

Description

An arm rest, in particular for an office chair

- 5 The invention relates to an arm rest, in particular for an office chair, preferably with a height-adjustable arm rest column and an arm support positioned on the arm rest column.

An arm rest of this type is known from the German patent
10 application DE 101 25 996 submitted by the applicant. The arm rest described therein can be adjusted with respect to its length and rotation. Particularly when a narrow basic arm rest position is required, for example when the seat is wider than the inner dimensions of the arm supports, the
15 limitations of the individual setting options for the arm rests described therein become evident.

A task of the present invention is therefore to improve the way in which an arm rest of this type can be used. This
20 object is attained in a particularly simple constructive design by an arm rest according to claim 1. According to this design, a multi-function bearing head is provided, which comprises a mechanism for rotational, longitudinal and lateral adjustment.

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In addition to the known rotational and longitudinal adjustment, a lateral adjustment of the arm rest is also possible according to the invention.

- 30 Advantageous embodiments of the invention are described in the dependant claims.

Embodiments of the invention which have a simple construction, are easy to assemble, and yet guarantee reliable rotational, longitudinal and lateral adjustment are described in claims 2 to 10.

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The adjustment mechanisms are preferably catch-lock mechanisms, and are therefore particularly easy to operate and/or can be used without a release button. In other words, the position of the arm support can be altered without a
10 release button having to be pressed. As a result, the arm rest is particularly user-friendly.

The lateral adjustment mechanism in particular preferably comprises a fixed location platform section acting in
15 conjunction with a load bearing element which moves laterally in relation to the platform section. In a further embodiment of the invention, in order to realise the locking mechanism which can be activated without a release button, the platform section and the support element comprise locking elements
20 which act in conjunction with each other.

The multi-function bearing head is preferably structured in different function levels in such a way that in each case, a lower function level supports the overlying function levels.
25 According to a particularly preferred embodiment of the invention, the support element for the lateral adjustment mechanism supports the entire longitudinal adjustment mechanism, while the rotational adjustment mechanism is in turn supported by the longitudinal adjustment mechanism, or
30 is integrated into the latter.

In a further embodiment of the invention, the longitudinal adjustment mechanism comprises a linear sliding guide. This

is preferably designed in such a way that it comprises a longitudinal guide frame in which a bearing block is inserted. This bearing block now preferably supports the rotational adjustment mechanism in turn, via which the arm support is connected to the multi-function bearing head.

If the rotational adjustment mechanism enables the arm support to be rotated by 360 degrees, a particularly flexible adjustment of the arm support is possible. This applies in particular when the arm support is asymmetrically formed in such a way that its longitudinal sides extend to different lengths. In connection with the lateral adjustment of the arm support, the option of a complete rotation of the arm support enables the inner dimension between the arm supports to be adjusted with a particularly large number of variations.

In a further embodiment of the invention, the arm support can be firmly latched into its standard position using a locking element. This is preferably achieved by only enabling the arm support to be turned after it has been unlocked by pressing a button. This ensures that the arm rest always points towards the front in such a way that the user is provided with a comfortable support position.

The invention will now be described in greater detail below by way of an exemplary embodiment which is explained with reference to the drawings, in which:

Fig. 1 shows a perspective, detailed view of an arm rest

Fig. 2 shows a further perspective, detailed view of the arm rest

Fig. 3 shows a profile view of the arm rest in the longitudinal direction

Fig. 4 shows a profile view of the arm rest in the lateral direction along the line IV-IV in Fig. 3, and

Fig. 5 shows a perspective view of the underside of the longitudinal guide frame with load bearing element

10 The arm rest 1 comprises a height-adjustable arm rest column 2, in particular with a telescope-type structure, on the upper end of which a multi-function bearing head 3 is arranged. This bears an arm support 4, which can be rotated around a vertical rotational axis 5, and which is retained on
15 the bearing head 3 in such a way that it can be moved in both the longitudinal direction 6 and the lateral direction 7.

The vertical side bar of the arm rest column 2 takes the form of a guide holder, onto which the outer sleeve 8 of the arm
20 rest column 2 is guided in the vertical direction 9 in such a way that it can be moved. The guide holder contains a height-adjustable arresting device (not shown). A horizontal side bar formed on the arm rest column 2 (not shown) is used to affix the arm rest 1 onto the base of an office chair or
25 similar.

On the upper end of the arm rest column 2, the outer sleeve 8 is extended outwards opposite the actual column section, thus forming the base 10 for the multi-function bearing head 3.
30 This base 10 is open at the top, the opening 11 being closed by a lid-type base plate 12 of the multi-function bearing head 3. The base plate 12, which is made of a synthetic

material, is screwed to the arm rest column 2 using a number of attachment screws 13.

In order to adjust the height of the arm rest 1, an operating
5 lever is provided, the operating end of which (not shown) extends over an opening 14 which is open towards the outer side of the base 10. A possible design of the height adjustment mechanism is contained in the publication DE 101 25 996 A1. However, in principle, other techniques can also
10 be used to adjust the height.

A lateral adjustment mechanism 16 is arranged on the base plate 12, which consists primarily of a platform section in the form of a locking plate 17 and a support element 18 which
15 is attached to said plate in such a way that it moves in a transverse direction 7. The support element 18 comprises three guide channels 19 which are arranged at a distance from each other, offset in a triangular form, and which run in the transverse direction 7. Each of these guide channels 19 is
20 assigned a bolt-type attachment element 20. Here, each attachment element 20 is fitted with a ring-shaped sliding element 21, and is inserted in the guide channel 19 in such a way that it affixes the locking plate 17 on the base plate 12 of the multi-function bearing head 3, while at the same time
25 enabling the lateral adjustment of the support element 18. In the final mounting position, the sliding elements 21 lie on the collar of the attachment element 20 and rest on the guide grooves 15 which run around the inner sides of the guide channels 19. The attachment elements 20 lead through the
30 guide channels 19 and the corresponding retainer bore holes 22 in the locking plate 17 and act in conjunction with the screw threads which are fitted into three support elements

23, which extend upwards in a dome shape out of the base plate 12 to the support piece of the locking plate 17.

In the upper side 24 of the locking plate 17 which faces the
5 load bearing element 18, a number of locking stages 26 have been created, which are arranged one after the other in a depression 25 in the lateral direction 7. A roll-shaped catch locking element 27 is fitted between the locking plate 17 and the load bearing element 18, which is impacted by a spring
10 element in the form of an elastomer block 28, and which acts in conjunction with the locking stages 26. Here, the elastomer block 28 lies in a corresponding retainer 29 on the underside 31 of the load bearing element 18. In other words, the catch locking element 27 is moved from one locking stage
15 26 to the next by a lateral adjustment of the load bearing element 18, without activating a release button or similar, against the resistance of the elastomer block 28 and while being deformed by said block. Here, the locking stages 26 are preferably fitted with identical interim gradient surfaces on
20 both sides, so that both the forward and backward movement can be achieved using the same amount of force.

The locking plate 17 is preferably made of a synthetic material, the locking stages 26 being formed during the
25 manufacturing process as an integral part of the locking plate 17.

The load bearing element 18, which is preferably made of aluminium, comprises on its upper side 32 an attachment dome
30 33 with an internal screw thread. This is used to attach a rotational and longitudinal adjustment mechanism on the lateral adjustment mechanism 16 in a manner to be explained below.

A longitudinal guide frame 34 for a longitudinal adjustment mechanism 35 is arranged directly on the load bearing element 18, and simultaneously serves as the support for a base
5 element 36 of the arm support 4. In the guide channel 37, which primarily runs over the entire length of the longitudinal guide frame 34, a bearing block 38 for a rotational adjustment mechanism 39 is inserted. Here, the bearing block 38 is guided longitudinally by guide flanks 40
10 which run in the longitudinal direction 6 on both sides of the longitudinal guide frame 34 and the corresponding counterpart guide flanks 41 on the bearing block 38.

To provide compensation-for-play in the lateral direction 7,
15 two pairs of spring elements, which are made of an elastic material such as rubber, are fitted to the underside of the bearing block 42. One of the spring element pairs 30, 30', is shown as an example. The individual spring elements, which comprise a spherical profile when not mounted, lie under
20 tension in oval receptacles 43 on the bearing block 38. Here, they lie with their outer jacket surfaces on locking depressions 44, which are arranged in the guide flanks 40 of the longitudinal guide frame 34, and which primarily extend over the entire length of the guide channel 37. When mounted,
25 the long semiaxes of the receptacles 43 are larger, and the short semiaxes of the receptacles 43 are smaller than the outer diameter of the spring elements. Here, the distance between the locking depressions 44 has been selected in such a way that all four spring elements always lie in locking
30 depressions 44.

The spring elements take the form of a short piece of pipe and comprise identical inner diameters. The two spring

elements 30, 30' of a spring element pair are placed with their openings onto retaining cylinders 46, 46' with spherical profiles. Here, each single spring element 30 of a spring element pair is allocated one retaining cylinder 46
5 with a profile which corresponds to the inner diameter of the spring element, while the other spring element 30' of the spring element pair is allocated one retaining cylinder 46' with a significantly smaller profile. As a result, when the bearing block 38 is moved in the longitudinal direction 6,
10 the spring element 30' allocated to the retaining cylinder 46' with the smaller diameter is deformed, while the corresponding second spring element 30 remains almost undeformed. Here, in the sliding direction 6, the retaining cylinders 46, 46' with different diameters alternate with
15 each other. This guarantees that the spring elements 30, 30' lie on the guide flanks 40, thus providing compensation-for-play at all times. In addition, the roll-shaped spring elements 30, 30', act in conjunction with the locking depressions 44 to form a release button-free, locking
20 adjustment mechanism, with which both the forward and backward movements of the bearing block require the same amount of force due to the uniform design of the locking depressions 44.

25 The bearing block 38 comprises in its centre a primarily spherical retainer recess 47, in which a locking mechanism lies for the rotational adjustment mechanism 39. A spherical locking disc 48 is provided for this purpose, which is fitted on its underside 49 with radially arranged locking stages 50,
30 and which lies at least partially in the retainer recess 47 of the bearing block 38. In order to create the rotational lock, the retainer recess 47 comprises two depressions 51, which are opposite each other, and which run in the

longitudinal direction of the bearing block and in the centre of the bearing block 38, and which serve to retain the locking elements in the form of sliding blocks 52. These are impacted by the spring elements in the form of elastomer blocks 53, which can be inserted while mounding into the depressions 51 which are open at the top behind each of the sliding blocks 52.

The locking disc 48 comprises a central bore hole 54 which takes an essentially quadratic form on the underside 49 of the locking disc 48 in order to act in conjunction with the attachment dome 33 of the load bearing element 18. For this purpose, the attachment dome 33 comprises an essentially quadratic profile in its upper section which is designed to be inserted into the bore hole 54. The bore hole 54 serves to retain a holding screw 55, which is used to affix the locking disc 48, the bearing block 38 and the longitudinal guide frame 34 to the attachment dome 33 of the load bearing element 18. For this purpose, the retainer recess 47 of the bearing block 38 comprises a central, spherical opening 56. In the same way, a corresponding guide channel 58 for adjustment in the longitudinal direction 6 is fitted in the end plate 57 of the longitudinal adjustment mechanism 35 which connects the guide flanks 40 of the longitudinal guide frame 34, and which retains the attachment dome 33.

The base element 36 of the arm support 4 is connected with the longitudinal guide frame 34 of the longitudinal adjustment mechanism 35 via screw connections 59. In order to be able to move the bearing block 38 in the longitudinal guide frame 34 as far as possible in the longitudinal direction 6, recesses 61 for the screw connections 59 are fitted on the lateral sides 60 of the bearing block 38.

The arm support cushion 61 is attached to the base element 36 via a snap or lock connection 62.

5 In order to move the arm support longitudinally and/or laterally on the multi-function bearing head 3, only the arm support 4 needs to be held and moved accordingly. Since no release buttons are provided for the longitudinal and lateral adjustment, this operation can be achieved with the minimum
10 of effort.

Since the arm support 4 is asymmetrically formed in such a way, that the longitudinal sides 63, 63' extend out differently in the lateral direction 7, a particularly
15 variable inner dimension between the arm supports 4 can be created by rotating the arm support 4 by 180°.

The multi-function bearing head 3 according to the invention can be used with any arm rest 1, in particular with those arm
20 rests for which the height can be adjusted in the arm rest column 2. Naturally, however, the multi-function bearing head 3 can also be used for arm rests which have no height adjustment.

25 In addition, the arm rest 4 has a locking mechanism in its standard position. For this purpose, a button 64 and a locking tappet 65 are fitted between the load bearing element 18 and the locking plate 17, see Fig. 1A and 2A, and Fig. 5. The locking tappet 65 extends through the penetration opening
30 70 through the load bearing element 18, and when locked, reaches into one of the locking recesses 66 or 67 on the end plate 57. In its standard positions, which are defined by the position of the locking recesses 66, 67, approximately

parallel to the guide channel 58, the arm supports 4 are arranged approximately vertically to the back rest of the office chair (not shown). Due to the arrangement of the locking recesses 66, 67 in the end plate 57, the standard
5 position can naturally also be set so that the arm supports 4 stand slightly at an angle to each other, for example, in such a way that they correspond to the position of the lower arms of a user working at a computer keyboard.

10 The button 64, which is preferably made of a synthetic material, comprises in detail a button element 68 and a pull-out finger 69 which is formed on the end of the button element 68. This is supported in such a way that it can be rotated on the opposite end of the button element 68 over a
15 bearing point 72 on the load bearing element 18. On the end of the pull-out finger 69, a wedge 73 is formed as a single part, and in particular is attached using injection moulding. When the button 64 is pressed in the release direction 71, the button element 68 is rotated around the bearing point 72
20 in such a way that the pull-out finger 69 moves towards the locking tappet 65. Here, the pull-out finger 69 presses the tappet of the wedge 73 in the release direction 71 into the locking tappet 65, which comprises a retainer opening 74 which has been adapted to the wedge form and which has been
25 slanted in the same manner for this purpose. When the interim gradient surface 76 of the wedge 73 is inserted into the retainer opening 74, the locking tappet 65 is led out in a straight line from the locking recess 65 or 66 when the button 64 is pressed again; see Fig. 5. In other words, the
30 arm support 4 is released for rotation. Since the locking process is achieved by the locking tappet moving either in or out in a straight line in the unlocking direction 77, see

Fig. 4, the locking tappet 65 is prevented from being forced out of the locking recess when the arm support 4 is rotated.

The button element 68 is pressed and the locking tappet 65 is moved against the spring force of a spring element 78 which supports the locking tappet 65 against the edge of the load bearing element 18, thus preventing inadvertent unlocking.

Since the locking recesses 66, 67 are fitted on both sides of the guide channel 58, a rotation of the arm support 4 by 180 degrees is possible through to the next locking position. It should be noted that the design of the locking recesses 66, 67 as guide grooves ensures that the arm support 4 can also be moved in the longitudinal direction 6 when it is locked. Naturally, it is also possible to move it in the lateral direction 7 at any time. It is of course also possible to use the invention without the locking mechanism described. This will then provide a release button-free rotational, longitudinal and lateral adjustment mechanism 39, 35, 16.

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When the fundamental idea of the invention and the embodiment of the invention explained in the description are applied, a person having the ordinary skill in the art will appreciate that many further examples of embodiments are possible which cannot however be described here in detail. It should be noted that all the features represented in the description, the claims and the drawings can be essential to the invention, either individually or in any combination with each other.

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List of reference numerals

1 Arm rest

	2	Arm rest column
	3	Multi-function bearing head
	4	Arm support
	5	Rotational axis
5	6	Longitudinal direction
	7	Lateral direction
	8	Outer sleeve
	9	Vertical direction
	10	Base
10	11	Opening
	12	Base plate
	13	Attachment screw
	14	Opening
	15	Unassigned
15	16	Lateral adjustment mechanism
	17	Locking plate
	18	Load bearing element
	19	Guide channel
	20	Attachment element
20	21	Sliding element
	22	Retainer bore hole
	23	Supporting element
	24	Upper side
	25	Depression
25	26	Locking stage
	27	Catch locking element
	28	Elastomer block
	29	Retainer
	30	Spring element
30	31	Underside
	32	Upper side

	33	Attachment dome
	34	Longitudinal guide frame
	35	Longitudinal adjustment mechanism
	36	Base element
5	37	Guide channel
	38	Bearing block
	39	Rotational adjustment mechanism
	40	Guide flank
	41	Counterpart guide flank
10	42	Underside of bearing block
	43	Retainer
	44	Locking depression
	45	Unassigned
	46	Retaining cylinder
15	47	Retainer recess
	48	Locking disc
	49	Underside
	50	Locking stage
	51	Depression
20	52	Sliding block
	53	Elastomer block
	54	Bore hole
	55	Holding screw
	56	Opening
25	57	End plate
	58	Guide channel
	59	Screw connection
	60	Lateral side
	61	Arm support cushion
30	62	Snap connection
	63	Longitudinal side

	64	Button
	65	Locking tappet
	66	Locking recess
	67	Locking recess
5	68	Button element
	69	Pull-out finger
	70	Penetration opening
	71	Release direction
	72	Bearing point
10	73	Wedge
	74	Retainer opening
	75	Tappet
	76	Interim gradient surface
	77	Unlocking direction
15	78	Spring element

Claims

1. An arm rest (1), in particular for an office chair, with a preferably height-adjustable arm rest column (2) and an arm
5 support (4) positioned on the arm rest column (2), characterized by a multi-function bearing head (3) arranged on the arm rest column (2) with a rotational, longitudinal and lateral adjustment mechanism (39, 35, 16) for the arm support (4).
- 10 2. An arm rest (1) according to claim 1, characterized in that the rotational and/or longitudinal and/or lateral adjustment mechanism is a locking mechanism.
- 15 3. An arm rest (1) according to claim 1 or 2, characterized in that the rotational and/or longitudinal and/or lateral adjustment mechanism is release button-free.
4. An arm rest (1) according to one of claims 1 to 3,
20 characterized in that the lateral adjustment mechanism (16) comprises a platform section (17), and a load bearing element (18) which moves laterally to the platform section (17).
5. An arm rest (1) according to claim 4, characterized by a
25 load bearing element (18) which supports the longitudinal adjustment mechanism (35).
6. An arm rest (1) according to one of claims 1 to 5, characterized in that the longitudinal adjustment mechanism
30 (35) comprises a linear sliding guide (34, 38).
7. An arm rest (1) according to claim 6, characterized in that the linear sliding guide (34, 38) comprises a

longitudinal guide frame (34), in which lies a bearing block (38).

8. An arm rest (1) according to claim 7, characterized in
5 that the rotational adjustment mechanism (39) comprises a locking mechanism (48, 52), which is supported in the bearing block (38).

9. An arm rest (1) according to one of claims 1 to 8,
10 characterized in that the rotational adjustment mechanism (39) enables the arm support (4) to be rotated by 360 degrees.

10. An arm rest (1) according to one of claims 1 to 9,
15 characterized in that the arm support (4) can be fixed in its standard position using a locking element.