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(54) Shelf-support bracket arrangement

(57) The present invention refers to a shelf-support bracket arrangement for supporting shelves of various thickness.

The bracket arrangement of the invention is constituted by a first jaw (2) and a second jaw (4) provided with a first resting surface (3) and a second resting surface (7), respectively, which are so oriented as to face each other. Said first jaw (2) is secured to a stationary mounting structure with the aid of appropriate fastening means (14). First adjustment means) (10) enable the position of said second jaw (4) to be varied in relation to said first jaw (2).

A basic feature of the invention is that said first adjustment means (10) engage an interconnecting member (9) adapted to be associated to said first jaw (2) according to one or more positions.

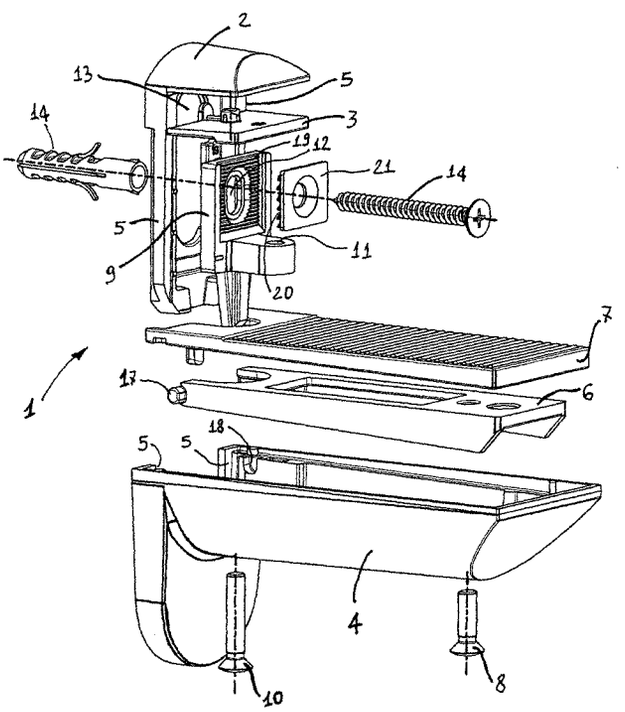

Fig. 1

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Description

[0001] The present invention refers to a shelf-support bracket arrangement for supporting shelves of various thickness.

[0002] Shelves currently available on the market are largely known to be made in a variety of forms and sizes and, as a result, they are available in a corresponding variety of dimensions as far as the thickness thereof is concerned, depending on a number of factors, such as for instance the materials which they are made of, the load that they are intended to bear, and/or their length size.

[0003] For these shelves to be capable of being installed, e.g. wall-mounted, shelf-support devices, such as brackets, are being since a long time now, which are provided with a pair of jaws defining a pair of mutually facing resting surfaces. In view of making such support bracket arrangements suitable for supporting shelves of various thicknesses, a number of adjustment contrivances have been developed in the past for adjusting the distance between the jaws. The simplest ones among these adjustment devices allow for such a distance to be varied at discrete intervals, whereas more recent devices of this kind allow for the distance among said jaws to be varied continuously by acting on an adjustment arrangement that is generally constituted by a threaded member engaging at least one of said two jaws.

[0004] It can be readily appreciated that prior-art shelf-support bracket arrangements provided with adjustment facility for adjusting the distance between the jaws at discrete intervals, have a major drawback in that they allow for just shelves having pre-determined thickness sizes to be accommodated therebetween.

[0005] The US patent publication US 4,709,892 discloses a shelf-support bracket arrangement of the continuous adjustment kind, which comprises a pair of jaws and a threaded member rotatably mounted on one of said jaws. The threaded member itself is provided so as to further engage the second jaw, in such a manner that a rotation of said threaded member in either direction causes the gap existing between the jaws to be reduced or increased, respectively. This solution, therefore, allows for the aperture, i.e. the gap between the jaws to be adjusted continuously within a range of values as defined by the length which the moving jaw is able to cover when displacing along the threaded member. As a result, if it is desired that the value of the largest shelf thickness capable of being accommodated between the jaws be increased, use shall be necessarily made of a threaded member of a considerable length, with the resulting disadvantage of having to increase the overall size and space requirements of the shelf-support bracket arrangement accordingly. In addition, even the aesthetical impact of the shelf-support bracket arrangement is detrimentally affected by such an increase of the length of the threaded member, since the outer covering used to conceal said threaded member must necessarily be sized to a correspondingly large extent vertically.

[0006] The shelf-support bracket disclosed in US 4,709,892 is further provided with means for compensating possible surface irregularities that may be found on the wall which the bracket arrangement has to be attached to. Said compensation is achieved by varying in a continuous manner the inclination of the whole shelf-support bracket in relation to the mounting wall. Such a solution has however a drawback in that the shelf-support bracket is thereby moved away from said wall gradually, so that a gradually increasing stress is applied to the fastening means securing the bracket arrangement to the wall, which are therefore subject to a bending moment tending to draw them out of the same wall.

[0007] It is therefore the object of the present invention to provide a shelf-support bracket arrangement which is capable of doing away with all of the afore-cited drawbacks and disadvantages of prior-art brackets of the same kind, and is further capable of being adapted to support shelves of most various thickness sizes. Within this main object, it is a purpose of the present invention to provide a shelf-support bracket arrangement that is simple to install and low-cost to manufacture, which is capable of being easily adapted to the thickness sizes of the shelves that are currently available on the market.

[0008] A further purpose of the present invention is to provide a shelf-support bracket arrangement, in which the range within which the gap or aperture between the jaws can be adjusted may be extended or reduced without any need arising for the size of the adjustment member displacing a jaw relative to the other one in a continuous manner to be altered anyway.

[0009] Another purpose yet of the present invention is to provide a shelf-support bracket arrangement, which is very compact in its overall size in relation to the largest shelf thickness that can be accommodated between the jaws thereof.

[0010] An equally important purpose of the present invention is to provide a shelf-support bracket arrangement, which is capable of compensating for possible irregularities that may be found on the surface of the mounting structure on which it is attached, or even possible positioning errors of the shelf-support bracket arrangement itself, and is further capable of allowing shelves to be installed, which have an upper surface and a lower surface that are slanting in relation to each other.

[0011] A further purpose of the present invention is to provide a shelf-support bracket arrangement, which is capable of being adjusted to compensate for the load weighing on the shelf supported by it.

[0012] According to the present invention, these aims are reached in a shelf-support bracket arrangement incorporating the characteristics as recited in the appended claim 1. Anyway, features and advantages of the present invention will be more readily understood from the description that is given below by way of non-limiting

example with reference to the accompanying drawings, in which:

- Figure 1 is a perspective exploded view of the shelf-support bracket arrangement according to the present invention;

- Figure 2 is a perspective view of the first jaw and the interconnecting member according to the present invention;

- Figure 3 is a side cross-sectional view of the shelf-support bracket arrangement according to the present invention, with the jaws thereof adjusted in a position of narrowest possible gap existing therebetween and the resting surfaces thereof slanting in relation to each other;

- Figure 4 is a side cross-sectional view of the shelf-support bracket arrangement according to the present invention, with the jaws thereof adjusted in a position of largest possible gap existing therebetween and the resting surfaces thereof parallel to each other;

- Figure 5 is a plan view of the second jaw;

- Figure 6 is a plan view of the movable flat support piece.

[0013] With reference to Figure 1, the shelf support bracket arrangement 1 comprises a first jaw 2, on which there is removably mounted a first resting surface 3, and further comprises a second jaw 4 that is able to slide in relation to said first jaw 2 with the aid of runners 5 that are preferably provided on the side edges of the upright portions of each jaw 2, 4. The second jaw 4 engages an interconnecting member 9 through first adjustment means 10 extending into the second jaw 4 and through a first aperture 11 provided in said interconnecting member 9. Said first adjustment means 10 are preferably constituted by a screw. The first aperture 11 extends preferably along an axis that is parallel to the plane of a stationary mounting structure, such as for instance, a wall or some other rigid structure (not shown in the Figure), on to which the bracket arrangement of the invention is secured. The interconnecting member 9 is capable of being associated to the first jaw 2 in one or more positions, and comprises a second aperture 12 extending preferably on a plane that is substantially parallel to the plane of the mounting structure. When the interconnecting member 9 is associated to the first jaw 2, said second aperture 12 comes to lie in a position in which it faces a corresponding aperture 13 provided on the upright portion of the first jaw 2 and advantageously constituted by a slot-like aperture having a larger size than the second aperture 12 itself. Thanks to the apertures 12 and 13 being capable of being in this way brought in such a corresponding agreement with each other, the first jaw 2 and the interconnecting member 9 can advantageously be associated with each other with the aid of appropriate means 14 for fastening the first jaw 2 to a stationary mounting structure. In order to securely prevent said fastening means 14 from being able to displace vertically, on a surface of the interconnecting member 9 there may be provided ribs 19 adapted to engage corresponding conjugate ribs 20 provided on a washer 21 tightly packed thereagainst by said fastening means 14.

[0014] On the second jaw 4 there is rotatably connected a movable flat support piece 6, which is removably engaged by a second resting surface 7.

The inclination of this flat support piece 6 and, as a result, the inclination of said resting surface 7 engaged thereupon, can be varied in a continuous manner by acting on second adjustment means 8, which are preferably constituted by a threaded member.

[0015] The vertical position of the second jaw 4, the movable flat support piece 6 and the second resting surface 7 associated thereto, can in turn be varied in a continuous manner by acting on the first adjustment means 10. Referring again to Figure 1, depending on the direction of rotation imparted to said first adjustment means 10, an increase or a reduction in the vertical distance separating said first and said second jaw 2, 4 from each other is determined accordingly.

[0016] Figure 2 illustrates, by way of non-limiting example, a possible embodiment of the first jaw 2 and the interconnecting member 9 according to the present invention. As shown in this Figure, the interconnecting member 9 comprises a surface, on which there are provided a plurality of projections 15 adapted to engage corresponding recesses 16, which are provided in the vertical portion of the first jaw 2 and are suitably spaced from each other vertically, preferably at constant intervals. The recesses 16 and the projections 15 may be given the most appropriate shapes and arrangements in view of enabling the interconnecting member 9 and the first jaw 2 to engage each other in such a manner as to prevent them from being able to slip relative to each other. The recesses 16 determine the possible positions in which the interconnecting member 9 can be associated to the first jaw 2. In other words, the vertical spacing of the recesses 16 relative to each other enables the interconnecting member 9 to be moved closer to or away from the first resting surface 3.

[0017] Each single position taken by the interconnecting member 9 defines the largest and narrowest aperture, i.e. gap, which can be provided between the jaws 2 and 4 by acting on the first adjustment means 10 illustrated in Figure 1. Therefore, the possibility for the position of the second jaw 4 to be adjusted continuously with respect to the first jaw 2 through said first adjustment means 10 will advantageously be given repeatedly in the vertical direction, i.e. for a number of times which is equal to the number of the different positions which

the interconnecting member 9 is capable of taking with respect to the first jaw 2. So, for instance, in the embodiment illustrated in Figure 2, the first jaw 2 - again by way of non-limiting example - can be noticed to have the recesses 16 arranged in such a manner as to enable the interconnecting member 3 to be set at three different positions, so that there will in this case be three dimensional intervals defining the range of the thickness sizes of the shelves that can be received between the jaws 2 and 4.

[0018] Figure 3 illustrates the interconnecting member 9 in the state in which it is associated to the first jaw 2 in the position which is the closest one with respect to the first resting surface 3. In the same Figure, the adjustment means 10 are set in the position that provides for the narrowest gap between the jaws 2 and 4. As this has already been stated earlier in this description, by acting on the adjustment means 10, while keeping the position of the interconnecting member 9 fixed, it is possible for the aperture between the jaws 2 and 4 to be increased. The operation of adjusting the distance of the jaws 2 and 4 from each other may be most conveniently carried out when the shelf is being mounted, since the adjustment means 10 remain anyway constantly accessible.

[0019] In the case that, by acting on the sole first adjustment means 10, it is not possible for any adequate or required aperture between the jaws 2 and 4 to be obtained for the thickness of the shelf to be mounted to be conveniently accepted therebetween, the need will arise for the interconnecting member 9 to be moved to a position which is farther away from the resting surface 3, and then the procedure for the adjustment of the aperture between the jaws 2 and 4 to be repeated with the help of the adjustment means 10.

[0020] Figure 4 illustrates the shelf-support bracket arrangement 1 according to the present invention in a configuration thereof, which is adapted to support shelves of a particularly large thickness. It can be noticed that, in this illustration, the interconnecting member 9 is associated to the first jaw 2 in the position that is the farthest one from the resting surface 3, thereby establishing a new pair of maximum and minimum values for the thickness that can be accommodated between the jaws 2 and 4. All dimensions comprised between said maximum and minimum values will be able to be obtained by acting on said first adjustment means 10 accordingly. By way of example, some of the afore cited pairs of maximum and minimum values are indicated in the jaw 2 illustrated in Figure 2, close to the recesses 16 that identify each single position in which the interconnecting member 9 can be set. For example, the three pairs of values may be 7-19, 18-30 and 29-41, where the numbers express corresponding dimensions in millimetres.

[0021] Figures 5 and 6 are plan views of the second jaw 4 and the movable flat support piece 6, respectively. The movable flat support piece 6 is pivotally connected to the second jaw 4 by means of pins 17 engaging corresponding seats 18 provided in the second jaw 4. The pins 17 and the related seats 18 are located in the vicinity of the stationary mounting structure on which the shelf-support bracket arrangement 1 can be mounted.

[0022] Within the second jaw 4, and preferably in proximity of the end portion thereof which is the farthest one from the above cited stationary mounting structure of the shelf-support bracket arrangement 1, there are extending the second adjustment means 8, which enable the inclination of the movable flat support piece 6 and, as a result, of the resting surface 7 associated thereto, to be varied. Figures 3 and 4 illustrate said second adjustment means 8 in the positions of maximum and minimum inclination thereof, respectively. In a preferred manner, the position of minimum inclination coincides with the condition in which said resting surfaces 3 and 7 are parallel in relation to each other.

[0023] The possibility for the inclination of the resting surface 7 to be adjusted enables a shelf to be placed between the jaws 2 and 4 of the shelf-support bracket arrangement 1 even in the presence of possible irregularities on the surface of the stationary mounting structure coming into contact with said shelf-support bracket arrangement 1, or even in the case that a positioning error occurs in mounting said shelf-support bracket arrangement 1 or, again, in the case that the top and bottom surfaces of a shelf are slanted in relation to each other.

[0024] Fully apparent from the above description is therefore the ability of the present invention to effectively reach the afore cited aims and advantages: in fact, it provides a shelf-support bracket arrangement, which is simple to install and low-cost to manufacture, and is further easily adapted to support shelves of varying thickness. Such an adaptation can be achieved by extending or reducing the adjustment range of the bracket arrangement of the invention without this implying any modification of the dimensions of the means provided to adjusting the gap or distance between the jaws in a continuous manner. It has been further shown how the bracket arrangement according to the present invention is compact and low in space requirements, and enables possible irregularities existing on the surface of the stationary mounting structure, or even possible positioning errors made when mounting in place the bracket arrangement of the invention, to be compensated for. Last, but not least, it has been shown that the bracket arrangement according to the present invention enables shelves to be installed, which have the top and bottom surfaces thereof that are slanting in relation to each other, and further enables the most appropriate adjustments to be made in view of compensating for the load weighing on the shelf.

[0025] It will of course be appreciated that the materials, as well as the shapes and the sizing of the individual component parts of the bracket arrangement according to the present invention may each time be se-

lected so as to more appropriately meet the particular requirements or suit the particular application, without departing from the scope of the present invention.

[0026] It will furthermore be appreciated that the various parts and items constituting the bracket arrangement according to the present invention shall not necessarily be embodied in the sole manner as described above, but can rather be inherently provided in many other embodiments and variants thereof, again without departing from the scope of the present invention.

Claims

1. Shelf-support bracket arrangement (1) comprising:

- a first jaw (2) provided with a first resting surface (3),
- fastening means (14) to secure said first jaw (2) to a stationary mounting structure,
- a second jaw (4) for coupling to said first jaw (2), provided with a second resting surface (7) facing said first surface (3),
- first adjustment means (10) for setting the position of said second jaw (4) in relation to said first jaw (2),

characterized in that said first adjustment means (10) engage an interconnecting member (9) adapted to be associated to said first jaw (2) according to one or more positions.

2. Shelf-support bracket arrangement (1) according to claim 1, **characterized in that** said first jaw (2) is slidably associated to said second jaw (4) and comprises at least an aperture (13) through which said fastening means (14) for securing said first jaw (2) to said stationary mounting structure are able to extend.

3. Shelf-support bracket arrangement (1) according to any of the preceding claims or a combination thereof, **characterized in that** said interconnecting member (9) is associated to said first jaw (2) by means of a plurality of projections (15) engaging corresponding recesses (16) provided on said first jaw (2).

4. Shelf-support bracket arrangement (1) according to any of the preceding claims or a combination thereof, **characterized in that** said interconnecting member (9) comprises a first aperture (11) extending according to an axis that is parallel to the plane of said stationary mounting structure, and a second aperture (12) extending on a plane that is substantially parallel to the plane of said stationary mounting structure.

5. Shelf-support bracket arrangement (1) according to claim 4, **characterized in that** said first adjustment means (10) engage said first aperture (11) of said interconnecting member (9).

6. Shelf-support bracket arrangement (1) according to any of the preceding claims or a combination thereof, **characterized in that** said second jaw (4) comprises second adjustment means (8) for adjusting the inclination of said second resting surface (7) in relation to said first resting surface (3).

7. Shelf-support bracket arrangement (1) according to claim 6, **characterized in that** said second resting surface (7) is associated to a movable flat support piece (6) that is pivotally connected to said second jaw (4), said second adjustment means (8) extending into said second jaw (4) and acting against said movable flat support piece (6).

8. Shelf-support bracket arrangement (1) according to claim 6, **characterized in that** said second resting surface (7) rotates about an axis extending parallel thereto and situated in proximity of the stationary mounting structure.

9. Shelf-support bracket arrangement (1) according to any of the preceding claims, **characterized by** what has been described and illustrated in and with reference to the accompanying drawings.

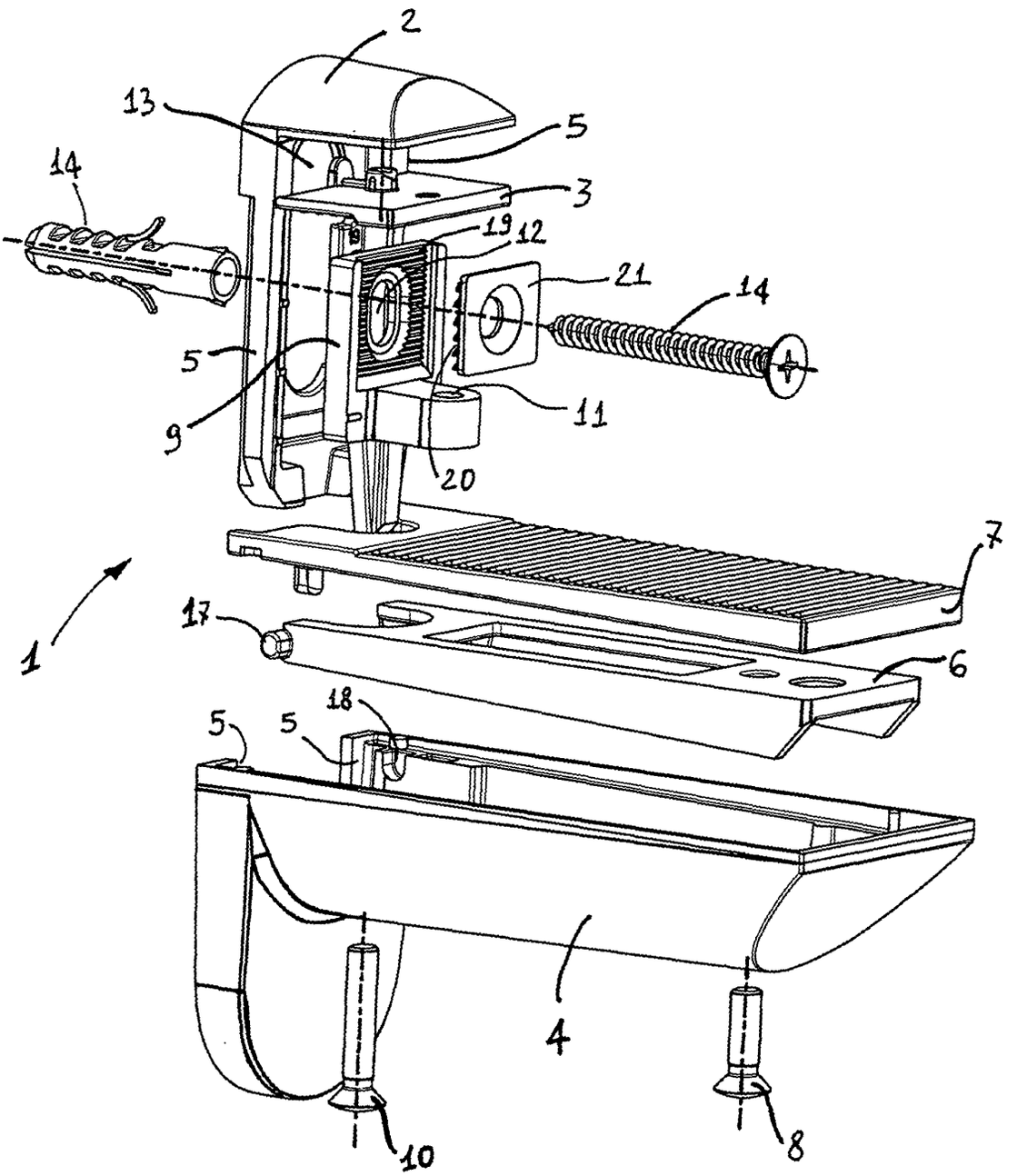


FIG. 1

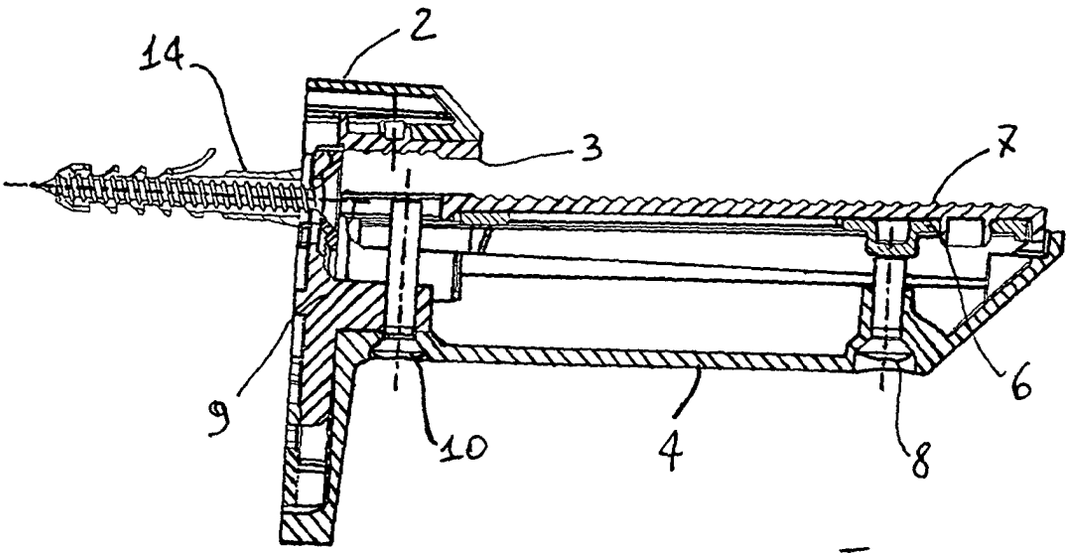


FIG.3

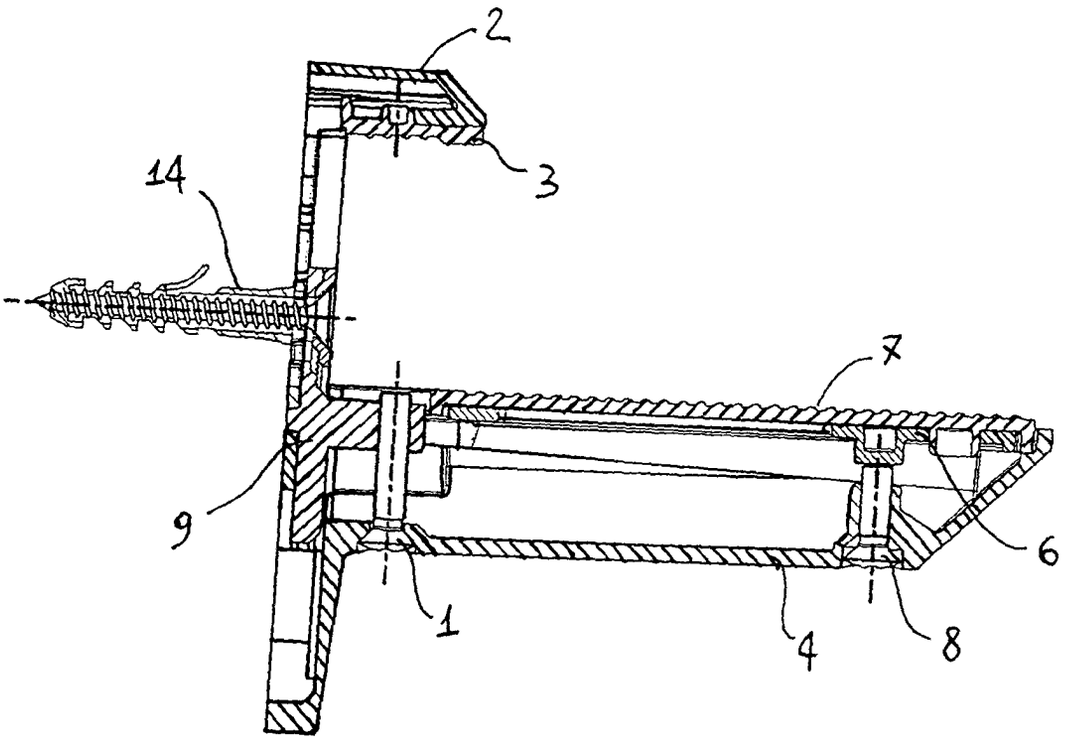


FIG.4

FIG. 2

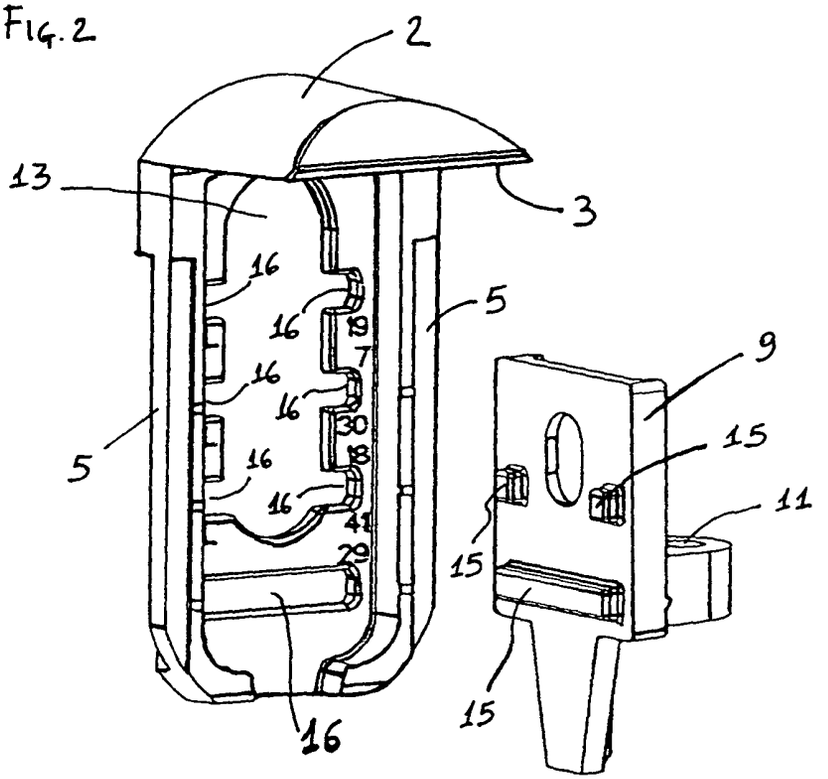


FIG. 5

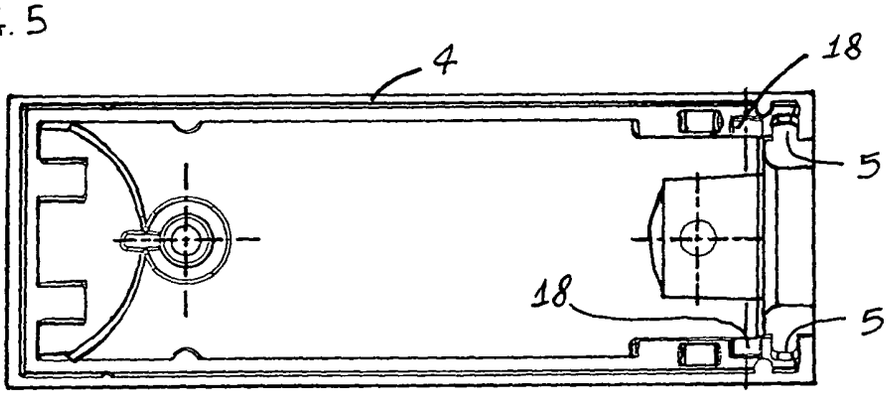
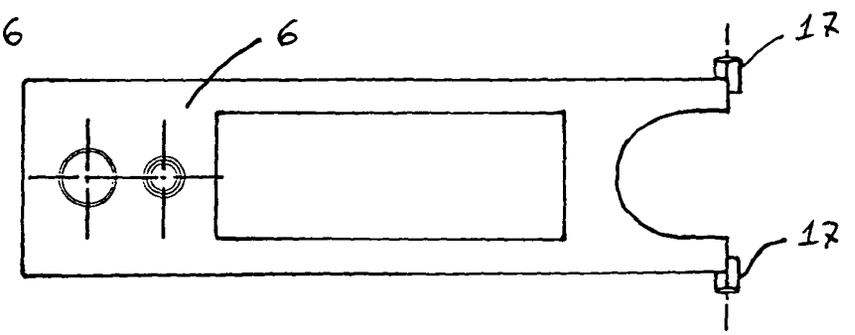


FIG. 6



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EUROPEAN SEARCH REPORT

Application Number
EP 03 01 6136

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	19 December 2003	Jones, C

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