United States Patent [19]

Tischler

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[45] **Apr. 17, 1973**

[54] **SEAT CONSTRUCTION**

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[73] Assignee: **Gulf & Western Metals Forming Company,** Southfield, Mich.

[22] Filed: **Sept. 16, 1971**

[21] Appl. No.: **181,041**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 25,832, April 6, 1970, Pat. No. 3,639,002.

[52] **U.S. Cl.**.....**297/452,** 297/DIG. 2, 297/458

[51] **Int. Cl.**.....**A47c 7/02,** A47c 27/00

[58] **Field of Search**.....297/452, 454, 458, 297/DIG. 1, DIG. 2, 218, 219

[56] **References Cited**

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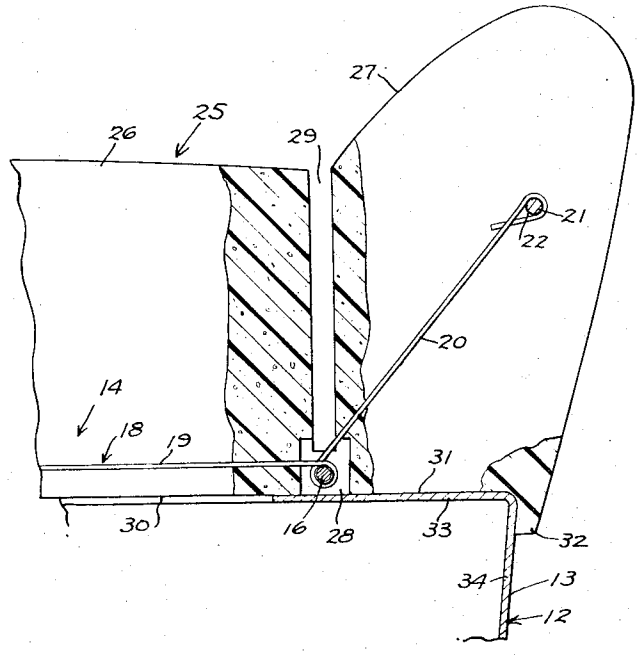
Primary Examiner—Casmir A. Nunberg

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[57] **ABSTRACT**

A seat construction comprising a frame including a base and a back. Each of the base and back have a frame with spaced side rails and a spring assembly mounted on the frame. Each spring assembly comprises a plurality of longitudinally extending wires, a plurality of transversely spaced wires having intermediate portions extending between the spaced wires and free ends extending beyond the longitudinally extending wires at an acute angle to the intermediate portion. Each spring assembly further comprises a longitudinal wire along each side edge connecting the free ends of said transversely spaced wires. Each spring assembly is embedded in a body of resilient foam plastic material.

10 Claims, 10 Drawing Figures

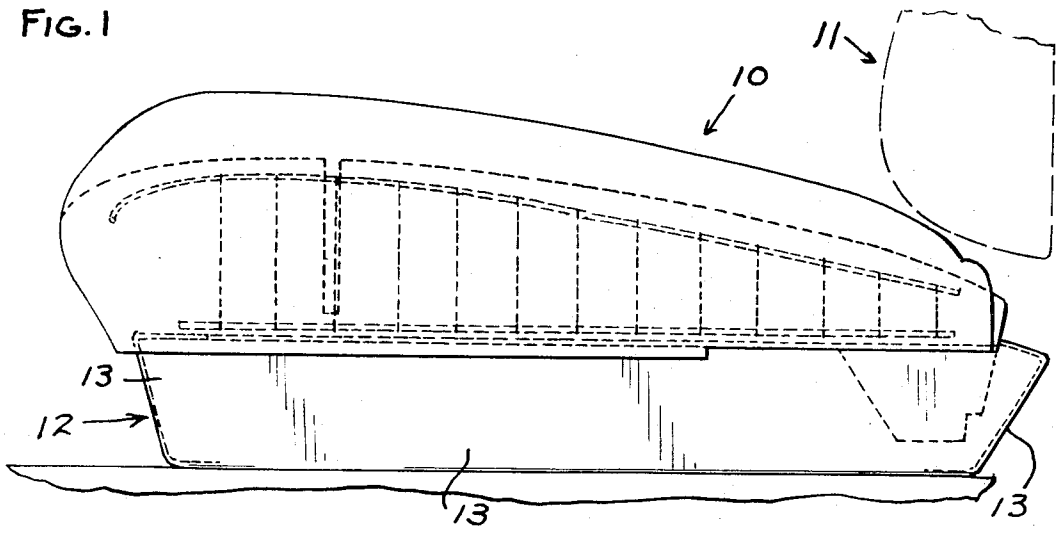


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SHEET 1 OF 4

FIG. 1



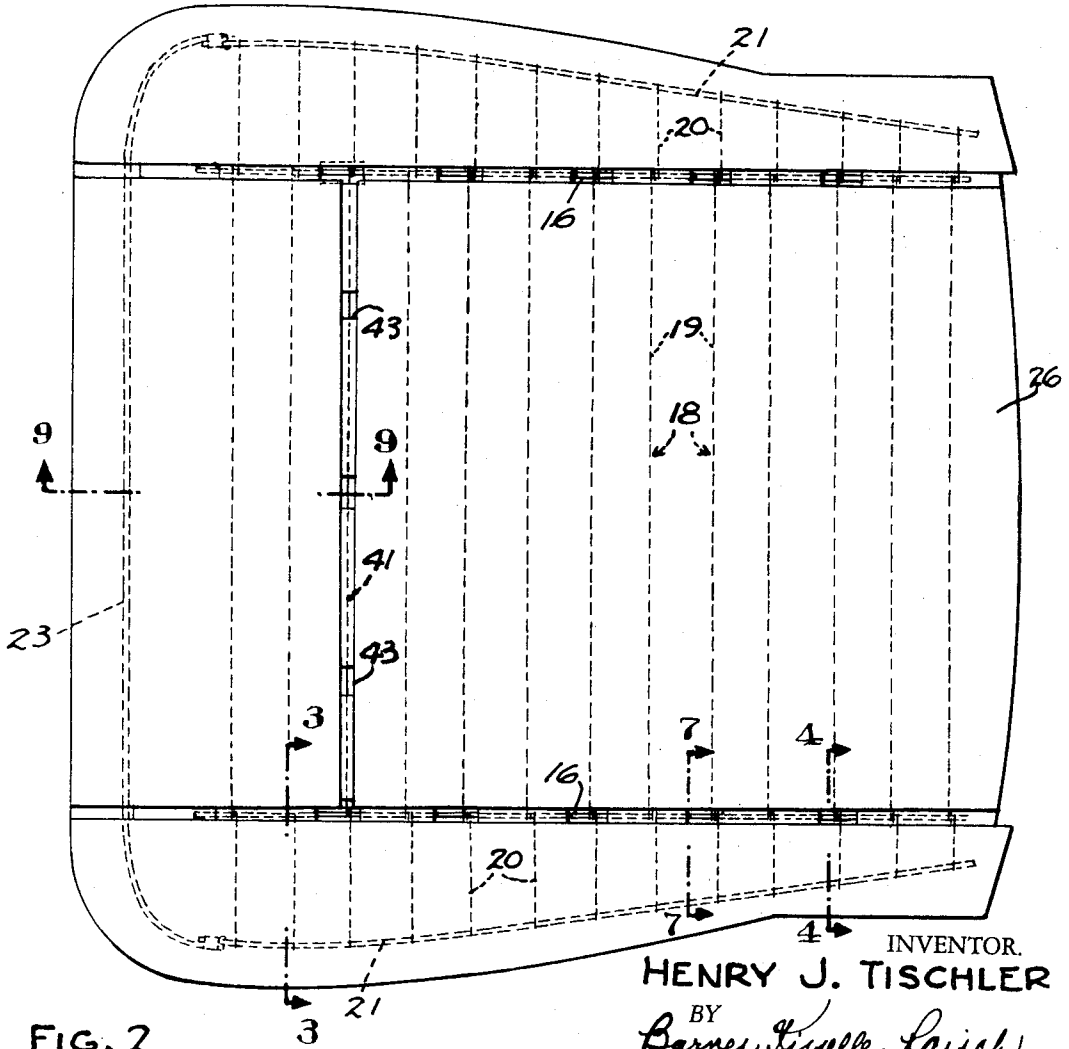


FIG. 2

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FIG. 3

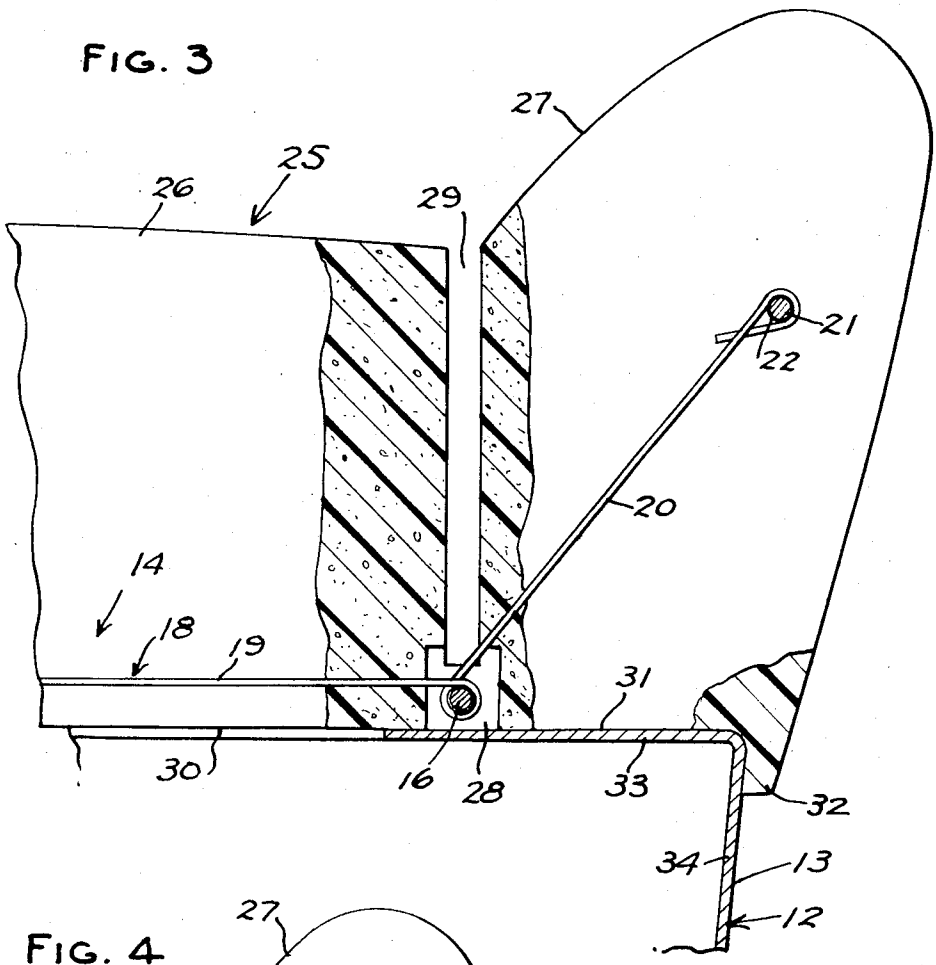
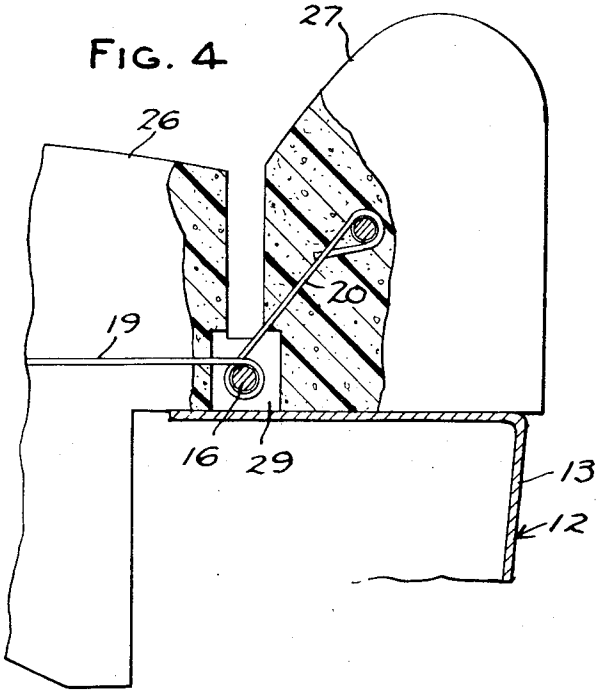


FIG. 4



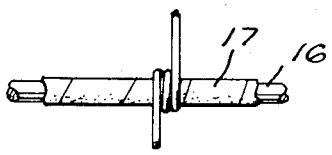


FIG. 5

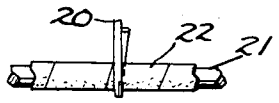


FIG. 6

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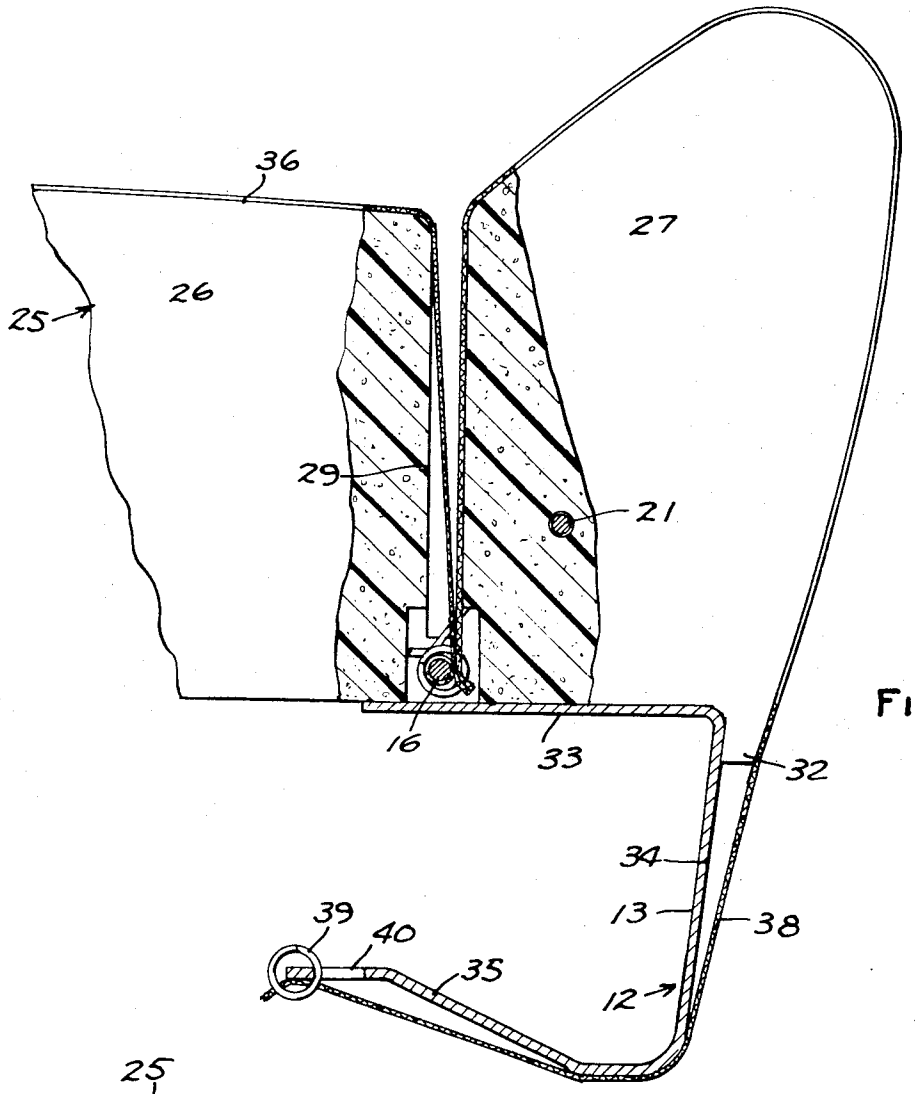


FIG. 7

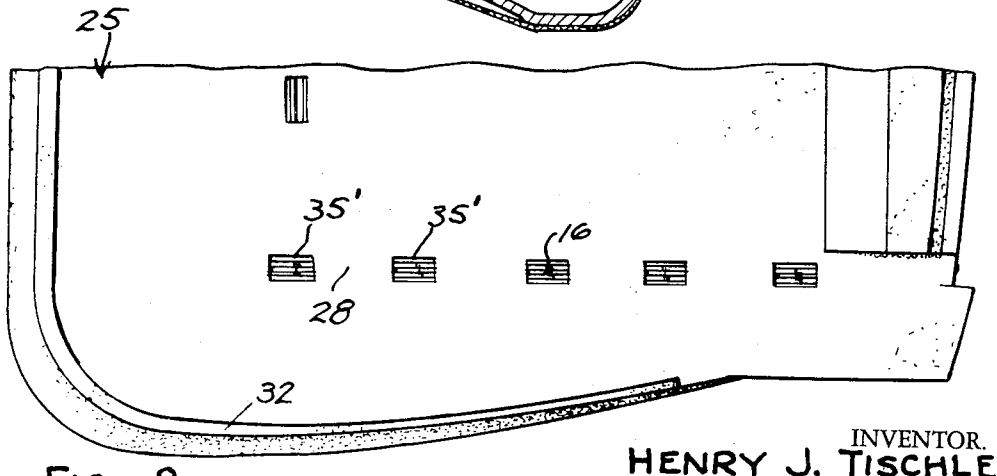


FIG. 8

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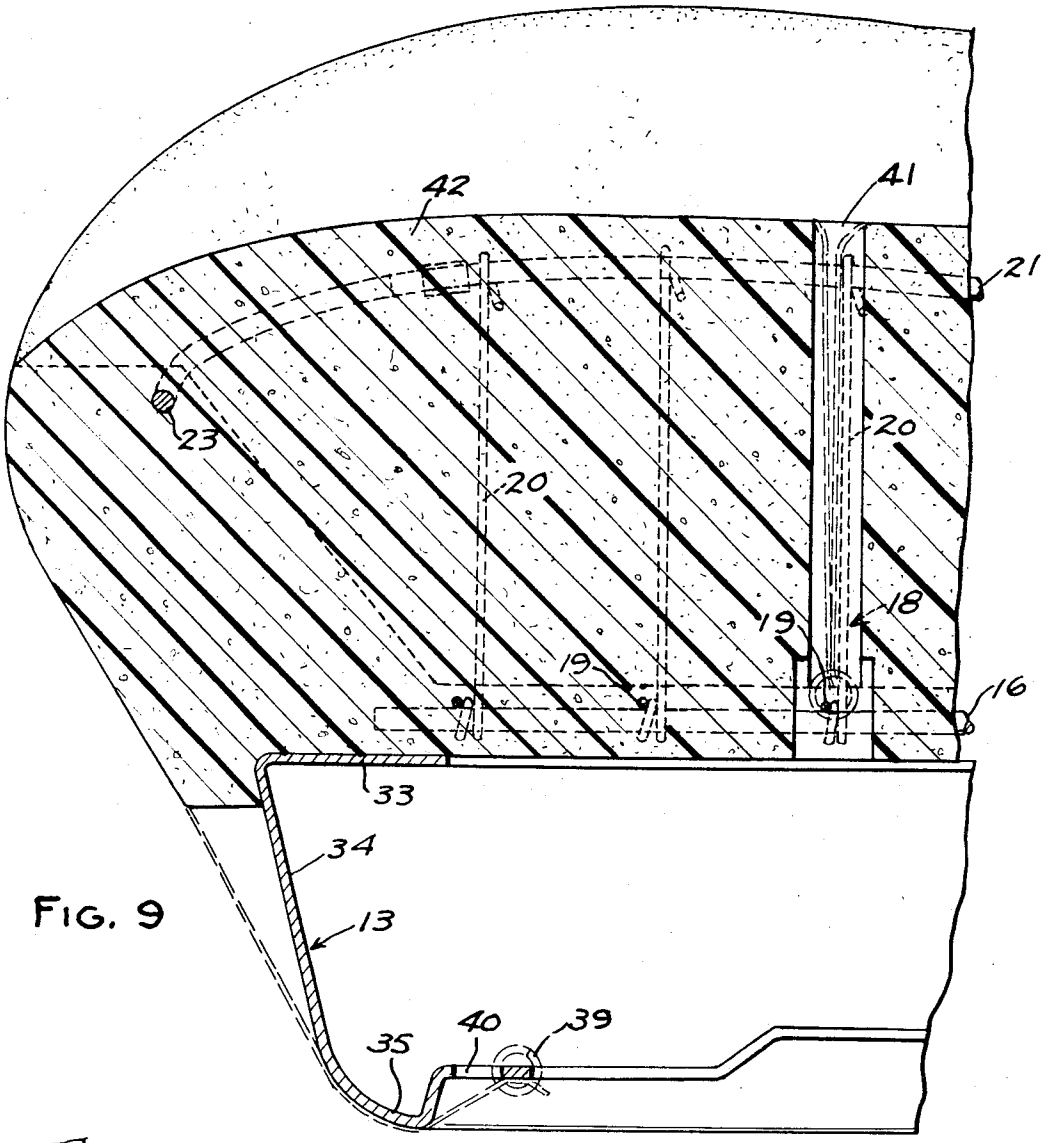


FIG. 9

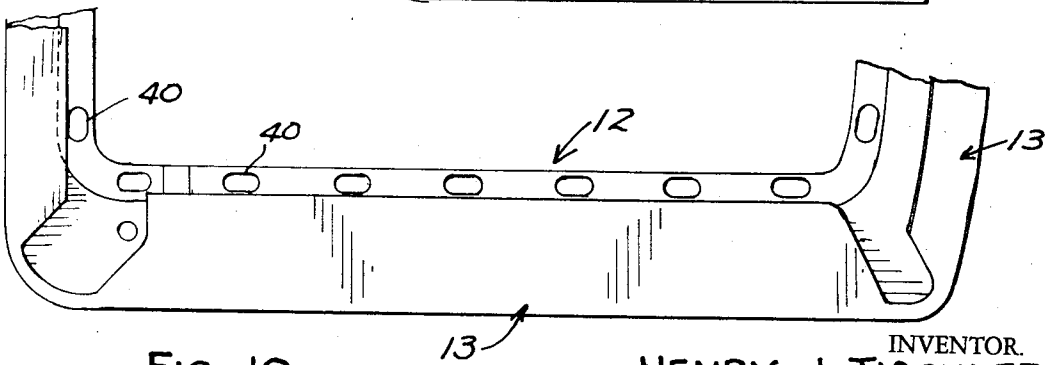


FIG. 10

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SEAT CONSTRUCTION

This application is a continuation-in-part of application Ser. No. 25,832, filed Apr. 6, 1970 now U.S. Pat. No. 3,639,002, issued Feb. 1, 1972.

This invention relates to seat construction and particularly to spring seat construction.

Conventional types of seat construction comprise coiled springs, sinuous springs, combinations of coiled and sinuous springs and the like.

In the aforementioned patent application there is provided a novel spring assembly that comprises a plurality of longitudinally extending wires, a plurality of transversely spaced spring wires having intermediate portions, extending between the spaced longitudinal wires, and free ends extending beyond the longitudinally extending wires at an acute angle to the intermediate portions. A longitudinal wire is provided along each side edge connecting the free ends of the transversely spaced wires. Such a construction obviates the need for coiled and sinuous springs in the spring assembly. The spring assembly is preferably embedded in a body of foam plastic material.

Among the objects of the invention are to provide an improved seat construction of the type shown in the aforementioned patent application; which utilizes longitudinally and transversely extending straight wires connected to form a spring assembly which is resiliently mounted on a frame, which seat construction is thinner than conventional constructions and yet at the same time produces the same luxurious feel on the occupant; which can be produced at low cost; which eliminates parts and which can be readily adjusted to produce varying degrees of resiliency and support.

SUMMARY OF THE INVENTION

In accordance with the invention, the seat construction comprises a frame including a base and a back. Each of the base and back have a frame with spaced side rails and a spring assembly mounted on the frame. Each spring assembly comprises a plurality of longitudinally extending wires, a plurality of transversely spaced wires having intermediate portions extending between the spaced wires and free ends extending beyond the longitudinally extending wires at an acute angle to the intermediate portion. Each spring assembly further comprises a longitudinal wire along each side edge connecting the free ends of said transversely spaced wires.

The spring assembly is embedded in a body of foam plastic material and is mounted directly on the frame of the base or back, being retained in position by interengaging portions of the body and frame and by the upholstering material that is connected to the frame.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary side elevational view of a seat embodying the invention.

FIG. 2 is a part sectional plan view of the seat base, before upholstering.

FIG. 3 is a fragmentary sectional view on an enlarged scale taken along the line 3—3 in FIG. 2.

FIG. 4 is a fragmentary sectional view taken along the line 4—4 in FIG. 2.

FIG. 5 is a fragmentary plan view of a portion of a spring assembly utilized in the seat.

FIG. 6 is a fragmentary plan view of another portion of the spring assembly.

FIG. 7 is a fragmentary sectional view similar to FIG. 3 showing upholstering applied to the seat.

FIG. 8 is a fragmentary bottom plan view of a portion of the seat.

FIG. 9 is a fragmentary sectional view on an enlarged scale taken along the line 9—9 in FIG. 2.

FIG. 10 is a fragmentary plan view of another portion of the seat.

DESCRIPTION

Referring to FIG. 1, the seat embodying the invention comprises a seat base 10 and a seat back 11 that may be fixed or pivoted relative to one another by appropriately mounting their frames in accordance with well-known construction.

Each of the seat base 10 and seat back 11 is of generally similar construction.

Referring to FIGS. 1 and 3, the seat base 10 comprises a frame 12 including spaced side and front rails 13, made of sheet metal. The seat base 10 further comprises a spring assembly 14 that is mounted on the rails 13 as presently described.

Spring assembly 14 comprises spaced longitudinally extending wires 16 of steel having a paper wrapping 17 and spaced transversely extending wires 18 of oil-tempered spring steel. Wires 18 include intermediate portions 19, the ends of which are wound around the wires 16 (FIG. 5) and extend in a free manner as at 20 at an acute or obtuse angle to the general plane of the intermediate portions 18 (FIG. 3). The free ends of portions 20 are attached by a single loop about additional longitudinally spaced wires 21 having a paper wrapping (FIG. 6). The ends of the longitudinally extending wires 21 can be interconnected by a transverse wire 23 (FIG. 2).

The spring assembly further comprises a body 25 in which the spring assembly is embedded by molding foam plastic material about the spring assembly.

As shown in FIGS. 2–4, the body 25 comprises a central portion 26 and upwardly extending side portions 27 connected to one another by a narrow portion 28 defining grooves 28, which are spaced from and overlie longitudinally extending wires 16. The body 25 thus takes on a bucket-type configuration.

The spring assembly 14 is embedded in the body in such a manner that the intermediate portions 19 are adjacent but spaced from the bottom surface 30 of the central portion 26, the longitudinal wires 16 are embedded in the narrow intermediate portions 28 and the free end portions 20 extend upwardly into the side portions 27. Each portion 27 further includes a flat underside 31 and a downwardly extending flange 32.

Referring to FIGS. 3, 4 and 10, the frame 12 is generally U-shaped and has side and front rails 13 that are made of sheet metal and are generally U-shaped in cross section to define a horizontal top wall 33, a generally vertical wall 34 and a generally horizontal bottom wall 35. The body 25 is dimensioned such that the intermediate portion 28 and surface 31 engage the top wall 33 while the flange 32 engages the outer surface of the side wall 34.

Referring to FIG. 8, the body 25 of foam plastic material further includes cut-away portions 35′ in the

intermediate portion 28 that define access to the longitudinal wires 16.

Further in accordance with the invention, the upholstery fabric 36 is applied to the outer surface of the portions 26, 27 as shown in FIG. 7 with portions of the fabric extending downwardly through groove 29 and fastened to the wire 16 by pulling portions of the fabric through the openings 35' and fastening them to the wire either by sewing, clamping or other means.

Another portion of the fabric is pulled over portion 27 downwardly as at 38 along the side wall 34 and bottom wall 35 and connected by rings 39 through openings 40 in the bottom wall.

As shown in FIG. 9, a transverse groove 41 is provided in body 25 overlying but spaced from an intermediate portion 19 of transverse wire 18 to define a front portion 42. The upholstery extends into this groove 41 and is fastened to the intermediate portion 19 by a sewing, clamping or other means through openings 43 (FIG. 2).

It has been found that the fastening of the covering 38 to the frame combined with the engagement of the flange 32 with the wall 34 provides sufficient confinement for the body 25 such that the body need not be fastened by any means directly to the frame.

In operation, it has been found that by supporting the body 25 directly on the seat frame, a firm, yet resilient, support is provided without the need for resilient springs and without the usual bouncing or continual spring action that occurs in conventional seats.

In accordance with the invention, the primary support for the seat is on the wall 33 wherein wires 16 overlie the wall but are spaced therefrom by a thin later of foam plastic material.

Although the body has been shown as being laterally confined by a flange 32 engaging the outer surface of the frame, it can be readily appreciated that lateral confinement or restraint might be obtained by a flange engaging an inner portion of the frame.

The construction of the seat back 11 is similar to that of the seat base 10.

In each of the forms of the invention, the foam material may be cast about the spring assemblies with the free portions entirely embedded in the foam material, the outer configuration of the foam material simulating the final shape of the seat.

By varying the inclination of the free portions of the transverse wires with respect to the intermediate portions, a varying shape and feel may be provided to the seat back and seat base. Similarly, by varying the configuration of the sinuous elements, varying degrees of resiliency may be achieved.

I claim:

1. In a seat construction, a spring assembly comprising

a pair of longitudinally extending wires,

a plurality of transversely extending spaced spring wires,

portions of said transversely extending spaced spring wires being wound around said longitudinally extending wires to define an intermediate portion extending between the spaced longitudinally extending wires and connected thereto and free ends extending beyond the longitudinally extending wires at an acute angle to the intermediate portion,

an additional longitudinally extending wire connecting the free ends of said transversely extending spring wires along each said first-mentioned longitudinally extending wire,

a body of foam plastic material in which substantially the entire spring assembly is embedded,

a frame comprising spaced side rails,

said body and said frame having interengaging portions to provide lateral confinement for said body,

said longitudinally extending wires overlying and spaced from portions of said side rails.

2. The combination set forth in claim 1 wherein said intermediate portions of said spaced wires are substantially adjacent but spaced from one surafac of said body.

3. The combination set forth in claim 1 including a border wire connecting said second-mentioned longitudinally extending wires.

4. The combination set forth in claim 1 wherein said body includes longitudinally extending grooves in the upper surface thereof overlying said longitudinally extending wires.

5. The combination set forth in claim 1 including upholstery material overlying said body and connected to said frame, said material providing the sole means for preventing movement of said body outwardly with respect to said frame.

6. The combination set forth in claim 5 including longitudinally extending grooves in said body overlying and spaced from said pair of longitudinally extending wires, said upholstery material extending into said grooves and means fastening said material to said wires.

7. The combination set forth in claim 5 including a transverse groove in said body overlying and spaced from an intermediate portion of a transverse wire, said upolstering material extending into said groove, and means fastening said material to said intermediate portion.

8. The combination set forth in claim 6 wherein said body of foam plastic material includes portions of said body cut away to provide access to said pair of longitudinally extending wires.

9. The combination set forth in claim 1 wherein said interengaging means between said body and said frame comprises a first extending surface which said first-mentioned longitudinally extending wire overlies and a second surface at an angle thereto, said body having portions thereof engaging said surfaces.

10. The combination set forth in claim 9 wherein said second surface faces outwardly.

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