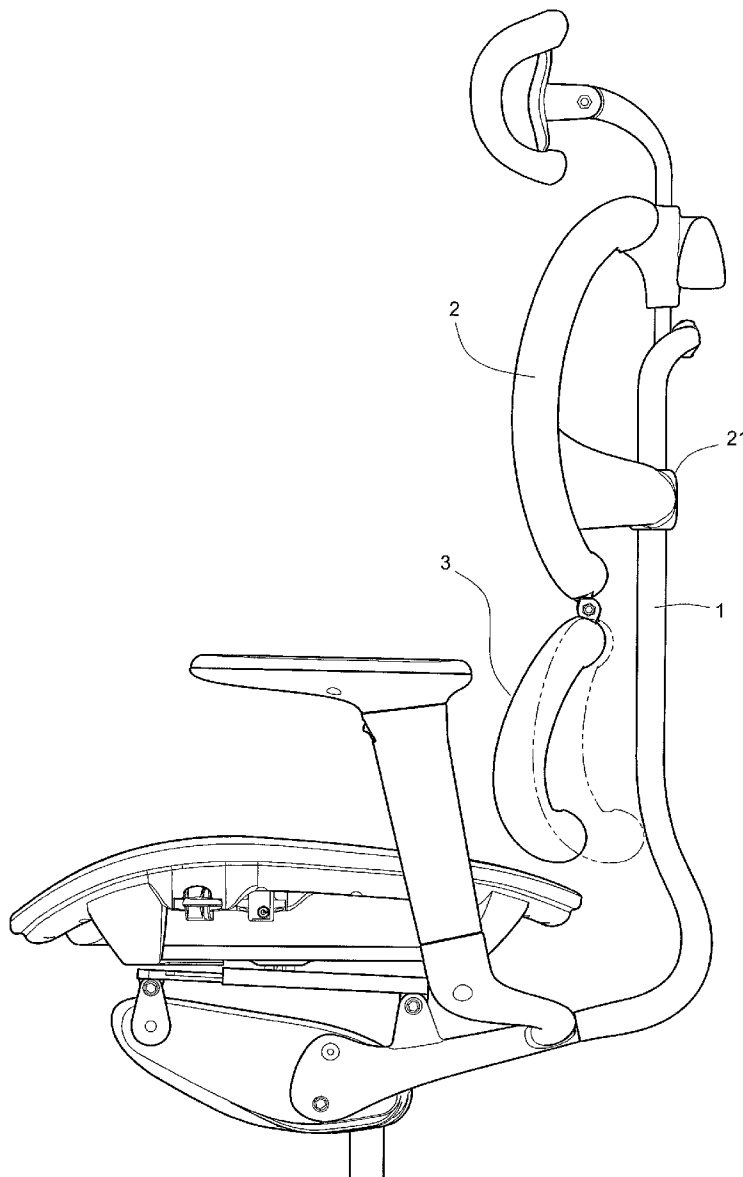




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(19) **United States**(12) **Patent Application Publication**
Tsai(10) **Pub. No.: US 2011/0215623 A1**(43) **Pub. Date: Sep. 8, 2011**(54) **HEIGHT-ADJUSTING ASSEMBLY FOR
OFFICE CHAIR BACKREST**(76) Inventor: **Hsuan-Chin Tsai**, Chai-Yi Hsien
(TW)(21) Appl. No.: **12/717,240**(22) Filed: **Mar. 4, 2010****Publication Classification**(51) **Int. Cl.***A47C 7/40* (2006.01)*A47C 3/00* (2006.01)(52) **U.S. Cl.** **297/301.1; 297/353**(57) **ABSTRACT**

A height-adjusting assembly for an office chair backrest includes a supporting unit mounted with a vertically movable backrest. The supporting unit and the backrest have correspondingly an engaging element and a series of positioning teeth, respectively, to be coupled mutually. Upper and lower ends of the series of positioning teeth have a retracting portion and an expanding portion for retracting and expanding the engaging element, respectively. When the backrest slides upward, the engaging element successively engages with one of the positioning teeth so as to position the backrest at a desired height. When the backrest reaches to an upmost position, the engaging element is pressed by the retracting portion and retracts so as to separate from the positioning teeth. Then the backrest reaches a bottommost position thereof has the engaging element expanded by the expanding portion, thereby allowing the engaging element to engage with the positioning teeth again.



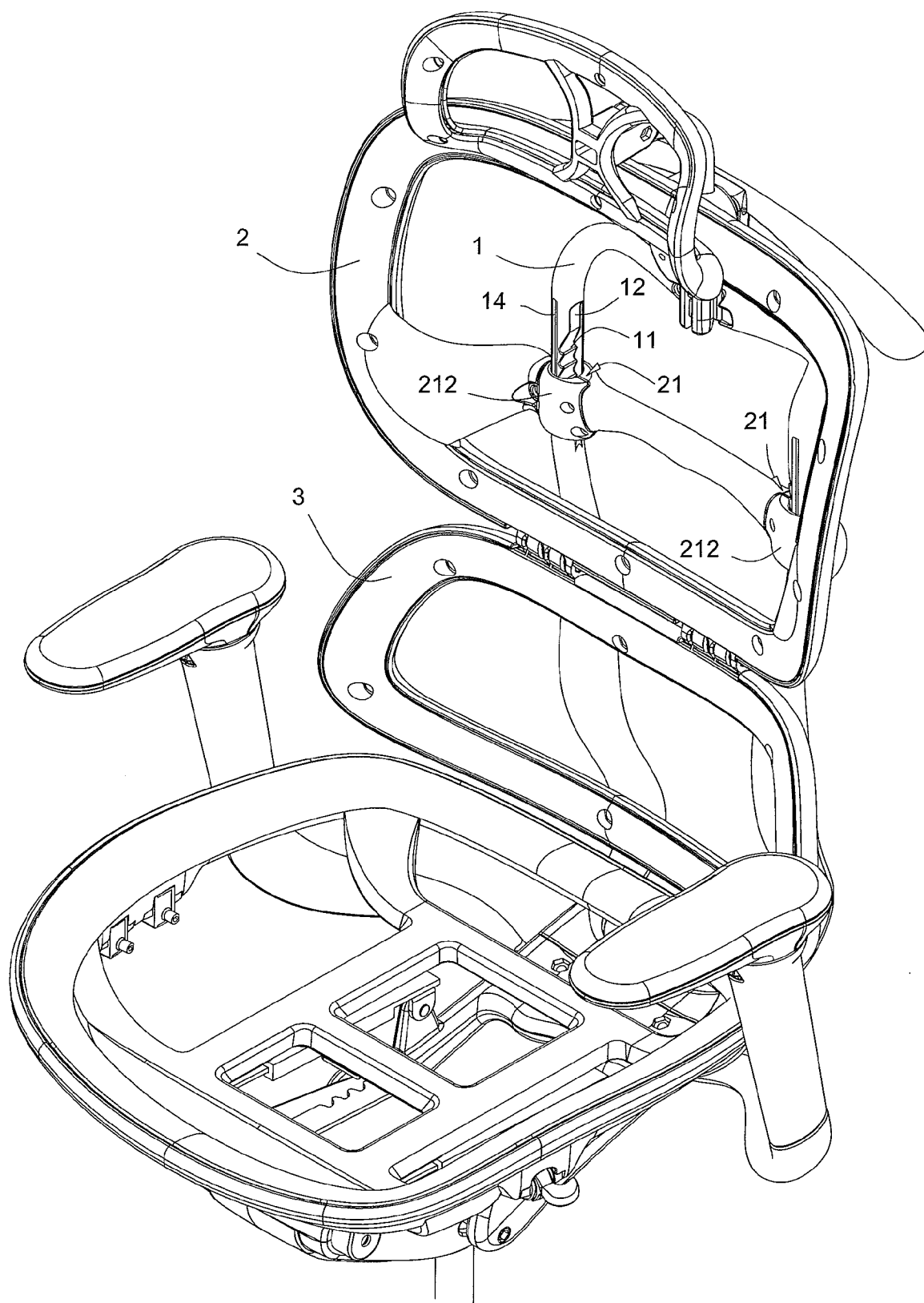


Fig . 1

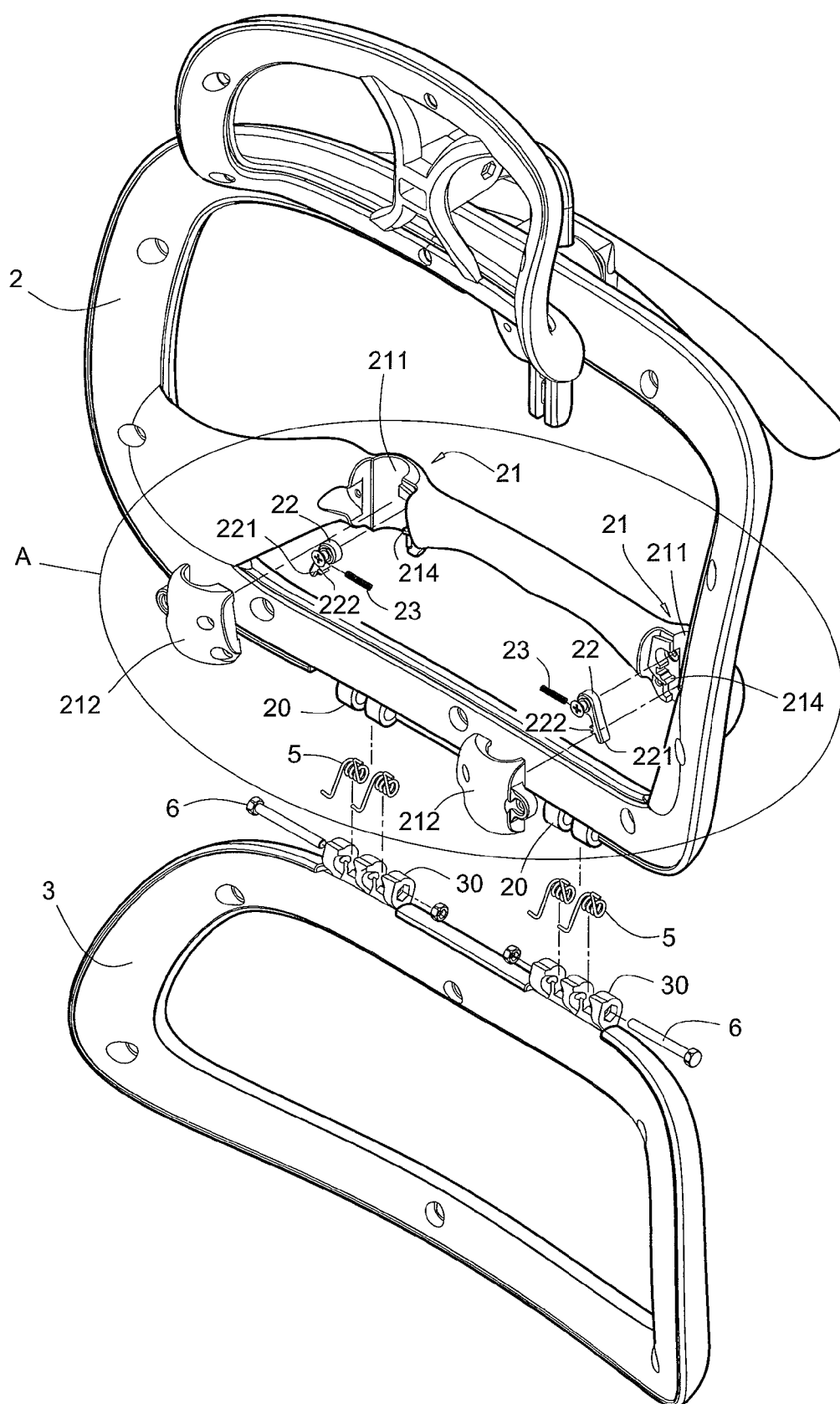


Fig . 2

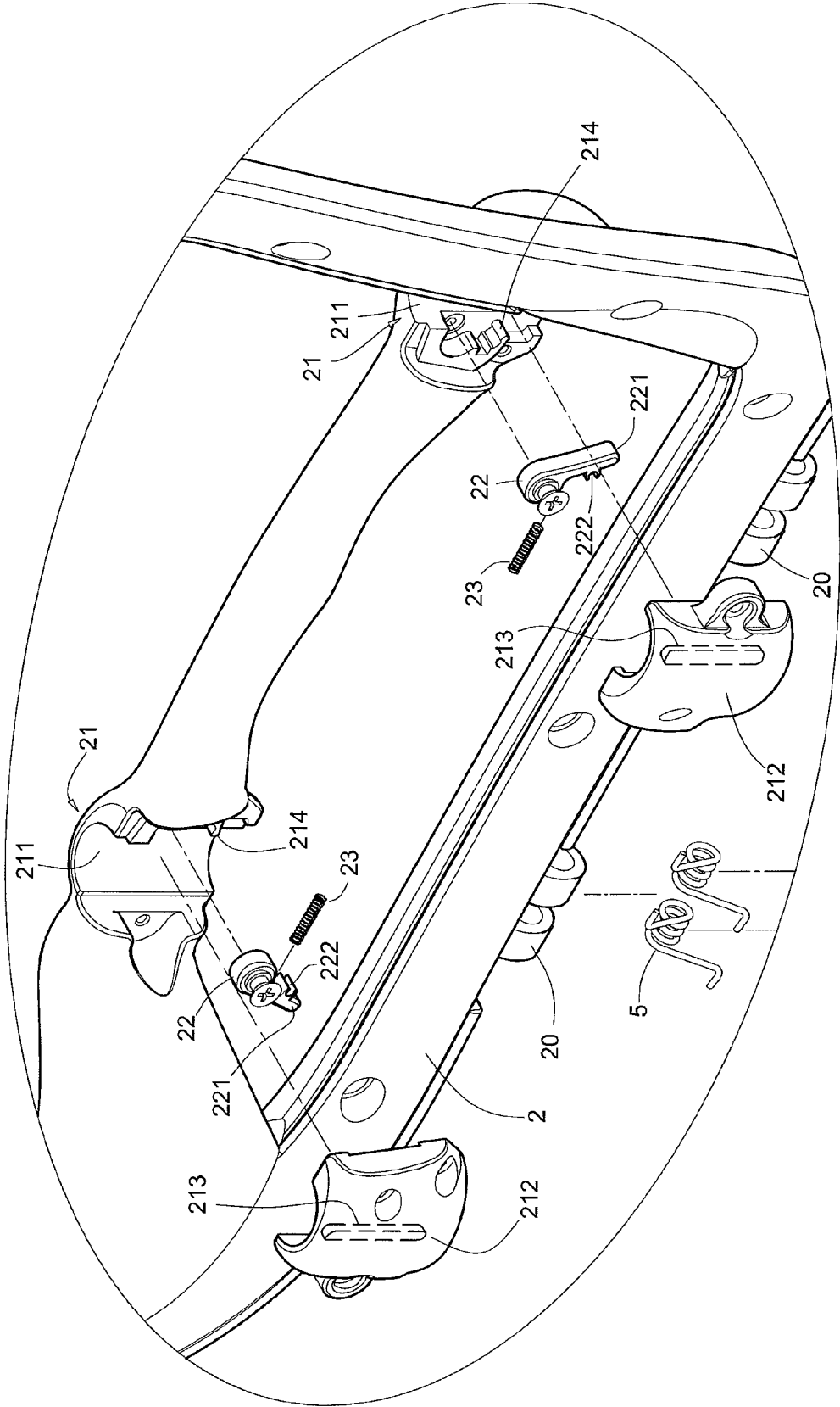


Fig . 3

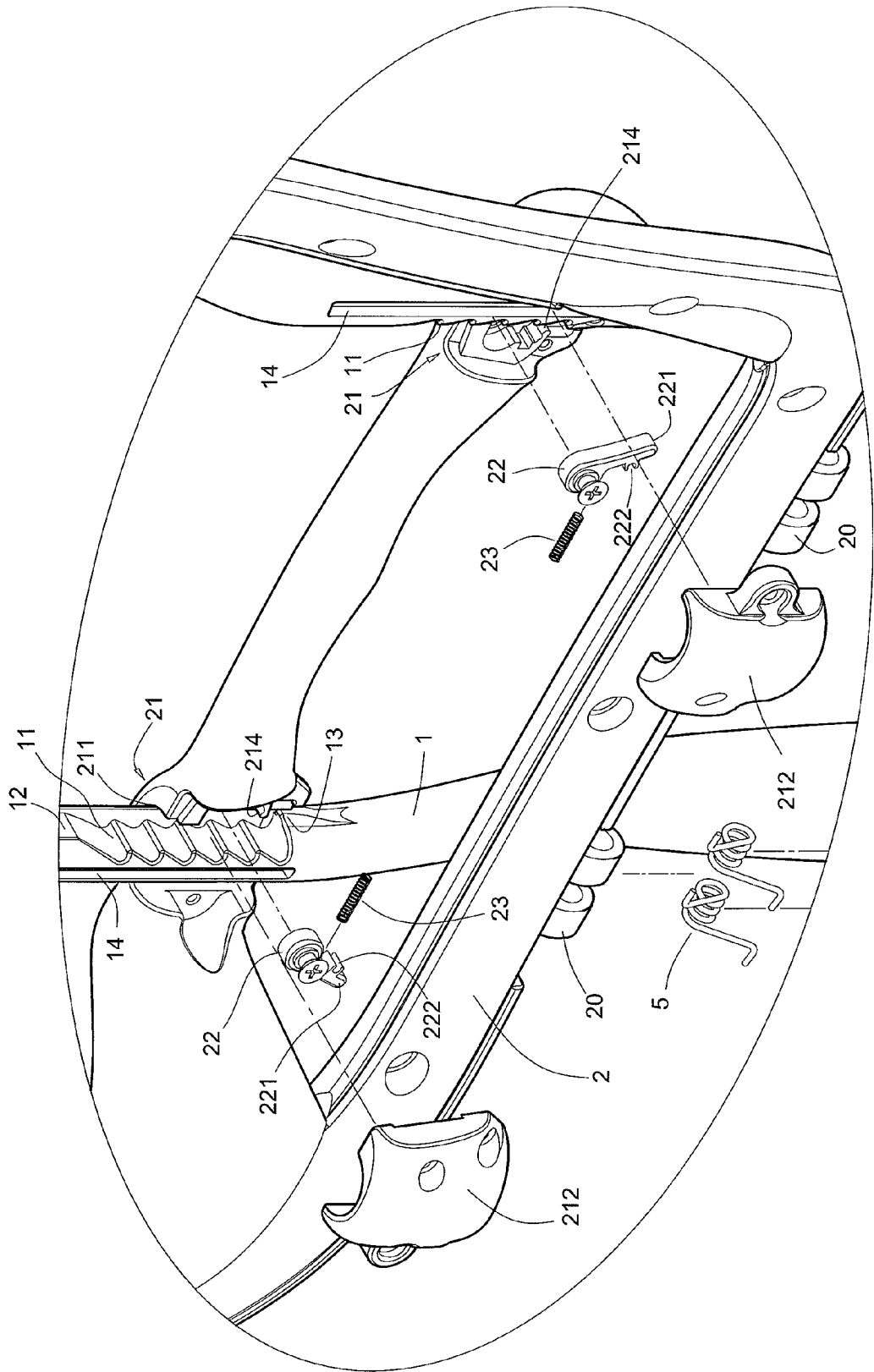


Fig . 4

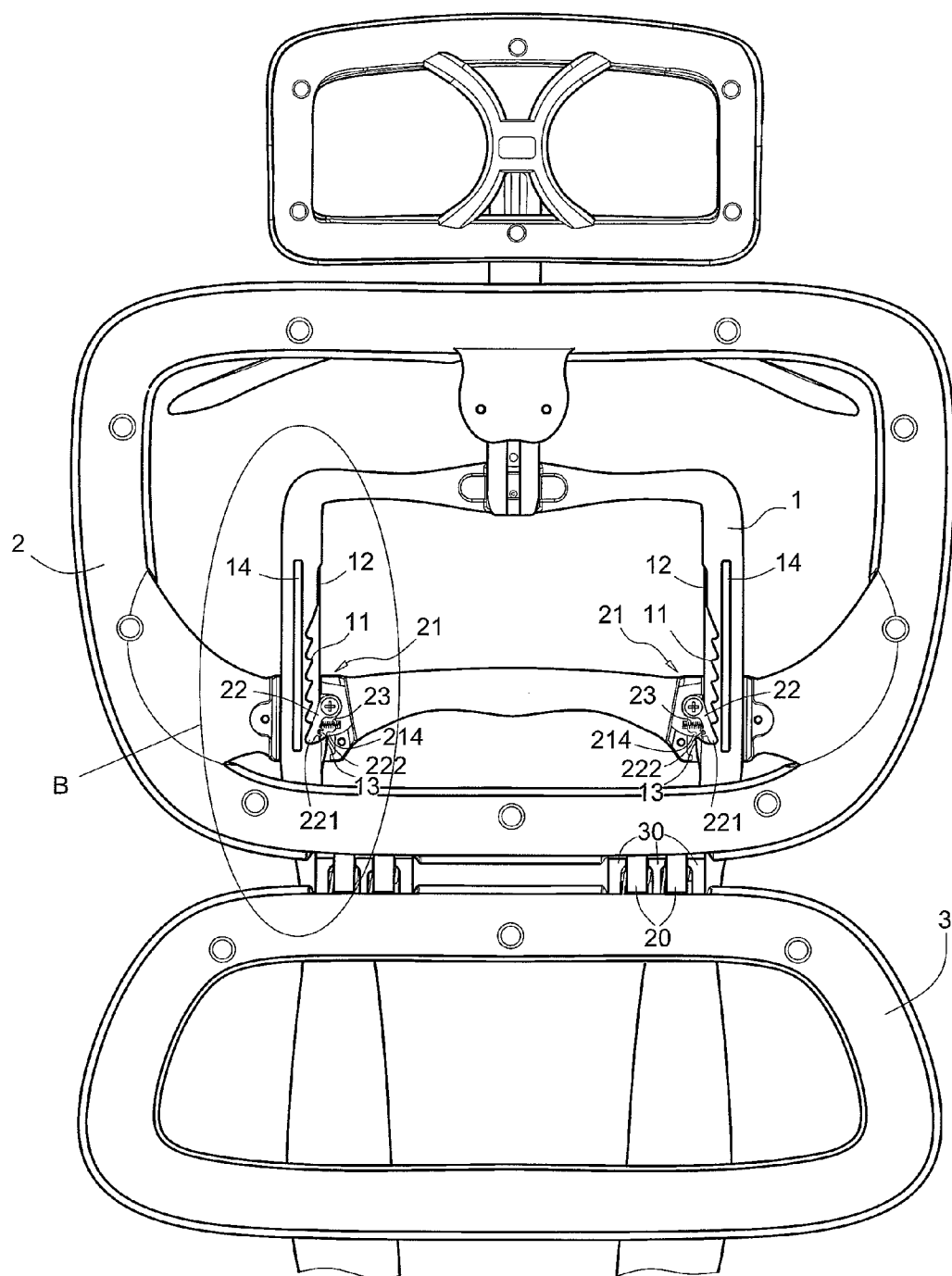


Fig . 5

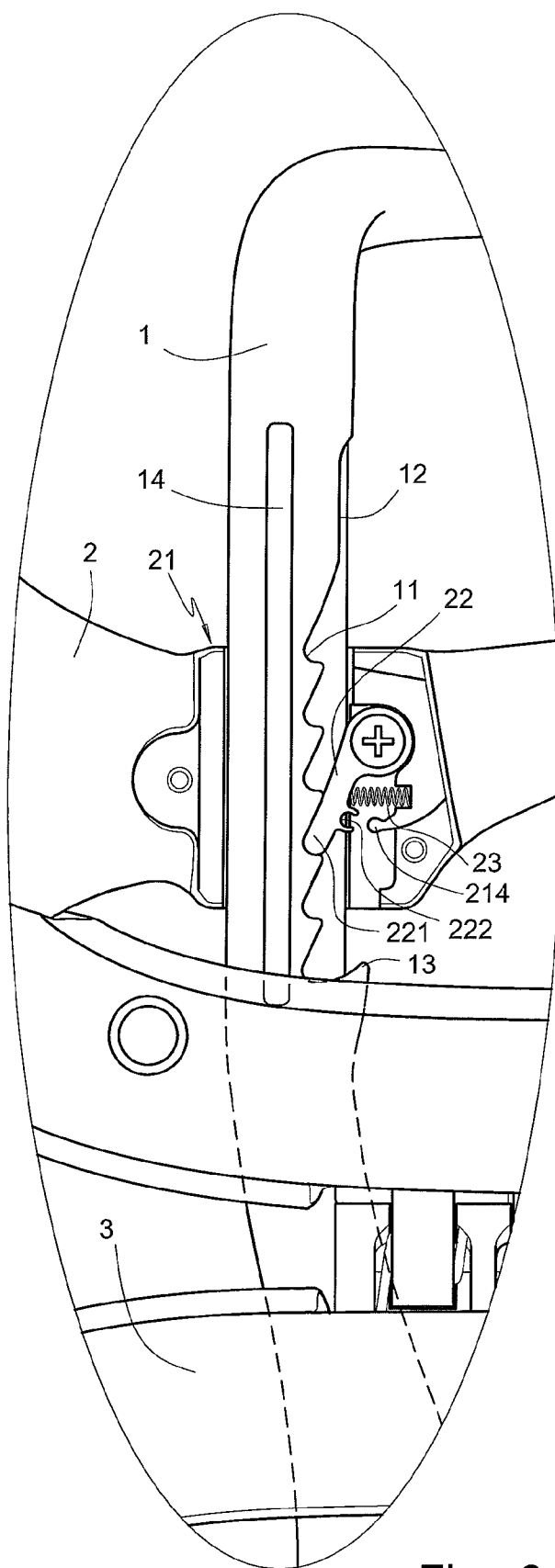


Fig . 6

Fig . 7

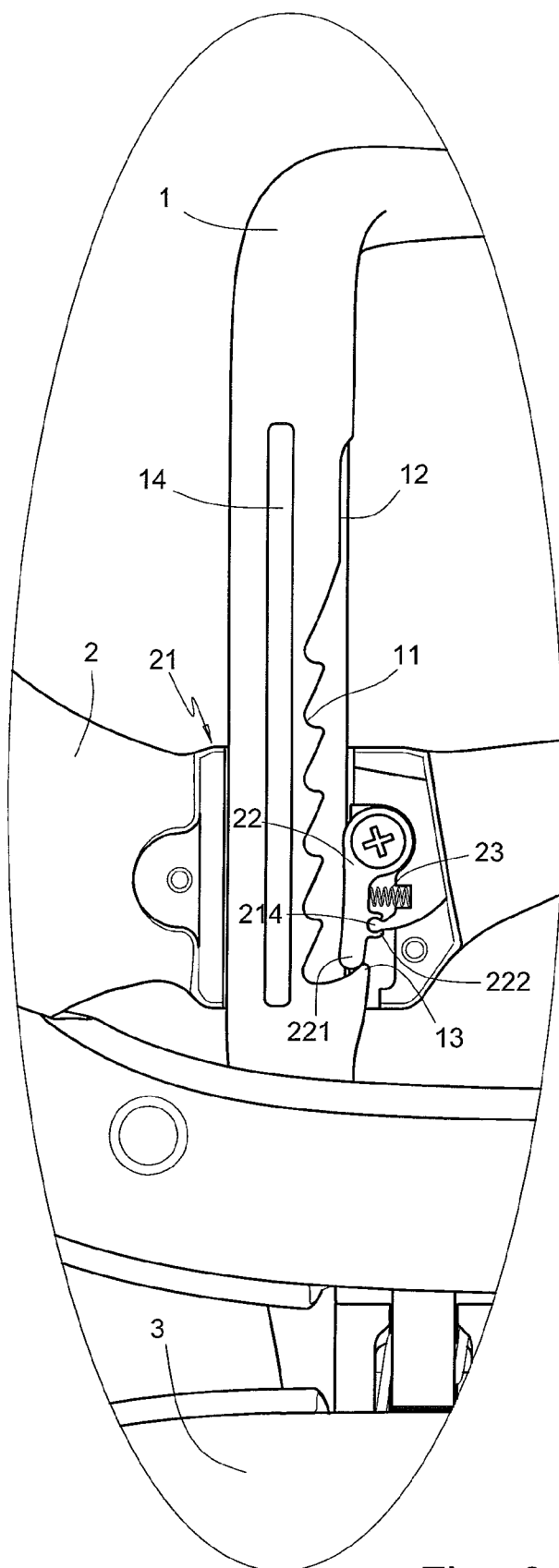


Fig . 8

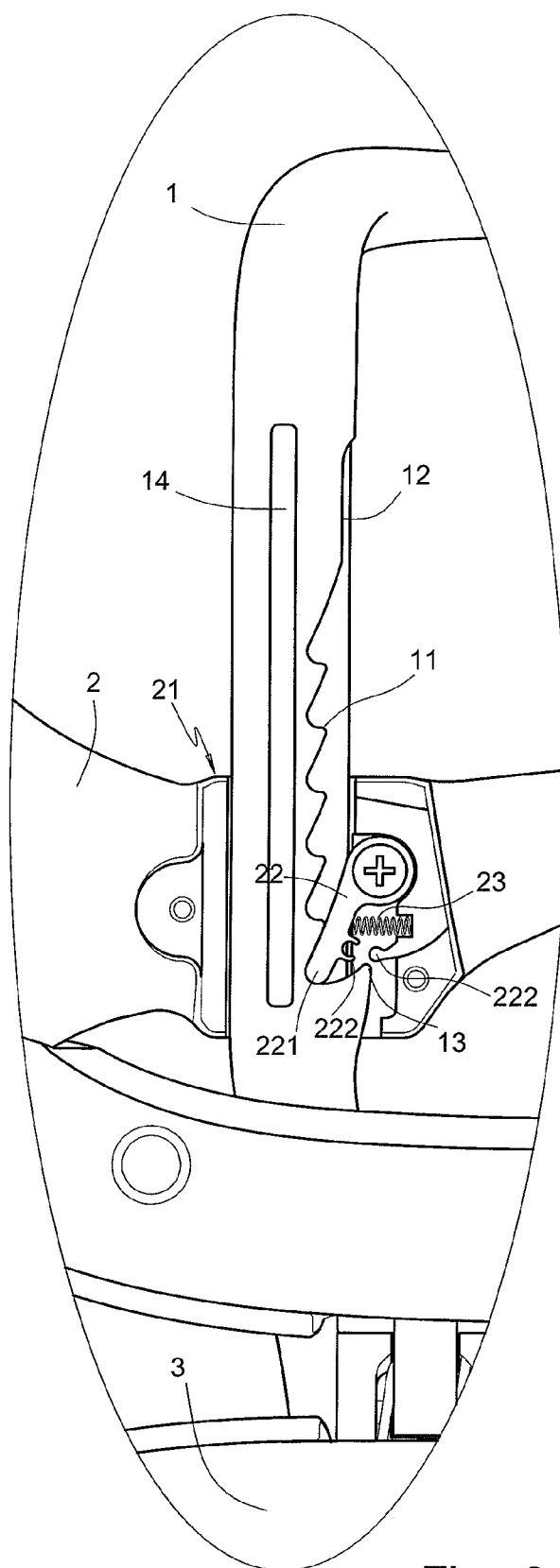


Fig . 9

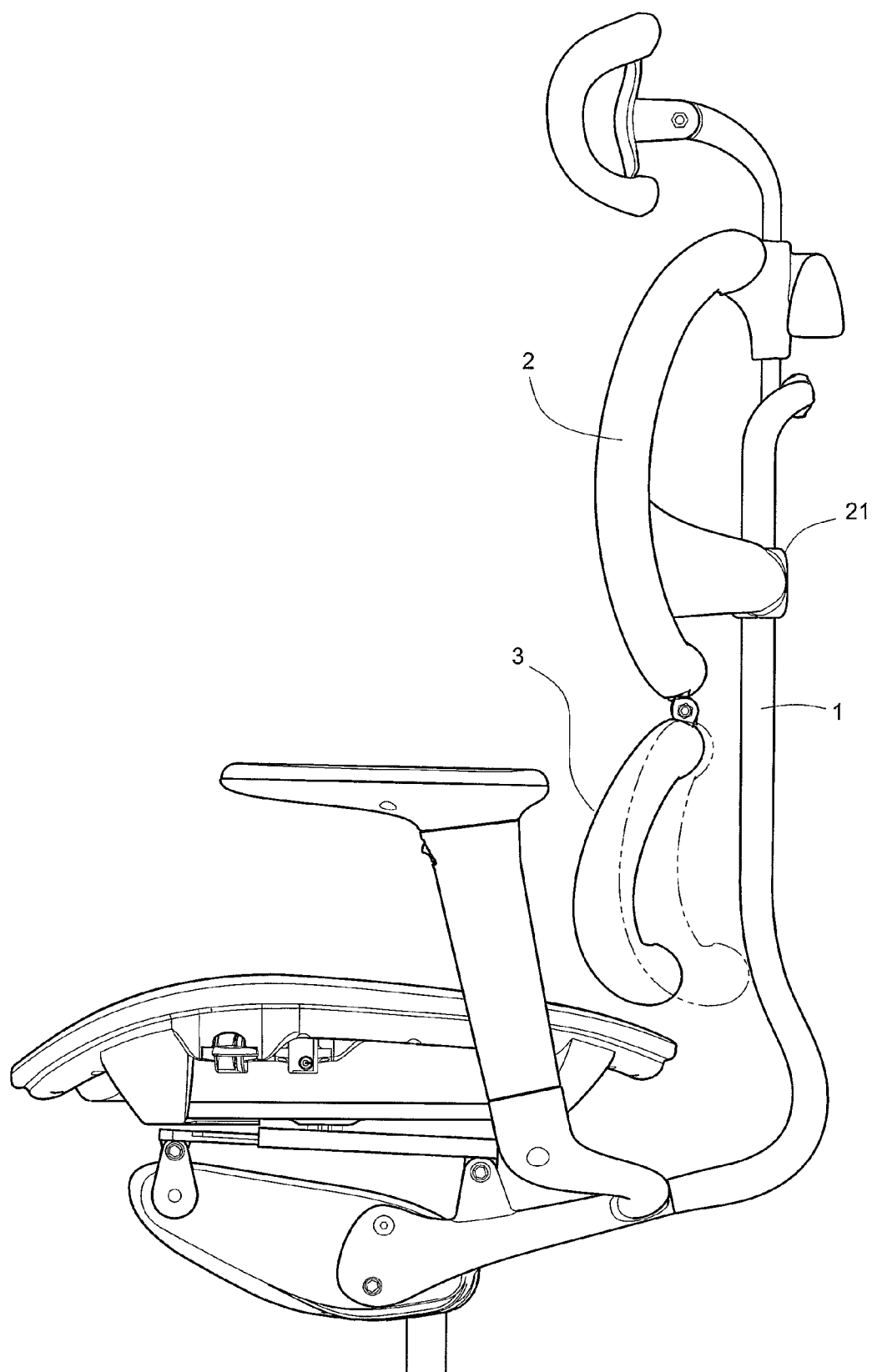


Fig . 10

HEIGHT-ADJUSTING ASSEMBLY FOR OFFICE CHAIR BACKREST

FIELD OF THE INVENTION

[0001] The present invention relates to a height-adjusting assembly for an office chair backrest, wherein a supporting unit mounted with a vertically movable backrest is fixed to a chair, while at least a series of positioning teeth and an engaging element that are configured to resiliently couple with each other are provided between the supporting unit and the backrest for allowing the backrest to vertically slide along and get positioned with respect to the supporting unit.

BACKGROUND OF THE INVENTION

[0002] Since modern people spend much more time in their offices than at home, whether an office chair is comfortable enough has become a major concern. In view of low back pain caused by long-term, constant sitting posture, some waist-protecting devices purported to be effective in preventing low back pain have been seen in the market. However, while the effectiveness of most of these waist-protecting devices has not been proven, excessive dependency on such waist-protecting devices may bring about adverse effects. Thus, for protecting people always staying sitting in work, such as computer users, from low back pain, an appropriate chair is necessary.

[0003] Generally, to a sitter, his/her intervertebral disks in the lumbar vertebra bear more pressure when the body remains vertical or slightly inclining forward (with an included angle between his/her thighs and upper part of body smaller than 90 degrees) than when he/she stands. Besides, the long-term still sitting posture (lacking for change in posture) is likely to result in the sitter's tiredness. Thus people tend to frequently move after long-term sitting for mitigating uncomfortableness. A chair with a backrest can facilitate supporting human body and relaxing the lumbar vertebra as well as muscles and is also helpful in supporting the waist, thereby preventing low back pain.

[0004] However, chairs can only provide these functions when properly designed. Otherwise, an excessive sitting depth may hinder the lumbar vertebra from contacting the backrest and in turn from getting supported. In some other cases, a backrest positioned excessively high or low can similarly owe the lumbar vertebra proper support.

SUMMARY OF THE INVENTION

[0005] Hence, in order to solve the problem of the prior art where the chair backrest fails to be properly settled in height to support a sitter's back and waist, the present invention provides a structure which allows a backrest to be freely adjusted in height, so as to ensure a sitter's back and waist with optimal support.

[0006] The technical means adopted by the present invention for solving the above problem includes a supporting unit fixed to a chair and a backrest which is configured to vertically slide along and get positioned with respect to the supporting unit, wherein the supporting unit is provided with at least one series of positioning teeth while the backrest has an engaging element for resiliently engaging with the positioning teeth. The engaging element is formed with a socket portion for corresponding and coupling with a plug portion formed on the backrest. Meantime, an upper end and a lower end of each said series of positioning teeth are formed with a retracting

portion for retracting the engaging element and an expanding portion for expanding the engaging element.

[0007] In addition, a waist-rest portion is pivotally attached below the backrest of the present invention for providing resilient support.

[0008] Thereby, when the backrest of the present invention vertically slides from upward, the engaging element equipped thereto successively engages with one said positioning tooth of the supporting unit, so as to position the backrest at a desired height. When the backrest reaches its upmost position, the engaging element is pressed by the retracting portion on the supporting unit so that the engaging element swings to retract and the backrest can be then lowered to a bottommost position thereof to have the engaging element re-expanded by the expanding portion on the supporting unit, thereby again being capable of resiliently coupling with the positioning teeth.

[0009] Thus, the present invention would be well understood and implemented according to the embodiment in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] FIG. 1 is a perspective view of the present invention.

[0011] FIG. 2 is an exploded view of a backrest according to the present invention.

[0012] FIG. 3 is a partially enlarged view of the area encircled by Circle A in FIG. 2.

[0013] FIG. 4 illustrates how the backrest and a supporting unit are combined.

[0014] FIG. 5 is a partial front view of the present invention.

[0015] FIG. 6 is a partially enlarged view of the area encircled by Circle B in FIG. 5.

[0016] FIG. 7 shows the backrest positioned at an upmost position.

[0017] FIG. 8 shows the backrest positioned at a bottommost position.

[0018] FIG. 9 is a schematic drawing of the present invention wherein an engaging element is expanded.

[0019] FIG. 10 is a schematic drawing illustrating operation of a waist-rest portion according to the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0020] Referring to FIGS. 1, 2, 3 and 4, the present invention has a supporting unit 1 assembled to a chair and a backrest 2 that is mounted on the supporting unit 1 and configured to vertically slide along and get positioned with respect to the supporting unit 1. The supporting unit 1 is a frame of a reversed-U shape and has two facing inner laterals each formed with a series of positioning teeth 11 so that the two series of positioning teeth 11 corresponding to each other. At an upper end and a lower end of each said series of positioning teeth 11, a retracting portion 12 and an expanding portion 13 are provided, respectively. In addition, two front laterals of the supporting unit 1 are each provided with a guiding groove 14.

[0021] Moreover, on the backrest 2 at where corresponds to the positioning teeth 11 of the supporting unit 1, sliding portions 21 are provided for connecting with the supporting unit 1. Each of the sliding portions 21 further includes a recessed part 211 formed on the backrest 2 and a cover 212 for combining with and covering the recessed part 211 so that a space is defined between the recessed part 211 and the cover 212 for the supporting unit 1 to pierce therethrough.

Besides, a raised guiding portion **213** is formed at an inner side of the cover **212** for slidably coupling with the guiding groove **14** of the supporting unit **1**. Meantime, an engaging element **22** is pivotally fixed to the sliding portion **21** near the positioning teeth (i.e. on the recessed part **211**) such that the engaging element **22** is able to freely swing. A spring **23** is provided to resiliently push the engaging element **22** outward so as to rightly make a free end **221** of the engaging element **22** resiliently engaged with any of the positioning teeth **11** on the supporting unit **1**. The engaging element **22** is further formed with a socket portion **222** while the sliding portion **21** (i.e. the recessed part **211**) has a plug portion **214**, so that when the engaging element **22** is engaged, the plug portion **214** is fittingly inlaid to and thus positioned with respect to the socket portion **222** thereof.

[0022] Additionally, a waist-rest portion **3** is attached below the backrest **2** by means of pivotally fixing portions **20**, **30** and a pivot **4** passing therethrough. The pivot **4** is mounted therearound with a plurality of springs **5**, wherein each of the springs **5** has two ends abutting against the backrest **2** and the waist-rest portion **3**, thereby allowing the waist-rest portion **3** to resiliently swing in a predetermined direction.

[0023] Therefore, as shown in FIGS. **5** and **6**, when height adjustment of the backrest **2** is desired, by easily pushing the backrest **2** upward, the engaging element **22** resiliently pushed can spring to successively make its free end **221** retained in the positioning teeth **11** of different heights, so that the backrest **2** can be moved to and positioned at different heights. Then referring to FIG. **7**, when the backrest **2** is pushed to a predetermined upmost position, the engaging element **22** is pressed by the retracting portion **12** at the upper end of the series of the positioning teeth **11** and forced to swing rightward so that the socket portion **222** thereon is coupled with the plug portion **214** and get positioned. At this time, the backrest **2** can freely slide downward. Afterward, as shown in FIGS. **8** and **9**, when the backrest slides to a predetermined bottommost position, the free end **221** of the engaging element **22** comes to abut against the expanding portion **13** and is pushed leftward, so that the socket portion **222** of the

engaging element **22** is decoupled from the plug portion **214** and then returns to its resilient engagement with any of the positioning teeth **11** due to the pushing force from the spring **23**. Consequently, the backrest **2** is allowed to be readjusted in height from lower to higher.

[0024] At last, as shown in FIG. **10**, when the backrest **1** is adjusted to the desired height, the waist-rest portion **3** is rightly positioned to properly support a waist of a sitter on the chair, thereby providing the sitter's waist with comforting support.

1. A height-adjusting assembly for an office chair backrest, comprising a supporting unit fixed to a chair for allowing a backrest to be mounted thereon, therein:

the supporting unit being a frame provided with at least one series of positioning teeth, wherein an upper end and a lower end of the series of positioning teeth are provide with a retracting portion and an expanding portion, respectively;

the backrest having at least one sliding portion corresponding to the series of positioning teeth of the supporting unit, and an engaging element pivotally fixed thereto for resiliently coupling with any of the positioning teeth, wherein the engaging element and the sliding portion have correspondingly a socket portion and a plug portion to be coupled with each other while the retracting portion and the expanding portion of the supporting unit serve to retract and expand the engaging element, respectively, so as to make the socket portion and the plug portion engaged or separated.

2. The height-adjusting assembly of claim **1**, wherein the sliding portion on the supporting unit includes a recessed part formed on the backrest and a cover, which such covers the recessed part that a space is defined between the recessed part and the cover for allowing the supporting unit to pass there-through.

3. The height-adjusting assembly of claim **1**, wherein a waist-rest portion is pivotally attached below the backrest for providing resilient support.

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