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(54) ARTICLE OF FURNITURE

(71) We, KADER INDUSTRIAL COMPANY LIMITED, a Company incorporated in Hong Kong under the Companies Ordinance of 24, Tanner Road, North Point, Hong Kong, 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 an article of furniture including a supporting frame and a body shell supported by the frame.

Chairs comprising a body shell having a seat portion and a back portion mounted on a tubular supporting frame of aluminium alloy, steel, or other metal are well known. The supporting frame, however, has generally been of welded construction so that it cannot be dismantled or folded for ease of packaging or storage. To overcome this disadvantage, chairs have been made with supporting frames made from two parts pivotally secured to each other so that the frames can be folded, and clamping bolts have been provided to restrict the pivotal movement.

Such known chairs have, however, suffered from the disadvantage that the construction of the supporting frame can be both time-consuming and costly. Furthermore, if the frame is to be constructed of light alloy and is to be welded together, the welding requires special skill and the alternatives of bolting or rivetting are generally not entirely satisfactory from a cost or from an aesthetic point of view.

An object of the invention, therefore, is to eliminate the need for welded joints in the frame of an article of furniture and to form the frame simply from two tubes or rods clamped together.

The present invention provides an article of furniture including a body shell connected to a supporting frame, said frame comprising two tubes or rods shaped to provide four legs arranged in two pairs, the legs of each pair converging upwardly towards a point of nearest approach and then diverging outwardly, each tube or rod integrally providing

one leg of each pair and including an intermediate portion connecting the two outwardly divergent portions at their outer ends and underlying the shell, and clamping means associated with each pair of legs, each clamping means comprising a pair of blocks engaged about and gripping the legs of its associated pair substantially at the point of nearest approach.

The invention is particularly suitable for stacking chairs where the body shell is a moulded seat having a seat portion and a back portion. The body portion may be of plastics and the supporting frame of light alloy tubing. If the chairs are stacking chairs, at least the upwardly converging portions of the legs and also the clamping means will preferably be positioned outwardly of the sides of the seat portion.

The pair of blocks which comprises each clamping means may be formed each with two grooves receiving and gripping the pair of legs at their point nearest approach, and the shape of the grooves is preferably such that each will closely conform to the shape of the leg which it grips. It will be understood therefore that if the legs are curved where they are gripped, then the grooves will also be curved in conformity.

The blocks of each pair are preferably held together for gripping the legs of screw means. This screw means may suitably be a set screw passing through one of the blocks and screwed into a tapped hole in the other block at a point intermediate the two grooves.

A suitable attachment between the supporting frame and the body shell may be provided by lugs which embrace the intermediate tube or rod portions. These intermediate portions may be either straight or curved and they are preferably shaped to conform closely to the adjacent parts of the shell.

By way of example, the accompanying drawings illustrate, in schematic form, a preferred embodiment of the invention. In the drawings:—

Figure 1 is a perspective view of the chair;

[Price 33p]

Figure 2 shows in more detail a clamping means used in the chair shown in Figure 1; and

Figure 3 is a cross-section through a foot at the lowermost end of a leg.

As shown in Figure 1, a chair 1 comprises a body shell 2 and a supporting frame 3. The body shell 2 is of moulded polypropylene and includes a seat portion 4 and a back portion 5. Integral with the body shell 2 are four pairs of lugs 6 arranged to receive between them transverse intermediate portions 16 and 17 of the supporting frame 3 and the body shell can be secured to the supporting frame by passing retaining pins 7 through the lugs.

The supporting frame 3 consists basically of two bent light alloy tubes 8 and 9 which are secured together by two light alloy clamps 10 and 11 positioned one on each side of the chair. The two tubes 8 and 9 provide four legs arranged in two pairs 12, 13 and 14, 15. The legs of each pair 12, 13 and 14, 15 converge upwardly to a point of nearest approach and then diverge outwardly so that one leg (12, 14) of each pair extends forwardly of the body shell 2 and the other leg (13, 15) extends rearwardly thereof. The uppermost ends of the legs 12 and 14 are connected by the intermediate portion 16 of the tube 8 which is straight and underlies a front edge of the body shell 2, and the uppermost ends of the legs 13 and 15 are connected by the intermediate portion 17 of the tube 9 which underlies a rear part of the body shell 2 and is curved to conform to the shape of that part of the shell. Since the chair 1 is a stacking chair, upwardly converging portions of the legs are positioned outwardly of the body shell 2 when the chair is in plan.

The clamps 10 and 11 rigidly clamp together the legs 12, 14 and 13, 15 respectively at or near their points of nearest approach and like the upwardly converging portions of the legs, they are positioned outwardly of the body shell 2 when the chair 1 is viewed in plan. As shown more clearly in Figure 2, each of the clamps 10 and 11 comprises a pair of blocks 18 and 19. The blocks are arranged to face one another at their faces 20 and 21 and each is provided with two grooves 22 and 23 shaped to receive closely within them and to grip the legs 12 and 13 or 14 and 15 when the blocks are forced towards one another. As shown, the grooves 22 and 23 are curved to match the curvature of the legs at their points of nearest approach but it is to be understood that they could be made of any other shape as determined by the shape of the legs at these points. The blocks 18 and 19 are forced towards one another by a clamping screw 24 which passes through a hole in the block 19

and is received in a tapped hole 25 in the block 18.

At the lowermost ends of the legs 12 to 15 there are protective feet 26 of rubber or plastics one of which is shown more clearly in Figure 3. The foot 26 comprises a central locating part 27 and an outer part 28 secured to the central part 27. The central part 27 is press-fitted into the end of a respective leg (the leg 15 is shown as an example) so that it lies substantially flush with the end of the tube, and the end of the tube with the central part 27 of the foot within it is received within a blind hole 29 in the outer part 28 of the foot. The outer part 28 of the foot is held securely in place by a screw 30 passing through it axially of the leg and into the central part 27 of the foot.

WHAT WE CLAIM IS:—

1. An article of furniture including a body shell connected to a supporting frame, said frame comprising two tubes or rods shaped to provide four legs arranged in two pairs, the legs of each pair converging upwardly towards a point of nearest approach and then diverging outwardly, each tube or rod integrally providing one leg of each pair and including an intermediate portion connecting the two divergent portions at their outer ends and underlying the shell, and clamping means associated with each pair of legs, each clamping means comprising a pair of blocks engaged about and gripping the legs of its associated pair substantially at the point of nearest approach.
2. An article of furniture as claimed in claim 1 wherein the body shell is a moulded seat having a seat portion and a back portion.
3. An article of furniture as claimed in claim 2 wherein at least the upwardly converging portions of the legs are positioned outwardly of the sides of the seat portion to permit the article to be stacked upon other similar articles.
4. An article of furniture as claimed in claim 2 or claim 3 wherein the clamping means are positioned outwardly of the sides of the seat portion.
5. An article of furniture as claimed in any one of the preceding claims wherein the pair of blocks which comprises each clamping means is formed each with two grooves receiving and gripping the pair of legs at their point of nearest approach.
6. An article of furniture as claimed in claim 5 wherein the shape of the grooves is such that each conforms to the shape of the leg which it grips.
7. An article of furniture as claimed in any one of the preceding claims wherein the blocks of each pair are held together by screw means.
8. An article of furniture as claimed in

Figure 2 shows in more detail a clamping means used in the chair shown in Figure 1; and

Figure 3 is a cross-section through a foot at the lowermost end of a leg.

As shown in Figure 1, a chair 1 comprises a body shell 2 and a supporting frame 3. The body shell 2 is of moulded polypropylene and includes a seat portion 4 and a back portion 5. Integral with the body shell 2 are four pairs of lugs 6 arranged to receive between them transverse intermediate portions 16 and 17 of the supporting frame 3 and the body shell can be secured to the supporting frame by passing retaining pins 7 through the lugs.

The supporting frame 3 consists basically of two bent light alloy tubes 8 and 9 which are secured together by two light alloy clamps 10 and 11 positioned one on each side of the chair. The two tubes 8 and 9 provide four legs arranged in two pairs 12, 13 and 14, 15. The legs of each pair 12, 13 and 14, 15 converge upwardly to a point of nearest approach and then diverge outwardly so that one leg (12, 14) of each pair extends forwardly of the body shell 2 and the other leg (13, 15) extends rearwardly thereof. The uppermost ends of the legs 12 and 14 are connected by the intermediate portion 16 of the tube 8 which is straight and underlies a front edge of the body shell 2, and the uppermost ends of the legs 13 and 15 are connected by the intermediate portion 17 of the tube 9 which underlies a rear part of the body shell 2 and is curved to conform to the shape of that part of the shell. Since the chair 1 is a stacking chair, upwardly converging portions of the legs are positioned outwardly of the body shell 2 when the chair is view in plan.

The clamps 10 and 11 rigidly clamp together the legs 12, 14 and 13, 15 respectively at or near their points of nearest approach and like the upwardly converging portions of the legs, they are positioned outwardly of the body shell 2 when the chair 1 is viewed in plan. As shown more clearly in Figure 2, each of the claims 10 and 11 comprises a pair of blocks 18 and 19. The blocks are arranged to face one another at their faces 20 and 21 and each is provided with two grooves 22 and 23 shaped to receive closely within them and to grip the legs 12 and 13 or 14 and 15 when the blocks are forced towards one another. As shown, the grooves 22 and 23 are curved to match the curvature of the legs at their points of nearest approach but it is to be understood that they could be made of any other shape as determined by the shape of the legs at these points. The blocks 18 and 19 are forced towards one another by a clamping screw 24 which passes through a hole in the block 19

and is received in a tapped hole 25 in the block 18.

At the lowermost ends of the legs 12 to 15 there are protective feet 26 of rubber or plastics one of which is shown more clearly in Figure 3. The foot 26 comprises a central locating part 27 and an outer part 28 secured to the central part 27. The central part 27 is press-fitted into the end of a respective leg (the leg 15 is shown as an example) so that it lies substantially flush with the end of the tube, and the end of the tube with the central part 27 of the foot within it is received within a blind hole 29 in the outer part 28 of the foot. The outer part 28 of the foot is held securely in place by a screw 30 passing through it axially of the leg and into the central part 27 of the foot.

WHAT WE CLAIM IS:—

1. An article of furniture including a body shell connected to a supporting frame, said frame comprising two tubes or rods shaped to provide four legs arranged in two pairs, the legs of each pair converging upwardly towards a point of nearest approach and then diverging outwardly, each tube or rod integrally providing one leg of each pair and including an intermediate portion connecting the two divergent portions at their outer ends and underlying the shell, and clamping means associated with each pair of legs, each clamping means comprising a pair of blocks engaged about and gripping the legs of its associated pair substantially at the point of nearest approach.
2. An article of furniture as claimed in claim 1 wherein the body shell is a moulded seat having a seat portion and a back portion.
3. An article of furniture as claimed in claim 2 wherein at least the upwardly converging portions of the legs are positioned outwardly of the sides of the seat portion to permit the article to be stacked upon other similar articles.
4. An article of furniture as claimed in claim 2 or claim 3 wherein the clamping means are positioned outwardly of the sides of the seat portion.
5. An article of furniture as claimed in any one of the preceding claims wherein the pair of blocks which comprises each clamping means is formed each with two grooves receiving and gripping the pair of legs at their point of nearest approach.
6. An article of furniture as claimed in claim 5 wherein the shape of the grooves is such that each conforms to the shape of the leg which it grips.
7. An article of furniture as claimed in any one of the preceding claims wherein the blocks of each pair are held together by screw means.
8. An article of furniture as claimed in



claim 5 or claim 6 wherein the blocks of each pair are held together by screw means, and the screw means of each pair of blocks comprises a set screw passing through one of the blocks and screwed into a tapped hole in the other block at a point intermediate the two grooves.

9. An article of furniture as claimed in any one of the preceding claims including lugs on the body shell which embrace the intermediate tube or rod portions for securing the body shell to the supporting frame.

10. An article of furniture as claimed in any one of the preceding claims wherein the intermediate tube or rod portions are shaped to conform closely to the adjacent parts of the shell.

11. An article of furniture as claimed in any one of the preceding claims wherein the body shell is of plastics material.

12. An article of furniture as claimed in

claim 1 wherein the plastics material is polypropylene.

13. An article of furniture as claimed in any one of the preceding claims wherein the supporting frame is of light alloy.

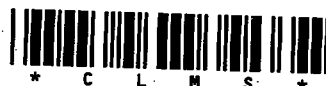
14. An article of furniture as claimed in any one of the preceding claims including protective feet of rubber or plastics at the lowermost ends of the legs.

15. An article of furniture as claimed in claim 14 wherein the protective feet are each secured to a respective one of the legs by screw means passing upwardly into locating means within the interior of the leg.

16. An article of furniture substantially as herein described with reference to the accompanying drawings.

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