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(54) **Chair**

(57) A chair provided with internal supporting inserts (19, 20, 24, 29, 119, 120, 124, 129) made of metallic material, its particularity consisting in that the internal supporting inserts (19, 20, 24, 29, 119, 120, 124, 129) made of metallic material are mutually connected so as to form a frame (50, 150) that is completed by internal inserts (21, 25, 26, 27, 31, 126) made of plastics material. In a first embodiment, the chair is characterized in that the internal supporting inserts (19, 20, 24, 29) made of metallic material are combined and cooperate with internal inserts (21, 25, 26, 27, 31) made of plastics material, which are mutually differentiated by regions in their mechanical strength features. In a second embodiment, there is a single frame obtained by welding the supporting inserts made of metallic material. In both cases, the entire assembly is enclosed in an overmolded cladding (17, 18, 117) produced by injecting thermo-plastic material, which also forms the contact portions of the seat (12, 112) and backrest (15, 115).

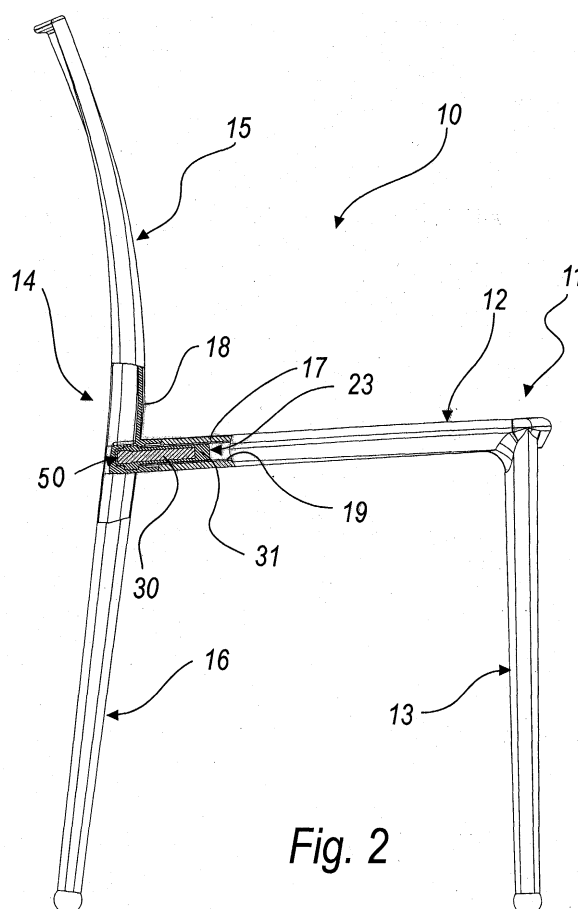


Fig. 2

Description

[0001] The present invention relates to a chair.

[0002] It is known that in the field of the manufacture of chairs (as well as armchairs and the like) it is particularly important to combine excellent strength characteristics with the possibility of good constructive flexibility in terms of low costs, aesthetics/styling, and ergonomic design.

[0003] On the basis of these requirements, a chair has been provided in which the seat and backrest are produced individually by overmolding plastics material on supporting elements made of metallic material.

[0004] The components are provided in the finished state simply with a single process, which is the molding process, and are assembled simply by interlocking.

[0005] This ensures considerable strength together with low weight and flexibility of shape in manufacturing.

[0006] Moreover, the structure allows the components to be packed in the disassembled state, with a great reduction in overall dimensions for storage and transport.

[0007] This chair has been quite successful commercially thanks to the advantages cited above, but has still shown that further evolutions of the basic technical concept of overmolding plastics materials on the metallic supporting elements are possible, such evolutions being aimed at optimizing the structure as a function of the mechanical strength characteristics required for the various regions and of the optimization of the production cycle in order to obtain the finished product without the need for finishing processes after molding.

[0008] The aim of the present invention is to provide a chair that by utilizing the technique of overmolding on metallic supporting elements has characteristics of mechanical strength that are differentiated by regions, such as adequate rigidity at the legs and flexibility at the backrest.

[0009] Within this aim, an object of the present invention is to provide a chair whose structure is substantially weatherproof and is therefore suitable both for indoor use and for outdoor use or in any case in environments with a high chemical aggression factor.

[0010] Another object of the present invention is to provide a chair whose structure allows a considerable reduction of the thicknesses of the various regions, with consequent savings of material.

[0011] Another object of the present invention is to provide a chair that can be obtained in the finished state simply by means of the molding process.

[0012] Another object of the present invention is to provide a chair that can be manufactured with known equipment and technologies.

[0013] This aim and these and other objects that will become better apparent hereinafter are achieved by a chair having a structure provided with internal supporting inserts made of metallic material, characterized in that said internal supporting inserts made of metallic

material are mutually connected so as to form a frame that is completed by internal inserts made of plastics material, the entire assembly being enclosed in an overmolded cladding produced by injecting thermoplastic material, which also forms the contact portions of the seat and backrest.

[0014] Conveniently, the internal supporting inserts made of metallic material are combined and cooperate with internal inserts made of plastics material that are mutually differentiated by regions in their mechanical strength features, the entire assembly being enclosed in an overmolded cladding made of plastics material, which also forms the contact portions of the seat and backrest.

[0015] Further characteristics and advantages of the present invention will become better apparent from the description of two embodiments thereof, illustrated by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is an external front view of a chair according to the invention, assembled in its two components;

Figure 2 is a partially sectional side view of the chair of Figure 1 in the assembled condition;

Figure 3 is a sectional side view of the chair of Figure 1 in the disassembled condition;

Figure 4 is a sectional view, taken along a substantially horizontal plane, of the chair of Figure 1 in the assembled condition;

Figure 5 is a sectional view of a detail of a front leg; Figure 6 is a sectional view of a detail of a backrest and of a rear leg;

Figure 7 is an enlarged-scale sectional view of the region of mutual coupling of the two components of the chair of Figure 1;

Figure 8 is an enlarged-scale sectional view, taken along a plane that is perpendicular to the plane of Figure 6, of the region of mutual coupling of the two components of the chair of Figure 1;

Figure 9 is an exploded perspective view of a frame according to the invention, completed with inserts made of plastics material;

Figure 10 is a perspective view of a chair according to the invention;

Figure 11 is a perspective view of a detail of a leg according to the invention.

[0016] With reference to the figures, a chair having the structure according to the invention is generally designated by the reference numeral 10 in a first embodiment.

[0017] The chair 10 is composed of two components, which are mutually reversibly associated by interlocking as described hereinafter.

[0018] A first component 11 comprises a seat 12 and two front legs 13, and a second component 14 comprises a backrest 15 and two rear legs 16.

[0019] According to the invention, the two components 11 and 14 are each formed by injection overmolding of a cladding, respectively designated by the reference numerals 17 and 18, made of thermoplastic material, such as for example polypropylene, over tubular internal supporting inserts made of metallic material that will be described in greater detail hereinafter.

[0020] In particular, the first component 11 comprises, in this case, a tubular insert 19 made of shaped steel for the perimeter of the seat 12 and tubular steel inserts 20 for the front legs 13, which are closed at their lower free ends by inserts made of plastics material 21 (so as to prevent the cladding 17 from entering the inserts 20 during molding).

[0021] The free ends 22 of the tubular insert 19 (which are arranged at the rear) are instead arranged so as to remain open in order to constitute the receptacles for the insertion of tangs 23 that protrude from the second component 14 of the chair 10.

[0022] As regards the second component 14, it comprises in this case tubular inserts 24 made of steel for the rear legs 16, which are closed at their lower free ends by inserts 25 made of plastics (so as to prevent the cladding 18 from penetrating in the inserts 24 during molding).

[0023] Hole plugging inserts 26 made of plastics are instead inserted in the upper ends of the tubular inserts 24 and also extend inside the backrest 15.

[0024] Elongated inserts 27 made of plastics, such as for example nylon, are overmolded on these inserts 26, are shaped so as to taper toward their ends along the respective sides 28 of the backrest 15, and are also embedded in the cladding 18.

[0025] The inserts 27 conveniently have different mechanical strength characteristics with respect to the metallic inserts 24, giving elasticity to the backrest 15, which can thus be flexed backward (like a cantilevered leaf spring) in order to adapt to the movements of the back of the user.

[0026] The backrest 15 has, between the upper ends of the rear legs 16, a straight metallic insert 29 from which, adjacent to the ends, perpendicular tabs 30 protrude which constitute the cores of the tangs 23.

[0027] The insert 29, with the tabs 30, is enclosed by an overmolded cladding 31 (insert) made of plastics, such as for example nylon, which except for the regions of the tabs 30 is further enclosed by the cladding 18.

[0028] The internal metallic inserts designated by the reference numerals 19, 20, 24 and 29 constitute as a whole a frame 50 that is completed by the plastic inserts 21, 25, 26, 27 and 31.

[0029] Moreover, the claddings 31 and 18 form tabs 32 that are arranged laterally adjacent to the tangs 23 for resting against the rear edge 33 of the seat 12.

[0030] The cladding 31 in the region of the tabs 30 avoids metal-on-metal contact between the tangs 23 and the respective receptacles formed by the ends of the tubular insert 19 and allows a better interlocking be-

tween the parts by way of the adaptability of the plastic material.

[0031] A second embodiment of a chair having the structure according to the invention is designated by the reference numeral 110 in Figures 9 to 11.

[0032] The supporting internal inserts made of metallic material, here designated respectively by the reference numerals 119, 120, 124 and 129, are mutually connected so as to form a single supporting insert 150 to be inserted in a mold.

[0033] As in the first embodiment, a first insert 119 forms the seat 112, second inserts 120 form the front legs 113, third inserts 124 form the rear legs 116, and a fourth insert 129 completes the seat 112, connecting the inserts 124 for the rear legs.

[0034] Hole plugging inserts 126 made of plastics material are inserted in the upper free ends 151 of the single metallic supporting insert 150 and, in the same manner described for the first embodiment of the chair 10 according to the invention, also extend within the corresponding backrest 115, improving its backward flexural elasticity.

[0035] External inserts 161 made of plastics for resting on the ground are instead inserted in the lower free ends 152 of the single supporting insert 150.

[0036] Such internal inserts made of metallic material 119, 120, 124 and 129 are connected by welding.

[0037] The single metallic supporting insert 150 and the internal hole plugging inserts 126 made of plastics are enclosed in a single overmolded cladding 117, which also forms the contact portions of the seat 112 and of the backrest 115, so as to form a monolithic chair.

[0038] In practice it has been found that the present invention has achieved the intended aim and objects.

[0039] The chair in fact has a structure provided with internal supporting inserts 19, 20, 24, 29, 119, 120, 124, 129 that are mutually connected so as to form a frame 50, 150, which is completed by internal inserts 21, 25, 26, 27, 31, 126 made of plastics.

[0040] Moreover, advantageously, in a first embodiment the chair has a structure provided with internal supporting inserts 19, 20, 24, 29 made of metallic material, which are combined and cooperate with internal inserts 21, 25, 26, 27, 31 made of plastics, which are mutually differentiated by regions in their mechanical strength features.

[0041] Therefore, by utilizing the technique of overmolding over metallic supporting elements, the chair has mechanical strength characteristics that are differentiated by regions, such as adequate rigidity at the legs and flexibility at the backrest.

[0042] Further, in said first embodiment the components are provided in the finished state simply with a single process, which is the molding process, and are simply assembled by interlocking.

[0043] This ensures considerable strength together with low weight and flexibility of configuration and manufacture.

[0044] Further, the structure described and exemplified with the first embodiment allows pluralities of the two components to be mutually packed, in the disassembled state prior to final assembly, with a considerable reduction of overall dimensions for storage and transport.

[0045] Advantageously, the second embodiment instead allows to obtain a monolithic chair simply and cheaply, by inserting in a mold a single metallic insert and by means of a subsequent single injection overmolding operation.

[0046] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0047] The materials, so long as they are compatible with the contingent use, as well as the dimensions, may be any according to requirements.

[0048] The disclosures in Italian Patent Application No. PD2002A000177, from which this application claims priority, are incorporated herein by reference.

[0049] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A chair with a structure provided with internal supporting inserts (19, 20, 24, 29) made of metallic material, **characterized in that** said internal supporting inserts (19, 20, 24, 29, 119, 120, 124, 129) made of metallic material are mutually connected so as to form a frame (50, 150) that is completed by internal inserts (21, 25, 26, 27, 31, 126) made of plastics material, the entire assembly being enclosed in an overmolded cladding (17, 18, 117) produced by injecting thermoplastic material, which also forms the contact portions of the seat (12, 112) and backrest (15, 115).
2. The chair provided with the structure according to claim 1, **characterized in that** said internal supporting inserts (19, 20, 24, 29) made of metallic material are combined and cooperate with said internal inserts (21, 25, 26, 27, 31) made of plastics material, which are mutually differentiated by regions in their mechanical strength features, the entire assembly being enclosed by an overmolded cladding (17, 18) made of plastics material, which also forms the contact portions of the seat (12) and backrest (15).
3. The chair according to claims 1 and 2, **characterized in that** it is composed of two components that

are mutually associated reversibly by interlocking, a first component (11) comprising the seat (12) and two front legs (13) and a second component (14) comprising the backrest (15) and the rear legs (16).

4. The chair provided with the structure according to one or more of claims 1 to 3, **characterized in that** said two components (11, 14) are each formed by overmolding a cladding (17, 18) made of plastics material over internal supporting inserts (19, 20, 24, 29) made of metallic material combined with internal inserts (21, 25, 26, 27, 31) made of plastics material.
5. The chair provided with the structure according to one or more of the preceding claims, **characterized in that** a first component (11) comprises a tubular insert (19) made of contoured metal for the perimeter of the seat (12) and tubular inserts (20) made of metal for said front legs (13) which are closed at their lower free ends by inserts (21) made of plastics material.
6. The chair provided with the structure according to one or more of the preceding claims, **characterized in that** the free ends (22) of said metallic insert (19) for the perimeter of the seat (12) that are arranged at the rear are arranged so as to remain open in order to constitute the receptacles for the insertion of tangs (23) that protrude from said second component (14) of the chair (10).
7. The chair provided with the structure according to one or more of the preceding claims, **characterized in that** said second component (14) comprises tubular inserts (24) made of metal for the rear legs (16), which are closed at their lower free ends by inserts made of plastics material (25).
8. The chair provided with the structure according to one or more of the preceding claims, **characterized in that** hole plugging inserts (26) made of plastics are inserted in the upper ends of said tubular inserts (24) of said second component and also extend inside the backrest (15).
9. The chair provided with the structure according to one or more of the preceding claims, **characterized in that** elongated inserts (27) made of plastics material are overmolded on said hole plugging inserts (26) of said metallic tubular inserts (24), are shaped so as to taper toward their ends along the respective sides (28) of said backrest (15), and are also embedded in said cladding (18) thereof, said elongated inserts (27) giving elasticity to said backrest (15).
10. The chair provided with the structure according to one or more of the preceding claims, **characterized**

in that said backrest (15) has, between the upper ends of the rear legs (16), a metallic insert (29) from which perpendicular tabs (30) protrude adjacent to the ends, said tabs constituting the cores of said tangs (23), said insert (29) with said tabs (30) being enclosed by an overmolded cladding (31) made of plastics material which, except for the regions of the tabs (30), is further enclosed by said cladding (18).

11. The chair provided with the structure according to one or more of the preceding claims, **characterized in that** said claddings (31, 18) of said backrest (15) form tabs (32) that are laterally adjacent to the tangs (23) for contact against a rear edge (33) of said seat (12).

12. The chair provided with the structure according to claim 1, **characterized in that** said internal supporting inserts (119, 120, 124, 129) made of metallic material are mutually connected so as to form a single metallic supporting insert (150) to be inserted in a mold.

13. The chair provided with the structure according to claims 1 and 12, **characterized in that** hole plugging inserts (126) made of plastics material are inserted in the upper free ends (151) of said single metallic supporting insert (150) and also extend inside the backrest (115).

14. The chair provided with the structure according to claims 1, 12 and 13, **characterized in that** external inserts (161) made of plastics for resting on the ground are inserted in the lower free ends (152) of said single metallic supporting insert (150).

15. The chair provided with the structure according to claims 1 and 12 to 14, **characterized in that** said internal supporting inserts (119, 120, 124, 129) made of metallic material are connected by welding.

16. The chair provided with the structure according to claims 12 to 15, **characterized in that** said single metallic supporting insert (150) and said internal hole plugging inserts (126) made of plastics material are enclosed in a single overmolded cladding (117), which also forms the contact portions of the seat (112) and the backrest (115), forming a monolithic chair.

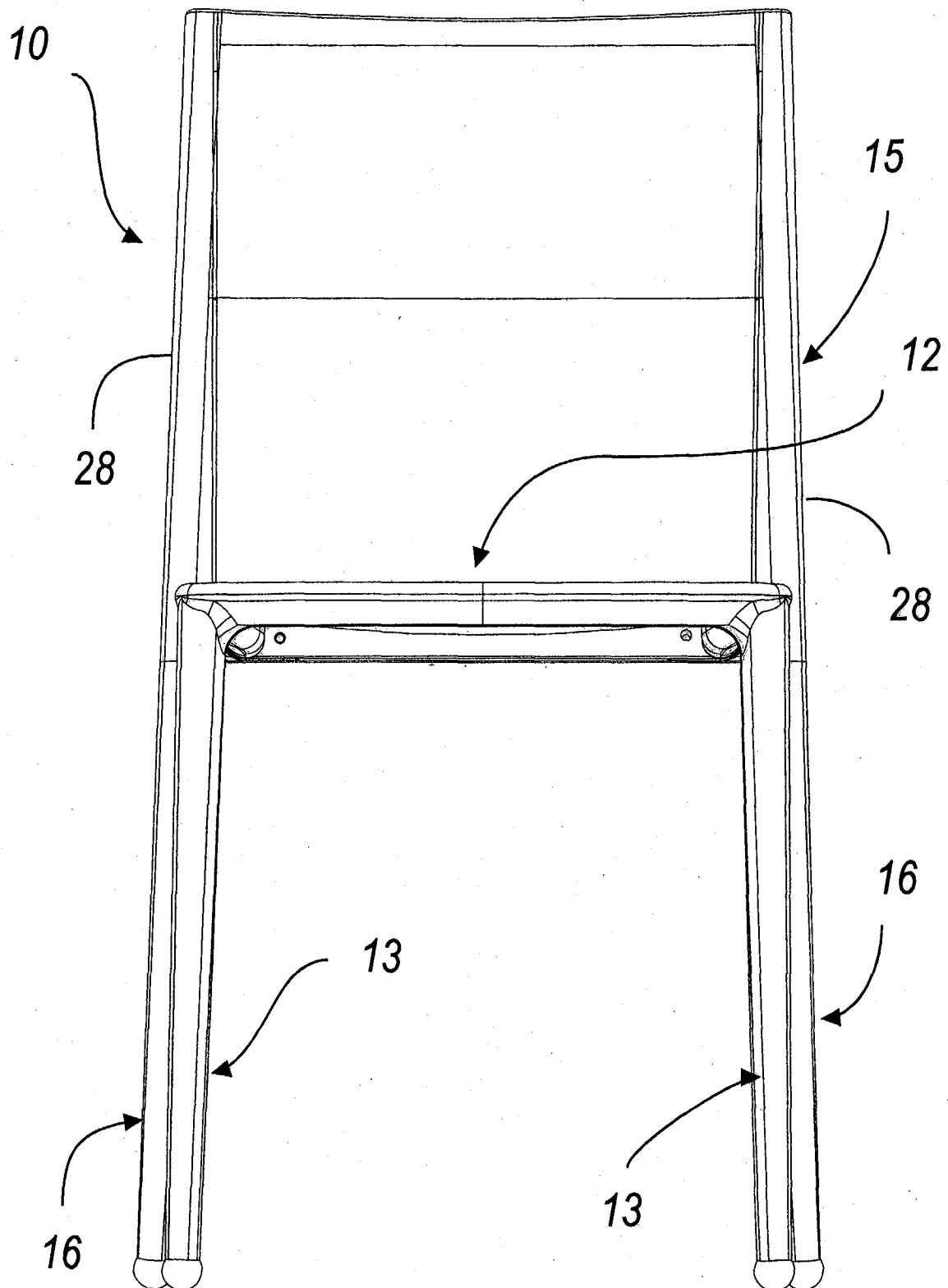


Fig. 1

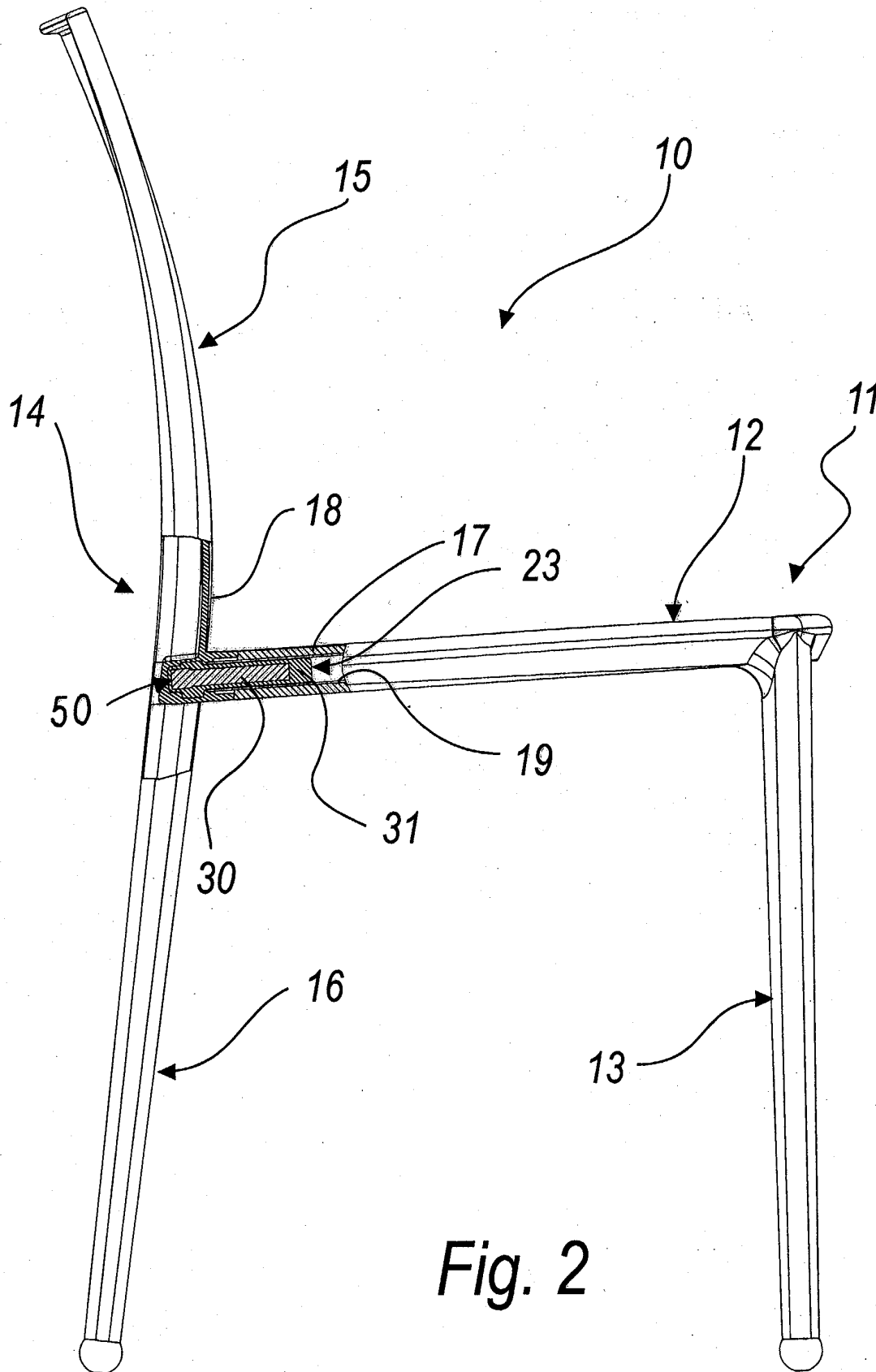
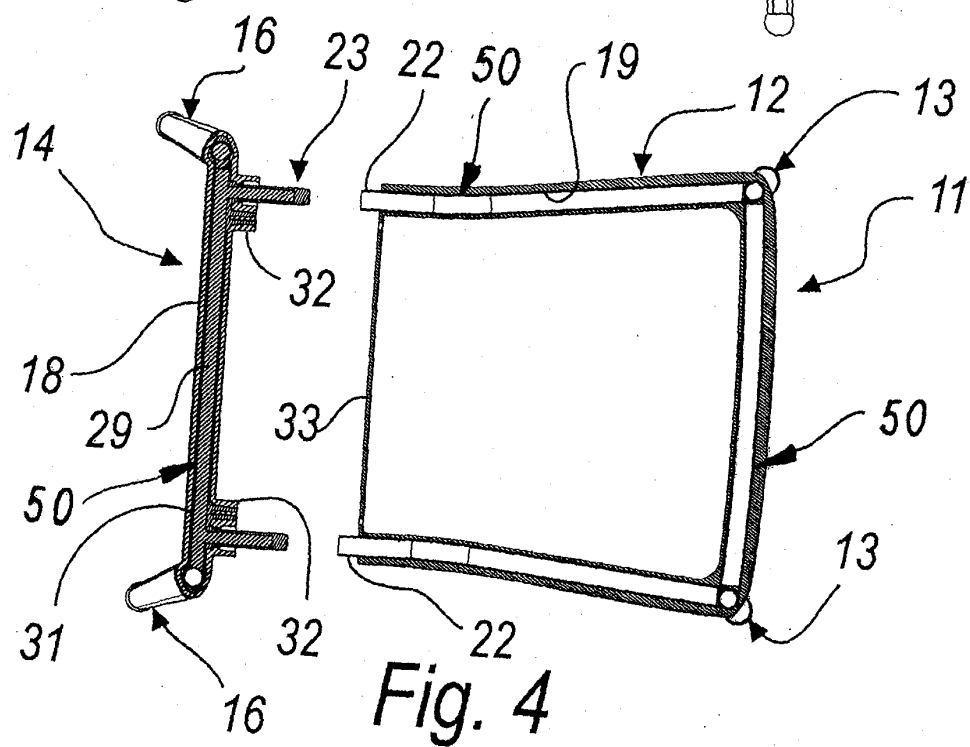
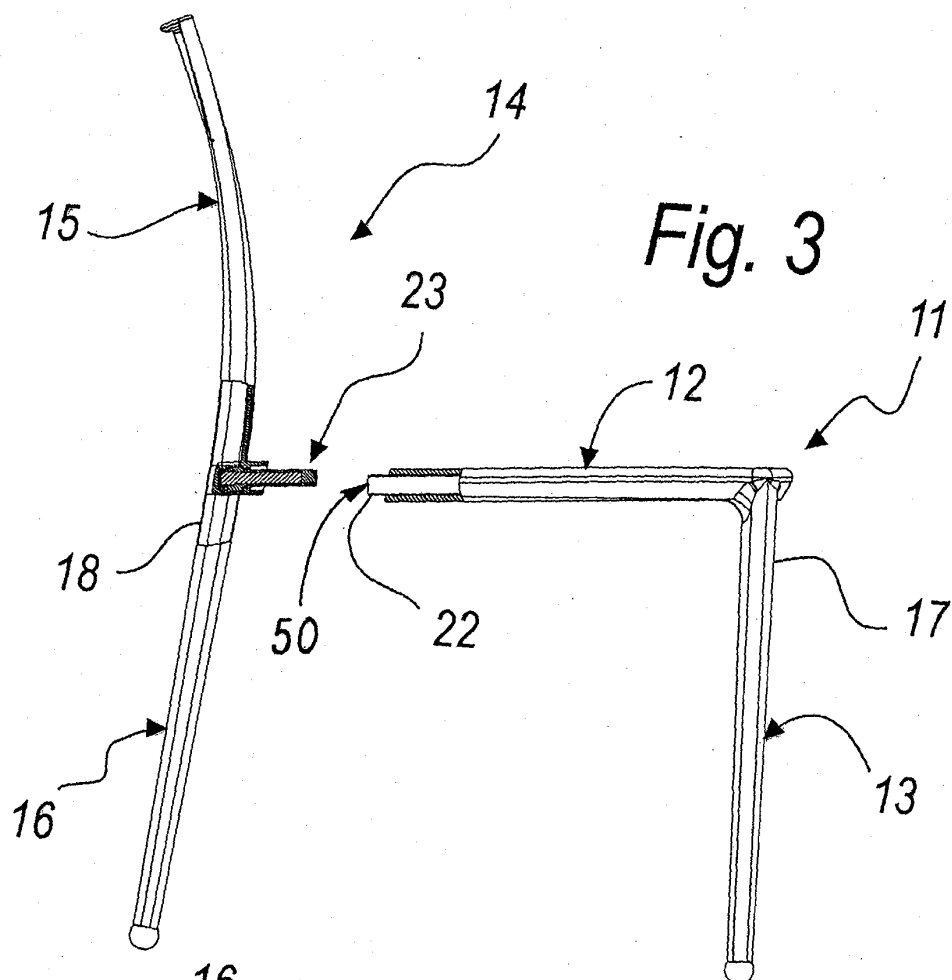
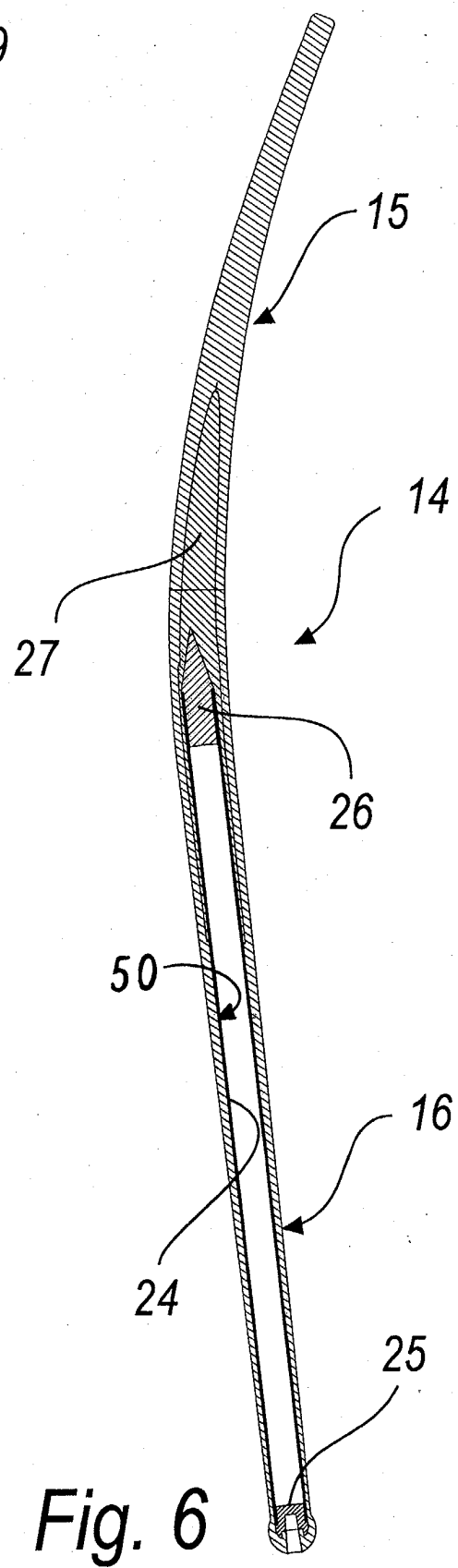
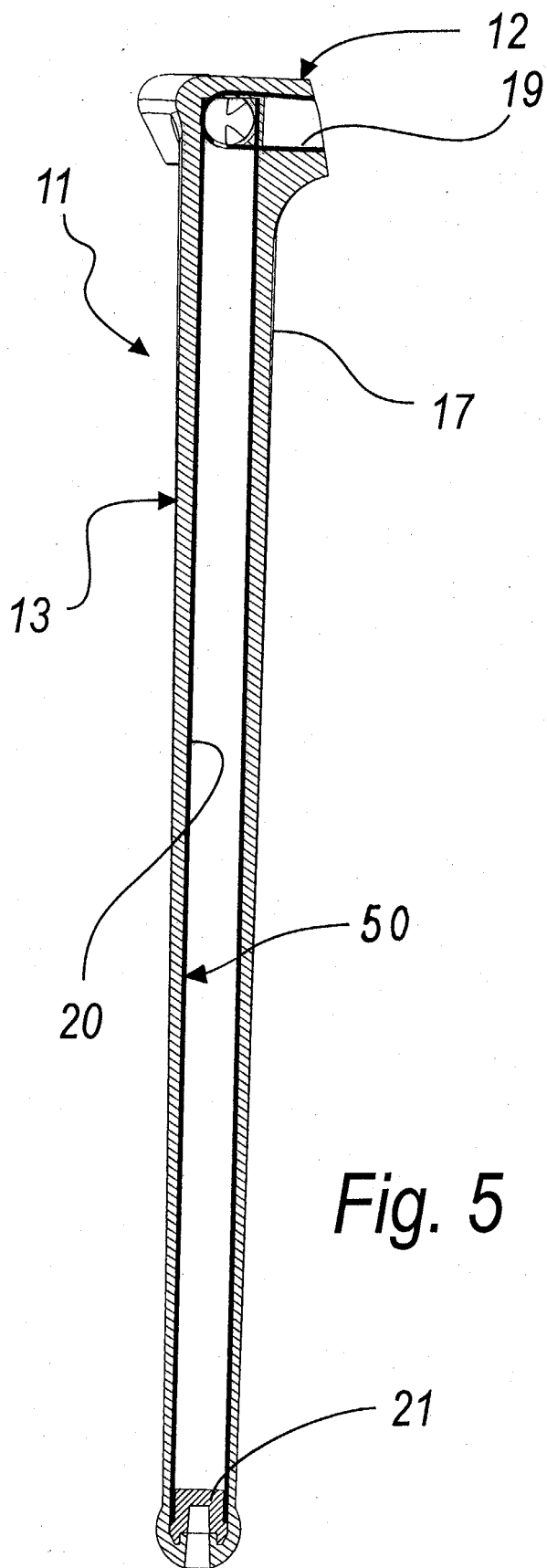
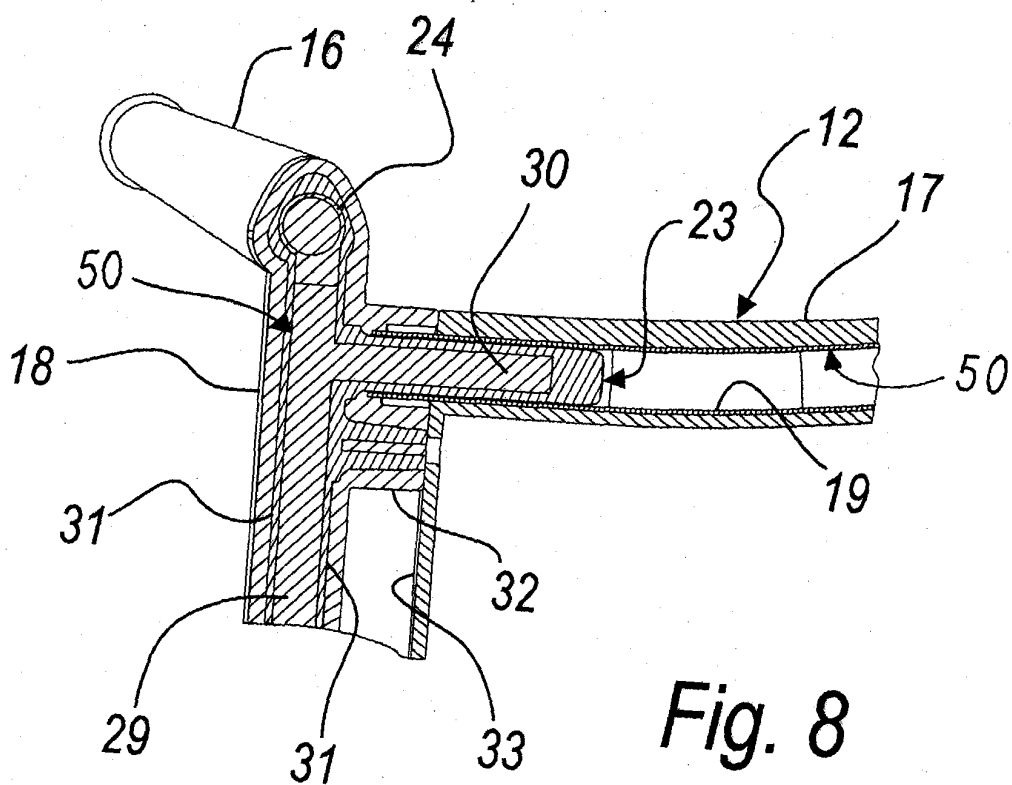
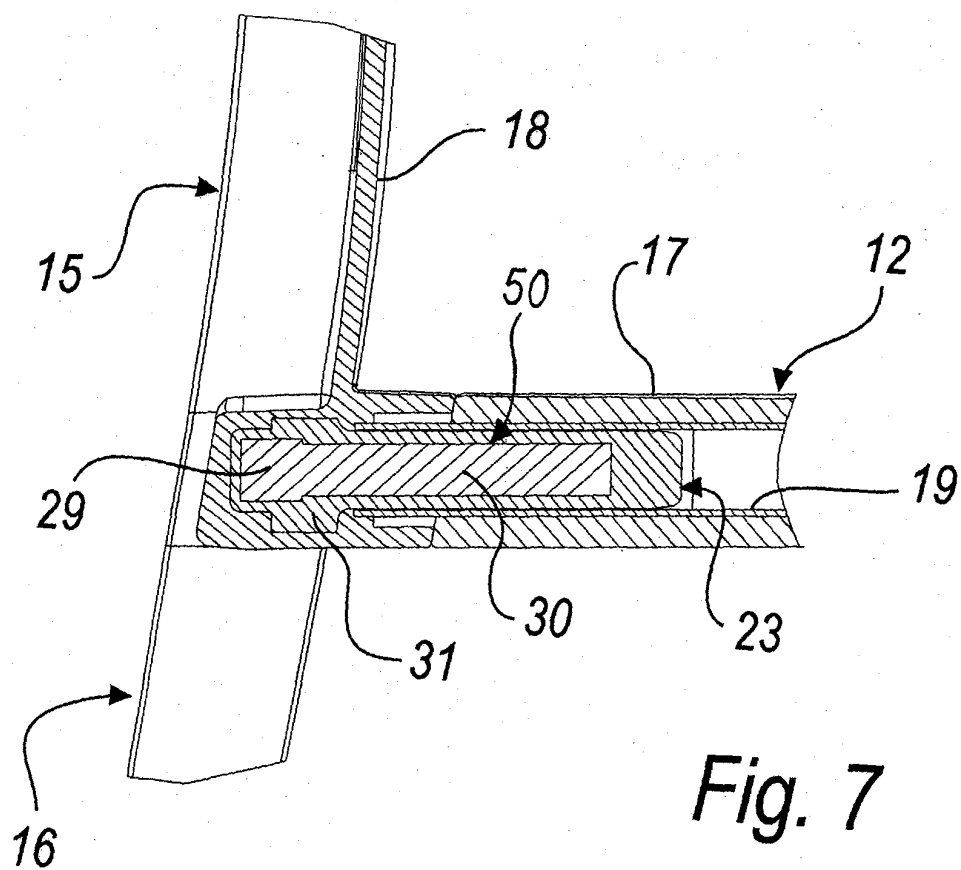
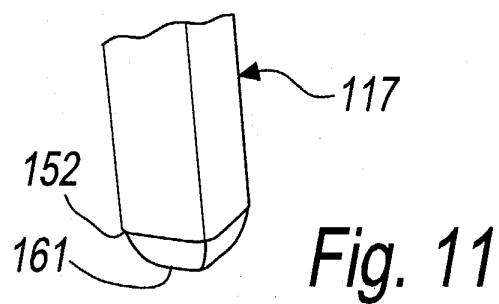
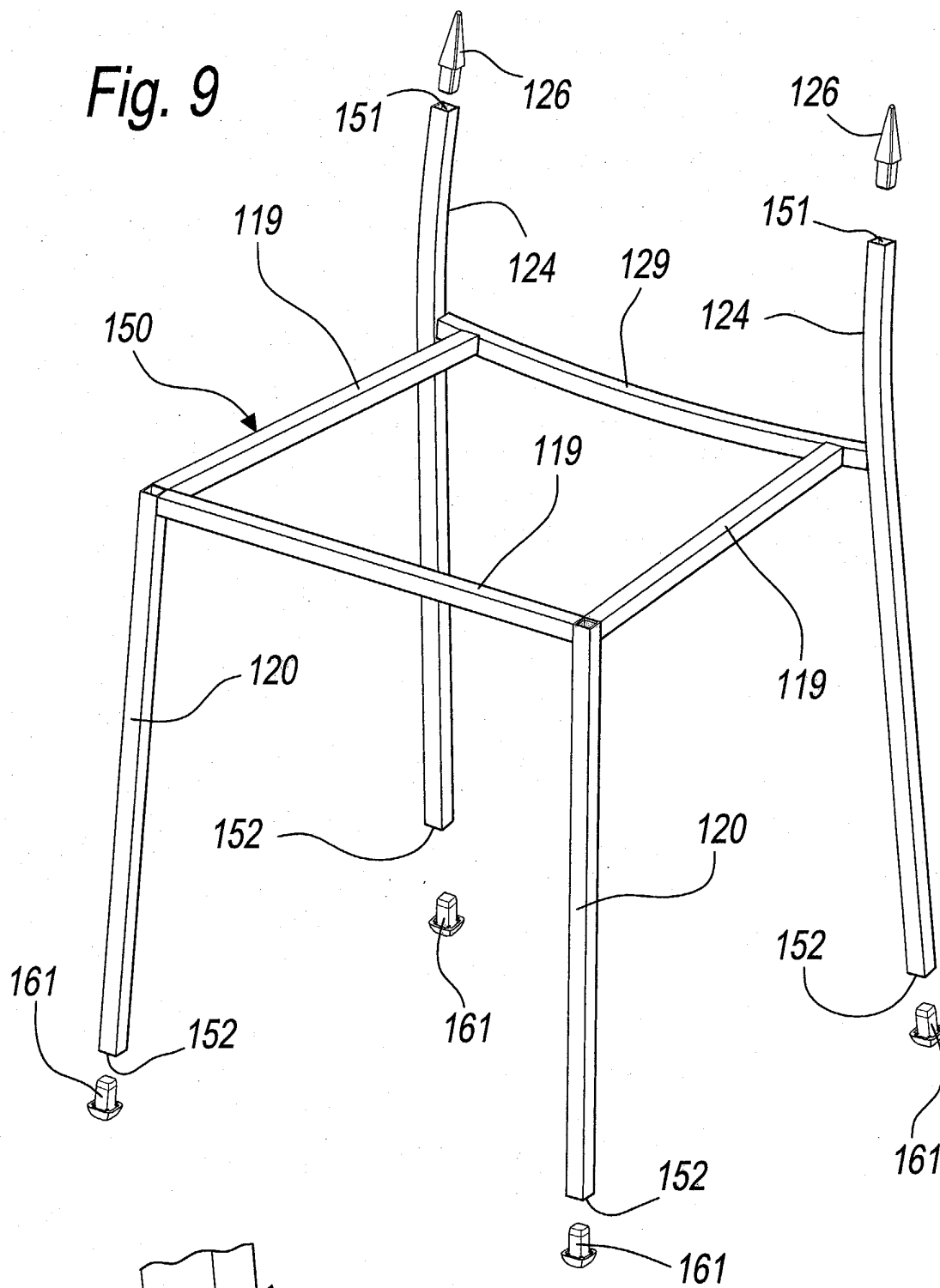


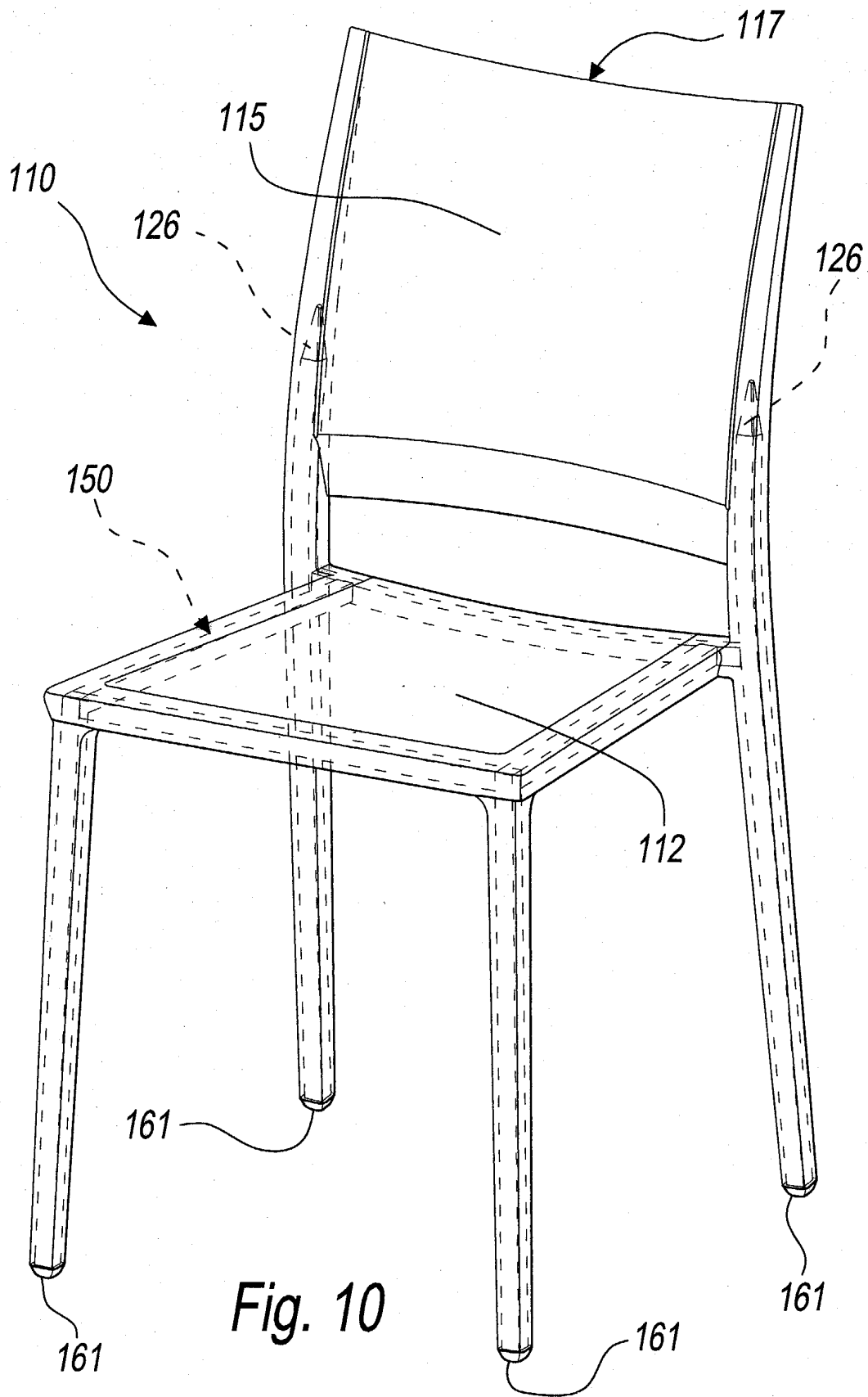
Fig. 2













European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 03 42 5434

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	DE 196 22 577 A (GUMPERT HEINZ) 28 August 1997 (1997-08-28) * the whole document *	1-16	A47C3/023 A47C5/04
A	WO 93 04613 A (PERRY CHARLES O) 18 March 1993 (1993-03-18) * the whole document *	1-16	
A	FR 1 417 682 A (MULLCA S A) 12 November 1965 (1965-11-12) * the whole document *	1-16	
A	FR 1 319 565 A (PINAUD ROGER) 1 March 1963 (1963-03-01) * the whole document *	1-16	
A	EP 0 914 786 A (STOLL SEDUS AG) 12 May 1999 (1999-05-12) * the whole document *	1-16	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			A47C
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 3 September 2003	Examiner Cardan, C
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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 03 42 5434

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03-09-2003

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 19622577 A	28-08-1997	DE 29603008 U1	04-04-1996
		DE 19622577 A1	28-08-1997
WO 9304613 A	18-03-1993	AU 8909791 A	05-04-1993
		WO 9304613 A1	18-03-1993
		US 5338094 A	16-08-1994
		US 5383712 A	24-01-1995
		US RE36335 E	12-10-1999
FR 1417682 A	12-11-1965	NONE	
FR 1319565 A	01-03-1963	NONE	
EP 0914786 A	12-05-1999	DE 19748566 A1	06-05-1999
		AT 237976 T	15-05-2003
		DE 59808034 D1	28-05-2003
		EP 0914786 A2	12-05-1999