

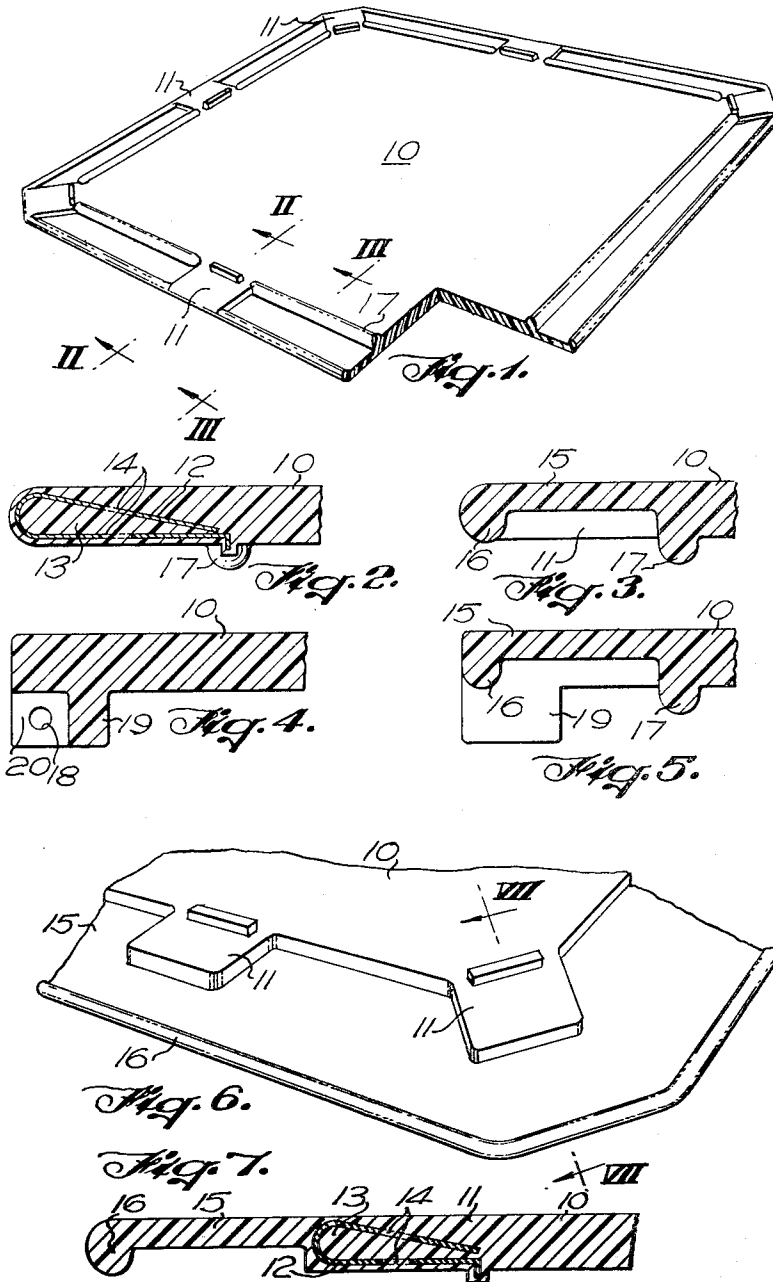
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CUSHION SUPPORTING MEMBERS

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**CUSHION SUPPORTING MEMBERS**

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This invention concerns cushion supporting members, which term is to be construed as meaning a member or members capable of being attached to the framework of a piece of upholstered furniture to support a resilient pad, cushion, seat back or seat squab. The term "upholstered furniture" is to be construed as including furniture for road, sea, rail and aircraft both private and commercial, such furniture being used for sitting, lying or reclining upon.

The manner in which cushions have been supported in the past has varied considerably, and recently it has been found that rubber or like material is particularly useful for the purpose. Due to the variety of types of cushion to be supported, however, it is found that in some instances straps are the most acceptable, whilst in other instances moulded rubber or like material straps do not enable the cushion to be supported exactly as desired and as a result it has been proposed to provide a unitary platform of material upon which the cushion can be located. For example, the cushions used in vehicle seating vary in size, shape and use, namely some cushions form seat squabs whilst others form back rests. The seats themselves may be bench type, individual or bucket type or may consist of a bench type cushion with individually adjustable backs or squabs.

In the furniture industry the shapes and sizes of cushioned seats are of infinite variety.

One of the difficulties associated with known methods used for securing cushion supports lies in the length of time taken to secure the support to the frame.

In some cases the support given to the cushion is unevenly distributed, and localised relatively large non-supported areas exist which tend, after a period of use, to result in deformation or tearing of the cushion.

In the case of presently used platforms of rubber or like material, there are spaces between the extremity of the platform and the frame to which it is, in use, attached and thus the edge regions of a pad of resilient upholstery material are unsupported between the frame and the platform. Although this space may be in fact small, relative to the over-all size of the seat, there is the tendency of the pad to deform or tear. In the case of, for example, seat base upholstery pads, the latter will take a permanent set after considerable use and thus the shape and comfort of the seat will deteriorate. In motor vehicle seats the driver's seat will usually be the one first to suffer from this effect, and the driver will in consequence be more likely to suffer from driving fatigue than is the case when the seat is new and conforms to the designed shape.

In addition, in some known seats a phenomenon known as "bottoming" is also experienced. This phenomenon occurs when the limit of resilience of the support has been reached and in most cases results in an uncomfortable ride. The phenomenon becomes more noticeable as the age of the vehicle increases.

The above mentioned properties of the vehicle seat platform, both of which in time add to driving fatigue, should if possible be overcome since driving fatigue is one cause of accidents.

It is the object of the present invention to provide a cushion support which may be moulded to any particular requirements in one operation to the desired shape

and size with consistent accuracy and at the same time to be so formed as to eliminate spaces, thereby preventing upholstery pad deformation, and also to provide means whereby the support can easily be attached to the framework of the seat for which it was designed.

According to the present invention a cushion support moulded from a material which will flow when subjected to heat and pressure and will be resilient when cool includes a plurality of spaced apart areas including non-resilient moulded in attachment members located in positions adapted for attachment of the support to a framework, at least the spaces between the members being provided with an integral peripheral web portion of said moulded material whereby when the support is attached to the framework a continuous and completely inaper-tured surface is formed.

The invention also includes the method for producing the moulding including the steps of pre-positioning the attachment members in one part of a two part mould, placing in the mould a piece of the said material whose dimensions are less than the total extent of the mould, closing the mould and subjecting it to heat and pressure to cause the material to flow so as completely to fill the mould and to cure and encase the whole or part of the attachment members and thereafter removing from the mould the resilient cushion support so formed.

Preferably the attachment members are initially in the form of open U or V shaped clips, which latter, upon closing the mould become deformed to bring the free edges thereof into close proximity with each other.

In a further form the attachment members are in the form of rod-like elements, the mould in this case being formed so that the elements each become substantially embedded in a thickened portion of the moulding.

Preferably the mouldable material used is uncured rubber compound which under the influence of heat and pressure flows and becomes vulcanised and resilient.

The invention will be described further, by way of example, with reference to the accompanying drawings in which:

FIG. 1 is an underneath perspective view of one form of cushion supporting platform,

FIG. 2 is a section on the line II—II of FIG. 1,

FIG. 3 is a section on the line III—III of FIG. 1,

FIG. 4 is a section corresponding to FIG. 2 of a modification,

FIG. 5 is a section corresponding to FIG. 3 of the modification of FIG. 4,

FIG. 6 is a perspective underneath view of part of a further modification, and

FIG. 7 is a section on the line VII—VII of FIG. 6.

Like reference numerals will be used to identify like parts in the drawings.

In one form of the invention a platform is produced having a major portion 10 of substantially rectangular shape provided with outwardly projecting spaced-apart tongues 11 located, for example, at its corners and along three of its sides. The thickness of the major portion 10 of the platform is constant except for the end regions of the tongues 11 which contain clips 12 and which may be somewhat thicker. The clips 12 are metallic and are preferably made from brass and of initially open U or V shape. The clip in the finished product has its arms substantially closed in their free end regions. By virtue of the closing of the arms of the clips 12 a wedge shaped piece of rubber 13, integral with the major portion 10 of the platform, is enclosed by the clips 12 thus providing an extremely strong mechanical bond between the metal and the rubber. The bond strength is further increased by providing holes 14 in the arms of the clips 12. These holes are, in practice substantially filled with rubber which

has, during moulding, flowed around the clips 12 substantially to encase them. The portions of the platform between adjacent tongues 11, are provided with a web 15 of rubber which is thinner than the major portion 10. The extreme periphery of the platform is provided with a bead 16 to reduce the risk of tearing the rubber when the platform is in use. If desired the periphery of the major portion 10 (i.e. the thicker portion) of the platform may also be provided with a peripheral bead 17.

To produce the platform above described, a two part mould is used. One part of the mould, namely the base, is provided with a rectangular depression having principally two depths, one corresponding to the shape of the major portion of the platform and the tongues, and one corresponding to the portions between the tongues thereby to enable the multiple thickness platform to be produced. At the outer region of the tongues the depth of the depression is further increased and locating pegs (corresponding in position to the holes in the clips) are provided. A groove or grooves for forming the bead or beads is also provided.

To mould a platform a piece of uncured rubber compound is placed in the base of a mould. The size of the uncured compound is less than the size of the mould depression. Open U or V shaped clips 12 are located on the pegs in the mould, which latter are a free fit in the holes in the clips. The mould lid is closed and heat and pressure are applied to cause the rubber compound to flow, completely to fill the mould depression and substantially to encase the clips and also to vulcanise the rubber. The open arms of the clips 12 are brought into closer proximity with each other in their end regions when the mould lid is closed and thus the rubber as it flows into and around the clips 12 forms, between the arms of the clips 12, the wedge 14 of rubber thus providing great mechanical bond strength. The fact that rubber flows into the holes 14 of the clips adds to the mechanical bond strength. When using brass as the metal for the clips it is also found that the rubber adheres to the metal without the use of a bonding agent and thus in addition to the mechanical bond there is a strong chemical bond formed between the rubber and the brass. In practice it is found by testing the bond strength, the bond is in fact stronger than the rubber.

As an alternative to the clips above referred to there may be provided, as shown in FIG. 4 rod-like elements 18, these latter during moulding becoming substantially embedded in the rubber. In this case the mould base is modified to provide slots in which the rods 18 are located and supported by upstanding pegs. The slots during moulding become filled with rubber and if necessary can be partially filled with pieces of uncured rubber prior to moulding. The end regions of the tongues 11 thus have a thick region 19 which encases the rod 18 except for a substantially centrally disposed central area 20 whereby a hook may be attached to the rod 18.

In a second form of platform, shown in FIGS. 6 and 7 the mould is substantially identical to that first referred to above, but in this case the depression is enlarged so that the tongues 11 formed around the periphery of the major portion 10 of the platform are inset from the periphery of the platform as a whole. In this case the bead 17 extending between the tongues may be dispensed with and a peripheral bead 16 provided around the whole of the extreme periphery of the platform.

In use, any one of the platforms above referred to may be attached to a framework by securing to the clips 12 or the rods 18 an attachment hook which latter is then

attached to the framework in such a manner as to cause the whole platform to be under tension.

In the first form of platform the webs 15 between the tongues 11 are of such a size as to ensure that no appreciable space exists between the platform and the framework so that deformation and permanent set of an upholstery pad is prevented.

In the second form of platform, the web effectively forms a skirt around the thicker portion 10 of the platform, this skirt being of such a size that when the platform is in use it overlies the framework around the whole of its periphery, and against no chance of deformation of an upholstery pad exists.

It has been found possible to carry out the moulding operation at 150° C. at a pressure of 2,240 p.s.i.

One of the major advantages of the invention lies in the fact that the platform is formed in a single operation. The fact that the clips or rods become, in effect, integral with the rubber ensures that very high loading can be applied to the platform without danger of fracture or breakage at the bond. This is also assisted by the fact that by correctly spacing the clips or rods the tension applied by loading the platform is evenly distributed, to the clips or rods and thus failure due to excessive loading at one of the attachment points is eliminated.

The shape and size of the platform can be made to suit any specified requirements and the number and spacing of attachment clips or rods used is dependent upon the requirements of a user of the platform.

Due to the fact that the platforms are produced by a moulding operation identical platforms can be produced in large quantities with a very high degree of accuracy.

I claim:

1. A resilient, one-piece, rubber cushion support comprising, a generally rectangular, flat, center portion of substantially uniform thickness, a plurality of tongues extending outwardly from said portion at spaced locations along the sides of said portion, metal attachment means moulded within said tongues, and a web of thinner dimension than said center portion and extending around the periphery of said center portion and extending outwardly at least to the same extent as said tongues and filling the space between said tongues to form a continuous and flat upper surface for the entire support.

2. A support as defined in claim 1 further characterized in that said web has a reinforcing bead of thicker dimension than said web around the periphery thereof.

3. A support as defined in claim 1 including a bead of thicker dimension than said central portion and located on one side of said support and at least at a portion of the periphery of said central portion.

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