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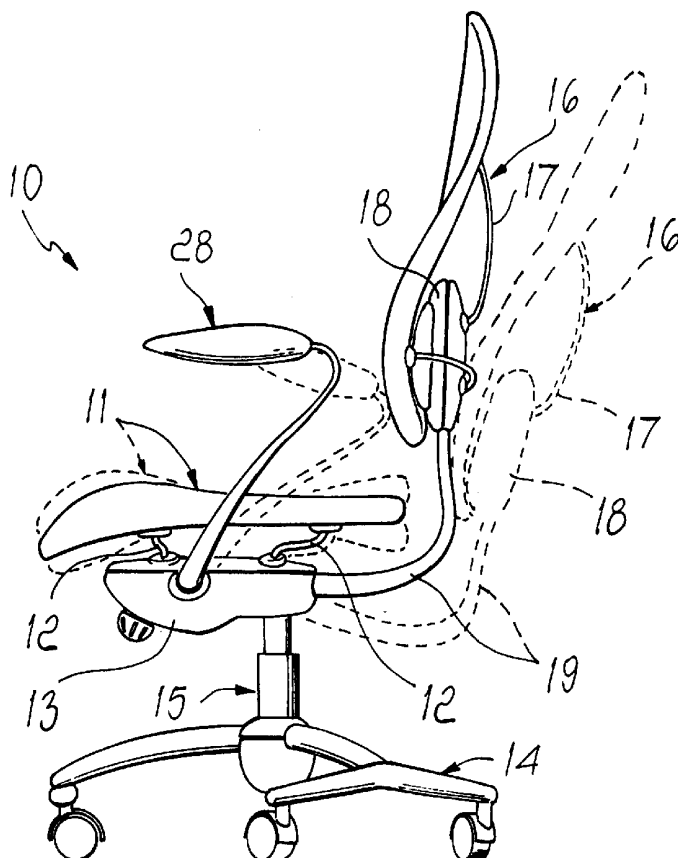
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- (71) Applicant (for all designated States except US): CAZZARO S.P.A. [IT/IT]; Via Pacinotti, 19, I-35017 Piombino Dese (IT).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): VASSALLO ROSSI, Alessandro [IT/IT]; Via Turazza, 48/F int. 35, I-35128 Padova (IT).
- (74) Agent: MODIANO, Guido; Modiano & Associati, Via Meravigli, 16, I-20123 Milano (IT).
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(54) Title: CHAIR



(57) Abstract: A chair (10) comprising a seat (11) supported by deformable elastomeric arms (12) which connect it to a rigid support (13) provided with means (14, 15) for resting on the floor. The back (16) of the chair is also supported by deformable elastomeric arms (17) which connect it to a rigid support (18) which is associated with the support (13) for the seat (11).



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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

CHAIR

Technical Field

The present invention relates to a chair.

Background Art

5 Chairs, particularly office chairs, in which it is possible to adjust the height of the seat and/or the inclination of the back are already known.

 These chairs are substantially composed of a base for resting on the floor, generally provided with castors and from which a column rises upwardly and supports a rigid shell which forms the seat, which is padded in
10 an upward region.

 An L-shaped arm protrudes from the shell to the rear and ends with a rigid shell which forms the back, which is conveniently padded at the front.

 The height adjustment of the seat and the tilting of the back occur respectively by virtue of the extension of the vertical column, normally
15 including a gas-filled cylinder which can be operated by means of a lever, and by tilting the L-shaped support of the back by virtue of spring elements and knobs.

 The adaptability of the chair to the posture of the user is therefore at present the result of adjustments which the user can perform by means of
20 levers and/or knobs, while comfort is closely linked to the quality of the padding of the seat and/or back.

 However, current chairs cannot vary their overall configuration continuously and automatically during use according to the various positions and postures assumed by the user in the possibly long periods for
25 which he remains seated.

Disclosure of the Invention

 The aim of the present invention is to provide a seat with a structure which can change its shape and its configuration continuously according to the position and posture assumed by the user without requiring direct
30 intervention of the user.

Within this aim, a consequent primary object of the invention is to improve seating comfort for the user.

Another important object of the invention is to provide a chair which can adapt without problems to users having different body weights.

5 Another object of the invention is to provide a chair which in any case integrates the height and back inclination adjustments provided in current chairs.

This aim and these and other objects which will become better apparent hereinafter are achieved by a chair characterized in that it comprises a seat
10 supported by deformable elastomeric arms which connect it to a rigid support provided with means for resting on the floor.

Advantageously, the chair comprises a back being supported by deformable elastomeric arms for connection to a rigid support which is associated with said seat support.

15 Brief description of the drawings

Further characteristics and advantages of the chair according to the present invention will become better apparent from the following detailed description of some embodiments thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

20 Figure 1 is a perspective view of a chair with armrests according to the present invention;

Figure 2 is a rear view of the back of the chair of Figure 1;

Figure 3 is a partially sectional enlarged-scale perspective view of a detail, in a region for the coupling of the back to the corresponding support;

25 Figure 4 is a side view of the chair of Figure 1, showing its configuration adjustment movements in dashed lines;

Figure 5 is an enlarged-scale view of a detail of the front part of the seat;

Figure 6 is a partially sectional exploded perspective view of the detail of Figure 3;

30 Figure 7 is a sectional view of the elements of Figure 6 in the assembled

condition;

Figure 8 is a perspective view of a detail of the chair;

Figures 9 and 10 are respectively a rear view and a side view of a second embodiment of the chair with adjustable-height armrests.

5 Ways of carrying out the invention

With reference to the figures, a chair according to the invention is generally designated by the reference numeral 10 and comprises a seat 11 being supported by four deformable elastomeric arms 12 which are arranged so as to outline a quadrilateral and connect the seat to a rigid support 13 (for
10 example made of metal) provided with means for resting on the floor being constituted by a base 14 with castors and a corresponding column 15 of the telescopic type, which is per se known.

Advantageously, the back 16 is supported by four deformable elastomeric arms 17 which connect it to a rigid support 18 (for example
15 made of metal) being associated with the rigid support 13 of the back 11 by means of a pair of rigid parallel shaped rods 19 which also are made for example of metal.

The elastomeric arms 12 and 17 are fixed at their ends, at the seat 11 or at the back 16, by means of snap-acting couplings, generally designated by
20 the reference numeral 20, which comprise a dome-shaped end 21 of the arm 12 or 13 in which a central seat 22 having a noncircular cross-section is formed axially and peripheral seats 23 are provided which form undercuts 24 for engagement.

A complementarily shaped pin 25 can be inserted in the seat 22,
25 protrudes from a plate 26 and is surrounded by hook-shaped protrusions 27 which can flex elastically and can be inserted with a snap action in the peripheral seats 23 by elastic deformation and subsequent coupling to the undercuts 24, as shown in Figure 7.

The elastomeric arms 12 and 17 taper from the region for coupling to the
30 rigid supports 13 or 18 to the region for coupling to the seat 11 or to the

back 16.

This is done so that their response to the forces applied by the user, for example due to his weight, is gradual, in that the regions closest to the seat 11 or back 16 start to deform first, as shown in particular in Figure 5.

5 The figures further show that the arms 12 and 17 have a central configuration which is substantially parallel to the resting plane of the seat 11 or back 16, so that the deformation applied to them is predominantly flexural.

The seat 11 and the back 16 are preferably made of an elastomeric gel in
10 which the plates 26 are embedded; the plates can also be made of the same material but with a higher density.

As an alternative, padded structures can also be provided.

The chair 10 is provided with armrests 28 which protrude from the rigid support 13.

15 It is also possible to provide, as in Figures 1 and 8, a front part 29 of the seat 11 which can slide longitudinally by being rigidly coupled to two parallel rods 30 being slidingly coupled to guides, not shown, which are integrated in the rigid support 13.

With reference now to Figures 9 and 10, the armrests, now designated by
20 the reference numeral 31, can protrude from the rods 19 and be slidingly coupled thereto in order to allow to adjust their height.

Accordingly, sliding sleeves 32 are provided which surround the rods 19 and from which the armrests 31 protrude.

The intended position can be set by means of screws.

25 It is also possible to provide a lumbar cushion 33 which is rigidly coupled at the front of the support 18 of the back 16 and whose height can be adjusted by being slidingly coupled to the support.

As to operation, the chair 10 can be adjusted as regards the height of its seat and the inclination of its back in the conventional manner by adjusting
30 the column 15 and tilting inclination of the rods 19.

This adjustment is “rigid”, in that it can be performed only if the user acts on knobs or levers and maneuvers them.

In use, however, there is a continuous adjustment which adapts the configuration of the seat 11 and the back 16 to the various forces that act thereon, which can be both symmetrical and asymmetrical.

The arms 12 and 17 in fact flex according to the load applied thereto and therefore the corresponding part of the seat 11 or back 16 adapts accordingly.

The seat and back are made entirely of deformable material, for example elastomeric gel, and therefore adapt to the configurations set by the arms 12 and 17.

In practice it has been observed that the intended aim and objects of the present invention have been achieved.

The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the inventive concept.

All the details may further be replaced with other technically equivalent elements.

In practice, the materials employed, so long as they are compatible with the contingent use, as well as the dimensions, may be any according to requirements.

The disclosures in Italian Patent Application No. PD2000A000076 from which this application claims priority are incorporated herein by reference.

CLAIMS

1. A chair, characterized in that it comprises a seat supported by deformable elastomeric arms which connect said seat to a rigid support provided with means for resting on the floor.

5 2. The chair according to claim 1, characterized in that it comprises a back being supported by deformable elastomeric arms for connection to a rigid support which is associated with said seat support.

3. The chair according to claim 2, characterized in that said elastomeric arms taper from said rigid supports toward said seat and/or toward said
10 back.

4. The chair according to one or more of the preceding claims, characterized in that said elastomeric arms have a central part of their extension which lies substantially parallel to the inactive configuration of the seat and/or back.

15 5. The chair according to one or more of the preceding claims, characterized in that said seat is supported by four deformable elastomeric arms which connect said seat to its rigid support.

6. The chair according to one or more of the preceding claims, characterized in that said means for resting on the floor of said rigid support
20 of the seat are constituted by a base with a column.

7. The chair according to one or more of the preceding claims, characterized in that said back is supported by four deformable elastomeric arms which connect said back to its rigid support.

8. The chair according to one or more of the preceding claims,
25 characterized in that said rigid support of the back is associated with said rigid support of the seat by means of a pair of parallel rigid shaped rods.

9. The chair according to one or more of the preceding claims, characterized in that said elastomeric arms are fixed at their ends, at the seat or back, by means of snap-acting couplings.

30 10. The chair according to claim 9, characterized in that said snap-acting

couplings comprise a dome-shaped end of the arm in which a central seat having a noncircular cross-section is formed axially and in which there are peripheral seats which form engagement undercuts.

11. The chair according to claim 10, characterized in that a
5 complementarily shaped pin can be inserted in said seat, protrudes from a plate and is surrounded by elastically flexible hook-shaped protrusions which can be inserted with a snap action in said peripheral seats by elastic deformation and subsequent engagement to said undercuts.

12. The chair according to one or more of the preceding claims,
10 characterized in that said seat and/or said back are made of an elastomeric gel in which said plates are embedded, said plates being made of a higher-density material.

13. The chair according to one or more of the preceding claims,
15 characterized in that the front part of the seat can slide longitudinally by being rigidly coupled to parallel rods which are slidingly coupled to guides being integrated in said rigid support of the seat.

14. The chair according to one or more of the preceding claims,
characterized in that it is provided with armrests which protrude from said rigid support of the seat.

20 15. The chair according to one or more of claims 1 to 13, characterized in that the armrests protrude from the rods for connecting the seat to the back and are slidingly rigidly coupled to them in order to be able to adjust their height.

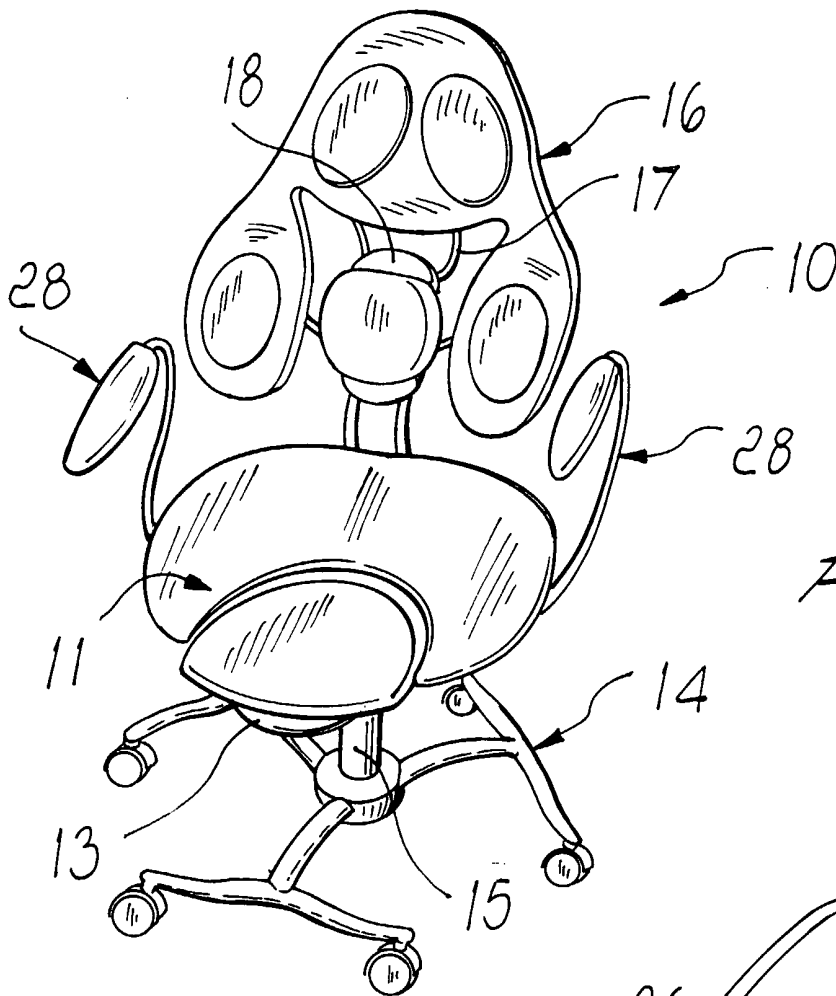


Fig. 1

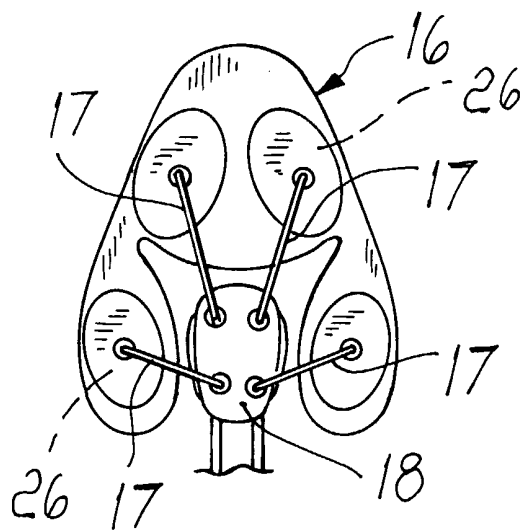


Fig. 2

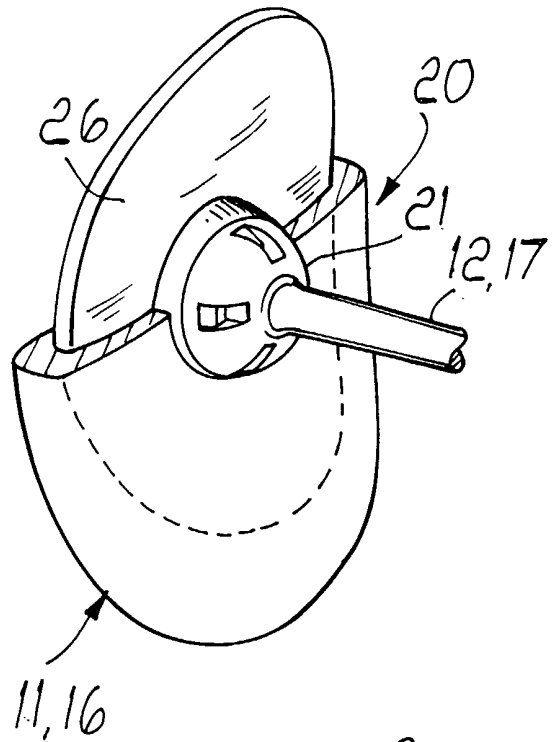


Fig. 3

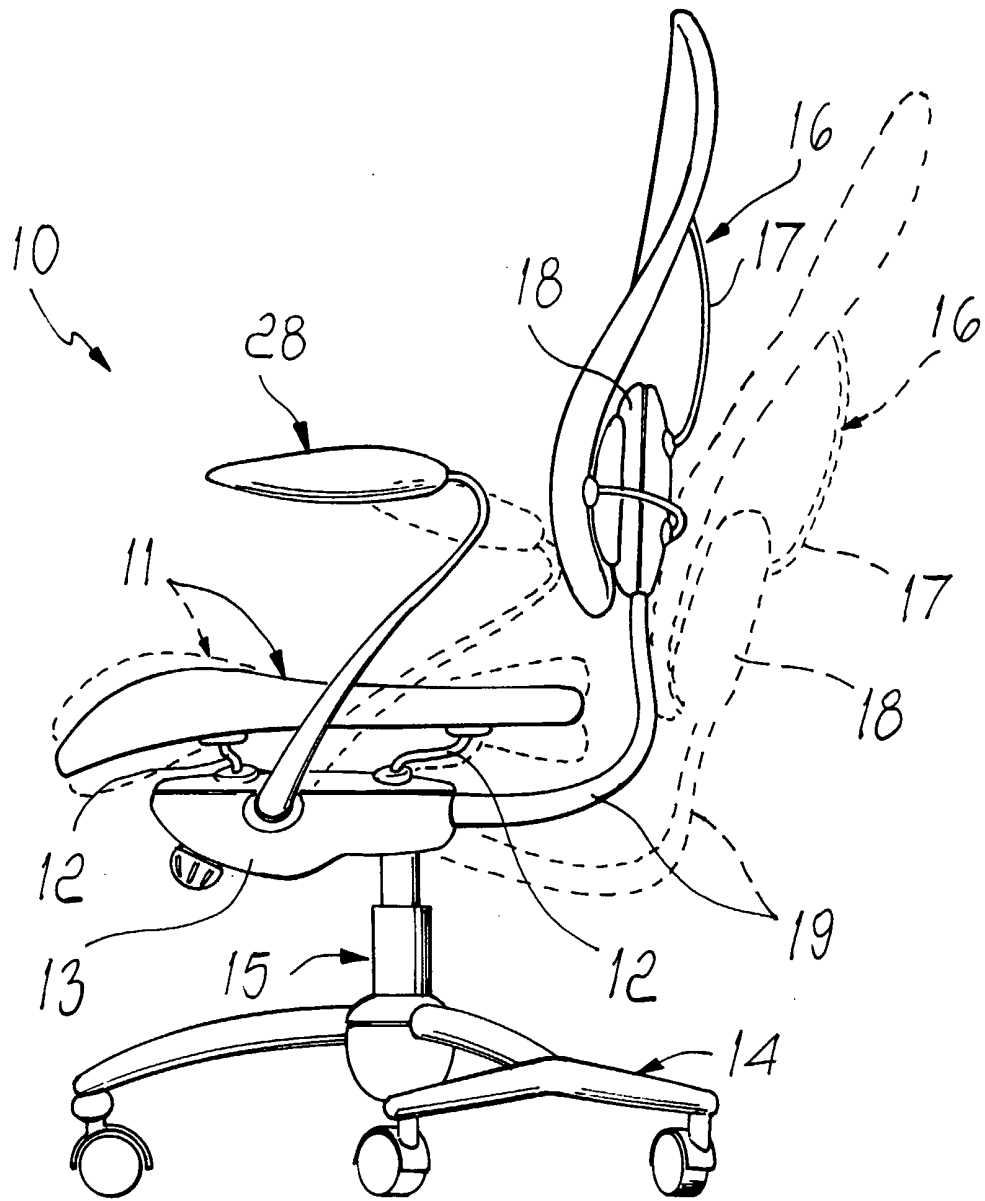


Fig. 4

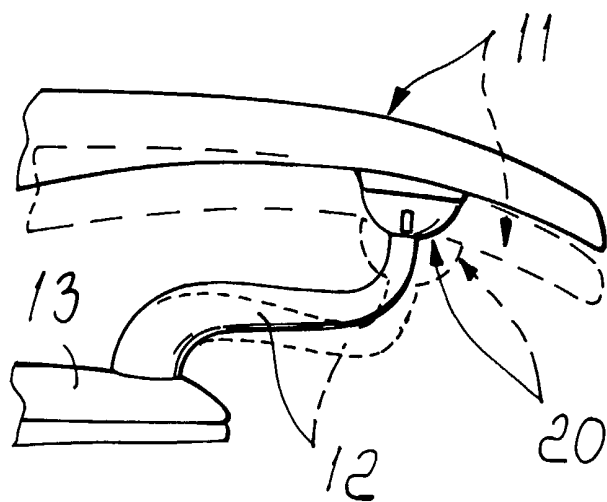


Fig. 5

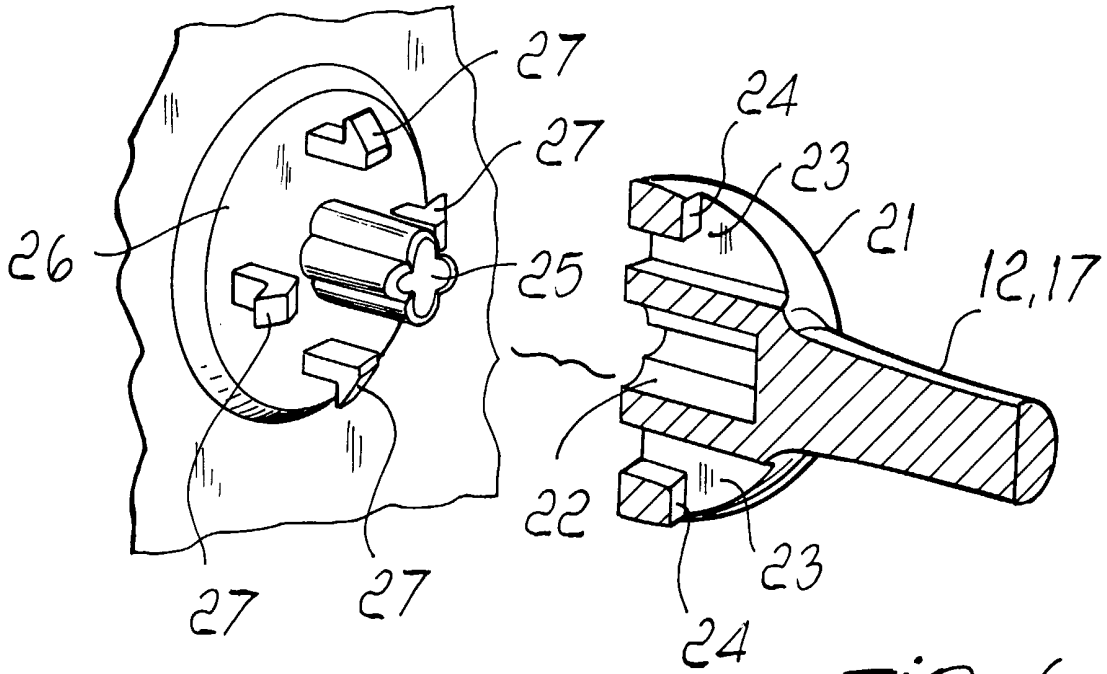


FIG. 6

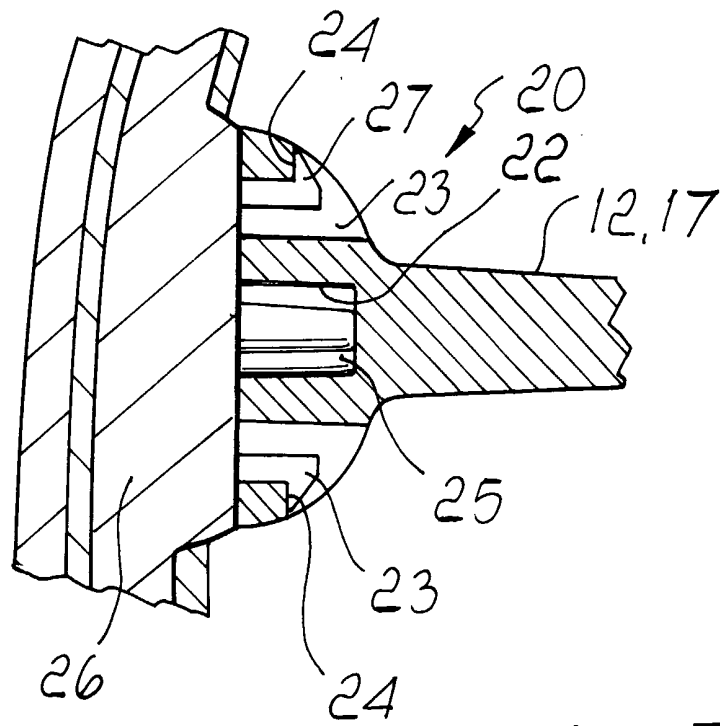


FIG. 7

Fig. 8

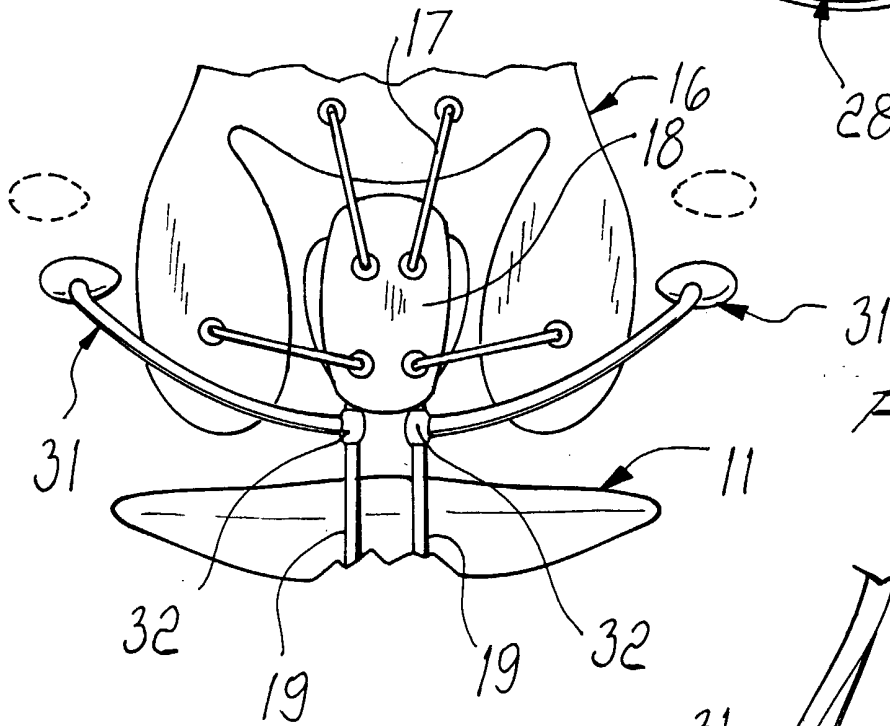
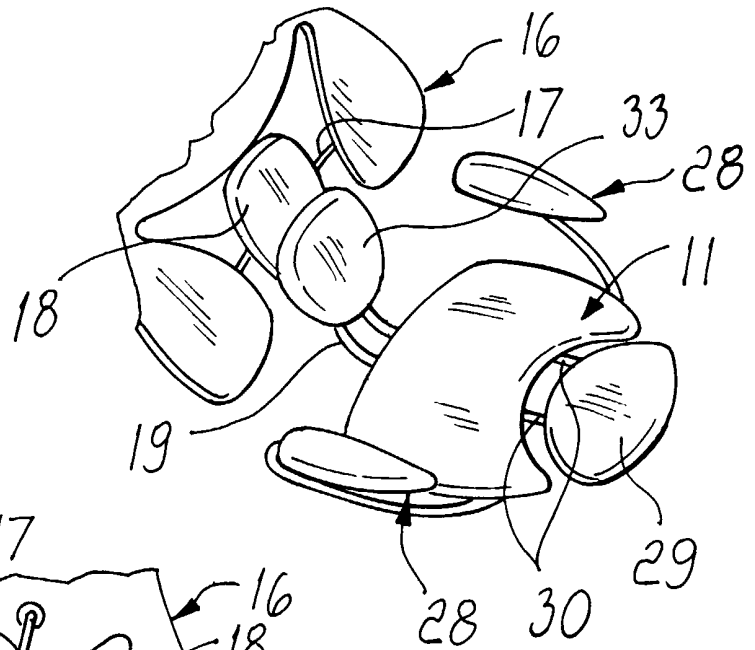
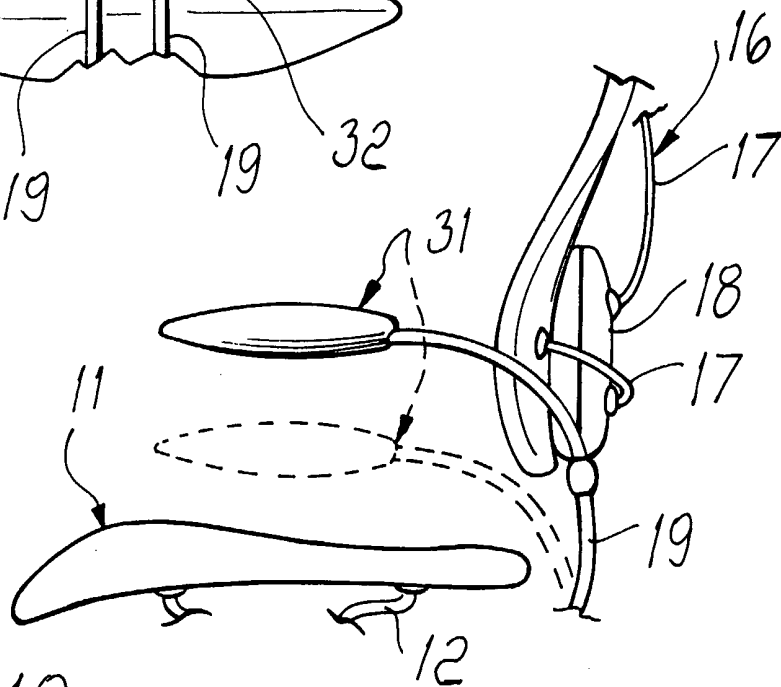


Fig. 9

Fig. 10



INTERNATIONAL SEARCH REPORT

national Application No
PCT/EP 01/02880

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A47C1/032 A47C3/026 A47C3/021 A47C7/44

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A47C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ

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A	page 6, line 21-24; claims 1,7,8,12-15; figures 1,2,13,14	5,7,8, 13,14
A	US 5 979 984 A (TEPPO DAVID S ET AL) 9 November 1999 (1999-11-09)	1,2, 9-12,14, 15
	column 6, line 30,31; claims 1,8; figures 1-6,12-12I,14,14B	
X	EP 0 870 443 A (LACKNER KLAUS ;SCHMIDT ROLAND (DE)) 14 October 1998 (1998-10-14)	1,2
	claim 1; figures	
	-/--	

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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Date of the actual completion of the international search 16 July 2001	Date of mailing of the international search report 24/07/2001
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INTERNATIONAL SEARCH REPORT

national Application No
PCT/EP 01/02880

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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Information on patent family members

national Application No

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