



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
19.12.2007 Bulletin 2007/51

(51) Int Cl.:
A47C 1/032 (2006.01)

(21) Application number: **07425270.1**

(22) Date of filing: **09.05.2007**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK YU

(71) Applicant: **Ivars S.p.A.**
25078 Vestone (Brescia) (IT)

(72) Inventor: **Ebenestelli, Aldo**
25078 Vestone (Brescia) (IT)

(74) Representative: **Sangiaco, Fulvia**
BIESSE S.R.L.,
Corso Matteotti 42
25122 Brescia (IT)

(30) Priority: **16.05.2006 IT BS20060105**

(54) **Oscillating support for chairs with seat and backrest having synchronized variable tilting**

(57) The invention concerns a support for chairs with synchronized variable seat and backrest inclination. It comprises a stationary box-shaped body (11), an oscillating support (12) for the seat, and oscillating support (13) for the backrest, a selector device moving longitudinally

between a blocked and a released position, and stop means (27) associated with a slide (23) designed to interact with rack teeth (22) provided in two opposite walls of the oscillating support (13) for the backrest to establish the different sitting positions of the seat.

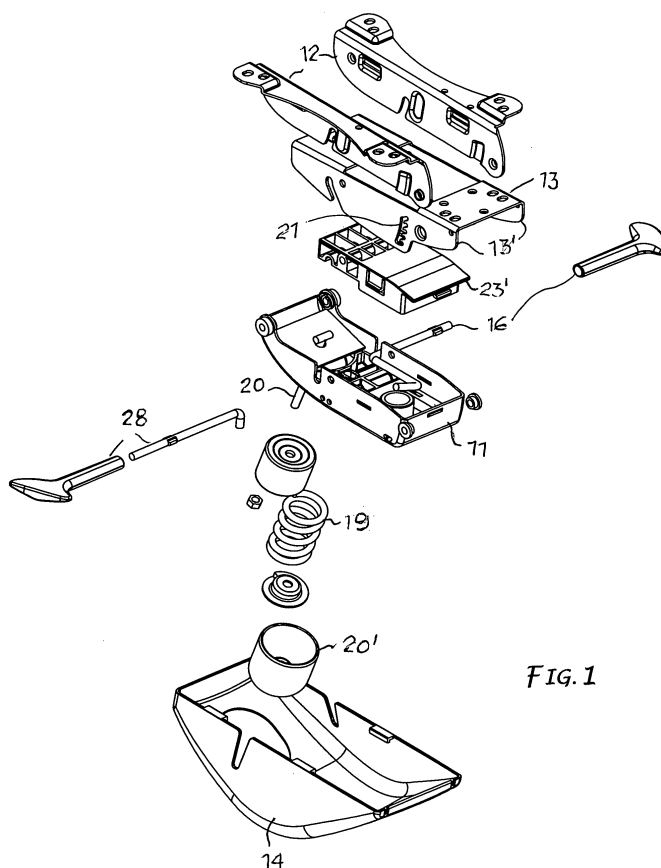


FIG. 1

Description

Field of the Invention

[0001] The present invention concerns in general to chairs with synchronized variable seat and backrest inclination, and in particular regards an oscillating support group for the seat components of said chairs, including also a device for adjusting the inclination of the backrest.

State of the Technique

[0002] Various types of chairs or armchairs, in particular for office use, with a synchronized variable inclination seat and backrest, capable that is of angular movements on respective horizontal rotation axes are already known and available on the market. The seat can be gradually tilted on and with respect to a fixed support body held by a base, whereas the backrest can gradually vary its tilt with respect to its upright position in relation to the position of the seat, or vice versa.

[0003] Also known are chairs and office chairs with a support group for the seat and backrest that incorporates an adjustment selector device designed to vary the position of the oscillating elements in order to correspondingly establish several different sitting positions of the seat to make its use more comfortable and restful.

Objective of the Invention

[0004] One of the objectives of this invention however is to provide an oscillating support group for chairs and office chairs referred to above comprising an original, simple and functional selector device, which integrates with the other components of the support group and which enables the inclination of the seat and backrest to be changed without difficulty and set in the various sitting positions of the chair or office chair according to the requirements of the person using it.

[0005] This objective and implicit advantages deriving from it are achieved, in compliance with the invention, by a support group for seat and backrest of variable inclination chairs according to claim 1.

Brief Description of the Drawings

[0006] Greater details of the invention will however become more evident in the following description made in reference to the enclosed indicative and not restrictive drawings, in which:

Fig. 1 shows a blow-up view of the components of the support group;

Fig. 2 shows the separated fixed box-shaped body and the selector device;

Fig. 3 shows a side view of the assembled support group;

Fig. 4 shows a side view as in Fig 3, but with a part

of the covering element removed;

Fig. 5 shows a longitudinal section of the support group;

and

Fig. 6 shows a view in perspective from below of the inside of the support group.

Detailed Description of the Invention.

[0007] As shown, the support group for chairs proposed here basically comprises a stationary box-shaped body 11, an oscillating support 12 for the seat, an oscillating support 13 for the backrest and a covering element 14 which at least partially encloses them from the bottom towards the top.

[0008] The box-shaped body 11 has a rigid structure and is fixed to the top of a support upright 15 which extends upwards from a base, nor shown, and which is usually made up of an extendible piston in height, controlled by a lever 16 connected and protruding from a slot provided in one side of said body.

[0009] The oscillating support 12 for the seat, which can be made up of two parallel brackets, is pivoted at the front to the fixed body 11 with a shaft 17, positioned crossways to the seat, and extends projecting backwards along the sides of said body 11.

[0010] The oscillating support 13 for the backrest is pivoted to a back part of the support for the backrest by means of lateral coaxial pins 18 parallel to the front oscillating shaft 17 so that the two supports 12, 13 can oscillate jointly in response to either of the two oscillating.

[0011] These oscillations are, as is known, contrasted by a helical or other type of spring 19, which rests in the fixed body 11, and operates on the oscillating support 13 for the backrest by means of a tie rod 20 and which can be preloaded by adjusting using a knob 20' associated with said tie rod.

[0012] The support 13 for the backrest is made up of two facing lateral walls 13', in each one of which, towards the rear part of the support group, is provided an arch shaped slot 21 with the centre of the curve on the front of said group. One side of each of both the above mentioned lateral slots 21 has a number of teeth 22 like a rack, facing forward, sloping from the top towards the bottom and forming corresponding gaps between them.

[0013] In an intermediate part of the fixed box-shaped body 11, is assembled and guided in a longitudinal direction, a slide 23 held by a top cover 23'. The slide is connected by means of a spring 24, to the proximal ends of the two arms 25 which extend back towards the slots 21 in the lateral walls 13' of the support for the backrest 13.

[0014] The distal ends of said arms 25 are joined by a bar 26, whose opposite ends are equipped with selector pins 27 which extend towards and interact with the teeth of the rack 22 in said slots 21 passing through slits 11' in the sides of the box-shaped body.

[0015] A second control lever 28 is connected to the

slide 23 by passing through slits provided in the lateral walls of the backrest 13 support and the box-shaped body 11 and designed to move the slide 23 longitudinally and, by means of the connecting springs 24, to move the arms 25 with the stop pins 27 between an active and an inactive position respectively engaging and disengaging the pins with the teeth of the rack and consequently of the oscillating supports 12, 13 with respect to the fixed body 11.

[0016] A means of stopping 29, such as a ball operated by a spring, to engage with the recesses 30 in the sides of the fixed box-shaped body so as to set said block and release positions, is provided on at least one side of the slide 23.

[0017] Practically, the stop pins 27 normally engage in the recesses between the rack teeth 22, maintaining a pre-set position of the oscillating supports 12, 13 of the support group and consequently of the chair and backrest of the seat in regards to the fixed body 11. This position can however be changed by having the stop pins 27 engage each time in a different recess formed by the rack teeth 22.

[0018] To do this, simply use the second control lever 28 by moving the slide 23 forward so as to allow said pins to move away from the rack teeth they are engaged with.

[0019] The arms 25 with the stop pins however, do not move simultaneously with the slide 23, but with a delay compared with the latter, thus maintaining transitorily the blocked condition. In fact the forward movement of the slide 23 places the spring 24 under tension, but the pins 27 remain engaged with the respective teeth 22, both due to the inclination downwards of the latter which tend to hold them back, and to the load weighing on the seat which prevents it from disengaging. In other words, the stop pins are not moved directly by the slide 23 when it is moved by the control lever 28, but indirectly by the connecting springs 24 of said slide to said arms.

[0020] In this way the release of the pins from the teeth can take place only following a backward thrust exerted against the backrest sufficient to free the pins and allow the springs to distance them from the teeth, a condition above all directed at avoiding the backrest knocking against the body of the person occupying the seat. Only in this way the may the inclination of the backrest be changed as required to a new and different position of the seat which will then be stabilised, as soon as the control lever is released and the slide returns to the starting position and the springs are released allowing the pins to move and engage with the rack teeth at the level required.

[0021] Evidently, the seat may be adjusted to as many different positions as there are recesses formed by the rack teeth the stop pins can engage with.

Claims

1. Oscillating support group for chairs with synchro-

nised variable inclination seat and backrest, comprising a stationary box-shaped body (11) fixed on a supporting base, a first oscillating support (12) pivoted on said stationary body and designed to hold a chair seat, a second oscillating support (13) articulated to said first support and to said stationary body and designed to hold a chair backrest, a flexible means of contrasting the oscillations of said oscillating supports, and a block/release selector device of said oscillating support for the backrest so as to set a number of sitting positions of the seat, **characterised by** the fact that said selector device includes an assembled means moving longitudinally in said fixed box-shaped body between a blocked and released position and holding stop means interacting with rack teeth provided in two opposite walls of the oscillating support for the backrest.

2. Oscillating support group according to claim 1, wherein an arch shaped slot (21) with curve centre at the front of said group is provided in each of the opposite lateral walls of the oscillating support (13) for the backrest and in which the rack teeth (22) are provided on one side of each slot (21), facing forwards, sloping from the top downwards and forming between them corresponding recesses.
3. Oscillating support group according to claims 1 and 2, wherein said means moving longitudinally in the box-shaped fixed body comprises a slide (23) associated with and moved by a manoeuvring lever (28) between the blocked and released positions, in which said slide is connected, by means of springs (24), to the proximal ends of two arms (25) which extend back towards the slots (21) in the lateral walls of said support for the backrest, and in which the distal ends of said arms (25) are joined by a bar (26) holding at its opposite ends the stop means designed to interact with the rack teeth (22) in said slots (21), said stop means being made up of stop pins (27) facing towards the rack teeth passing through the slits in the sides of the box-shaped body.
4. Oscillating support group according to the previous claims, wherein said stop pins engage transitorily with the rack teeth even when the slide is moved into the released position due to the inclination of the teeth and the load weighing on the seat, and where the stop pins become disengaged from the rack teeth by the action of the connecting springs (24) only following a backward thrust exerted against the backrest.
5. Oscillating support group according to claims 3 and 4, wherein a spring operated stop means (29) is provided, so as to engage with the recesses in at least one side of said slide (23) in order to establish said block and release positions.

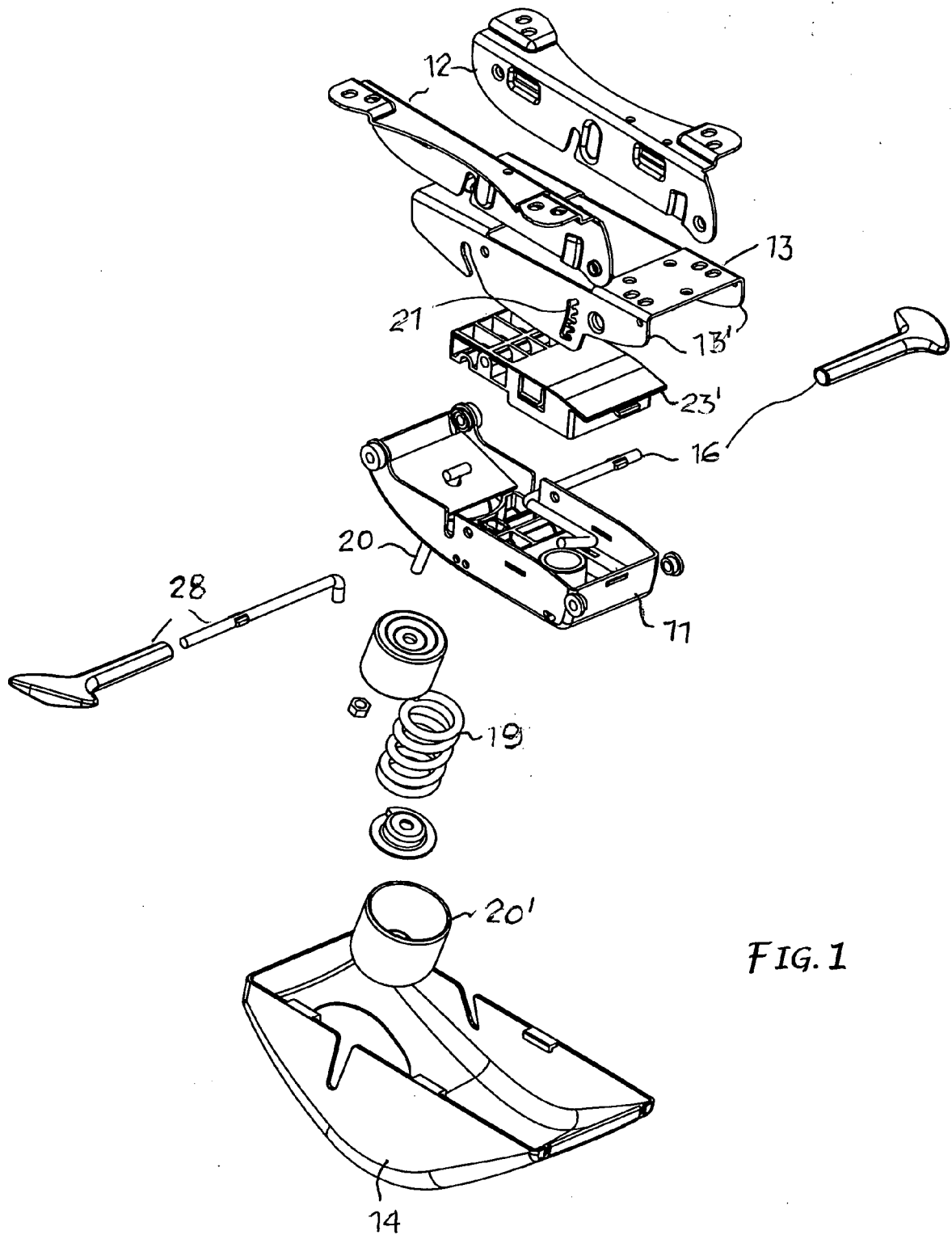
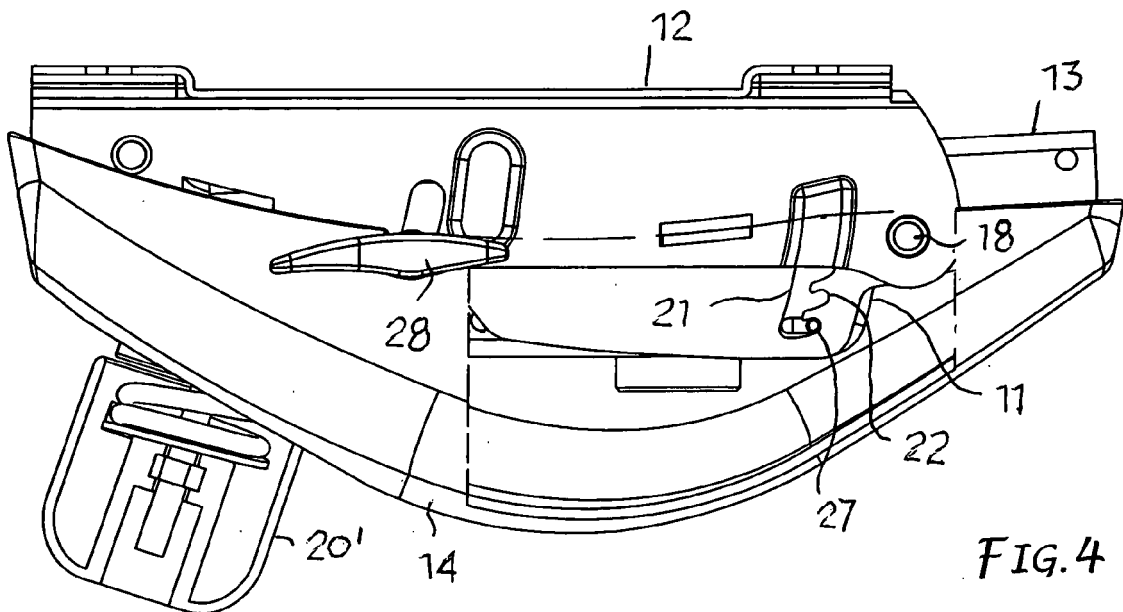
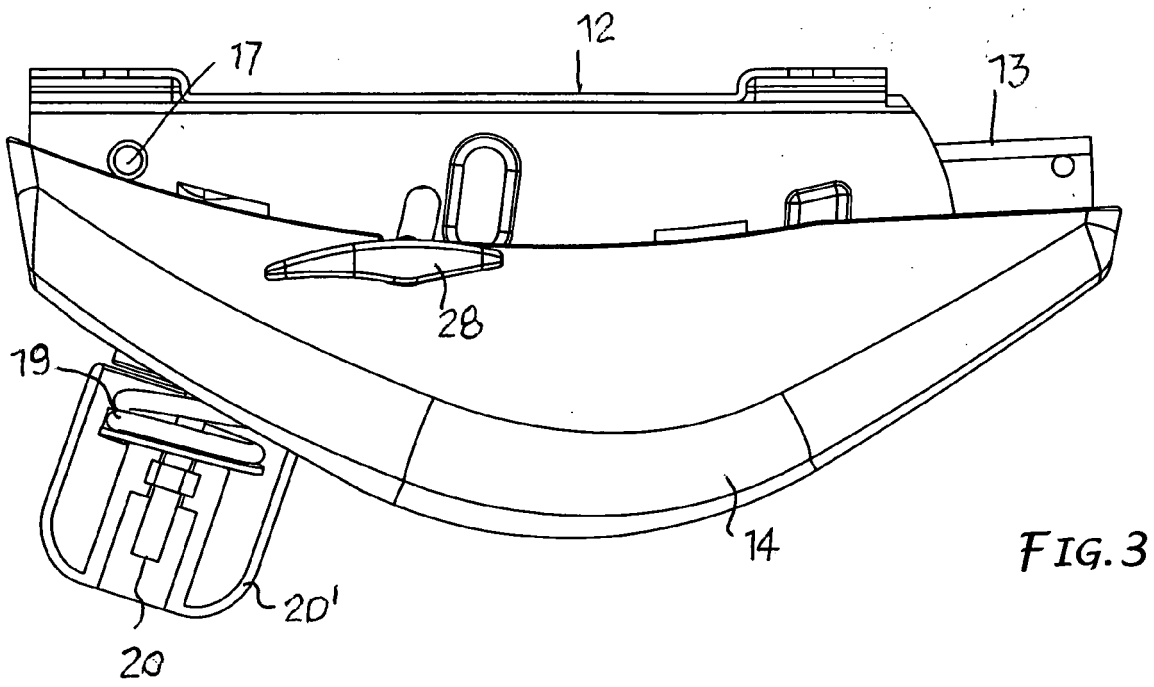


FIG. 1



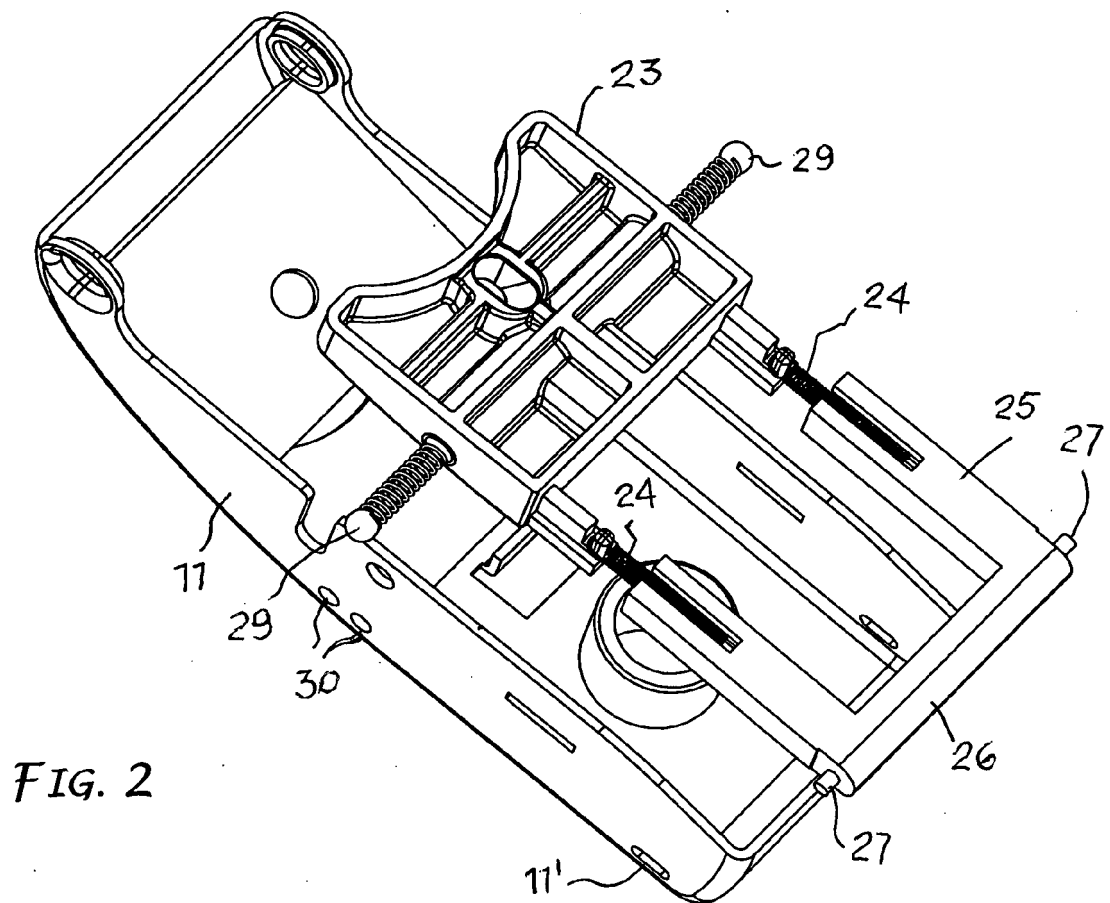
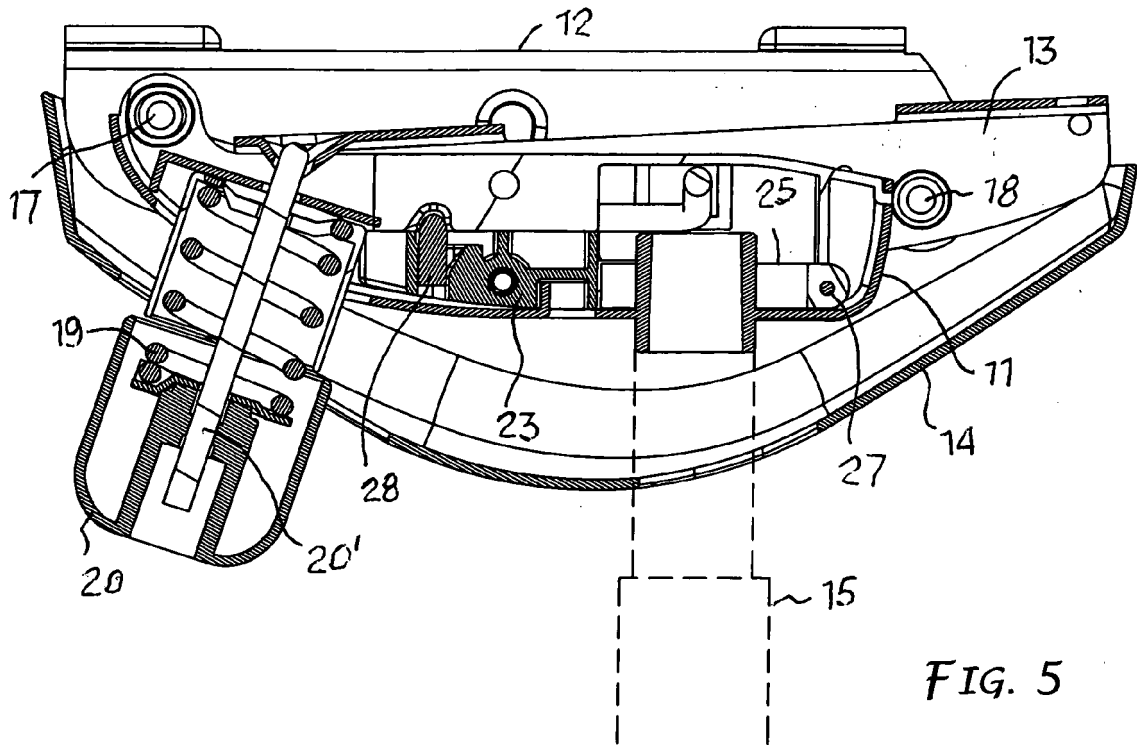
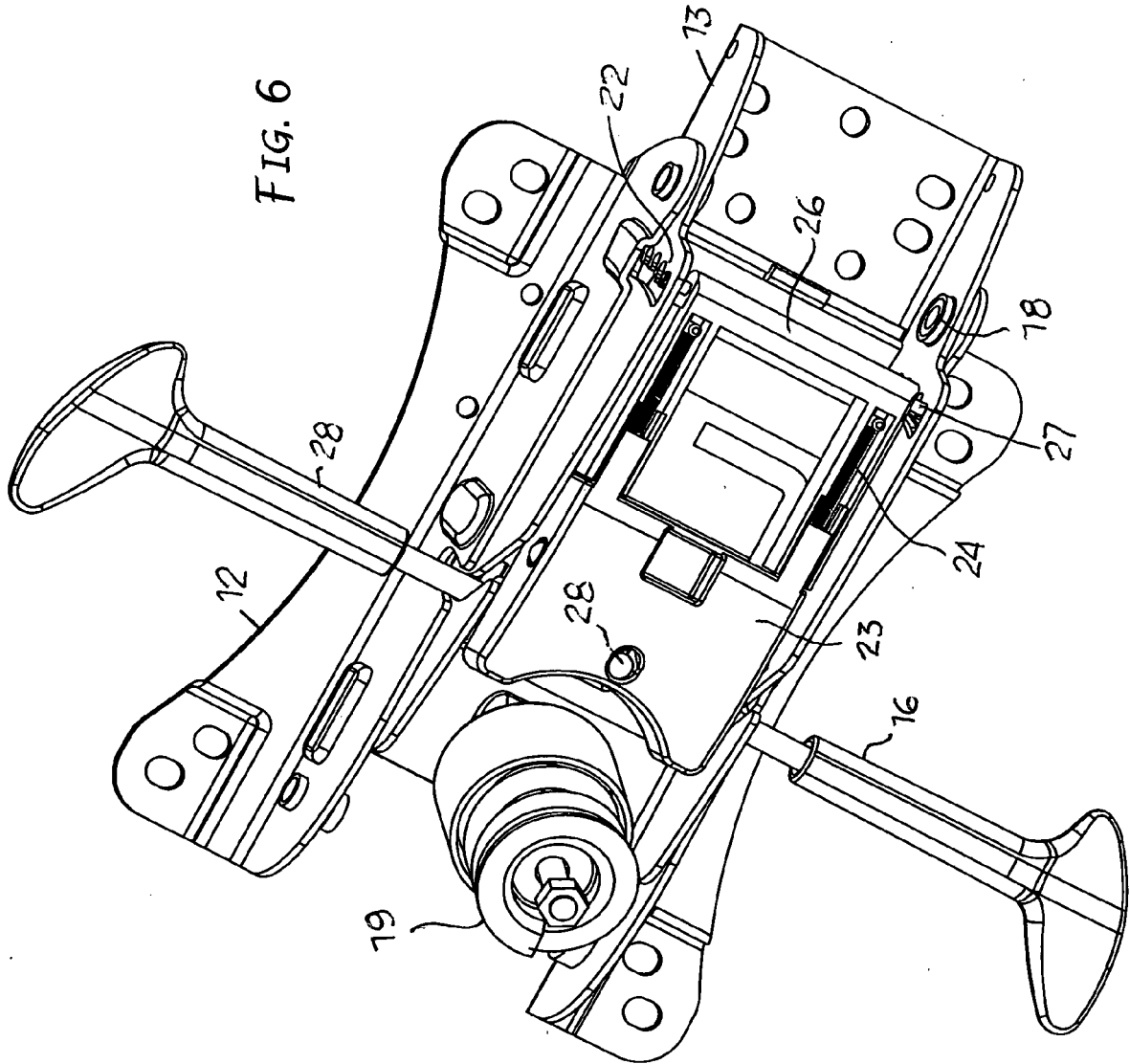


FIG. 6





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 42 5270

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2005/236878 A1 (ROSSETTO MARCO [IT] ET AL) 27 October 2005 (2005-10-27) * paragraph [0037] - paragraph [0058]; figure 14 *	1-5	INV. A47C1/032
A	US 6 010 189 A (HYBARGER KENNETH C [US] ET AL) 4 January 2000 (2000-01-04) * column 4, line 3 - column 6, line 49; figures 1-10 *	1-5	
A	EP 1 228 722 A (COFEMO SPA [IT]) 7 August 2002 (2002-08-07) * figures 1-3 *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			A47C
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		5 November 2007	Kus, Slawomir
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

1
EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 07 42 5270

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

05-11-2007

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
US 2005236878	A1	27-10-2005	AU	2003239977	A1	06-01-2004
			CA	2489995	A1	31-12-2003
			CN	1662168	A	31-08-2005
			EP	1531705	A2	25-05-2005
			WO	2004000075	A2	31-12-2003

US 6010189	A	04-01-2000	US	6139103	A	31-10-2000
			US	6000756	A	14-12-1999

EP 1228722	A	07-08-2002	DE	60100014	D1	19-09-2002
			DE	60100014	T2	05-06-2003
			ES	2179033	T3	16-01-2003
			US	2003001417	A1	02-01-2003
