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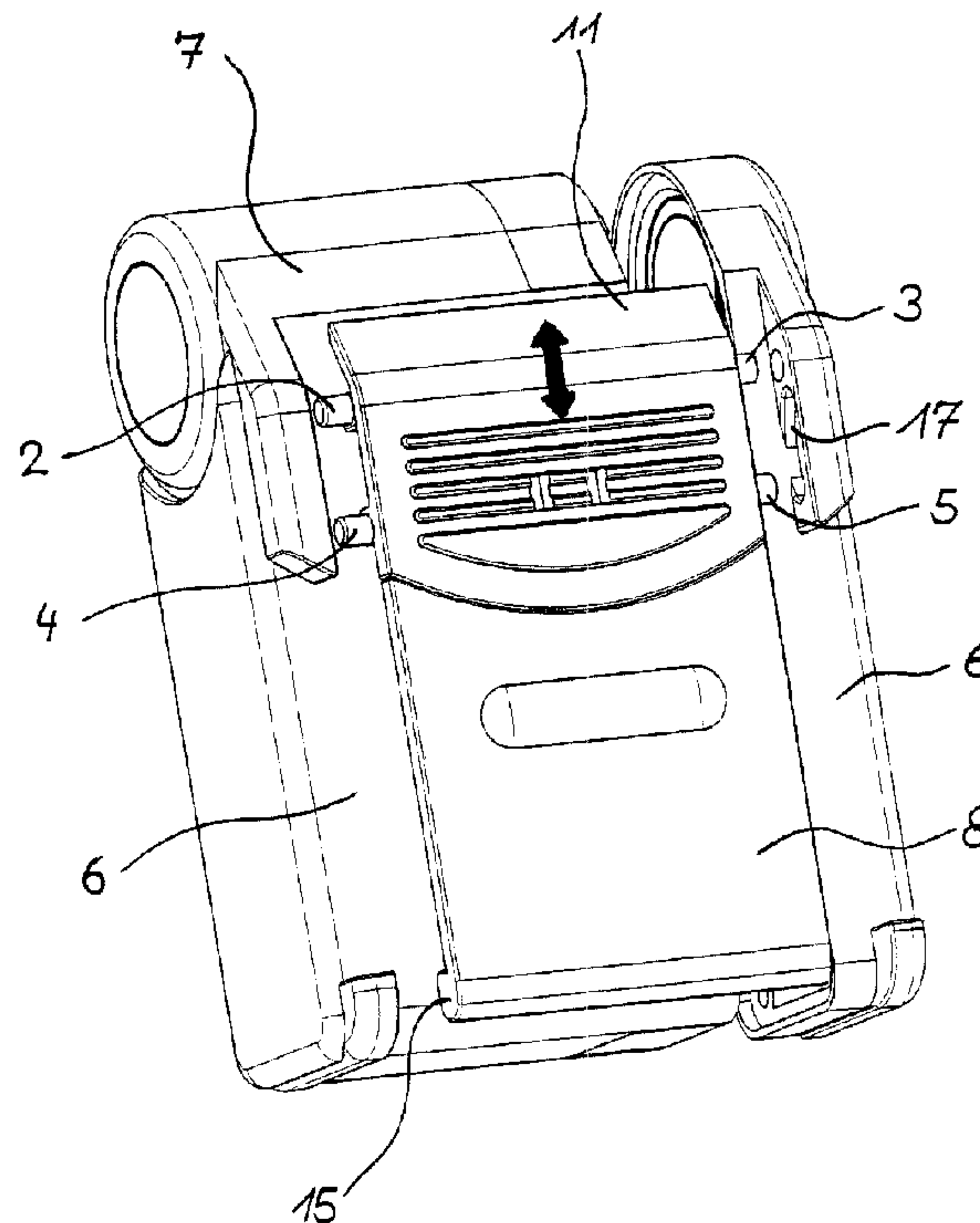
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(54) Title: MEASURING DEVICE WITH A HOLDER



(57) Abrégé/Abstract:

The present invention relates to a portable measuring device (7) that can be carried on an individual's body, which has a springless holder (1) that permits it to be attached to an article of clothing and released therefrom, this device having the following features: a) On one of the two short sides, the plate (8) incorporates a recess (9) with an opening (10); b) A flat slide element (11) has a guide element (12) and is connected through an opening (13) to the plate (8); c) Both the plate (8) and the slide element (11) are fitted on the opposite longer sides of the plate (8) with studs (2,3; 4,5) that are parallel to each other, d) the studs (2,3) of the plate (8) being held in the housing (6) of the measuring device (7) so as to be fixed in position but able to swivel, and e) the studs (4,5) of the slide (11) that are arranged in two guides (17) in the housing (6) of the measuring device (7) being displaceable between a maximum and a minimum distance from the studs (2,3) of the plate (8) as a function of the path of movement of the slide element (11).



Abstract

The present invention relates to a portable measuring device (7) that can be carried on an individual's body, which has a springless holder (1) that permits it to be attached to an article of clothing and released therefrom, this device having the following features:

- a) On one of the two short sides, the plate (8) incorporates a recess (9) with an opening (10);
- b) A flat slide element (11) has a guide element (12) and is connected through an opening (13) to the plate (8);
- c) Both the plate (8) and the slide element (11) are fitted on the opposite longer sides of the plate (8) with studs (2,3; 4,5) that are parallel to each other,
- d) the studs (2,3) of the plate (8) being held in the housing (6) of the measuring device (7) so as to be fixed in position but able to swivel, and
- e) the studs (4,5) of the slide (11) that are arranged in two guides (17) in the housing (6) of the measuring device (7) being displaceable between a maximum and a minimum distance from the studs (2,3) of the plate (8) as a function of the path of movement of the slide element (11).

Measuring Device with a Holder

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The present invention relates to a measuring device with a holder to provide for releasable attachment to an article of clothing.

Such measuring devices are worn by individuals either on the
10 body or on the clothing, in the form of compact, portable gas-measuring devices that provide a warning function. Individuals who are exposed to danger as a result of gases carry such devices in order that they are warned, visually or acoustically, in the event that a specific, predetermined gas concentration is
15 exceeded.

Depending on the user's clothing and activities, it must be possible to secure the measuring device on different items of clothing, simply and reliably and can still be removed.

Usually, positive attachment is effected using spring
20 clips, in which case the holding power is a function of the strength of the spring, the surface characteristics and the shape of the holder, and on the nature of the clothing to which it is to be attached. Depending on the design of the holder, it will be necessary to exert a relatively large amount of force in order

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to open the holder. The strength and the functional reliability of the spring can decline as it ages.

It is the task of the present invention to propose a measuring device that has a holder that is improved
5 compared to the prior art, this holder incorporating no springs and being simple and safe to operate.

An important advantage of the present invention is that the holder for the measuring device comprises only two structural elements, these working in conjunction with each
10 other in such a way that when the slide is in a first position the holder is opened so that it can be attached or removed, whereas when the slide is in the second position, the holder is closed, which is to say fixed in position.

The invention may be summarized according to a
15 first aspect as a fabric attachment device comprising: a housing; a plate including two pins rotatably connected to said housing, said plate including a recess and defining a slide cutout; a slide element with guide element for slidably connecting to said plate through said cutout, said
20 slide element including two pins held slidably displaceable in said housing between a maximum and minimum distance from said pins on said plate depending on a path of displacement of said slide element.

According to a second aspect the invention
25 provides a fabric attachment device comprising: a housing; a plate rotatably connected to said housing at one end of said plate between a first position and a second position, another end of said plate being positioned further away from said housing in said first position than in said second
30 position; a slide element slidably connecting to said plate

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between a first position and a second position, said slide element having one end extending from said one end of said plate in said second position; bias means for biasing said plate toward said second position of said plate when said
5 slide element is in said first position.

One embodiment of the present invention is described in greater detail below on the basis of the drawings appended hereto. These drawings show the following:

10 Figure 1: A perspective view of the holder 1 when open, as viewed from the measuring device 7 side;

Figure 2: The holder as shown in Figure 1, on the measuring device 7 when open, as viewed from the outside.

Figure 1 shows a holder 1 according to the present invention that is held by the studs 2, 3 in the housing 6 (Figure 2) of a measuring device 7 so as to be able to swivel; the holder 1 is held by the studs 4, 5, each in a guide 17, in the housing 6, so as to be movable. The holder 1 comprises two parts, namely a first part that consists of a plate 8 that is, for example, rectangular and incorporates a recess 9 and an opening 10 that determines the length of the path of movement, as well as a flat slide element 11, which in the example shown is also rectangular, that has a guide piece 12, by which the slide element 11 is connected to the rectangular plate 8 through the opening 10. The guide piece 12 can be in the form of two knobs that overlap the opening 10.

One important advantage of the present invention is that the holder 1 comprises only the two parts referred to; it is preferred that these be manufactured from glass-fibre reinforced polyamide, for example, by injection moulding. A further advantage is that no spring that has characteristics that can change over time is required.

The holder 1 can be moved by sliding the slide element in the direction indicated in the drawing by the arrow between a maximum and a minimum distance between the two studs 2, 3 of the rectangular plate 8 and the studs 4, 5 of the slide element 11.

This means that the slide element 11 can be opened and closed with almost no effort and that, because of the rounded or curved shape of the parts, it is locked positively and in a stable manner when in the closed position.

5 The shape of the holder 1 is such that sufficient clamping force and friction can be generated, even in the case of smooth, thin materials, and at the same time that there is sufficient space between the housing 6 and the holder 1 to accommodate a strong leather belt, for example; this has been
10 effected in that the slide element 11 is angled towards the housing 6 on the side that is remote from the rectangular plate 8, and by reinforcement 15 of the rectangular plate 8 on the side that is shorter relative to the slide element 11 and remote from it, by a thicker section of approximately the same thickness as
15 the plate 8, towards the housing 6. A strip of textured silicon rubber that is snapped into the openings 13, 14 in the plate 8 increase frictional forces on smooth materials; this strip can be removed when the measuring device 7 has to be secured on thicker materials or belts.

20 When closed, the holder 1 is slid together; in the open state, when it can be swung away from the housing by at most approximately 1.0 to 1.5 cm, the slide element, with its studs 4, 5 in the slot-like guides 17 on both sides of the housing 7 can be pivoted away from the plate 8 by the greatest distance.

There is then a space between upper part of the slide element 11 and the housing 6, and this makes it possible to pivot the holder 1 down in the appropriate manner.

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CLAIMS:

1. A fabric attachment device comprising:

a housing;

a plate including two pins rotatably connected to
5 said housing, said plate including a recess and defining a
slide cutout;

a slide element with guide element for slidably
connecting to said plate through said cutout, said slide
element including two pins held slidably displaceable in
10 said housing between a maximum and minimum distance from
said pins on said plate depending on a path of displacement
of said slide element.

2. A device in accordance with claim 1, wherein:

said plate has first and second sides, said first
15 sides are shorter than said second sides, said slide cutout
is positioned adjacent one of said first sides, each of said
two pins of said plate are positioned on opposite said
second sides of said plate, said slide element has first and
second sides, said first sides of said slide element are
20 shorter than said second sides of said slide element, each
of said two pins of said slide element are positioned on
opposite said second sides of said slide element;

said housing includes a measuring instrument.

3. A device in accordance with claim 2, wherein:

25 said measuring instrument is a mobile gas-
measuring instrument with a warning function means.

4. A device in accordance with claim 1, wherein:

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said slide element and said plate have adjacent sides when said pins of said plate are at said minimum distance from said pins of said slide element, said adjacent sides are shaped substantially complementarily to create a substantially flush surface over said plate and slide element when said pins are at said minimum distance.

5 5. A device in accordance with claim 4, wherein:

said adjacent sides are one of circular and arc shaped.

10 6. A device in accordance with claim 1, wherein:

said plate and said slide element are formed of one of a glass fiber- and carbon fiber-reinforced plastic.

7. A device in accordance with claim 1, wherein:

15 said plate and said slide element are formed of a glass fiber-reinforced polyamide.

8. A device in accordance with claim 1, wherein:

said slide element includes an end section diametrically opposite to said plate, said end section is bent at an acute angle toward said housing from a plane of a remainder of said slide element for contact with said housing.

9. A device in accordance with claim 1, wherein:

said plate includes a reinforcement positioned diametrically opposite said slide element, said reinforcement having a thickness approximately corresponding to a thickness of said plate in a direction of said housing.

10. A device in accordance with claim 1, wherein:

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said plate defines a knob cutout;

a knob strip made of one of silicone rubber and plastic is detachably fastened to said knob cutout.

11. The device in accordance with claim 1, wherein:

5 said slide element and said plate are slidably connected in a plane substantially parallel to said plate and said slide element.

12. The device in accordance with claim 1, wherein:

10 said pins of said slide slide in a guide groove of said housing, said guide groove having a shape to lock said plate against said housing.

13. A fabric attachment device comprising:

a housing;

15 a plate rotatably connected to said housing at one end of said plate between a first position and a second position, another end of said plate being positioned further away from said housing in said first position than in said second position;

20 a slide element slidably connecting to said plate between a first position and a second position, said slide element having one end extending from said one end of said plate in said second position;

25 bias means for biasing said plate toward said second position of said plate when said slide element is in said first position.

14. A device in accordance with claim 13, wherein:

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said bias means includes said housing and said one end of said slide element having a shape to contact each other in said first position of said slide element and force said plate into said second position of said plate.

5 15. A device in accordance with claim 14, wherein:

said shape of said housing and said one end of said slide element allowing rotation of said plate between said first and second positions of said plate when said slide element is in said second position.

10 16. A device in accordance with claim 15, wherein:

said shape of said housing and said one end of said slide element are spaced from each other when said slide element and said plate is in said second position.

17. A device in accordance with claim 14, wherein:

15 said shape of said housing and said one end of said slide element are in contact with each other when said slide element is in said second position and said plate is in said first position.

18. The device in accordance with claim 13, wherein:

20 said slide element and said plate are slidably connected in a plane substantially parallel to said plate and said slide element.

19. The device in accordance with claim 13, wherein:

25 said slide element includes pins slidable in a guide groove of said housing, said guide groove having a shape to lock said plate in said second position.

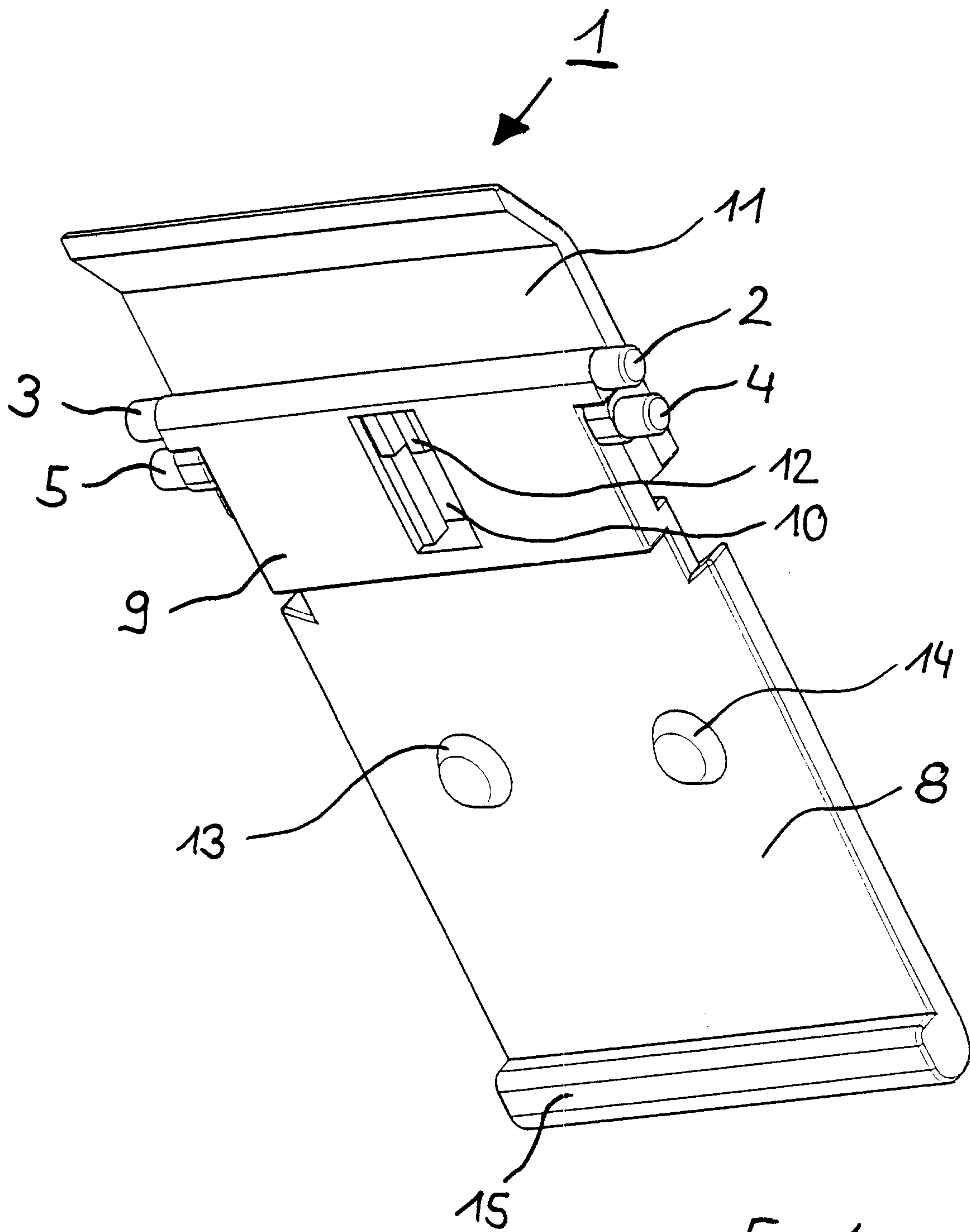


Fig. 1

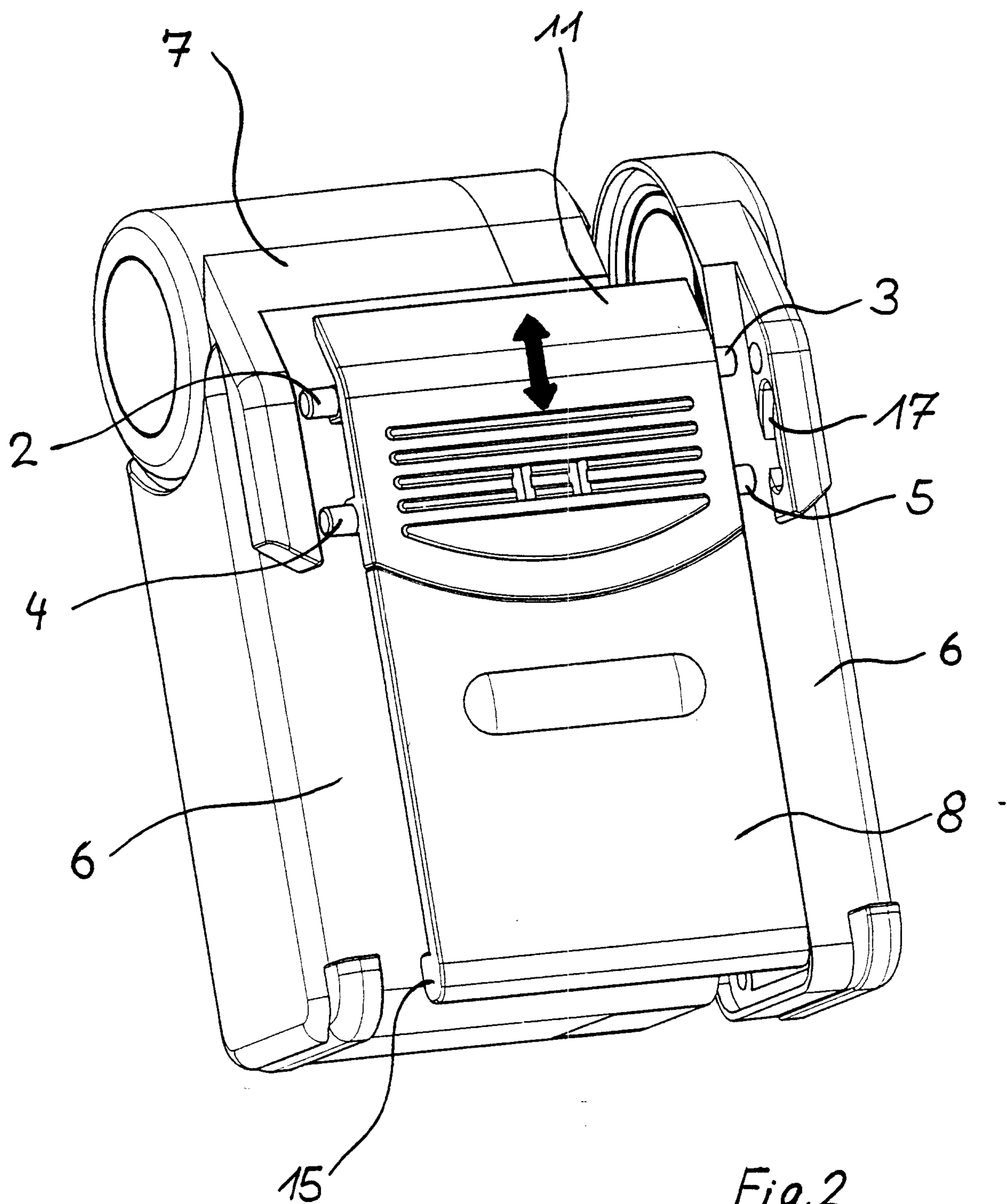


Fig.2

