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Harder, Jr.

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[54] **SEAT AND BACK CUSHION ASSEMBLY**

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[73] Assignee: **Coach and Car Equipment Corporation**, Elk Grove Village, Ill.

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[21] Appl. No.: **383,341**

Related U.S. Application Data

[63] Continuation of Ser. No. 226,905, Feb. 16, 1972, abandoned.

[52] **U.S. Cl.** **297/452**, 297/DIG. 1

[51] **Int. Cl.** **A47c 7/02**

[58] **Field of Search** ..... 297/DIG. 1, DIG. 3, 452, 297/458–460; 5/309

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Attorney, Agent, or Firm—Merriam, Marshall, Shapiro & Klose

[57] **ABSTRACT**

A seat comprising a seat cushion and a back cushion. The seat cushion includes a spring unit encased in a flexible, film-like cover and mounted on a bottom support member with foam covering the top and sides of the coil spring unit and underlapping the margins of the bottom support member. The back cushion comprises a less dense foam slab cemented to a rigid backing plate, with the face and edges of the backing plate and slab encased in a higher density foam.

5 Claims, 12 Drawing Figures

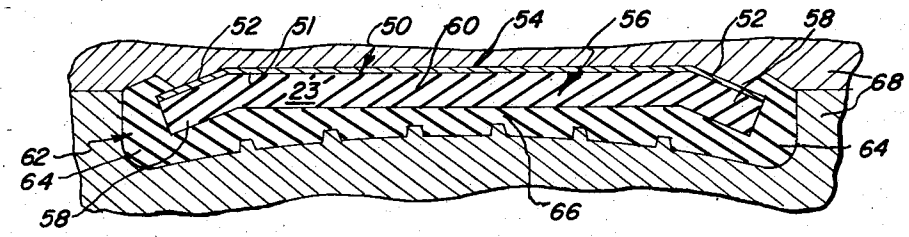


FIG. 6

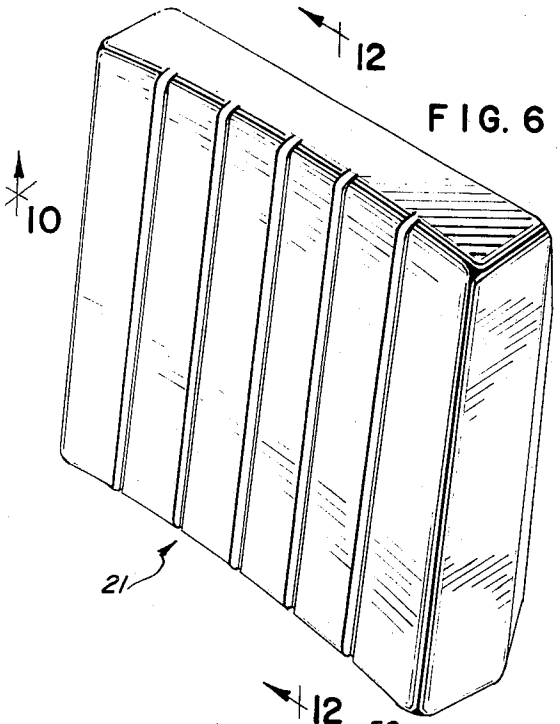


FIG. 1

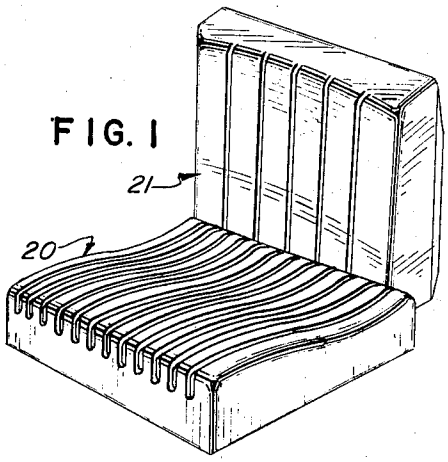


FIG. 7



FIG. 8

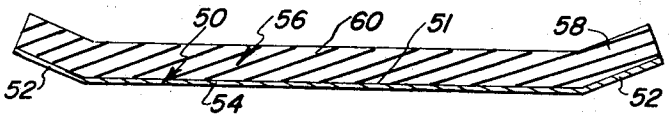


FIG. 9

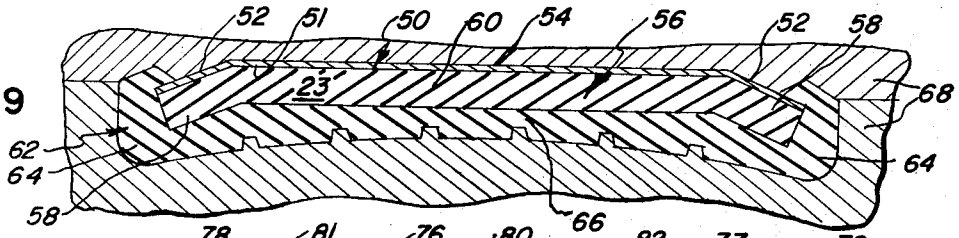


FIG. 10

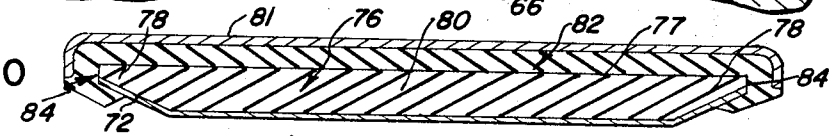


FIG. 11

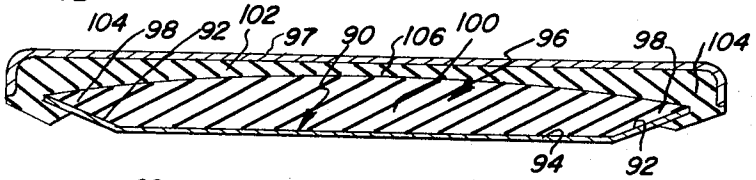


FIG. 12

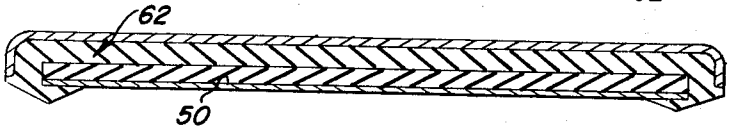


FIG. 2

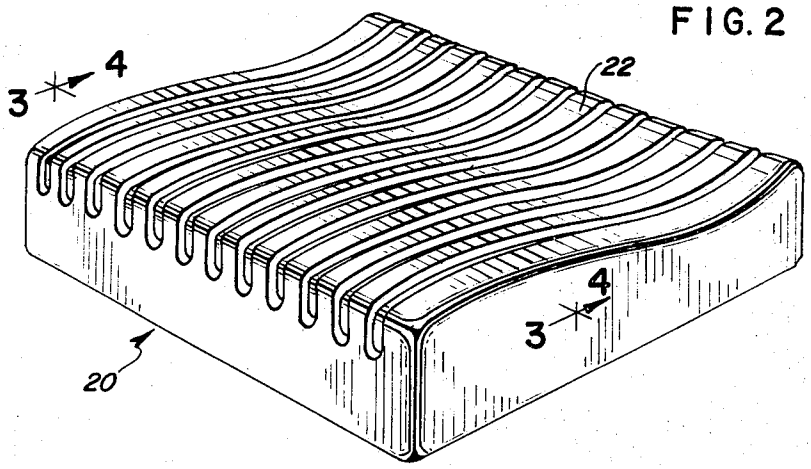


FIG. 3

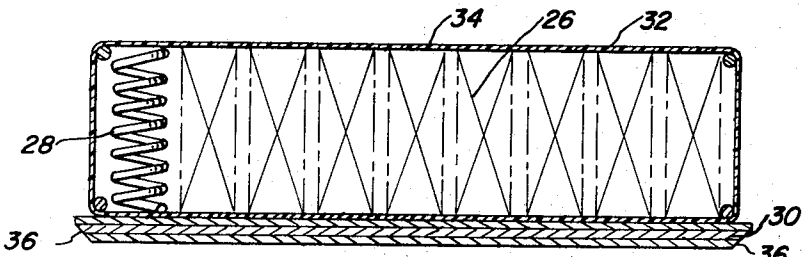


FIG. 4

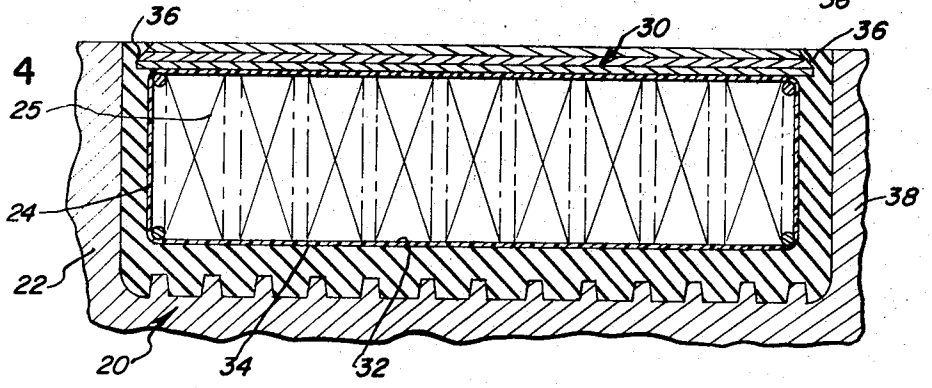
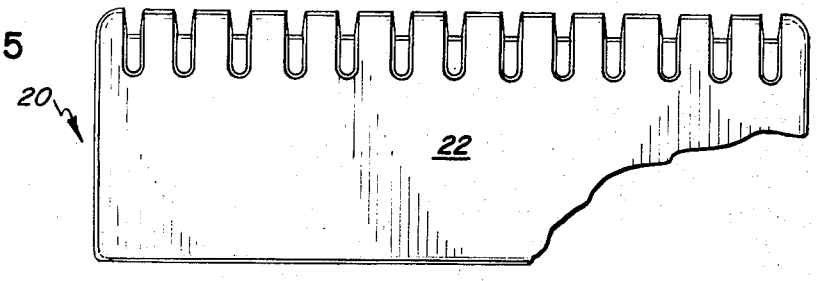


FIG. 5



SEAT AND BACK CUSHION ASSEMBLY

This is a continuation, of application Ser. No. 226,905, Filed Feb. 16, 1972, abandoned.

BACKGROUND OF THE INVENTION

The present invention relates generally to seats and more particularly to a seat having seat and back cushions produced with minimum waste of raw materials and which provides maximum comfort to the user.

Urethane foam is a suitable material for making molded seat and back cushions. In the prior art it has been sewn or otherwise held in place in block or pad form. When held in place in this fashion, a fabric cover for the cushion is needed. However, when liquid urethane is foamed into place, a number of advantages result. Since molded urethane foam is self-skinning, the cushion manufactured therefrom has a waterproof surface, which eliminates the need for fabric or other covering. The manufacture of a cushion by foaming urethane into place, rather than by sewing or otherwise attaching slabs or blocks of urethane to the other parts of the cushion, also permits the cushion surface to be manufactured in diverse configurations, both utilitarian and decorative.

Coil springs are often used in a seat cushion inside the urethane foam. However, in order for the seat cushion to flex properly, the spring cavity (i.e., the space inside the urethane foam containing the coil springs) must remain relatively free of urethane foam. Coil springs for seat cushions are conventionally covered with burlap, and this permits seepage of urethane foam into the spring cavity during molding of the urethane foam. Since a precise amount of liquid urethane typically is dispensed into the mold during molding, if some should leak into the spring cavity, voids would occur in the cushion surface.

Another problem encountered by seat cushion manufacturers is the added cost of permanently affixing a bottom support member to a previously molded cushion. A bottom support member added after the molding process is often not attached well enough to provide a permanent base for the cushion.

Conventional urethane foam back cushions present another problem. If the foam is light and soft, there is insufficient support for the individual utilizing the cushion; but, if sufficient support is provided, the cushion is lacking in softness and comfort.

SUMMARY OF THE INVENTION

The present invention is directed to a seat having both a seat cushion and back cushion molded from urethane foam.

The seat cushion contains a cavity containing a coil spring assembly encased in a sealed, flexible, film-like cover (e.g., a polyethylene bag). Before molding, a bottom support board with beveled or tapered marginal edges, or periphery, is securely attached to the encased coil spring assembly. This unit is then inverted in a mold, and urethane foam is poured into the mold. The urethane foam completely surrounds the top and sides of the encased spring assembly and the beveled marginal edges of the bottom support board. The sealed cover prevents foam seepage into the spring cavity, and the cover adheres to the foam.

The back cushion comprises a less dense urethane slab cemented to a rigid back plate. Urethane foam of a greater density is then molded around this unit so as to provide higher density urethane foam of greater thickness near the periphery of the back cushion than near its center. This gives both firm support near the back cushion periphery and softness near the back cushion center.

BRIEF DESCRIPTION OF THE DRAWING

FIG. **1** is a perspective view of a seat having a seat cushion and seat back in accordance with the present invention.

FIG. **2** is a perspective view of an embodiment of a seat cushion in accordance with the present invention.

FIG. **3** is a sectional view, taken along line **3—3** in FIG. **2**, of a portion of the seat cushion before molding.

FIG. **4** is a sectional view similar to FIG. **3** showing the seat cushion after molding.

FIG. **5** is a fragmentary front view of the seat cushion.

FIG. **6** is a perspective view of an embodiment of a back cushion in accordance with the present invention.

FIG. **7** is a sectional view of the rigid support for the back cushion.

FIG. **8** is a sectional view of the rigid support and the urethane slab of the back cushion.

FIG. **9** is a sectional view of the back cushion after molding.

FIG. **10** is a sectional view of the back cushion, taken along line **10—10** in FIG. **6.**

FIG. **11** is a sectional view, similar to FIG. **10,** of an alternate embodiment of a back cushion.

FIG. **12** is a vertical sectional view of the back cushion taken along line **12—12** in FIG. **6.**

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

FIG. **1** shows a seat comprising a seat cushion **20** (FIG. **2**) and a back cushion **21** (FIG. **6**), both in accordance with embodiments of the present invention.

Referring to FIGS. **3** and **4,** seat cushion **20** comprises an outer urethane foam layer **22** molded over a flexible, film-like cover means **24** sealingly encasing coil spring means **26,** composed of several vertically disposed individual coil springs **28,** and attached to a bottom member **30** having a periphery **36** which tapers downwardly and inwardly (FIG. **3**).

Cover means **24** may constitute a polyethylene bag having a top **32** folded over the top of coil spring means **26** and sealed. The exterior **34** of polyethylene cover means **24** may be treated, e.g., by conventional electronic bombardment or conventional flame treatment used prior to imprinting polyethylene sheet material, so that urethane foam means **22** and cover means **24** will adhere to each other.

After coil spring means **26** is enclosed and sealed in cover means **24,** it is mounted atop bottom member **30,** e.g., by staples (not shown), and placed upside-down within a mold **38** (FIG. **4**). Bottom member **30,** eventually to constitute the bottom of seat cushion **20,** is thus at the top of mold **38.**

Urethane foam means **22** is then introduced into mold **38** and foamed into place to surround the inverted top and the sides of coil spring means **26** on the outside of cover means **24** and to cover tapered periphery **36** of inverted bottom member. Urethane foam

means 22 cannot penetrate through cover means 24; and, because exterior 34 of cover means 24 has been treated, urethane foam means 22 adheres especially well thereto and, thus, conforms closely to the configuration of coil spring means 26, filling in any recesses and and accomodating any bulges in coil spring means 26.

Referring to FIGS. 6–9 and 12, back cushion 21 comprises a rigid back support plate 50 having angled side portions 52, 52 extending from a central portion 54. An inner urethane foam slab 56 having wing portions 58, 58 and a central portion 60 is mounted on one side 51 of back support plate 50. Outer urethane foam means 62 having a periphery 64 and a central portion 66 encloses inner urethane foam slab 56 and the edges of back support plate 50. Inner urethane foam slab 56 is less dense and softer than outer urethane foam means 62.

During manufacture, prefabricated inner urethane foam slab 56 is cemented onto rigid back support plate 50; and this assembly is then placed in a mold 68 into which outer urethane foam means 62 is introduced, as shown in FIG. 9.

The resulting back cushion 21 has molded outer urethane foam means 62 adjacent the back of the seat occupant at central portion 66, with inner urethane foam slab 56 behind outer urethane foam means 62. The outer urethane foam means 62 is thickest at periphery 64, and back cushion 21 is firmer there. The outer urethane foam means 62 is thinnest in central portion 66, and back cushion 21 is more yieldable or softer because the less dense, more yieldable inner urethane foam slab 56 can be felt through the thinner central portion 66 of outer urethane foam means 62.

Referring to the embodiment of FIG. 10, an inner urethane foam slab 76 is cemented onto a rigid back support plate 70 comprising angled side portions 72, 72 extending from a central portion 74. Inner urethane foam slab 76 has wing portions 78, 78 on either side of a central portion 80, and the wing portions taper outwardly to their sides 84, 84 rather than being the same thickness as in the prior embodiment (FIGS. 8 and 9). Inner urethane foam slab 76 has a flat outer surface 77 rather than an indented outer surface as in the prior embodiment (FIGS. 8 and 9). Outer urethane foam means 82 may be molded to provide a flat outer surface 81 rather than the slightly curved surface of the embodiment of FIG. 9.

Referring to the embodiment of FIG. 11, an inner urethane foam slab 96 is cemented onto a rigid back support plate 90 comprising angled side portions 92, 92 extending from a central portion 94. Inner urethane foam slab 96 is relatively thick near its central portion 100 and tapers toward its side portions 98, 98. Outer urethane foam means 102, comprises peripheral portions 104, 104 and central portion 106 and may have a flat outer surface 97. Central portion 106 of outer urethane foam means 102 is relatively thin and peripheral portions 104, 104 are relatively thick. This makes the central area of back cushion 21 softer than the periphery of the cushion which is relatively firm for greater support.

The foregoing descriptions have been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, as modifications will be obvious to those skilled in the art.

What is claimed is:

1. A seat comprising a seat cushion and a back cushion:
said seat cushion comprising:
coil spring means;
flexible, film-like cover means impenetrable to urethane foam sealingly enclosing said coil spring means;
urethane foam including means surrounding the top and sides of said coil spring means on the outside of said cover means;
the space enclosed by said cover means being devoid of urethane foam;
said cover means adhering to those parts of said urethane foam surrounding the top and sides of the coil spring means;
and a bottom member underlying and attached to said coil spring means;
said bottom member having a periphery tapering downwardly and inwardly to a bottom surface of said member;
said urethane foam including means covering said tapered periphery and having a bottom marginal surface flush with said bottom surface of said bottom member;
said back cushion comprising:
rigid back support means;
inner urethane foam means mounted on one side of said rigid back support means; and
outer urethane foam means enclosingly and permanently molded around and bonded to said inner urethane foam means and the edges of said back support means;
said outer urethane foam means having a greater density than said inner urethane foam means.

2. A seat cushion comprising:
coil spring means;
flexible, film-like cover means impenetrable to urethane foam sealingly enclosing said coil spring means;
urethane foam including means surrounding the top and sides of said coil spring means on the outside of said cover means;
the space enclosed by said cover means being devoid of urethane foam;
said cover means adhering to those parts of said urethane foam surrounding the top and sides of the coil spring means; and
a bottom member underlying and attached to said coil spring means;
said bottom member having a periphery tapering downwardly and inwardly to a bottom surface of said member;
said urethane foam including means covering said tapered periphery and having a bottom marginal surface flush with said bottom surface of said bottom member.

3. A back cushion comprising:
a rigid back support member having inner and outer surfaces, and a peripheral edge;
an inner layer of urethane foam mounted on said rigid back support member;
said inner layer of urethane foam having a first surface in contact with the inner surface of said rigid back support member and a second surface opposite said first surface;

an outer layer of urethane foam having a density greater than the density of said inner layer of foam;

said outer layer of foam being bonded to said second surface of said inner layer of urethane foam and extending around the peripheral edges of said rigid back support member and covering the marginal portion of said outer surface of the back support member;

the remainder of said outer surface of the back support member being uncovered by either said inner or said outer layer of urethane foam.

4. A back cushion as recited in claim **3** wherein:

said outer layer of urethane foam is thinner near the center of said back cushion and thicker at the periphery of said back cushion.

5. A back cushion as recited in claim **3** wherein:

said inner layer of urethane foam is thicker near the center of said back cushion and thinner near the edges.

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