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(54) **Furniture and method of assembling furniture**

(57) A piece of furniture, for example a chair (2), with integrated shell (4) forming a furniture part, e.g. a seat (6) and a backrest (8), and a number of legs (10), e.g. four legs that are fastened at the underside of the furniture part or the seat (6), where the shell (4) is made by injection moulding of fibre reinforced plastic, and where the furniture part or seat (6) is provided with sockets (22) at the underside for receiving and retaining end parts (16) of the legs (10) which have identical shape. The legs (10) are made of steel with elongated, straight parts (12) and end parts (16) angularly bent in relation thereto and designed with an elongated conical guide pin (18) with external grooves. The sockets (22) at the underside of the furniture part or seat (6) are designed with an internal shape which is complementary to the external grooves (18) of the end parts (16) of the legs (10). Moreover, there is disclosed a method for establishing a joint, e.g. a furniture joint. In a very simple way is hereby provided a furniture or a chair adapted for packing and shipping in separated condition, and which subsequently is readily assembled by the consumer in a simple and unambiguously correct way.

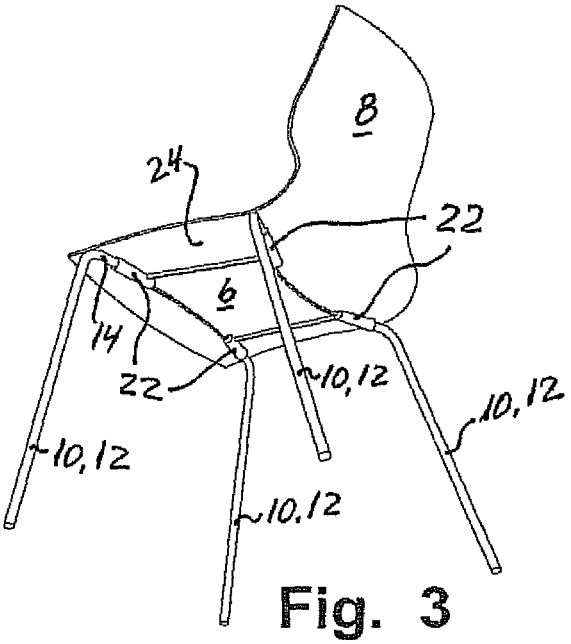

Fig. 3

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Description

Field of the Invention

[0001] The present invention concerns a piece of furniture, e.g. a chair, with integrated shell forming seat and backrest, and four legs fastened at the underside of the chair.

[0002] Moreover, the invention concerns a method for establishing a joint, e.g. furniture joint.

Background of the Invention

[0003] There exist several chairs of this kind where seat and back are formed by an integrated shell, and where bent end parts of the legs are fastened to the underside of the seat in such a way that the legs project out of the seat in such a way that the chair may immediately be stacked.

Object of the Invention

[0004] On this background, the invention has the purpose of indicating a piece of furniture, e.g. of a chair of the kind described in the introduction, and which in addition is adapted to be packed and shipped in separated condition, and which subsequently is easy to assemble for the consumer in a simple and unambiguously correct way.

Description of the Invention

[0005] The chair according to the invention is characterised in that the shell is made by injection moulding of fibre reinforced plastic, and that the furniture part or seat is provided with sockets at the underside for receiving and retaining end parts of the legs which have identical shape. In a very simple way is hereby provided a piece of furniture, e.g. a chair adapted for packing and shipping in separated condition, and which subsequently is readily assembled by the consumer in a simple and unambiguously correct way.

[0006] It will be appreciated that a number of separated chairs, e.g. four chairs in the form of four chair shells and sixteen legs, may easily be packed in a common packing.

[0007] The fact that all chair legs are made identical of course results in a considerable simplification of production and stocking. The furniture or the shell parts of the chair can be made of coloured plastic, while the legs of the furniture or chair preferably are made of stainless steel.

[0008] The furniture or chair according to the invention is suitably made such that the legs are made of steel with elongated, straight parts, and end parts angularly bent in relation thereto and designed with an elongated conical guide pin.

[0009] With the object of ensuring a rotationally rigid connection between the socket of the furniture or the seat and the legs, the furniture or chair according to the invention is designed such that the conical pin is designed with external grooves.

[0010] For additionally ensuring an accurate and unequivocally rotationally rigid connection between the socket of the furniture or seat and the legs, the chair according to the invention is designed such that the spacing between two of the external grooves is greater than the mutual spacing between the remaining grooves.

[0011] The furniture or chair according to the invention is suitably designed such that the sockets at the underside of the seat are designed with an internal shape which is complementary to the grooves of the conical guide pin of the end parts of the legs.

[0012] With the object of ensuring correct retaining engagement between the conical pin and the socket, the furniture or chair according to the invention is designed such that the conical guide pin of the end parts of the legs in a free end is designed with an axial threaded hole for receiving a lock screw, as the sockets opposite the end parts of the legs are formed with an axial hole for the lock screw.

[0013] With the object of ensuring a simple and unambiguous establishing of the correct inclination of the legs of the furniture or chair, this is designed such that the internal complementary shape of the sockets is adapted to determine the angular displacement of the end parts of the legs in relation to the furniture or the seat.

[0014] The identical legs of the furniture or chair are suitably designed such that the angle between the end parts and the elongated straight parts of the legs is of the magnitude 85 - 95°. The said angle is preferably about 91°.

[0015] The furniture or chair according to the invention - in the shown and described embodiment - is suitably designed such that the length ratio between the end parts and the elongated straight parts of the legs is of the magnitude 1:4.

[0016] The invention also concerns a method for establishing a joint, e.g. a furniture joint, where a conical connecting part of e.g. a table or chair leg is used for forming a connection with a socket part of e.g. a table top or a chair seat made by injection moulding, the method being characterised in that a part with multiple grooves is used as the conical connecting part, that at least one of the tongues of the multiple grooves have greater width than the width of the remaining tongues, and that the socket member thereby is provided a complementing internal shape.

[0017] In other words, the invention generally concerns a method for establishing a joint where special demands are made to the angular orientation of one of the joint parts, as this angularly correct orientation is obtained by making use of multiple grooves, where at least one tongue has greater width, i.e. where the spacing between two grooves is greater than the spacing between the remaining grooves. Hereby it becomes possible to establish joints where one of the joint members automatically

receives the correct angular orientation in relation to one or more other furniture or machine parts.

[0018] In principle, it may be any kind of technical assembly, it being within the furniture industry, machine or construction industry; and finally it is to be noted that the method according to the invention is not limited to the use of conical multiple grooves, but may be performed in connection with straight multiple grooves.

Description of the Drawing

[0019] The invention is explained more closely in the following with reference to the drawing, on which:

Figs. 1-3 show perspective views of an embodiment of a chair according to the invention;

Fig. 4 shows a plan view of the chair cf. Figs. 1-3, as seen from the front;

Fig. 5 shows a plan view of the chair cf. Figs. 1-3, as seen from the back side;

Fig. 6 shows a plan view of the chair cf. Figs. 1-3, as seen from the side;

Fig. 7 shows a plan view of the chair cf. Figs. 1-3, as seen from above;

Fig. 8 shows a plan view of the chair cf. Figs. 1-3, as seen from below;

Fig. 9 shows a perspective detail view of an embodiment of a leg for a chair according to the invention;

Fig. 10 shows a perspective view in detail for illustrating fastening of a leg in a socket at the underside of the seat; and

Fig. 11 shows a perspective view in detail of an established fastening of a leg in a socket at the underside of the seat.

Detailed Description of the Invention

[0020] The chair 2 shown in Figs. 1-8 includes a shell part 4 that constitutes a chair seat and a chair backrest 8. The chair 2 is fitted with four chair legs 10 which are identical in shape and which consist of a straight leg part 12 and an end part 14 bent in relation thereto and designed with conical connecting part 16 (Fig. 9).

[0021] The shell 4 constituting the chair seat 6 and the chair back 8 are made by injection moulding of glass fibre reinforced polyamide (Nylon), or e.g. PA6 with 30% glass fibres.

[0022] Externally, the conical connecting part 16 is provided with a shape as a conical pin with multiple grooves 18, where a somewhat wider conical tongue 20 of the multiple grooves 18 is formed opposite the straight leg part 12, such that the retaining engagement is provided between the conical connecting part 16 and sockets 22 at an underside 24 of the chair seat 6, the sockets 22 being formed by means of conical core drives by injection moulding (Figs. 10 and 11).

[0023] The sockets 22 are designed with an internal shape entirely corresponding to the external shape of the conical connecting part 16, i.e. a shape which is complementary with the multiple grooves 18 and the slightly wider guide tongue 20, such that the correct mutual angular displacement between the chair seat 6 and the straight leg parts 12 of front and rear legs, respectively, of the chair 2 have been unequivocally determined already at the injection moulding of the shell 4.

[0024] In an outer end of the conical connecting part 16, an axial threaded hole 26 is formed for a lock screw 28 (Fig. 9), such that the locking engagement between the connecting part 16 and the sockets 22 may be secured by means of the lock screw 28. Fatigue tests of the chair 2 have surprisingly shown that the retaining engagement between the conical connecting part 16 and the sockets 22 do not deteriorate by removing the lock screw 28. In other words, this has primarily significance for establishing correct retaining engagement between the conical connecting part 16 and the socket 22.

[0025] It is to be noted that the described method for assembling the furniture part, e.g. a chair seat, with a number of identical legs can be applied more generally where the matter is to establish a joint in which a furniture part, e.g. a table or chair leg, is to have a certain angular orientation in relation to a second furniture part, e.g. a table top or a seat.

[0026] Also by making stackable tables or stools with three or four legs, it will be advantageous to make use of the joining method according to the invention, where the table top or the seat part is formed by injection moulding with the wanted number of sockets for receiving conical connecting part of upper angularly bent end parts of respective legs.

[0027] By furniture with just one leg - e.g. café tables or stools - it may also be advantageous to make use of the inventive method for providing a solid and stable joint between a central upright or leg which may be joined directly with a central socket which is established by injection moulding at the centre under the table top or the seat.

Claims

1. A piece of furniture, for example a chair, with an integrated shell forming a furniture part, e.g. a seat and a backrest, and a number of legs, e.g. four legs that are fastened at the underside of the furniture part or the seat, **characterised in that** the shell is made by injection moulding of fibre reinforced plas-

tic, and that the furniture part or seat is provided with sockets at the underside for receiving and retaining end parts of the legs which have identical shape.

2. Furniture or chair according to claim 1, **characterised in that** the legs are made of steel with elongated, straight parts, and end parts angularly bent in relation thereto and designed with an elongated conical guide pin.

3. Furniture or chair according to claim 1 or 2, **characterised in that** the conical guide pin is designed with external grooves.

4. Furniture or chair according to claim 3, **characterised in that** the spacing between two of the external grooves is greater than the mutual spacing between the remaining grooves.

5. Furniture or chair according to any preceding claim, **characterised in that** the sockets at the underside of the seat are designed with an internal shape which is complementary to the grooves of the conical guide pin of the end parts of the legs.

6. Furniture or chair according to any preceding claim, **characterised in that** the conical guide pin of the end parts of the legs in a free end is designed with an axial threaded hole for receiving a lock screw, as the sockets opposite the end parts of the legs is designed with an axial hole for the lock screw.

7. Furniture or chair according to any preceding claim, **characterised in that** the internal complementary shape of the sockets is adapted to determine the angular displacement of the end parts of the legs in relation to the seat.

8. Furniture or chair according to any preceding claim, **characterised in that** the angle between the end parts and the elongated straight parts of the legs is of the magnitude 85 - 95°.

9. Furniture or chair according to any preceding claim, **characterised in that** the ratio of the length between the end parts and the elongated straight parts of the legs is 1:4.

10. A method for establishing a joint, e.g. a furniture joint, where a conical connecting part of e.g. a table or chair leg is used for forming a connection with a socket part of e.g. a table top or a chair seat made by injection moulding, **characterised in that** a part with multiple grooves is used as the conical connecting part, that at least one of the tongues of the multiple grooves have greater width than the width of the remaining tongues, and that the socket member thereby is provided a complementing internal shape.

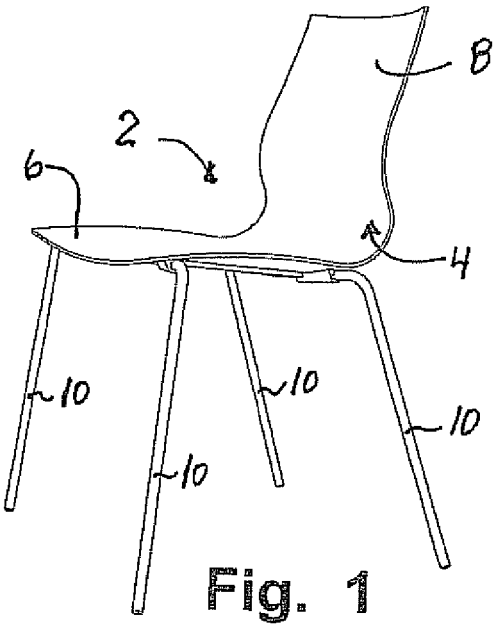

Fig. 1

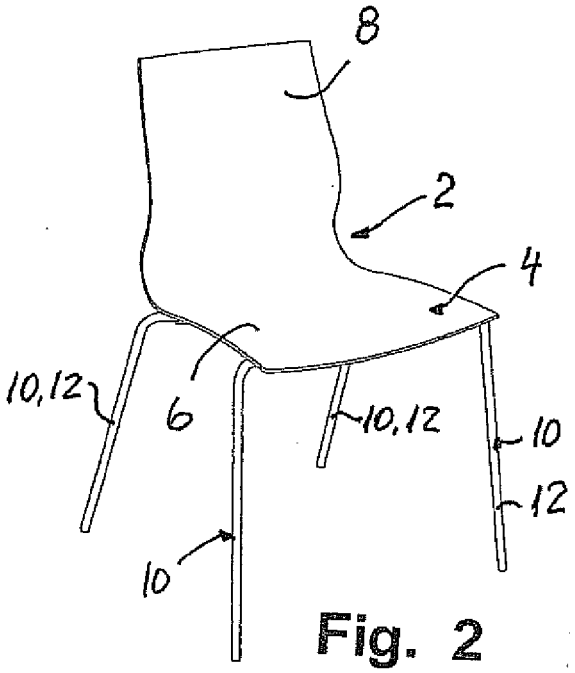

Fig. 2

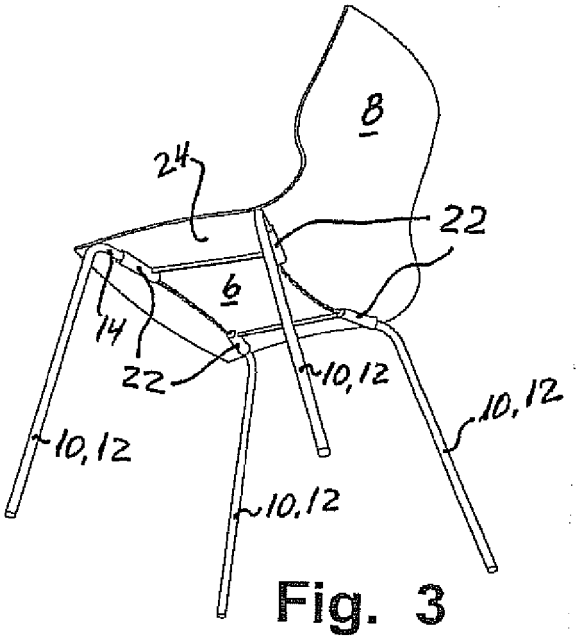

Fig. 3

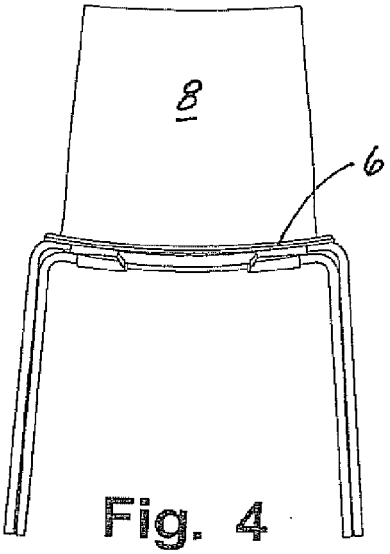

Fig. 4

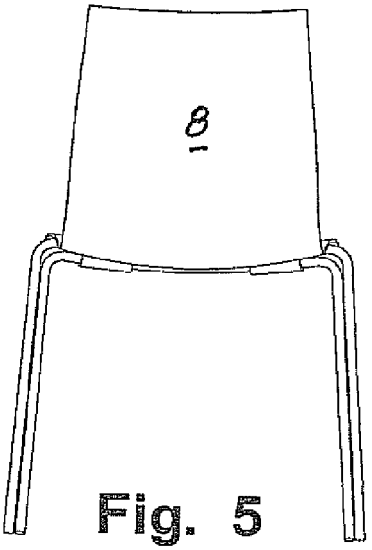

Fig. 5

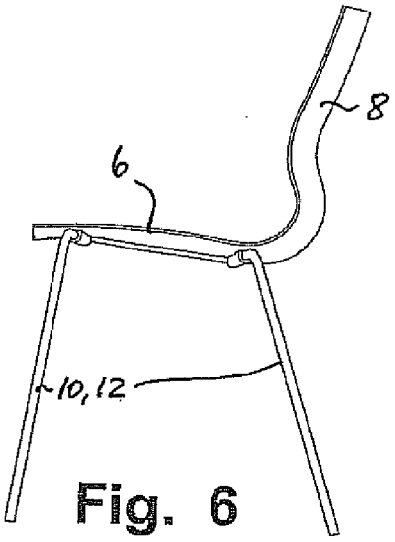

Fig. 6

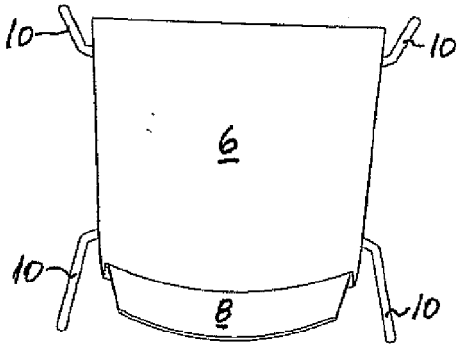

Fig. 7

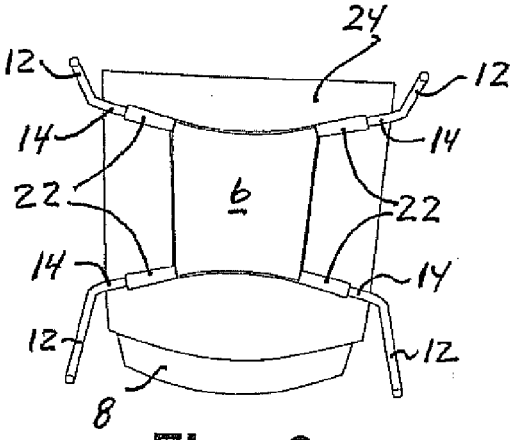

Fig. 8

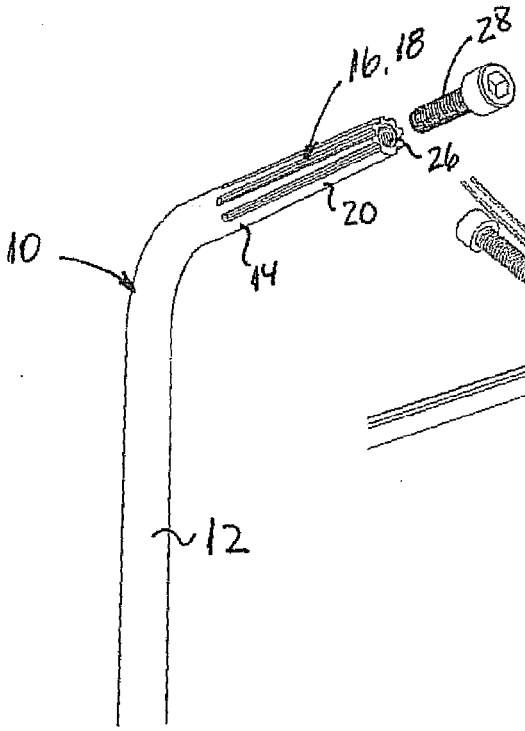

Fig. 9

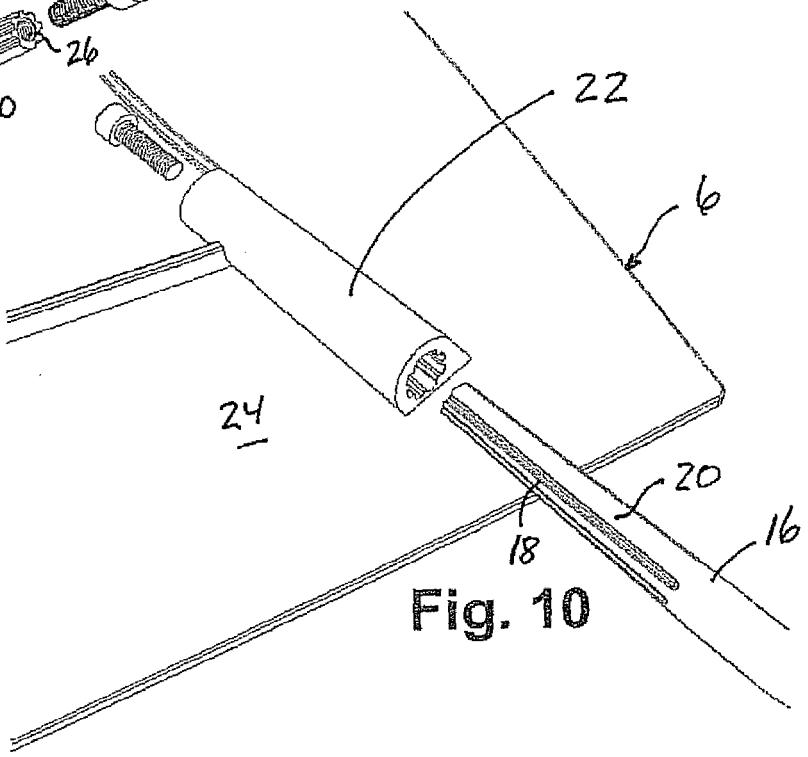

Fig. 10

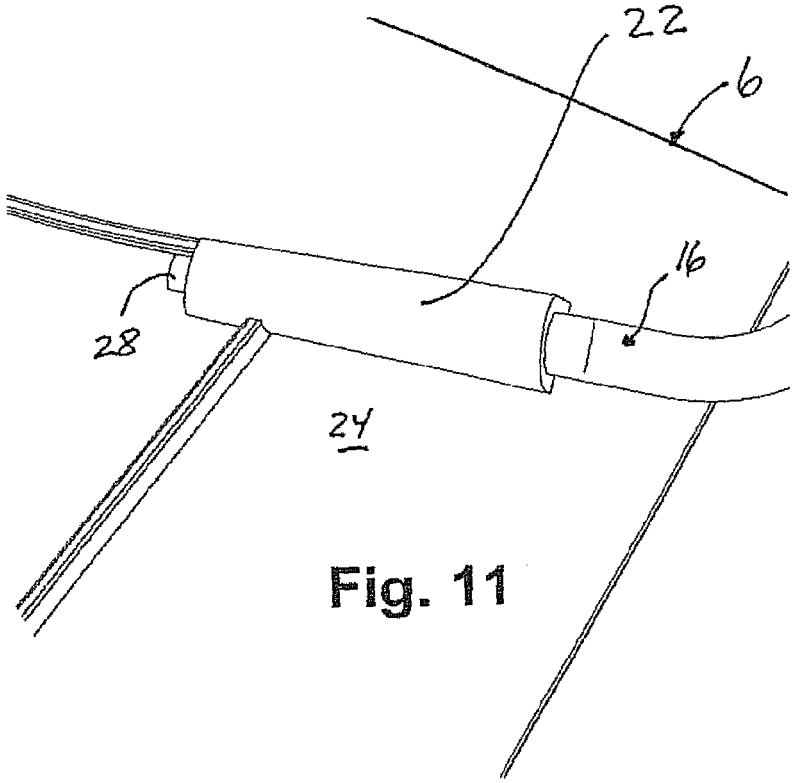

Fig. 11