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(54) **CHAIR WITH A RESILIENT BACK**

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(76) **Inventor: Yao-Chuan Wu, Minhsiung Hsiang (TW)**

(57) **ABSTRACT**

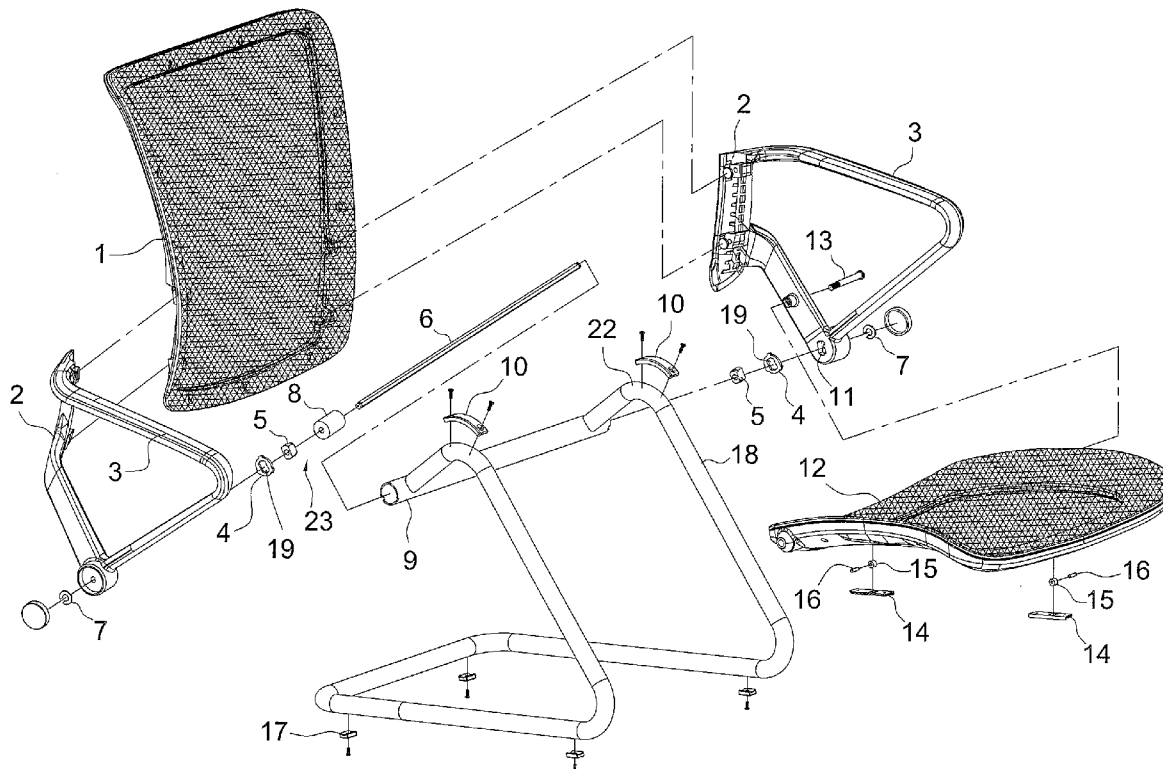
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A chair with a resilient back contains a back member, a cushion, and a support member, characterized in that: the support member includes a horizontally hollow tube in which an elastic mechanism is disposed, the back member includes two pressed pieces fixed on two sides thereof respectively, lower ends of the two pressed pieces connect with two ends of the elastic mechanism individually, and the cushion is secured on the support member, wherein the elastic mechanism is a torsion spring, a middle section of the elastic spring is fixed, and two outer ends of the torsion spring are coupled with the lower end of the pressed piece.

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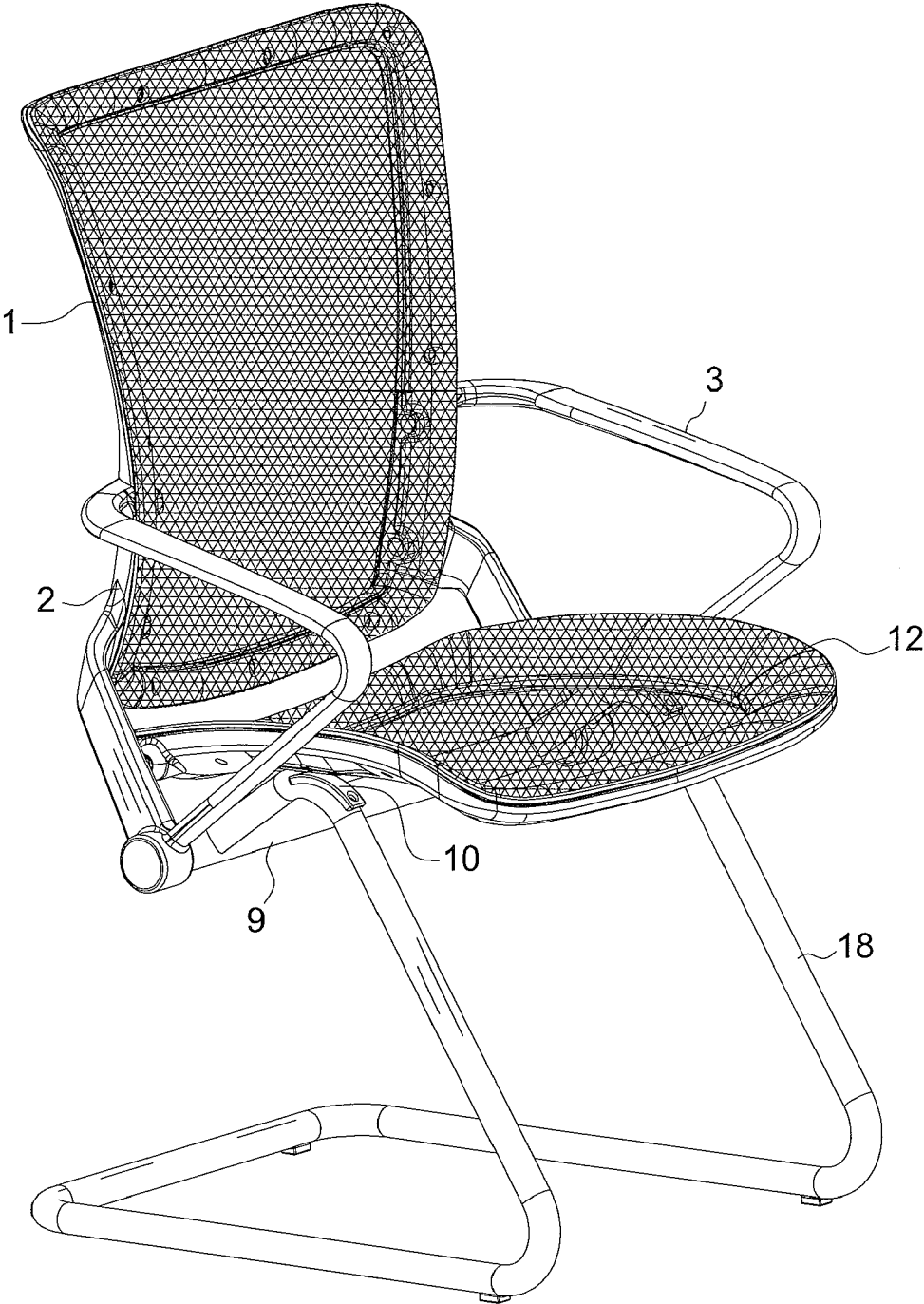


FIG. 1

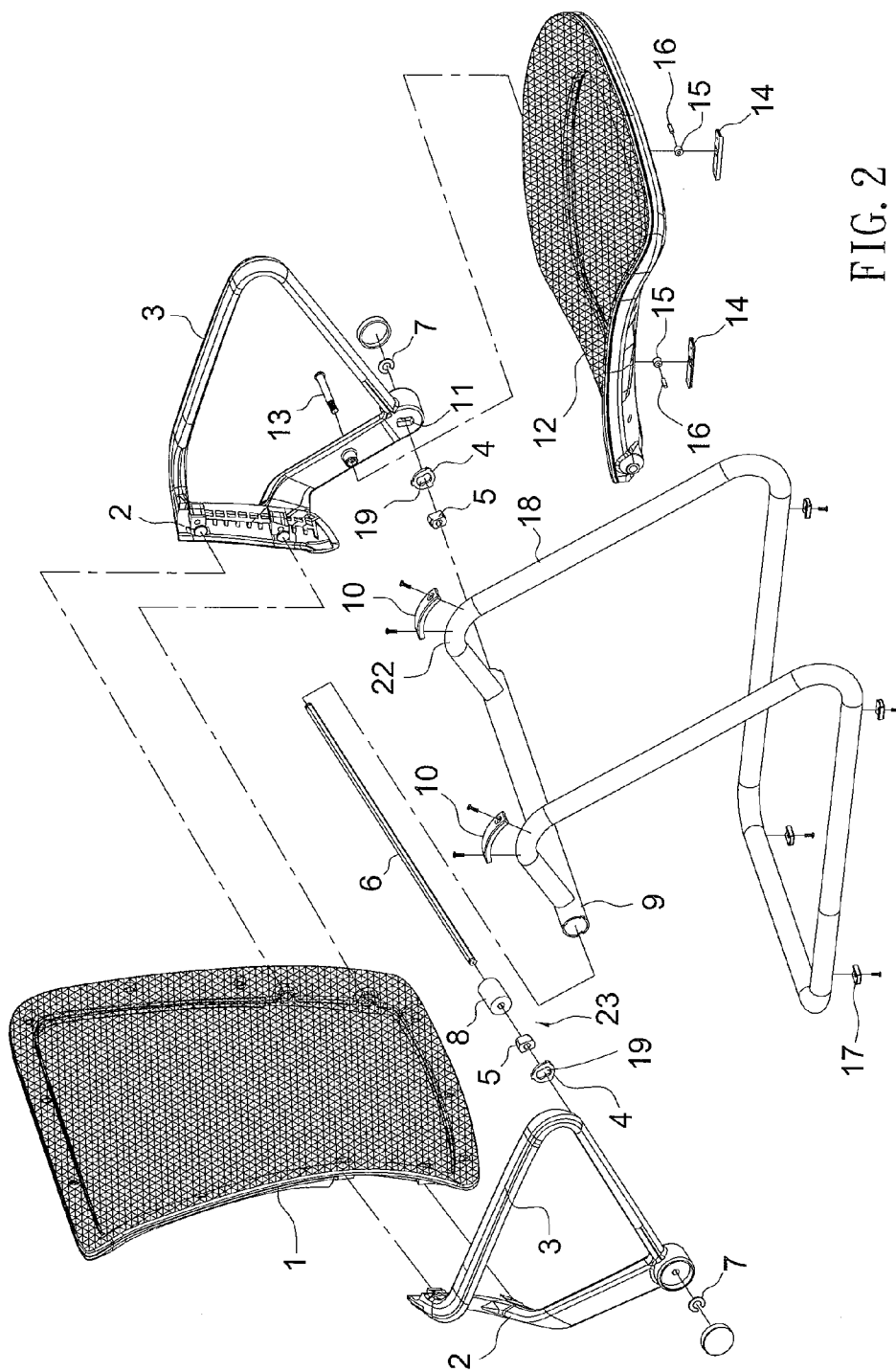


FIG. 2

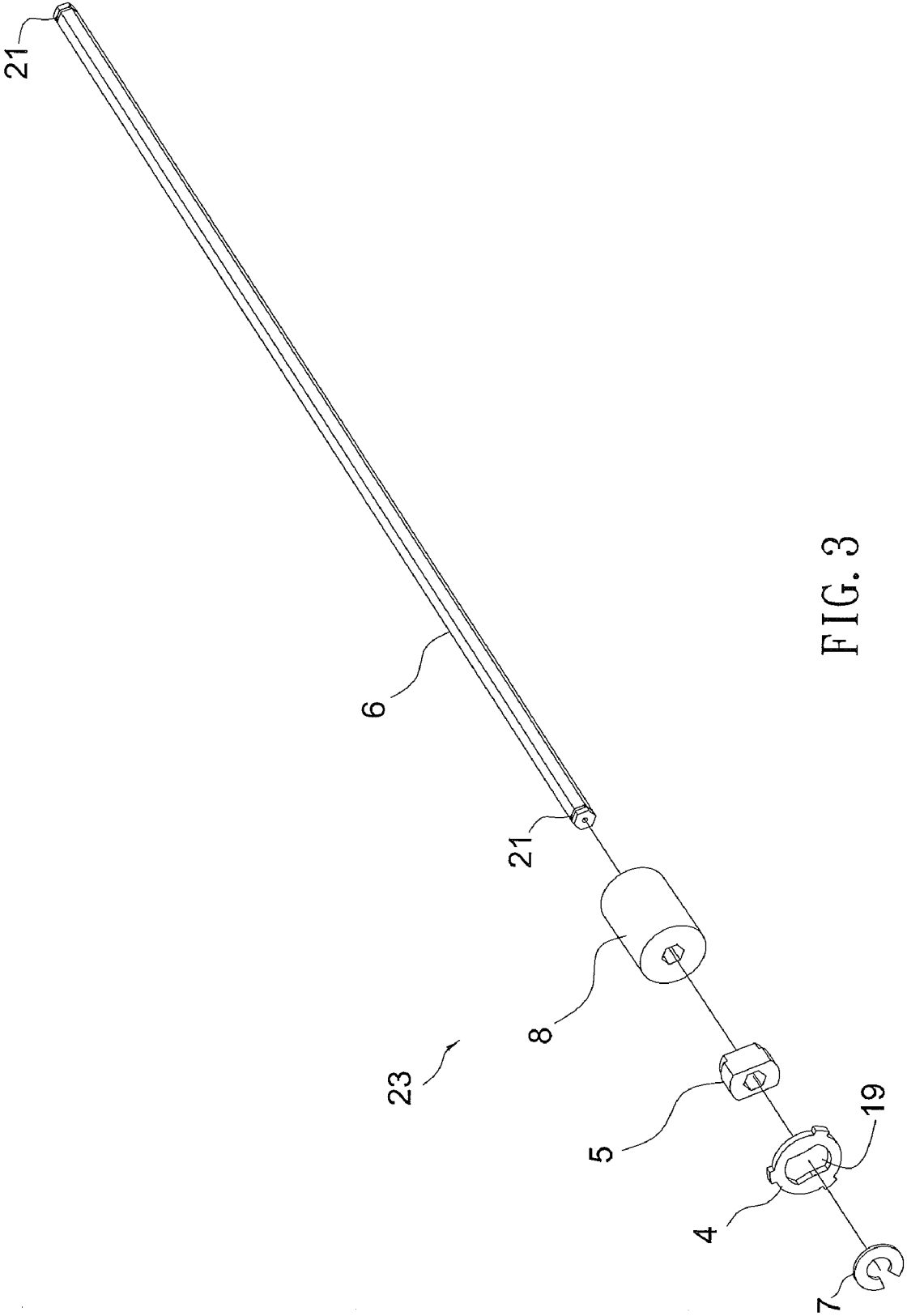


FIG. 3

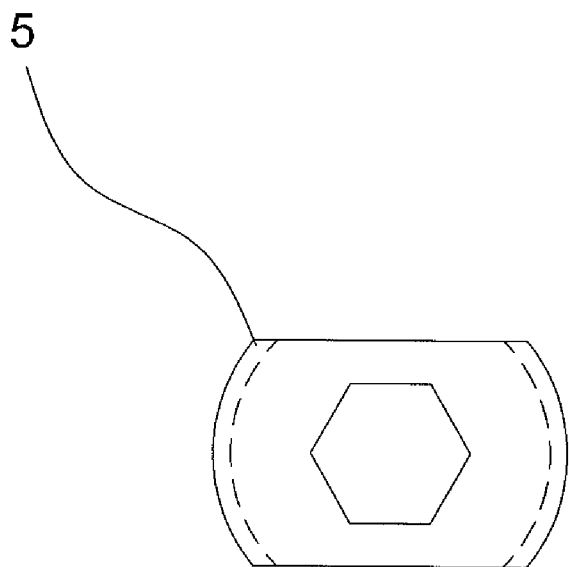


FIG. 4

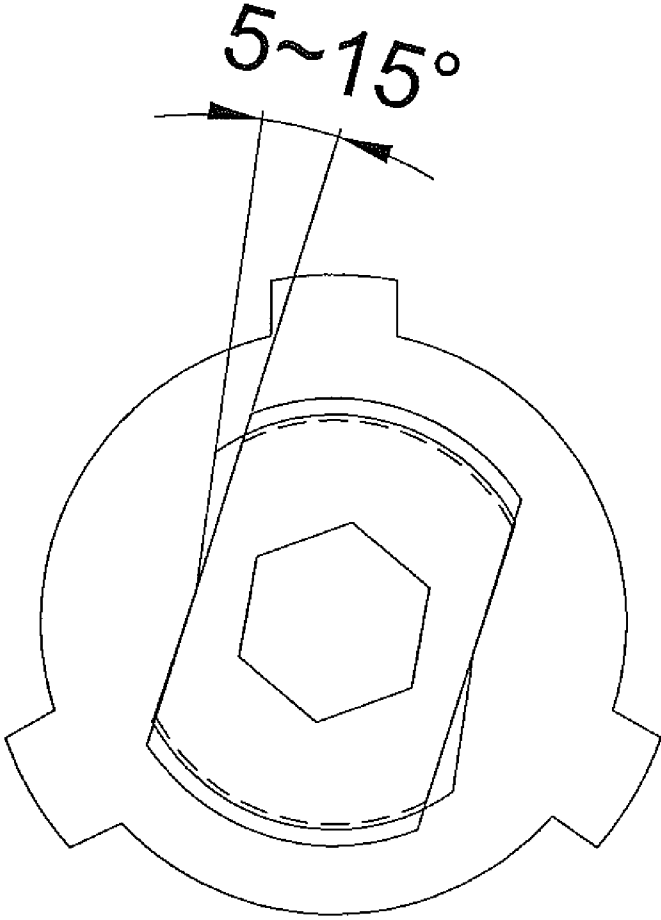


FIG. 5

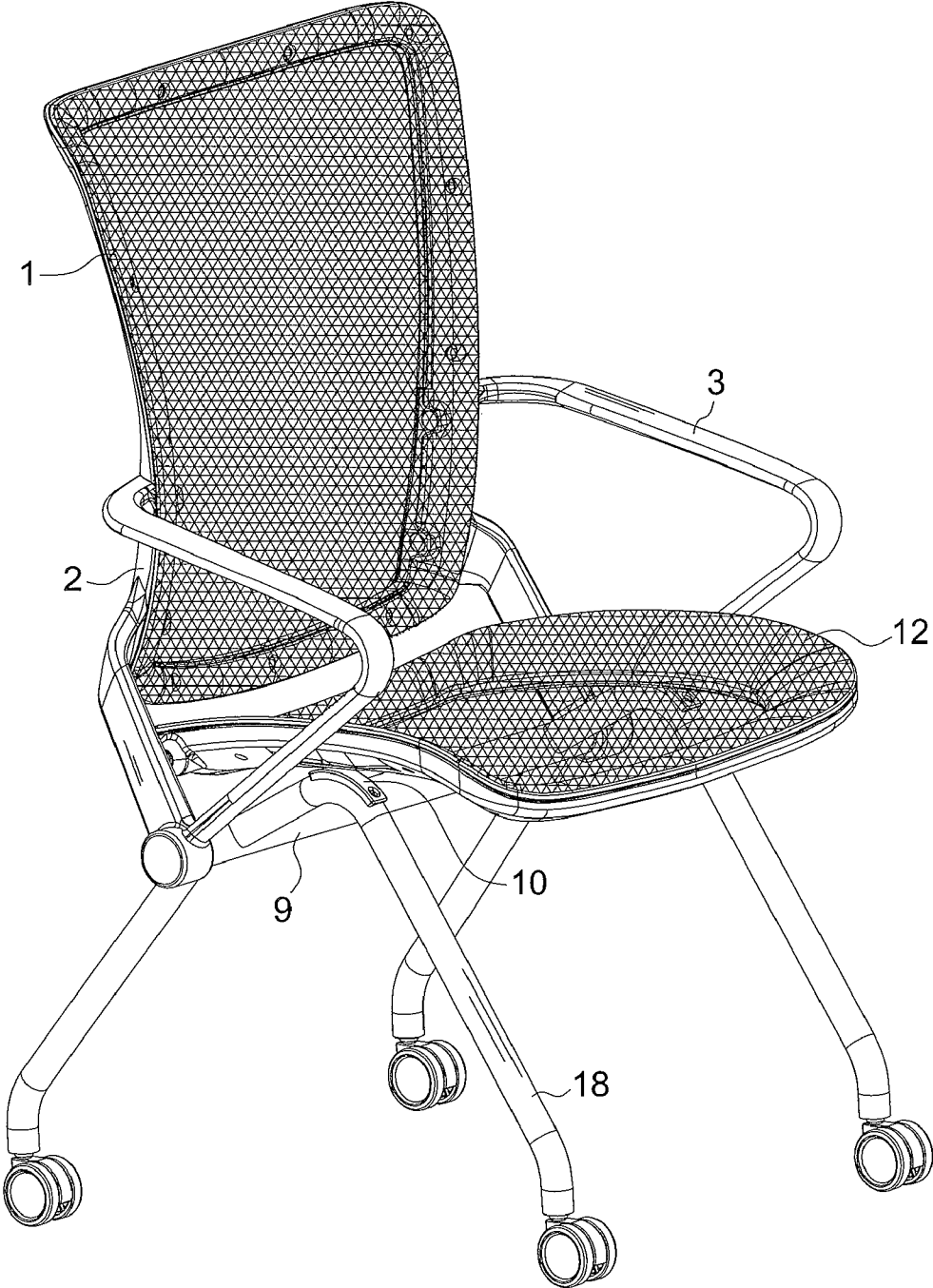


FIG. 6

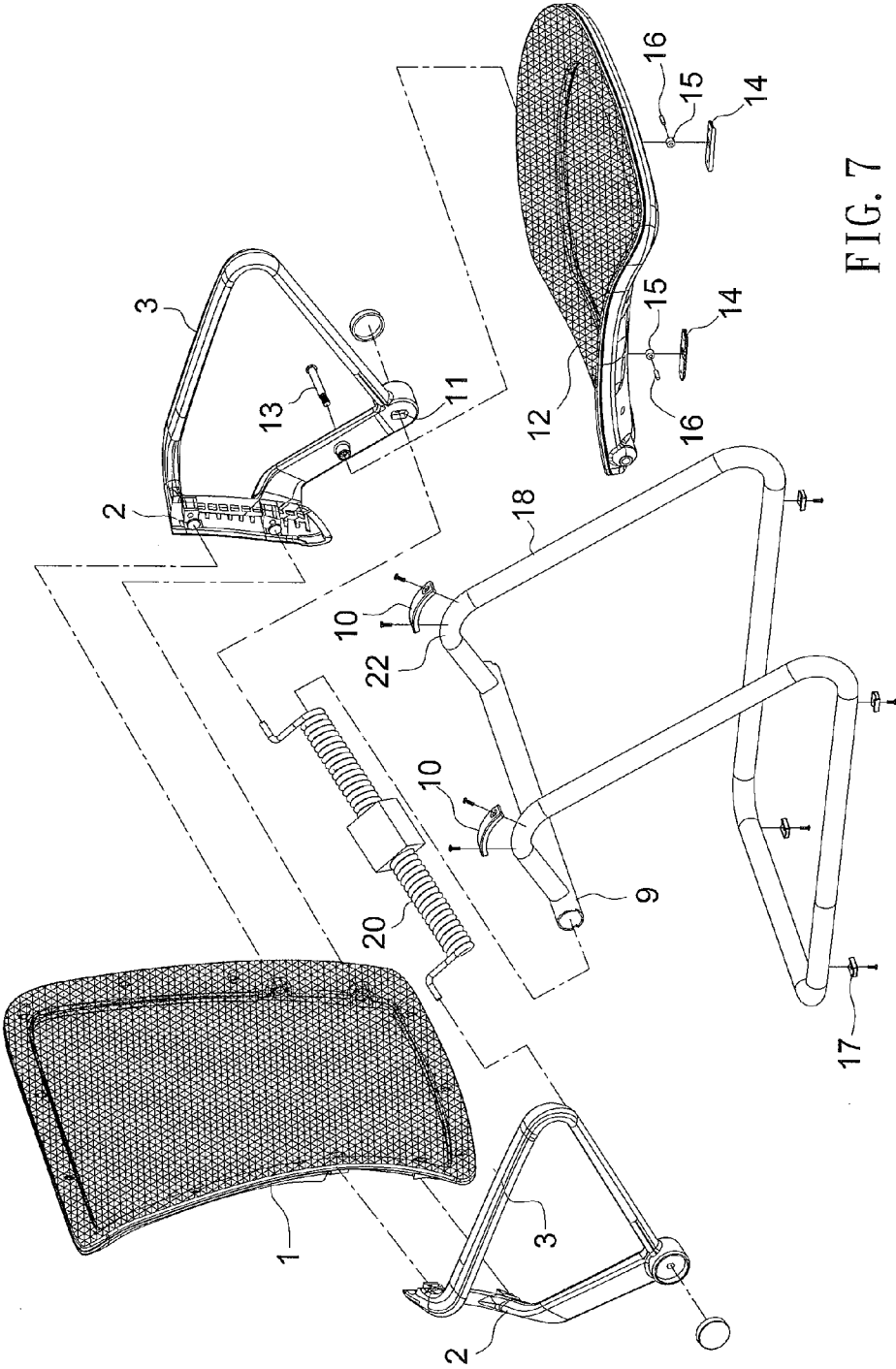


FIG. 7



**CHAIR WITH A RESILIENT BACK**

**BACKGROUND OF THE INVENTION**

**[0001]** 1. Field of the Invention  
**[0002]** The present invention relates to a chair, and more particularly to a chair with a resilient back.  
**[0003]** 2. Description of the Prior Art  
**[0004]** Conventional various chairs, such as an office chair, a meeting chair, and a house chair, most of these chairs are provided with a resilient back member, and the back member and a support member are connected together by means of a flexible metal element so that the back member rotates downward when a back of an user presses the back member backward and then move leftward and rightward. However, the metal element is broken easily, and a comfort can not be obtained. Besides, the chair falls easily when pressing the back member, and when the back member rotates, a cushion can not rotate with the back member, having a poor comfort.  
**[0005]** The present invention has arisen to mitigate and/or obviate the afore-described disadvantages.

**SUMMARY OF THE INVENTION**

**[0006]** The primary object of the present invention is to provide a chair with a resilient back that is capable of obtaining a comfort and safety purpose, and a cushion rotates with a back member.  
**[0007]** Further object of the present invention is to provide a chair with a resilient back that is capable of transmitting an axial force.  
**[0008]** Another object of the present invention is to provide a chair with a resilient back that is capable of obtaining any backward pressed angle by adjusting a bore.  
**[0009]** Another object of the present invention is to provide a chair with a resilient back that is capable of pressing the back member backward and returning the back member back to an original position by ways of a deformation of the resilient rotating shaft, thereafter the cushion moves backward and returns an initial position to achieve a comfort.  
**[0010]** To obtain the above objective, a chair with a resilient back provided by the present invention contains:  
**[0011]** a back member, a cushion, and a support member, characterized in that: the support member includes a horizontally hollow tube in which an elastic mechanism is disposed, the back member includes two pressed pieces fixed on two sides thereof respectively, lower ends of the two pressed pieces connect with two ends of the elastic mechanism individually, and the cushion is secured on the support member;  
**[0012]** characterized in that the elastic mechanism is a torsion spring, a middle section of the elastic mechanism is fixed, and two outer ends of the torsion spring are coupled with the lower end of the pressed piece;  
**[0013]** characterized in that the elastic mechanism includes a positioning member, a resilient rotating shaft, two rotary blocks, two limiting members, and two locking members, the positioning member is fixed in the horizontally hollow tube of the support member and includes a first non-circular hole, the resilient rotating shaft is a non-circular bar and is inserted through the positioning member, each rotary block includes a second non-circular hole, and the two rotary blocks are fitted onto two ends of the resilient rotating shaft respectively, each limiting member includes a bore, a diameter of which is larger than that of the rotary block, so that the bore is fitted onto the rotary block, the two limiting members are covered on two

ends of the horizontally hollow tube individually, each pressed piece includes an aperture, a shape of which is identical to that of the rotary block, the rotary block is inserted into the aperture, the lower ends of the two pressed pieces are connected together via the two locking members and the resilient rotating shaft;  
**[0014]** characterized in that the pressed piece includes a third non-circular hole formed on the lower end thereof, the resilient rotating shaft is inserted through the lower end of the pressed piece and includes a slot arranged on a distal end thereof to retain the locking member;  
**[0015]** characterized in that the first non-circular hole of the positioning member is hexagonal, the resilient rotating shaft is formed in a hexagonal column and made of a steel, the second non-circular hole of the rotary block is hexagonal, and the third non-circular hole of the pressed piece is hexagonal;  
**[0016]** characterized in that a cross section of the rotary block is formed in a drum shape;  
**[0017]** characterized in that a rotating angle of the rotary block in the bore is 5-15 degrees, i.e., a backward pressed angle of the back member is 5-15 degrees;  
**[0018]** characterized in that the limiting members are connected with the horizontally hollow tube by selecting from a screw connecting, a bolt connecting, a rivet connecting, and a welding manner;  
**[0019]** characterized in that the cushion is slidably placed on the support member, and the support member includes two projections, and each projection includes a washer, the washer includes two rollers disposed on a lower side thereof, and the two rollers are covered by two covers individually and pressed on two washers respectively, two sides of the cushion are coupled with the two pressed pieces;  
**[0020]** characterized in that the pressed pieces and two armrests are integrally formed.

**BRIEF DESCRIPTION OF THE DRAWINGS**

**[0021]** FIG. 1 is a perspective view showing the assembly of a chair with a resilient back according to a first preferred embodiment of the present invention;  
**[0022]** FIG. 2 is a perspective view showing the exploded components of the chair with the resilient back according to the first preferred embodiment of the present invention;  
**[0023]** FIG. 3 is a partially amplified view showing of FIG. 2;  
**[0024]** FIG. 4 is a cross sectional view of a rotary blocks of the chair with the resilient back according to the first preferred embodiment of the present invention;  
**[0025]** FIG. 5 is a cross sectional view showing the operation of the rotary blocks of the chair with the resilient back according to the first preferred embodiment of the present invention;  
**[0026]** FIG. 6 is a perspective view showing the assembly of a chair with a resilient back according to a second preferred embodiment of the present invention;  
**[0027]** FIG. 7 is a perspective view showing the exploded components of a chair with a resilient back according to a third preferred embodiment of the present invention.

**DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

**[0028]** The present invention will be clearer from the following description when viewed together with the accompa-

nying drawings, which show, for purpose of illustrations only, the preferred embodiment in accordance with the present invention.

[0029] With reference to FIGS. 1-3, a chair with a resilient back according to a first preferred embodiment of the present invention comprises a back member 1, a cushion 12, and a support member 18, the support member 18 includes a horizontally hollow tube 9 in which an elastic mechanism 23 is disposed, the back member 1 includes two pressed pieces 2 fixed on two sides thereof respectively, lower ends of the two pressed pieces 2 connect with two ends of the elastic mechanism 23 individually, and the cushion 12 is secured on the support member 18.

[0030] The elastic mechanism 23 includes a positioning member 8, a resilient rotating shaft 6, two rotary blocks 5, two limiting members 4, and two locking members 7, wherein the positioning member 8 is fixed in the horizontally hollow tube 9 of the support member 18 and includes a first non-circular hole, the resilient rotating shaft 6 is a non-circular bar and is inserted through the positioning member 8, each rotary block 5 includes a second non-circular hole, and the two rotary blocks 5 are fitted onto two ends of the resilient rotating shaft 6 respectively, each limiting member 4 includes a bore 19, a diameter of which is larger than that of the rotary block 5, so that the bore 19 is fitted onto the rotary block 5, the two limiting members 4 are covered on two ends of the horizontally hollow tube 9 individually, each pressed piece 2 includes an aperture 11, a shape of which is identical to that of the rotary block 5, so that the rotary block 5 is inserted into the aperture 11, the lower ends of the two pressed pieces 2 are connected together via the two locking members 7 and the resilient rotating shaft 6.

[0031] The pressed piece 2 also includes a third non-circular hole formed on the lower end thereof, the resilient rotating shaft 6 is inserted through the lower end of the pressed piece 2 and includes a slot 21 arranged on a distal end thereof to retain the locking member 7.

[0032] In this embodiment, the first non-circular hole of the positioning member 8 is hexagonal, the resilient rotating shaft 6 is formed in a hexagonal column and made of a steel, the second non-circular hole of the rotary block 5 is hexagonal, and the third non-circular hole of the pressed piece 2 is hexagonal as well, such that an axial force is transmitted easily by using the first, the second, and the third non-circular holes of the positioning member 8, the rotary block 5, and the pressed piece 2 and the resilient rotating shaft 6. Of course, the first, the second, the third non-circular holes of the positioning member 8, the rotary block 5, and the pressed piece 2 can be semi-circular, oval, oblong, pentagonal, and trapezoid to transmit the axial force.

[0033] A cross section of the rotary block 5 is formed in a drum shape (as shown in FIG. 4). A rotating angle of the rotary block 5 in the bore 19 is 5-15 degrees (as illustrated in FIG. 5), i.e., a backward pressed angle of the back member 1 is 5-15 degrees to obtain a comfort and a safety purpose. Thereby, any desired backward pressed angle of the back member 1 is obtained by adjusting bore 19.

[0034] In this embodiment, the limiting member 4 is connected with the horizontally hollow tube 9 by welding.

[0035] The cushion 12 is slidably placed on the support member 18, and the support member 18 includes two projections 22, and each projection 22 includes a washer 10, the washer 12 includes two rollers 15 disposed on a lower side thereof, and the two rollers 15 are fixed beneath the washer 12

by means of two stems 16 and covered by two covers 14 individually, the two rollers 15 are pressed on two washers 10 respectively, two sides of the cushion 12 are coupled with the two pressed pieces 2 by ways of two bolts 13 individually. Thereby, when the back member 1 is pressed backward, the cushion 12 rotates with the back member 1.

[0036] In this embodiment, the support member 18 includes four pads 17 secured therebeneath to prevent the chair from movement.

[0037] The pressed pieces 2 and two armrests 3 are integrally formed to enhance an aesthetics appearance and facilitate production.

[0038] Referring to FIG. 6, a chair with a resilient back according to a second preferred embodiment of the present invention comprises a support member 18 having four feet.

[0039] A chair with a resilient back according to a third preferred embodiment of the present invention comprises a back member 1, a cushion 12, and a support member 18, the support member 18 includes a horizontally hollow tube 9 in which an elastic mechanism 23 is disposed, and the back member 1 includes two pressed pieces 2 fixed on two sides thereof respectively, and lower ends of the two pressed pieces 2 connect with two ends of the elastic mechanism 23 individually, the cushion 12 is slidably placed on the support member 18.

[0040] In this embodiment, the elastic mechanism 23 is a torsion spring 20 (as illustrated in FIG. 7), wherein a middle section of the elastic mechanism 20 is fixed, and two outer ends of the torsion spring 20 are coupled with the lower end of the pressed piece 2.

[0041] It is to be noted that the horizontally hollow tubes 9 of the first, the second, and the third embodiments are all integrally formed on the support member 18. Of course, the horizontally hollow tubes 9 are capable of being connected with the support member 18.

[0042] While we have shown and described various embodiments in accordance with the present invention, it is clear to those skilled in the art that further embodiments may be made without departing from the scope of the present invention.

What is claimed is:

1. A chair with a resilient back comprising:

a back member, a cushion, and a support member, characterized in that: the support member includes a horizontally hollow tube in which an elastic mechanism is disposed, the back member includes two pressed pieces fixed on two sides thereof respectively, lower ends of the two pressed pieces connect with two ends of the elastic mechanism individually, and the cushion is secured on the support member.

2. The chair with a resilient back as claimed in claim 1, characterized in that the elastic mechanism is a torsion spring, a middle section of the elastic mechanism is fixed, and two outer ends of the torsion spring are coupled with the lower end of the pressed piece.

3. The chair with a resilient back as claimed in claim 1, characterized in that the elastic mechanism includes a positioning member, a resilient rotating shaft, two rotary blocks, two limiting members, and two locking members, the positioning member is fixed in the horizontally hollow tube of the support member and includes a first non-circular hole, the resilient rotating shaft is a non-circular bar and is inserted through the positioning member, each rotary block includes a second non-circular hole, and the two rotary blocks are fitted

onto two ends of the resilient rotating shaft respectively, each limiting member includes a bore, a diameter of which is larger than that of the rotary block, so that the bore is fitted onto the rotary block, the two limiting members are covered on two ends of the horizontally hollow tube individually, each pressed piece includes an aperture, a shape of which is identical to that of the rotary block, the rotary block is inserted into the aperture, the lower ends of the two pressed pieces are connected together via the two locking members and the resilient rotating shaft.

4. The chair with a resilient back as claimed in claim 3, characterized in that the pressed piece includes a third non-circular hole formed on the lower end thereof, the resilient rotating shaft is inserted through the lower end of the pressed piece and includes a slot arranged on a distal end thereof to retain the locking member.

5. The chair with a resilient back as claimed in claim 4, characterized in that the first non-circular hole of the positioning member is hexagonal, the resilient rotating shaft is formed in a hexagonal column and made of a steel, the second non-circular hole of the rotary block is hexagonal, and the third non-circular hole of the pressed piece is hexagonal.

6. The chair with a resilient back as claimed in claim 3, characterized in that a cross section of the rotary block is formed in a drum shape.

7. The chair with a resilient back as claimed in claim 3, characterized in that a rotating angle of the rotary block in the bore is 5-15 degrees, and a backward pressed angle of the back member is 5-15 degrees.

8. The chair with a resilient back as claimed in claim 3, characterized in that the limiting members are connected with the horizontally hollow tube by selecting from a screw connecting, a bolt connecting, a rivet connecting, and a welding manner.

9. The chair with a resilient back as claimed in claim 1, characterized in that the cushion is slidably placed on the support member, and the support member includes two projections, and each projection includes a washer, the washer includes two rollers disposed on a lower side thereof, and the two rollers are covered by two covers individually and pressed on two washers respectively, two sides of the cushion are coupled with the two pressed pieces.

10. The chair with a resilient back as claimed in claim 1, characterized in that the pressed pieces and two armrests are integrally formed.

11. The chair with a resilient back as claimed in claim 2, characterized in that the pressed pieces and two armrests are integrally formed.

12. The chair with a resilient back as claimed in claim 3, characterized in that the pressed pieces and two armrests are integrally formed.

13. The chair with a resilient back as claimed in claim 4, characterized in that the pressed pieces and two armrests are integrally formed.

14. The chair with a resilient back as claimed in claim 5, characterized in that the pressed pieces and two armrests are integrally formed.

15. The chair with a resilient back as claimed in claim 6, characterized in that the pressed pieces and two armrests are integrally formed.

16. The chair with a resilient back as claimed in claim 7, characterized in that the pressed pieces and two armrests are integrally formed.

17. The chair with a resilient back as claimed in claim 8, characterized in that the pressed pieces and two armrests are integrally formed.

18. The chair with a resilient back as claimed in claim 9, characterized in that the pressed pieces and two armrests are integrally formed.

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