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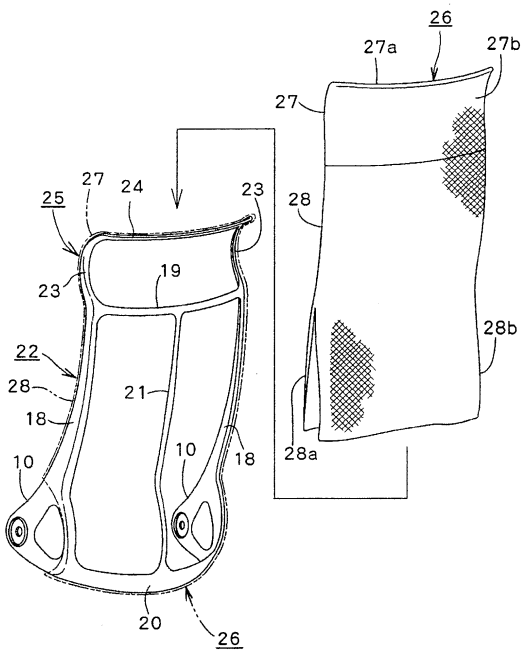
(54) CHAIR BACKREST

(57) A chair backrest in which a frame-like back frame (22) is covered with a bag-like upholstering material (26) having an open lower end in a state of tension, the back frame being formed by connecting a pair of left and right side portion frames (18, 18), which extend in an up and down direction, together at upper ends and lower ends thereof by an upper frame (19) and a lower frame (20) which extend in the left and right direction, wherein intermediate portions in the left and right direction of the upper frame and the lower frame are connected to each other by an intermediate frame (21) which is situated behind the both side portion frames and is extended in the up and down direction, thereby causing an intermediate portion of a rear surface portion of the upholstering material to project rearward. According to such a backrest, when a person sitting on the chair leans against the backrest, the reaction force of the upholstering material does not vary to an extreme extent during the leaning action, and a rearward recess amount of the upholstering material of the backrest in response to a load can be sufficiently secured, thereby obtaining a comfortable sitting sensation.

FIG. 4



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Description

[Technical Field]

[0001] The present invention relates to a chair backrest.
This application claims priorities based on Japanese Patent Application Nos. 2008-277530 filed in Japan on October 29, 2008, and 2009-54129 filed in Japan on March 6, 2009, the contents of which are incorporated herein by reference.

[Background Art]

[0002] In a chair backrest of the related art, there is one in which a frame-like back frame is covered and upholstered with a bag-like upholstering material having an open lower end in a tension state (for example, see Patent Document 1).

[Patent Literature]

[0003]

[Patent Document 1] Specification of European Patent Application, First Publication No. 0922419

[Summary of the Invention]

[Technical Problem]

[0004] In the chair backrest described in Patent Document 1, a front surface portion and a rear surface portion of an upholstering material covering a back frame are in close proximity to each other. For that reason, when a person sitting on the chair leans against the backrest, initially, only the front surface portion of the upholstering material sinks rearward, then the front surface portion of the upholstering material comes into contact with the rear surface portion thereof, and then both of the front surface portion and the rear surface portion bend rearward to receive the weight of the back of a person sitting on the chair. As a consequence, a reaction force relative to the back of a person sitting in the chair is changed in two stages of an early stage when leaning against the backrest and a subsequent stage, which is uncomfortable for the person sitting in the chair.
[0005] Furthermore, when a person sitting in the chair leans against the backrest, in order to obtain a comfortable sitting sensation, there is a need to increase a rearward recess amount of the upholstering material when a load is applied to the upholstering material of the backrest. However, in the chair backrest described in Patent Document 1, except for the beginning when leaning against the backrest, since both of the front surface portion and the rear surface portion of the upholstering material are integrally bent and the reaction force thereof is increased, it is difficult to increase the recess amount.

[0006] In view of the above problems of the related art, an object of the present invention is to provide a chair backrest in which, when a person sitting on the chair leans against the backrest, a reaction force of the upholstering material does not vary to an extreme extent during the leaning action and a rearward recess amount of the upholstering material of the backrest in response to a load is sufficiently secured, thereby obtaining a comfortable sitting sensation.

[Solution to Problem]

[0007] According to the present invention, the above problem is solved by the following means:

(1) A chair backrest in which a frame-like back frame is covered with a bag-like upholstering material having an open lower end in a state of tension, the back frame being formed by connecting a pair of left and right side portion frames, which extend in an up and down direction, together at upper ends and lower ends thereof by an upper frame and a lower frame which extend in the left and right direction, wherein intermediate portions in the left and right direction of the upper frame and the lower frame are connected to each other by an intermediate frame which is situated behind the both side portion frames and is extended in the up and down direction, thereby causing an intermediate portion of a rear surface portion of the upholstering material to project rearward.

[0008] According to such a configuration, when a person sitting on the chair leans against the backrest, since the front surface portion of the upholstering material does not come into contact with the rear surface portion thereof and the resistance force of the upholstering material does not vary to an extreme extent during the leaning action. Furthermore, in conjunction with the elongation of the front surface portion of the upholstering material, the rear surface portion is also elongated, whereby the elongation of the rear surface portion causes an increase in the rearward recess ratio of the front surface portion, thus making it possible to obtain a comfortable sitting sensation.
[0009]

(2) In the above (1), the upper and lower frames have a curved shape in which the intermediate portions are situated behind the both side portion frames when viewed in a planar view.

[0010] According to such a configuration, the intermediate frames can be greatly separated rearward from the both side portion frames. As a consequence, the effect of the above (1) can be further enhanced, and the thickness of the backrest in the front and rear direction can be thickly formed, which can give the backrest a high quality sensation.
[0011]

(3) In the above (1) or (2), the lower portions of both side portion frames and the intermediate frame have an arced curved shape in which a curvature center is situated in the front when the lower portions of both side portion framed and the intermediate frame are viewed from the lateral view.

[0012] According to such a configuration, it is possible to cause the side surface shape of the backrest to imitate a side surface shape of the buttocks of a person sitting on the chair, which can reliably support the buttocks to the back of a person sitting on the chair.

[0013]

(4) In any one of the above (1) to (3), rearward displacement amounts of the intermediate frame relative to both side portion frames are in parts different from each other in the up and down direction.

[0014] According to such a configuration, it is possible to make the tension of an upholstering material upon being mounted on the back frame different in the up and down direction, without changing in parts the material, the shape, or the like of the bag-like upholstering material in the up and down direction.
Thus, by increasing or decreasing the displacement amount of a portion of the backrest having a desired height of the backrest in compliance with demand, the tension of the upholstering material of that portion can be strengthened or weakened.

[0015]

(5) In any one of the above (1) to (4), the intermediate frame is formed by an elastic material, such that the intermediate frame can be elastically deformed forward when a load is applied to the front surface portion of the upholstering material.

[0016] According to such a configuration, the elasticity of the intermediate frame complements the tension of the upholstering material, whereby it is possible to further increase the rearward recess ratio of the front surface portion of the upholstering material according to this synergistic action.

[0017]

(6) In any one of the above (1) to (5), in the upper ends of both side portion frames in the back frame, upward-facing extension frames, which are curved such that intermediate portions are situated ahead of the upper and lower portions when viewed from the side surface, are consecutively provided. Furthermore, upper ends of both extension frames are connected to each other by a top portion frame which extends in the left and right direction, whereby a headrest frame is formed by the extension frames and the top portion frame.

[0018] According to such a configuration, it is possible to integrally form a headrest having a characteristic shape with the back frame in a simple manner.

[Advantageous Effects of Invention]

[0019] According to the present invention, it is possible to provide a chair backrest in which, when a person sitting on the chair leans against the backrest, the reaction force of the upholstering material does not vary to an extreme extent during the leaning action, and a rearward recess amount of the upholstering material of the backrest in response to a load can be sufficiently secured, thereby obtaining a comfortable sitting sensation.

[Brief Description of Drawings]

[0020]

FIG. 1 is a side view of a stand-by state of a chair that includes a first embodiment of a backrest of the present invention.
FIG. 2 is a side view of a sitting state of the chair shown in FIG. 1.
FIG. 3 is a side view of a reclining state of the chair shown in FIG. 1.
FIG. 4 is a perspective view that shows a state before a back frame is covered with an upholstering material when viewed from an inclined rear part of the backrest.
FIG. 5 is a side view of a chair that includes a backrest device of a second embodiment in the present invention.
FIG. 6 is a partially enlarged front view that cuts away a part of the upholstering material of a front surface in a chair backrest and shows the upholstering material of a front surface and the upholstering material of a rear surface.
FIG. 7 is an enlarged longitudinal cross-sectional view of major parts of the backrest taken along lines VII-VII of FIG. 6.
FIG. 8A is a diagram that shows an example of a moiré pattern due to a change (%) in the size of a hole portion of a stretched material of a front surface relative to a long material of a rear surface, and shows a shape of a case where the hole portion of the long material of the front surface has a size which is 95% of that of the long material of the rear surface.
FIG. 8B is a diagram that shows an example of a pattern having a moiré pattern due to a change (%) in the size of a hole portion of a long material of a front surface relative to a long material of a rear surface, and shows a shape of a case where the hole portion of the long material of the front surface has a size which is 90% of that of the long material of the rear surface.
FIG. 8C is a diagram that shows an example of a pattern having a moiré pattern due to a change (%)

in the size of a hole portion of a long material of a front surface relative to a long material of a rear surface, and shows a shape of a case where the hole portion of the long material of the front surface has a size which is 80% of that of the long material of the rear surface.

FIG. 9A is a diagram that shows another example of a pattern having a moiré pattern due to a change (%) in the size of a hole portion of a long material of a front surface relative to a long material of a rear surface, and shows a shape of a case where the hole portion of the long material of the front surface has a size which is 95% of that of the long material of the rear surface.

FIG. 9B is a diagram that shows another example of a pattern having a moiré pattern due to a change (%) in the size of a hole portion of a long material of a front surface relative to a long material of a rear surface, and shows a shape of a case where the hole portion of the long material of the front surface has a size which is 90% of that of the long material of the rear surface.

FIG. 9C is a diagram that shows another example of a pattern having a moiré pattern due to a change (%) in the size of a hole portion of a long material of a front surface relative to a long material of a rear surface, and shows a shape of a case where the hole portion of the long material of the front surface has a size which is 80% of that of the long material of the rear surface.

[Description of Embodiments]

[0021] Hereinafter, an embodiment of the present invention will be described with reference to the attached drawings.

FIGS. 1 to 3 show a chair that includes a first embodiment of a backrest of the present invention.

The chair includes a lower portion constituent body 4 in which a leg column 2 is vertically provided in the center of a base 1 of a disk and a support base 3 is attached to an upper end of the leg column 2.

[0022] The leg column 2 may be configured such that the height thereof can be controlled by a gas spring (not shown).

The support base 3 has a shape that is expanded from the upper end of the leg column 2 toward the front in a nearly triangular shape in a planar view and the side surface.

[0023] In the front end portion of the support base 3, a front lower portion of a seat 5 is supported via a base shaft 6 extending in the left and right direction, and the seat 5 can be rotated around the base shaft 6 between a stand-by position inclining rearward and upward as shown in FIG. 1 and a horizontal or a slightly rearward and downwardly inclined use position as shown in FIGS. 2 and 3.

[0024] In both side rear portions of the seat 5, a pair of left and right armrests 7 and 7 is integrally formed. The respective armrests 7 and 7 are vertically provided in the rear portion of both sides of the seat 5. Furthermore, the rear portions of the respective armrests 7 and 7 include a backrest pivot support portion 7a having a curved surface 8 which is protruded rearward centered on a support shaft 11 of the backrest 9 described later and has a semicircular arc shape or a fan shape when viewed from the side surface, and an arm support portion 7b that is extended forward from the upper portion of the backrest pivot support portion 7a and has an upward arc shape, and the entire shape forms an approximately forward triangular shape when viewed from the side surface that converges toward the front upper part.

[0025] The size of the arm support portion 7b in the front and rear direction is set such that the front end portion thereof is in the stand-by position shown in FIG. 1 and is located further forward from a vertical line V passing through the center of the base shaft 6 that is an attachment shaft of the seat 5. Furthermore, as shown in FIG. 2, the size is set such that, when the seat 5 is in the use position, the front end portion of the arm support portion 7b is situated behind the vertical line V, that is, slightly behind the base shaft 6.

[0026] On the outer side surface slightly toward the front of the backrest pivot support portion 7a in the left and right armrests 7 and 7, a front inventory of a front side piece 10 extending forward from both lower portions of the backrest 9 is supported via the support shaft 11 extended approximately in the left and right direction. The backrest 9 can be rotated centering on the support shaft 11 between a standing position shown in FIG. 2 and a rearward slope position shown in FIG. 3 with respect to the seat 5 and the armrest 7. In addition, the outer surface of the backrest pivot support portion 7a is protruded outward such that the attachment part of the front side piece 10 is situated in the outermost side such that the inner surface of the front side piece 10 does not widely come into contact with the outer surface of the backrest pivot support portion 7a.

[0027] Portions of both side lower portions of the backrest 9 facing the rear surface of the backrest pivot support portion 7a become a circular arc-shaped concave curved surface 12 which forms a shape approximately corresponding to the curved surface 8 of the rear surface of the backrest pivot support portion 7a, and the backrest 9 can be rotated around the support shaft 11 in a state in which the mutually opposed surfaces come close to each other. Between a center portion in the left and right direction of a lower frame 20 described later in the backrest 9 and a front end portion upper surface of the support base 3, there is provided first biasing means 13 formed of a gas spring which biases the backrest 9 in the standing direction, a compression spring or the like.

[0028] Moreover, in the base 3, there is provided second biasing means 14 that can assist the standing of a person sitting on the chair by biasing the seat 5 toward the stand-by position.

The second biasing means 14 includes a rubber torsion unit 15 that has an axis for example which extends in the left and right direction; a rearward-facing first link 16 that is connected to the rubber torsion unit 15 and is biased in a counterclockwise direction when viewed from the side surface in FIG. 1; and an obliquely rearward upward-facing second link 17 that is supported on the front end portion of the first link 16 at a lower end portion thereof via a shaft extending in the left and right direction and is supported on the lower surface of an intermediate portion of the seat 5 in the front and rear direction at an upper end portion thereof via the shaft extending in the left and right direction.

[0029] Since the armrest 7 is formed integrally with the seat 5, even when the seat 5 is rotated between the stand-by position and the use position or the backrest 9 slopes, the relative position of the armrest 7 relative to the seat 5 is not changed. For that reason, the elbows of a person can be placed on the armrest 7 in a natural state between the stand-by position and the use position, whereby the usability of the chair is improved.

[0030] Furthermore, when the seat 5 is in the stand-by position, the front end portion of the arm support portion 7b in the armrest 7 is situated in front of a vertical line V passing through the center of the base shaft 6 with the seat 5 attached thereto. Thus, when a person sits on the chair with his hands placed on the front end portion of the arm support portion 7b in the stand-by position, there is no possibility that the seat 5 will be rotated to the lower portion due to the weight thereof, and he or she can sit in the chair at ease.

[0031] In addition, the front end portion of the front side piece 10 extending forward from both side lower portions of the backrest 9 is attached to the backrest pivot support portion 7a standing up from the rear both side portions of the seat 5 via the support shaft 11, and the opposed surfaces of the backrest pivot support portion 7a and the lower portion of the backrest 9 are a circular arc-shaped or fan-shaped round surface 8 and a circular arc-shaped concave curved surface 12 around the support shaft 11. Thus, it is possible to cause the backrest 9 to greatly slope rearward without interfering with the seat 5 and the armrest 7. In addition, since the lower portion of the backrest 9 is firmly supported on the backrest pivot support portion 7a of the armrest 7 formed integrally with the seat 5, the backrest 9 having a large up and down size can also be supported such that it can be stably and smoothly rotated.

[0032] As shown in FIG. 4, the backrest 9 includes a back frame 22 having a front shape of a longitudinal rectangular frame shape that is formed by connecting the upper ends of a pair of left and right side portion frames 18 and 18 extending in the up and down direction by a lower frame 20 extending in the left and right direction, connecting the lower ends of both side portion frames 18 and 18 by the upper frame 19 extending in the left and right direction, and connecting the intermediate portions of an upper frame 19 and the lower frame 20 in the left and right direction by an intermediate frame 21 that is situated behind the both side portion frames 18 and 18 and is extended in the up and down direction.

[0033] The back frame 22 is integrally formed by a synthetic resin material having a suitable elasticity. It is desirable that a reinforced fiber such as a glass fiber or a carbon fiber is added to the synthetic resin material.

[0034] The lower portions of both side portion frames 18 and 18 and the lower portion of the intermediate frame 21 have circular arc-shaped curved shapes with a curvature center thereof situated in the front when viewed from the side surface, and the upper frame 19 and the lower frame 20 have curved shapes with an intermediate portion thereof situated behind the both side portions when viewed in a plan view. As a result, the lower portion of the backrest 9 is separated rearward from the rear end portions of the seat 5 and the armrest 7, and the backrest 9 is prevented from interfering with the rear ends of the seat 5 and the armrest 7 upon being rotated, whereby the rearward rotation range of the backrest 9 can be enlarged.

[0035] It is desirable that the curvature center of the curved shape of the lower portions of both side portion frames 18 and 18 and the lower portion of the intermediate frame 21 coincides with the support shaft 11 of the backrest 9.

[0036] The intermediate frame 21 is easier to deform elastically than other portions as it is formed to be thinner than other frame constitution members in the back frame 22. For that reason, when a load is applied to the front surface portion of an upholstering material 26 described later, the intermediate frame 21 can be elastically deformed rearward.

[0037] The rearward displacement amount of the intermediate frame 21 relative to both side portion frames 18 and 18 is set to increase as it moves closer to the lower part.

[0038] Furthermore, the aforementioned left and right front side pieces 10 are formed integrally with the lower portions of both side portion frames 18 and 18.

[0039] In the upper end of both side portion frames 18 and 18, upward-facing extension frames 23 and 23, which are curved such that intermediate portions thereof are situated ahead of the upper and lower portions when viewed from the side surface, are consecutively provided. Furthermore, a headrest frame 25 is integrally formed in the upper end of the back frame 22, the headrest frame 25 being formed by connecting the upper ends of both extension frames 23 and 23 to each other by a top portion frame 24 extended in the left and right direction.

[0040] As shown in FIG. 4, in the back frame 22 and the headrest frame 25, the bag-like upholstering material 26 having elasticity with a lower end open and both lower portions open is provided in a state of tension by covering the frames from the upper part.

[0041] The upholstering material 26 includes a headrest cover portion 27 that covers a headrest frame 25, and a backrest cover portion 28 that covers the back

frame 22, and the fabrics thereof are different from each other. Furthermore, the fabrics of the front surface portion 27a and the rear surface portion 27b in the headrest cover portion 27 and the fabrics of the front surface portion 28a and the rear surface portion 28b in the backrest cover portion 28 are also different from each other.

[0042] Both of the fabrics of the headrest cover portion 27 and the backrest cover portion 28 are mesh materials, but the fabric of at least the front surface portion 27a of the headrest cover portion 27 is formed by a mesh material having elasticity superior to that of the fabric of at least the front surface portion 28a of the backrest cover portion 28.

[0043] Furthermore, the fabric of at least the front surface portion 27a of the headrest cover portion 27 is a mesh material having coarse eyes of a low density, and the fabric of at least the front surface portion 28a of the backrest cover portion 28 is a fine-mesh material which has a high mesh density.

[0044] The direction of the texture or the stitches of the mesh material is extended in the left and right direction in the front surface portion 27a in the headrest cover portion 27 and the front surface portion 28a in the backrest cover portion 28, and is extended in the up and down direction in the rear surface portion 27b in the headrest cover portion 27 and the rear surface portion 28b in the backrest cover portion 28. That is, such a mesh material is elongated in a transverse direction in the front surface portions 27a and 28a and is elongated in a longitudinal direction in the rear surface portions 27b and 28b.

[0045] Furthermore, as mentioned above, the front surface portion 28a in the backrest cover portion 28 is a mesh material having fine eyes of a high density and the surface thereof is a fabric of a mesh material which is flexible and has a low light transmitting property or transparency. Moreover, the rear surface portion 28b in the backrest cover portion 28 is a mesh material having coarse eyes of a low density and is a fabric of a mesh material having a high light transmitting property or transparency.

As the fabric of the front surface portion 28a, it is desirable to use a maul-shaped fiber that is formed by twisting a short fiber interposed between a plurality of elastic threads.

[0046] In addition, the front surface portion 27a and the rear surface portion 27b in the headrest cover portion 27 and the front surface portion 28a and the rear surface portion 28b in the backrest cover portion 28 are different from each other in color as well as material, thereby the high-quality design can be provided..

[0047] The upholstering material 26 may be formed by covering and providing one formed in a bag shape over the back frame 22 or the like in a state of tension. Alternatively, it may be possible to interpose the headrest frame 25 and the back frame 22 from the front and back by the front surface portions 27a and 28a and the rear surface portions 27b and 28b of the upholstering material 26 which is separated into the front and the rear surface portions, and to connect the periphery edge portions of the front surface portions 27a and 28a with the periphery edge portions of the rear surface portions 27b and 28b. As a result, the upholstering material 26 may be formed in a bag shape.

[0048] The lower end portion of the upholstering material 26 is attached to the lower end portion of the lower frame 20 by causing the left and right front side pieces 10 and 10 to protrude from the openings of both side lower portions toward the front and joining the lower end portions of the front surface portion 28a and the rear surface portion 28b to each other by a surface fastener, a hook, a fastener, and other joining means (none of which are shown) in the lower part of the lower frame 20 in the back frame 22.

[0049] In addition, when the headrest is not necessary, the headrest cover portion 27 that covers a headrest frame 25 of the upholstering material 26 may be omitted.

[0050] In the backrest 9 having such a configuration, the intermediate portions of the upper frame 19 and the lower frame 20 are connected by the intermediate frame 21 that is situated behind the both side portion frames 18 and 18 and is extended in the up and down direction, and the intermediate portion of the rear surface portion 26b of the upholstering material 26 protrudes rearward from the intermediate frame 21. For that reason, when a person sitting on the chair leans against the backrest 9, the front surface portion 28a of the upholstering material 26 does not come into contact with the rear surface portion 28b, and the resistance force of the upholstering material 26 does not vary to an extreme extent during the leaning action. Furthermore, since the rear surface portion 28b is also elongated along with the elongation of the front surface portion 28a of the upholstering material 26 and the rearward recess amount of the front surface portion 28a is increased by the elongation of the rear surface portion 28b, a comfortable sitting sensation can be obtained.

[0051] Furthermore, since the upper frame 19 and the lower frame 20 have a curved shape in which an intermediate portion is situated behind the both side portions when viewed in a plan view, the intermediate frame 21 can be greatly separated rearward from both side portion frames 18 and 18. For that reason, the aforementioned effect can be further enhanced, and it is possible to give the backrest 9 a high quality sensation by increasing the thickness of the backrest 9 in the front and rear direction.

[0052] In addition, it is possible to simply form the headrest having a characteristic shape integrally with the back frame 22 by the headrest frame 25 and by the headrest cover portion 27 covering the headrest frame 25 in the bag-like upholstering material 26.

[0053] In the upholstering material 26, the fabrics of the front surface portions 27a and 28a and the rear surface portions 27b and 28b are different from each other as mentioned above. Thus, even when they are formed of a mesh material, the occurrence of a moiré pattern can be prevented. Furthermore, it is possible to cause

the upholstering material 26 to exhibit a suitable deflection amount and to cause the surface of the upholstering material 26 to have the flexibility. In addition, it is possible to obtain a sufficient ventilation property and elasticity in the upholstering material 26 without reducing the light transmitting property or the transparency thereof.

[0054] In addition, in the aforementioned embodiment, the rearward displacement amount of the intermediated frame 21 relative to both side portion frames 18 and 18 increases as it moves closer to the lower part. Thus, simply by covering the back frame 22 with the bag-like upholstering material 26 having the same material, size or the like in any portion of the up and down direction, it is possible to make the initial tension of the upholstering material 22 in the lower portion of the backrest 9 greater than the initial tension of the upholstering material 26 in the upper portion of the backrest 9. As a result, when a person sitting on the chair leans against the backrest 9, the tension of the upholstering material 26 of the upper portion of the backrest 9 abutting against the upper portion of the back is weak, and the upholstering material 26 is flexibly and deeply recessed rearward. Meanwhile, the upholstering material 26 of the lower portion of the backrest 9 abutting against the waist and buttocks from the lower portion of the back is strong in tension and strongly supports the body. As a consequence, it is possible to provide a person sitting on the chair with a comfortable sitting sensation.

[0055] In this manner, by partially making the rearward displacement amount of the intermediate frame 21 relative to both side portion frames 18 and 18 different from each other in the up and down direction, it is possible to partially make the tension of the upholstering material 26 upon being mounted on the back frame 22 different from each other in the up and down direction without partially changing the material, the shape or the like of the bag-like upholstering material 26 in the up and down direction. Thus, by increasing or decreasing the displacement amount of the portion of the backrest having the desired height in compliance with demand, the tension of the upholstering material 26 of that portion can be strengthened or weakened.

[0056] Hereinafter, a second embodiment of the present invention will be described.

FIG. 5 is a side view of a chair including a backrest device of a second embodiment in the present invention, FIG. 6 is a partially enlarged front view that partially cuts away upholstering material of a front surface in a chair backrest and shows the upholstering material of a front surface and the upholstering material of a rear surface, and FIG. 7 is a major part enlarged longitudinal cross-sectional view of a backrest taken along lines VII-VII of FIG. 6.

In addition, in the following description, the members having the same configuration as those of the first embodiment will be denoted by the same reference numerals as in the first embodiment, and descriptions thereof will be omitted.

[0057] The chair of the present embodiment can be rotated around the base shaft 6 between an A position of a stand-by state inclining rearward and upward as shown in FIG. 5, a B position of a nearly horizontal normal use state and a C position of a reclining-use state slightly inclining rearward and downwardly as shown in FIG. 5 by two-dot chain lines.

[0058] In the backrest frame 22 and the headrest frame 25, a porous sheet-like upholstering material, for example, the upholstering material 26 of a mesh shape having flexibility composed of cloth or the like in a bag shape with a lower end open and both side lower portions open is provided in a state of tension.

[0059] As shown in FIGS. 6 and 7, a mesh 127 in a front surface 26A side of the upholstering material 26 relative to the backrest frame 22 has the same shape as that of a mesh 128 in a rear surface 26B thereof. Furthermore, the sizes of the meshes 127 and 128 are different from each other such that the size of the front surface 26A side is fine and that of the rear surface 26B side is coarse.

As a result, when viewing the chair backrest 9 from the front, a clear pattern formed of a plurality of assembly shapes similar to the shapes of the meshes 127 and 128 can clearly emerge on the whole surface of the backrest 9.

[0060] In this case, when setting the size of the mesh 128 of the rear surface 26B to 100%, it is desirable that the size of the mesh 127 of the front surface 26A in the upholstering material 26 is within the range of 95% to 80% of the mesh 128 of the rear surface 26B.

That is, as in a case where the size of the mesh 127 of the front surface 26A in the upholstering material 26 is equal to or greater than 95% of the mesh 128 of the rear surface 26B, when there is no great difference in the sizes of the meshes 127 and 128, the moiré pattern is simple as in the related art and does not change sufficiently, and there is no depth in terms of design. Meanwhile, when the size of the mesh 27 of the front surface 26A is equal to or less than 80% of that of the mesh 128 of the rear surface 26B, for example, 50%, there is no interest due to the combination, and in the size equal to or less than 25%, only a shape with insufficient change is obtained in which the shape of the mesh 127 of the front surface 26A and the shape of the mesh 128 of the rear surface 26B overlap with each other.

[0061] FIGS. 8A to 8C show a pattern of a moiré pattern due to a change (%) in the sizes of the mesh of the upholstering material of the front surface relative to the upholstering material of the rear surface. FIG. 8A is a diagram that shows a shape of a case where the size of the mesh of the upholstering material of the front surface is 95% of that of the upholstering material of the rear surface. FIG. 8B is a diagram that shows a shape of a case where the size of the mesh of the upholstering material of the front surface is 90% of that of the upholstering material of the rear surface. FIG. 8C is a diagram that shows a shape of a case where the size of the mesh of the upholstering material of the front surface is 80% of

that of the upholstering material of the rear surface.

[0062] As shown in FIGS. 8A to 8C, when the mesh 127 of the front surface 26A and the mesh 128 of the rear surface 28B in the upholstering material 26 have a circular (sphere) shape of the same shape, the clear moiré pattern formed of a plurality of assembly shapes similar to the circular (sphere) shape of the meshes 127 and 128 clearly emerges on the whole surface of the backrest 9 while increasing in number as the size of the mesh 127 of the upholstering material 26 of the front surface 26A becomes smaller than that of the mesh 128 of the upholstering material 26 of the rear surface 26B.

[0063] FIGS. 9A to 9C show another embodiment of a pattern of a moiré pattern due to a change (%) in the sizes of the mesh of the upholstering material of the front surface relative to the upholstering material of the rear surface. FIG. 9A is a diagram that shows a shape of a case where the size of the mesh of the upholstering material of the front surface is 95% of that of the upholstering material of the rear surface. FIG. 9B is a diagram that shows a shape of a case where the size of the mesh of the upholstering material of the front surface is 90% of that of the upholstering material of the rear surface. FIG. 9C is a diagram that shows a shape of a case where the size of the mesh of the upholstering material of the front surface is 80% of that of the upholstering material of the rear surface.

[0064] As shown in FIGS. 9A to 9C, when the mesh 127 of the front surface 26A and the mesh 128 of the rear surface 26B in the upholstering material 26 have a longitudinal long square of the same shape, the moiré patterns of a longitudinal stripe shape are regularly arranged in parallel in a transverse direction and clearly emerge over the whole surface of the backrest 9.

[0065] In addition, although, in the aforementioned embodiment, as a porous sheet-like upholstering material, the upholstering material forming a mesh shape formed of a cloth or the like was used, it is also possible to use a punching metal having a plurality of opened hole portions, a wire composed in a mesh shape or the like as the upholstering material.

[0066] The present invention can be carried out in a plurality of modified forms without being limited to only the above embodiments.

[Industrial Applicability]

[0067] As mentioned above, according to the present invention, it is possible to provide a chair backrest in which, when a person sitting on the chair leans against the backrest, the reaction force of the upholstering material does not vary to an extreme extent during the leaning action, and a rearward recess amount of the upholstering material of the backrest in response to a load can be sufficiently secured, thereby obtaining a comfortable sitting sensation.

[Reference Signs List]

[0068] 1 base, 2 leg column, 3 support base, 4 lower constituent body, 5 seat, 6 base shaft, 7 armrest, 7a backrest pivot support portion, 7b arm support portion, 8 curved surface, 9 backrest, 10 front side piece, 11 support shaft, 12 concave curved surface, 13 first biasing means, 14 second biasing means, 15 rubber torsion unit, 16 first link, 17 second link, 18side portion frame, 19 upper frame, 20 lower frame, 21 intermediate frame, 22 back frame, 23 extension frame, 24 top frame, 25 headrest frame, 26 upholstering material, 26A front surface, 26B rear surface, 27 headrest cover portion, 27a front surface portion, 27b rear surface portion, 28 backrest cover portion, 28a front surface portion, 28b rear surface portion, 127, 128 mesh, V vertical line

Claims

1. A chair backrest in which a frame-like back frame is covered with a bag-like upholstering material having an open lower end in a state of tension, the back frame being formed by connecting a pair of left and right side portion frames, which extend in an up and down direction, together at upper ends and lower ends thereof by an upper frame and a lower frame which extend in the left and right direction,
wherein intermediate portions in the left and right direction of the upper frame and the lower frame are connected to each other by an intermediate frame which is situated behind the both side portion frames and is extended in the up and down direction, thereby causing an intermediate portion of a rear surface portion of the upholstering material to project rearward.

2. The chair backrest according to Claim 1,
wherein the upper and lower frames have a curved shape in which the intermediate portions are situated behind the both side portion frames in a plan view.

3. The chair backrest according to Claim 1 or 2,
wherein the lower portions of both side portion frames and the intermediate frame have an arced curved shape in which a curvature center is situated in the front when viewed from the side.

4. The chair backrest according to Claim 1 or 2,
wherein rearward displacement amounts of the intermediate frame relative to both side portion frames are in parts different from each other in the up and down direction.

5. The chair backrest according to Claim 3,
wherein rearward displacement amounts of the intermediate frame relative to both side portion frames are in parts different from each other in the up and down direction.

6. The chair backrest according to Claim 1 or 2, wherein the intermediate frame is formed by an elastic material, such that the intermediate frame can be elastically deformed forward when a load is applied to a front surface portion of the upholstering material.

7. The chair backrest according to Claim 3, wherein the intermediate frame is formed by an elastic material, such that the intermediate frame can be elastically deformed forward when a load is applied to a front surface portion of the upholstering material.

8. The chair backrest according to Claim 4, wherein the intermediate frame is formed by an elastic material, such that the intermediate frame can be elastically deformed forward when a load is applied to a front surface portion of the upholstering material.

9. The chair backrest according to Claim 1 or 2, wherein, in the upper ends of both side portion frames in the back frame, upward-facing extension frames, which are curved such that intermediate portions are situated ahead of the upper and lower portions when viewed from the side surface, are consecutively provided, and upper ends of both extension frames are connected to each other by a top portion frame which extends in the left and right direction, whereby a headrest frame is formed by the extension frames and the top portion frame.

10. The chair backrest according to Claim 3, wherein, in the upper ends of both side portion frames in the back frame, upward-facing extension frames, which are curved such that intermediate portions are situated ahead of the upper and lower portions when viewed from the side surface, are consecutively provided, and upper ends of both extension frames are connected to each other by a top portion frame which extends in the left and right direction, whereby a headrest frame is formed by the extension frames and the top portion frame.

11. The chair backrest according to Claim 4, wherein, in the upper ends of both side portion frames in the back frame, upward-facing extension frames, which are curved such that intermediate portions are situated ahead of the upper and lower portions when viewed from the side surface, are consecutively provided, and upper ends of both extension frames are connected to each other by a top portion frame which extends in the left and right direction, whereby a headrest frame is formed by the extension frames and the top portion frame.

12. The chair backrest according to Claim 5, wherein, in the upper ends of both side portion frames in the back frame, upward-facing extension frames, which are curved such that intermediate portions are situated ahead of the upper and lower portions when viewed from the side surface, are consecutively provided, and upper ends of both extension frames are connected to each other by a top portion frame which extends in the left and right direction, whereby a headrest frame is formed by the extension frames and the top portion frame.

FIG. 1

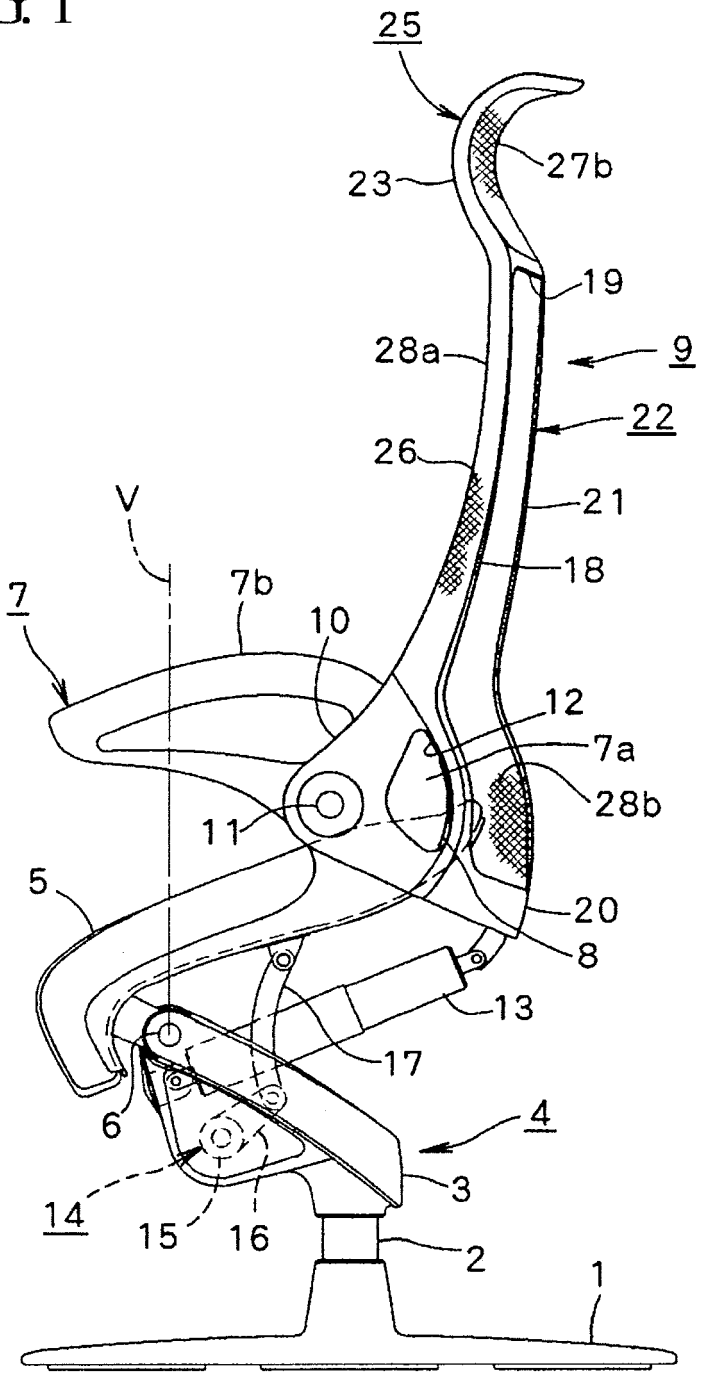
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FIG. 2

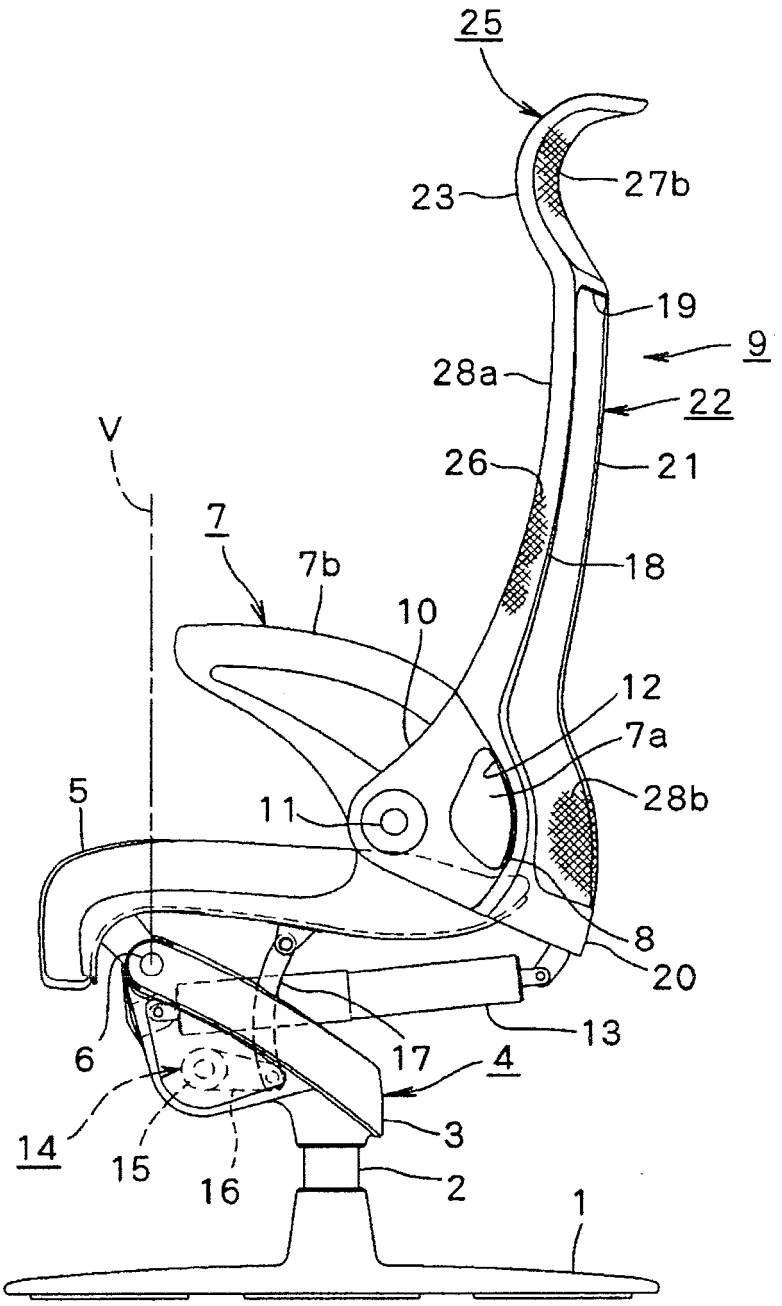
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FIG. 3

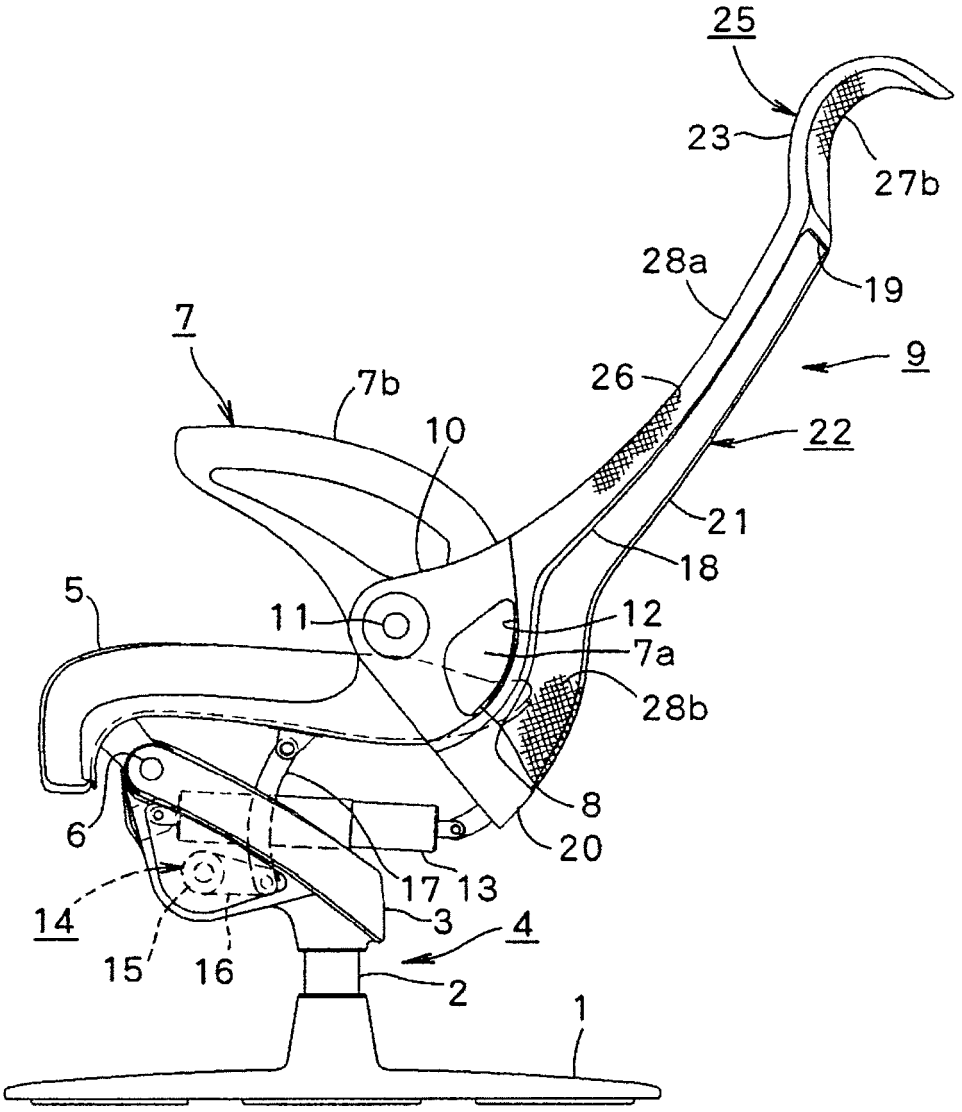
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FIG. 4

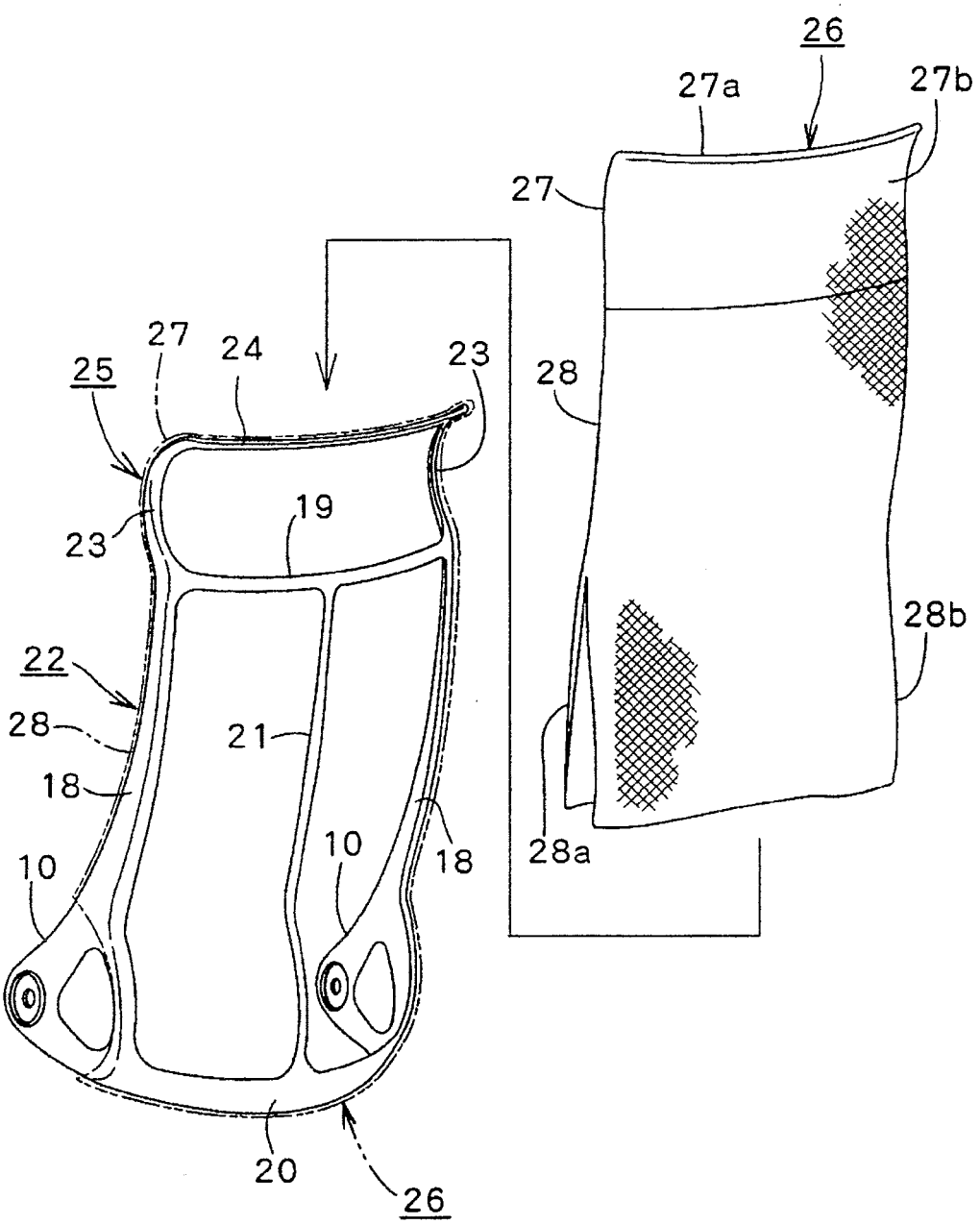

FIG. 5

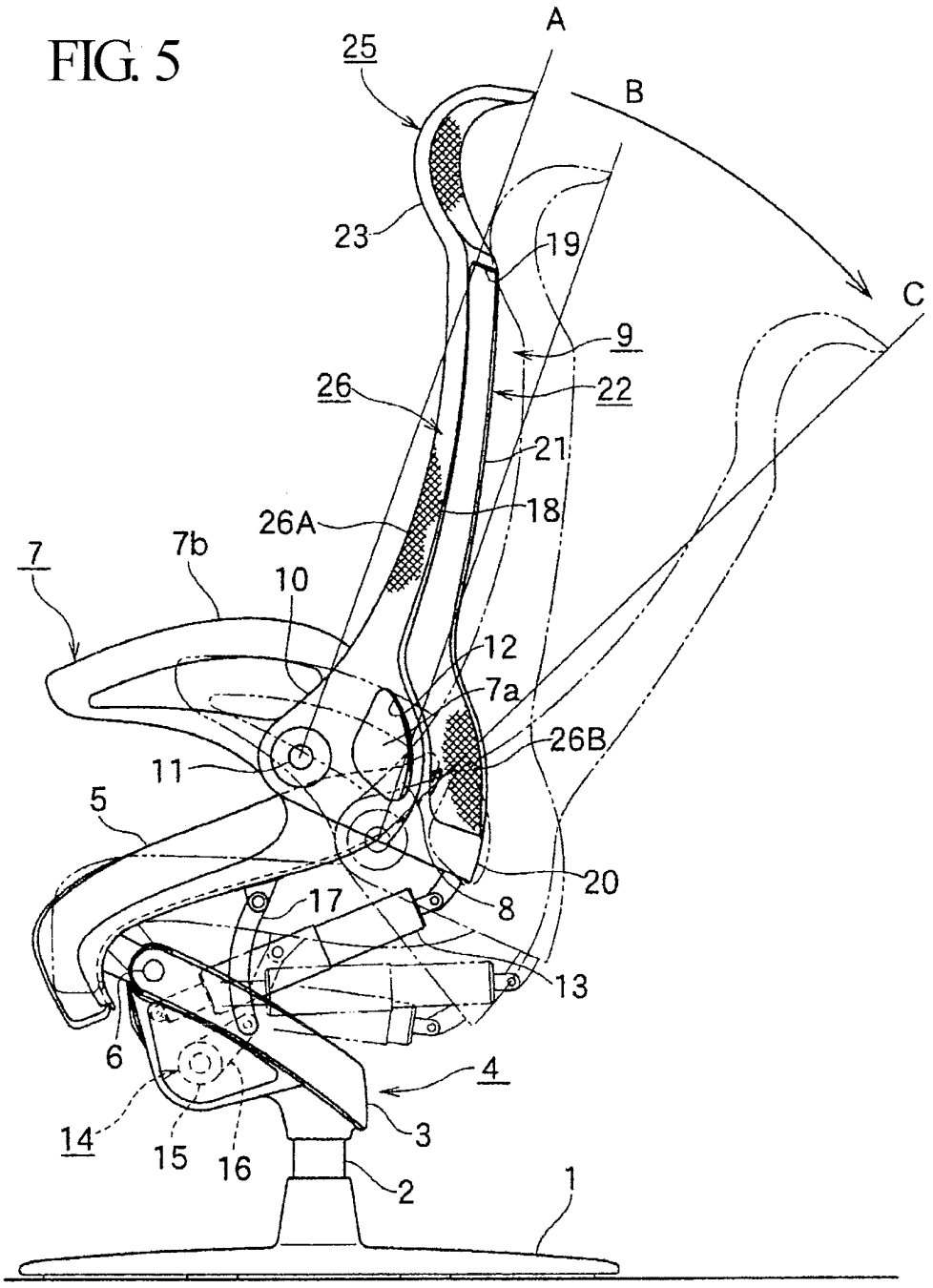
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FIG. 6

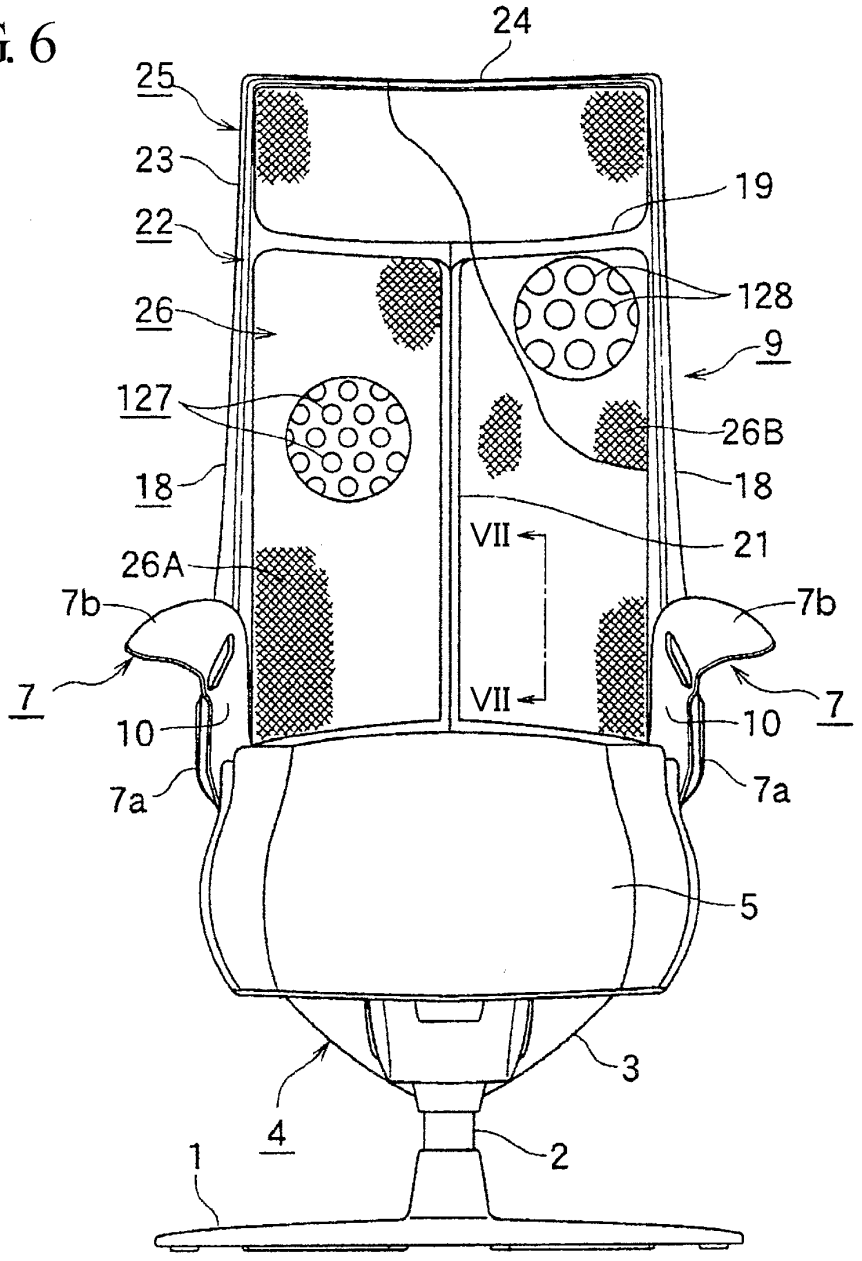
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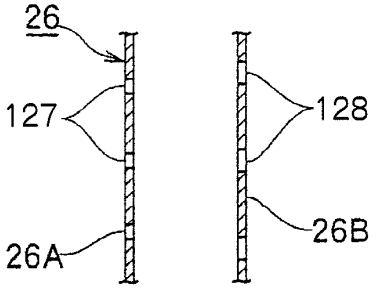
FIG. 7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26B

FIG. 8A

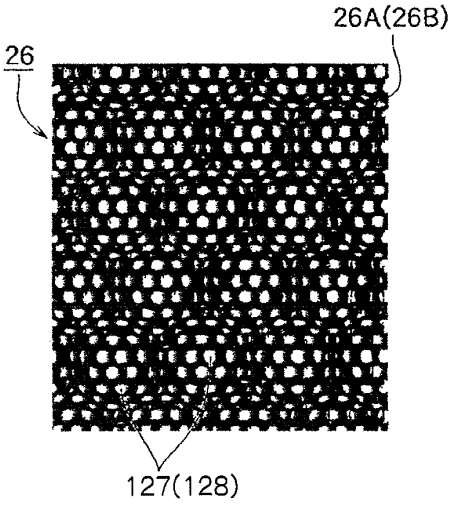


FIG. 8B

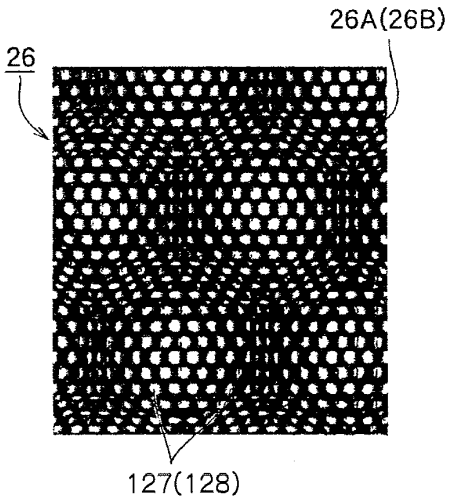


FIG. 8C

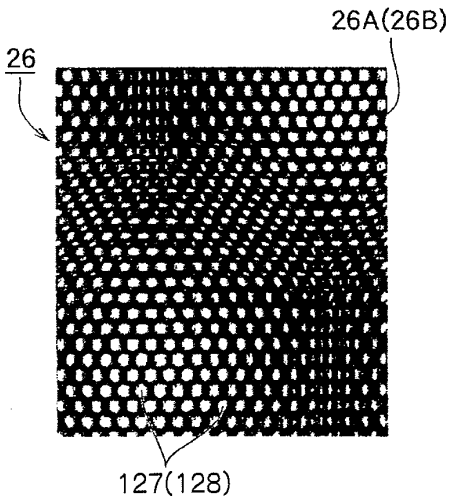


FIG. 9A

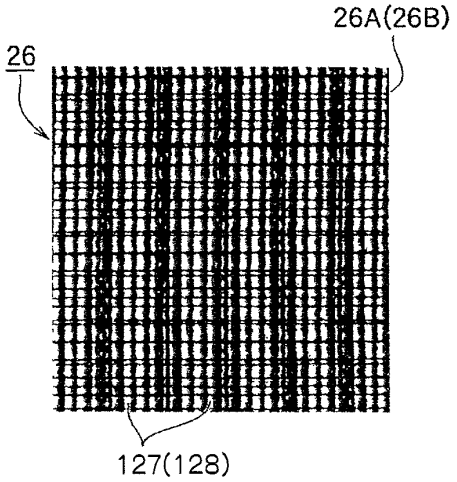


FIG. 9B

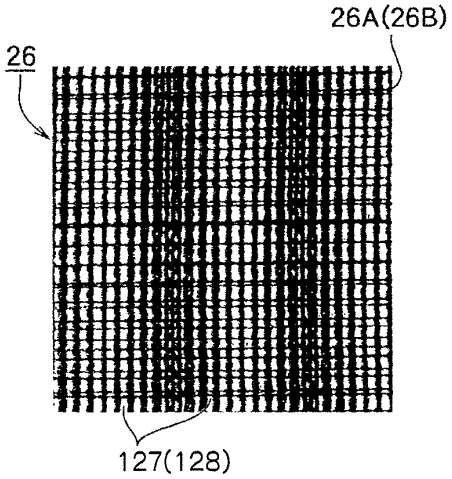
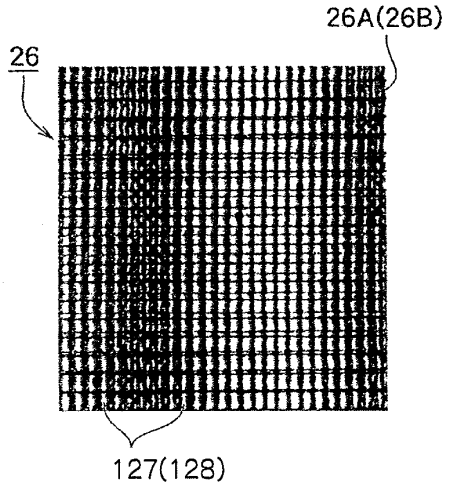


FIG. 9C



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2009/005705

A. CLASSIFICATION OF SUBJECT MATTER
A47C7/40(2006.01)i, *A47C1/02*(2006.01)i

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)
A47C7/40, A47C1/02

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2009
Kokai Jitsuyo Shinan Koho 1971-2009 Toroku Jitsuyo Shinan Koho 1994-2009

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2008-532625 A (Steelcase Development Corp.), 21 August 2008 (21.08.2008), paragraphs [0017] to [0023], [0050] to [0063]; fig. 1 to 4, 21 to 26 & US 2006/0202535 A1 & EP 001855912 A1 & WO 2006/096369 A2	1-12

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
13 November, 2009 (13.11.09)	24 November, 2009 (24.11.09)
Name and mailing address of the ISA/ Japanese Patent Office Facsimile No.	Authorized officer Telephone No.

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Patent documents cited in the description

- JP 2008277530 A **[0001]**
- JP 2009054129 A **[0001]**
- EP 0922419 A **[0003]**