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I. E. WARD

3,083,056

UPHOLSTERED SEAT ARTICLE

Filed Dec. 21, 1960

FIG. 1

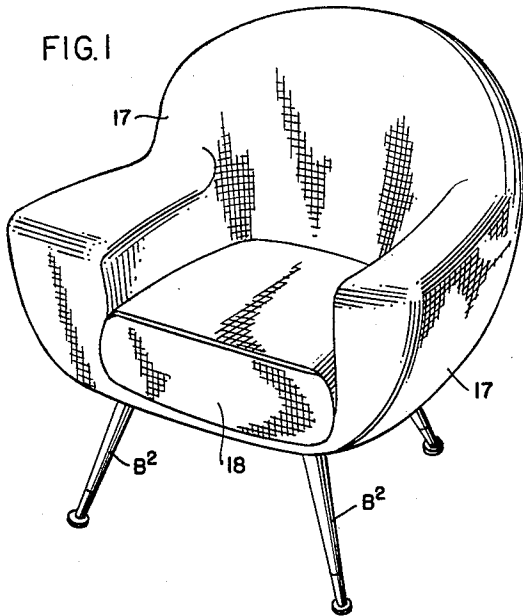


FIG. 2

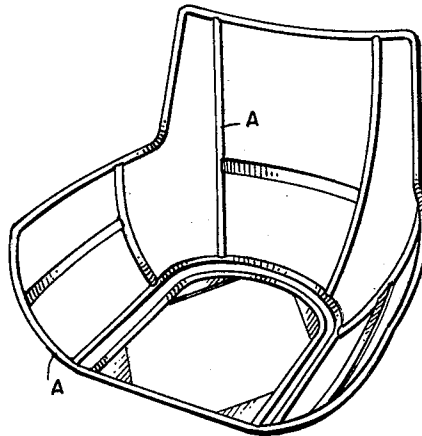


FIG. 3

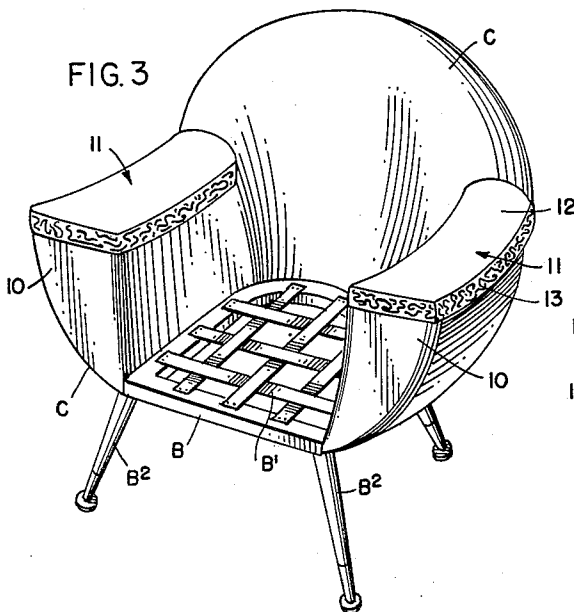
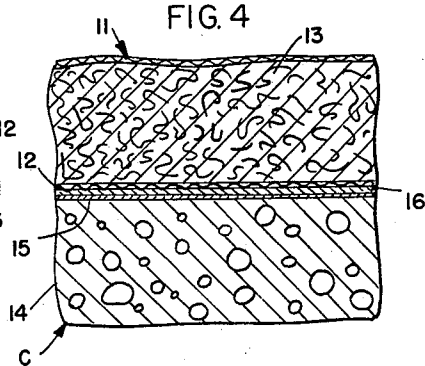


FIG. 4



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UPHOLSTERED SEAT ARTICLE

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This invention relates to an upholstered seat article, and more particularly to a chair, sofa, davenport, and the like, in which a supporting skeleton frame is enclosed within a foam cushioning material.

In the forming of an upholstered seat article such as, for example, a chair or davenport, a metal frame may be secured upon a base structure and a foam cushioning material may be cast about the metal frame by expanding a material such as polyurethane, etc. Cellular material such as foam rubber and other cushioning foam substances may be cast about the metal frame and the expanded or foam material may be molded so as to have the desired final shape for the seat article. One difficulty with the cushion or upholstered article is that the expanded cellular material, while having a flexibility and resilience which is desired because of its cushioning effect, does not provide as much cushioning for the supporting metal frame at points immediately over the frame parts as may be desired. If it were possible to retain the resilient cushioning effect of the expanded material such as, for example, polyurethane, while at the same time utilizing cushioning material of a type which prevents "feel" of the metal parts embedded within the structure, a substantial advance would be made in the art.

I have discovered that if the expanded cellular material is provided with a skin which is tough and elastic and resilient, extending continuously over the cellular area in which the metal part in question is embedded, and if a pad of fiber or other effective cushioning material were anchored to the skin, "feel" of the skeleton frame parts would be eliminated without diminishing the cushioning effect of the cellular material through the action of the resilient skin in distributing the stress over wide areas.

A primary object, therefore of the invention is to provide, in combination with a cellular material in which metal parts are embedded, fibers or other padding material for insulating the "feel" of the frame parts without diminishing the cushioning properties of the cellular material. Another object is to provide in such a structure an elastic and tough skin which extends in a continuous sheet over the cellular body and to which adheres a cushioning pad, the cellular body and cushioning pad being enclosed within a cover. A further object is to provide, in combination with a frame-supported foam body providing a seat structure, a pad material which is anchored to a resilient skin continuously extending over the cellular body portion above the metal frame part. Other specific objects and advantages of the invention will appear as the specification proceeds.

The invention is shown, in an illustrative embodiment, by the accompanying drawing, in which—

FIG. 1 is a perspective view of a chair structure embodying my invention; FIG. 2, a perspective view of a base and a metal skeleton structure adapted to be embedded within the foam material or enclosed within the foam material; FIG. 3, a view similar to FIG. 2 but showing the article after the foam material has been cast about the frame to form the chair body and showing also the added fibrous pads over the arms of the expanded material; and FIG. 4, a greatly enlarged detail sectional view showing the skin structure of the foam and the fibrous pad material united to the skin.

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In the illustration given, A designates a frame body which may be formed of metal or other suitable rigid or supporting material, and B designates a base formed of wood or other suitable material and equipped with a webbing support B'. To the base B may be secured legs B₂ of any desired type or any other suitable base-supporting means.

The metal frame A is preferably placed within a mold and then a material such as, for example, polyurethane is introduced into the mold and is allowed to expand so as to form a cellular body about the frame, the cellular body being indicated by the letter C. As shown more clearly in FIG. 3, the cellular body is provided with arm rests 10 having flat top surfaces on which are placed fibrous pads 11. In the specific example, the pad 11 consists of upper and lower netting or cheesecloth sheets 12, between which extend synthetic polyester fibers 13, generally referred to as Dacron.

As shown more clearly in FIG. 4, the cellular polyurethane body material 14 is provided with an elastic resilient skin 15, and the skin 15 is secured to the pad 11 by rubber or other resilient adhesive 16.

In the expanding of polyurethane, it is well known that a skin may be formed on the foam material within widely-varying limits. A thick skin which is substantially rigid may be formed, while under other conditions a relatively thin and resilient skin can be formed. The thickness of the skin may be controlled by the molding technique through the use of pre-heating molds or through external heat and by other conditions which are well known in the industry. In the practice of my invention, the skin is preferably formed in a thickness of one-half mil to five mils, and preferably within the range of 1/2 to 1 1/2 mils. While the body 14 of the polyurethane is formed of open cells with thin walls, the skin 15 thereabove, and particularly above any metal part of the frame which is to be insulated as to "feel," is continuous in character and not cellular. The continuous skin sheet 15, however, is integrated with the walls forming the cells of the expanded body 14 therebelow, so that the skin thus can distribute stress evenly over the spaced-apart cellular walls therebelow. By anchoring the pad 11 to the unifying skin 15 through the use of a resilient adhesive 16, I find that the pad 11 can be utilized so as to dampen out "feel" of the metal parts therebelow because the stresses imposed upon the pad are distributed through the continuous skin over a wide area of the cellular body 14 therebelow.

After the cushion body C has been formed, as illustrated in FIG. 3, and the fibrous pad 11 added as shown in FIG. 3, the final preferred step is to enclose structures C and 11 in a fabric cover 17, as shown in FIG. 1, the cover 17 being preferably adhered to the structures C and 11 through the use of adhesive. A cushion 18 may then be placed upon the base B, as shown in FIG. 1, and the cushion may be formed in the same manner as the chair is formed, or it may be formed of any other suitable material.

In the operation of the finished product, it is found that when one is seated within the chair or like article, the fibrous pad 11 transmits the stress of any weight placed thereon to the underlying skin 15 and the skin in turn resiliently distributes the stress over the expanded body 14 therebelow, with the result that there is no "feel" of the steel or other rigid structure forming the skeleton A within the arm rests C. While I have shown the padding 11 applied to the arm rests of the chair, it will be understood that such padding may be applied to any portions of the cushion structure C.

While I prefer to form the padding 11 of fibrous material because of its transmitting stress in a different manner

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from that transmitted by the cellular structure 14, it will be understood that other materials such as cotton felt, synthetic fibers, polyvinyl foam, polyether foam, rubber foam, etc., may be employed. As stated a fibrous structure is preferred because such structures tend to bunch in directing the stress upon the skin below and the skin in turn spreads the stress, distributing it over a large area of the cell walls therebelow.

While I have described the body C as being formed of polyurethane by way of example, it will be understood that other materials such as polyvinyl foam, polyether foam, rubber foam, etc., may be employed. I prefer an expanding cellular material such as polyurethane, because it is effectively molded about the rigid frame material and because of the accurate control of the skin in thickness and elasticity for the distribution purposes herein described.

While I have referred to the adhesive 16 as a rubber adhesive, it will be understood that any suitable flexing adhesive such as latex adhesive or other synthetic adhesives which will effectively anchor the pad 11 to the skin 15, may be employed.

I have described the polyurethane body C as being cast in one operation about the metal frame A. It will be understood, however, that the casting may be in segments, as, for example, an outside half of the chair may be formed by one casting and an inside half by another casting, the two portions or segments being then united by adhesive or other suitable means.

While, in the foregoing specification, I have set forth a structure in considerable detail for the purpose of illustrating the invention, it will be understood that such details may be varied widely by those skilled in the art without departing from the spirit of my invention.

I claim:

1. In an upholstered seat article, a base, a frame carried by said base and providing a skeleton support for the article structure above said base, resilient foam material in which said skeleton frame is enclosed and forming a cushioning body about said frame in the general shape

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of the article, said cushioning body having a portion thereof overlying a frame portion, provided with a surface skin which is elastic and resilient and of a thickness of about $\frac{1}{2}$ mil to 5 mils, a cushion pad over said skin an adhesive between said skin and pad, said adhesive anchoring said pad to said skin, and a covering enclosing said cushion body and pad, said pad being of substantially greater thickness than said skin.

2. The structure of claim 1 in which said skin has a thickness of about $\frac{1}{2}$ mil to $1\frac{1}{2}$ mils.

3. The structure of claim 1 in which said cushioning body is formed of polyurethane.

4. In an upholstered seat article, a base, a frame carried by said base and providing a skeleton support for the article structure above said base, including rigid arm supports, resilient foam material enclosing said frame and surrounding said arm supports to form a cushioning body about said frame and arm supports, said arm cushioning body about said arm supports being provided with a surface skin which is resilient and of a thickness of about $\frac{1}{2}$ mil to 5 mils, a fibrous pad over said skin an adhesive between said pad and skin securing said pad and skin together, and a cover enclosing said cushion body and pad, said pad being of substantially greater thickness than said skin, the fibers of said pad being operative to bunch in directing a stress applied to said pad to said skin, whereby said skin is adapted to apply said stress over a large area of said material.

References Cited in the file of this patent

UNITED STATES PATENTS

2,766,164	Salem	Oct. 9, 1956
2,831,534	Thayden	Apr. 22, 1958
2,838,100	Follows	June 10, 1958
2,845,997	Waite	Aug. 5, 1958
2,892,489	Hurley	June 30, 1959
2,913,041	Mathison	Nov. 17, 1959
2,944,266	Wertheimer	July 12, 1960