

PATENT SPECIFICATION

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(54) IMPROVEMENTS IN OR RELATING TO SEATS

(71) We, GPG HOLDINGS LIMITED of Cranford, Blackdown, Leamington Spa, Warwickshire, a British Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to seats and is particularly concerned with a seat which is formed as a combination comprising a seat unit and a frame to which the seat unit is attached.

Seats formed by the aforementioned combination are well known in the relevant art, especially in which the seat unit is formed as a one piece moulding in plastics material and the frame is formed by two or more appropriately shaped steel bars or tubes which are welded together to form the legs of the seat and a substantially horizontal support part on which the seat unit is mounted. Generally the seat unit is secured to the support part of the frame by three or four screws or bolts which are respectively located at the apices of a notional triangle or the corners of a notional rectangle. In assembling the aforementioned combination with three or four screws, difficulties can arise in mating the screws with appropriate screw holes in the seat unit and it is an object of the present invention to provide a combination of a seat unit and a frame to which the seat unit is attached in which this difficulty may be alleviated and in which the seat unit can be quickly and easily assembled on the frame.

According to the present invention there is provided a combination comprising a plastics moulded seat unit and a frame; the frame having a substantially horizontal support part to which the seat unit is attached; the seat unit having two integrally moulded downwardly extending lugs which are located to engage with portions of the support part on opposed sides thereof, the surfaces of said lugs which engage with said

portions of the support part being concave to receive and hook onto the said portions; and wherein the seat unit is assembled with the frame by relative movement in the general plane of the support part between the seat unit as a whole and the frame to move the lugs into hooked engagement with the said portions of the support part.

Preferably, after assembly the lugs are located inwardly with respect to their respective said portions, and before assembly the minimum spacing between the concave surfaces of the two lugs is slightly larger than the minimum spacing between the portions of the support part with which they are respectively intended to engage so that the lugs, seat unit or support part are slightly deformed during the aforementioned relative movement of the lugs into hooked engagement with the support part and resilience in the plastics material of the seat unit or in the frame causes the lugs to be biased into firm engagement with the support part. While the lugs will retain the seat unit on the frame, it is preferred that at least one screw, bolt, clip or other securing means is provided between the frame and seat unit to retain these two components together and conveniently to relieve undue strain on the lugs by preventing the seat unit from pivoting about the lugs and relative to the support part. Preferably, one or two screws are provided between the support part and seat unit.

Preferably the support part forms an enclosure within which the lugs are located and the seat unit is assembled with the frame by first locating the two lugs in the enclosure out of hooked engagement with the support part and then twisting one of the seat unit as a whole and the frame relative to the other in the general plane of the support part, to move the lugs into hooked engagement with the support part as aforementioned. The enclosure of the support part may be of any convenient shape in plan, such as a four sided

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configuration, having a pair of opposed sides with which the lugs engage. These opposed sides may converge towards each other but preferably the enclosure of the support part is substantially rectangular and the seat unit is assembled with the frame by first locating the two lugs in the rectangular enclosure generally along a notional diagonal line thereof and subsequently twisting one of the seat unit as a whole and the frame relative to the other in the general plane of the support part to move the lugs into hooked engagement with opposed parallel sides of the support part.

Where further securing means are provided, these may interengage the seat unit and frame along a side of the rectangular support part which is at right angles to the opposed sides with which the lugs engage.

The seat unit is a one piece moulding in plastics and can be in the form, for example, of a chair shell in which a back support is provided or of a stool seat.

The frame will generally be formed of tubular steel and in a preferred embodiment the substantially horizontal support part is cantilevered relative to the remaining part of the frame. By this latter form of construction the cantilevered support part may afford, after assembly, a degree of springing for the seat unit due to the resilience of the material of the frame.

One embodiment of the present invention will now be described, by way of example only, with reference to the accompanying illustrative drawings in which:—

Figure 1 is a perspective view of a chair formed from the combination of a seat unit and a frame constructed in accordance with the present invention;

Figure 2 is a side elevation of the chair shown in Figure 1;

Figure 3 is a plan view of the underside of the chair shown in Figures 1 and 2 and illustrates the manner in which the seat unit is attached to the frame, and

Figure 4 is a similar view to that shown in Figure 3 and illustrates the manner in which the seat unit and frame are assembled to form the chair.

The chair illustrated comprises a seat unit shown generally at 1 in the form of a one piece plastics moulded chair shell having a back support 2 and a base 3. Extending downwardly from the underside of the base 3 are two spaced lugs 4 and 5. The lugs 4 and 5 are located on the base 3 towards the rear of the chair shell and each has a concave surface 6 which provides a generally hook shape to the lugs. As will be apparent from the drawings, the two concave surfaces 6 are directed outwardly from each other.

The seat unit 1 is carried on a frame 7

having two forward legs 8, two rear legs 9 and a substantially horizontal, support part shown generally at 10 which is generally rectangular in plan and is cantilevered relative to the remaining part of the frame. As is seen from Figures 3 and 4 the support part 10 forms an oblong rectangular enclosure in plan. The frame 7 is formed from two steel tubes one of which is of generally "U" shape to provide the legs 8 and to provide one side of the rectangular support part 10 while the other of which is kinked to provide the rear legs 9 and the remaining three sides of the support part 10. The two tubes are welded together at 11.

The seat unit 1 is attached to the frame 7 by the two lugs 4 and 5 which are located within the rectangular enclosure formed by the support part 10 with their concave surfaces 6 receiving and hooking onto portions of the tubular bars of the support part on opposite parallel sides thereof. In this way the hooks formed by the lugs 4 and 5 restrain the seat unit from being lifted off the frame.

To assemble the seat unit 1 on the frame 7 the former is positioned on the latter so that the lugs 4 and 5 are located within the rectangular enclosure of the support part 10 and along a diagonal line of such rectangular enclosure (as shown in Figure 4). The frame 7 is now twisted as a whole relative to the seat unit 1 and in the direction of arrow X (Figure 4) to move the lugs 4 and 5 along the opposite parallel sides of the support part and into the positions shown in Figure 3 with the lugs in firm hooked engagement with the frame. The minimum distance between the two concave surfaces 6 of the lugs is slightly larger than the minimum distance between the portions of the support part 10 with which they are respectively intended to engage. By such an arrangement, during assembly of the chair from the condition shown in Figure 4 to that in Figure 3, the lugs are displaced slightly towards each other and the resilience of the plastics material of the seat unit causes the lugs to be biased away from each other and thereby urged into firm engagement with the support part 10.

With the lugs engaging the frame as shown in Figure 3, the seat unit is additionally secured to the frame by two screws or bolts 12 which pass through appropriate holes in the tube which extends along the front side of the support frame and into tapped sockets 13 provided on the underside of the base 3. As well as retaining the front part of the seat unit to the frame the screws 12 conveniently alleviate undue strain on the lugs 4 and 5 which may otherwise occur by the tendency for the seat unit 1 to pivot on the frame 7 about the

two lugs. It will be appreciated that only one centrally located screw similar to that shown at 12 need be provided but even if one or two screws are used the alignment of such screws and their respective sockets 13 can be achieved without difficulty by appropriate adjustment of the support part 10 in the two lugs.

As an alternative, or in addition to, the screws or bolts 12, the seat unit may be additionally secured to the frame by one or more auxiliary lugs or hooks (not shown) moulded on (or otherwise secured to) the underside of the base 3. These additional hooks when moulded on the base 3 are so located that they will closely receive parts of the bars of the support frame 7 after the seat unit 1 has been twisted to locate the appropriate parts of the support frame 7 in the lugs 4 and 5. Conveniently the aforementioned auxiliary hooks are located in similar positions to the screws or bolts 12. Alternatively the auxiliary hooks may be in the form of clips which are applied to grip both the seat unit and the support frame.

It will be noted that the back support 2 is positioned generally to overlie the free end of the cantilevered support part 10. In this way a couple is exerted on the cantilevered support part 10 when the chair is in use and the resilience of the metal tubes of the frame affords a desirable form of springing to the seat unit.

WHAT WE CLAIM IS:—

1. A combination comprising a plastics moulded seat unit and a frame; the frame having a substantially horizontal support part to which the seat unit is attached; the seat unit having two integrally moulded downwardly extending lugs which are located to engage with portions of the support part on opposed sides thereof, the surfaces of said lugs which engage with said portions of the support part being concave to receive and hook onto the said portions; and wherein the seat unit is assembled with the frame by relative movement in the general plane of the support part between the seat unit as a whole and the frame to move the lugs into hooked engagement with the said portions of the support part.

2. The combination as claimed in claim 1 wherein, after assembly the lugs are located inwardly with respect to their respective said portions, and wherein before assembly the minimum spacing between the concave surfaces of the two lugs is slightly larger than the minimum spacing between the portions of the support part with which they are respectively intended to engage so that the lugs, seat unit or support part are slightly deformed during assembly of the

seat unit with the frame and resilience in the plastics material of the seat unit or in the frame causes the lugs to be biased into firm engagement with the support part.

3. The combination as claimed in either claim 1 or claim 2 wherein the support part forms an enclosure within which the lugs are located and the seat unit is assembled with the frame by first locating the two lugs in the enclosure out of hooked engagement with the support part and subsequently twisting one of the seat unit as a whole and the frame relative to the other in the general plane of the support part, to move the lugs into hooked engagement with the said portions of the support part.

4. The combination as claimed in claim 3 wherein the support part forms a substantially rectangular enclosure and the seat unit is assembled with the frame by first locating the two lugs in the said rectangular enclosure generally along a notional diagonal line thereof and subsequently twisting one of the seat unit as a whole and the frame relative to the other in the general plane of the support part, to move the lugs into hooked engagement with opposed parallel sides of the support part.

5. The combination as claimed in any one of the preceding claims in which at least one securing means in addition to the said lugs is provided between the frame and seat unit to retain these two components together and prevent the seat unit from pivoting about the lugs and relative to the support part.

6. The combination as claimed in claim 5 wherein the securing means comprises a screw, bolt or clip.

7. The combination as claimed in any one of the preceding claims wherein the substantially horizontal support part is cantilevered relative to the remaining part of the frame to provide, after assembly, a degree of springing for the seat unit by the resilience of the material of the frame.

8. The combination as claimed in claim 7 in which the seat unit comprises a substantially horizontal base on the underside of which are located said lugs and a back support extending upwardly from the said base, and wherein when the seat unit is assembled with the frame the base substantially overlies the support part and the back support substantially overlies the free end of the cantilevered support part.

9. The combination as claimed in any one of the preceding claims wherein the frame is formed of tubular steel.

10. The combination of a seat unit and a frame substantially as herein described with reference to the accompanying illustrative drawings.



two lugs. It will be appreciated that only one centrally located screw similar to that shown at 12 need be provided but even if one or two screws are used the alignment of such screws and their respective sockets 13 can be achieved without difficulty by appropriate adjustment of the support part 10 in the two lugs.

As an alternative, or in addition to, the screws or bolts 12, the seat unit may be additionally secured to the frame by one or more auxiliary lugs or hooks (not shown) moulded on (or otherwise secured to) the underside of the base 3. These additional hooks when moulded on the base 3 are so located that they will closely receive parts of the bars of the support frame 7 after the seat unit 1 has been twisted to locate the appropriate parts of the support frame 7 in the lugs 4 and 5. Conveniently the aforementioned auxiliary hooks are located in similar positions to the screws or bolts 12. Alternatively the auxiliary hooks may be in the form of clips which are applied to grip both the seat unit and the support frame.

It will be noted that the back support 2 is positioned generally to overlie the free end of the cantilevered support part 10. In this way a couple is exerted on the cantilevered support part 10 when the chair is in use and the resilience of the metal tubes of the frame affords a desirable form of springing to the seat unit.

WHAT WE CLAIM IS:—

1. A combination comprising a plastics moulded seat unit and a frame; the frame having a substantially horizontal support part to which the seat unit is attached; the seat unit having two integrally moulded downwardly extending lugs which are located to engage with portions of the support part on opposed sides thereof, the surfaces of said lugs which engage with said portions of the support part being concave to receive and hook onto the said portions; and wherein the seat unit is assembled with the frame by relative movement in the general plane of the support part between the seat unit as a whole and the frame to move the lugs into hooked engagement with the said portions of the support part.

2. The combination as claimed in claim 1 wherein, after assembly the lugs are located inwardly with respect to their respective said portions, and wherein before assembly the minimum spacing between the concave surfaces of the two lugs is slightly larger than the minimum spacing between the portions of the support part with which they are respectively intended to engage so that the lugs, seat unit or support part are slightly deformed during assembly of the

seat unit with the frame and resilience in the plastics material of the seat unit or in the frame causes the lugs to be biased into firm engagement with the support part.

3. The combination as claimed in either claim 1 or claim 2 wherein the support part forms an enclosure within which the lugs are located and the seat unit is assembled with the frame by first locating the two lugs in the enclosure out of hooked engagement with the support part and subsequently twisting one of the seat unit as a whole and the frame relative to the other in the general plane of the support part, to move the lugs into hooked engagement with the said portions of the support part.

4. The combination as claimed in claim 3 wherein the support part forms a substantially rectangular enclosure and the seat unit is assembled with the frame by first locating the two lugs in the said rectangular enclosure generally along a notional diagonal line thereof and subsequently twisting one of the seat unit as a whole and the frame relative to the other in the general plane of the support part, to move the lugs into hooked engagement with opposed parallel sides of the support part.

5. The combination as claimed in any one of the preceding claims in which at least one securing means in addition to the said lugs is provided between the frame and seat unit to retain these two components together and prevent the seat unit from pivoting about the lugs and relative to the support part.

6. The combination as claimed in claim 5 wherein the securing means comprises a screw, bolt or clip.

7. The combination as claimed in any one of the preceding claims wherein the substantially horizontal support part is cantilevered relative to the remaining part of the frame to provide, after assembly, a degree of springing for the seat unit by the resilience of the material of the frame.

8. The combination as claimed in claim 7 in which the seat unit comprises a substantially horizontal base on the underside of which are located said lugs and a back support extending upwardly from the said base, and wherein when the seat unit is assembled with the frame the base substantially overlies the support part and the back support substantially overlies the free end of the cantilevered support part.

9. The combination as claimed in any one of the preceding claims wherein the frame is formed of tubular steel.

10. The combination of a seat unit and a frame substantially as herein described with reference to the accompanying illustrative drawings.



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