

Nov. 3, 1970

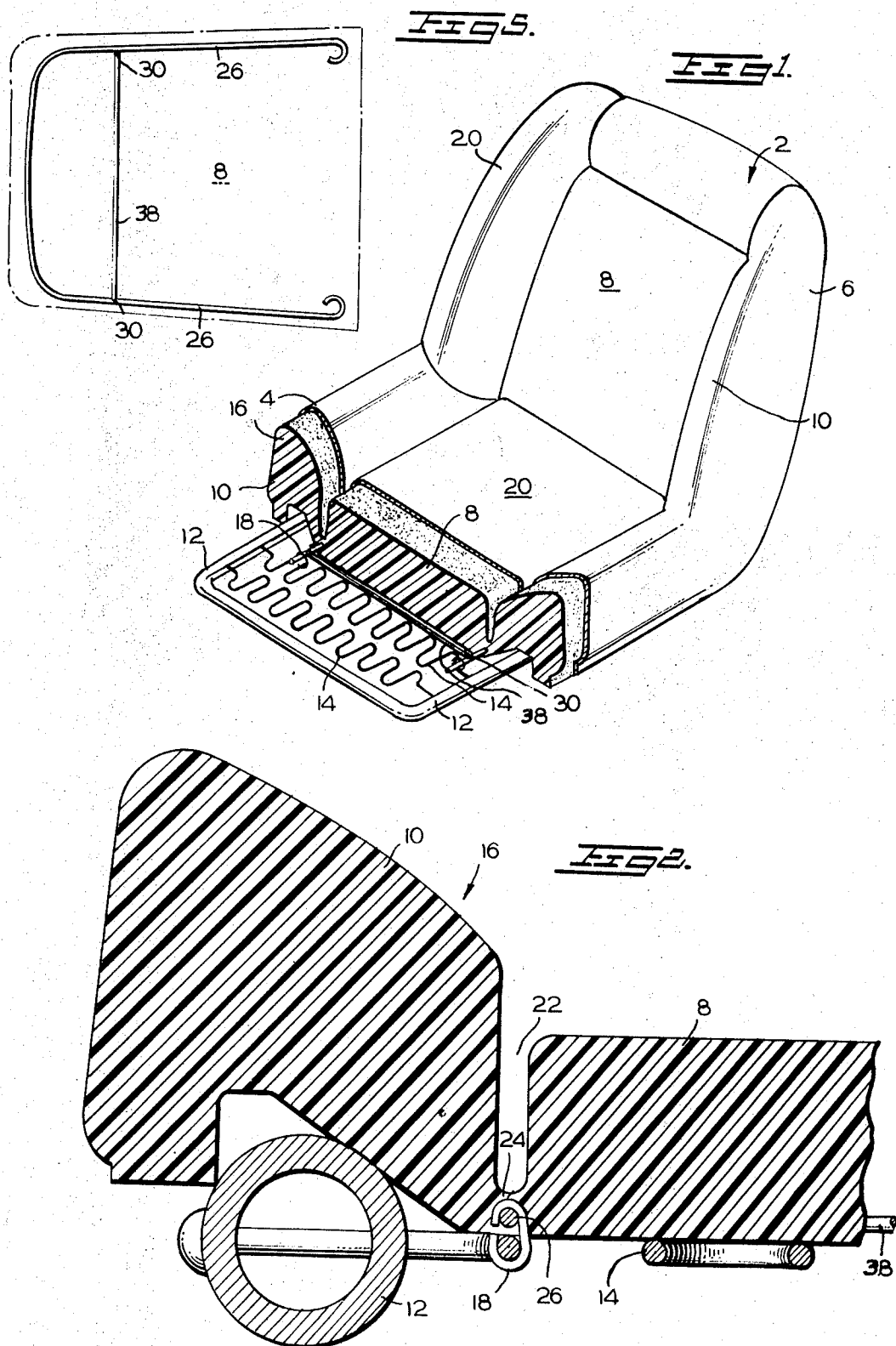
H. A. KUSHNAROV ET AL

3,537,752

UPHOLSTERED SEATS AND MOLDED FOAM PADS THEREFOR

Filed Sept. 19, 1968

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

FIG 3.

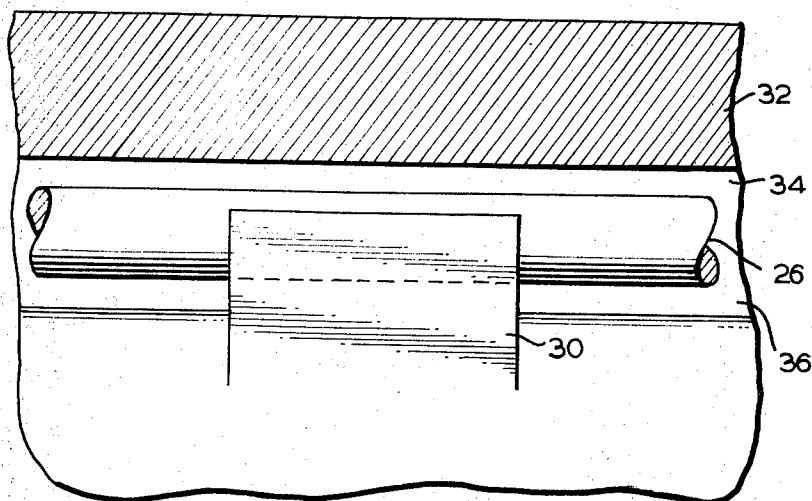
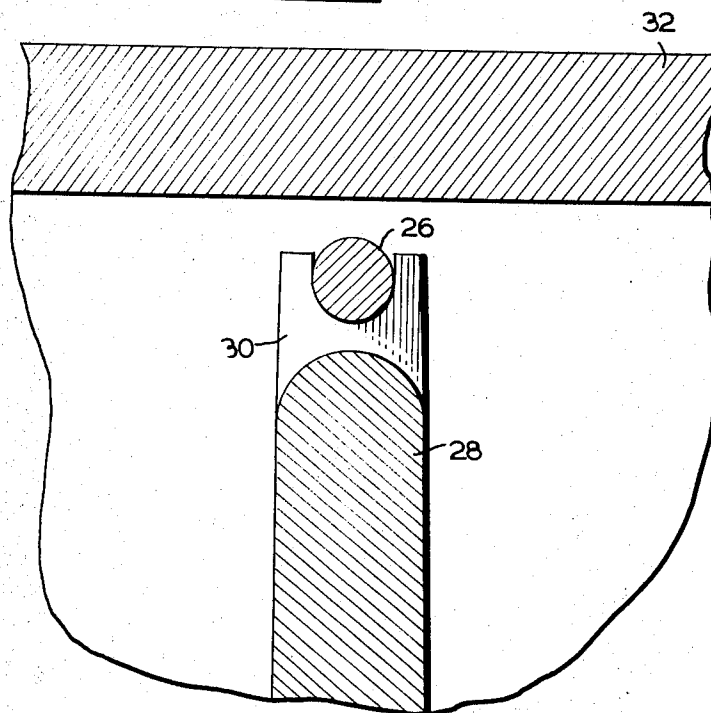


FIG 4.



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Filed Sept. 19, 1968, Ser. No. 760,858

Int. Cl. A47c 7/20, 7/14

U.S. Cl. 297—456

4 Claims

ABSTRACT OF THE DISCLOSURE

Molded foam pads for construction of upholstered seats of the body contoured type, e.g., automobile bucket seats, are formed with a wire embedded in the foam material, preferably along the crevasse between the center portion of the pad and the surrounding yoke. The pad may then be fixed to the supporting springs of the seat by fasteners joined to the enclosed wire and covering fabric may also be fixed to the seat by means of the wire.

This invention relates to upholstered seats of the body contoured type, such as bucket seats for motor vehicles, aircraft and the like. It also concerns new forms of molded foam pads which serve to improve the assembly of such upholstered seats and help to maintain the proper shape in the upholstered seat during use. Throughout the following specification and claims, the term "seat" is employed in a broad sense to refer not only to the horizontal portion of a chair or seat, but also to the back and side portions as well, since in the modern bucket type seats the boundaries of such portions are often indistinguishable or of no significance.

Conventional bucket type seats or similar seats of the body contoured type normally contain a center portion and a surrounding yoke of a different configuration. These portions of the seat are normally separated by a deep groove or crevasse which, for the most part, is formed in the pad or cushion which is a component of the seat. During the upholstery operation in the creation of such contoured seats, it is customary practice to lay against the underside of this pad a burlap insulator. To this insulator, there will frequently be attached a cord made of paper or other suitable material and of small diameter. The configuration of attachment of such cord is made to correspond to the crevasse on the face side of the seat pad or cushion. The insulator is then attached to underlying springs of the seat by means of hog rings or other suitable fasteners, the pad or cushion is placed over the insulator and then cover fabric is placed over the pad or cushion and pulled down into the grooves or crevasses in the pad. The cover fabric is anchored in the chair by fasteners which connect to the paper cord beneath the pad or cushion. Problems arise during upholstering of seats in this manner due to trouble in locating the cord so that its position will correspond exactly to the groove in the pad or cushion and therefore give proper configuration to the covering fabric. Accordingly, there is a need in the construction of seats of the body contoured type of some way to eliminate the problems associated with fastening of molded pads or cushions upon the seat and the covering of such cushions with fabric as just explained.

The present invention is generally related to the molding of resilient foam materials into a suitable shape as to serve as a cushion or pad portion for an upholstered seat structure. It is, of course, well known to mold foam rubber, polyurethane foam material, vinyl foam material and the like in order to produce cushion or pad sections for seats or other furniture articles. Such molding of re-

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silient foam may include creation of deep groove or crevasse portions within the molded foam pad (see U.S. 3,377,103). Additionally, it is known in the construction of seats with resilient foam portions to mold the foam about spring steel bar stock or other metal inserts (see U.S. 3,259,435). The molding of the foam material to encase the metallic inserts may even include enclosure of spring units (see U.S. 3,363,943) or portions of wire cloth or the like (see U.S. 3,082,486). It is also known to mold seat pads or cushions so that a portion of the foam material contacts a wire or rod member which may form an edging of the pad or cushion (see U.S. 2,785,440) or a section of fabric which is to be held in contact with a metal spring or other metallic portion of a completed upholstered seat (see U.S. 3,239,584).

A principal object of this invention is the provision of new improvements in the construction of upholstered seats of the body contoured type, particularly improvements in construction of automobile bucket seats. Further objects include the provision of:

(1) New methods for the molding of foam pads or cushions for upholstered seats of the body contoured type.

(2) New improved forms of upholstered seats of the bucket or other contoured type, comprising a pad or cushion molded of essentially resilient foam material, underlying springs or similar supporting units and a covering such as of fabric.

(3) Improved construction of upholstered seats permitting trouble-free anchorage of a resilient pad or cushion to underlying springs or other supporting units and easy installation of fabric covering the seat.

(4) Upholstered seats upon which the covering fabric may be applied over a deeply grooved molded pad or cushion which eliminate the problem of location of underlying cord by which the fabric is anchored to the seat.

These objects are accomplished in accordance with the present invention by forming a molded pad for an upholstered seat with a wire embedded in the foam pad. More particularly, the pad is molded for a seat of the body contoured type to have a center portion of resilient foam material, a yoke of foam material surrounding at least a part of the center portion with the yoke and the center portion being separated by a crevasse molded into the pad integral with the yoke and the center portion so the crevasse is defined by an area of the molded foam material substantially thinner in section than the yoke, and the center portion, and further by the encasement of a wire within the molded foam material extending along the crevasse area of the molded pad.

The objects of the invention are further attained by formation of upholstered seats of the body contoured type comprising underlying springs, providing a molded pad covering said springs, which pad is molded essentially of resilient foam material having a yoke of foam material surrounding a center portion of the same foam material with the yoke and center portion being separated by a crevasse in the pad integral with the yoke and center portion, said crevasse being defined by an area of the foam material substantially thinner in section than the yoke and center portion, a wire encased within the foam material extending along said crevasse area and fastening means connected to said springs and said wire, anchoring the molded pad into position upon the springs.

The objects are in part further attained by the invention through a method of making a molded pad for an upholstered seat of the body contoured type which comprises providing a mold shaped to form a pad of molded foam material having a center portion and an integral yoke separated from each other by a crevasse defined by an area of said foam material substantially thinner in

section than said yoke and center portion, said mold comprising a standing rib which creates said crevasse in molding of foam material therein, positioning a wire above said rib in the mold below the top level of the mold, and molding resilient foam material within the mold to surround said wire and fix it within the resulting molded pad along the locus of said crevasse.

In a preferred embodiment of the invention, the molded pads and upholstered seats of the improved construction of the invention are bucket type seats of an automobile. Advantageously, the foam material employed in the new articles and methods is polyurethane foam material.

It has been found that with a preformed wire molded into a foam pad for an upholstered seat as described, the wire is prelocated in the pad or cushion and remains in perfect register with the cushion. With such an encased wire, one can attach the pad or cushion to underlying springs of the upholstered seat and this wire also serves as a means for attachment of covering fabrics to the seat. Should additional anchorage to the springs be desired, this can be obtained by additional fabric and burlap insulation being incorporated as components of the seat construction. The degree to which any such underside coverings, if used in an upholstered seat, will depend upon the particular upholstering technique and also the nature of the spring base of which the seat is constructed. Regardless of such variations which may be incorporated in upholstered seats made in accordance with the invention, the key to the new improvements is the fact that the preformed wire included as an integral part of the molded foam pad or cushion permits anchorage of the pad to underlying springs and also covering fabric. Accordingly, the new construction of the invention opens the door to a general modification of upholstered seats of the subject type and the elimination of serious problems which have been encountered heretofore in the construction of conventional bucket type seats.

A more complete understanding of the new improvements in upholstered seat pads, upholstered seats and their methods of manufacture, may be had by reference to the accompanying drawings in which:

FIG. 1 is a perspective view, partly broken away, of an upholstered seat constructed in accordance with the invention.

FIG. 2 is an enlarged fragmentary sectional view of an edge portion of a molded foam pad or cushion employed in the construction of the upholstered seat shown in FIG. 1.

FIG. 3 is an enlarged fragmentary side sectional view of a mold used in the construction of the foam pad shown in FIG. 2.

FIG. 4 is an enlarged fragmentary and sectional view of the mold shown in FIG. 3.

FIG. 5 is a top plan view of a preferred form of wire reinforcement for use in the new structures of the invention with the foam pad shown in phantom line.

With reference to FIG. 1, the upholstered seat 2 comprises a horizontal portion 4 and a back portion 6. Both of these are formed of a center portion 8 and a surrounding yoke 10. The seat also involves an inner frame member 12, across which extend underlying springs 14 to which the foam pad 16 is fixed to the hog rings 18. The foam pad in turn is covered by fabric 20 or other suitable plastic film or similar upholstering covering material.

FIG. 2 shows in more detail the construction of the foam pad 16 of the upholstered seat. The center portion 8 and the yoke portion 10 of the pad 16 are separated by the deep groove or crevasse 22, the base 24 of which joins the yoke 10 and the center portion 8 into an integral unit. This portion 24, as seen in FIG. 2, presents a cross-section area much thinner than the pad center portion 8 or the yoke portion 10. Within the crevasse area 24 there is encased a metal wire 26. This metal wire can be of a single strand construction or of multiple strands braided or twisted cable construction. The foam pad 16

is held in the contoured upholstered seat as seen in FIG. 1 by the hog rings 18, which fasten to the underlying springs 14 as well as to the encased wire 26.

The molding of the pad to include the encased wire 26 in accordance with the invention will follow normal plastic or rubber foam molding procedures conventional in the art with the exception as explained in connection with FIGS. 3 and 4. Any suitable foam material known to be useful in the art for the production of pads, cushions or the like for upholstered seats or other articles of furniture may be used for the purpose of the invention. Polyurethane foam material is preferred, however, and compositions and techniques employed conventionally for producing molded foam structures from such polyurethane material as disclosed in numerous publications, e.g., see U.S. Pats. Nos. 3,194,770; 3,208,959 and 3,322,699.

With reference to FIGS. 3 and 4, the encasement of the metal wire 26 within the molded foam pad 16 is attained by fixing to a conventional standing rib 28 of the casting mold a wire locator 30. This wire locator is preferably made of the same metal as the standing rib and the remainder of the mold and is welded to the rib. However, the locator 30 may be made of any other suitable material and fixed in any suitable fashion such as with durable adhesive or the like. Further, as is well known in the art, the casting mold for the foam material need not be of metal, but may be of any other suitable material. With the wire 26 in place upon the locator 30, foam material is introduced into the mold, whereupon the mold lid 32 is closed upon the mold and the foam material is caused in conventional manner to expand and fill the casting mold cavity. The spaces 34 above and 36 below the wire 26 will be filled with foam and will thus create the crevasse area 24 of the molded foam pad 16 with the wire 26 encased therein. After suitable curing of the foam material within the mold, the foam pad is removed from the mold and will take with it the wire 26.

In another embodiment of the invention, the wire 26 encased in the foam pad may have additional cross wires 38 that are fixed to the main wire 26 such as by welds 30. These cross wires 38 serve to provide further points of attachment of the foam pad to the underlying springs by means of hog rings or the like. A preferred form of wire reinforcement to be used in creating the new foam pads and seats is shown in FIG. 5, i.e., a U-shaped wire in which the base of the U will be encased within the foam pad along one of its ends.

The foregoing detailed description, while indicating preferred embodiments of the invention, is given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description. It should also be understood the foregoing abstract of the disclosure is for the purpose of providing a non-legal brief statement to serve as a searching-scanning tool for scientists, engineers and researchers and is not intended to limit the scope of the invention as disclosed herein nor is it intended it should be used in interpreting or in any way limiting the scope or fair meaning of the appended claims.

The embodiments of the invention in which an exclusive property or right is claimed are defined by the following claims:

1. An upholstered seat of the body contoured type comprising underlying springs, a molded foam pad covering said springs, said foam pad being molded essentially of resilient foam material and a yoke of the same foam material surrounding at least a portion of said center portion, said yoke and said center portion being separated by a crevasse molded into said pad integral with said yoke and center portion, said crevasse being defined by an area of said foam material substantially thinner in section than said yoke and center portion, a wire encased within said foam material extending along said crevasse area and fastening means connected to said springs and

said wire holding said foam pad in position upon the springs.

2. An upholstered seat as claimed in claim 1 wherein said foam material is polyurethane foam material.

3. An upholstered seat as claimed in claim 1 wherein said upholstered seat is an automobile bucket type seat. 5

4. An upholstered seat as claimed in claim 1 wherein fabric covers said molded pad and said fabric is at least in part held in position upon the seat by fasteners connected to said wire of said molded pad. 10

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CASMIR A. NUNBERG, Primary Examiner

U.S. Cl. X.R.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,537,752

November 3, 1970

Harry A. Kushnarov et al.

It is certified that error appears in the above identified patent and that said Letters Patent are hereby corrected as shown below:

In the heading to the printed specification, line 6, after "46992" insert -- assignors to The General Tire & Rubber Company, a corporation of Ohio --.

Signed and sealed this 26th day of January 1971.

(SEAL)

Attest:

Edward M. Fletcher, Jr.

Attesting Officer

WILLIAM E. SCHUYLER, JR.

Commissioner of Patents