



(11)

EP 2 397 803 A2

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
21.12.2011 Bulletin 2011/51

(51) Int Cl.:
F25D 25/02 ^(2006.01) **F25D 25/04** ^(2006.01)

(21) Application number: **11167684.7**

(22) Date of filing: **26.05.2011**

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**
Designated Extension States:
BA ME

(30) Priority: **18.06.2010 TR 201004947**

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(54) **Height adjustable carrier**

(57) The present invention provides a directing element (1) for the household goods (C) for the height adjustment of the carriers (2) with at least one moving element (3) thereon; without reducing the size and by preventing the abrupt movements of the said (2). In an household good (C) comprising a directing element (1) which is fixed to at least one of the walls of its internal part (C'), and which adjusts the height of the carrier (2) by means of the moving element (3) moving therein; the

said directing element (1) comprises at least one upper channel (6) and at least one lower channel (6') in which the moving element (3) moves, and at least one joint area (8) where one ends of said channels (6, 6') meet and at least one curve (7) located on at least one of the said channels (6, 6'), in which the moving element (3) is seated. The said upper channel (6) is inclined upwards with respect to the joint area (8) and the lower channel (6') is inclined downwards with respect to the joint area (8).

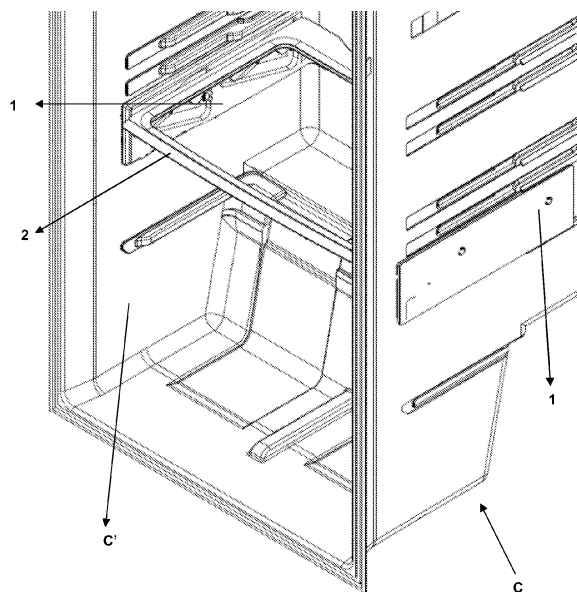


Figure 1

Description**Technical Field**

5 **[0001]** This invention relates to household goods comprising shelf-like height adjustable carriers.

Prior Art

10 **[0002]** The carrier used in household goods is located inside the good, and inserted into at least one channel on the internal wall of the good. The carrier inserted into the channel is fixed at the height of channel on the wall. For this reason, the user can not change the height of the carrier and thus can not adjust the height needed.

15 **[0003]** A variety of methods are presented to solve this existent problem in the prior art. One of these methods aims to adjust the height of the carrier by means of inclined plane principle. This method is widely used and beneficial; however, when the user intends to lower the carrier, if the lowering direction is designed to follow a perpendicular trajectory, the carrier may make an abrupt lowering movement. Also, in the systems developed by utilizing inclined plane principle, if the lowering direction is configured in the same way as the lifting direction utilizing the inclined plane principle, then both the depth of the shelf and the space available for use is decreased.

20 **[0004]** The patent document US3516369 of prior art discloses a cooler shelf mechanism moving by means of a wheel, making use of the advantages that the inclined plane principle provides for lifting mechanisms. On the interior surfaces of the lateral walls of the cooler is located a mechanism comprising two channels parallel to each other, in which the shelf is inserted. These parallel channels are joined to channels in inclined plane form, thus providing a mechanism in the form of a parallelogram. Pins are provided on the spots these channels intersect. Therefore, the shelf moving by means of wheels is prevented from falling into the gaps at the intersection points. The above-mentioned shelf can be moved backwards and forwards inside the channel by means of its wheels. Due to this back and forth movement, the shelf, under the control of pins, can pass through the horizontal channels and through the channels in the form of inclined planes, thus allowing for the adjustment of height. However, in this method disclosed in the patent document US3516369, as the inclined plane principle is also employed in the lowering of the shelf, the horizontal route of the channel is prolonged and since it is required to move within a limited volume, shelf has to be reduced in size.

30 **[0005]** In another patent document JP9250870 of the prior art, a mechanism for shelf height adjustment utilizing inclined plane principle and using pins. In this mechanism, a shelf support part comprising elliptic channels thereon is located on the internal wall of the cooler device. Supplementary channels were provided to ensure the extension of channel on horizontal and vertical axes of said channels. On the shelf itself, protrusions are provided to settle the shelf into the supplementary channels. When the shelf is positioned in the said channels on the support part, in accordance with the desired height, the protrusions on the shelf are placed in the supplementary channels.

35 **[0006]** In another prior art patent document WO03095912, a household good comprising a mechanism constituted by horizontal and vertical channels providing for the movement of shelf is described. In this invention, no solutions are proposed for the intersection points of vertical and horizontal channels. Because of this, the balance of the shelf may be lost and the items thereon may fall down as a result of an unwanted movement of the shelf during use.

40 **[0007]** In another prior art patent document US 2009308098 a shelf mechanism of a cooler device, comprising a support part movable inside the channel in the form of an inclined plane and a shelf mounted onto the said support part is disclosed. Said support part adjusts the height of the shelf through moving forwards and backwards within the channels of mechanism in the form of inclined planes.

Brief Disclosure of the Invention

45 **[0008]** This invention provides a household good comprising a height adjustable carrier shelf, whose size is not decreased and whose abrupt movement is prevented. The said household good comprises at least one carrier on which at least one moving element is located and at least one directing element mounted on at least one of the internal walls of the good, where the height of the carrier is adjusted upon the movement of moving element inside the said directing element.

50 **[0009]** Directing element comprises at least one upper channel and at least one lower channel, at least one joint area where one ends of these channels meet, at least another channel which connects the other ends of said channels and at least one curve provided on at least one of the channels in which the moving element is inserted. The upper channel of the directing element is inclined upwards and the lower channel is inclined downwards with respect to the joint area. When carrier is desired to be lifted up, the moving element in the lower channel is moved towards the joint area and transferred into the upper channel. The height of the carrier is increased when the moving element settle into the curve in this channel. When the height of the carrier is desired to be decreased, the moving element present in the upper channel is directed towards the other channel connecting the upper channel to the lower channel and it is ensured to

lift down in the lower channel by passing through the said other channel. In order to prevent abrupt passage of carrier from upper channel to lower channel, structures that slow down the movement of the moving element in the other channel are utilized.

5 **Objective of the invention**

[0010] The aim of this invention is to provide a household good which comprises a height-adjustable carrier.

[0011] Another aim of this invention is to provide a household good comprising a directing element for adjusting the height of carrier.

10 [0012] One other aim of this invention is to provide a household good comprising a carrier whose height is adjustable by means of a directing element even when it is loaded.

[0013] A further aim of this invention is to provide a household good comprising height adjustable carrier without reducing the dimensions thereof.

15 [0014] Another aim of this invention is to provide a household good comprising a carrier whose abrupt movement is prevented while adjusting height.

Brief Description of Figures

20 [0015] As an example of the household good of the invention, an exemplary cooler device, an exemplary shelf used in the said device and directing embodiments are illustrated in the accompanying figures; in which

Figure 1 is a perspective view of directing element embodiment in a cooler device;

25 Figure 2 is a perspective view of an exemplary movable shelf which will be used with the directing element

Figure 3 is a perspective view of an exemplary directing element;

Figure 4 is a side view of the placement of the shelf in Figure 2 on the directing element of Figure 3;

30 Figure 5 is a perspective view of an exemplary moving element which will be used together with the directing element of Figure 3;

Figure 6 is a side view of another directing element;

35 Figure 7 is a side view of another directing element;

Figure 8 is a front view of another moving element;

40 Figure 9 is a view of the "A" in detail in the directing element of Figure 7.

[0016] All the parts illustrated in figures are each assigned a reference numeral which can be listed as below:

Household good	(C)
45 Internal wall	(C')
Directing element	(1)
Carrier	(2)
50 Shaft	(2')
Moving element	(3)
55 Movable component	(3')
Gear rack	(4)

	Gear	(5)
	Upper channel	(6)
5	Lower channel	(6')
	Curve	(7)
	Joint area	(8)
10	Channel	(9)
	Arm	(10)
15	Entrance channel	(11)
	Flexible element	(12)
	Space	(13)
20	Swivel joint	(14)

Disclosure of the Invention

25 **[0017]** The present invention discloses at least one directing in household goods comprising a carrier and the said directing provides for the height adjustment of the carrier inside the good in accordance with the needs of the user. On the edge of the carrier, which is intended to be placed in the directing element, moving elements are located which provides for the adjustment of the height of the carrier by moving element inside the directing element.

30 **[0018]** In order to clarify the operation method of the mechanism in the Figures, household good is illustrated as a cooler device and the carrier is illustrated as a shelf of the cooler device on which food products are stored.

[0019] The directing element (1) of the invention is fixed to at least one internal wall (C') of the exemplary household good (C) shown in Figure 1. At least one moving element (3) (shown in the form of a wheel in the accompanying figures) is located on the exemplary carrier (2) shown in Figure 2 (said carrier can be in the form of a shelf, rack, tray or basket). By placing the moving element (3) into the directing element (1) and by moving it in the directing element (1) the height of the carrier (2) inside the good (C) can be changed (carrier (2) can be inserted to the good (C) through at least one entrance channel (11) arranged on the directing element (1) as shown in Figures 6 and 7).

35 **[0020]** A directing element (1), subject matter of the invention, is shown in Figure 3. The said directing element (1) comprises at least one upper channel (6) and at least one lower channel (6'). One ends of these channels (6, 6') are connected to each other at the joint area (8). The said upper channel (6) is inclined upwards with respect to the joint area (8) and the lower channel (6') is inclined downwards with respect to the joint area (8). A curve (7) is in which the moving element (3) is seated in is provided on at least one of these channels (6, 6'). The other end of the upper channel (6), which is not related to the joint area (8) and the other end of the lower channel (6') which is not related to the joint area (8) are connected by means of a channel (9). Due to this channel structure of the directing element (1), the height of carrier (2) can be adjusted without any need to reduce its size. In the said channel (9), a structure is provided which slows down the movement and thus smoothes the passage of moving element (3) from upper channel (6) to the lower channel (6'). Therefore, the abrupt movement of carrier (2) is prevented and the height of the (2) is easily adjusted even when it is loaded.

40 **[0021]** The directing element (1) shown in Figure 3, comprises at least one arm (10) supporting the movement of the moving element (3) between the channels (6, 6'). Arm (10) is fixed by a swivel joint (14) at one end and freely moves around this joint (14). Arm (10) is in a position to close the end of the lower channel (6'), said end connected to the joint area (8).

45 **[0022]** Figure 4 shows the arrangement of carrier (2) in the directing element (1) and the movement of moving element (3) in the channels (6, 6', 9) inside the directing element (1). When the carrier (2) is at the lowest height, moving element (3), is seated in the curve (7) in the lower channel (6'). When the carrier (2) is desired to be lifted up, moving element (3) advances in the lower channel (6') and reaches the joint area (8). While passing through the lower channel (6') into the joint area (8), the moving element (3) rotates the arm (10) closing the end of the lower channel (6') therein, towards the upper channel (6) around the joint (14) axis. When the moving element (3) reaches the joint area (8) the arm (10) comes back to its original location (closing the said end of the lower channel (6')) under the influence of gravity since it

rotates freely around joint (14) axis (the arm can be turned back to its original location by means of at least one spring). Therefore, the moving element (3) present at the joint area (8) is moved towards the upper channel (6) passing through the arm (10) and it is prevented from turning back to its original location. The height of the carrier (2) is lifted up by settling the moving element (3) advancing through the upper channel (6) into the curve (7) thereon.

[0023] When the carrier (2) is desired to be lowered, the moving element (3) is displaced from the curve (7) and moved towards the other end of upper channel, the other end being not related to the joint area (8). The moving element (3) advances in the channel (9) connecting the other ends of upper channel (6) and lower channel (6') and passes into the lower channel (6'), thus lowering the height of the carrier (2).

[0024] An exemplary moving element (3), which can be used with the directing element (1) of Figures 3 and 4, is shown in Figure 5. The moving element (3) comprises at least one shaft (2') fixed onto the carrier (2) from one side and at least one movable component (3') around the shaft (2') on the other side of the shaft (2'). On this (3) at least one gear (5) is provided which moves together with the (3). The said gear (5) is fixed to the moving element (3) by means of another shaft (not shown in the Figures) located at the centre. The gear (5) surface contacting with the not-shown-in-figures central shaft is covered with a viscous material. In this way, due to the said viscous material on the other shaft fixed onto the moving element (3), the movement of the gear slows down when the gear (5) moves.

[0025] At least one gear rack (4) is located on at least one of the side walls of the channel (9) connecting the upper channel (6) and the lower channel (6') of the directing element (3) shown in Figures 3 and 4. The movement of the carrier (2) in the upper channel (6) or in the lower channel (6') is ensured by means of the movable component (3') located on the moving element (3). In order to reduce the height of the carrier (2), when the moving element (3) enters the channel (9) connecting the upper channel (6) and the lower channel (6'), the teeth of the gear (5) is inserted in the gear rack (4) in this channel (9). Therefore, while the moving element (3) directed from the upper channel (6) into the lower channel (6') passes through the said channel (9), the gear (5) is moved by means of the gear rack (4). Because of the contact of the movable component (3') with the side walls of the channel (9) and due to the increase in the friction caused by the viscous material between the gear (5) fixed to the moving element (3) by means of the central shaft and the said central shaft, the movement of the gear (5) is slowed down. Accordingly, the movement of the moving element is also slowed down and thus, the lowering movement of the carrier (2) is rendered smooth.

[0026] An embodiment of directing element (1) illustrated in Figure 6 comprises a different structure which slows the passage of carrier (2) from upper channel (6) into the lower channel (6'). In this embodiment, the width of the channel (9) connecting the upper channel (6) and lower channel (6') is smaller than the moving element (3). At the same time, this channel is made of a flexible material and one of the side walls has a jagged channel form. In order for the said side wall of the channel (9) to stretch while the moving element (3) proceeds through the channel (9), at least one space (13) should be provided behind the said wall. Therefore, owing to the stretching and contracting movements resulting from the movement of the moving element (3) inside the channel (9) due to the flexible structure of the said channel (9), the movement of the (3) is smoothed and the abrupt passage of the carrier (2) from the upper channel (6) to the lower channel (6') is prevented.

[0027] Another embodiment of the directing element (1) with a different structure of movement smoothing is provided in Figure 7. In this embodiment, the structure of the side walls of the channel (9) connecting the upper channel (6) and the lower channel (6') shown in Figure 9, is in the form of arcs of circle with a certain radius (R). End - to - end union of these arcs of circle is in the form of an arc of circle having a different radius (r). The centers of these arcs of circle with different radii (R, r) are aligned on the axis "E". The difference between these radii (R, r) is determined in a way that the difference is greater than or equal to the radius of the moving element (3). As shown in Figure 8, the moving element (3) which will be used in the configuration of this channel (9) is surrounded by at least one flexible (12) (this (12) can be in the form of an o - ring). The moving element (3) moving inside this channel (9) performs a zig - zaggy lowering movement and with the help of the flexible (12) thereon the movement is smoothed. Therefore, the abrupt passage of the carrier (2) from the upper channel (6) to the lower channel (6') is prevented.

Claims

1. An household good (C) comprising a carrier (2) comprising at least one moving element (3); and a directing element (1) which is fixed to at least one of the side walls of its internal part (C'), and which adjusts the height of the carrier (2) by means of the moving element (3) moving therein; the household good (C) **characterized in that** the directing element (1) comprises

- at least one upper channel inclined upwards, and at least one lower channel (6') inclined downwards with respect to the joint area (8) where one ends of the said channels meet and in which the moving element (3) moves,
- at least one curve (7) located on at least one of the said channels (6, 6'), in which the moving element (3) is seated,
- at least one arm (10) closing the lower channel (6') end which is connected to the joint area (8) and fixed on

one side by at least one swivel joint (14) to move around the said joint (14),

- at least one channel (9) connecting the other end of upper channel (6) which is not related to joint area (8) and the other end of the lower channel (6') which is not related to the joint area (8), and comprising a gear rack (4) on at least one side wall to smooth the movement of the moving element (3) while the carrier (2) passes from the upper channel (6) into the lower channel (6').

2. A household good (C) according to Claim 1, **characterized in that**; the said moving element (3) comprises at least a shaft (2') fixed to the carrier on one side; at least one movable component (3') surrounding the shaft (2') on the other side of the shaft (2'); at least one gear (5) which is fixed to the moving element (3) at the center through at least one shaft and which moves by the insertion of its teeth in the gear rack (4) when the moving element (3) enters the said channel (9).

3. A household good (C) according to Claim 2, **characterized in that**; on the surface where the said center shaft contacts with the gear is provided a viscous material which slows the movement of the gear (5).

4. An household good (C) comprising a carrier (2) comprising at least one moving element (3); and a directing element (1) which is fixed to at least one of the walls of its internal part (C'), and which adjusts the height of the carrier (2) by means of the moving element (3) moving therein; the household good (C) **characterized in that** the directing element (1) comprises

- at least one upper channel (6) inclined upwards and at least one lower channel (6') inclined downwards with respect to the joint area (8) where one ends of the said channels meet and in which the moving element (3) moves,
 - at least one curve (7) located on at least one of the said channels (6, 6'), in which the moving element (3) is seated,
 - at least one arm (10) closing the lower channel (6') end which is connected to the joint area (8) and fixed on one side by at least one swivel joint (14) and movable around the said joint (14),
 - at least one channel (9) connecting the other end of upper channel (6) which is not related to joint area (8) and the other end of the lower channel (6') which is not related to the joint area (8), and the channel (9) having a jagged form which causes stretching and contracting movements in at least one side wall which slows the movement of the moving element (3).

5. A household good (C) according to Claim 4, **characterized in that**; the channel (9) connecting the upper channel (6) and the lower channel (6') is made of a flexible material.

6. A household good (C) according to Claim 5, **characterized in that**; the width of the said channel (9) is smaller than the moving element (3).

7. A household good (C) according to Claims 4 or 6, **characterized in that**; a space is provided behind at least one side wall of the said channel (9).

8. An household good (C) comprising a carrier (2) comprising at least one moving element (3); and a directing element (1) which is fixed to at least one of the walls of its internal part (C'), and which adjusts the height of the carrier (2) by means of the moving element (3) moving therein; the household good (C) **characterized in that** the directing element (1) comprises

- at least one upper channel (6) inclined upwards and at least one lower channel (6') inclined downwards with respect to the joint area (8) where one ends of the said channels meet and in which the moving element (3) moves,
 - at least one curve (7) located on at least one of the said channels (6, 6'), in which the moving element (3) is seated,
 - at least one arm (10) closing the lower channel (6') end which is connected to the joint area (8) and fixed on one side by at least one swivel joint (14) and movable around the said joint (14),
 - at least one channel (9) connecting the other end of upper channel (6) which is not related to joint area (8) and the other end of the lower channel (6') which is not related to the joint area (8), whose side walls have a form of arcs of circle having a certain radius (R); the end-to-end connection of which constitutes another arc of circle with a different radius (r) and the centers of arcs of circle with different radii (R, r) are aligned with respect to the axis "E".

9. A household good (C) according to Claim 8, **characterized in that**; the difference between the said radii (R, r), is equal to or greater than the radius of the moving element (3).

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10. A household good (C) according to Claim 9, **characterized in that**; the said moving element (3) comprises at least one surrounding flexible (12).
- 5 11. A household good (C) according to Claims 4 or 8, **characterized in that**; directing element (1), comprises at least one entrance channel (11) from which the carrier (2) is inserted into the good (C).

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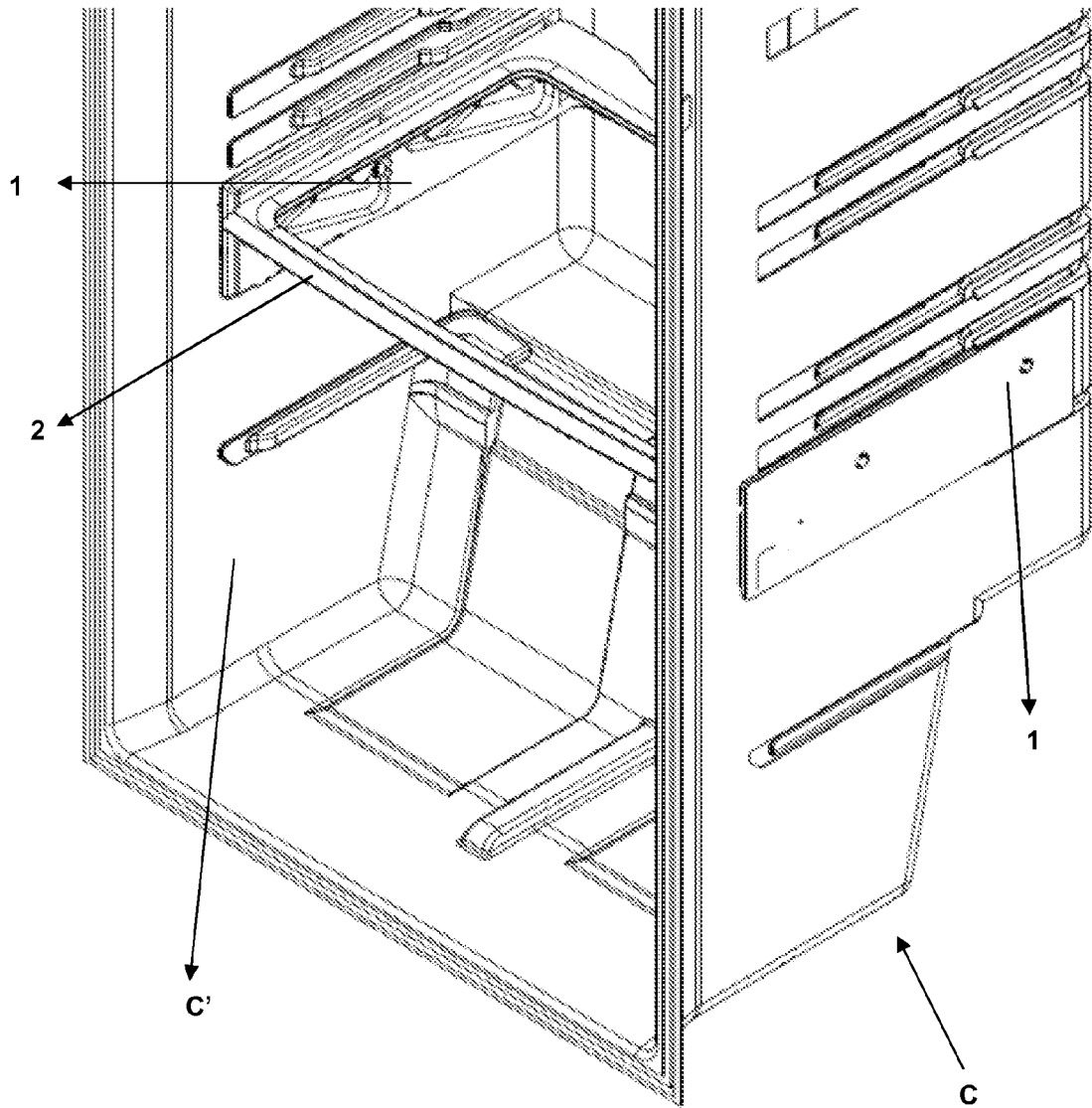


Figure 1

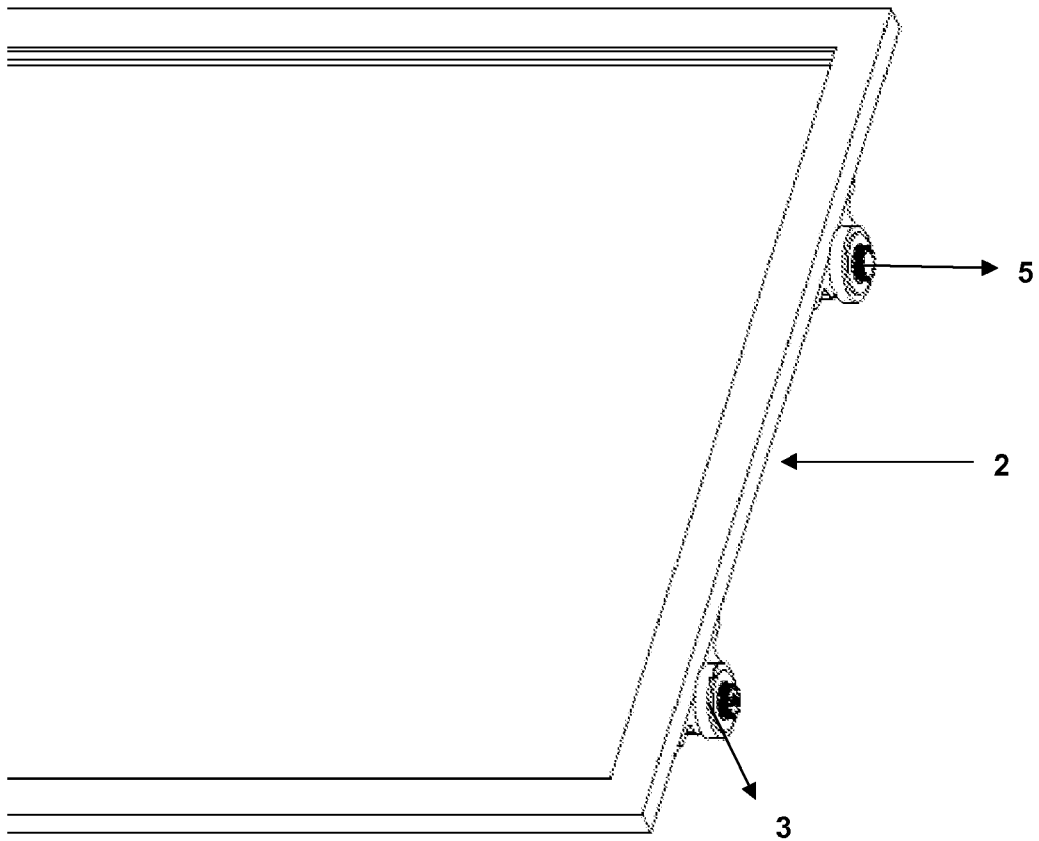


Figure 2

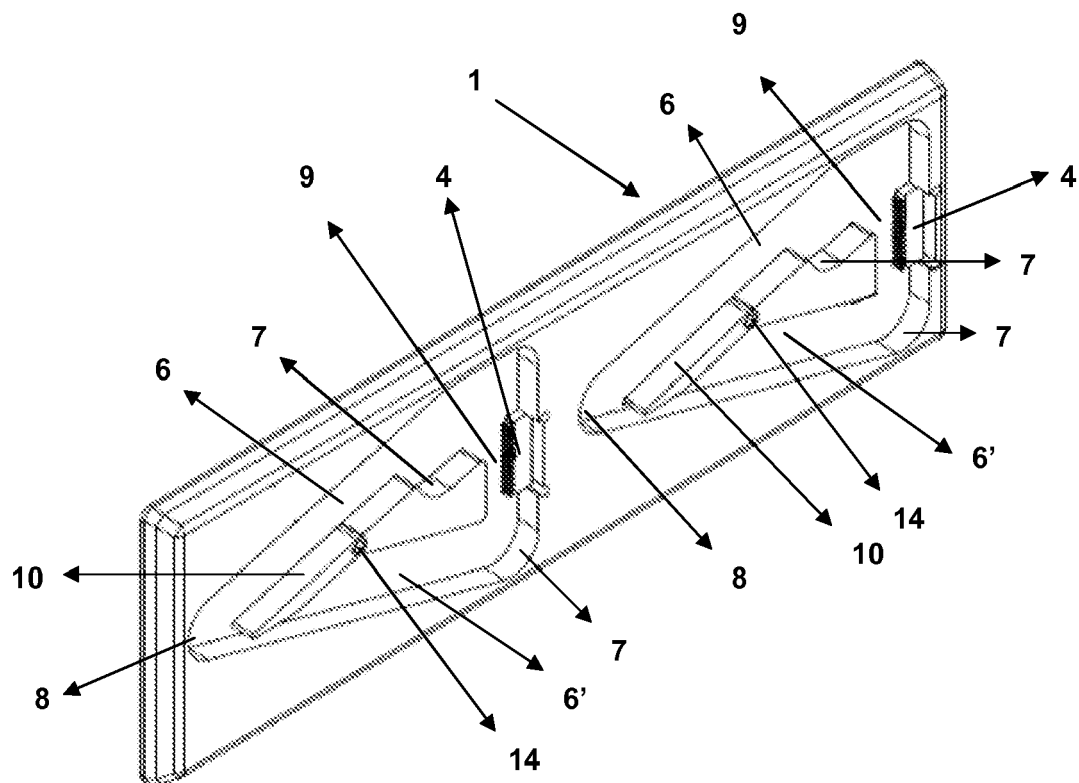


Figure 3

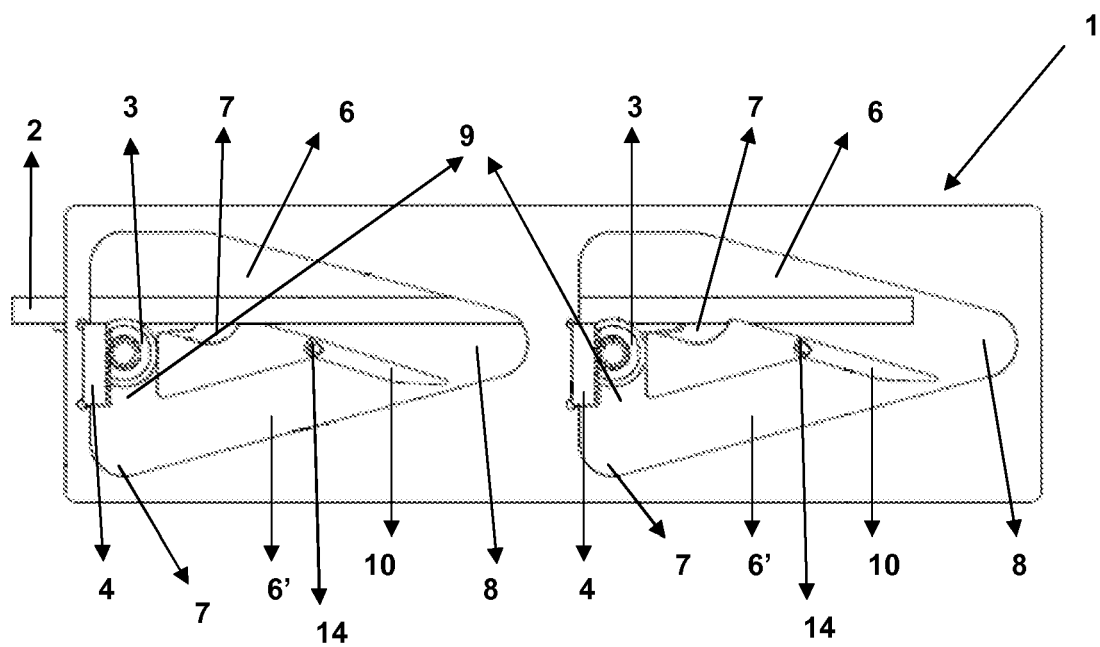


Figure 4

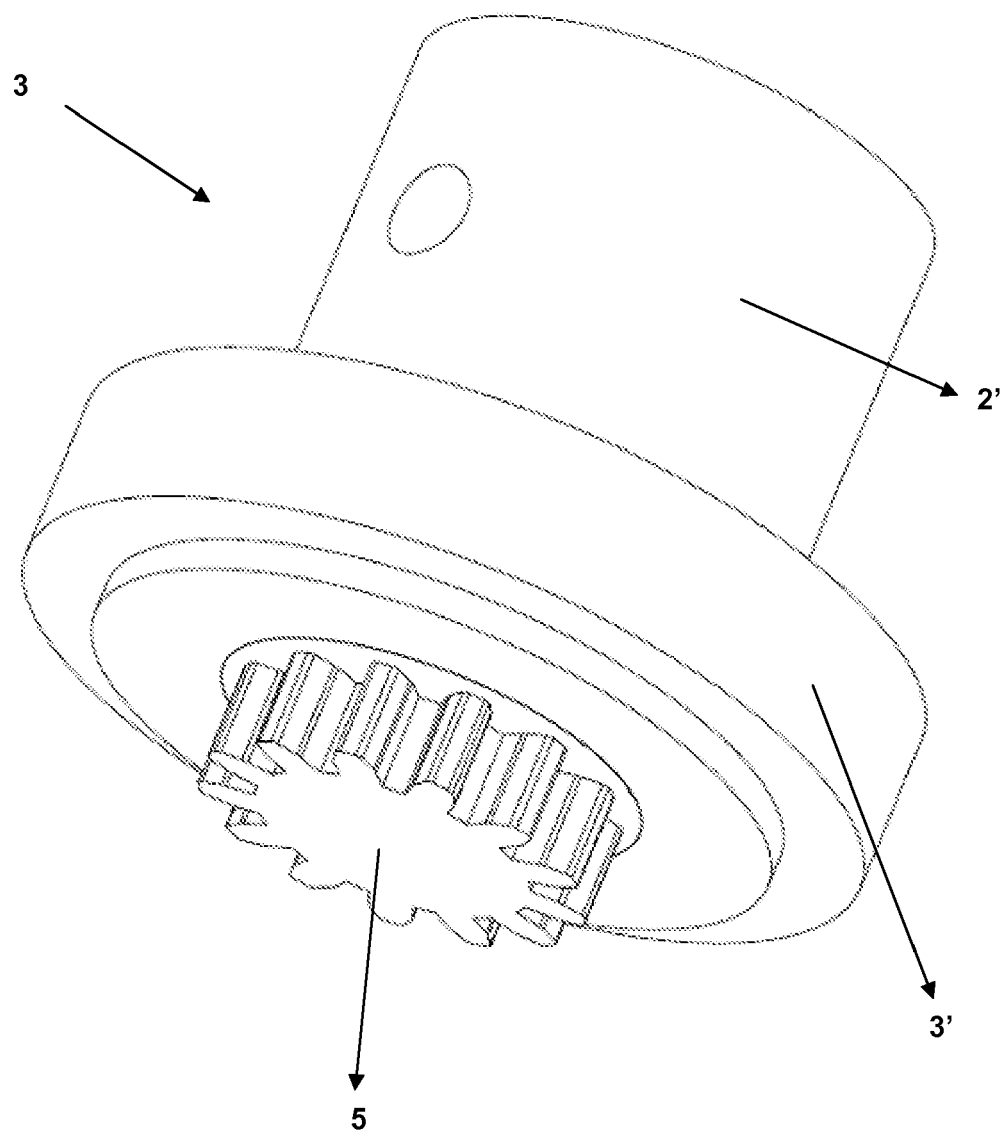


Figure 5

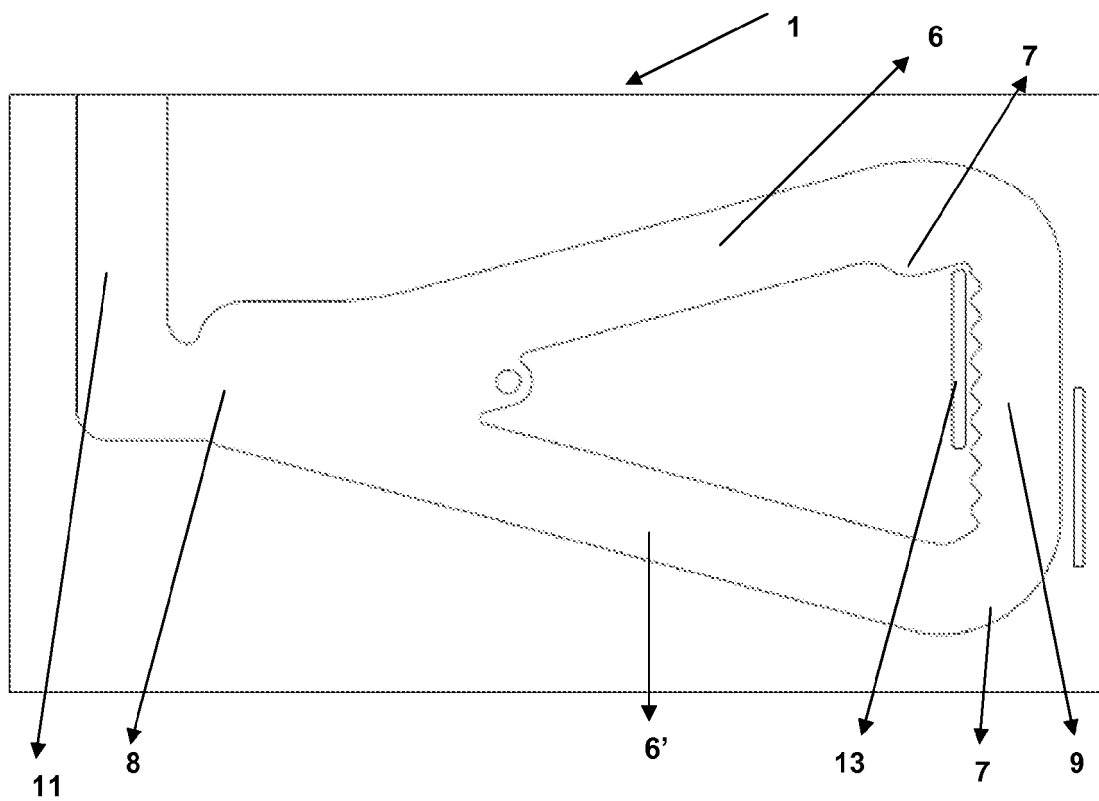


Figure 6

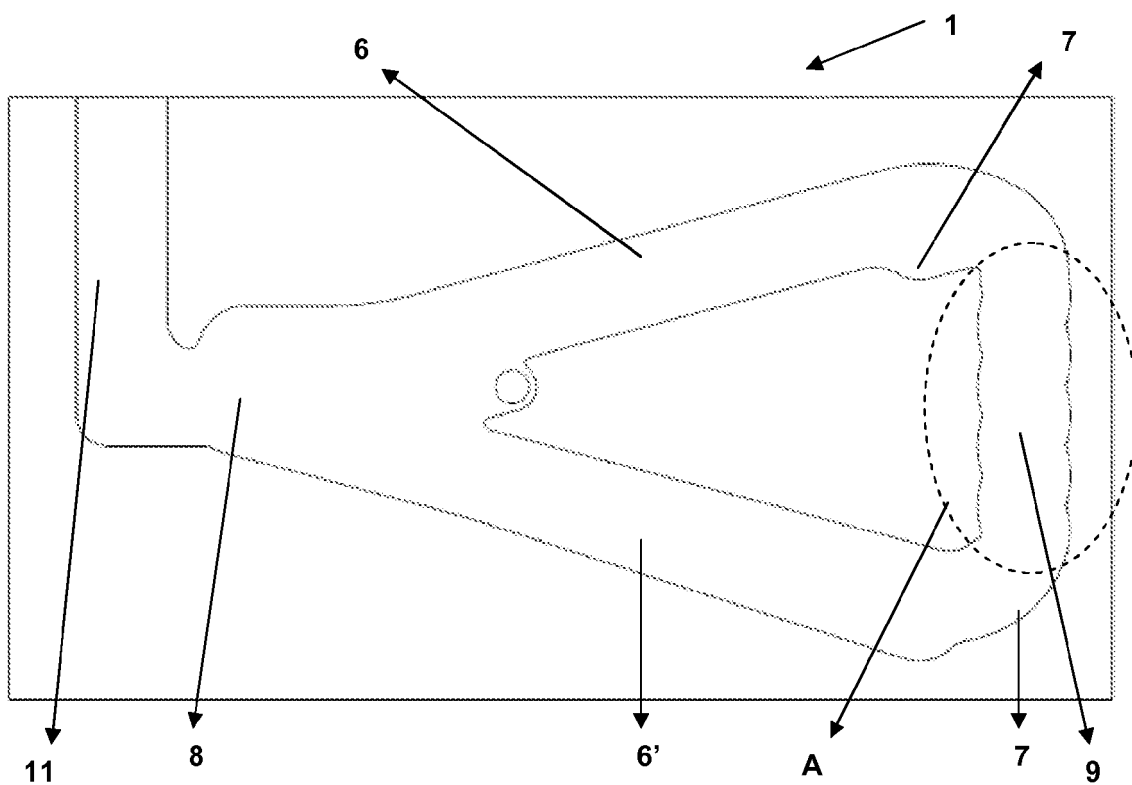


Figure 7

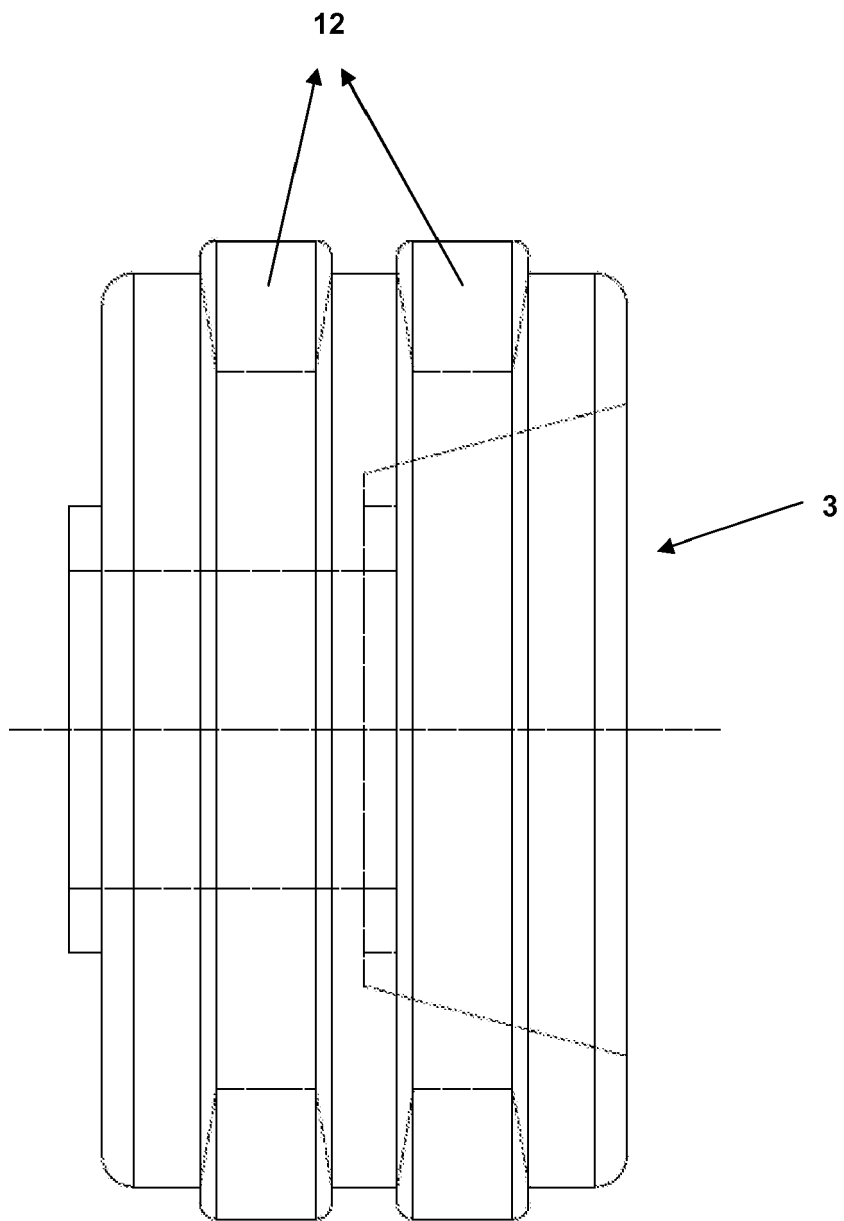


Figure 8

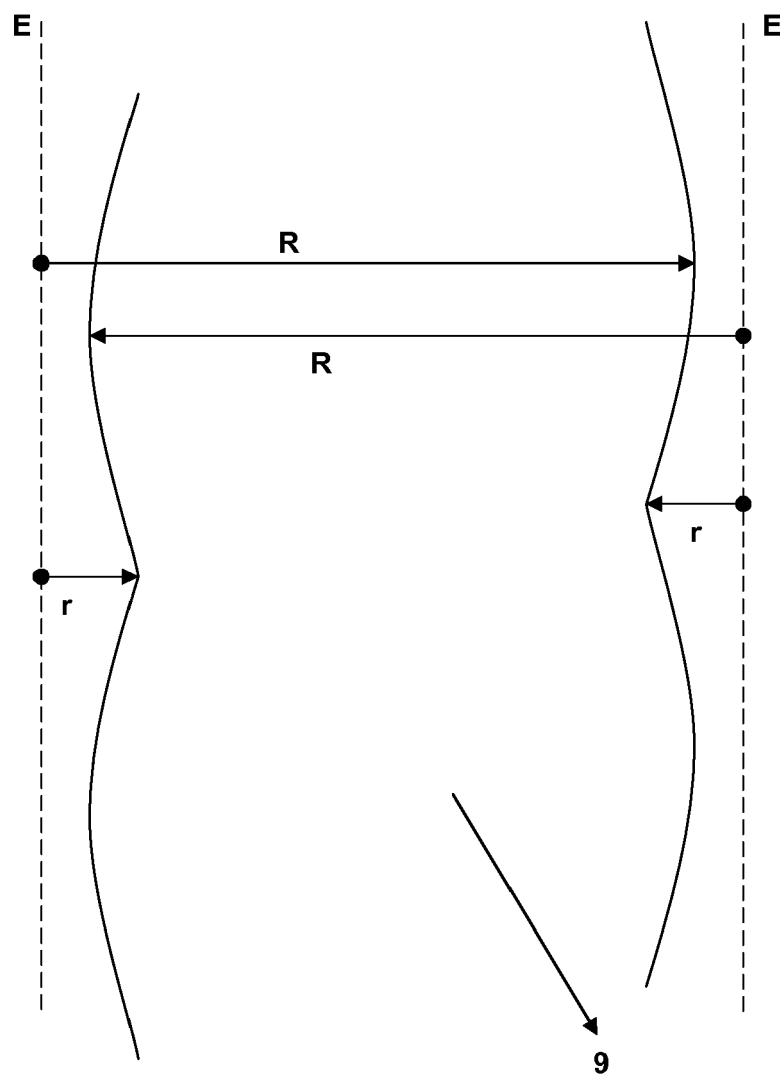


Figure 9

REFERENCES CITED IN THE DESCRIPTION

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