, however, are provided with a plurality of symmetrically spaced arcuate openings **34** on their upper surfaces and with a rotatably mounted cover plate **35** which is provided with an equal number of openings **36** of substantially the same size and shape as the openings **34**. In utilizing the above as a ventilating means, the cover **35** is rotated varying amounts to exposed varying portions of the openings **34** in the bosses **33**. Thus it is possible to completely close off the bosses **33** or to rotate the cover **35** until its apertures **36** are in full alignment with the apertures **34** in the bosses **33**, in which case the maximum amount of air would be permitted to enter and leave the interior of the seat.

If desired, as where the base **10** is placed in intimate contact on its surface and around its edges with an air tight surface, ventilators of any desired type may be used in the upholstering material **12** to permit a controlled flow of air therethrough to or from the interior of the cushion. A suitable form of ventilator of this nature is shown at **37** in Fig. 10. Similar ventilators may also be placed in the upper portion of the cover **12**, although it is usually preferable to place them in the side wall **38**, as shown.

As the base member **10** is preferably formed of a plastic material, it may be readily molded to any desired configuration to adapt the seat to fit in any desired seat compartment. Thus, when used as the rear seat in a motor vehicle body, it is frequently necessary to provide a contoured portion, such as shown at **39** in Fig. 1, which will extend over the propeller shaft tunnel frequently employed in motor vehicle constructions, and to provide a contoured portion **40** to permit the seat to fit around the wheel housing commonly provided in a motor vehicle body. This achieves a substantial economy in construction over conventional structures which employ a metal framework which must be bent to the desired shape and contour.

From the foregoing it will be seen that I have provided an improved type of resilient seat in which provision is made for trapping and utilizing the air within the seat to modify the resilient characteristics of the spring units employed. Thus, the rate of exhaustion of the air from the seat may be controlled to effect a control over its riding qualities. In addition, the seat construction of the present invention provides a sheet-like resilient bottom acting as a common support for the spring units, and also provides unique means for securely fastening the springs to the base and otherwise holding them in place. The base member **10**, formed from a plurality of joined separate sections **10***a*, may be readily fabricated to any desired size by joining the required number and sizes and shapes of the separate sections **10***a*. The sections **10***a* are of such sizes and shapes that they may be readily formed from a molded plastic substance by conventional manufacturing operations.

I claim:

1. A resilient seat construction comprising a base member, a plurality of coiled spring units, a cover for said spring units, a plurality of spaced bosses in the upper surface of said base member, each of said bosses being of such size as to snugly fit within one of the end coils of said spring units, and means extending through said bosses and engaging the lowermost coils of the spring units to hold said units in place.

2. A resilient seat construction comprising a base member, a plurality of coiled spring units, a covering for said spring units, a plurality of spaced bosses in the upper surface of said base member, and retaining means extending through said bosses for fastening the lowermost coils of said spring units to said bosses.

3. A resilient seat construction comprising a base member, a plurality of coiled spring units, a covering for said spring units, a plurality of spaced bosses on the upper surface of said base member, each of said bosses being of such size as to fit within the lowermost coil of one of said spring units and being provided with aligned apertures, and a pin extending through said apertures and serving to fasten said lowermost coils to said base member.

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