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(54)

ARMREST STRUCTURE FOR A CHAIR, AND CHAIR WITH ARMREST STRUCTURE

(57) It is provided an armrest structure for a chair, the armrest structure comprising a base member, and an attachment part which is attachable to a support structure of a chair, a clutch mechanism and an activation mechanism.

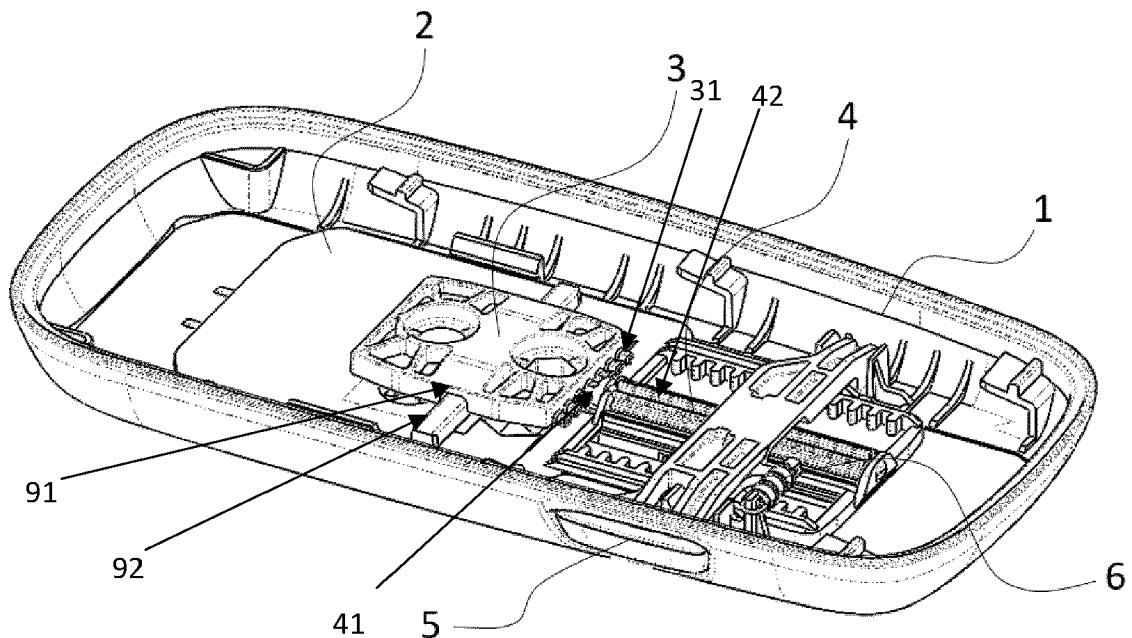


Fig. 3

Description

TECHNICAL FIELD

[0001] Embodiments herein relate to an armrest structure for a chair. Embodiments herein further relate to a chair comprising one or more armrest structures.

BACKGROUND

[0002] Many chairs, in particular office chairs, are to some extent adjustable to fit users of different size and with different seating preferences. For example, it may be possible to adjust inclination of the seat and/or back, lumbar support and neck support. In cases when an office chair is equipped with armrests, they may be foldable or adjustable.

[0003] A user normally has to release a lever for adjusting an armrest position. An example is illustrated in US6053578A. While such solutions may work well in some applications, they are associated with some drawbacks or shortcomings. Release of a lever a button requires an extra moment before the position on the armrest can actually be shifted. When several adjustment possibilities are available on a chair, some trial-and-error may be required before the user understands which lever or button that is associated with release of a particular part of the chair before adjustment can be initiated. This is time consuming, and may lead to unintentional adjustments and readjustments of other parts of the chair before the armrest is released and adjusted. In modern and flexible work places a particular chair may used by several different persons over a day or week. Cumbersome adjustments may then be necessary quite frequently, and it may also be unhygienic when many users have to touch the same release levers and/or buttons for the adjustment.

[0004] In US5746480A an armrest assembly for a chair is shown. The armrest assembly is responsive to downward force on the armrest from a user's arm to restrict movement of the armrest. Pressure, i.e. weight of the arm or gravity, locks the armrest into a given position. Hence, no release buttons are necessary.

[0005] While the armrest assembly in US5746480A may be useful in some situations, it remains a need for an armrest structure which is easy, intuitive and/or ergonomic to use.

[0006] Thus, improvements in the field of armrest structures and chairs with armrest(s) are still desirable.

SUMMARY

[0007] According to an embodiment, this is provided by an armrest structure for a chair, the armrest structure comprising:

- a base member;
- an attachment part which is attachable to a support

structure of the chair, wherein the attachment part is displaceable relative to the base member in at least a first direction and wherein the attachment part comprises first part protrusions,

- 5 - a clutch mechanism comprising second part protrusions, wherein the second part protrusions are arranged to engage with the first part protrusions, wherein the clutch mechanism further comprises a third part protrusions,
- 10 - an activation mechanism comprises a fourth part protrusions wherein the fourth part protrusions are arranged to engage with the third part protrusions.

[0008] According to some embodiments, the activation mechanism is adapted to be displaced in the first direction to rotate the clutch mechanism and disengaging the second part protrusions from the first part protrusions, whereby the base member can move in at least the first direction and/or opposite the first direction relative the an attachment part.

[0009] According to some embodiments, the clutch mechanism is rotatable around an axis perpendicular to the first direction and the third part protrusions comprises gear protrusions in a radiant direction around the axis.

[0010] According to some embodiments, the clutch mechanism comprises a clutch head protruding in a direction along the axis towards the attachment part, the clutch head comprising the second part protrusions comprises at least two protrusions protruding in a direction along the axis towards the attachment part and being offset from the axis, and wherein the at least two protrusions defines an open space in the clutch head.

[0011] According to some embodiments, the clutch head comprises at least a first position wherein the second part protrusions are situated adjacent to at least one protrusion of the first part protrusions, and a second position whereby clutch head is rotated in relation to a first position, whereby the open space in the clutch head is situated adjacent to at least a part of the first part protrusions, and wherein the first position of the clutch head corresponds to a locked state of the armrest structure, and wherein the second position of the clutch head corresponds to an unlocked state of the armrest structure

[0012] According to some embodiments, the first part protrusions comprising a rack portion comprising at least two protrusions at a side thereof towards the clutch head.

[0013] According to some embodiments, the clutch head comprises at least two protrusion protruding in a direction along the axis towards the attachment part and mirrored on either side of the axis.

[0014] According to some embodiments, the second part protrusions of the clutch mechanism are adapted to be in a locked state when the second part protrusions are situated in at least partly between the first part protrusions, and to be in an unlocked state when second part protrusions are rotated in relation to the locked state, whereby the second part protrusions are not situated in between the first part protrusions.

[0015] According to some embodiments, the arm pad structure comprises a pretension mechanism adapted to pretension the activation mechanism in an initial state.

[0016] According to some embodiments, the activation mechanism comprises a pressing portion located on one side thereof and the fourth part protrusions comprising a rack portion at an underside thereof.

[0017] According to some embodiments, the pretension mechanism comprises a spring element in a first end attached to the base member, or parts thereof, and in a second end attached to the activation mechanism, or parts thereof.

[0018] According to some embodiments, the attachment part and base member comprises directional guide, wherein the directional guide comprises:

- a sliding groove aligned the first direction of the an attachment part, and
- a sliding protrusion aligned the first direction of the base assembly slidably engaged with the sliding groove,
- or
- a sliding groove aligned the first direction of the base member, and
- a sliding longitudinal protrusion aligned the first direction of the an attachment part slidably engaged with the sliding groove.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] The various aspects of embodiments herein, including its particular features and advantages, will be readily understood from the following detailed description and the accompanying drawings, in which:

- Fig. 1 illustrates a front view of a chair comprising movable armrest.
- Fig. 2 illustrates a perspective view of a movable armrest.
- Fig. 3 illustrates a perspective view of the assembly of an armrest structure.
- Fig. 4 illustrates a part of an armrest structure.
- Fig. 5 illustrates a perspective view of the assembly of an armrest structure with sectional highlights.
- Fig. 6 illustrates a perspective view of the assembly of an armrest structure with sectional highlights.
- Fig. 7 illustrates a perspective view of the assembly of an armrest structure with sectional highlights.

DETAILED DESCRIPTION

[0020] Embodiments herein will now be described more fully with reference to the accompanying drawings, in which example embodiments are shown. However, this application should not be construed as limited to the embodiments set forth herein. Disclosed features of example embodiments may be combined as readily understood by one of ordinary skill in the art to which this ap-

plication belongs. Like numbers refer to like elements throughout.

[0021] Well-known functions or constructions will not necessarily be described in detail for brevity and/or clarity.

[0022] Fig. 1 illustrates a chair 100 comprising two armrest structures 0, 0' that may alternatively be referred to as an armrest assembly, an armrest or similar. The armrest structures 0, 0' are movable at least in the direction F1, which is defined sideways in both directions in relation to the chair 100 in normal use.

[0023] Fig. 2 illustrates an armrest structure 0 movably to a support structure 7 of the chair 100 (of which only a side support structure is shown), the armrest structure 0 comprising a pressing portion 52 arranged to be operable by a user. The chair may be any type of chair, such as an office chair, a car seat or the like. The chair may comprise legs, a frame, a seat, a back support and possibly a neck support. The support structure 7 onto which the armrest structure 0 may be attached to e.g. a frame of the chair, or to the seat or back support. It may be permanently attached or removable. For example, it may be attached with screws, bolts, press-fitting, glue or any other suitable attachment means. The armrest structure 0 may be attached to the support structure 7 by any suitable attachment means, such as screws, bolts, glue or similar.

[0024] The armrest structure 0 comprising a base member 1 (shown in Fig. 2) providing structural support and an top member 10 adapted to provide a resting or support surface for a user. The base member 1 and top member 10 operatively connected to each other, i.e. positioned relatively each other by shape-locking, snap-fitting or similar.

[0025] Figure 3 illustrates parts of the armrest structure 0 wherein base member 1 comprises an attachment part 3, which is attachable to a support structure 7 of the chair, wherein the attachment part 3 is displaceable relative to the base member 1 in at least a first direction F1. The attachment part 3 may be attachable to the support structure 7 via fastening means 8, such that the attachment part 3 is stationary in relation to the support structure 7 and wherein the base member 1 is movable at least in the directions F1. The base member 1 may thus comprise an aperture 12 or opening with an extent in at least the first direction F1, and in an another embodiment, also in the second direction F1, whereby the fastening means 8 for the attachment part 3 goes through the opening in the base member 1.

[0026] In an embodiment, the attachment part 3 and base member 1 may comprise directional guiding means, wherein the directional guiding means comprises a sliding groove 91 aligned the first direction F1 of the an attachment part 3, and a sliding protrusion 92 aligned the first direction F1 of the base assembly 1 slidably engaged with the sliding groove, or alternatively a sliding groove aligned the first direction F1 of the base member 1, and a sliding longitudinal protrusion aligned the first direction F1 of the an attachment part 3 slidably engaged with the

sliding groove.

[0027] As further illustrated in fig. 3, the attachment part 3 comprises first part protrusions 31, and wherein the armrest structure 0 further comprises a clutch mechanism 4 comprising second part protrusions 41, wherein the second part protrusions 41 are arranged to engage with the first part protrusions 31 of the attachment part 3, and wherein the clutch mechanism 4 further comprises a third part protrusions 42. The armrest structure 0 further comprises an activation mechanism 5 comprising a fourth part protrusions 51 wherein the fourth part protrusions 51 are arranged to engage with the third part protrusions 42 of the clutch mechanism 4.

[0028] In an embodiment, the activation mechanism 5 is adapted to be displaced in the first direction F1, preferably by a user, to rotate the clutch mechanism 4 and disengaging the second part protrusions 41 from the first part protrusions 31, whereby the base member 1 can move in at least the first direction F1 and/or opposite the first direction F1 relative to the attachment part 3. The activation mechanism 5 may be movable in the first direction F1 in relation to the base member 1, such that fourth part protrusions 51 interacts with the third part protrusions 42 of the clutch mechanism 4, to translate movement of the activation mechanism 5 to the clutch mechanism 4.

[0029] In an embodiment, the clutch mechanism 4 is rotatable around an axis X-X perpendicular to the first direction F1 and the third part protrusions 42 comprises gear protrusions in a radial direction around the axis X-X. In the illustrated embodiment in figure 4, the clutch mechanism 4 comprised of a gear, which in the illustrations comprises an extent in the second direction F2.

[0030] As illustrated in fig. 4, the clutch mechanism 4 may in an embodiment comprises a clutch head 43 protruding in a direction along the axis X-X towards the attachment part 3, the clutch head 43 comprising the second part protrusions 41 comprises at least two protrusions protruding in a direction along the axis X-X towards the attachment part 3 and being off-set from the axis X-X, and wherein the at least two protrusions defines an open space in the clutch head 43. In the illustrated embodiment, the clutch head 43 comprises at least two protrusion protruding in a direction along the axis X-X towards the attachment part 3 and mirrored on either side of the axis X-X.

[0031] Fig. 5 illustrates an embodiment wherein parts of the armrest structure 0 comprising a base member 1 is seen from above and with the sectional views of the planes A-A and B-B, and wherein the armrest structure is in a locked state L. In the sectional view of section A-A the fourth part protrusions 51 is illustrated as a rack of protrusion on an underside of the activation mechanism 5, wherein at least some of the fourth part protrusions 51 coincides with the radial second part protrusions 41 of the clutch mechanism 4. When a pressing portion 52 of the activation mechanism 5 is not activated, the activation mechanism 5 is in a tensioned position, and

the fourth part protrusions 51 of the activation mechanism 5 interacts and holds the second part protrusions 41, and thus the clutch mechanism 4, in an initial first position.

[0032] In the sectional view of section B-B of fig. 5, the two second part protrusions 41 of the clutch head 43 is seen in the first position whereby the two second part protrusions 41 of the clutch head 43 is situated between the at least a part of the first part protrusions 31. In this position, parts of the clutch head 43 sits between at least two of the protrusions of the first part protrusions 31, and the base member 1 is not movable in relation to the attachment part 3, and the armrest structure 0 is in its locked state L.

[0033] Fig. 6 illustrates an embodiment wherein parts of the armrest structure 0 comprising a base member 1 is seen from above and with the sectional views of the planes A-A and B-B. In the sectional view of section A-A the fourth part protrusions 51 is illustrated as a rack of protrusion on an underside of the activation mechanism 5, wherein at least some of the fourth part protrusions 51 coincides with the radial second part protrusions 41 of the clutch mechanism 4. When a user presses or pushes a pressing portion 52 of the activation mechanism 5, the activation mechanism 5 is translated a distance sideways, thus translating sideways translation of the activation mechanism 5, via the fourth part protrusions 51 and the second part protrusions 41, to rotational motion of the clutch mechanism 4, as indicated by the rotational arrow.

[0034] In the sectional view of section B-B, the two second part protrusions 41 of the clutch head 43 is seen in a second position whereby clutch head 43 is rotated in relation to a first position, whereby the open space in the clutch head 43 is situated adjacent to at least a part of the first part protrusions 31, wherein the second state of the clutch head 43 corresponds to an unlocked state U of the armrest structure 0. In the second state, the clutch head 43 does not sit between the first part protrusions 31, and the base member 1 is movable in relation to the attachment part 3. When a user actuates the pressing portion 52, the armrest structure is set in the second position.

[0035] As seen in Fig. 5 and 6, an embodiment is illustrated with, wherein the first part protrusions 31 comprising a rack portion comprising at least two protrusions arranged adjacent to another at a side thereof towards the clutch head 43. The first part protrusions 31 can comprise a row of any number of protrusions.

[0036] In an embodiment, wherein the second part protrusions 41 of the clutch mechanism 4 are adapted to be in a locked state L when the second part protrusions 41 are situated in at least partly between any of the first part protrusions 31, and to be in an unlocked U state when second part protrusions 41 are rotated in relation to the locked state L, whereby the second part protrusions 41 are not situated in between the first part protrusions 31.

[0037] As seen in fig. 5 and 6, the armrest structure 0 may comprise a pretension mechanism 6 adapted to pre-

tension the activation mechanism 5 in an initial first position, corresponding to the first position and the locked state L. The pretension mechanism 6 may comprises a spring element in a first end attached to the base member 1, or parts thereof, and in a second end attached to the activation mechanism 5, or parts thereof, to pretension the activation mechanism 5 to a position wherein the clutch head 43 stops relative movement between the attachment part 3 and the base member 1.

[0038] In an embodiment, the activation mechanism 5 comprises a pressing portion 52 located on one side thereof and the fourth part protrusions 51 comprising a rack portion at an underside thereof. The pressing portion 52 can be accessible through an opening or cut-out of base member 1, and adapted to be activated by a user to change the state from a locked state L to an unlocked state U. The attachment part 3, the clutch mechanism 4 and the activation mechanism 5 are adapted to translate movement of the activation mechanism 5, from an initial locked state L to an activated unlocked state U. This may be achieved by the activation mechanism 5 inducing rotation on the clutch mechanism 4 and disengaging the second part protrusions 41 from the first part protrusions 31, whereby the base member 1 can move in at least the first direction F1 relative the an attachment part 3.

[0039] In another embodiment, the activation mechanism 5 comprises a fifth part protrusion 53 wherein the base member comprises a sixth part protrusion 11. The sixth part protrusion 11 are arranged in a row or the like along a second direction the direction F2, and the fifth part protrusion 53 are arranged to engage the sixth part protrusion 11. In an first initial position, the activation mechanism 5 may be in a pretension state, wherein the sixth part protrusion 11 the fifth part protrusion 53 are engaged, preventing any movement between the the base member 1 and the an attachment part 3 in the second direction F2. The second direction F2 being perpendicular to the first direction F1. When the activation mechanism 5 is activated, the activation mechanism 5 is translated away from the sixth part protrusion 11, and the fifth part protrusion 53 are no longer engaging with the the sixth part protrusion 11. As the clutch mechanism 4 comprised of a gear, which in the illustrations comprises an extent in the second direction F2, the fourth part protrusions 51 can move in relation to the third part protrusions 42 in the second direction F2. Thus, in said embodiment, the base member 1, and hence the top member 10, can be locked in both the first F1 and second direction F2, in the locked state L, and be movable in both the first F1 and second direction F2, in the unlocked state U.

[0040] Fig. 7 illustrates an embodiment wherein the base member 1 comprises a sliding plate 2 adapted to move in the second direction F2 within the base member 1. In this embodiment, the sliding plate 2 comprises the sliding protrusion 92 adapted to receive the sliding groove 91 of the attachment part 3 and to hold the clutch mechanism 4 in a rotational manner. This can be achieved with two snap supports or the like, in, or close

to, either end of the clutch mechanism 4. In the figure, the base member 1 is illustrated without any of the associated parts installed, wherein the aperture 12 is illustrated. Furthermore, the sliding plate 2 is illustrated on its own. As can be seen from the figure, in one embodiment, the sliding plate 2 comprises the sixth part protrusions 11 adapted to interact with the fifth part protrusions 53 of the activation mechanism 5. The sliding plate 2 can be movably supported in the base member 1 via a first set of guiding means 13, 13' such as snap arms or the like. The activation mechanism 5 can be movably supported in the base member 1 via a second set of guiding means 14, 14' such as snap arms or the like.

15	0	Armrest structure
	100	Chair
	1	Base member
	2	Sliding plate
	3	Attachment part
20	31	First part protrusions
	4	Clutch mechanism
	41	Second part protrusions
	42	Third part protrusions
	43	Clutch Head
25	5	Activation mechanism
	51	Fourth part protrusions
	52	Pressing portion
	53	Fifth part protrusions
	6	Pretension mechanism
30	7	Support structure
	8	Fastening Means
	91	Sliding groove
	92	Sliding protrusion
	10	Top member
35	11	Sixth part protrusions
	12	Aperture
	13	First guiding means
	14	Second guiding means

Claims

1. An armrest structure (0) for a chair (100), the armrest structure (0) comprising:
 - a base member (1);
 - an attachment part (3) which is attachable to a support structure (7) of the chair, wherein the attachment part (3) is displaceable relative to the base member (1) in at least a first direction (F1) and wherein the attachment part comprises first part protrusions (31),
 - a clutch mechanism (4) comprising second part protrusions (41), wherein the second part protrusions (41) are arranged to engage with the first part protrusions (31), wherein the clutch mechanism (4) further comprises a third part protrusions (42),

- an activation mechanism (5) comprises a fourth part protrusions (51) wherein the fourth part protrusions (51) are arranged to engage with the third part protrusions (42).
2. The armrest structure (0) according to claim 1, wherein the activation mechanism (5) is adapted to be displaced in the first direction (F1) to rotate the clutch mechanism (4) and disengaging the second part protrusions (41) from the first part protrusions (31), whereby the base member (1) can move in at least the first direction (F1) and/or opposite the first direction (F1) relative the an attachment part (3).
 3. The armrest structure (0) according to claim 1 or 2, wherein the clutch mechanism (4) is rotatable around an axis (X-X) perpendicular to the first direction (F1) and the third part protrusions (42) comprises gear protrusions in a radiant direction around the axis (X-X).
 4. The armrest structure (0) according to any one of the claims 1-3, wherein the clutch mechanism (4) comprises a clutch head (43) protruding in a direction along the axis (X-X) towards the attachment part (3), the clutch head (43) comprising the second part protrusions (41) comprises at least two protrusions protruding in a direction along the axis (X-X) towards the attachment part (3) and being off-set from the axis (X-X), and wherein the at least two protrusions defines an open space in the clutch head (43).
 5. The armrest structure (0) according to any one of the claims 1-4, wherein the clutch head (43) comprises at least a first position wherein the second part protrusions (41) are situated adjacent to at least one protrusion of the first part protrusions (31), and a second position whereby clutch head (43) is rotated in relation to a first position, whereby the open space in the clutch head (43) is situated adjacent to at least a part of the first part protrusions (31), and wherein the first position of the clutch head (43) corresponds to a locked state (L) of the armrest structure (0), and wherein the second position of the clutch head (43) corresponds to an unlocked state (U) of the armrest structure (0).
 6. The armrest structure (0) according to any one of the previous claims, wherein the first part protrusions (31) comprising a rack portion comprising at least two protrusions at a side thereof towards the clutch head (43).
 7. The armrest structure (0) according to any one of the previous claims, wherein the clutch head (43) comprises at least two protrusion protruding in a direction along the axis (X-X) towards the attachment part (3) and mirrored on either side of the axis (X-X).
 8. The armrest structure (0) according to any one of the previous claims, wherein the second part protrusions (41) of the clutch mechanism (4) are adapted to be in a locked state (L) when the second part protrusions (41) are situated in at least partly between the first part protrusions (31), and to be in an unlocked state when second part protrusions (41) are rotated in relation to the locked state (L), whereby the second part protrusions (41) are not situated in between the first part protrusions (31).
 9. The armrest structure (0) according to any one of the previous claims, further comprises a pretension mechanism (6) adapted to pretension the activation mechanism (5) in an initial state.
 10. The armrest structure (0) according to any one of the previous claims, wherein the activation mechanism (5) comprises a pressing portion (52) located on one side thereof and the fourth part protrusions (51) comprising a rack portion at an underside thereof.
 11. The armrest structure (0) according to any one of the previous claims, wherein the pretension mechanism (6) comprises a spring element in a first end attached to the base member (1), or parts thereof, and in a second end attached to the activation mechanism (5), or parts thereof.
 12. The armrest structure (0) according to any one of the previous claims, wherein the attachment part (3) and base member (1) comprises directional guide, wherein the directional guide comprises:
 - a sliding groove (91) aligned the first direction (F1) of the an attachment part (3), and
 - a sliding protrusion (92) aligned the first direction (F1) of the base assembly (1) slidably engaged with the sliding groove,
 - or
 - a sliding groove aligned the first direction (F1) of the base member (1), and
 - a sliding longitudinal protrusion aligned the first direction (F1) of the an attachment part (3) slidably engaged with the sliding groove.

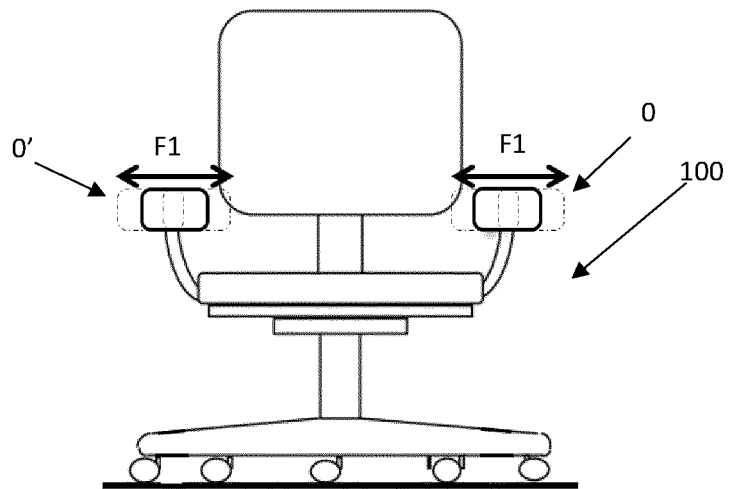


Fig. 1

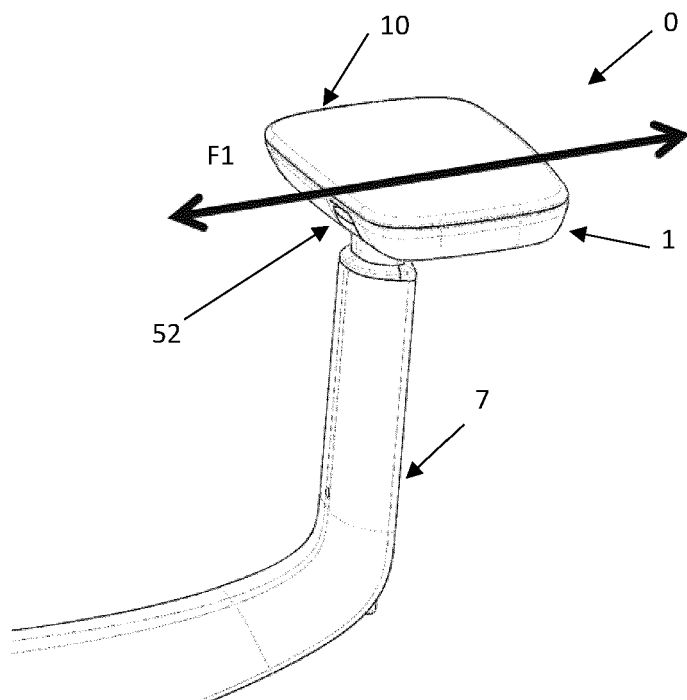


Fig. 2

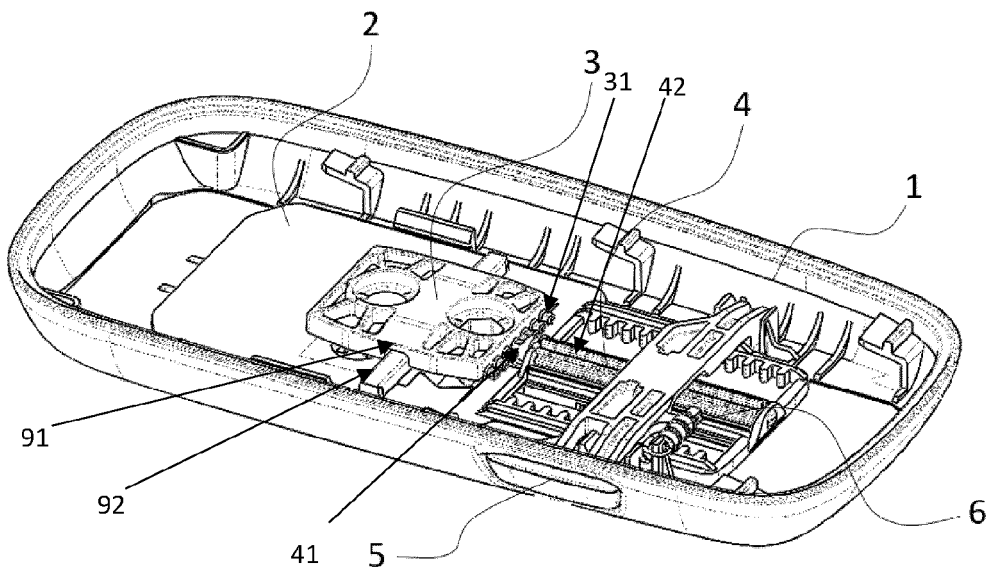


Fig. 3

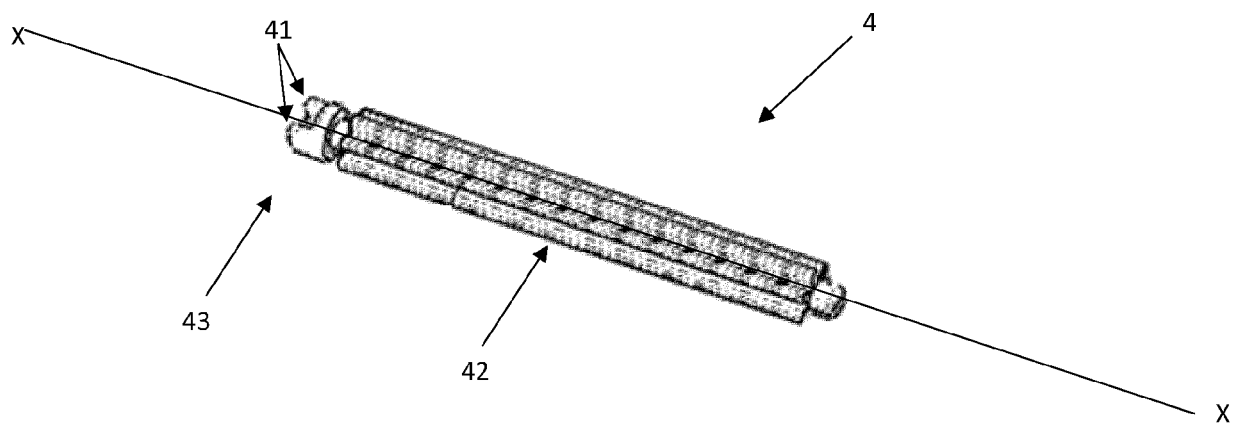


Fig. 4

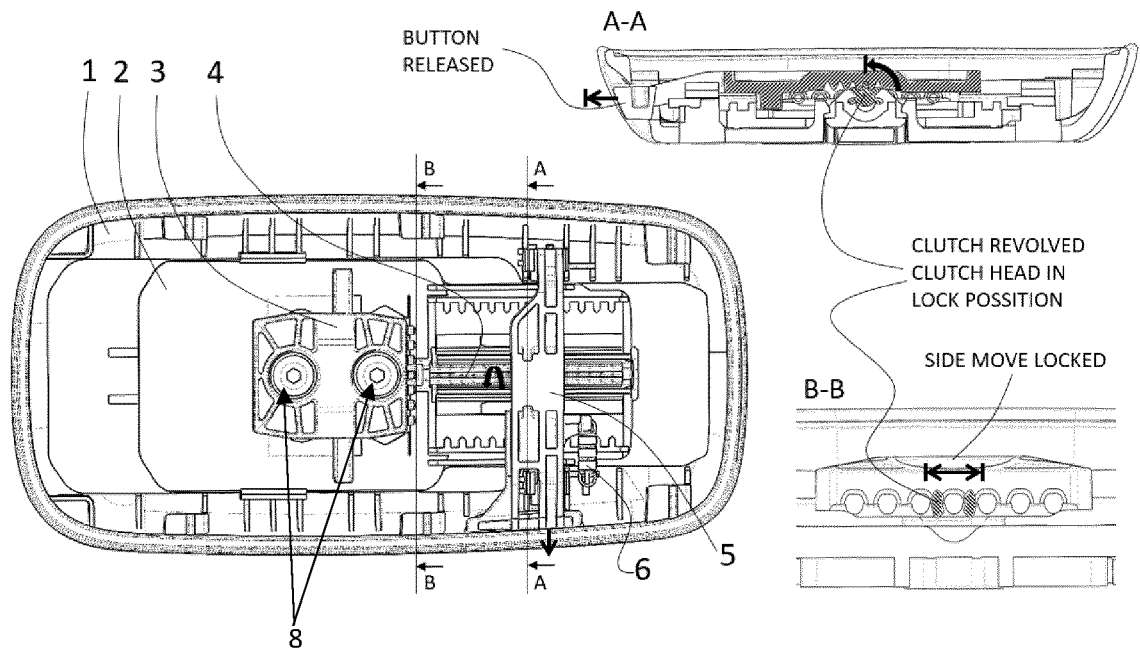


Fig. 5

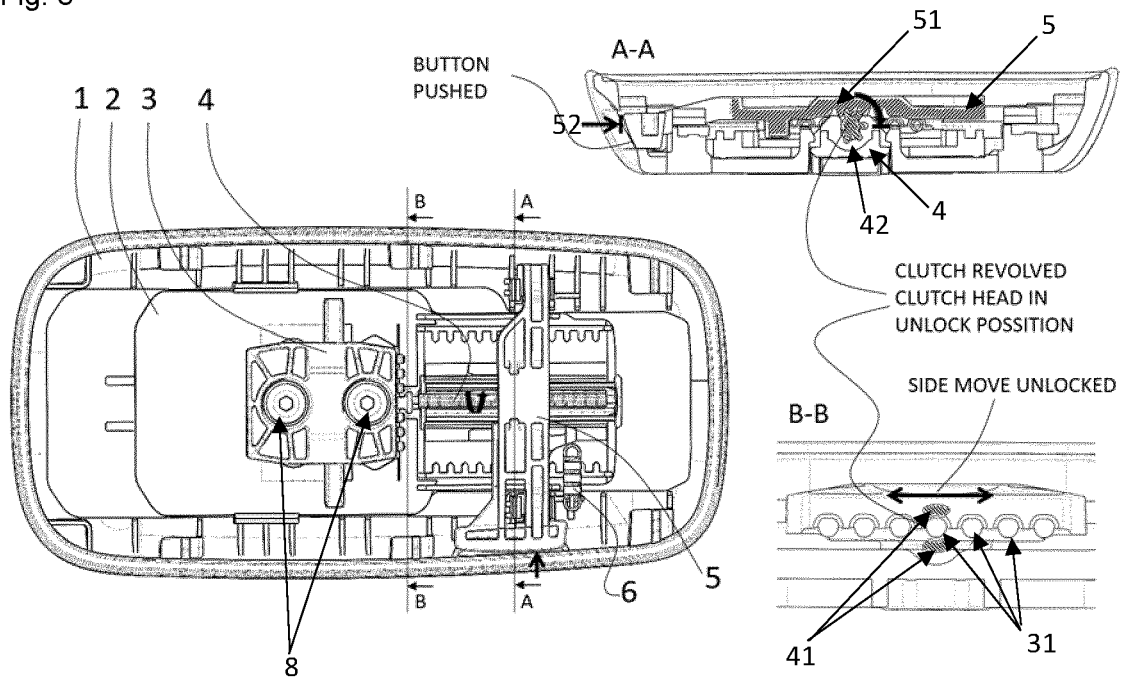


Fig. 6

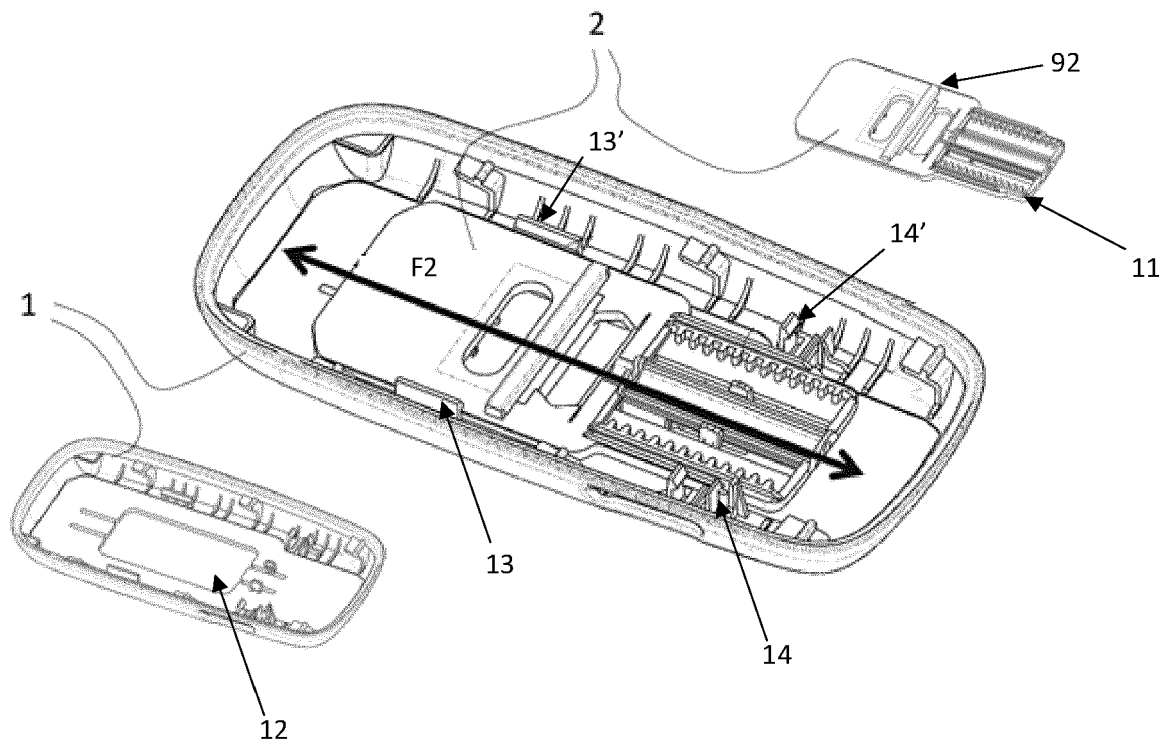


Fig. 7



EUROPEAN SEARCH REPORT

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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	US 2019/174921 A1 (CHEN TE-CHUN [TW]) 13 June 2019 (2019-06-13)	1, 8-12	INV. A47C1/03
A	* paragraph [0013] - paragraph [0068]; figures 1-26 *	2-7	
A	US 2021/274940 A1 (HSIEH WEN-PING [TW]) 9 September 2021 (2021-09-09) * paragraph [0006] - paragraph [0061]; figures 1-39 *	1	
			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		4 July 2024	Lehe, Jörn
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 24 15 8026

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10	Patent document cited in search report	Publication date	Patent family member(s)	Publication date
	US 2019174921 A1	13-06-2019	NONE	

15	US 2021274940 A1	09-09-2021	NONE	

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REFERENCES CITED IN THE DESCRIPTION

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