This invention relates generally to furniture, and more particularly to resilient cushions for seats, backrests or the like. The invention finds particular though not exclusive utility in vehicle seats and backrests for the motor vehicle industry.

Devices of this character must be economically produced and yet be capable of withstanding abuse, maintaining their shape, and providing comfort to the user. Prior art devices of this general type have utilized a framework in which springs, wire mesh, or other supports were secured to provide some resiliency and on which supports wedging, foamed latex or other stuffing was placed; a cover of cloth, leather or synthetic fabric or the like was then stretched over the stuffing and secured therearound. These devices are not only costly to manufacture because of the numerous operations required, but they did not maintain their shape or form after a period of use because of the shifting or loosening of the various materials in the finished cushion.

Accordingly, one aspect of the present invention is to provide an integral and composite, resilient cushion which is formed as a single unit. The cushion provided by the present invention can be produced rapidly and economically with a minimum of operations or labour in general; it is capable of retaining its shape and resiliency through repeated and severe use; it is attractive in appearance and of clean design; and it is comfortable.

Other aspects of the invention relate to methods for making the above cushion.

These and other objects and advantages of the present invention will appear hereinafter as this disclosure progresses; reference being had to the accompanying drawings, in which:

FIG. 1 is a perspective view of certain parts of a cushion which are used in the present invention;
FIG. 2 is an enlarged, fragmentary view of one portion of FIG. 1 device, as indicated by the arrow A in FIG. 1;
FIG. 2 is an elevation view of a mold showing the core in the raised position and the base in cross section and
FIG. 3 is a perspective view showing a cushion made in accordance with the present invention a portion being broken away and shown in section for clarity.

Referring in greater detail to the drawings, a rigid frame 10 is provided which is made of any desired material, shape, or size. Metal tubular or rod stock is particularly satisfactory for such a frame. As the seat or backrest of a chair or the like is usually rectangular the frame 10 is preferably of that shape.

A resilient and generally flat support 11 is provided within and attached to the rigid frame. This resilient support may be made of any of various materials, but natural or synthetic rubber is preferable because of its ability to provide uniform and lasting support across the entire area of the cushion.

The support 11 has a series of tongues 14 at spaced locations around its periphery. A metal clip 13 is bonded in each tongue for reinforcing purposes and which forms a particularly strong union with the respective tongue.

The support 11 is secured under tension within the rigid frame 10 by attaching means 15 which take the form of double-ended hooks that extend at one end through the tongue and its associated clip and at the other end extend through an aperture 16 in the frame.

It will be noted that a considerable space extends between the support proper and the frame.

To carry out the method of the present invention a two piece mold is provided having a cover 17 and a base 18 having a cavity 18a of the desired shape. The frame 10 and the attached support 11 as shown in FIG. 1 are firmly secured to the inside surface 17a of lid 17 in any suitable manner. According to one of the methods contemplated by the present invention, a sheet 19 of suitably pre-formed, pre-fused polyvinyl chloride is placed in the cavity 18a and conforms to the size and shape thereof.

Polyether 20 is then poured into the cavity 18a and the cover 17 then closed over the base. The polyether 20 is then allowed to foam up to completely fill the mold cavity, including flowing through holes 11a of the support and between and around the spaces between the frame support and attaching means.

The mold is then placed in a curing oven (not shown) to cure the polyether foam. The curing time may vary depending on the required properties of the finished product, temperatures and other factors, but a time range of five to fifteen minutes at a temperature of about 150° C. has been found to be satisfactory. In any event sufficient heat is applied to raise the temperature of the contents of the mold to cure the polyether, but this heat should be insufficient to affect the pre-fused polyvinyl chloride sheet 19.

During the curing process the polyether is caused to adhere tightly to the frame 10, support 11 and polyvinyl chloride sheet 19.

After the mold is cooled sufficiently, the completed cushion is removed from the mold as an integral and one-piece unit.

As an alternative to the above process, the base 18 of the mold is heated, and the polyvinyl chloride may then be sprayed into the mold cavity and gelled and cured by the heat. Then the rest of the above process is carried out as described.

As still another alternative, the polyether may be poured into the mold after the polyvinyl chloride has gelled, but prior to curing thereof. The polyvinyl chloride is then cured during or after the foaming of the polyether as above described.

If it is desired to provide a covering for the back side of the cushion, another sheet or spraying of polyvinyl as above described is placed between the inside of the lid 17 and the sub-assembly of the frame 10 and support 11. When the polyether then foams in the closed mold, it will adhere to the inside of the polyvinyl layer and secure it to the rest of the cushion. Thereby a completely covered cushion will be provided, such as for use as a backrest cushion of an automobile.

An uncovered unitary seat may be made by the above process, in which case the polyvinyl chloride would not be present, either in sheet or sprayed form. A seat having no polyvinyl chloride cover would, of course, require a cover and this may be of any known seat covering material.

The advantages of the above processes lie in the fact that the unitary seat or seat back can be more rapidly and economically produced than the manufacture of conventional seating. No skilled labour is required for the assembly of springs and upholstery as has previously been the case.

Various modes of carrying out the invention are contemplated as being within the scope of the following claims particularly pointing out and distinctly claiming the subject matter which is regarded as the invention.
I claim:

1. A composite and integral, resilient cushion comprising a rigid frame having an open centre, a resilient support secured under tension in and to said frame, attaching means for attaching said support to said frame, and foamed and cured polyether which has been poured around said support and which when cooled forms a cushion and extends into the space between said frame and support and surrounds said attaching means and said resilient support and is firmly bonded to said support, said attaching means and frame.

2. A composite and integral, resilient cushion comprising a rigid frame having an open centre, a flat sheet of perforated rubber having a plurality of tongues extending outwardly at spaced locations around its periphery, attaching means securing said tongues to said frame whereby said rubber is secured under tension in and to said frame, foamed and cured polyether which has been poured around said support and which when cooled forms a cushion and extends into the space between said frame and support and surrounds said attaching means and said resilient support and is firmly bonded to said rubber, tongues, attaching means, and frame, and a covering of polyvinyl chloride over said polyether and at least a portion of said frames and firmly bonded to both.

References Cited by the Examiner

UNITED STATES PATENTS

2,532,713 12/50 Gottfried 297—452
2,907,074 10/59 Rhodes 267—45
2,976,577 3/61 Gould 264—45
3,084,980 4/63 Lawson 297—455
3,117,819 1/64 Kudriavetz 297—452

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