

CHAIR

This Sheet Has Been Replaced



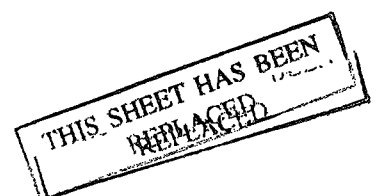
Background of the Invention

(1) Field of the Invention

The present invention relates to a chair characterized by the structure for securing mounting members of a seat such as a seat portion, a seat back portion and armrest portions, to a frame. More specifically, it relates to a chair wherein the mounting members are made of a synthetic resin material and formed into a plate-like form, and the mounting members can readily be secured to the frame.

(2) Background Information

There have been known chairs wherein their leg frames and seat back frames are composed of pipe materials, and a seat plate constituting a seat portion, a seat back plate constituting a seat back portion, armrest plates constituting armrest portions and the like, are composed of synthetic resin material, and these are secured to the frames. The mounting members such as the seat plate, seat back plate and armrest plates, are mostly mounted on the frames and secured thereto by screws. For example, the seat plate is mostly secured by inserting fixing parts such as screws into securing holes formed at seat frames or at a stay bridging the seat frames, or into securing





holes formed at a tongue-like securing plate which is provided at the seat frames, stay, etc., and then threadably attaching the fixing members to the back side of the seat plates.

When the seat plates are composed of synthetic resin materials, bosses are formed at the back side of the seat plate, and screws are threadably attached to the bosses through the securing plate.

Accordingly, in conventional structures, many securing holes are required to be formed at the seat frame, stay or the like, or small securing plates are required to be provided at plural portions by welding or the like, and many thread-mounting portions are formed, whereby the production and fabrication of such structures have been troublesome. Particularly, if the securing position is not exactly adjusted at the time of fabrication operation, it is impossible to insert the screws, whereby operation efficiency is not good.

Summary of the Invention

It is an object of the present invention to provide a chair wherein mounting members such as the seat plate or the seat back plate can easily be secured to the frames without providing the tongue-like securing plates at the seat frame or the stay as above, and even if thread-mounting is required,



the number of the thread-mounting portions is small.

Another object of the present invention is to provide a chair by which positioning at the time of mounting can readily be made by directly engaging the mounting members to the frames of the chair.

According to the present invention, the above objects have been accomplished by a chair wherein standing walls are formed on the mounting members so that the standing walls are located along side faces of the frames, at the time of mounting the mounting members on the frames; fastening pieces are disposed at the ends of the standing walls so that the fastening pieces are located along the back face sides of the frames; and the mounting members are secured to the frames by surrounding the frames with the standing walls and the fastening pieces. And, by fastening the fastening pieces to the frames or engaging the fastening pieces with engaging portions provided on the mounting members, the mounting members can be secured to the frames without disposing securing plates, etc. on the frames as conventionally made.

Further, according to the present invention, a chair is presented wherein to the mounting members, hook pieces, standing walls and fastening pieces are disposed respectively in correspondence to the frames which are oppositely disposed; and



each of the hook pieces is engaged with one of the frames and at the same time, each of the standing walls and each of the fastening pieces are used to hold another frame, to secure the mounting members, by which the mounting members can readily be secured to the frames.

Brief Description of the Drawings

Fig. 1 is a perspective view of a chair showing one embodiment of the present invention.

Fig. 2 is a perspective view of the chair as shown in Fig. 1 wherein a seat portion is removed.

Fig. 3(A) is a sectional view taken along line A-A of Fig. 1, showing the entire seat portion.

Fig. 3(B) is an enlarged sectional view of a fastening piece portion of Fig. 3(A).

Fig. 4(A) is a sectional view taken along line A-A of another embodiment of Fig. 1, showing the entire seat portion.

Fig. 4(B) is an enlarged sectional view of a fastening piece portion of Fig. 4(A).

Fig. 5(A) is a sectional view taken along line B-B of Fig. 1, showing the entire seat portion.

Fig. 5(B) is an enlarged sectional view of a fastening piece portion of Fig. 5(A).





Fig. 6 is a sectional view showing another embodiment of a hook piece.

Fig. 7 is a sectional view showing another embodiment of the fastening piece portion.

Fig. 8 is a sectional view showing a still another embodiment of the fastening piece portion.

Fig. 9 is a sectional view showing another embodiment of the fastening piece portion.

Fig. 10 is a perspective view of a chair showing another embodiment of the present invention.

Fig. 11 is an exploded perspective view of the chair as shown in Fig. 10.

Fig. 12 is an exploded perspective view of a frame of the chair as shown in Fig. 10.

Fig. 13 is a bottom view of a seat portion of the chair as shown in Fig. 10.

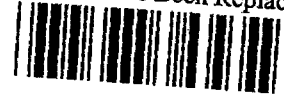
Fig. 14(A) is a sectional view taken along line C-C of Fig. 10, showing the entire seat portion.

Fig. 14(B) is an enlarged sectional view of a fastening piece portion of Fig. 14(A).

Fig. 14(C) is an enlarged sectional view of another embodiment of the fastening piece portion of Fig. 14(A).

Fig. 15 is a front view of a part of the seat back





portion of the chair of Fig. 10.

Fig. 16 is a sectional view taken along line D-D of Fig. 15.

Fig. 17(A) is a sectional view taken along line E-E of Fig. 16, showing the entire seat back portion.

Fig. 17(B) is an enlarged sectional view of a fastening piece portion of Fig. 16(A).

Detailed Description of the Preferred Embodiments

The present invention can be applied to respective mounting members such as a seat portion, a seat back portion and armrest portions. Fig. 1 shows an example wherein the present invention is applied to the seat portion as the mounting member. As shown in Fig. 2 wherein the seat portion is removed, the chair as shown in this drawing has a frame 5 including fore legs 1, hind legs 2, seat frames 3 and seat back frames 4. The seat frames 3 are provided with a front side stay 6 and a rear side stay 7 disposed oppositely. In this drawing, a seat portion (mounting member) is secured to the seat frame 3 and the stays 6, 7.

On the frame 5, a seat plate 9 constituting a seat portion 8, and a seat back plate 11 constituting a seat back portion 10 are disposed, and the seat plate 9 and the seat back



plate 11 are made of a synthetic resin material. On the back side face of the seat plate 9, hook pieces 12 and fastening pieces 13 are disposed respectively in correspondence to the frames such as seat frames 3 and the stays 6, 7. Hook pieces 12 have a L-letter like shape in section which opens toward one direction so that each of these hook pieces can be engaged with the seat frames 3, stay 6, etc. in the side direction, and can clamp the seat frames 3, stay 6, etc. in the opening. Each of the hook pieces may be formed in a C-letter like shape in section so that the seat frames, etc. can be closely fitted, or may be provided with a small protruded part 14 at the terminal end of the opening so that the engagement is not readily detached or loosened (Fig. 6).

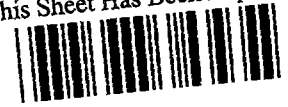
The fastening pieces 13 are formed so that they will be located along the back side face of each of the frames such as the seat frames 3 or stay 7. In the drawings, standing walls 15 are provided on the bottom of the seat plate 9, which are located along the side faces of the frames, and the fastening piece 13 is provided in a bendable form through a thin hinge 16 at the end portion of each of the standing walls 15. The standing walls and the fastening pieces may be formed into an appropriate structure. For example, a standing wall 17 and a fastening piece 18 are integrally formed into a substantia-



lly L-letter shape or U- letter shape in section, and the base end of the standing wall 7 is communicated to the bottom portion of the seat plate through a hinge 19 (Fig. 7); or the standing walls and the fastening pieces are made of a soft synthetic resin material in the entire portion and formed in a bendable structure (not shown in the drawings). Fig. 8 shows an example wherein each of fastening pieces 20a, 20b is disposed at the terminal end of each of two standing walls 21, 21 formed oppositely, and these pieces are engaged for connection. A fastening piece 22 and standing walls 23, 23 may be prepared separately, and put together for connection when the mounting member is secured to the frames (Fig. 9).

The fastening pieces are bent over the back side face of the frame such as the seat frame 3 or stay 7, and fastened in such a form that they hold the frame. At that time, the frame may not be held over the entire circumference of the frame, and as shown in Fig. 3, the fastening piece 13 may be provided so that it extends over at least the back face side of the frame, and the fastening piece 13 may be fastened with a fixing tool 24 such as screw or rivet.

In order to use no screws, it is preferred to provide a fastening piece so that the frame can be surrounded and held in its entire circumference with the fastening piece and



the standing wall. In this case, on the bottom side face of the seat plate 9, an engaging portion 25 is formed at the opposite side of the standing wall 15 so that they clamp the frame, and fastening piece 13 is engaged with the engaging portion 25. With respect to the engagement, in the example as shown in Fig. 4, a locking click 26 is formed at the end of the fastening piece 13, and the locking click 26 is engaged with a locking aperture 27 formed at the engaging portion 25. However, an appropriate structure can be applied, for example, a locking aperture or a locking groove is provided at the fastening piece side and a locking click is provided at the engaging portion side.

For example, in the example as shown in Fig. 7, at the terminal end of the fastening piece 18 and the side face of an engaging portion 28, notched-shape locking protrusions 29, 30 are formed respectively, to engage the locking protrusions 29, 30. In the example as shown in Fig. 8, two fastening pieces 20a, 20b are put together, and a locking protrusion 31 formed on the fastening piece 20a is engaged with a locking aperture 32 formed on another fastening piece 20b. In the example as shown in Fig. 9, the fastening piece 22 has clicks 33, 33 at its both ends, and these clicks are engaged with locking apertures 34, 34 of the standing wall 23.

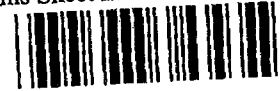


The above fastening pieces, standing walls and hook pieces may be provided in a necessary number at appropriate positions of the mounting members. In the above examples, as shown in Fig. 5, at the rear side of the seat plate 9, a flange 35 of the seat plate is used as the standing wall, and the fastening piece 13 is provided to the flange through a hinge 16, and the engaging portion 25 for locking the fastening piece is provided on the bottom side face of the mounting plate at the inner portion of the flange 35.

Figs. 10 to 17 show other examples wherein the present invention is applied to a stacking chair.

In these drawings, the frame of the chair has a frame 36 which is formed by a metal pipe material having a diameter of about 10 and a few millimeters such as a stainless pipe or a high tension steel pipe and other steel pipe, and a seat portion 37 and a seat back portion 38 which are secured to the frame 36, wherein the frame 36 is composed of a pair of leg frames 39, 39 and a rear frame 40.

As shown in Fig. 12, the leg frame 39 has a fore leg 42 and a hind leg 43 standing upwardly at the front and rear side of a floor side frame 41; a front seat frame 44 which extends substantially horizontally toward the rear end, at the upper end of the fore leg 42; and a seat back frame 45 which



stands upwardly and the terminal end of which bends a little toward the rear end, at the upper end of the hind leg 43, in series.

The rear portion frame 40 has rear seat frames 46, 46 formed in such a structure that they can be connected to the front seat frame 44 of the leg frame 39, at both sides; inside frames 47, 47 which touch internally with the seat back frame, standing upwardly at the rear ends of the rear seat frame 46, 46; and a seat back stay 48 which connects the inside frames 47, 47 at the terminal ends of the inside frames 47, 47 in series.

The leg frames 39, 39 and the rear frame 40, are connected to each other as follows. The base portions of the seat back frames 45 of the leg frame 39 are firmly attached to the outward sides of the inside frames 47, 47, and at the same time, the terminal ends of the rear seat frame 46, 46 are firmly fixed to the rear ends of the front seat frames 44, 44, to form a seat frame 49, whereby the leg frames 39, 39 are connected to both ends of the rear frame 40. In the drawings, the above firmly attached portions are welded. However, these may be connected through appropriate connecting tools (not shown in the drawings), or tightened with bolts or rivets, or have a fitting structure.



Between the seat frames 49, 49, a front side stay 50 and a rear side stay 51 are firmly attached by, for example, welding. At this time, the respective stays 50, 51 may be composed of a metal pipe material. However, in the drawings, the front side stay 50 is composed of a plate-like material formed by bending a flat plate into a wave shape. Preferably, when the front seat frame 44 and the rear seat frame 46 are attached by welding, both ends of the front side stay 50 may be welded together at the same welding portions, to save much time and labor of welding. At the upper portions of the fore legs 42, 42, a fore leg stay 52 is firmly attached.

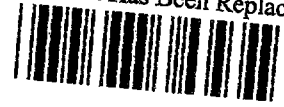
The seat portion 37 is secured to the seat frame 49 and the stay 50, 51, and the seat back portion 38 is secured to the seat back frame 45 and the seat back stay 48. The seat portion 37 and the seat back portion 38 may be formed into appropriate shapes or structures. For example, these may be formed simply into a plate shape with a synthetic resin material. However, in the drawings, a seat plate 53 and a seat back plate 54 are formed with a synthetic resin material, and pads 55, 55 are provided on its surface, and at each of the seat plate 53 and the seat back plate 54, a bending portion 58 for forming an insertion groove 57 for inserting a peripheral portion 56 of the pad 55, is provided.



As shown in Fig. 13, on the back side face of the seat plate 53, hook pieces 59, fastening pieces 60, etc. are provided in correspondence to the stays 50, 51. At this time, the hook pieces 59 are engaged with the stay 50 from the rear side of the front side stay 50 as shown in Fig. 14, and when the fore leg stay 52 is formed into a substantially L-letter shape in section, it is preferred to engage the bending portion 58 with the stay 52.

With respect to the fastening piece 60, as shown in Fig. 14(B), a bending portion 58 of the seat plate 53 is used as a standing wall, and the fastening piece 60 is provided at the bending portion 58 through a thin hinge 61. However, as shown in Fig. 14(C), a fastening portion 62 may be made bendable by preparing the fastening portion 62 separately and pivotally fixing an axis portion 64 formed at the terminal end of the fastening piece 62 to a receiving groove 63 formed at the seat plate 53.

The respective fastening pieces 60, 62 have a locking click 65, and the locking click 65 is engaged with a locking aperture 67 formed at an engaging portion 66. However, as shown in Figs. 3, 7, 8 and 9, such engagement may be made by various structures, wherein the rear side stay 51 is surrounded by the bending portion (standing wall) and the fastening piece.



As shown in Figs. 14(A) to (C), since the hook piece 59 is engaged with the front side stay 50 from the rear side, when a person takes a seat, the seat portion 37 is elastically deformable as indicated by the chain line in Fig. 14(A) by the weight of the person, and even if the thickness of the pad is thin, accurate cushion effect can be obtained entirely, whereby comfortable feeling can be obtained. The hook piece 59 is engaged with the front side stay 50 within such a range of length that these will not be detached even if the deformation is caused as indicated in the drawing.

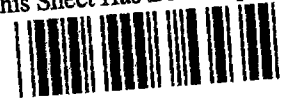
The seat back plate 54 has tubular portions 68 at both sides as shown in Figs. 15 and 16, and the tubular portions 68 are inserted into each of the upper ends of the seat back frames 45, 45 to secure the seat back plate 54 to the seat back frame 45, 45. Further, as shown in Fig. 17, at the lower portion of the seat back plate 54, a fastening piece 70 is disposed in a bendable form through a hinge 69, and the fastening piece 70 is bent over the back side face of the seat back stay 48 to hold the seat back stay, and a locking click 72 is engaged with a locking aperture 71 formed on the side face of the bending portion 58 of the seat back plate for securing the fastening piece. In this case, the standing wall and the fastening piece are integrally formed. However, these may



have various forms as shown in the above examples.

In the chairs as shown in Figs. 10 to 17, the frame of the chair is composed of a leg frame and a rear side frame, and the production steps of the respective frames are thereby simplified and these frames can be produced at an economical cost. Further, since both seat back frames are connected with the seat back stay of the rear side frame, even if the frame is composed of a relatively narrow metal pipe material, the frame is strong against rolling from side to side, and the seat back portion is reinforced, and even if the seat back plate is broken, the upper half body can be supported by the seat back stay, such being excellent in safety. In addition, since the front side seat frame formed in the leg frame and the rear side seat frame formed in the rear side frame are fixedly secured to form a seat frame and a seat plate is secured thereto to form a seat portion, the fixedly secured portion can be covered with the seat plate and a chair of good appearance can be obtained.

To secure the mounting members such as the seat portion and the seat back portion, they are mounted on the frames, the hook pieces, etc. are engaged with one of the frames, and the fastening pieces are bent over the back side face of another frame to hold and fasten the frames. Further, the mounting



members can be detached from the frames by unlocking the fastening pieces.

The present invention is constructed as above, i.e. , standing walls and fastening pieces for surrounding frames are disposed on mounting members such as a seat portion and a seat back portion, the mounting members are mounted on a seat frame, and the fastening pieces are secured to the frame along the back side face of the frame, whereby there is no need to provide securing plates for securing the mounting members on the frames by, for example, welding as made in conventional chairs. Further, since the hook pieces, standing walls and fastening pieces are formed on the mounting members in correspondence to the frames, the mounting members can readily be secured to the frames after mounting them on the frames; attachment, detachment and change of the seat portion, seat back portion, etc. can readily be made; and the fabrication operation and the separating operation of the destroyed chair, can be made readily.



What is claimed is:

1. A chair which comprises a frame, mounting members to be mounted by the frame, standing walls disposed on the back side face of the mounting members so that the standing walls are located along the side face of a part of the frame, and fastening pieces disposed on the back side face of the mounting members so that the fastening pieces are located along the back side face of a part of the frame, wherein the mounting members are secured to the frame by surrounding a part of the frame with the standing walls and the fastening pieces.

2. The chair according to Claim 1, wherein the mounting members have hook pieces which engage with another part of the frame from the side direction.

3. The chair according to Claim 1, wherein the fastening piece is disposed at the terminal end of the standing wall through a hinge in a bendable form.

4. The chair according to Claim 1, wherein the standing wall and the fastening piece are integrally formed, and the standing wall is connected to the mounting member through a hinge.

5. The chair according to Claim 1, wherein the fastening piece is pivotally secured in a bendable form to a



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receiving groove disposed at the mounting member.

6. The chair according to Claim 1, wherein the fastening pieces are produced separately from the standing walls and then secured to the standing walls.

7. The chair according to Claim 1, wherein the fastening piece is secured to the frame with a securing tool.

8. The chair according to Claim 1, wherein the fastening piece is engaged with the engaging portion disposed on the mounting member, in correspondence to the standing wall.

9. The chair according to Claim 1, wherein the frame comprises a pair of leg frames each having a front side seat frame, a fore leg, a floor side frame, a hind leg and a seat back frame in series, and a rear side frame having a rear side seat frame connected to the front side seat frame, inside frames which touch internally with the seat back frame to which the seat back frame is secured, and a seat back stay for connecting the inside frames with the seat back frame at both sides.

