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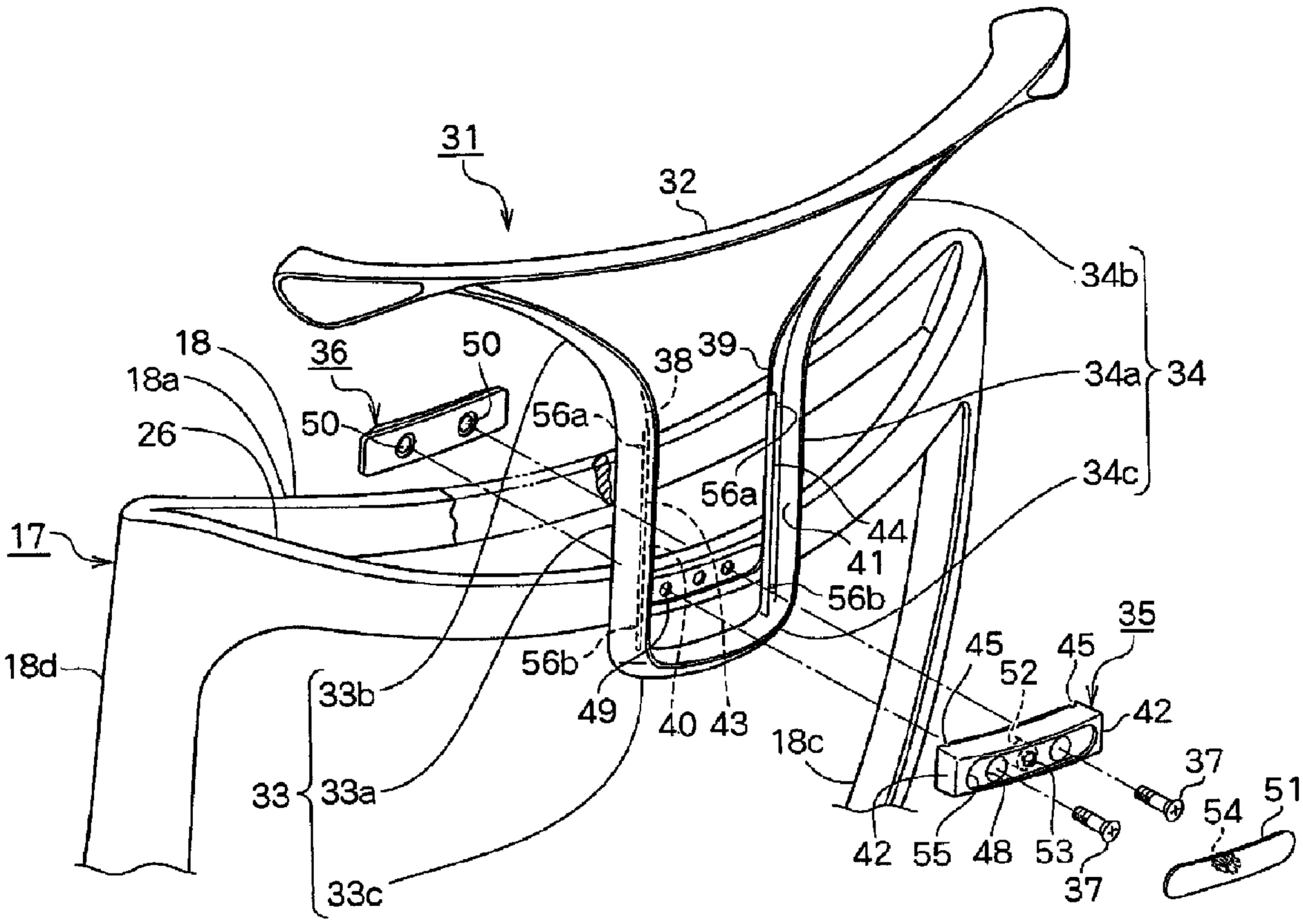
(54) Titre : STRUCTURE EXTENSIBLE EN MATIERE EXTENSIBLE DANS UNE CHAISE ET DOSSIER DE CHAISE

(54) Title: CHAIR AND THE STRUCTURE FOR STRETCHING A MESH OVER AN ELEMENT OF THE CHAIR



(57) Abrégé/Abstract:
A structure of stretching mesh over an element of a chair comprising a frame comprising a pair of frame rods having groove along inner side edge on the frame rod, the mesh comprising a pair of edge portions which is wound front surface of each of said pair of the frame rods to a rear surface around an outer side edge, and an edge piece mounted to the edge portion of the mesh and having a hook-like portion at one end including an outward portion and a turning portion, said edge piece engaging on a corner between an inner side surface and the front surface of the frame rod and engaging in the groove so that the mesh is stretched over the frame.

ABSTRACT

A structure of stretching mesh over an element of a chair comprising a frame comprising a pair of frame rods having groove along inner side edge on the frame rod, the mesh comprising a pair of edge portions which is wound front surface of each of said pair of the frame rods to a rear surface around an outer side edge, and an edge piece mounted to the edge portion of the mesh and having a hook-like portion at one end including an outward portion and a turning portion, said edge piece engaging on a corner between an inner side surface and the front surface of the frame rod and engaging in the groove so that the mesh is stretched over the frame.

SPECIFICATION

CHAIR AND THE STRUCTURE FOR STRETCHING A MESH OVER AN ELEMENT OF THE CHAIR

TECHNICAL FIELD

The present invention relates to a chair and the structure for stretching a mesh over the backrest, a seat, a headrest etc. of the chair.

BACKGROUND OF THE INVENTION

US6,386,634B1 discloses the backrest structure of a chair and the stretching structure of a mesh in the backrest in which edge material is mounted by molding around the mesh to which tension is already applied, the edge material engaging in grooves in a front surface of a back frame to apply mesh over the front surface of the back frame.

JP2004-49685A discloses that an engagement piece mounted to the periphery of a mesh engages on a peripheral groove on the rear surface of a back frame, said engagement piece being pressed into the groove by the binding frame mounted to the rear surface of the back frame to apply tension to the mesh over the upper surface of the back frame.

A hanger for having clothes of a sitting person is mounted to the backrest of a chair in JP6-45553U, JP2004-159745A, JP9-10189U, JP11-155690A and JP5-7179U.

PROBLEMS TO BE SOLVED BY THE INVENTION

However, US6,386,634B1 discloses that it is necessary to take the width of the back frame to prevent flexure of the back frame by force applied to the mesh when the user sits down, a groove which

engages with the edge material around the mesh being formed on the front surface of the back frame so that the periphery of the back frame is exposed from the mesh. The back frame greatly occupying the appearance of the chair causes bad appearance in design.

In JP2004-49685A, when a user sits down on the chair, flexing of the back frame against the force applied to the mesh is prevented by both the back frame and binding frame. Thus, the back frame covered with the mesh and binding frame not covered with the mesh are overlapped and exposed to the outside, which does not produce good appearance in design as well as heavy weight, a lot of the parts, a lot of time for assembling and high cost.

In JP6-45553U and JP2004-159745A, the support rod for supporting the hanger body is directly mounted in the middle of the rear surface of the backrest. It cannot be applied to a chair in which mesh is applied to the back frame. And a special device is required so that the mounting parts do not project from the front surface of the backrest when the support rod is directly attached to the middle of the rear surface of the backrest.

In JP9-10189U, JP11-155690A and JP5-7179U, the support rod is mounted to the transverse rod at the lower part of the rear of the backrest or support post standing from the lower part thereby increasing the length of the support rod. When the chair is pulled with the hunger body, the hanger is likely to be broken.

In view of the above disadvantages in the prior art, it is objects of the present invention to solve the problems below:

(A) To provide a chair with the backrest structure in which the ratio of the back frame is small with respect to the appearance of the

chair, having good design, light weight, reduction in the number of parts and improvement in assembling.

(B) To provide a chair with a hanger in which the hanger is easily mounted to the backrest to allow parts for mounting the hanger not to project from the front surface of the backrest, preventing the hanger from being damaged and providing good appearance.

(C) To provide the structure for a mesh over the backrest of a chair in which the ratio of a frame to appearance of the chair is small to provide good appearance, light weight, reduction in the number of parts and improvement in assembling.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a front elevational view of the first embodiment of a chair according to the present invention;

Fig. 2 is a side elevational view thereof;

Fig. 3 is a rear perspective view thereof;

Fig. 4 is a front perspective view of the backrest;

Fig. 5 is a sectional view taken along the line V-V in Fig. 4;

Fig. 6 is a sectional view taken along the line VI-VI in Fig. 4;

Fig. 7 is an enlarged perspective view of the part VII in Fig. 4;

Fig. 8 is a side view of the second embodiment of a chair with a hanger according to the present invention;

Fig. 9 is an enlarged rear perspective view of main part of the chair in Fig. 8;

Fig. 10 is a rear enlarged exploded perspective view of the chair in Fig. 8;

Fig. 11 is a front enlarged exploded perspective view thereof;

Fig. 12 is an enlarged sectional view taken along the line

XII-XII in Fig. 9; and

Fig. 13 is an enlarged sectional view taken along the line XIII-XIII in Fig. 9.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Figs. 1-7 show the first embodiment of the present invention.

The present application is applied to the structure of the backrest of the chair and the structure of mesh in the backrest.

As shown in Figs. 1 and 2, a reclining chair 1 comprises a leg 4 comprising five leg rods 3 each of which has a caster 2 at the end. At the center of the leg 4, a telescopic leg post 6 which comprises a gas spring 5 stands. At the upper end of the leg post 6, a rear part of a support base 7 is fixed.

The support base 7 comprises a hollow rhombus-like box which opens at an upper front part, and arms 8,8 are integrally formed from each side of the front part of the support base 7.

A hexagonal pivot 9 passes through the support base 7 in the middle. At each end of the pivot 9 extending from the support base 7, a tubular portion 11a fits. The tubular portions 11a are provided at the lower front ends of a pair of backrest support rods 11,11 that support a backrest 10. The backrest 10, the backrest support rods 11,11 and the backrest 10 are rotated around the pivot 9 with respect to the support base 7.

Inside the support base 7, there are provided a rubber torsion unit for promoting the pivot 8 in an anticlockwise direction and a promoting–force adjusting device (not shown). In the middle of the front lower surface of the support base 7, there is a gas spring unit 13 for assisting promoting force of the rubber torsion unit in connection

with the rubber torsion unit to form a force-promoting unit to stand the backrest 10.

Short arms 12,12 project from the backrest support rods 11,11 at the back of the pivot 9. At the upper ends of the arms 12,12, a pair of seat-supporting frames 15,15 which support each side of a seat 14 are connected at the rear ends with a shaft 16.

The backrest 10 will be described with respect to Figs. 3-7.

In Fig. 3, a back frame 17 of the backrest 10 comprises a rectangular synthetic-resin front face frame 18. The front face frame 18 comprises an upper frame rod 18a, a lower frame rod 18b, a left-side frame rod 18c and a right-side frame rod 18d. The rods 18b,18d are wider than the rods 18a,18b. A mesh is held on the rods 18a,18b,18c,18d.

In Figs. 4 and 5, a pair of grooves 19,20 is formed longitudinally on the outer side surfaces of the right and left side frame rods 18c,18d.

In Fig. 6, a groove 21 is horizontally formed along the lower edge of the front surface of the upper frame rod 18a, and a groove 22 is horizontally formed along the upper edge of the front surface of the lower frame rod 18b.

A surface 21a between the lower edge of the front surface of the upper frame rod 18a and the groove 21 and a surface 22a between the upper edge of the front surface of the lower frame rod 18b and the groove 22 are grooved by thickness of an outward portion 25b of an edge piece 25. When the edge piece 25 engages with a corner between the lower surface and the front surface of the upper frame rod 18a and the front surface and with a corner between the upper

surface and the front surface of the lower frame rod 18b, the end face of each of the edge piece 25 is coplanar with the front surfaces of the upper frame rod 18a and the lower frame rod 18b.

A mesh 23 may be preferably net-like or mesh-like material knitted or woven from high-tension plastic or other elastic fibers, or may be woven fabric, synthetic resin sheet or porous sheet. Synthetic resin edge pieces 24,24 which engage in a pair of grooves 19,20 are fixed in the left and right side edges of the mesh 23 by molding. The synthetic-resin edge pieces 25,25 which has a hook-like portions 25d,25d and engage in the grooves 21,22 are fixed in the upper and lower edges by molding.

The edge piece 25 comprises a base 25a, the outward portion 25b, and a turning portion 25c which turns in parallel with the base 25a from the end of the outward portion 25b. The base 25a and the outward portion 25b constitute the hook-like portion 25d.

The size of the mesh 23 mounted to the edge pieces 24,24,25,25 is formerly determined to apply a suitable tension to the mesh 23 when the edge pieces 24,24,25,25 engage in the grooves 19,20 or the grooves 21,22.

In Figs. 4-7, the right and left edge pieces 24,24 of the mesh 23 engage in the grooves 19,20 of the right and left side frame rods 18c,18d. The upper and lower ends of the mesh 23 are wound from the front surface to the rear surface around the upper and lower surfaces of the upper and lower frame rods 18a,18b. The hook-like portions 25d,25d of the upper and lower edge pieces 25,25 engage on the corner between the lower surface and the front surface, and the corner between the upper surface and the front surface. The turning

portions 25c,25c of the upper and lower edge pieces 25,25 engage in the upper and lower grooves 21,22, so that the mesh 23 is stretched over the entire front surface of the front face frame 18 tensionally.

Thus, the front surface of the front face frame 18 or the front surface of the back frame 17 is entirely covered with the mesh 23. So the back frame 17 is not so occupied in the appearance of the chair, so that good impression is given in design.

In Figs. 3 and 6, to each side end of the upper frame rod 18a of the front face frame 18, an arcuate upper reinforcement rod 26 is joined so that the middle of the rod 26 is spaced apart from the upper frame rod 18a. The upper reinforcement rod 26 and the upper frame rod 18a is like crescent.

The upper reinforcement rod 26 keeps strength of the upper part of the back frame 17 together with the back frame 17. When a user is reclined on the backrest 10, it is allowed for the upper frame rod 18a to be slightly flexed elastically.

The upper reinforcement rod 26 is spaced apart from the upper frame rod 18a. Thus, without hindering attachment of the mesh 23, a headrest 27 as shown by dotted lines in Fig. 4 and an optional member such as a hanger for clothes in Fig. 8 and so on are detachably mounted.

The upper reinforcement rod 26 is also used with a hand when the chair is moved.

In Figs. 3, 6 and 7, to the lower ends of the right and left side frame rods 18c,18d of the front face frame 18, both ends of the lower reinforcement rod 28 are coupled. The middle of the lower frame rod 18b is spaced forward of the lower reinforcement rod 28, but each end

thereof is fastened to each end of the lower reinforcement rod 28 with a screw 29.

The lower end of the mesh 23 is wound around the lower frame rod 18b after the lower frame rod 18b is fastened to the front surface of the lower reinforcement rod 28. A folding portion 25c of the lower edge piece 25 is engaged in the groove 22 of the lower frame rod 18b, so that the mesh 23 is mounted to the lower frame rod 18b.

When the chair is scrapped, a tool such as a screwdriver (not shown) is stuck through the mesh 23 and engaged with a head of the screw 29 which is loosened, so that the lower frame rod 18b is removed from the lower reinforcement rod 28. Thereafter, the upper edge of the mesh 23 and the right and left side edges are removed from the upper frame rod 18a and the right and left side frame rods 18c,18d with the edge members 25,24,24. The mesh 23 is separately removed from the back frame 17 and replaced with a new one.

When the chair is moved and hit with another chair, the lower frame rod 18b is protected by the lower reinforcement rod 28, so that the lower ends of the lower frame rod 18b and the mesh 23 are prevented from being damaged.

Figs. 8-13 show the second embodiment in which a hanger is mounted to the chair in the first embodiment of the present invention. The basic structure of the chair is similar to the first embodiment, and the same numerals are allotted to the same members. Description thereof is omitted.

A chair 30 with a hanger in the second embodiment of the invention comprises a hanger 31 that moves up and down behind the

backrest 10.

The hanger 31 comprises a hanger body 32 on which a suit can be hung; and a pair of support rods 33,34 which support the body 32. The support rods 33,34 are mounted on the backrest 10 with a mounting member 35 and a screw seat piece 36 by a screws 37.

The backrest 10 comprises the back frame 17 in which the mesh 23 in Figs. 1-7 is stretched over the front face frame 18. The middle of the hanger 31 is spaced apart from the upper frame rod 18a of the front face frame 18, and each end of the hanger 31 is mounted to the middle of the upper reinforcement rod 26 connected to the upper frame rod 18a.

A pair of support rods 33,34 comprises parallel vertical rod portions 33a,34a; extending rod portions 33b,34b inclined upward of the vertical rod portions 33a,34a; and connecting portions 33c,34c curved downward of the vertical rod portions 33a,34a. The support rods 33,34 are connected at inner ends of the connecting portions 33c,34c.

The upper ends of the extending rod portions 33b,34b are plain. The extending rod portions 33b,34b are mounted to the right and left ends of the hanger body 32 with screws (not shown), so that the support rods 33,34 are fixed to the hanger body 32.

The extending rod portions 33b,34b of the support rods 33,34 are curved forward. So the hanger body 32 is positioned in front of the rear end of the upper reinforcement rod 26.

Figs. 12 and 13 are enlarged sectional views taken along the line XII-XII and XIII-XIII in Fig. 9.

In Figs. 9-12, plain portions 40,41 are formed on opposite

surfaces 38,39 of the vertical rod portions 33a,34a of the right and left support rods 33,34.

A mounting member 35 comprises a thick rectangular plate. The right and left ends 42,42 are formed in size such that the mounting member 35 can engage in the plain portions 40,41 of the vertical rod portions 33a,34a of the right and left support rods 33,34.

On the inner side edges of the plain portions 40,41, vertical projections 43,44 are provided in parallel with each other.

The projections 43,44 engage in engagement grooves 45,45 on the front surface of the mounting member 35 so that the support rods 33,34 slidably move with respect to the mounting member 35.

In Figs. 11 and 12, vertical forward projections 46,46 are provided on the front surface of the vertical rod portions 33a,34a of the right and left support rods 33,34. On the rear surface of the upper reinforcement rod 26 of the backrest 10, vertical engagement grooves 47,47 are provided to engage with the forward projections 46,46.

Through holes 48,48 are formed in the mounting member 35, and through holes 49,49 are formed in the upper reinforcement rod 26. Blind bores 50,50 are formed in the rear surface of a screw seat piece 36 at a position corresponding to the through holes 48,48.

The hanger 31 will be mounted to the upper reinforcement rod 26 below.

The right and left support rods 33,34 having the hanger body 32 at the upper end contacts the upper reinforcement rod 26 to allow the forward projections 46,46 of the vertical rods 33a,34a of the support rods 33,34 to engage in the engagement grooves 47,47 on the

rear surface of the screw seat piece 26, thereby positioning the support rods 33,34.

Then, the right and left ends of the mounting member 35 engage in the plain portions 40,41 of the vertical rod portions 33a,34a of the right and left support rods 33,34. In the engagement grooves 45,45 on the front surface of the mounting member 35, the projections 43,44 of the plain portions 40,41 of the vertical rod portions 33a,34a engage, and the mounting member 35 is positioned between the right and left vertical rod portions 33a and 34a.

Then, the screw seat piece 36 contacts the front surface of the upper reinforcement rod 26. While the support rods 33,34 are put between the upper reinforcement rod 26 and the mounting member 35, the upper reinforcement rod 26 is held between the mounting member 35 and the screw seat piece 36. The screws 37,37 pass into the blind bores 50 of the screw seat piece 36 through the through holes 48,49, so that the hanger 31 is mounted to move up and down with suitable resistance behind the backrest.

An engagement bore 52 for mounting a cover member 51 is formed in the middle of the mounting member 35. An inward projection 53 is provided on a rear edge of the engagement bore 52. The cover member 51 comprises a thin elongate plate and has in the middle an engagement claw 54 which is engagable with the inward projection 53 of the engagement bore 52.

On the rear surface of the mounting member 35, there is formed a recess 55 which engages with the cover member 51. The engagement claw 54 of the cover member 51 is put in the engagement bore 52 of the mounting member 35 to allow the claw 54 to engage on

the inward projection 53. The entire cover member 51 engages in the recess 55, so that the cover member 51 is mounted to the mounting member 35.

The cover member 51 is also used as nameplate.

The hanger 31 is slidable up and down. When a suit is hung at an upper limit where the hanger slides, the hanger 31 moves down owing to the weight of the suit and the lower end of the suit contacts a floor, so that the suit is likely to become dirty.

For prevention, in Figs. 10 and 12, a plurality of small rearward projections 56a,56b are provided on the vertical rod portions 33a,34a. and an engagement groove 57 which is elastically engagable with the small projections 56a,56b are provided in Figs. 11 and 12. Thus, at a plurality of vertical positions where the small projections 56a,56b elastically engage in the engagement groove 57, the hanger can be held against a certain load.

By tightening the screw 37, the support rods 33,34 may be held between the upper reinforcement rod 26 and the mounting member 35. To change a height of the hanger 31, the screw 37 is loosened to allow the support rods 33,34 to move up and down. Thereafter, the screw 37 is tightened again to allow the hanger 31 to be held at a desired height.

Various modifications of the present invention may be possible without departing from the scope of claims.

For example, in the foregoing embodiment, the upper reinforcement rod 26 and the lower reinforcement rod 28 are mounted on the rear surface of the upper and lower frame rods 18a,18b. But the upper reinforcement rod 26 or the lower reinforcement rod 28 may

be omitted.

In the foregoing embodiments, the present invention is applied to the stretching structure of the mesh 23 of the backrest 10 of the chair, but may be applied to a seat of a chair or a headrest.

The edge member 25 is made like a letter L and may engage to a corner between the lower surface and front surface of the upper frame rod 18a or lower frame rod 18b.

1. A structure of stretching mesh over an element of a chair;
the said structure comprising:

a frame comprising a pair of frame rods having a groove along inner side edge on the frame rod;

the mesh comprising a pair of edge portions which is wound front surface of each of said pair of the frame rods to a rear surface around an outer side edge; and

an edge piece mounted to the edge portion of the mesh and having a hook-like portion at one end including an outward portion and a turning portion, said edge piece engaging on a corner between an inner side surface and the front surface of the frame rod and engaging in the groove so that the mesh is stretched over the frame.

2. The structure of claim 1 wherein the element of the chair comprises a backrest.

3. The structure of claim 1 wherein the element comprises a seat.

4 The structure of claim 1 wherein a surface between the inner edge and the groove of the surface of the frame rod is removed by thickness equal to that of the outward portion of the turning portion so that an end face of the edge piece is coplanar with the surface of the frame rod.

5. The structure of claim 4 wherein the mesh is pressed on the end face of the edge piece.

6. The structure of claim 1 wherein a longitudinal groove is formed on an

outer side surface of the frame rod, the edge portion and the edge piece fixed thereto being engaged in the groove.

FIG.1

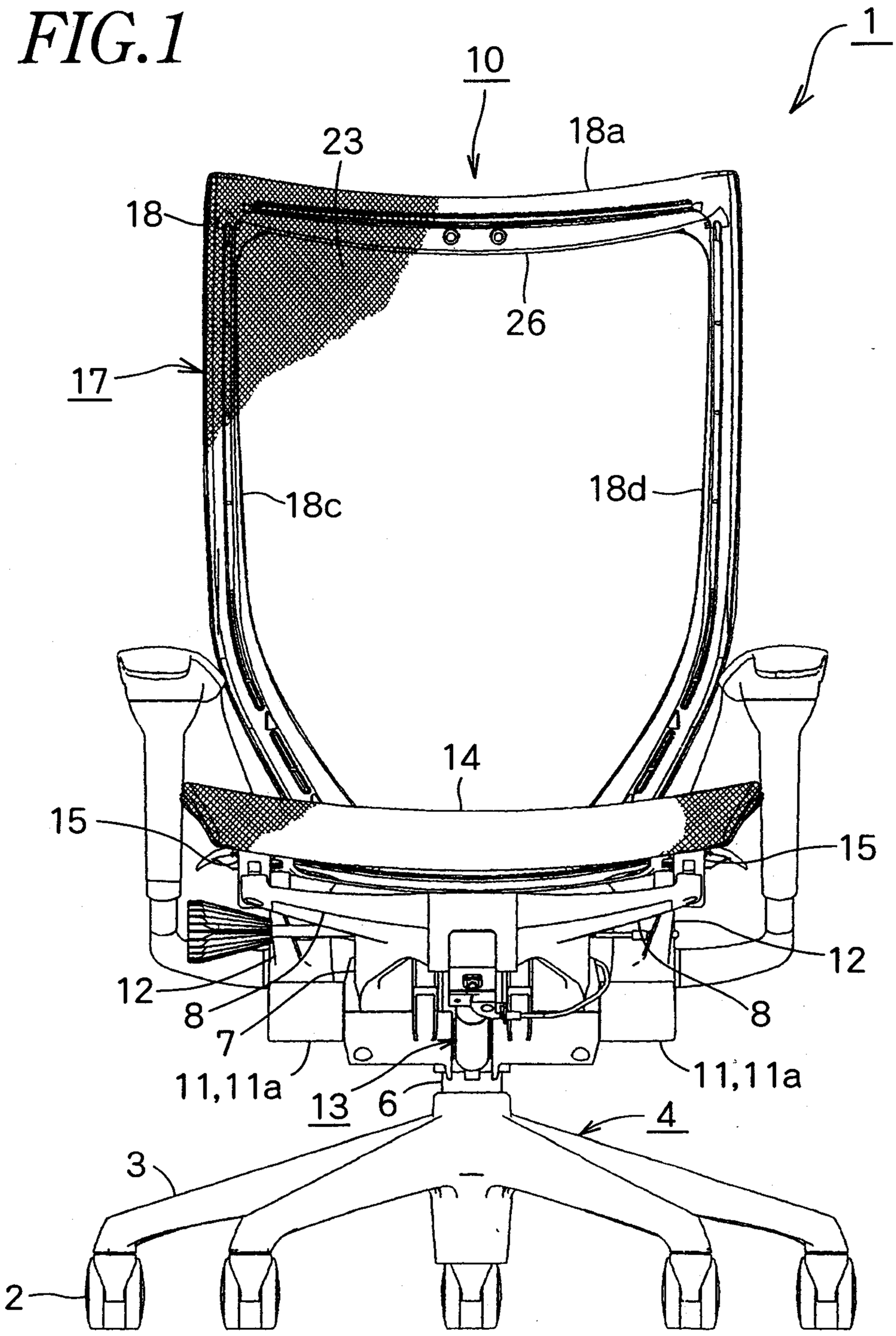


FIG.2

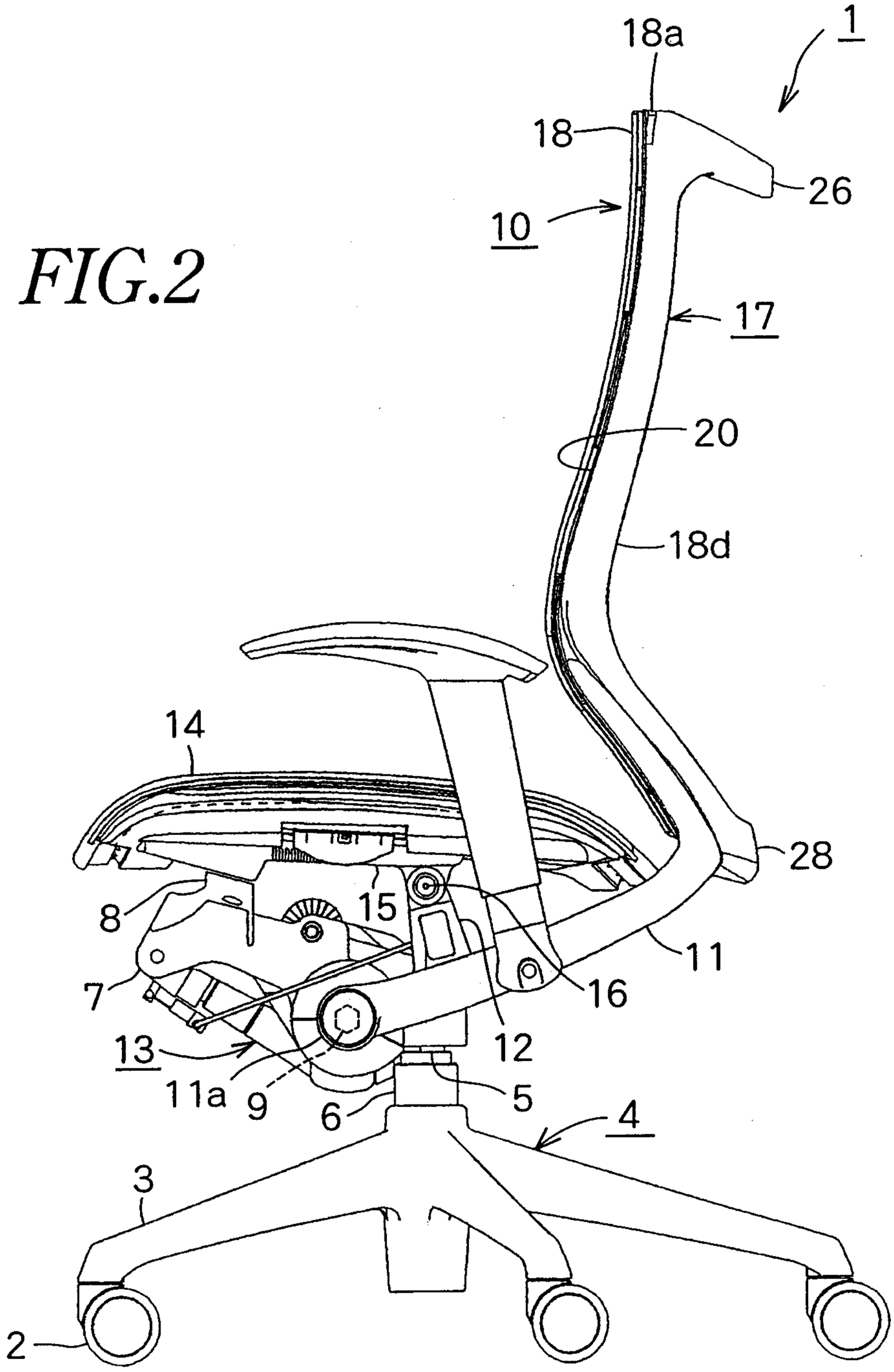


FIG.3

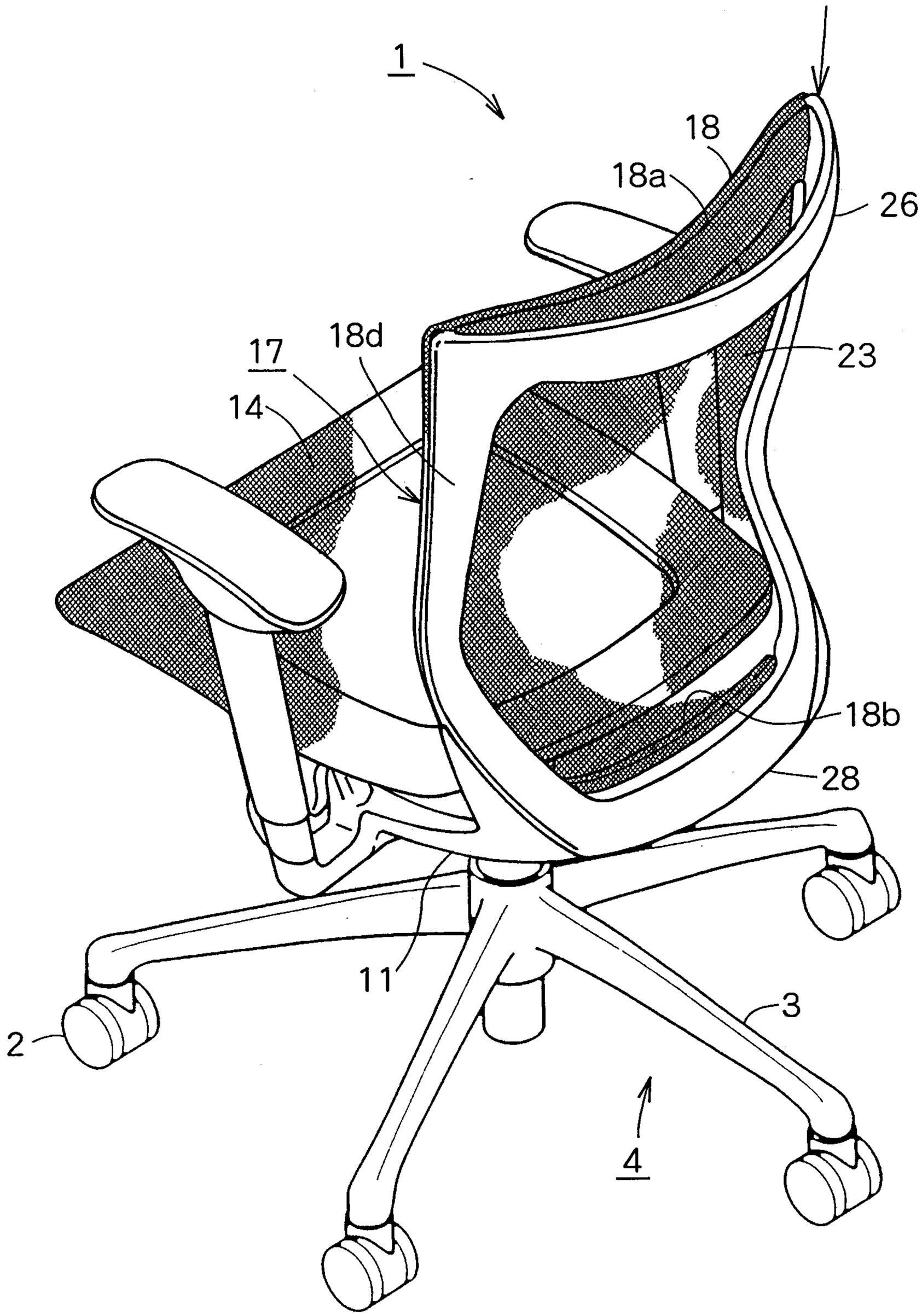
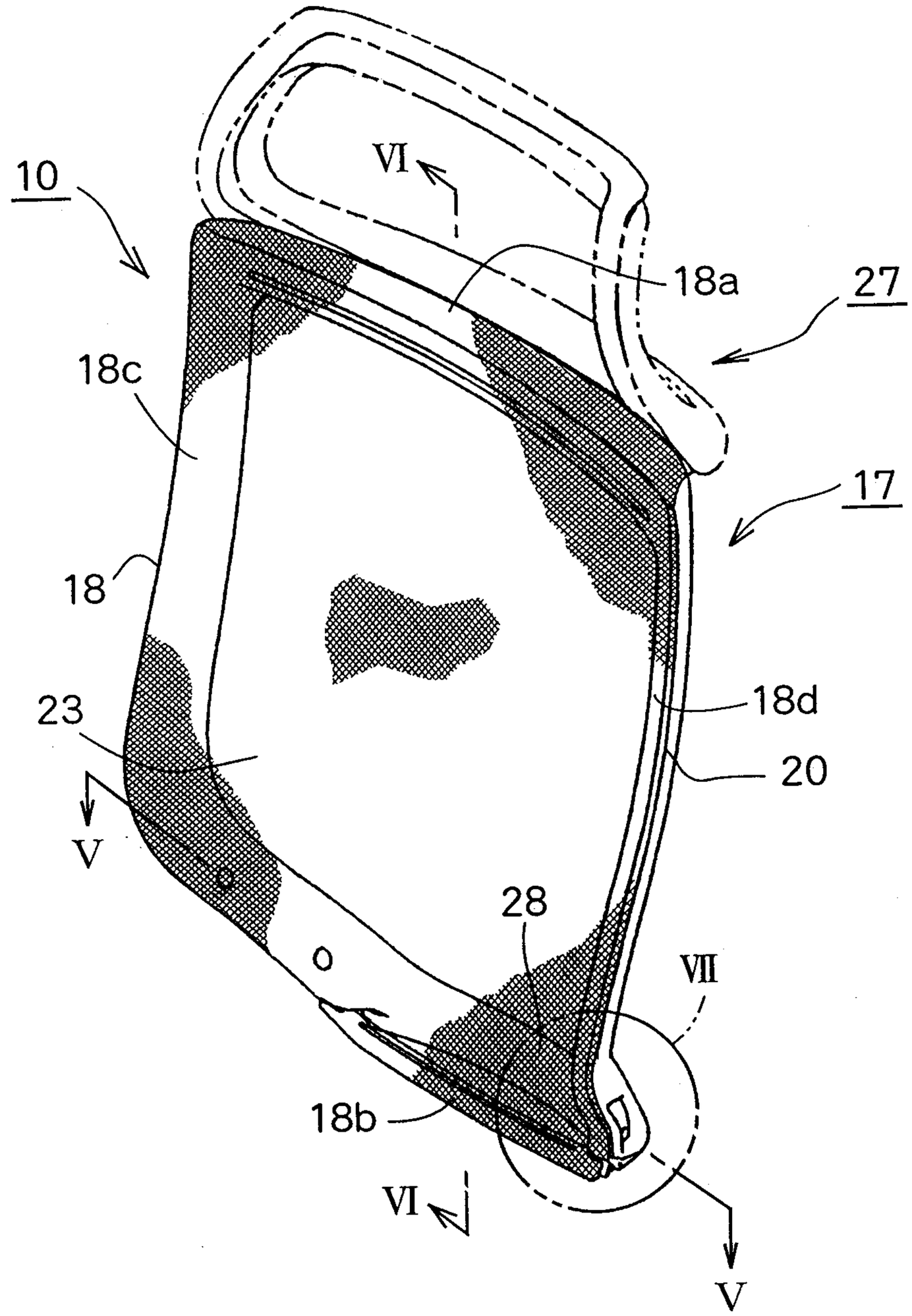


FIG.4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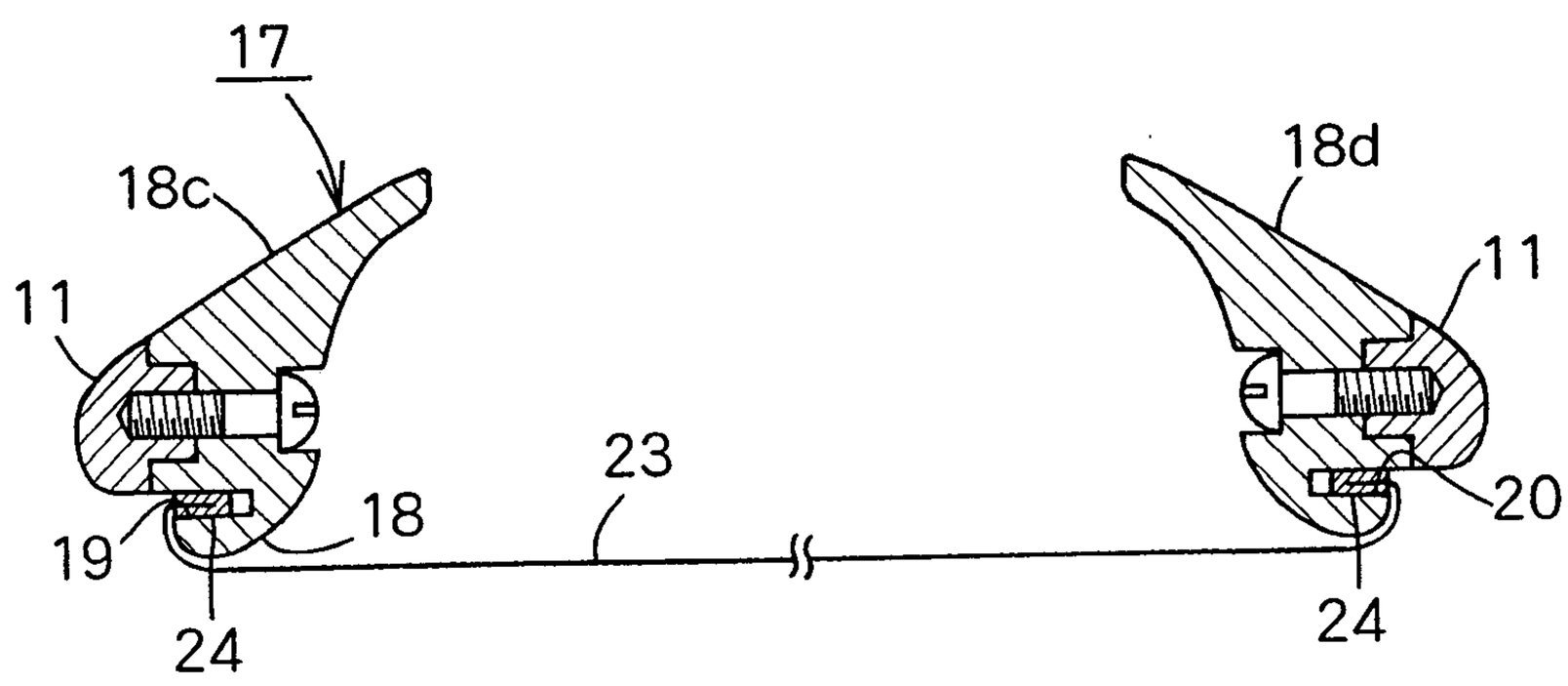
VI
18a
27
18c
17
18
18d
23
20
V
28
VII
18b
VI
V

FIG.5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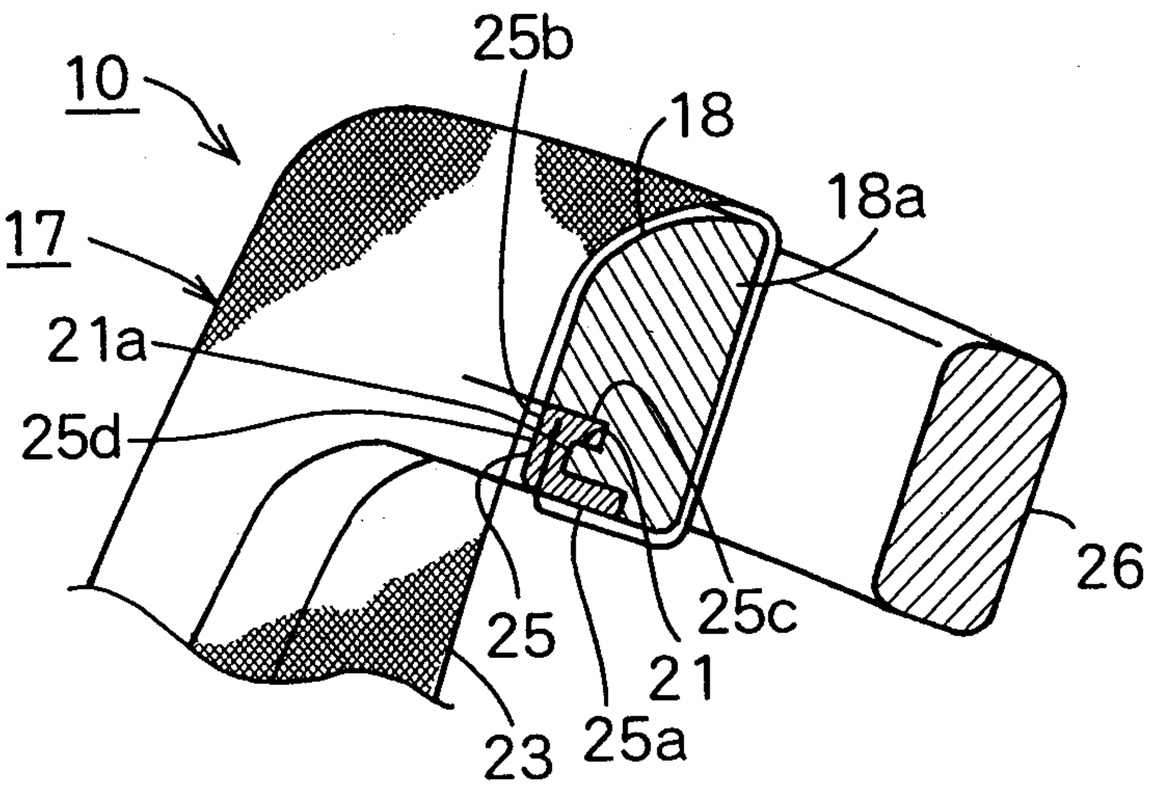
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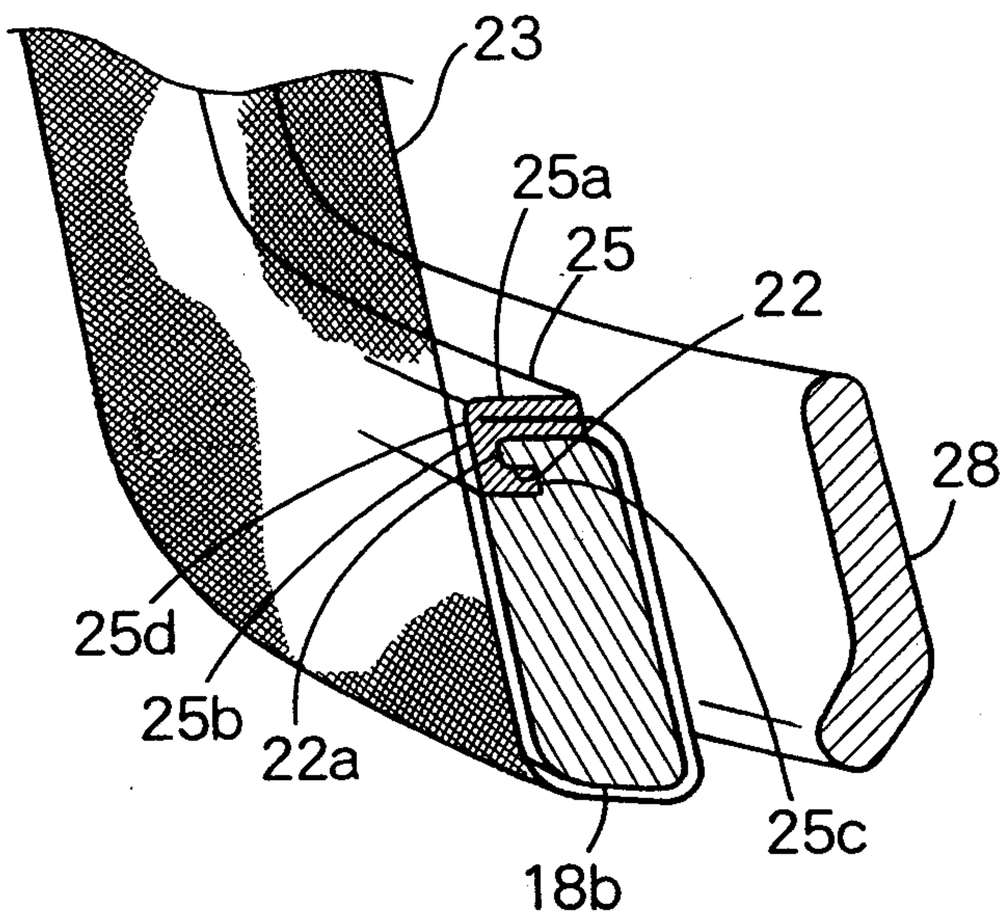
FIG.6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22
28
25d
25b
22a
25c
18b

FIG.7

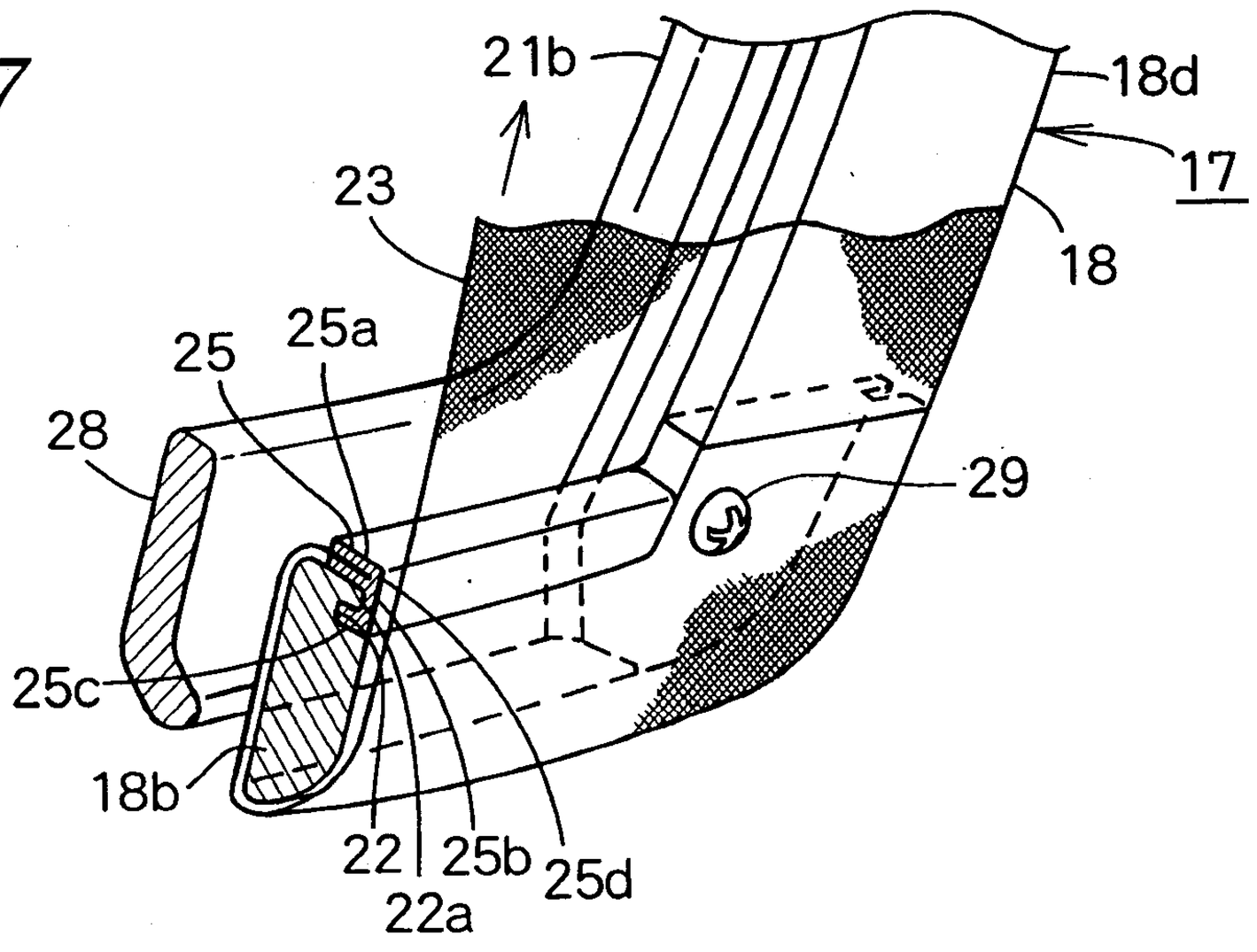
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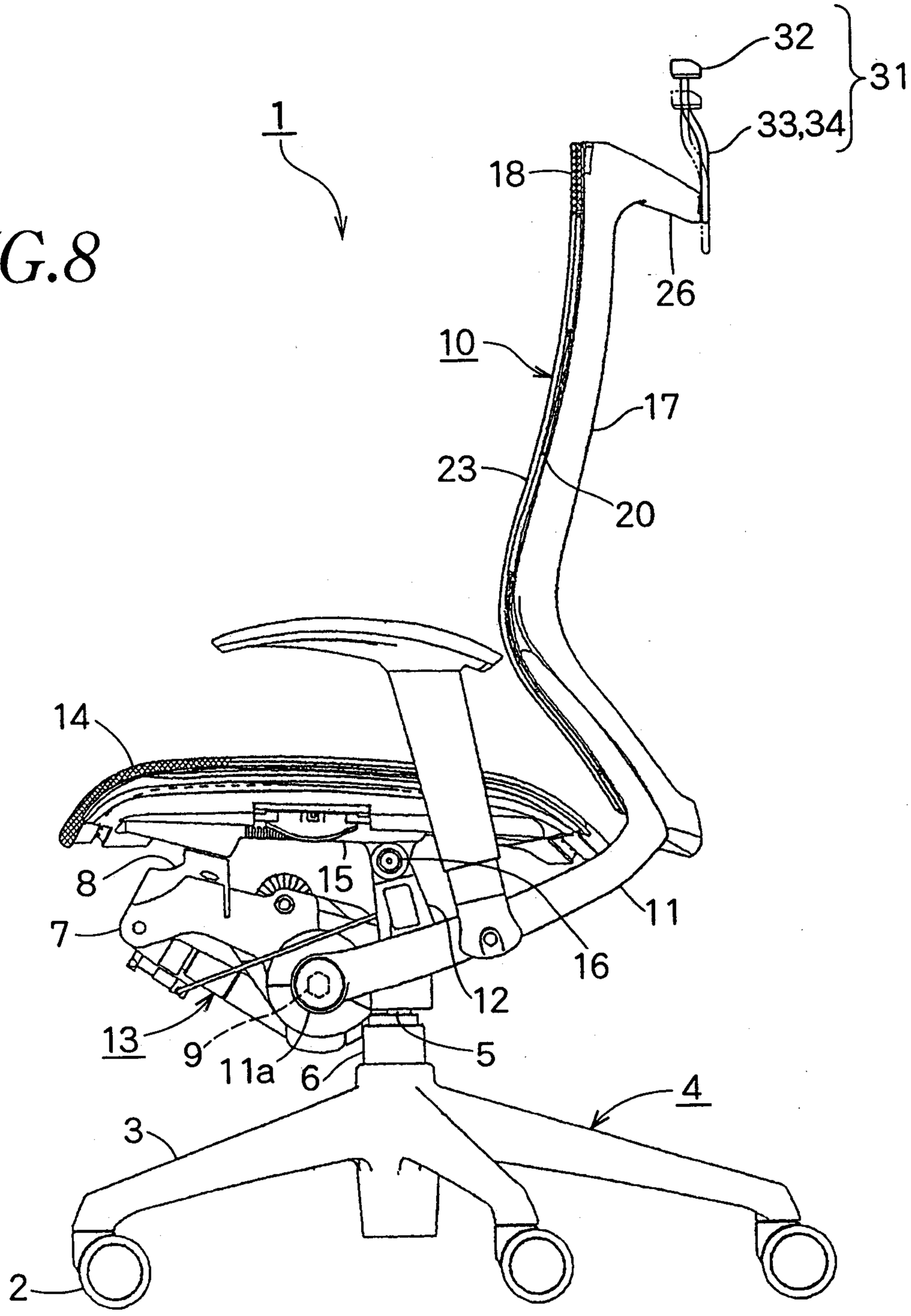
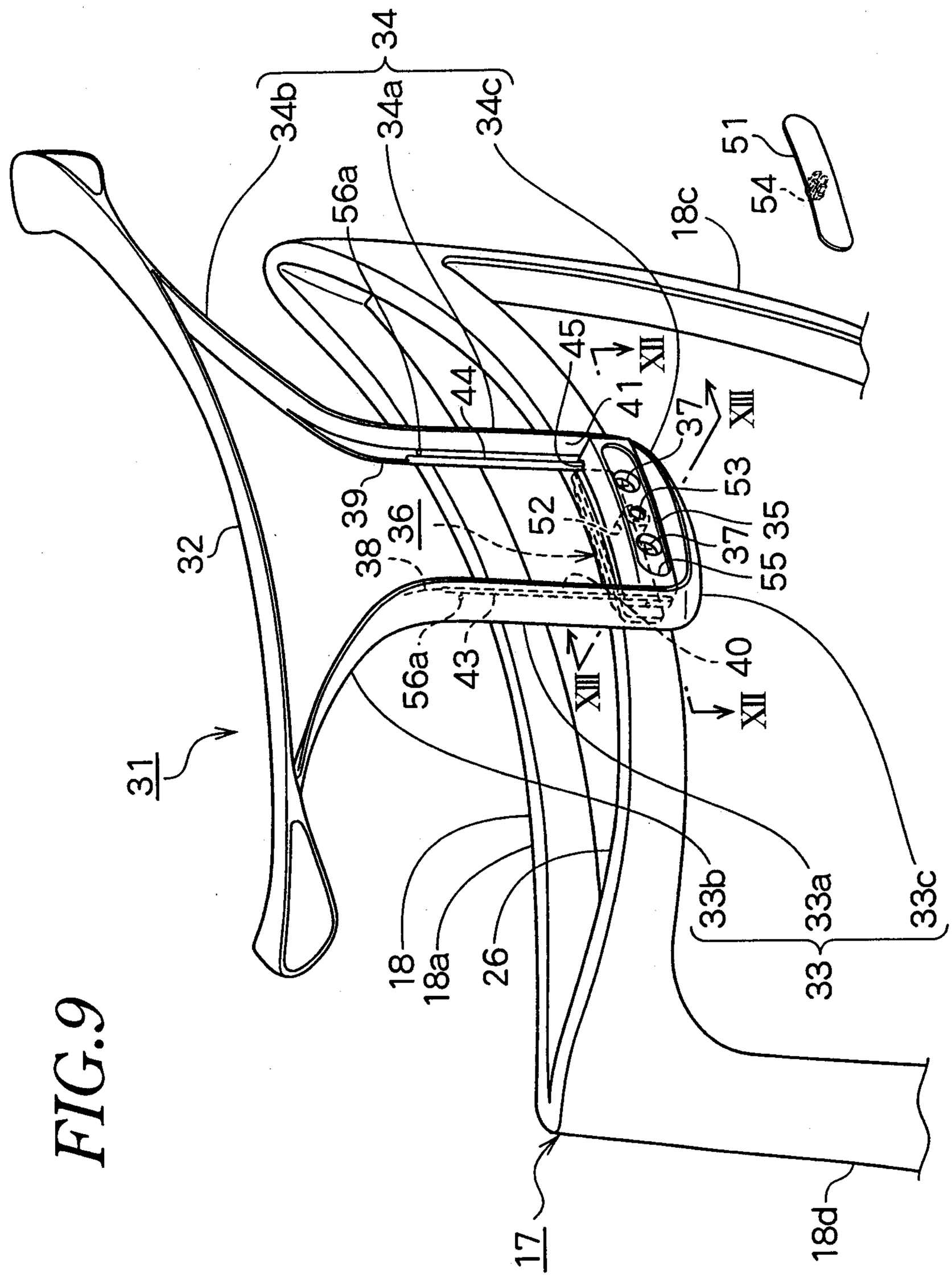
FIG.8

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55
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33c
18
18a
26
33
17
18d

FIG.9

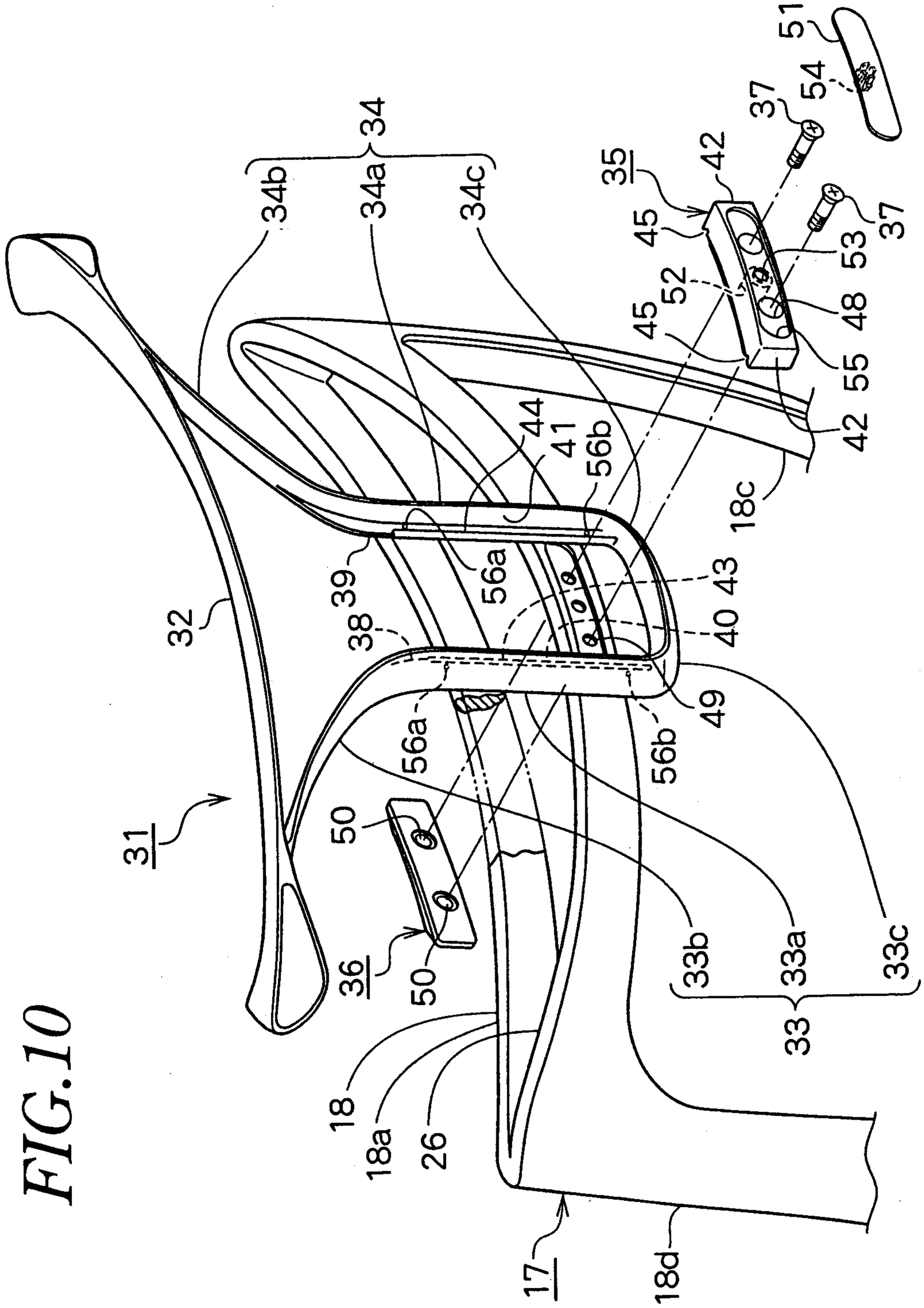
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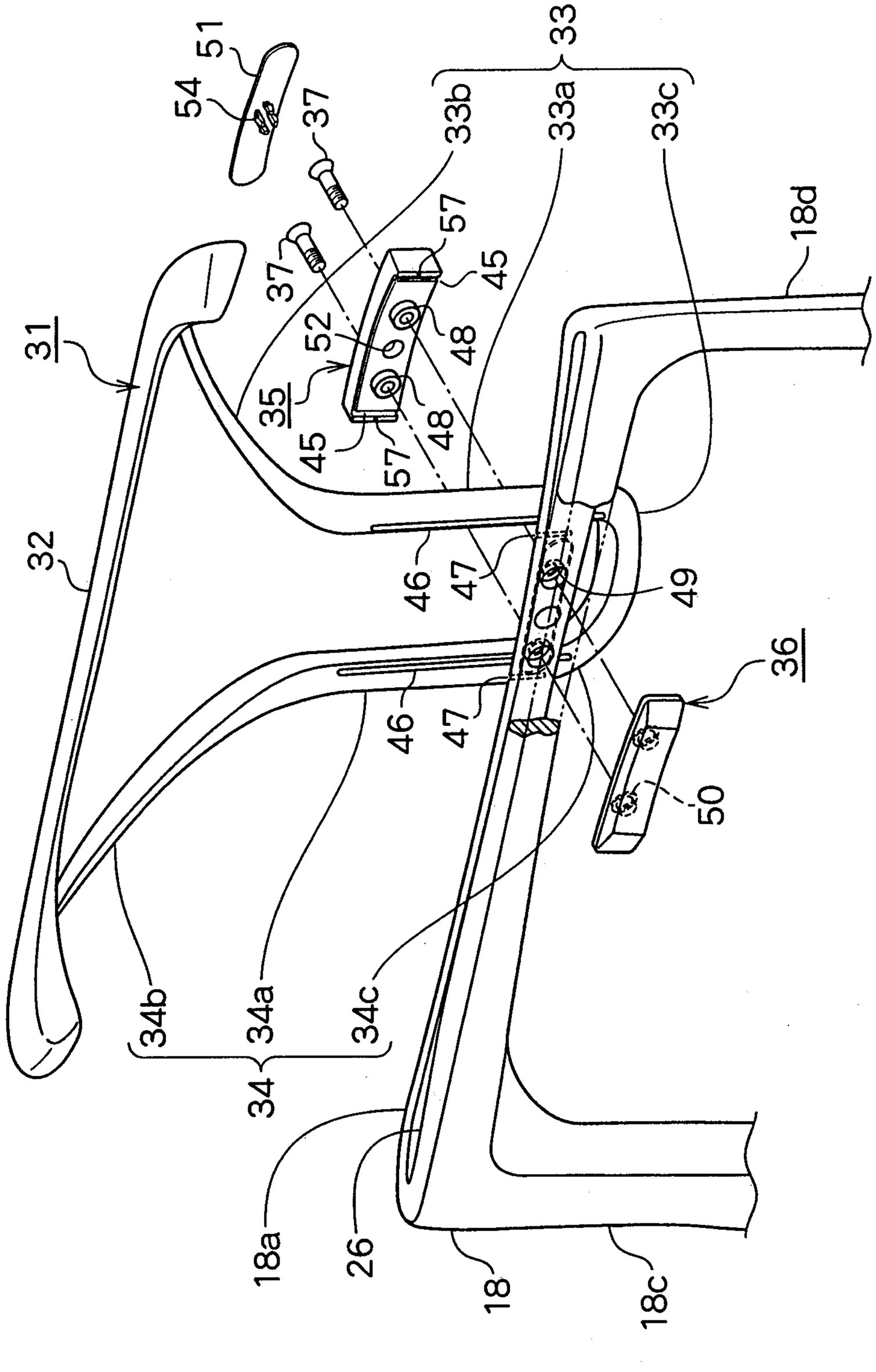
FIG.10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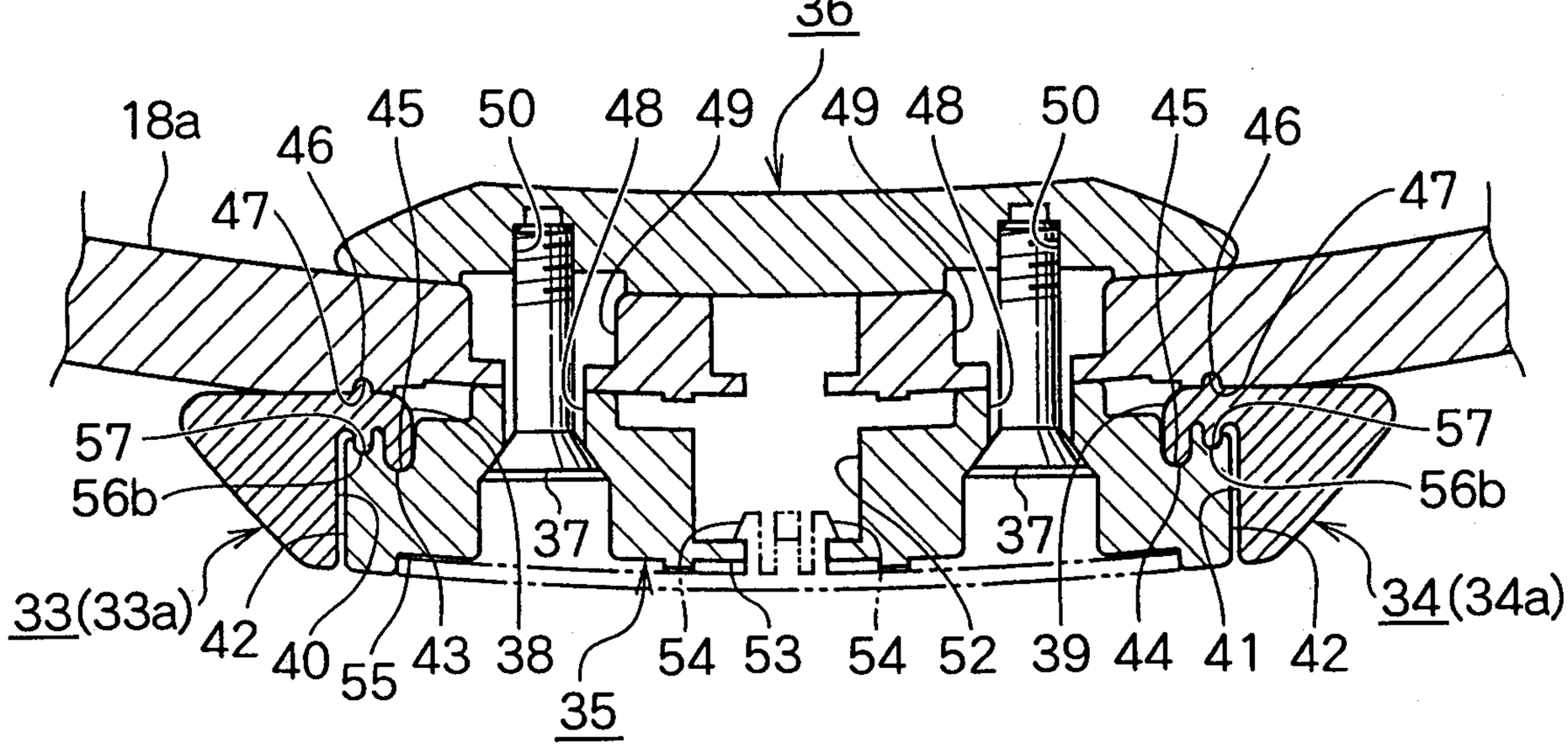
18c

FIG.11

FIG.12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34(34a)
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38
35
54
53
54
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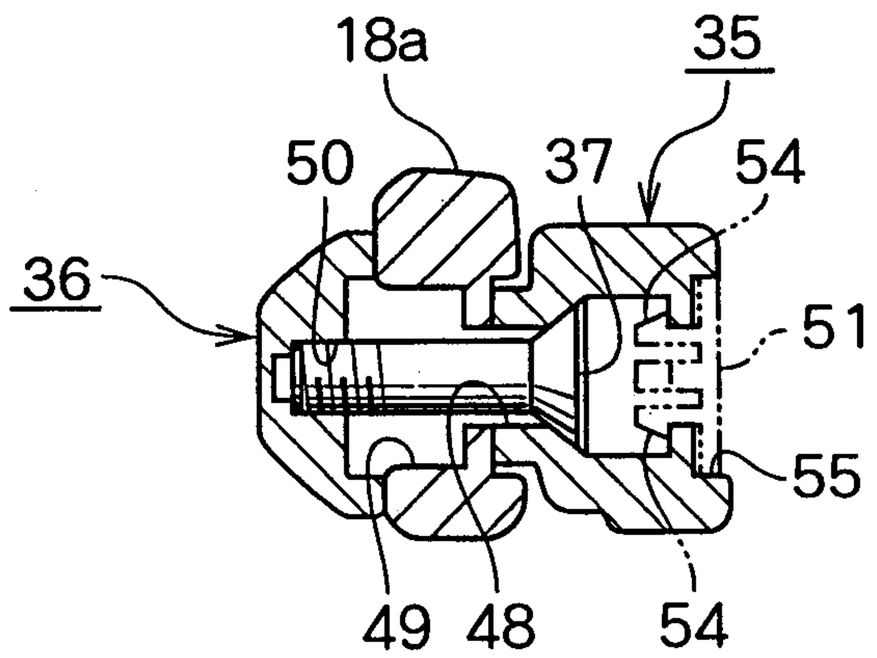
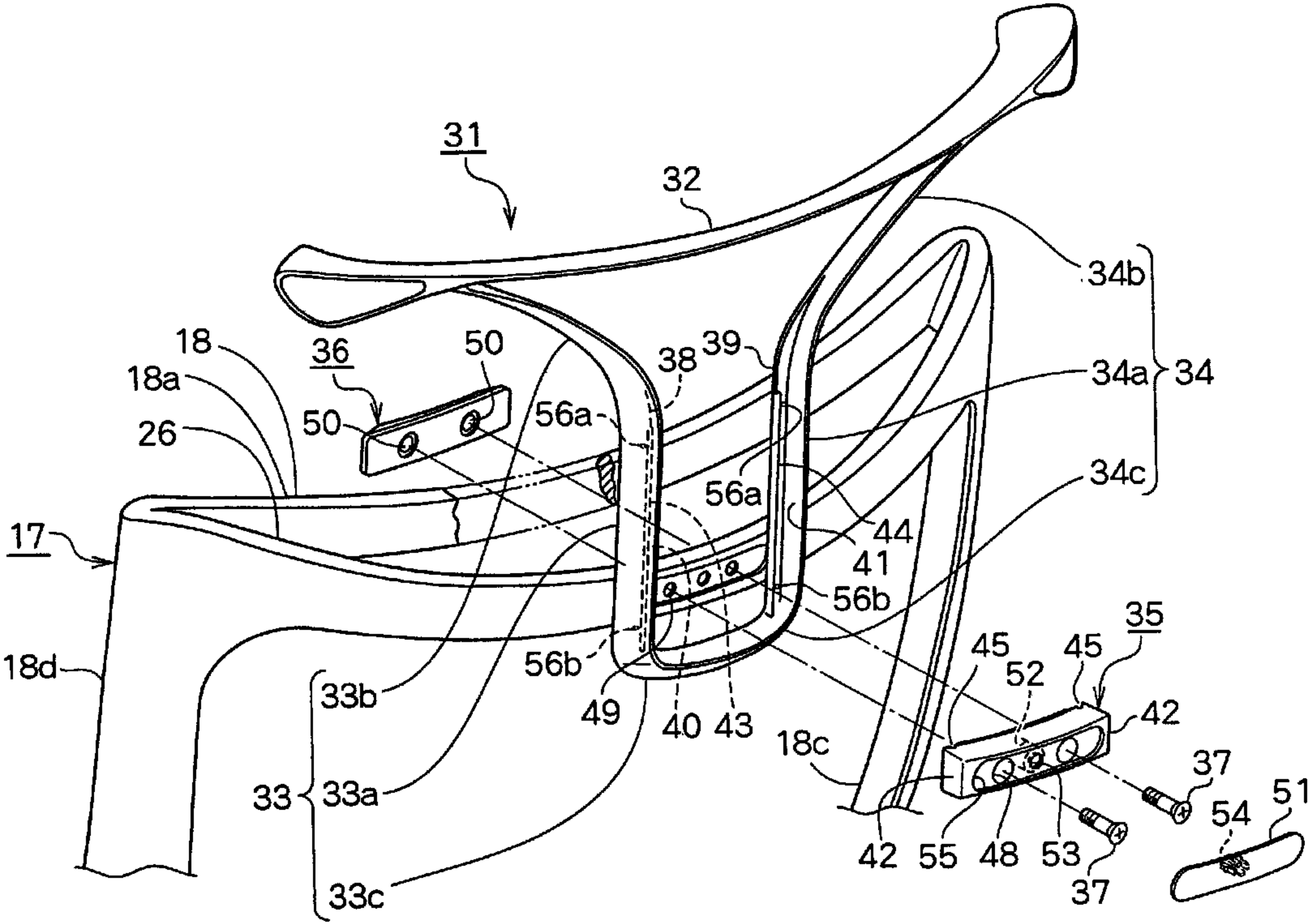
41
42

FIG.13


18a
35
50
37
54
36
51
55
49
48
54


31
32
34b
34a
34
34c
18
18a
26
36
50
50
38
39
56a
56a
44
41
56b
56b
17
18d
33b
33
33a
33c
49
40
43
35
45
45
52
42
18c
37
54
51
42
55
48
53
37