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D. L. HIBBARD ET AL

2,549,902

SEAT

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3 Sheets-Sheet 2

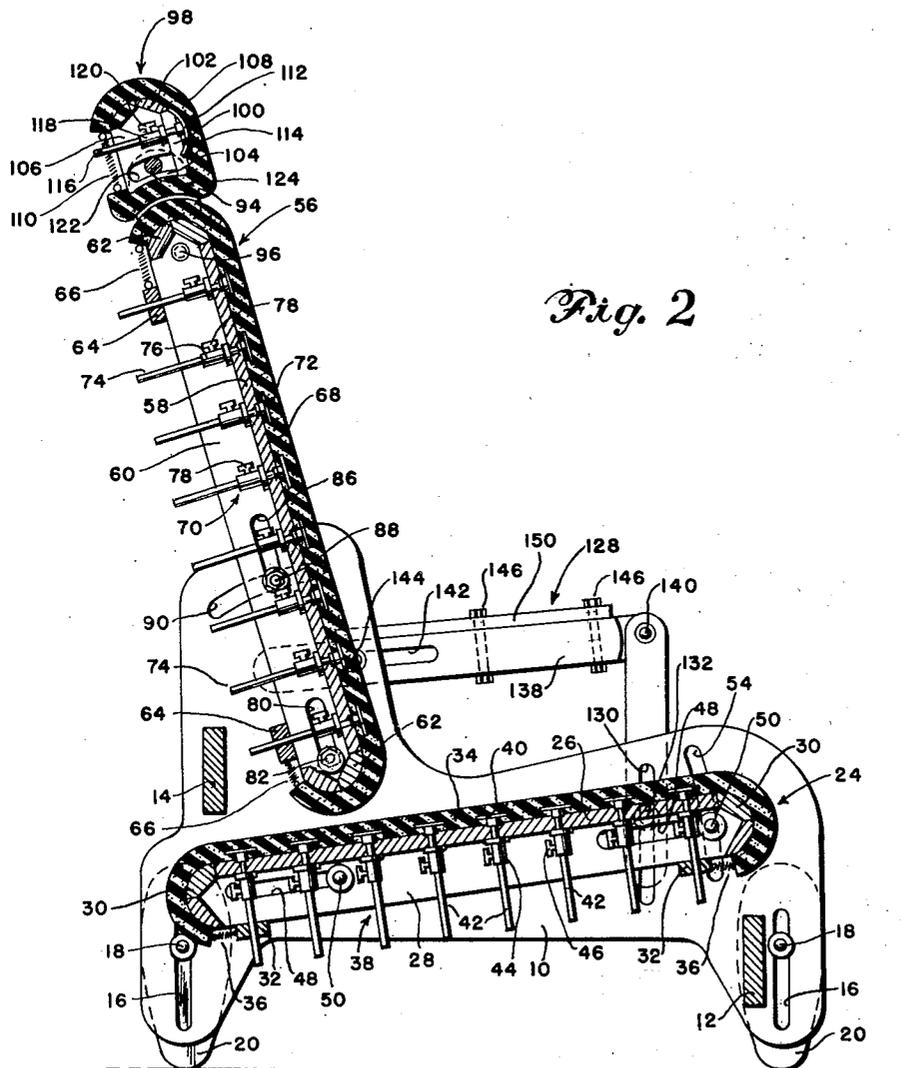


Fig. 2

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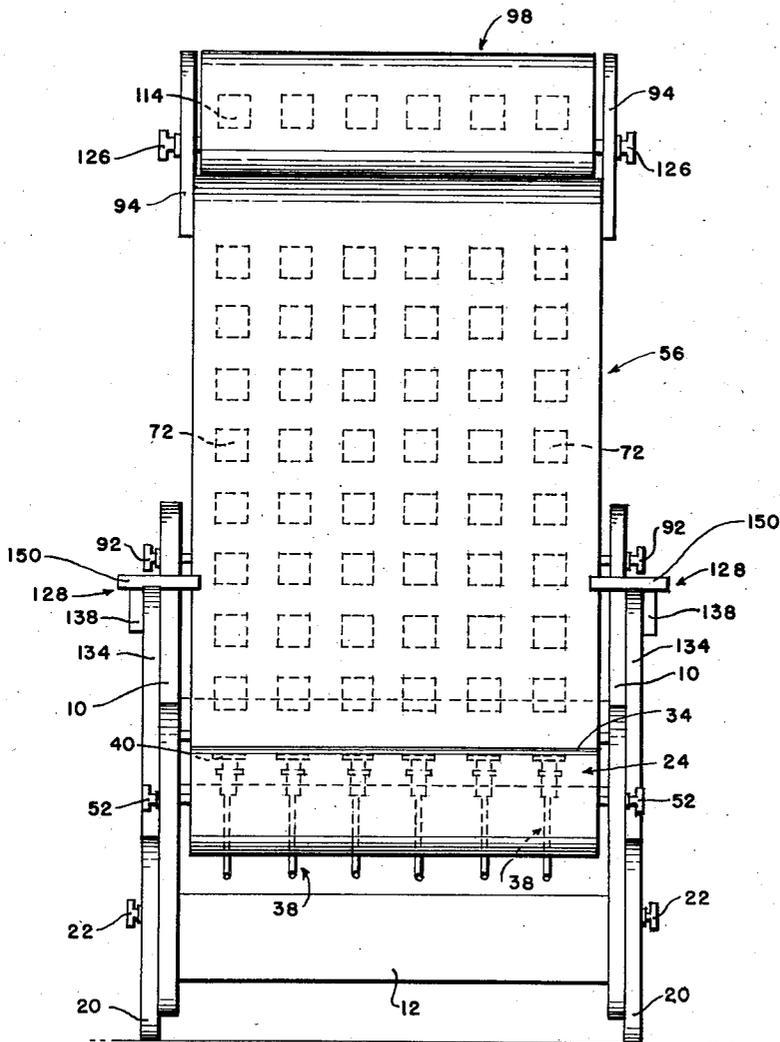


Fig. 3

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# UNITED STATES PATENT OFFICE

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SEAT

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Sitting posture varies widely among individuals, yet commercially available chairs are for the most part of stereotype construction. No two persons have identical physical configurations, nor do they assume precisely the same sitting positions for maximum comfort.

Attempts have been made to construct the most comfortable average seat based upon data obtained from a large number of persons seated in a highly adjustable chair provided with indicative scales. This disclosure appears in U. S. Patent No. 2,359,318, dated October 3, 1944, and in the name of W. E. Lay et al. An adjustable chair combined with a foot stool of variable height for the use of upholsterers in ascertaining data for the design of custom furniture has also been proposed in British Patent No. 150,117, completely accepted on September 2, 1920, and in the name of A. T. Prentice. A chair back supported by spring pressed pads which are locked in place after an occupant has assumed his favorite positions in the chair is described in U. S. Patent No. 958,356 dated May 17, 1910, and in the name of P. G. A. Bode. But none of these prior art disclosures takes into sufficient account the varied requirements of individuals and their peculiar needs based upon either normal physiques or deformities.

In accordance with the present invention, a device is produced which may in itself constitute a chair, or may be used to conform to the requirements of a customer and serve as a pattern or gauge for the construction of a chair, settee, bench or other form of seat. The device may be highly adjustable and sturdy in construction, and at the same time, inexpensive to build and simple to use.

The device may comprise a frame supporting a flexible seat and back whose contours may be adjusted at a plurality of points both longitudinally and transversely of the seat and back respectively. The inclination and height of the frame may be adjusted with respect to the floor, the inclination of the seat and back may be adjusted, each with respect to the other, the depth of the seat may be varied, the spacing between the seat and back may be modified, the height and spacing of the arms may be changed, and the height of the back may be altered by incorporating an adjustable head rest.

When employed as a gauge, the various adjustments will be made to best conform to the requirements of an individual, whereupon, the dimensions will be recorded for use in the construc-

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tion of a seat best adapted to the desires and needs of the purchaser. When employed as a chair, the device will be conformed to the body of the purchaser and secured in its adjusted positions to retain its form indefinitely.

A more complete understanding of the invention will follow from a detailed description of the one embodiment shown in the accompanying drawings wherein:

Figure 1 is a perspective of an adjustable chair; Figure 2 is a sectional elevation of the chair; and

Figure 3 is an elevation showing the chair from the front.

The chair depicted in the drawings comprises side members 10 joined by a front brace 12 and a rear brace 14, suitably united to constitute a frame. The four lower corners of the frame are provided with vertical slots 16 for the reception of bolts 18 employed to secure feet or legs 20 adjustably to the frame. The ends of the bolts threadedly receive winged nuts 22 to secure the legs in any adjusted position.

The seat 24 comprises a rigid frame defined by a top surface 26 having longitudinal members 28, transverse rounded members 30 and lower slats 32 joined thereto. A flexible covering 34 of such material as sponge rubber is stretched over the top surface 26 and around the transverse members by means of springs 36 secured to the covering 34 and slats 32. The covering 34 is conformed to the proper contour suitable to the body of the user by means of distending elements 38 comprising heads 40 imbedded in or otherwise secured to the flexible covering, and spaced at convenient intervals longitudinally and transversely thereof. Each of the heads is mounted on a shank or rod 42 which is slidably received through a sleeve 44 fastened to the under side of the top surface 26. These rods are secured in any adjusted positions with reference to their respective sleeves by means of thumb screws 46 threaded through a wall of each sleeve.

The longitudinal members 28 of the seat frame are provided with forward and rear slots 48 which receive bolts 50, the threaded ends of which project through the side members 10 of the chair frame to receive winged nuts 52. The forward bolts 50 may be raised and lowered in arcuate slots 54 formed in the chair sides to permit raising and lowering the front of the seat about the rear bolts 50.

The back 56 is similar in construction to the seat. It comprises a rigid frame defined by a

supporting surface 58, side members 60, rounded end members 62, and rear slats 64. Springs 66 fastened to these slats are also connected to the ends of a flexible covering 68 such as sponge rubber, which is presented in taut condition to the back of the occupant of the chair. As in the case of the seat, the back covering receives a plurality of distending elements 70 having heads 72 imbedded in or otherwise suitably attached to the covering material to adjust its contour to conform with the requirements of the occupant. Each head 72 is mounted on a shank or rod 74, which is adjustable through a sleeve 76 fastened to the supporting surface 58. Each sleeve is provided with a threaded opening in its wall to receive a headed set screw 78 for securing the rod in any adjusted position.

The side members 60 of the back frame are provided with elongated slots 80 to permit adjustment of the spacing between the lower end of the back and the seat, the back being clamped in adjusted position by means of a bolt 82 projected through the slot and through an opening in its adjacent side member 10.

The axial clamping is effected by means of a winged nut 84 threaded on the end of the bolt. A similar elongated slot 86 is formed in each side member 60 of the back frame in alignment with the slot 80 to receive a bolt 88 projecting there-through and through an arcuate slot 90 provided at the upper portion of each side member 10. By virtue of the slot arrangement, the inclination of the back with respect to the seat can be adjusted over a wide range and clamped in any adjusted position by means of a winged nut 92 threaded on each of the bolts 88.

Each side member 60 of the back frame has projecting from its upper edge, an extension 94, attached to its respective side member by one or more bolts 96. These extensions adjustably support a head rest 98 having a frame comprising a supporting surface 100, a convex upper edge 102, a concave lower edge 104, and ends 106. A flexible, resilient covering 108 of sponge rubber or the like is applied to the supporting surface and around the upper and lower edges, having its ends tied together by a suitable number of helical springs 110. To impart a desired contour to the flexible covering 108, one or more transverse rows of distending elements 112 are provided, each having a convex head 114 mounted upon a rod 116 which slides through a sleeve 118 in which it is clamped in any adjusted position by a headed set screw 120. The ends of the head rest frame are formed with arcuate slots 122, permitting adjustment with respect to bolts 124 which pass therethrough and through openings in the upper ends of the projecting extensions 94. Here again, clamping action is effected with winged nuts 125 threaded upon the bolts.

The spacing and inclination of the chair arms 128 are also adjustable. Each side member of the chair frame is provided with an elongated vertical slot 130 for reception of a bolt 132 projecting therethrough and through an opening in a vertical arm support 134 to receive a winged clamping nut 136. The upper end of the vertical arm support is pivotally related to the forward end of a horizontal arm support 138 by means of a suitable nut or rivet 140. The horizontal arm support contains an elongated horizontal slot 142 permitting sliding adjustment on a bolt 144 projecting through the adjacent side member 10, clamping in any adjusted position being

effected by a winged nut 145 threaded on each such bolt.

Each horizontal arm support 138 receives a pair of bolts 146 which project through transverse slots 148 in each arm rest 150. When the bolts are loose, the arm rests may be adjusted towards and away from one another until the desired spacing is attained, whereupon, the bolts will be tightened to clamp the parts as adjusted.

With the high degree of adjustability possessed by the device illustrated and described, it will be clear that it will adapt itself to the needs of any individual whom it is desired to accommodate. The form of the invention illustrated is but one example of the manner in which the invention may be applied, and is not to be restrictive beyond the scope of the appended claims.

We claim:

1. A chair comprising a frame, a longitudinally and transversely flexible seat member carried by said frame, a plurality of contour modifying elements arranged in longitudinally spaced relationship with respect to a surface of said member, a plurality of contour modifying elements arranged in transversely spaced relationship with respect to said surface of said member, and a clamping member individual to each of said elements individually and adjustably securing each of said elements with respect to said frame independently of the others.

2. A chair comprising a frame, a longitudinally and transversely flexible back engaging member carried by said frame, a plurality of contour modifying elements arranged in longitudinally spaced relationship with respect to a surface of said member, a plurality of contour modifying elements arranged in transversely spaced relationship with respect to said surface of said member, and a clamping member individual to each of said elements individually and adjustably securing each of said elements with respect to said frame independently of the others.

3. A chair comprising a frame, longitudinally and transversely flexible seat and back engaging members carried by said frame, a plurality of contour modifying elements arranged in longitudinally spaced relationship with respect to a surface of each of said members, a plurality of contour modifying elements arranged in transversely spaced relationship with respect to said surface of each of said members, and a clamping member individual to each of said elements individually and adjustably securing each of said elements with respect to said frame independently of the others.

4. An article of furniture comprising a frame, a longitudinally and transversely flexible occupant supporting member carried by said frame, a plurality of contour modifying elements embedded in said member and arranged in longitudinally and transversely spaced relationship with respect to a surface of said member, and a clamping member individual to each of said elements individually and adjustably securing each of said elements with respect to said frame independently of the others.

5. An article of furniture comprising a frame, a longitudinally and transversely flexible occupant supporting member carried by said frame, a plurality of contour modifying elements secured to said member and arranged in longitudinally and transversely spaced relationship with respect to a surface of said member, and a clamping member individual to each of said elements individually and adjustably securing each of said ele-

ments with respect to said frame independently of the others.

6. An article of furniture comprising a frame, a longitudinally and transversely flexible occupant supporting member carried by said frame, a tensioning means connecting said member and frame, a plurality of contour modifying elements arranged in longitudinally spaced relationship with respect to a surface of said member, a plurality of contour modifying elements arranged in transversely spaced relationship with respect to said surface of said member, and a clamping member individual to each of said elements individually and adjustably securing each of said elements with respect to said frame independently of the others.

7. An article of furniture comprising a frame, a longitudinally and transversely flexible expanded rubber occupant supporting member carried by said frame, a plurality of contour modifying elements arranged in longitudinally spaced relationship with respect to a surface of said member, a plurality of contour modifying elements arranged in transversely spaced relationship with respect to said surface of said member, and a clamping member individual to each of said elements individually and adjustably securing each of said elements with respect to said frame independently of the others.

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