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(54) Title: SUPPORT FOR A CAMERA ON A MOTOR VEHICLE

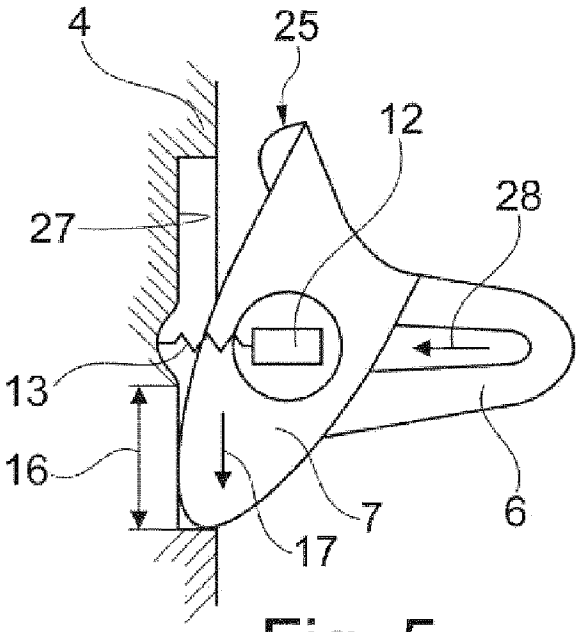

Fig. 5

(57) Abrégé/Abstract:
The invention relates to a support (1) for a camera (2) on a motor vehicle (3), comprising at least a main body (4) with a guide (27) and a bracket element (7) which is able to pivot in relation to the main body (4) and is connected to the main body (4) by way of at least one guide rail (5, 6), which bracket element extends between a first end (8) and a second end (9) along an extent (10), wherein the camera (2) may be arranged on the second end (9), wherein the first end (8) is arranged on the guide (27), wherein the bracket element (7) is connected pivotably between the first end (8) and the second end (9) to the at least one guide rail (5, 6), wherein, when the bracket element (7) is pivoted (11), the first end (8) is displaceable along the guide (27) and the bracket element (7) is displaceable along the at least one guide rail (5, 6).

Abstract

Support for a Camera on a Motor Vehicle

A support (1) for a camera (2) on a motor vehicle (3), comprising at least a main body (4) with a guide (27) and a bracket element (7) which is pivotable relative to the main body (4) and is connected to the main body (4) via at least one guide rail (5, 6), and which extends along an extent (10 between a first end (8) and a second end (9)), wherein the camera (2) may be arranged on the second end (9), wherein the first end (8) is arranged on the guide (27), wherein the bracket element (7) is pivotably connected to the at least one guide rail (5, 6) between the first end (8) and the second end (9); wherein, when the bracket element (7) is pivoted (11), the first end (8) is displaceable along the guide (27) and the bracket element (7) is displaceable along the at least one guide rail (5, 6).

(Fig. 1)

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Description

Support for a Camera on a Motor Vehicle

[0001] The invention concerns a support for a camera for a motor vehicle. In particular, the camera arranged on the support is intended for detecting an image region located outside the motor vehicle. In particular, the camera is intended as a replacement for known side mirrors of a motor vehicle.

[0002] Side mirrors for motor vehicles are known which can be rotated relative to the bodywork of the motor vehicle in order to detect an image region which can be set individually.

[0003] Cameras are also known which can be arranged on the bodywork via supports. Usually, the cameras are attached to the bodywork via rigid supports.

[0004] DE 10 2012 015 395 B3 describes a folding camera arm for a motor vehicle.

[0005] In operation of the motor vehicle, contact between the support or camera and other objects arranged outside the motor vehicle (other motor vehicles or persons) may damage the support or the camera. If the camera is arranged rigidly, it is also possible that the other objects may be damaged.

[0006] The object of the present invention is to at least partially solve the problems outlined with respect to the prior art. In particular, a support is proposed which is at least partially movable relative to the bodywork.

[0007] To achieve this object, a support is proposed with the features of claim 1. The dependent patent claims relate to advantageous refinements. The features specified individually

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in the patent claims may be combined with one another in any technologically meaningful way and may be supplemented by explanatory facts from the description and/or details from the figures, with further design variants of the invention being specified.

[0008] A support for a camera (alternatively or additionally, for sensors)on a motor vehicle is proposed. The support has at least one main body with a guide and a bracket element which is pivotable relative to the main body and connected to the main body via at least one guide rail. The bracket element extends along an extent between a first end and a second end. The camera may be or is arranged at the second end. The first end is arranged at the guide. The bracket element is pivotably connected to the at least one guide rail between the first end and the second end. When the bracket element is pivoted, the first end is displaceable along the guide and the bracket element is displaceable along the guide rail (relative to the main body).

[0009] The support may in particular be arranged on a bodywork of a motor vehicle via the main body. The at least one guide rail is in particular connected fixedly to the main body or bodywork, wherein the bracket element is displaceable along the guide rail and movable relative to the bodywork.

[0010] In particular, during pivoting, the bracket element moves relative to the main body or relative to the at least one guide rail, and during displacement, it moves along the at least one guide rail in a common plane

[0011] In particular, the guide and the at least one guide rail are arranged stationarily relative to each other.

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[0012] Preferably, the bracket element is mounted rotatably on the at least one guide rail via a peg. In particular, the bracket element is guided along the at least one guide rail via the peg.

[0013] In particular, the bracket element is pivotable relative to the peg. In particular, the peg is arranged displaceably in the guide rail. In particular, the peg is arranged rotatably relative to the guide rail. Alternatively, the peg is not rotatable relative to the guide rail.

[0014] In particular, the bracket element is connected to the main body via at least one spring element. In particular, the peg, via which the bracket element is mounted rotatably on the at least one guide rail, is connected to the main body via the spring element.

[0015] Preferably, the at least one spring element is a tension spring. In some cases, several spring elements may also be provided.

[0016] In particular, in a starting position of the bracket element, the first end is arranged in a latching position of the guide. The latching position is formed for example by a depression in the guide, in which a latching lug of the bracket element is arranged.

[0017] Preferably, the guide has a sliding region adjacent to the latching position, wherein the latching position is configured such that a first force is required to move the bracket element along the sliding region, wherein a second force is required to move the bracket element out of the latching position. The first force is smaller than the second force.

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[0018] In particular, the bracket element is connected to the main body via a spring element, wherein the spring element is deflected to a maximum when the bracket element is in the starting position. As the bracket element pivots further relative to the starting position, the deflection of the spring element is increasingly reduced.

[0019] In particular, the pivoting of the bracket element may be supported by the spring element, or caused by the spring element (after the bracket element has been pivoted out of the latching position).

[0020] In particular, the first end is formed by a rotatable element so that when the bracket element is pivoted, said element rolls along the guide. The rotatable element may be formed e.g. by a cylindrical body which forms part of the otherwise rigid bracket element. A rotational axis of the rotatable element is in particular arranged parallel to an axis of pivoting of the bracket element.

[0021] In particular, the rotatable element may be driven via a drive element (e.g. a gearwheel or similar) of the support in order to pivot the bracket element. The drive element is arranged for example on the main body. In particular, the drive element may be driven via an electric motor.

[0022] In particular, the first end - or the first end configured as a rotatable element - may be connected to the main body via at least one holder. In particular, the first end may thus be guided by the holder along the guide on the main body.

[0023] In particular, the support has a first guide rail and a second guide rail. The guide rails run in particular parallel

to each other, wherein the bracket element is arranged between the guide rails.

[0024] Furthermore, a motor vehicle is provided having at least a bodywork and the described support which is arranged on the bodywork.

[0025] In particular, the support is arranged on a side of the motor vehicle. Preferably, the bracket element can be displaced along the at least one guide rail substantially parallel to a plane defined by all wheel hubs of the motor vehicle.

[0026] The orientation of the guide rail and bracket element relative to each other as proposed herein allows, for example, the bracket element to be displaced along the guide rail on rotation of the bracket element (caused e.g. by contact with an object).

[0027] The statements with respect to the support may be transferred in particular to the motor vehicle, and vice versa.

[0028] As a precaution, it is pointed out that the numerical terms used here ("first", "second" etc.) serve primarily (merely) to distinguish between several similar objects, sizes or processes, i.e. in particular they do not prescriptively impose any dependency and/or order of these objects, sizes or processes relative to each other. If a dependency and/or order is necessary, this is explicitly indicated or will be evident to the person skilled in the art studying the specific embodiment described.

[0029] The invention and the technical field will be explained in more detail below on the basis of the attached figures. It is pointed out that the invention is not restricted by the

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exemplary embodiments described. In particular, unless explicitly indicated otherwise, it is also possible to extract partial aspects of the situations explained in the figures and combine these with other constituents and knowledge from the present description. In particular, it should be noted that the figures and in particular the illustrated proportions are merely schematic. The drawings show:

Fig. 1: a motor vehicle in a side view;

Fig. 2: a first embodiment variant of a support in a side view;

Fig. 3: the support from figure 2 in a top view;

Fig. 4: the support from figure 3 in a sectional top view, in a starting position;

Fig. 5: the support from figure 4 after pivoting of the bracket element;

Fig. 6: a second embodiment variant of a support in a perspective view;

Fig. 7: the support from figure 6 in a perspective view, in a starting position;

Fig. 8: a third embodiment variant of a support in a perspective view;

Fig. 9: the support according to the second embodiment variant in a perspective view, in a starting position;

Fig. 10: the support from figure 9 during pivoting of the bracket element;

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Fig. 11: the support from figures 9 and 10 in the fully pivoted position.

[0030] Fig. 1 shows a motor vehicle 3 in a side view. The motor vehicle 3 comprises a bodywork 23 with support 1 attached thereto. The support 1 is arranged on a side 22 of the motor vehicle 3. The bracket element 4 can be displaced along the guide rail 5, 6 substantially parallel to a plane 24 defined by all wheel hubs 23 of the motor vehicle 3.

[0031] Figure 2 shows a side view of a first embodiment variant of a support 1. Figure 3 shows the support 1 from figure 2 in a top view. Figure 4 shows the support 1 from figure 3 in a sectional top view, in a starting position 14. Figure 5 shows the support 1 from figure 4 after pivoting 11 of the bracket element 7. Figures 2 to 5 are described jointly below. Reference is made to the statements relating to figure 1.

[0032] The support 1 has at least one main body 4 with a guide 27 and a bracket element 7 which is pivotable relative to the main body 4 and connected to the main body 4 via the first guide rail 5 and the second guide rail 6. The bracket element 7 extends along an extent 10 between a first end 8 and a second end 9. The camera 2 is arranged on the second end 9. The first end 8 is arranged on the guide 27. The bracket element 7 is connected pivotably to the guide rails 5, 6 between the first end 8 and the second end 9. When the bracket element 7 is pivoted 11, the first end 8 is displaceable along the guide 27 and the bracket element 7 is displaceable along the guide rails 5, 6 (relative to the main body 4).

[0033] The support element 7 is mounted rotatably on the guide rails 5, 6 via a peg 12. The support element 7 is guided along the guide rails 5, 6 via the peg 12. The peg 12 and hence the

bracket element 7 are moved (transversely) relative to the guide rails 5, 6 by the displacement amount 28 when the bracket element 7 is pivoted 11.

[0034] The bracket element 7 is here pivotable relative to the peg 12. The peg 12 is displaceable in the guide rails 5, 6 but is not rotatable relative to the guide rails 5, 6.

[0035] The bracket element 7 is connected to the main body 4 via a spring element 13. In the present case, the peg 12, via which the bracket element 7 is mounted rotatably on the guide rails 5, 6, is connected to the main body 4 via the spring element 13.

[0036] The spring element 13 is a tension spring. The spring element 13 is deflected to a maximum when the bracket element 7 is in the starting position 14. As the bracket element 7 pivots 11 further relative to the starting position 14, the deflection of the spring element 13 is increasingly reduced. The pivoting 11 of the bracket element 7 is supported by the spring element 13 or is caused thereby (after the bracket element 7 has pivoted 11 out of the latching position 15).

[0037] The first end 8 is arranged in a latching position 15 of the guide 27 when the bracket element 7 is in a starting position 14 (see figure 4). The latching position 15 is formed for example by a depression in the guide 27, in which a latching lug of the bracket element 7 is arranged.

[0038] The guide 27 has a sliding region 16 adjacent to the latching position 15, wherein the latching position 15 is configured such that a first force 17 is required to move the bracket element 7 along the sliding region 16 (see figure 5, at least until the end position shown is reached), wherein a

second force 18 is required to move the bracket element 7 out of the latching position 15 (see figure 4).

[0039] The pivoting 11 of the bracket element 7 may be limited via a damper 25 which is arranged on the bracket element 7 (alternatively or additionally, may be arranged on the main body 4) and cooperates with the main body 4 (see figure 5).

[0040] Figure 6 shows a perspective view of a second embodiment variant of the support 1. Figure 7 shows the support 1 from figure 6 in a perspective view, in a starting position 14. Figures 6 and 7 are described jointly below. Reference is made to the statements concerning figures 2 to 5.

[0041] In contrast to the first embodiment variant, the first end 8 of the bracket element 7 is formed by a rotatable element 19 so that on pivoting of the bracket element 7, said element 19 rolls along the guide 27. The rotatable element may be formed e.g. by a cylindrical body which forms part of the otherwise rigid bracket element 7. A rotational axis of the rotatable element 19 is in particular arranged parallel to an axis of pivoting 11 of the bracket element 7. The first end 8 configured as a rotatable element 19 is here connected to the main body 4 via a respective holder 26. The first end 8 may thus be guided by the holder 26 along the guide 27 on the main body 4.

[0042] Figure 8 shows in a perspective view a third embodiment variant of a support 1 (which is designed in particular to be suitable for a motorized drive). Reference is made to the statements relating to figures 6 and 7.

[0043] In contrast to the second embodiment variant, the rotatable element 19 may be driven via a drive element 20 (e.g.

a gearwheel or similar) of the support 1, in order to pivot the bracket element 7. The drive element 20 is arranged on the main body 4.

[0044] Figure 9 shows the support 1 in the second embodiment variant in a perspective view, in a starting position 14. Figure 10 shows the support 1 from figure 9 during pivoting 11 of the bracket element 7. Figure 11 shows the support 1 from figures 9 and 10 in the fully pivoted position. Figures 9 to 11 are described jointly below. Reference is made to the statements relating to figures 6 and 7.

[0045] In the starting position 14, the first end 8 (here the rotatable element 19) is arranged in a latching position 15 of the guide 27. In the partly pivoted position (figure 10), the first end 8 is situated in the sliding region 16 of the guide 27. The first end 8 is guided relative to the main body 4 via a holder 26. The peg 12 and the bracket element 7 are displaced by the displacement amount 28 along the first guide rail 5. In the fully pivoted position (figure 11), the peg 12 is displaced relative to the first guide rail 5 so far that it is arranged in the region of the main body 4.

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Claims

1. A support (1) for a camera (2) on a motor vehicle (3), comprising at least a main body (4) with a guide (27) and a bracket element (7) which is pivotable relative to the main body (4) and is connected to the main body (4) via at least one guide rail (5, 6), and which extends along an extent (10) between a first end (8) and a second end (9), wherein the camera (2) may be arranged on the second end (9), wherein the first end (8) is arranged on the guide (27), wherein the bracket element (7) is pivotably connected to the at least one guide rail (5, 6) between the first end (8) and the second end (9); wherein, when the bracket element (7) is pivoted (11), the first end (8) is displaceable along the guide (27) and the bracket element (7) is displaceable along the at least one guide rail (5, 6).

2. The support (1) as claimed in claim 1, wherein the guide (27) and the at least one guide rail (5, 6) are arranged stationarily relative to each other.

3. The support (1) as claimed in one of the preceding claims, wherein the bracket element (7) is rotatably mounted on the at least one guide rail (5, 6) via a peg (12).

4. The support (1) as claimed in any of the preceding claims, wherein the bracket element (7) is connected to the main body (4) via at least one spring element (13).

5. The support (1) as claimed in any of the preceding claims, wherein in a starting position (14) of the bracket element (7), the first end (8) is arranged in a latching position (15) of the guide (27).

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6. The support (1) as claimed in claim 5, wherein the guide (27) has a sliding region (16) adjacent to the latching position (15), wherein the latching position (15) is configured such that a first force (17) is required to move the bracket element (7) along the sliding region (16), wherein a second force (18) is required to move the bracket element (7) out of the latching position (15), wherein the first force is smaller than the second force.

7. The support (1) as claimed in one of the preceding claims 5 and 6, wherein the bracket element (7) is connected to the main body (4) via a spring element (13), wherein the spring element (13) is deflected to a maximum when the bracket element (7) is in the starting position (14).

8. The support (1) as claimed in any of the preceding claims, wherein the first end (8) is formed by a rotatable element (19) so that said element (19) rolls along the guide (27) when the bracket element (7) is pivoted (11).

9. The support (1) as claimed in claim 8, wherein the rotatable element (19) may be driven via a drive element (20) of the support (1) in order to pivot (11) the bracket element (7).

10. The support (1) as claimed in any of the preceding claims, wherein the support (1) has a first guide rail (5) and a second guide rail (6).

11. A motor vehicle (3) having at least a bodywork (23) and a support (1), as claimed in any of the preceding claims, arranged on the bodywork (21).

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12. The motor vehicle (3) as claimed in claim 11, wherein the support (1) is arranged on a side (22) of the motor vehicle (3); wherein the bracket element (7) can be displaced along the at least one guide rail (5, 6) substantially parallel to a plane (24) defined by all wheel hubs (23) of the motor vehicle (3).

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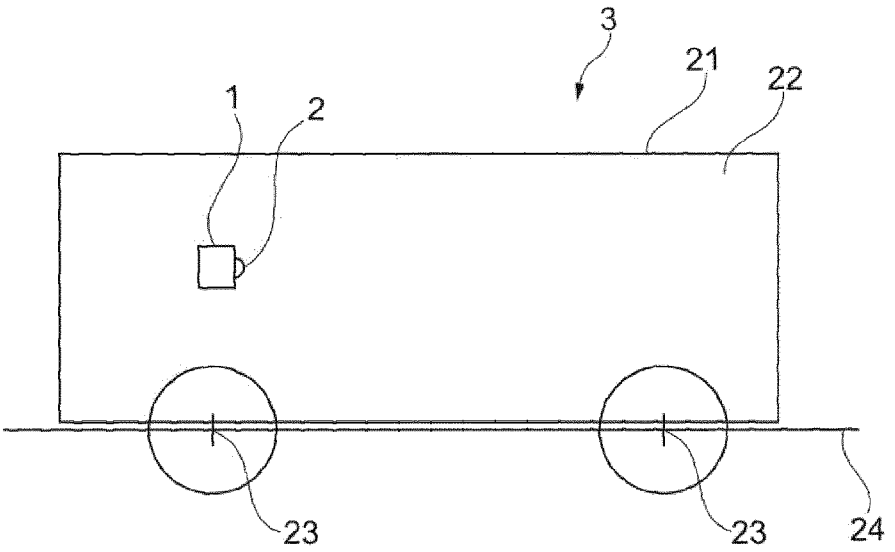

Fig. 1

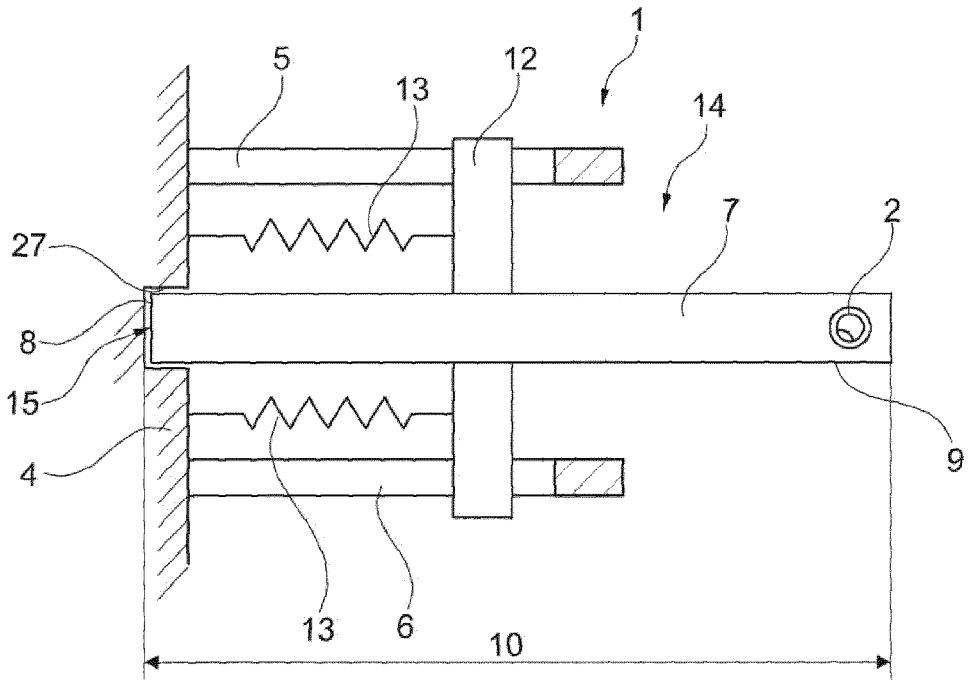

Fig. 2

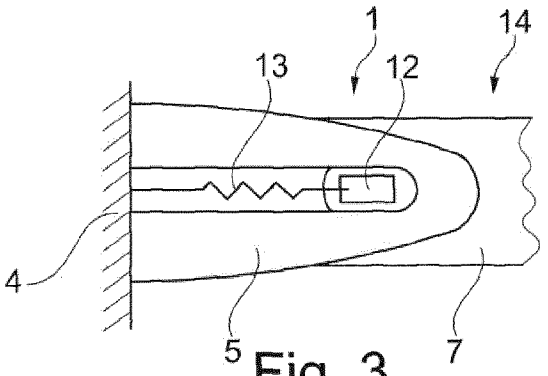

Fig. 3

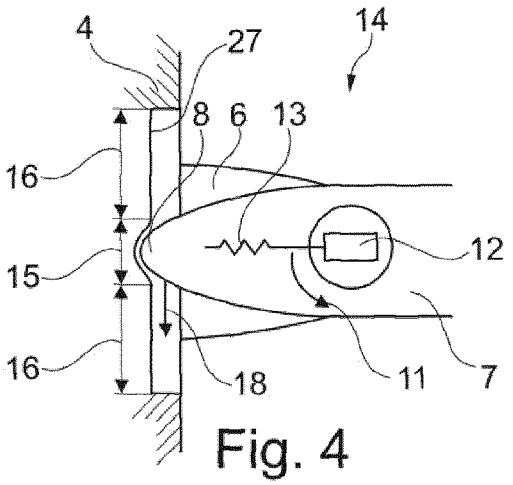

Fig. 4

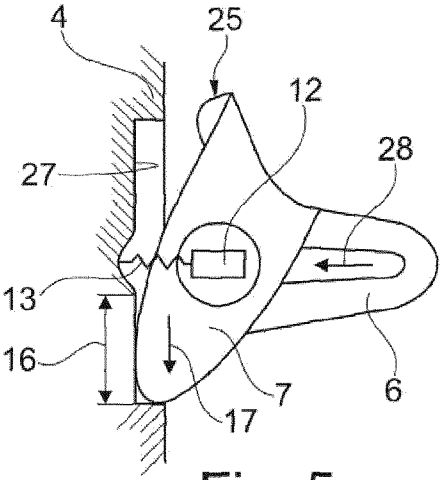

Fig. 5

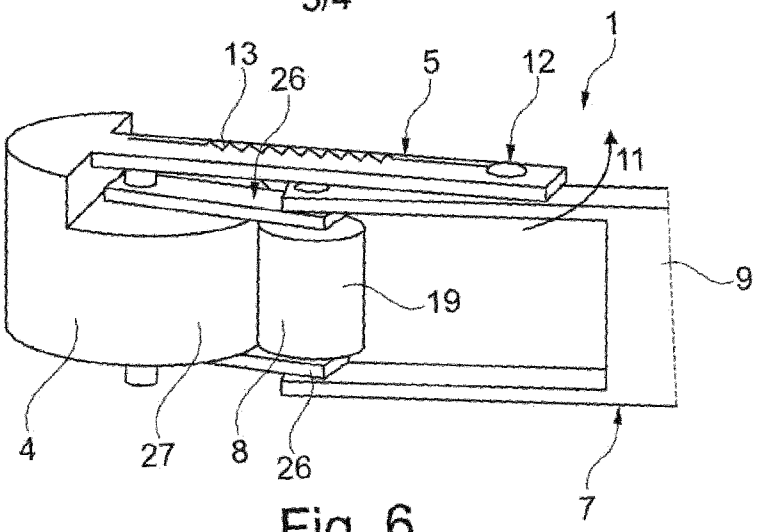

Fig. 6

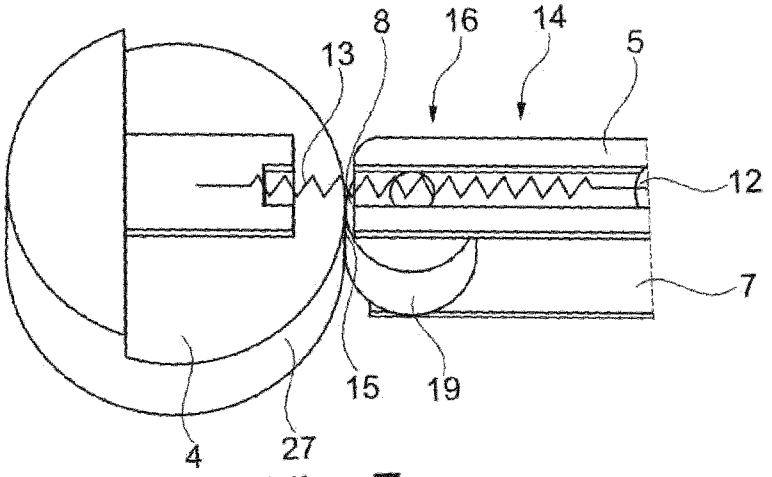

Fig. 7

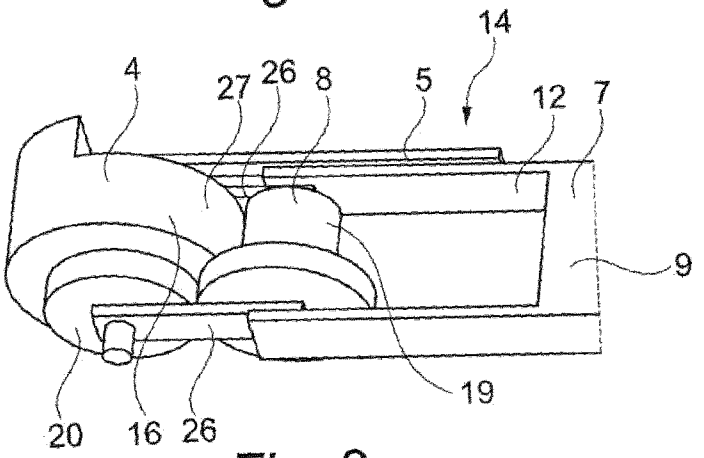

Fig. 8

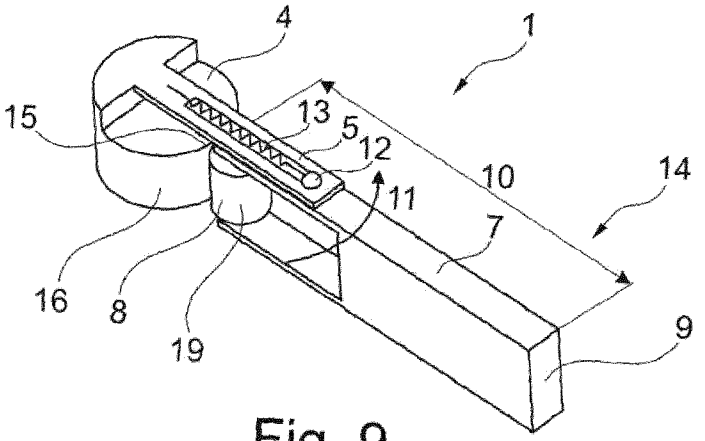

Fig. 9

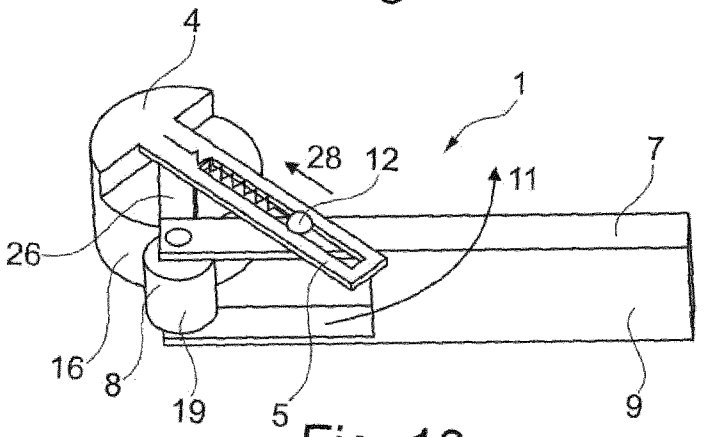

Fig. 10

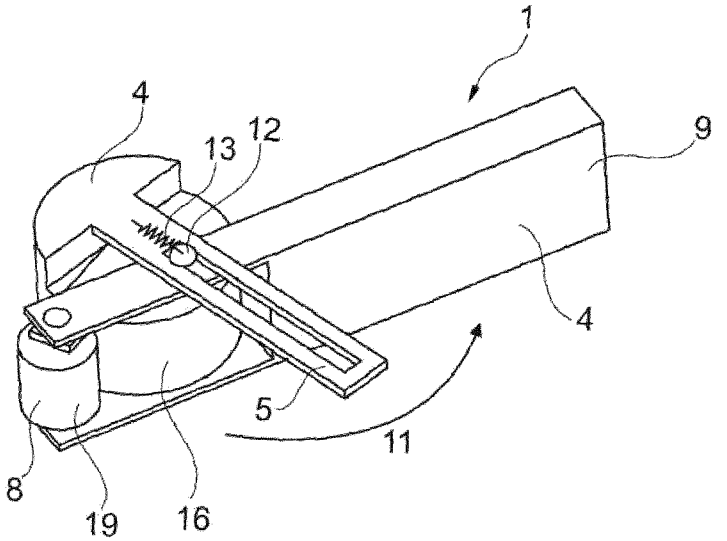

Fig. 11

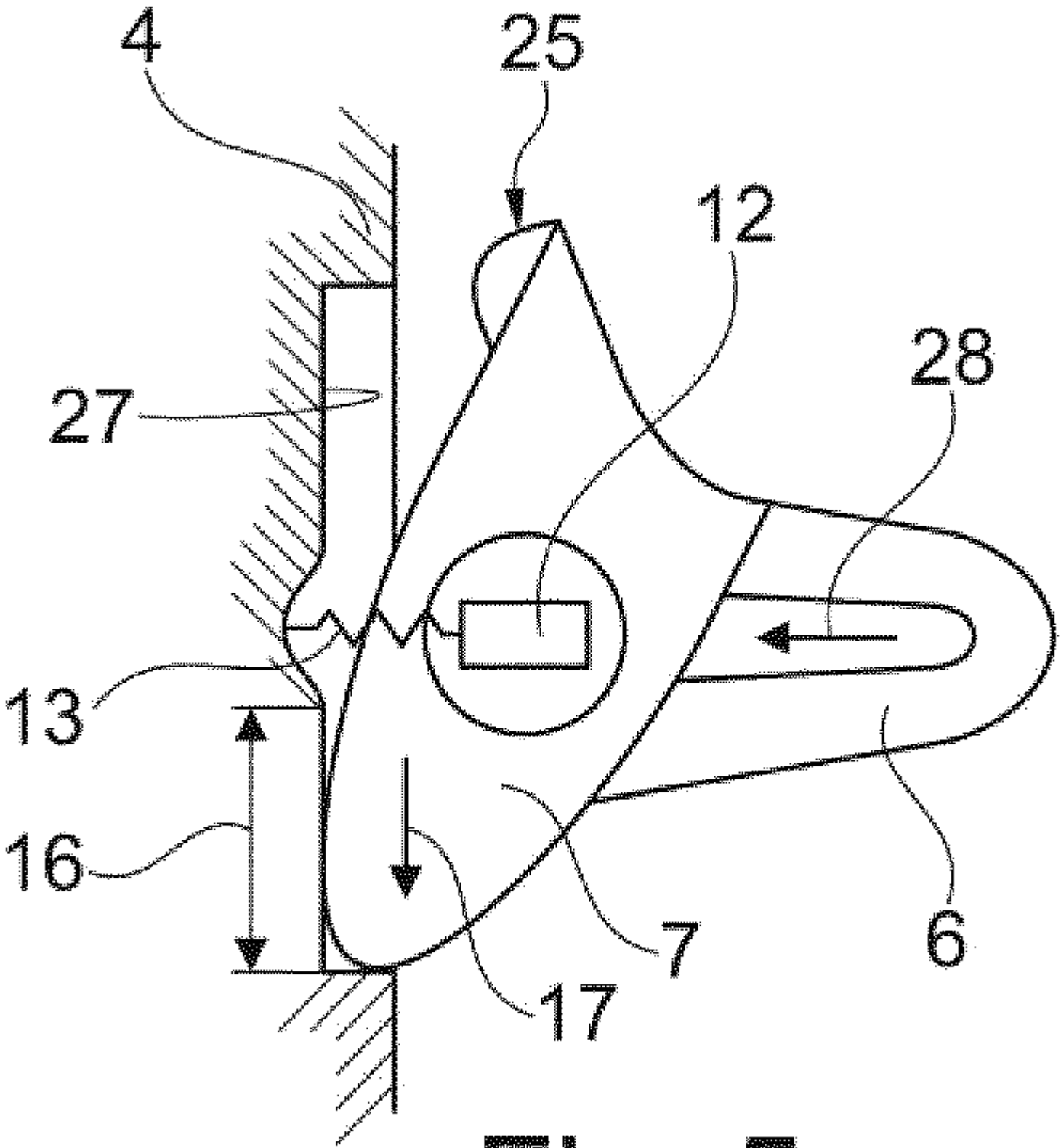

Fig. 5