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(54) KNOCK DOWN CHAIR BASE AND METHOD

(57) The present disclosure relates to a chair base assembly, the assembly comprising a central hub with a centre receptacle for receiving a centre column adapted to support a chair part and at least three side receptacles an opening in a radiant direction from a centre of the central hub, wherein each side receptacles comprises a receiving portions adapted for receiving a leg in a lockable and releasable manner, the side receptacles and the leg comprises corresponding locking components , ,

wherein the side receptacles comprising respective orifices with at least a lower section, and a hub locking component on an upper section within the orifice, wherein the respective legs comprises a first end adapted to be attached in the side receptacle and a second end adapted to be supported on the ground, to support a wheel or a support, wherein the first end of the leg comprises the leg locking component.

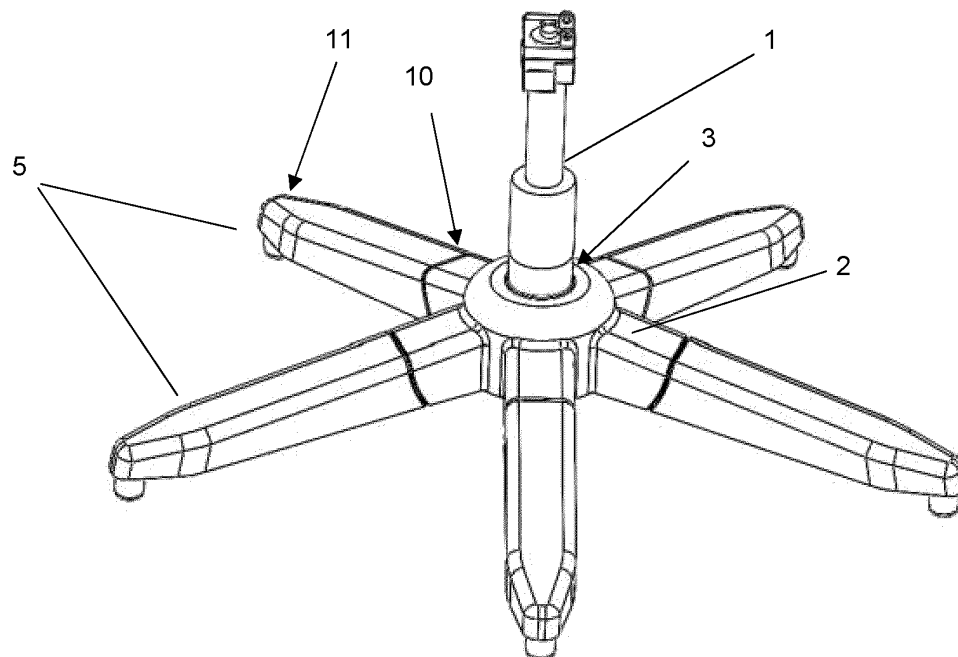


Fig. 1

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Description

Technical field

[0001] The present disclosure relates to a chair base assembly and a method for assembling a chair base assembly and a method for disassembly of chair base assembly. More specifically, the disclosure relates to a chair base assembly that can be assembled and disassembled without the need for tools.

Background art

[0002] A typical office chair comprises a seat and backrest supported on a mechanism to control movement and rotation of the seat and back. This assembly is typically supported on a gas spring column that sits in a base. Office chairs typically have a swivel base, allowing users to rotate the chair 360 degrees. This feature makes it easier for individuals to reach different areas of their workspace without straining. Furthermore, they are typically mounted on a set of wheels or casters to facilitate easy movement across the floor. This enables users to slide from one end of their desk to another without having to stand up. The base normally comprises five legs protruding in a star shaped pattern from the centre, and may in turn each be supported on wheels and the like. When shipping the chair, it is typically shipped in pieces of the backrest, the seat, the mechanism, the column and the base. The base is thus normally the largest part.

[0003] A problem with this prior assemblies is that they are large and expensive to pack, as they cannot be separated into smaller pieces. This is especially true for the base, which can be cast metal or a cumbersome one-piece shape. Large items or parts of office chairs, like the base, often require substantial packaging for protection during shipping. This can result in a significant amount of packaging waste, contributing to environmental concerns.

[0004] Furthermore, as the gas spring column is typically press fit into the base, a tool or a large force needs to be used to disassemble the column from the base, once fitted. This means that it is even harder to pack or ship the a chair once it is brought into use.

[0005] There existed some known solutions that has tried to solve this. Document US20220000267A1 discloses detachable chair leg support and a chair. The chair includes feet and a central support. The central support includes a support body and a plurality of mount portions, one side of the foot is provided with a mount groove. The mount portion is horizontally embedded in the mount groove, and a fastening assembly is provided between the foot and the central support to prevent the mount portion from removing laterally from the mount groove. At least one problem with this solution is the lack of strength and the hard disassemble the column from the base.

[0006] Document US10568432B2 disclose a foldable

five-star foot, comprising a center body and five legs; each one of the legs is provided with a first mounting block and a second mounting block; each one of the first mounting blocks corresponds to a first mounting groove; each one of the second mounting blocks corresponds to a second mounting groove; and the first and second mounting grooves are formed on the centre body. At least one problem with this solution is the lack of possibilities to remove the legs and the hard disassemble the column from the base.

[0007] Further known solutions are disclosed in US2023083858A1, CN104873023B and CN205649212U.

[0008] The invention solves this with a self-locking assembling and disassembling arrangement for the base.

Summary of the invention

[0009] According to an aspect of the invention, there is provided a chair base assembly, the assembly comprising a central hub with a centre receptacle for receiving a centre column adapted to support a chair part and at least three side receptacles an opening in a radiant direction from a centre of the central hub, wherein each side receptacles comprises a receiving portions adapted for receiving a leg in a lockable and releasable manner, the side receptacles and the leg comprises corresponding locking components, wherein the side receptacles comprising respective orifices with at least a lower section, and a hub locking component on an upper section within the orifice, wherein the respective legs comprises a first end adapted to be attached in the side receptacle and a second end adapted to be supported on the ground, to support a wheel or a support, wherein the first end of the leg comprises the leg locking component.

[0010] In an embodiment of the chair base assembly the leg locking component comprises a notch providing an outward facing locking face, and the hub locking component comprises a protrusion from an uppermost section within the orifice, protruding downwards and providing an inward facing locking face.

[0011] In an embodiment of the chair base assembly, the each leg comprising at least two positions; a first position p and a second position p, wherein the first position p, the leg is insertable and removable from the receiving portions and; wherein the second position p the leg is angled upwards or rotated in relation to the first position P, such that leg locking component interacts with hub internal locking component by the outward facing locking face abutting against the inwards facing locking face in a manner preventing the leg from being removed from the receiving portions.

[0012] In an embodiment of the chair base assembly, the outward facing locking face and the inwards facing locking face are parallel aligned or concentrically aligned, and/or both perpendicular to an axis X aligned with the direction of travel for the leg when inserting or removing

said leg.

[0013] In an embodiment of the chair base assembly, the orifices and the first end of the leg comprises corresponding cross section shapes.

[0014] In an embodiment of the chair base assembly, wherein the first end of the leg comprises a rotational support structure and the an internal end of the receptacles comprises a support surface adapted to receive and support the rotational support structure in a rotational manner.

[0015] In an embodiment of the chair base assembly, the first end of the legs comprises an interfacing protrusion or a cam profile, and the interfacing protrusion or a cam profile is located a distance away from the rotational support structure wherein the legs are adopted to be moved, when inserted into the receiving portions, between a first angle corresponding to the first position P, and a second angle corresponding to the second position P, and in the first angle or first position P, the interfacing protrusion or a cam profile is at least partly protruding into the centre receptacle, and wherein in the second angle second position P, the interfacing protrusion or a cam profile is retracted from, or moved out from, by rotation, the centre receptacle.

[0016] In an embodiment of the chair base assembly, the centre receptacle comprises a first section with a first diameter D and a second section, above the first section, with a second diameter D larger than the first diameter, wherein the centre receptacle is adapted to receive a centre column comprising a first column section with a first column diameter D and a second column section, above the first column section with a second column diameter D, the first column diameter D being smaller than the second column diameter D, and wherein the first column diameter D and first diameter D of the centre receptacle and/or the second column diameter D and second diameter D of the centre receptacle is adapted fit together in a press fit manner.

[0017] In an embodiment of the chair base assembly, wherein the interfacing protrusion or a cam profile is adapted to dislodge the centre column from a press fit state by moving from the second position P to the first position P whereby the interfacing protrusion or a cam profile interacts with the centre column and releases the fit between the two parts.

[0018] According to another aspect of the invention, there is provided a method for assembling the above mentioned chair base assembly, wherein the method comprising the steps of:

- a providing a central hub
- b inserting a first end of a leg into a side receptacle with a first angle;
- c rotating the leg from the first angle to the second angle, thereby locking the leg in the side receptacles;
- d repeating step a-c for all side receptacles present in the central hub -

[0019] In an embodiment of the method, wherein the method further comprises the step of e inserting a central column into the centre receptacle.

[0020] In an embodiment of the method for disassembly of the above mentioned chair base assembly, wherein the method comprising the steps of:

- a providing chair base assembly with the central column fitted,
- b rotating one or more of the legs from the second angle to the first angle, thereby dislodging central column from the centre receptacle and un-locking the legs from the side receptacles ;
- c removing each leg and;
- d removing the central column.

[0021] According to another aspect of the invention, there is provided a chair comprising the above mentioned chair base assembly.

[0022] According to another aspect of the invention, there is provided a chair, the chair is at least partly assembled using the above mentioned method.

[0023] In an embodiment of the chair, wherein the chair is at least partly disassembled using the above mentioned method.

Brief descriptions of the drawings

[0024] The above objects, as well as additional objects, features and advantages of the present disclosure, will be more fully appreciated by reference to the following illustrative and non-limiting detailed description of example embodiments of the present disclosure, when taken in conjunction with the accompanying drawings.

Figure 1 illustrates the base assembly, typically of an office chair.

Figure 2 illustrates a close up of a hub of the base

Figure 3 illustrates a leg initially placed in a receiving portion of the hub

Figure 4 illustrates a leg placed in a second position in the receiving portion of the hub

Figure 5 illustrates the hub, a leg and a centre column placed together, together with a cut out of the interaction between the leg and the column.

Figure 6 illustrates the hub, a leg and a centre column placed together, together with a cut out of the interaction between the leg and the column.

Fig. 7 illustrates a highlighted section of the interaction between a cam and a column.

Fig. 8 illustrates a highlighted section of the interaction between a cam and a column.

Detailed description

[0025] The present disclosure will now be described with reference to the accompanying drawings, in which preferred example embodiments of the disclosure are

shown. The disclosure may, however, be embodied in other forms and should not be construed as limited to the herein disclosed embodiments. The disclosed embodiments are provided to fully convey the scope of the disclosure to the skilled person.

[0026] Figure 1 illustrates the base of an office chair. Fig. 2 illustrates the hub 2 of the base. The hub comprises an opening 3 adapted for receiving the centre column 1 with actuator. The centre hub 2 further comprises a number of attachment means 4 adapted to receive the legs 5 of the assemblies.

[0027] Fig. 3 illustrates a leg 5 being initially placed in a receiving portion 6 of the attachment means 4. A first end of the leg 5 comprises a locking component 7 corresponding to an internal locking component 8 within the attachment means 4. Such that in a first position, the leg 5 can be inserted and removed from the receiving portion 6.

[0028] Fig. 4 illustrates the leg 5 in a second position, wherein the leg 5 is angled upwards in relation to the first position, such that the locking component 7 of the leg 5 interacts with the internal locking component 8, such that the leg 5 cannot be pulled out of the attachment means 4. Fig. 5 illustrates how centre column 1 can comprise a lower section with a smaller diameter than an upper section, such that when the centre column 1 is installed in the hub 2, an edge 9 between the smaller and larger diameter section of the column 1, interacts with the tip of the first end of the leg 5, such that the insertion of the centre column 1 into the opening 3 of the hub, the leg 5 is moved from the first to second position. Additionally, fig. 7 illustrates the highlighted section of fig. 5, wherein the cam profile 16 and the edge 9 interacts between the smaller and larger diameter section of the column 1. Fig. 5 and 7 illustrates the leg 5 in the first position p1, wherein the leg 5 is insertable and removable from the receiving portions 6.

[0029] Fig. 6 illustrates the centre column 1 completely installed and the leg 5 in the locked position. This assembly as disclosed herein further facilitates an easy disassembly of the base, whereby moving the second end of the leg 5 downwards i.e. rotating the leg from a first angle to a second angle, will force the column 1 from a press fit assembly and release the centre column 1 from the hub 2. Normally this requires a blow from a hammer or the like for prior art. Additionally, fig. 8 illustrates the highlighted section of fig. 5 wherein the cam profile 16 and the edge 9 interacts between the smaller and larger diameter section of the column 1. Fig. 6 and 8 illustrates the leg 5 in the second position p2, wherein the leg 5 is angled upwards, or rotated, in relation to the first position P1, such that leg locking component 7 interacts with hub internal locking component 8 by the outward facing locking face 12 abutting against the inwards facing locking face 13 in a manner preventing the leg 5 from being removed from the receiving portions 6.

[0030] The first aspect of this disclosure shows a chair base assembly, the assembly comprising a central hub 2 with a centre receptacle 3 for receiving a centre column 1

adapted to support a chair part and at least three side receptacles 4 each with an orifices with an opening in a radiant direction from a centre of the central hub 2, wherein each side receptacles 4 comprises a receiving portion 6 adapted for receiving a leg 5 in a lockable and releasable manner, the side receptacles 4 and the leg 5 comprises corresponding locking components 7,8, wherein the side receptacles 4 comprises respective orifices with at least a lower section, that may be smooth or otherwise adapted for insertion and mutual sliding of components or open downwards, and an hub locking component 8 on an upper section within the orifice, wherein the respective legs 5 comprises a first end 10 adapted to be attached to the side receptacle 4 and a second end 11 adapted to be supported on the ground, to support a wheel or a support, wherein the first end 10 of the leg 5 comprises the leg locking component 7. It should be understood that the hub 3 may comprise three to six, or more, receptacles 4 with a corresponding number of corresponding legs 5.

[0031] The leg locking component 7 comprises a notch providing an outward facing locking face 12, and wherein the hub locking component 8 comprises a protrusion from an uppermost section within the orifice, protruding downwards and providing an inwards facing locking face 13.

[0032] Each of the leg(s) 5 of the chair comprises at least two positions; a first position P1 and a second position P2, wherein the first position P1 (seen in fig. 3 and 5), the leg 5 is insertable and removable from the receiving portions 6 and; wherein the second position P2 (seen in fig. 4 and 6) the leg 5 is angled upwards or rotated in relation to the first position P1, such that leg locking component 7 interacts with hub internal locking component 8 by the outward facing locking face 12 abutting against the inwards facing locking face 13 in a manner preventing the leg 5 from being removed from the receiving portions 6.

[0033] To provide the locking of the legs 5 to the hub 4, the outward facing locking face 12 and the inwards facing locking face 13 may be parallel aligned or concentrically aligned, and/or both perpendicular to an axis X aligned with the longitudinal direction of the leg or the direction of travel for the leg 5 when inserting or removing said leg 5. Concentrically aligned should be understood that both faces 12, 13 has a curvature defined with a common axis of rotation for a point along the surface curves 12, 13.

[0034] In some embodiments, any one of the orifices and the first end of the legs 5 might comprises corresponding cross section shapes, such as square, round angled, T-shaped, I-shaped or the like.

[0035] Furthermore, as illustrated in fig. 4, any one of the first end 10 of the legs 5 may comprise a rotational support structure 14 and an internal end of the receptacles 4 might comprises a support surface 15 adapted to receive and support the rotational support structure 14 in a rotational manner.

[0036] In some embodiments, the first end 10 of the legs 5 may comprise an interfacing protrusion or a cam

profile 16 wherein the interfacing protrusion or a cam profile 16 is located a distance away from the rotational support structure 14 wherein the legs 5 are adopted to be moved, when inserted into the receiving portions 6, between a first angle corresponding to the first position, and a second angle corresponding to the second position, wherein in the first angle, the interfacing protrusion or a cam profile 16 is at least partly protruding into the centre receptacle 3, and wherein in the second angle, the interfacing protrusion or a cam profile 14 is retracted from, or moved out from, by rotation, the centre receptacle 3. The rotation of the leg within the side receptacle 4 will thus interact with the column if it is in the centre receptacle 3. The cam profile 16 will thereby be leveraged to apply a force to dislodge any press fit column. This is achieved by using the leg 5 and its second end 11 as a lever to amplify the force applied to the first end 10. The rotational support structure 14 will function as the fulcrum, which is the pivot point around which the leg 5 rotates. The location of the fulcrum is crucial for determining the effectiveness of the lever. Thus, by applying force to the second end 11 of the leg 5, the force will increase at the first end 10, when the distance from the second end 11 to the fulcrum 14 is longer than the distance from the fulcrum 14 to the first end 11. The longer the distance from the force application point to the fulcrum, the greater the leverage. The force is then transferred to the first end 10 of the leg 5, and the cam profile 16, allowing a user to exert a much larger force on a column in the centre receptacle 3 the force you initially applied.

[0037] The centre receptacle 3 may comprise a first section 17 with a first diameter D1 and a second section 18, above the first section 17, with a second diameter D2 larger than the first diameter, wherein the centre receptacle 3 is adapted to receive a the centre column 1 the chair comprises a first column section 19 with a first column diameter D3 and a second column section 20, above the first column section with a second column diameter D4, the first column diameter D3 being smaller than the second column diameter D4, and wherein the first column diameter D3 and first diameter D1 of the centre receptacle 3 and/or the second column diameter D4 and second diameter D2 of the centre receptacle 3 is adapted fit together in a press fit manner. The chair base assembly is adapted to be able to dislodge the centre column 1 from a press fit state by moving from the second position P2 to the first position P1 whereby the interfacing protrusion or a cam profile 16 interacts with the centre column 1 and releases the fit between the two parts. A press fit manner should be understood as, in a general sense, to refer to a method of joining two parts together by interference or force, without the need for additional fasteners like screws or adhesives. In a press fit, one part is designed to be slightly larger than the other, and the parts are pressed or pushed together to create a tight, secure connection. During assembly, the column 1 is pressed into the centre receptacle 3. This can be done using hydraulic presses, arbor presses, manual force or

other specialized tools. The interference fit creates a frictional force between the mating surfaces, holding the parts together, which is herein understood as press fit. To release the press fit parts, a force greater than the frictional force between the mating surfaces needs to be applied.

[0038] The second aspect of this disclosure shows a method for assembling a chair base assembly according the first aspect. The third aspect of this disclosure shows a method for disassembly of chair base assembly according the first aspect.

[0039] The second aspect of this disclosure shows a method for assembling a chair base assembly according the first aspect, wherein the method comprising the steps of: a) providing a central hub 2, b) inserting a first end of a leg 5 into a side receptacle 4 with a first angle; c) rotating the leg 5 from the first angle to the second angle, thereby locking the leg 5 in the side receptacles 4; d) repeating step a-c for all side receptacles 4 present in the central hub 2. The centre column 1 may be inserted into the centre receptacle 3 after the legs 5 are inserted and locked into position.

[0040] The third aspect of this disclosure shows a method for disassembly of chair base assembly according the first aspect-, wherein the method comprising the steps of: a) providing chair base assembly with the central column 1 fitted, b) rotating one or more of the legs 5 from the second angle or position to the first angle or position, thereby dislodging central column 1 from the centre receptacle 3 and un-locking the legs 5 from the side receptacles 4; c) removing each leg 5 and/or; d) removing the central column 1.

[0041] The person skilled in the art realizes that the present disclosure is not limited to the preferred embodiments described above. The person skilled in the art further realizes that modifications and variations are possible within the scope of the appended claims. Additionally, variations to the disclosed embodiments can be understood and effected by the skilled person in practicing the claimed disclosure, from a study of the drawings, the disclosure, and the appended claims.

Claims

1. A chair base assembly, the assembly comprising a central hub (2) with a centre receptacle (3) for receiving a centre column (1) adapted to support a chair part and at least three side receptacles (4) an opening in a radiant direction from a centre of the central hub (2), wherein each side receptacles (4) comprises a receiving portions (6) adapted for receiving a leg (5) in a lockable and releasable manner, the side receptacles (4) and the leg (5) comprises corresponding locking components (7, 8),

wherein the side receptacles (4) comprising respective orifices with at least a lower section,

- and a hub locking component (8) on an upper section within the orifice, wherein the respective legs (5) comprises a first end (10) adapted to be attached in the side receptacle (4) and a second end (11) adapted to be supported on the ground, to support a wheel or a support, wherein the first end (10) of the leg (5) comprises the leg locking component (7).
2. The chair base assembly according to claim 1, wherein
- the leg locking component (7) comprises a notch providing an outward facing locking face (12), and wherein
- the hub locking component (8) comprises a protrusion from an uppermost section within the orifice, protruding downwards and providing an inward facing locking face (13).
3. The chair base assembly according to claim 1 or 2, wherein the each leg (5) comprising at least two positions;
- a first position (p1) and a second position (p1), wherein the first position (p1), the leg (5) is insertable and removable from the receiving portions (6) and;
- wherein the second position (p1) the leg (5) is angled upwards or rotated in relation to the first position (P1), such that leg locking component (7) interacts with hub internal locking component (8) by the outward facing locking face (12) abutting against the inwards facing locking face (13) in a manner preventing the leg (5) from being removed from the receiving portions (6).
4. The chair base assembly according to claim any one of the claims 1-3, wherein the outward facing locking face (12) and the inwards facing locking face (13) are parallel aligned or concentrically aligned, and/or both perpendicular to an axis (X) aligned with the direction of travel for the leg (5) when inserting or removing said leg (5).
5. The chair base assembly according to claim any one of the claims 1-4, wherein the orifices and the first end of the leg (5) comprises corresponding cross section shapes.
6. The chair base assembly according to claim any one of the claims 1-5, wherein the first end (10) of the leg (5) comprises a rotational support structure (14) and the an internal end of the receptacles (4) comprises a support surface (14) adapted to receive and support the rotational support structure (14) in a rotational manner.
7. The chair base assembly according to any one of the claims 1-6, wherein
- the first end (10) of the legs (5) comprises an interfacing protrusion or a cam profile (16) wherein the interfacing protrusion or a cam profile (16) is located a distance away from the rotational support structure (14) wherein the legs (5) are adopted to be moved, when inserted into the receiving portions (6), between a first angle corresponding to the first position (P1), and a second angle corresponding to the second position (P2), wherein in the first angle or first position (P1), the interfacing protrusion or a cam profile (14) is at least partly protruding into the centre receptacle (3), and wherein in the second angle second position (P2), the interfacing protrusion or a cam profile (14) is retracted from, or moved out from, by rotation, the centre receptacle (3).
8. The chair base assembly according to claim any one of the claims 1-7, wherein the centre receptacle (3) comprises a first section (17) with a first diameter (D1) and a second section (18), above the first section (17), with a second diameter (D2) larger than the first diameter,
- wherein the centre receptacle (3) is adapted to receive a centre column (1) comprising a first column section (19) with a first column diameter (D3) and a second column section (20), above the first column section with a second column diameter (D4), the first column diameter (D3) being smaller than the second column diameter (D4), and wherein the first column diameter (D3) and first diameter (D1) of the centre receptacle (3) and/or the second column diameter (D4) and second diameter (D2) of the centre receptacle (3) is adapted fit together in a press fit manner.
9. The chair base assembly according to any one of the claims 1-, wherein the interfacing protrusion or a cam profile (16) is adapted to dislodge the centre column (1) from a press fit state by moving from the second position (P2) to the first position (P1) whereby the interfacing protrusion or a cam profile interacts with the centre column (1) and releases the fit between the two parts.
10. A method for assembling a chair base assembly according any one of the claims 1- 9, wherein the method comprising the steps of:
- a) providing a central hub (2)
- b) inserting a first end of a leg (5) into a side

receptacle (4) with a first angle;
 c) rotating the leg (5) from the first angle to the second angle, thereby locking the leg (5) in the side receptacles (4);
 d) repeating step a)-c) for all side receptacles (4) present in the central hub (2)- 5

11. The method according to claim 10, wherein the method further comprises the step of e) inserting a central column (1) into the centre receptacle (3). 10

12. A method for disassembly of chair base assembly according any one of the claims 1- 9, wherein the method comprising the steps of: 15

a) providing chair base assembly with the central column (1) fitted,
 b) rotating one or more of the leg(s) (5) from the second angle to the first angle, thereby dislodging central column (1) from the centre receptacle (3) and un-locking the leg(s) (5) from the side receptacles (4); 20
 c) removing each leg (5) and;
 d) removing the central column (1). 25

13. A chair comprising a chair base assembly according to any one of the claims 1-9.

14. The chair according to claim 13, wherein the chair is at least partly assembled using the method of claim 10 or 11. 30

15. The chair according to claim 13, wherein the chair is at least partly disassembled using the method of claim 12. 35

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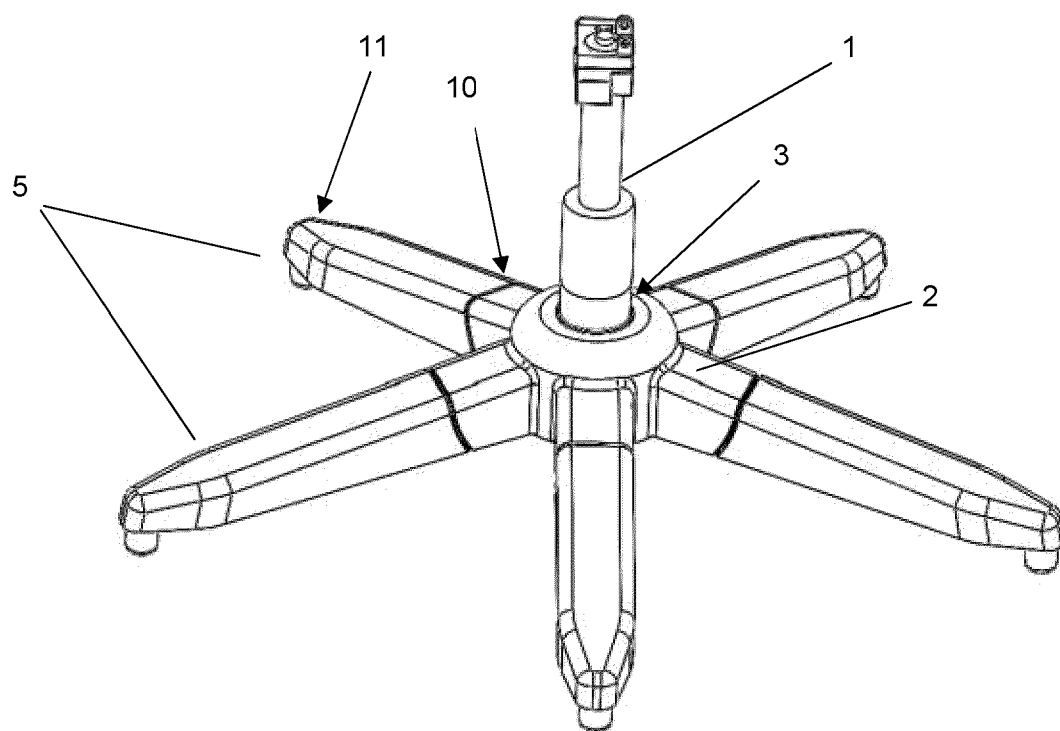


Fig. 1

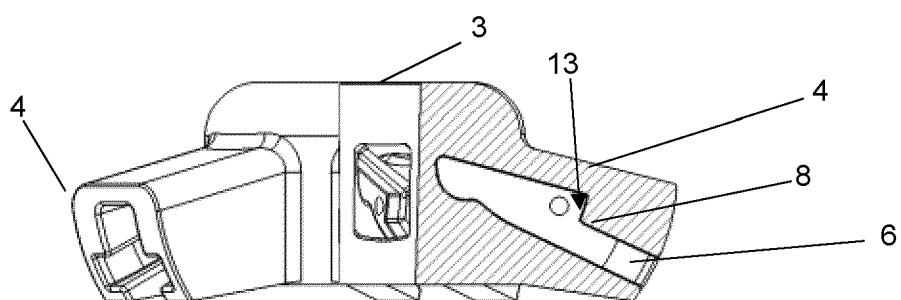


Fig. 2

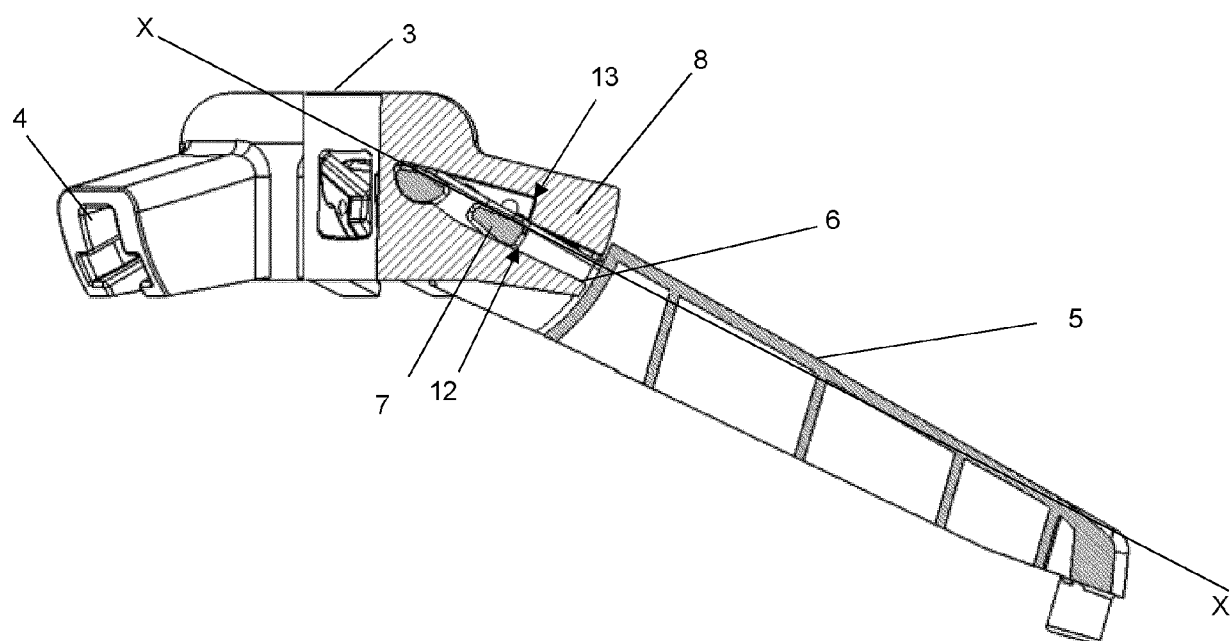


Fig. 3

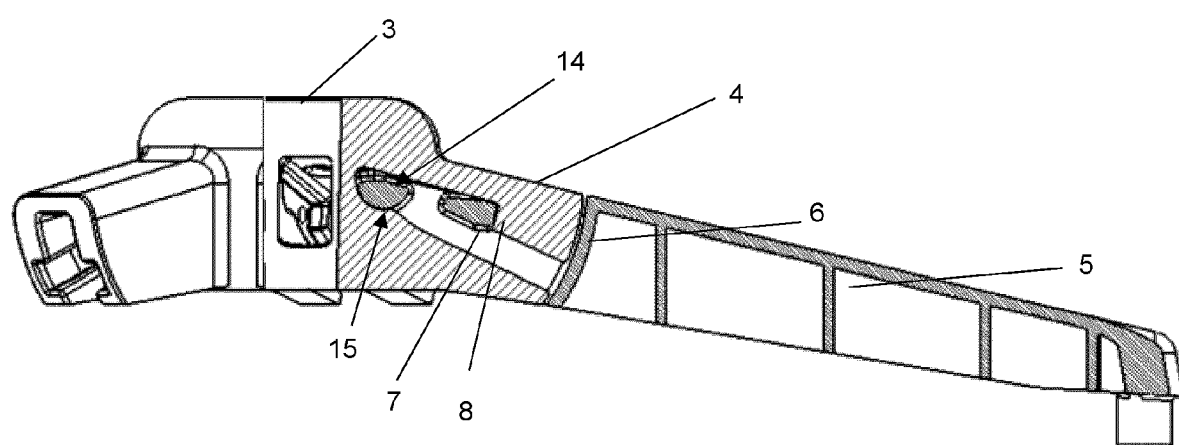


Fig. 4

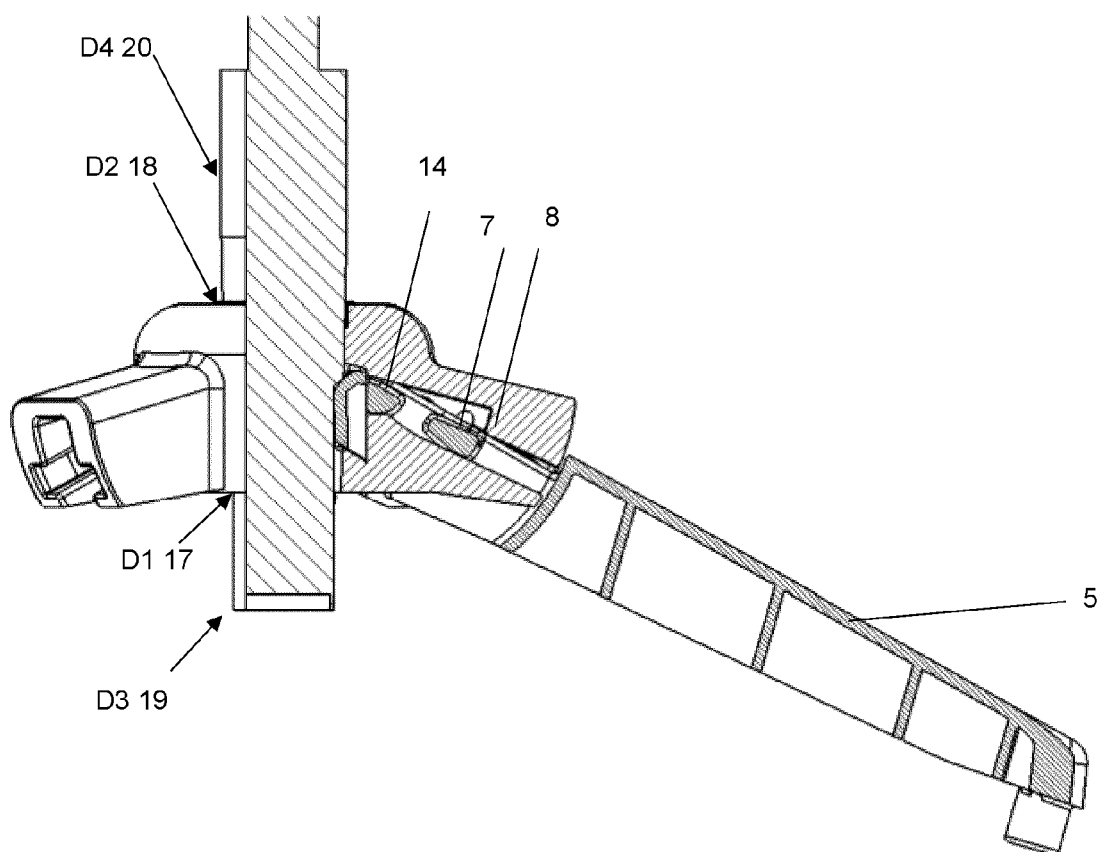


Fig. 5

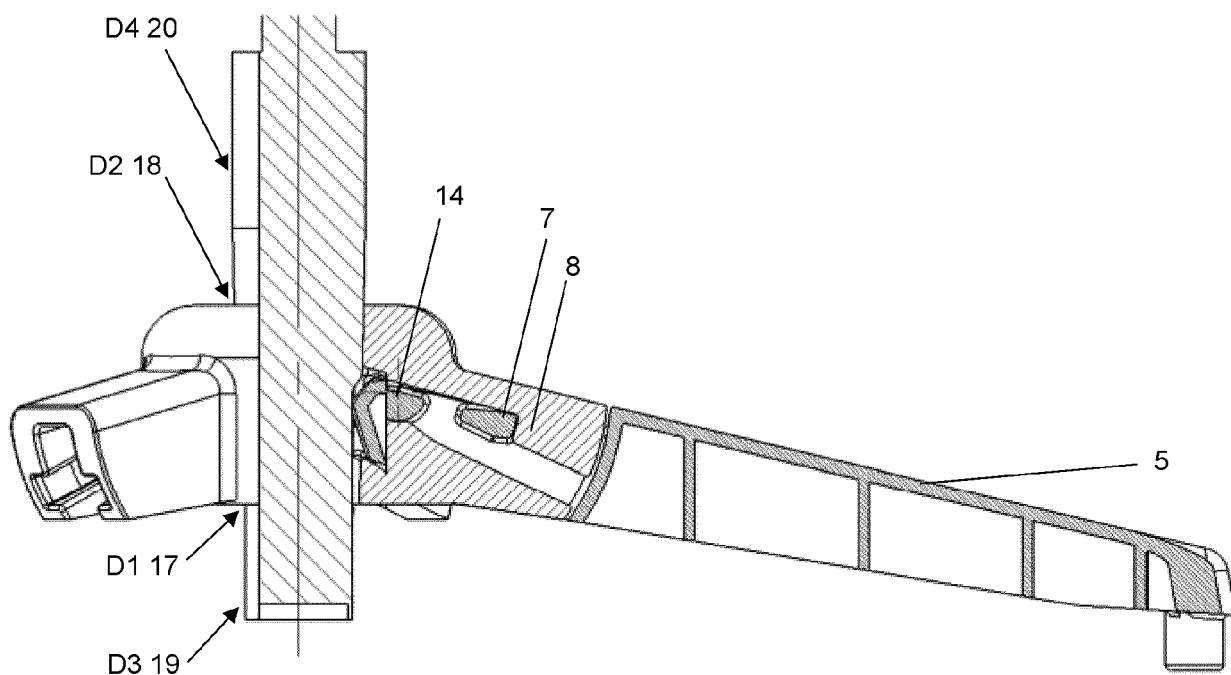
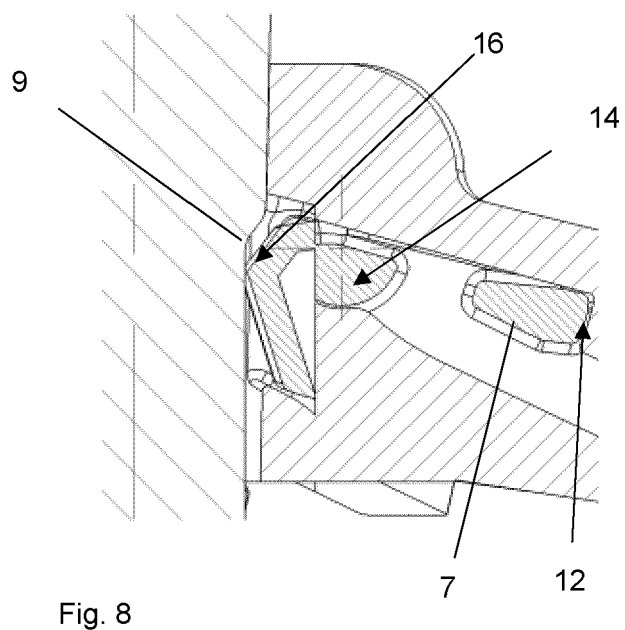
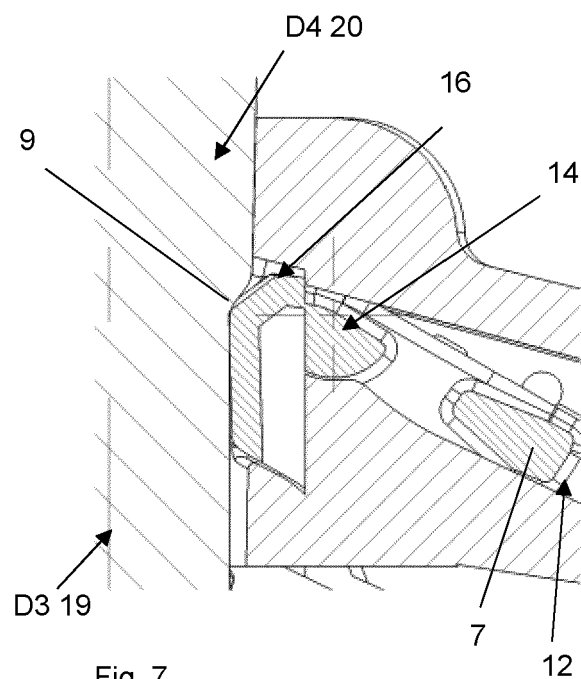


Fig. 6





EUROPEAN SEARCH REPORT

Application Number

EP 24 21 7657

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X A	CA 3 181 462 A1 (LIVING STYLE B V I LTD [GB]) 8 May 2023 (2023-05-08) * paragraph [0017] - paragraph [0039]; figures 1-10 *	1-6,10, 11,13-15 7-9,12	INV. A47C7/00
X	----- CN 113 116 071 A (UE FURNITURE CO LTD) 16 July 2021 (2021-07-16) * paragraph [0024] - paragraph [0036]; figures 1-6 *	1,10	
X	----- US 2022/218110 A1 (WU PENG [CN]) 14 July 2022 (2022-07-14) * paragraph [0016] - paragraph [0029]; figures 1-3 *	1,10	

			TECHNICAL FIELDS SEARCHED (IPC)
			A47C
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		17 April 2025	Lehe, Jörn
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone		T : theory or principle underlying the invention	
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P : intermediate document		& : member of the same patent family, corresponding document	

EPO FORM 1503 03.82 (P04C01)

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

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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