Oct. 7, 1969 E. A. MORRISON 3,471,200

CHAIR CONSTRUCTION

Filed Feb. 23, 1968 2 Sheets-Sheet 1

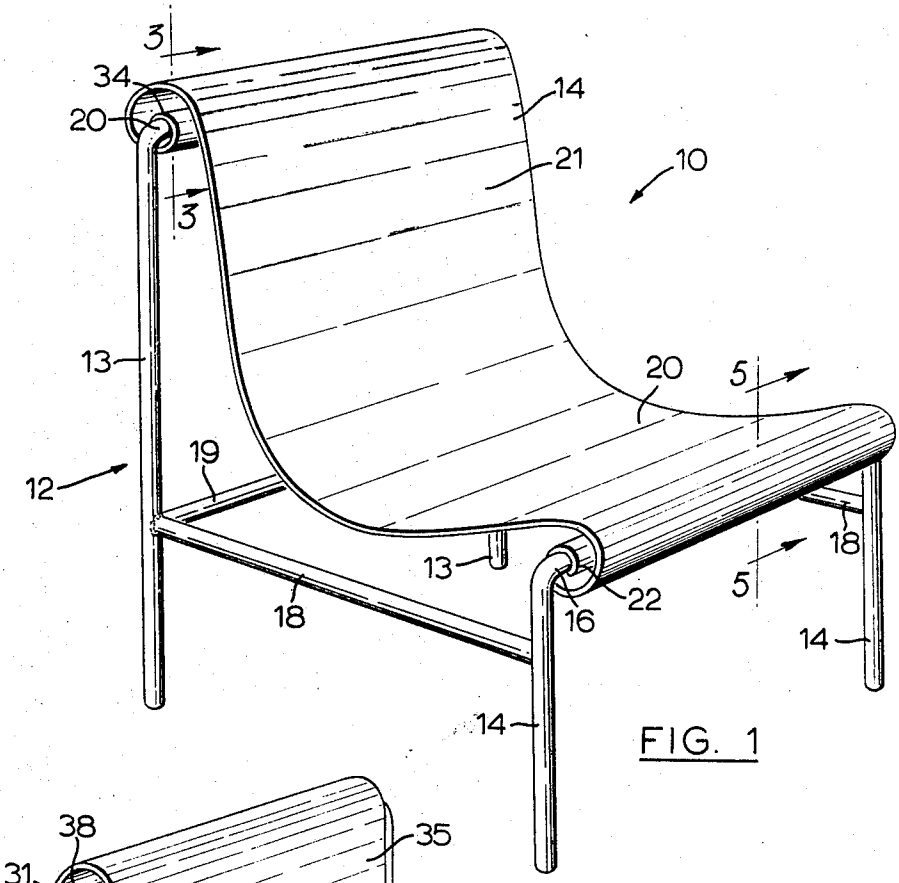


FIG. 1

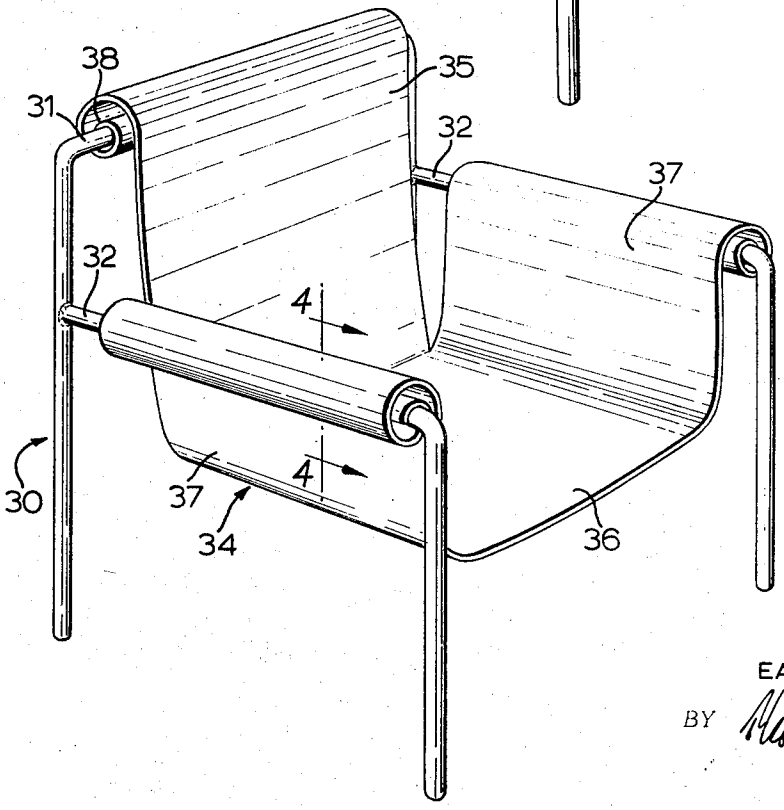


FIG. 2

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CHAIR CONSTRUCTION

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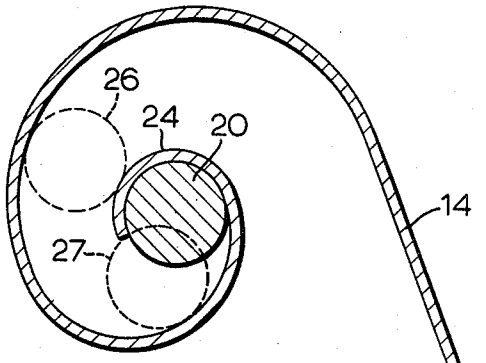


FIG. 3

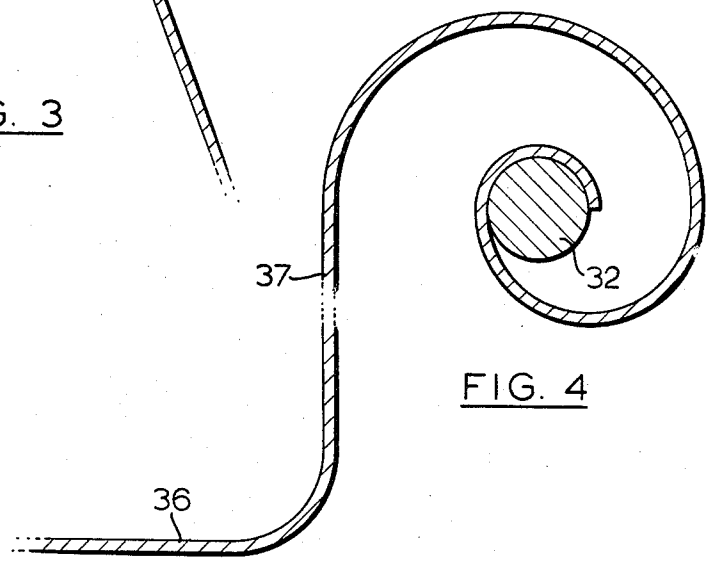


FIG. 4

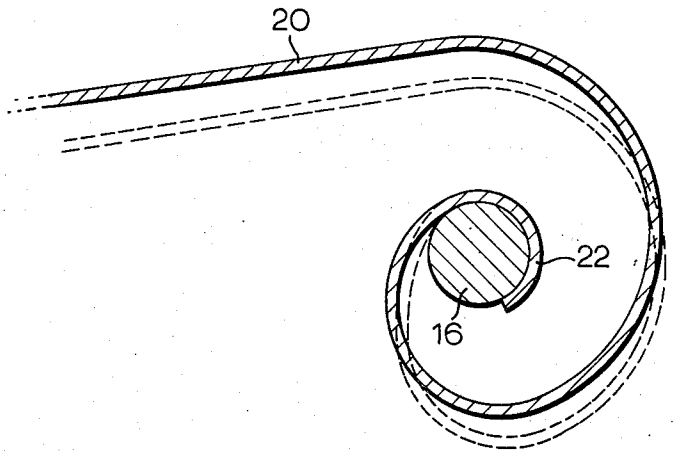


FIG. 5

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CHAIR CONSTRUCTION

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U.S. Cl. 297—441 4 Claims

ABSTRACT OF THE DISCLOSURE

A chair has a supporting framework that includes elongate members substantially horizontally oriented. A stiff but resilient member constitutes a support for a sitter and has at least two extremities attached to different ones of the elongate members. The portion of the stiff but resilient member adjacent each attached extremity is scrolled spirally so as to bring the extremity into contact with its respective elongate member so that the face of the stiff but resilient member opposite the face on which a person sits bears downwardly against the top of the elongate member.

This invention relates generally to chair constructions wherein a body-supporting portion is attached to a structural framework, and more particularly to the configuration of the body-supporting portion of the chair where it is connected to the structural framework.

It is an object of this invention to provide a chair construction which is both simple and economical to manufacture.

It is a further object of this invention to provide a chair construction in which the body-supporting portion of the chair is attached to the structural framework in such a way as to increase the deflection of the body-supporting portion of the chair under a given load, and thereby to enhance the "cushion" effect in the body-supporting portion.

Accordingly, this invention provides a chair construction, comprising: a supporting framework which includes elongate members in substantially horizontal orientations, and a stiff but resilient member adapted to support a sitter on one face thereof, the member having at least two extremities attached to different ones of said elongate members, the portion of the member adjacent each attached extremity being scrolled spirally away from said one face to bring the extremity into contact with the top of its respective elongate member.

Two embodiments of this invention are shown in the accompanying drawings, in which like numerals denote like parts throughout the several views, and in which:

FIGURE 1 is a perspective view of a first embodiment of this invention;

FIGURE 2 is a perspective view of a second embodiment of this invention;

FIGURE 3 is a sectional view taken at the line 3—3 in FIGURE 1;

FIGURE 4 is a sectional view taken at the line 4—4 in FIGURE 2; and

FIGURE 5 is a sectional view taken at the line 5—5 in FIGURE 1.

Turning first to FIGURE 1, a chair generally shown at **10** is seen to comprise generally a supporting framework **12** and a body-supporting sheet member **14**. The supporting framework **12** includes two rearward vertical members **13** (of which only one is visible in FIGURE 1), two forward vertical members **14**, a forward horizontal member **16** bridging between the upper ends of the forward vertical members **14**, two side horizontal members **18** (only one of which is visible in FIGURE 1), a lower rearward horizontal member **19** bridging between the two rearward vertical members **13**, and an upper rearward horizontal member **20** bridging between the upper ends of the rearward vertical members **13**. In the embodiment shown in FIGURE 1, the body-supporting member **14** is a stiff but resilient sheet member shaped to provide a seat portion **20** and a back portion **21** for supporting the body of a sitter. The forward edge **22** and the rearward edge **24** of the sheet member **14** are attached, respectively, to the forward horizontal member **16** and the upper rearward horizontal member **20**. The marginal portion of the sheet member **14** adjacent each edge **22** and **24** is scrolled spirally such that it encircles its respective horizontal member, passes therebeneath, and brings the edge **22** or **24** into contact with the top of the elongate member. This configuration is clearly shown in FIGURE 1. For the sake of clarity of definition in the appended claims, the scrolled portions of the sheet member **14** will be referred to as being scrolled spirally away from the surface of the sheet member **14** which supports the sitter. This terminology means that the surface of the sheet member **14** which contacts a person sitting on the chair is the surface which is on the outside of the scroll convolutions. It will be appreciated that if the scrolled portion were scrolled spirally toward the surface supporting a sitter, i.e. if the sitter-supporting surface were on the inside of the scroll convolutions, the scroll would project toward the body of the sitter and make the chair extremely uncomfortable, if not impossible to use.

As mentioned above, the edges **22** and **24** contact their respective horizontal members on the tops of the latter. This is important because it ensures that the edges **22** and **24** will be urged against their respective horizontal members when the chair is used, rather than being pulled away from the horizontal members as would be the case if the edges **22** and **24** were attached at the underside of their respective horizontal members.

A further consideration in the formation of the scrolled portions adjacent the edges **22** and **24** relates to the radial distance between the convolutions of the scroll. In the embodiment shown in FIGURE 1, the members **13** and **20** are integral, such that it is not possible to slide the horizontal members **16** and **20** longitudinally into position within the scrolled portions of the sheet member **14** when the chair is being assembled. Thus, in order to permit assembly of the chair, the adjacent convolutions of each scrolled portion must be spaced from each other sufficiently far to permit the respective horizontal members to pass inwardly between the convolutions to a position adjacent the edge.

It will be appreciated that other supporting frameworks could be designed in which it was possible to slide the horizontal members longitudinally into position within the scrolled portions, and for this reason the provision of convolution spacing sufficient to permit the horizontal member to pass between convolutions is not considered an essential limitation.

Attention is now directed to FIGURE 3, in which the upper rearward horizontal member **20** is shown in section, and in which the preferred curvature of the scrolled portion of the sheet member **14** is shown. Broken line circles **26** and **27** represent intermediate positions of the upper rearward horizontal member **20** as it is being passed inwardly between the convolutions to the solid line position shown in FIGURE 3. It will be noted that, at every point between the convolutions, there is sufficient spacing for the member **20** to pass without jamming.

The purpose of scrolling the portions of the sheet member **14** adjacent the attached edges **22** and **24** is to permit the sheet member **14** to deflect to a greater degree under load than it would if its edges were attached without being scrolled. In other words, the scrolling of the attached edges gives the sheet member **14** a greater "cushion" effect than it would normally have. Attention

is directed to FIGURE 5, which shows in solid lines the scroll configuration at the forward horizontal member **16** when the chair is unloaded, and which shows in broken lines the scroll configuration when the chair is loaded. It will be clear from this figure that the "cushion" effect is derived from the distortion of the scroll under load.

Attention is now directed to FIGURES 2 and 4, in which the second embodiment of this invention is shown. A supporting framework **30** includes a rearward horizontal member **31** and two side horizontal members **32**. The sheet member **34** includes a back portion **35**, a seat portion **36**, and two side portions **37**. The back portion **35** is scrolled adjacent the edge **38** in exactly the same manner as the back **21** in FIGURE 1. The sides **37** are scrolled similarly to the back portion **35**, as can be seen in FIGURE 4. Again, in FIGURE 2, as in FIGURE 1, the edges which are attached to the horizontal members contact the horizontal members along the top of the latter, in order to ensure a compression load as between the horizontal member and the attached edge.

A large choice of materials is available for the sheet member **14**. Reinforced plastics, sheet metal and laminated wood products, for example, could all be employed for the manufacture of the chair construction according to this invention. The use of sheet metal, however, is particularly advantageous with respect to the ease with which a flat edge can be scrolled, and the accurate duplication of a given scroll configuration. In this connection, it will be noted in FIGURES 3, 4 and 5, that the configuration of the three scrolled portions is identical. Note, for example, that the actual edge of each sheet member (the termination point of each scroll) lies in a plane which contains the axis of the respective horizontal member and which is normal to the flat portion of the sheet member immediately adjacent the scrolled portion thereof. This is not, of course, an essential limitation of this invention, but merely a consequence of providing identical scroll portions on the sheet member, which provision is likewise not essential to this invention.

In the embodiment shown in FIGURE 1, it will be readily appreciated that the sheet member **14** could be replaced by a plurality of parallel, spaced-apart bands all having the same general outline and scroll configurations as the sheet member **14**, without departing from the essence of this invention. It will further be appreciated that the principle of this invention would be employed if the sheet member **14** were replaced by a plurality of rods having no appreciable lateral dimension. In the appended claim **1**, the word "member" is intended to include within its ambit slat-like, band-like or rod-like members, as well as sheet members of the kind illustrated.

In the two embodiments disclosed in this invention, the framework members to which the edges of the sheet members **14** and **34** are attached are shown as horizontal. It will be appreciated that a small departure from horizontal orientation in these members will not affect the advantages deriving from this invention. Provided that the force being transmitted from the seat member to the framework member has its largest component perpendicular to the framework member, the "cushion" effect will be retained.

The attachment of the edges of the sheet members to the framework members can be accomplished in any number of conventional ways. For example, the edges can be welded to the framework members, or attached thereto by means of mechanical fastening devices such as screws, rivets, bolts, etc.

What I claim as my invention is:

1. A chair construction comprising:

a supporting framework which includes elongate members in substantially horizontal orientations,

and a stiff but resilient member adapted to support a sitter on one face thereof, the resilient member having at least two extremities attached to different ones of said elongate members, the portion of the resilient member adjacent each attached extremity being scrolled spirally away from said one face to encircle its respective elongate member in spaced relation therewith and to bring the extremity into contact with the top of its respective elongate member.

2. A chair construction as claimed in claim **1**, in which said stiff but resilient member is a sheet member, the extremities of said sheet member being the edges thereof.

3. A chair construction as claimed in claim **1**, in which adjacent convolutions of each scrolled portion are spaced from each other sufficiently far to permit the elongate member to pass inwardly between the convolutions to a position adjacent said opposite face of the extremity.

4. A chair construction as claimed in claim **2**, in which adjacent convolutions of each scrolled portion are spaced from each other sufficiently far to permit the elongate member to pass inwardly between the convolutions to a position adjacent said opposite face of the extremity, and in which the elongate members are of circular cross-section.

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U.S. Cl. X.R.

297—457