

Nov. 8, 1966

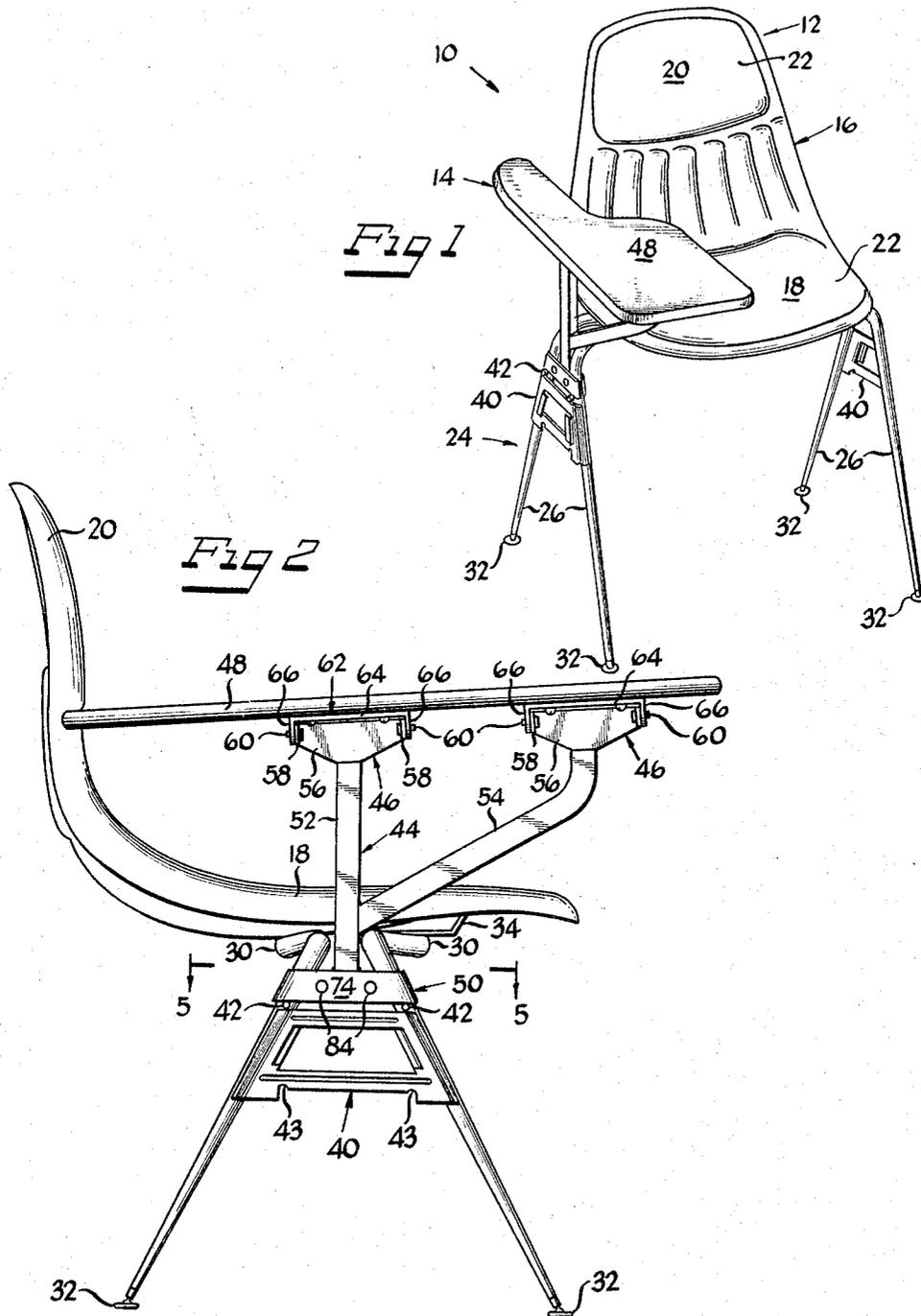
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3,284,132

SEATING UNIT

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2 Sheets-Sheet 1



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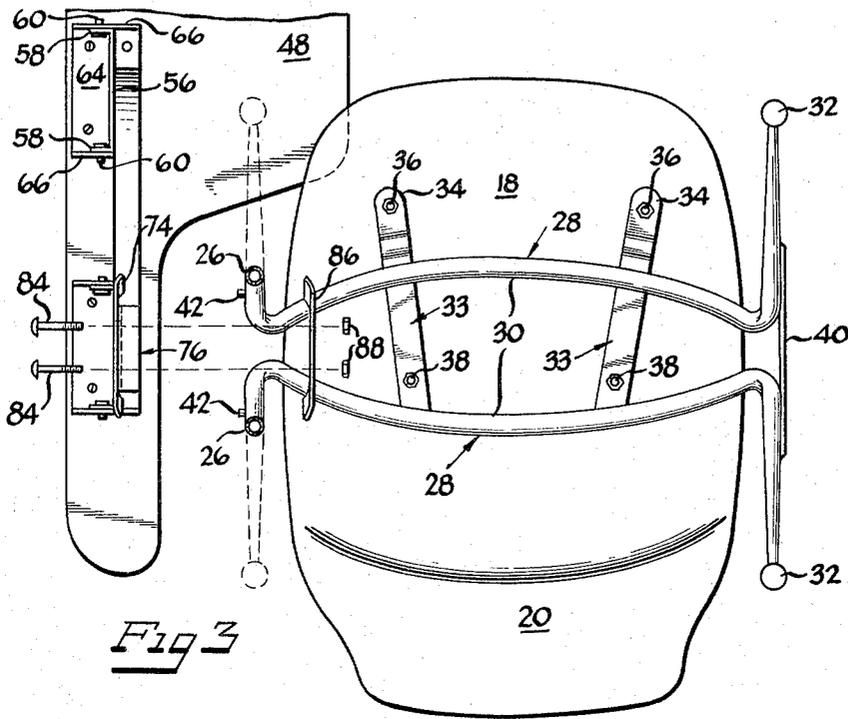


Fig 3

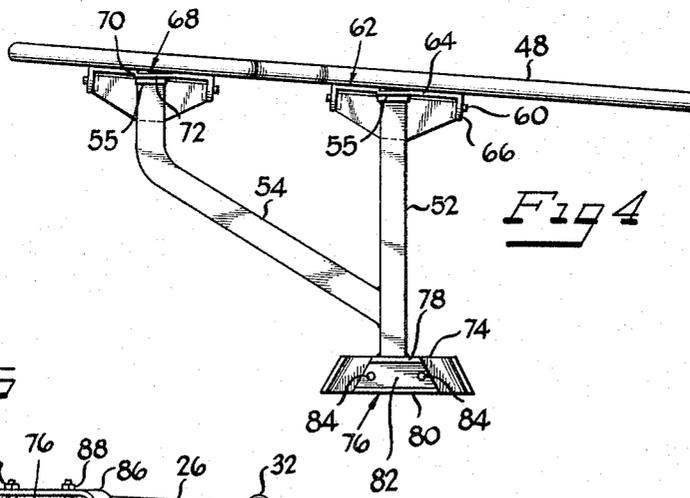


Fig 4

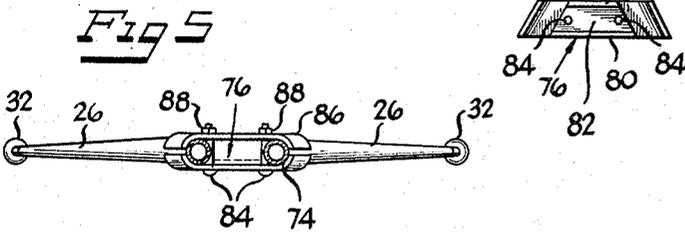


Fig 5

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3,284,132

SEATING UNIT

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 5 Claims. (Cl. 297-162)

The present invention relates to seating units and, more particularly, to seating units which include a detachable arm assembly.

Seating units provided for use in institutions such as schools, hospitals, industrial plants and the like should be capable of functioning equally well in each of a number of differing situations. For example, such seating units frequently are used to accommodate guests at lectures and the like and thus preferably include a tablet arm to support books and writing materials. On the other hand, these same seating units are often called upon for use in auditorium or informal social seating where a conventional arm rest rather than a tablet arm is more appropriate. Still other situations may arise, however, in which the seating units are used in conjunction with tables and the like, as in dining halls or conference rooms and, hence, an arm rest of any form may not only be unnecessary but undesirable.

Thus, there is a need for seating units which include readily attachable and detachable arm assemblies, either in the form of a tablet arm or a conventional arm rest, which will thereby render the seating units useful in a variety of circumstances.

In order that such seating units with detachable arm assemblies may best serve their intended functions, the arm assemblies are desirably attached to the remainder of the unit in such a manner that they will not weaken the unit, place undue strain upon certain components thereof, or upset the overall balance of the unit. Also, the arm assemblies must be an inexpensive accessory to the unit, must be rigid and sturdy, and must be capable of being securely attached without any tendency to loosen or wobble.

Accordingly, it is the principal object of the present invention to provide an improved seating unit which includes a detachable arm assembly.

Another object of the invention is to provide an improved arm assembly particularly adapted to be detachably mounted on a chair.

A further object of the invention is to provide an improved seating unit which includes a detachable arm assembly and which possesses to a greater or lesser degree all of the desirable characteristics enumerated above.

Other objects and advantages of the invention will become apparent with reference to the following description and the accompanying drawings.

In the drawings:

FIGURE 1 is a perspective view of a seating unit showing various of the features of the invention;

FIGURE 2 is an enlarged side elevational view of the seating unit of FIGURE 1;

FIGURE 3 is a fragmentary partially exploded bottom view of the seating unit of FIGURE 2;

FIGURE 4 is a side-elevational view of the arm assembly of the seating unit of FIGURE 2 as viewed from the opposite direction of that figure; and

FIGURE 5 is a sectional plan view taken along line 5-5 of FIGURE 2.

Very generally, there is illustrated in the drawings a seating unit 10 showing various of the features of the present invention. As illustrated, the seating unit comprises a chair 12 on which is detachably mounted an arm assembly 14. The chair 12 includes a body-supporting shell 16 which is preferably molded, as from

a fiber reinforced resin, to define a seat 18 and a backrest 20, each of which may be padded as at 22 if desired. The shell 16 is attached to and supported on a base structure 24 comprising two pairs of leg members 26, one of which depends from each side of the seat 18. The leg members 26 of each pair are downwardly divergent relative to each other and are defined by outwardly extending end portions of a pair of generally U-shaped tubular members 28 (FIG. 3) which members also define intermediate bight portions 30, referred to in greater detail shortly. The leg members are tapered toward their outer ends to provide a more graceful and pleasing appearance for the chair, and each of the outer ends has detachably affixed thereto a foot in the form of a universally mounted pad or button 32 constructed to permit swivelling movement of the pad relative to the leg member to thereby ensure full supporting engagement between the pad and the supporting surface.

The bight portions 30 of the U-shaped tubular members 28 extend transversely across the undersurface of the seat 18 from side to side and are bent in an arcuate shape. Each of a pair of horizontally spaced elongated metallic strips 33 is secured, as by welding or the like, to the upper surfaces of the bight portions 30 in spanning relation thereto and each includes an upwardly offset flange portion 34 at its forward end adapted to receive a bolt 36 to facilitate attachment of the base 24 to the undersurface of the seat 18. A second hole (not shown) is also provided in each of the strips 34 in rearwardly spaced relation to the forward ends thereof to receive a fastener 38 which also serves to attach the base 24 to the seat.

Attached to the outer surfaces of each pair of diverging leg members 26 is a bracket 40 adapted for releasable interconnection with a mating bracket of an adjacent chair to facilitate linking of the chairs in side by side relation. In addition, the particular form of brackets shown in the illustrated embodiment serve to interconnect and brace the leg members adjacent each side of the chair. These brackets and their function are disclosed in detail in United States Patent No. 3,084,977 and such disclosure is incorporated herein by reference.

To provide for vertical stacking of two or more of the chairs 12, as well as to facilitate mounting of the arm assembly 14 on a single chair, a stud 42 is provided on each leg member 26 and projects outwardly from the outer surface thereof immediately above each of the brackets 40. When two chairs are stacked one upon the other the studs 42 are engaged by the lower edge of a corresponding bracket of a stacked overlying chair. A recess 43 is formed in the lower edge of each of the brackets to receive the studs of an underlying chair. When an arm assembly is mounted on the chair, it rests upon and is partially supported by the upper edge of the studs, as hereinafter described.

The arm assembly 14 of the illustrated embodiment comprises generally a frame 44 provided at its upper end with a pair of hinged brackets 46 which pivotally secure a tablet arm 48 to the frame. A clamp 50 is provided at the lower end of the frame 44 and serves to detachably secure the frame to the leg members 26 at one side of the chair.

More specifically, the frame 44 comprises a post 52 of hollow tubular construction and of square cross sectional configuration which occupies a generally vertical position when the arm assembly is secured to the chair. A brace 54 of similar tubular construction projects forwardly and upwardly from adjacent the lower end of the post 52 and is so proportioned as to place its upper end slightly above the upper end of the post 52, thereby providing the tablet arm with a slight upward inclination from back to front. The upper ends of each the post and brace are closed by a cap 55 of a suitable material

such as plastic which defines a generally horizontal upper surface for each member.

The hinge brackets 46 are generally identical and each comprises a somewhat triangular shaped plate 56 which is welded to the outer side surface of the frame post and brace respectively adjacent the upper ends thereof and with their upper edges inclined at the slight angle to the horizontal assumed by the tablet arm. The ends of the plates 56 are offset to form ears 58 which project away from the chair when the arm assembly is mounted thereon, and each ear is provided with an opening to receive a rivet 60 which pivotally secures a channel 62 to the plate. The rivets of both brackets define a single axis which is disposed at an angle to the horizontal similar to that of the tablet arm 48.

Each channel 62 includes a web 64 bolted to the under surface of the tablet arm 48 and is provided with an up-standing flange 66 at each of opposite ends. Each flange includes an opening which receives one of the rivets 60 to pivotally interconnect the plate and channel. The axis defined by the rivets 60, the plane of the webs 64, and the tablet arm 48, are all disposed at a slight angle to the horizontal.

The tablet arm, as supported by the brackets 46, is pivotable between an upright position (not shown) in which it lies in a generally vertical plane, and an operative position, as seen in FIGURES 1-4. When the tablet arm is in the operative position (FIG. 4), the webs 66 of the channels 62 overlie and are engaged by the upper ends of the post 52 and brace 54. In order to provide the tablet arm with a particularly desirable disposition relative to the chair, that portion of the web 66 which is engaged by the post and brace is offset to provide a protuberance 68 having a generally normal leading edge 70 and a surface 72 which is disposed at a slight angle to the web and which is generally horizontal when the tablet arm is in the operative position despite the overall inclination of the web 66. This protuberance causes that edge of the tablet arm which overhangs the seat 18 to be at a slightly higher elevation than that edge which is adjacent the outer side edge of the chair, since the protuberance is located in spaced relation to the axis defined by the rivets 60 and about which the tablet arm rotate. This inclination is felt to increase the comfortable use of the tablet arm by the user. In addition, the surface 72 of the offset provides a generally horizontal shoulder which the generally horizontal upper surface of the caps 55 of the post or brace may abut.

In the illustrated embodiment, the tablet arm 48 is defined by a large board of somewhat L-shaped configuration. It should be clear, however, that a conventional form of arm rest might also be secured to the upper end of the frame 44 to render the seating unit more specifically adapted to other circumstances. When a conventional form of arm rest is employed, the use of rigid brackets (not shown) rather than the hinged brackets 46 would be more desirable.

The clamp 50 is provided at the lower end of the post 52 and comprises an elongated clamping strip 74 welded to the lower end of the outer surface of the post in generally transverse relation thereto. The end edges of the strip are canted downwardly and outwardly and the portions of the strip adjacent the ends are curved so as to enable the strip to partially encircle and intimately engage the outer surface of the generally cylindrical downwardly divergent upper portions of the legs 26 of the chair. The strip 74 thus defines the outer portion of each of a pair of downwardly diverging channels within which the legs 26 are received.

Secured to the inner face of the clamping strip 74 generally centrally thereof, and secured as well to the lower end of the post 52, is a C-shaped angle member 76 formed to provide upper and lower flanges 78 and 80 respectively interconnected by a web 82. The upper flange 78 is of lesser width than the lower flange 80

and the web 82 includes downwardly diverging side edges so as to render it of somewhat trapezoidal configuration similar to the configuration of the space intermediate the upper portion of the leg members 26. The angle member is arranged with the web 82 welded to the inner face of the strip 74 and with the upper flange 78 welded to the lower end of the post 52. The angle member 76 is of lesser width than the strip 74 so as not to interfere with the disposition of the legs 26 within the channels at each end of the strip. In effect, the edges of the flanges of the angle member 76 define the inner edges of the channels. Bolts 84 extend through the strip 74 and through the web 82 of the angle member and are welded in place.

The remainder of the clamp 50 is defined by a second clamping strip 86 which, generally speaking, is a mirror image of the previously referred to strip 74. More specifically, the strip 86 has downwardly diverging side edges and the portions of the strip adjacent the end edges are curved so as to enable the strip to partially encircle and intimately engage the inner surface of the downwardly divergent upper portions of the legs 26. The strip 86 thus cooperates with the strip 74 and the angle member 76 to define the pair of channels, previously referred to, which diverge downwardly and outwardly and receive the legs 26. Holes are provided in the strip 86 to receive the bolts 84, and nuts 88 are provided on the bolts to urge the strip 86 in the direction of the strip 74 to clamp the legs within the channels.

The arm assembly is attached to the chair by positioning of the arm assembly adjacent the side of the chair (the right side in the embodiment illustrated) with the outer surface of the upper ends of the leg members disposed in engagement with the inner surfaces of the curved portions of the strip 74 and with the angle member 76 and the bolts 84 projecting inwardly between the legs. In addition, the lower edge of the strip 74 rests upon the studs 42 which project from the sides of the leg members 26. The clamping strip 86 is then put in place and the nuts 88 are placed on the bolts 84 so as to draw the clamping strip into tight, intimate engagement with the inner side surface of the leg members. The legs are thus engaged on both their inner and outer surfaces, thereby insuring an intimate and tight connection rigidified by the angle member 76.

An improved seating unit, and arm assembly for a seating unit, has thus been provided which renders the seating unit adaptable to any one of several diverse situations and thus particularly useful for institutions and the like. More specifically, the readily attachable or detachable arm assembly, when provided with a tablet arm as shown in the illustrated embodiment, renders the chair particularly suitable for lectures and the like. When the arm assembly is provided with a conventional arm rest, the chair is rendered particularly useful for auditorium or other informal use. However, the arm assembly can be completely removed from the chair without leaving unsightly brackets or fixtures attached to the chair, thus rendering the chair useful in any of a number of other situations where an arm rest is not only not necessary but, perhaps, undesirable.

While the seating unit and arm assembly of the present invention have been shown and described with respect to one specific embodiment thereof, it should be apparent that various structural modifications may be made in the disclosed seating unit and arm assembly without departing from the scope of the invention.

Various of the features of the invention are set forth in the following claims.

What is claimed is:

1. An arm assembly for use with a chair having a pair of downwardly diverging legs at each side, which arm assembly comprises a frame, an arm rest mounted on the upper end of said frame, and means at the lower end of said frame adapted to detachably clamp said frame to

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each of the legs at one side of the chair, said means including a first clamping strip fixedly secured to the lower end of said frame and a second clamping strip, one of said clamping strips including end portions formed to partially encircle and intimately engage the upper portion of the outer surface of each leg member at one side of the chair and the other of said clamping strips including end portions formed to partially encircle and intimately engage the upper portion of the inner surface of each leg member opposite those portions of the outer surfaces of the leg members adapted to be engaged by said one clamping strip, the end portions of said second clamping strip being adapted to cooperate with the end portions of said first clamping strip to define a pair of channels diverging downwardly at an angle equal to the angle of divergence of the leg members, and means for urging said first and second clamping strips toward each other so as to maintain said strips in clamping engagement with each of the leg members at one side of the chair.

2. An arm assembly for use with a chair having a pair of downwardly diverging legs at each side, which arm assembly comprises a frame, including an upright post, an arm rest mounted on the upper end of said frame, and means at the lower end of said frame adapted to detachably clamp said frame to each of the legs at one side of the chair, said means including a first clamping strip fixedly secured to the lower end of said post, said strip including end portions formed to partially encircle and intimately engage the upper portion of the outer surface of each leg member at one side of the chair, an angle member secured to the inner surface of said first clamping strip and including an upper flange secured to the lower end of said post, said angle member also including a lower flange spaced downwardly from said upper flange having a width greater than said upper flange, a second clamping strip including end portions formed to partially encircle and intimately engage the upper portion of the inner surface of each leg member opposite those portions of the outer surfaces of the leg members adapted to be engaged by said first clamping strip, the end portions of said second clamping strip being adapted to cooperate with the end portions of said first clamping strip and with said angle member to define a pair of channels diverging downwardly at an angle equal to the angle of divergence of the leg members, and means for urging said first and second clamping strips toward each other so as to maintain said strips in clamping engagement with each of the leg members at one side of the chair.

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3. A seating unit comprising a seat and back rest, a base defined by a pair of legs diverging downwardly at each side of said seat, and an arm assembly detachably mounted on one of said pair of legs comprising a frame, an arm rest mounted on the upper end of said frame, and means at the lower end of said frame detachably clamping said frame to each of the legs at one side of the chair, said means including a first clamping strip fixedly secured to the lower end of said frame and a second clamping strip, one of said clamping strips including end portions formed to partially encircle and intimately engage the upper portion of the outer surface of each leg member at one side of the chair and the other of said strips including end portions formed to partially encircle and intimately engage the upper portion of the inner surface of each leg member opposite those portions of the outer surfaces of the leg members adapted to be engaged by said one clamping strip, the end portions of said second clamping strip being adapted to cooperate with the end portions of said first clamping strip to define a pair of channels diverging downwardly at an angle equal to the angle of divergence of the leg members, and means for urging said first and second clamping strips toward each other so as to maintain said strips in clamping engagement with each of the leg members at one side of the chair.

4. A seating unit in accordance with claim 3 wherein each of said one of said pair of legs is provided with a projecting lug positioned so as to be engaged by said detachable clamping means to provide vertical support for said arm assembly.

5. An arm assembly in accordance with claim 1 wherein said arm rest is in the form of a tablet arm mounted on said frame for pivotal movement between an operative and an out-of-the-way position.

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