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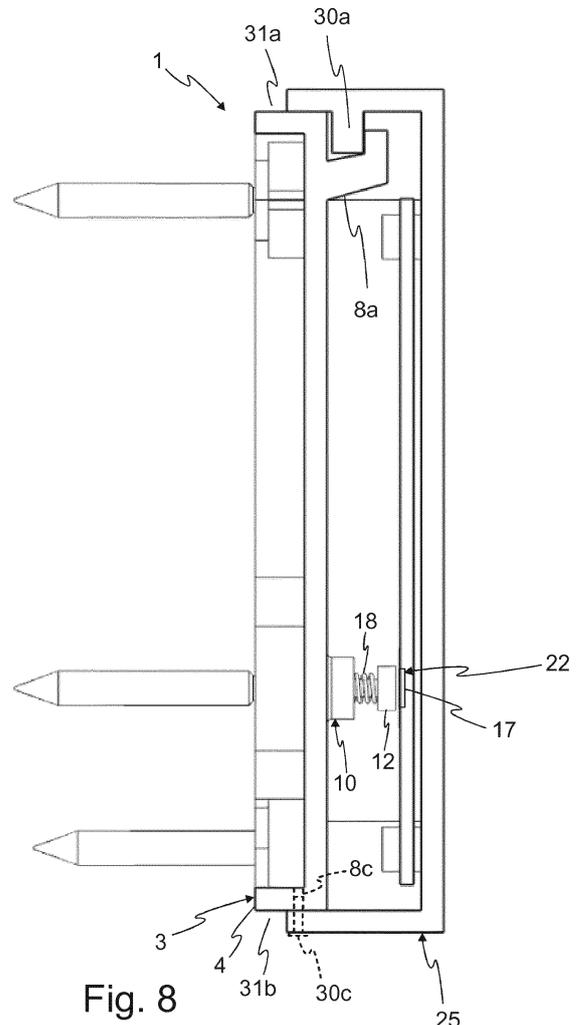
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(54) **AN ENCLOSURE OF AN ALARM SYSTEM AND AN ALARM PERIPHERAL THEREOF**

(57) An enclosure for an alarm peripheral, having a base plate (4) arranged to be mounted to a mounting surface, and an actuator unit (10). The actuator unit (10) is arranged to be independently mounted to the mounting surface. Further, the enclosure (1) comprises an anti-tamper detection system comprising a first element (12) associated with the actuator unit (10) and a second element (17) associated with the base plate (4), such that when the enclosure (1) is mounted to the mounting surface, the anti-tamper detection system is arranged to detect a relative movement between the first and second elements.



**Fig. 8**

**Description**

## TECHNICAL FIELD

**[0001]** The present invention relates to an enclosure of an alarm system, having an anti-tamper detection system, and to an alarm peripheral thereof.

## BACKGROUND

**[0002]** Alarm systems of different kinds are today widely known and used in private homes, working facilities and building complexes to prevent break-ins and to protect the owner's properties. A commonly used feature in an alarm system is some kind of tamper detector which can signal an attempt to tamper with e.g. a central unit and trigger an alarm. An example of an alarm system using a tamper detector is disclosed in WO 2007/021729 A2.

## SUMMARY

**[0003]** An object of the present invention is to provide improvements over prior art. This object is achieved by an invention defined in the appended independent claims; certain embodiments being set forth in the related dependent claims.

**[0004]** In a first aspect of the present invention, there is provided an enclosure for an alarm peripheral, including a base plate, arranged to be mounted to a mounting surface, and an actuator unit. The actuator unit is arranged to be independently mounted to the mounting surface. The enclosure further includes an anti-tamper detection system comprising a first element associated with the actuator unit and a second element associated with the base plate, such that when the enclosure is mounted to the mounting surface, the anti-tamper detection system is arranged to detect a relative movement between the first and second elements. The above defined enclosure firstly provides a secure and reliable tamper detection. Secondly, it provides easy and operator friendly mounting operations with the base plate and the actuator unit being separated from each other.

**[0005]** In an alternative aspect of the present invention, there is provided an electronic device for an alarm system, comprising a wall bracket having a base plate configured to be mounted to a surface, and a tamper unit. The tamper unit is mounted to the surface separated from the base plate of the wall bracket. The tamper unit comprises actuator means, arranged in connection with tamper detector means of the electronic device during a mounted state, where the tamper detector means is configured to detect movements of the electronic device in relation to the actuator means during the mounted state.

**[0006]** In another aspect of the present invention, there is provided an alarm peripheral including at least one enclosure as described above.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0007]** Embodiments of the invention will be described in the following, reference being made to the appended drawings which illustrate non-limiting examples of how the inventive concept can be reduced into practice.

Fig. 1 is a schematic perspective view of a wall bracket, according to an embodiment of the invention, of an enclosure,

Fig. 2 is a schematic perspective view of the wall bracket in Fig. 1 and a actuator unit, according to an embodiment of the invention, of the enclosure,

Fig. 3 is a schematic perspective view of the actuator unit in Fig. 2,

Fig. 4 is a schematic front view of the actuator unit in Fig. 2,

Fig. 5 is a schematic perspective view of the inside of a front cover, according to an embodiment of the invention, of the enclosure,

Fig. 6 is a schematic perspective view of the outside of the front cover in Fig. 5,

Fig. 7 is a schematic cross section view of the enclosure in a pre-mounted state,

Fig. 8 is a schematic cross section view of the enclosure in a mounted state,

Fig. 9 is a schematic cross section view of the enclosure and the actuator unit, in the mounted state, and

Fig. 10 is a detailed cross section view of the actuator unit, rotated 90 degrees in relation with Fig. 9, in the mounted state.

## DETAILED DESCRIPTION OF EMBODIMENTS

**[0008]** With reference to the drawings, an enclosure 1 of an electronic device 1 and some parts of the electronic device are illustrated. The enclosure 1 as illustrated and described is intended to be used in an alarm system, e.g. a home security system or the like. The enclosure 1, which could be for, for example, a central unit device, a key pad device, a display device or any other alarm peripheral, is often mounted to an inner surface 2 of a building, such as a wall surface or a door surface, in the illustrating drawings the surface is a wall surface 2.

**[0009]** The enclosure 1 includes a wall bracket 3 to which a front cover 25, housing the rest of the components of the electronic device, is detachably mounted to. The wall bracket 3 is configured to mount the enclosure

1 to the chosen surface 2. The wall bracket 3 includes a base plate 4 which has at least a first, substantially flat, surface facing the wall surface 2 in its mounted state. It also has several mounting apertures 5a-c in which screws or other fastening means 6a-c can be received when mounting the wall bracket 3 to the wall surface 2. Further, the wall bracket includes an opening 7 in its base plate 4 which is configured and designed to receive an actuator unit 10 of an anti-tamper detection system of the electronic device. The opening 7 is located away from the edges of the base plate 4. The shape and size of the opening 7 is, in the illustrated embodiment, as close to the shape and size of the actuator unit 10 as possible. During the mounting procedure, see Fig. 2, the opening 7 can be used as a guide when mounting the actuator unit 10 to the wall surface 2 or the actuator unit 10 can be used as a guide when mounting the base plate 4 of the wall bracket 3 to the wall surface 2. This is advantageous and will secure the installation of the enclosure 1 to the surface 2 such that all the components of the electronic device are arranged at their intended location, thus securing the operation of the electronic device, and especially the operation of the anti-tampering function.

**[0010]** Yet further, the wall bracket 3 includes three attachment means 8a-c, for attaching a, later described, front cover 25 of the enclosure 1 to the wall bracket 3. The first two attachment means 8a-b, arranged in an upper portion 9a of the wall bracket 3, are shaped such that they allow the front cover 25 to be hooked to the upper portion 9a of the wall bracket 3. The third attachment means 8c is arranged at a bottom rim portion 9b. The third attachment means is, in the illustrated embodiment an opening 8c for receiving fastening means, such as a screw, in order to secure the front cover 25 to the wall bracket 3 once the front cover 25 is hooked to the first two attachment means 8a-b. Alternative attachment means, such as screws, glue or snap-in attachments to name a few, are of course possible when attaching the front cover to the wall bracket.

**[0011]** The enclosure 1 further includes the above presented actuator unit 10, see Figs 3 and 4, having a first element of the anti-tamper detection system, from now on called actuator means 12, arranged in connection with and configured to affect a second element of the anti-tamper detection system, from now on called tamper detector means 17, arranged in the enclosure 1. The actuator means 12 and the tamper detector means 17 are related such that, movements of the enclosure 1 in relation to the actuator means 12 of the independently mounted actuator unit 10 are being detected by the tamper detector means 17. The purpose of this anti-tamper detection system is to, when the enclosure is mounted to the mounting surface, in the illustrated embodiment the wall surface 2, the anti-tamper detection system is arranged to detect a relative movement between the first and second elements. Thus, situations where the enclosure 1 is being tampered with when mounted can be detected, see e.g. Figs 9 and 10. Arranged in connection

with could mean that the actuator means and the tamper detector means are either in contact with each other or, as is illustrated in the drawings, arranged at a distance from each other. The distance between the actuator means and the tamper detector means depends on features of the respective means, for example with type of sensor or mechanical switch is used, or if a magnet has been chosen for the purpose.

**[0012]** The actuator unit 10 further has a base portion 13 which is mounted flush with the base plate 4 of the wall bracket 3 on the wall surface 2 by means of mounting means 14, such as a screw or similar. The mounting means 14 is received in a mounting aperture 15 of the base portion 13 of the actuator unit 10. The location of the mounted actuator unit 10 is in the opening 7 of the wall bracket 3 but separated from the wall bracket 3, i.e. not attached to the wall bracket 3 as it is mounted with its own mounting means 14 or mounted to the wall independently of the wall bracket 3. A person trying to tamper with the enclosure 1 will not be able to reach the actuator unit 10 as it is located, in the opening 7 of the wall bracket, away from the edges of the wall bracket 3. This means that only the wall bracket 3, to which the rest of the enclosure 1 is attached, is affected by a tampering of the enclosure 1 and not the actuator unit 10. Thus, if someone pulls the enclosure 1 off the wall 2, the separately mounted actuator unit 10 will move relative to the remainder of the enclosure 1 giving rise to a reliable tamper detection method, creating a secure, sensible and reliable tamper detection method. Mounting the actuator unit separate from the wall bracket is especially an advantage if the wall is a bit porous. A porous wall can cause the mounting means, such as screws or similar, to not be strongly attached to the wall, which in turn could make it easier to remove the wall bracket and an, to the wall bracket attached tamper detector. A known example of an attached tamper detector is an alarm device having a break-off feature by means of a brittle conductive adhesive which is configured to break if someone is trying to tamper with the device. These attachments between the tamper detector and the device could be affected by a porous wall and not work as desired. However, in the present case, since the actuator unit is not affected by the wall bracket and the tampering of the enclosure, a secure and reliable anti-tamper function is achieved. At the same time, the actuator unit is protected by the wall bracket and the enclosure, as explained above, making it very difficult to tamper with the actuator unit itself.

**[0013]** The actuator means 12 is biased and in connection with the tamper detector means 17 of the enclosure 1 in the mounted state, see Fig. 8, such that the tamper detector means 17 is able to detect movements of the enclosure 1, in relation to the actuator means 12, away from the wall surface 2 and the actuator means 12. In the illustrated embodiment, the actuator means 12 is arranged with a spring 18 which in turn is at least partly arranged in a spring recess 19 of the base portion 13. The actuator means 12 has a bottom portion 20a and a

top portion 20b, where the bottom portion 20a is arranged inside the coil of the spring 18 and the top portion 20b is arranged outside of the spring 18, facing the front cover 25 and the tamper detector means 17 when mounted. The top portion 20b may be provided with trigger means 21, such as a magnet, a shape/protrusion or a material of any suitable type. The trigger means 21 is configured to affect the tamper detector means 17, which in turn can be a magnet, a sensor or a mechanical switch of any suitable type. The tamper detector means 17 is configured to detect the movement of the enclosure 1, especially a movement of the enclosure away from the actuator unit 10, by triggering a change in the relationship between the trigger means 21 and the tamper detector means 17, for example a change in distance between the two, or a break in their magnetic connection. In the illustrated embodiment, the trigger means is a metal plate 21 and the tamper detector means 17 comprises a metal detector configured to sense the presence of the metal plate 21 of the trigger means. In an alternative embodiment, the trigger means may be a flat surface and the tamper detector means may comprise a range sensor measuring the distance between the two. The trigger means and components of the tamper detector means may however be chosen from a group of any suitable means in order to achieve the detection function.

**[0014]** The tamper detector means 17 is integrated in a PCB (Printed Circuit Board) 22 being a part of the anti-tamper detection system, configured to send a tampering signal to either the enclosure 1 or to any other suitable alarm peripheral for signaling that someone is trying to tamper with the enclosure 1. The actuator means 12 and the tamper detector means 17 are, when mounted, in a non-tampering state in connection with each other. Sometimes they can even be in contact with each other, which is the case if for example the trigger means and the tamper detector means comprise corresponding magnets (not shown). In other words, the first element 12, the actuator means, is associated with the actuator unit 10 and a second element 17, the tamper detector means, is associated with the base plate 4, as the base plate 4 and the front cover 25 are attached to each other, or if the base plate is an integrated part of the front cover, which is possible in an alternative embodiments. Thus, when the enclosure 1 is mounted to the mounting surface 2, the anti-tamper detection system is arranged to detect a relative movement between the first and second elements.

**[0015]** The enclosure 1 further comprises, which has been previously presented, a front cover 25, configured to house the remaining parts of the electronic device including the tamper detector means 17. The remaining parts could for example be the PCB (Printed Circuit Board) 22, transmitting/receiving means, or any other suitable means for an electronic device. On an inner top surface 27 or a top rim portion 28a of the front cover 25 there is provided attachment means 30a-b corresponding to the attachment means 8a-b arranged in the top

portion 9a of the wall bracket 3. On a bottom rim portion 28b there is provided an aperture for receiving a third attachment means 30c, see Fig. 8. The aperture in the bottom rim portion 28b corresponds to the third attachment means 8c of the wall bracket 3. The third attachment means 8c is configured to lock and secure the attachment of the front cover 25 to the wall bracket 3. Further attachment means for creating an even more secure and tight mounting between the front cover 25 and the wall bracket 3 is of course possible. Fig. 5 illustrates an inside of the front cover 25 while Fig. 6 illustrates an outside of the front cover 25 and what the enclosure 1 would look like in the mounted state.

**[0016]** Figs 7 and 8 illustrate how to mount the front cover 25 to the wall bracket 3 and how the actuator means 12 is placed to connect to the tamper detector means 17. The front cover 25 is by means of its attachment means 30a-b hooked to the attachment means 8a-b of the wall bracket 3. It is then folded towards the wall bracket 3 such that the front cover 25, in the mounted state, substantially encloses the wall bracket 3, thus protecting both the wall bracket 3 and the actuator unit 10. Finally, the front cover 25 is locked to the wall bracket 3 by means of the third attachment means 8c, 30c. As can be seen in Fig. 8, there is a gap 31a-b between the wall surface 2 and the front cover 25 extending around the circumference of the front cover 25. This may in some situations be an advantage as it facilitates the mounting procedure. It also reduces the impact of tight tolerances, reducing the risk of the electronic device being affected by how it is mounted to the wall.

**[0017]** Fig. 9 is a cross section view through the actuator unit 10 and the wall bracket 3, and Fig. 10 is a detailed cross section view of the actuator unit, rotated 90 degrees in relation to the cross section of Fig. 9, see the markings in Fig. 2. Here it is more clearly illustrated that the actuator means 12 is mounted with a spring 18 such that it is able to move both in and out of the spring recess 19 of the base portion 13. The spring recess 19 otherwise houses and attaches the spring 18 to the base portion 13 of the actuator unit 10. The top portion 20b, with the optional trigger means 21, is arranged, which is more clearly illustrated in Fig. 10, in close connection with the tamper detector means 17. The choice of how to mount the actuator means 12 in relation to the tamper detector means 17 may depend on the choice of trigger means 21 and the components of the tamper detector means 17

**[0018]** Finally, although the inventive concept has been described above with reference to specific embodiment, it is not intended to be limited to the specific form set forth herein. Rather, the invention is limited only by the accompanying claims. Other embodiments than the specific above are equally possible within the scope of these appended claims.

**Claims**

1. An enclosure for an alarm peripheral, comprising a base plate (4) arranged to be mounted to a mounting surface (2), and an actuator unit (10), wherein the actuator unit (10) is arranged to be independently mounted to the mounting surface (2), wherein said enclosure (1) further comprises a anti-tamper detection system comprising a first element (12) associated with the actuator unit (10) and a second element (17) associated with the base plate (4), such that when the enclosure (1) is mounted to the mounting surface (2), the anti-tamper detection system is arranged to detect a relative movement between the first and second elements. 5
2. The enclosure according to claim 1, further comprising a wall bracket (3) comprising said base plate (4) configured to be mounted to said surface (2), wherein said actuator unit (10) is mounted to said surface (2) separated from said base plate (4) of said wall bracket (3), and wherein said actuator unit (10) comprises said first element comprising actuator means (12), arranged in connection with said second element comprising tamper detector means (17) during a mounted state, wherein said tamper detector means (17) is configured to detect movements of said enclosure (1) in relation to said actuator means (12) during said mounted state. 10
3. The enclosure according to claim 1 or 2, wherein said base plate (4) comprises an opening (7) in which said actuator unit (10) is arranged in, in said mounted state, wherein said opening (7) is arranged away from the edges of said base plate (4). 15
4. The enclosure according to any one of the preceding claims, wherein a base portion (13) of said actuator unit (10) is mounted flush with said base plate (4) on said surface (2) in said mounted state. 20
5. The enclosure according to any one of the preceding claims, wherein said first element (12) is biased in said mounted state. 25
6. The enclosure according to claim 5, wherein said first element (12) is mounted with a spring (18) to said actuator unit (10). 30
7. The enclosure according to claim 6, wherein said spring (18) is at least partly mounted in a spring recess (19) of said actuator unit (10). 35
8. The enclosure according to any one of the preceding claims, wherein said second element (17) is configured to detect movements of said enclosure (1), in relation to said first element (12), away from said surface (2). 40
9. The enclosure according to any one of the preceding claims, wherein said second element (17) comprises a sensor, a magnet or a mechanical switch configured to detect the movements of said enclosure (1), in relation to said first element (12). 45
10. The enclosure according to any one of the preceding claims, wherein said first element (12) comprises trigger means (21) configured to cooperate with said second element (17) to detect the movements of said enclosure (1), in relation to said first element (12). 50
11. The enclosure according to any one of the preceding claims, wherein said actuator unit (10) comprises a mounting aperture (15) configured to receive mounting means (14) for mounting said actuator unit (10) to said surface (2). 55
12. The enclosure according to any one of the preceding claims, further comprising a front cover (25) detachable from said base plate (4) arranged to cover said base plate (4) and said actuator unit (10) in said mounted state. 60
13. The enclosure according to claim 12, wherein said front cover (25) is attached to said base plate (4), in the mounted state, such that there is provided a gap (31a-b) between said surface (2) and said front cover (25). 65
14. The enclosure according to claim 13, wherein said gap (31a-b) extends around the circumference of said front cover (25). 70
15. An alarm peripheral comprising at least one enclosure according to any one of the preceding claims. 75

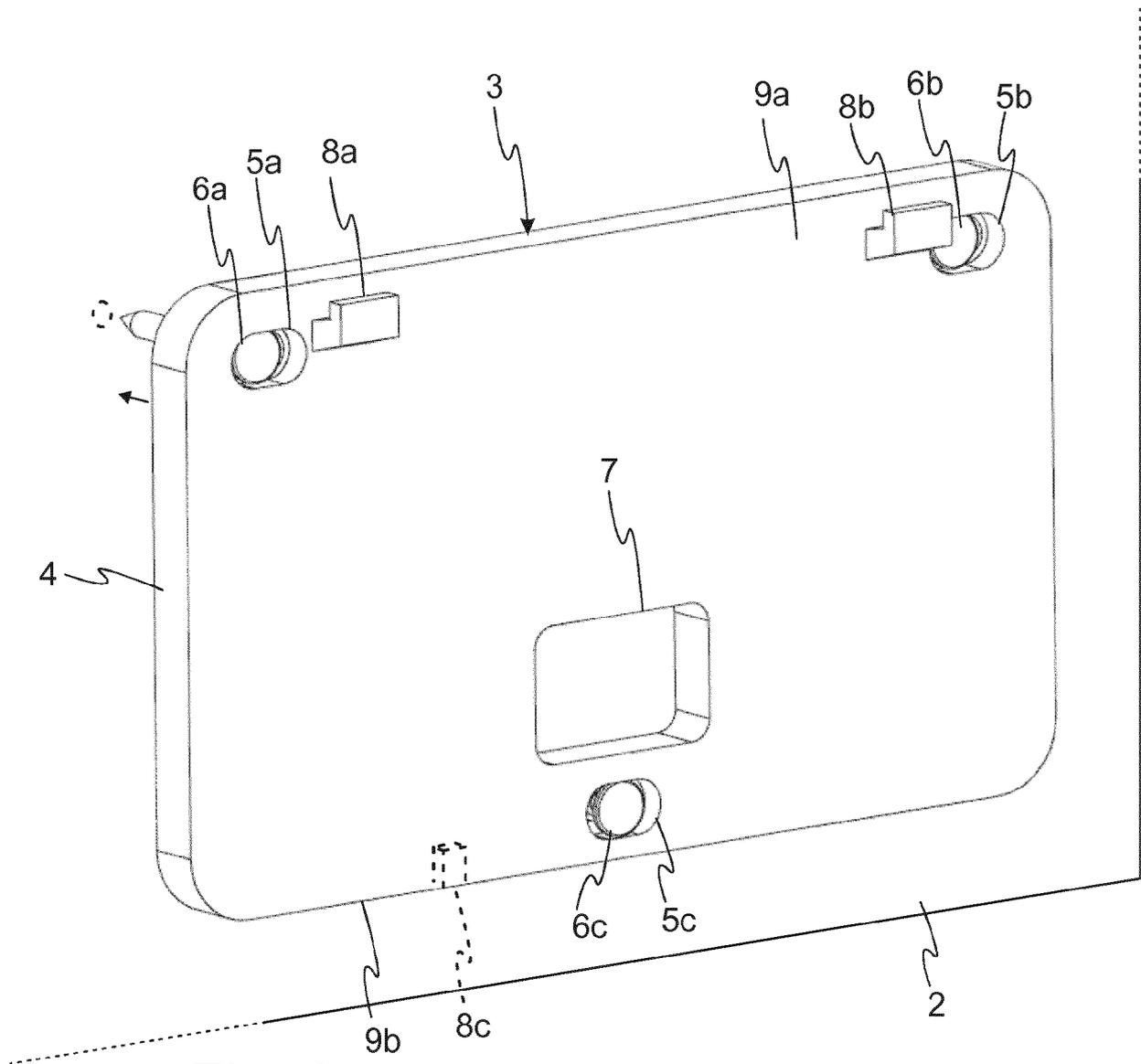
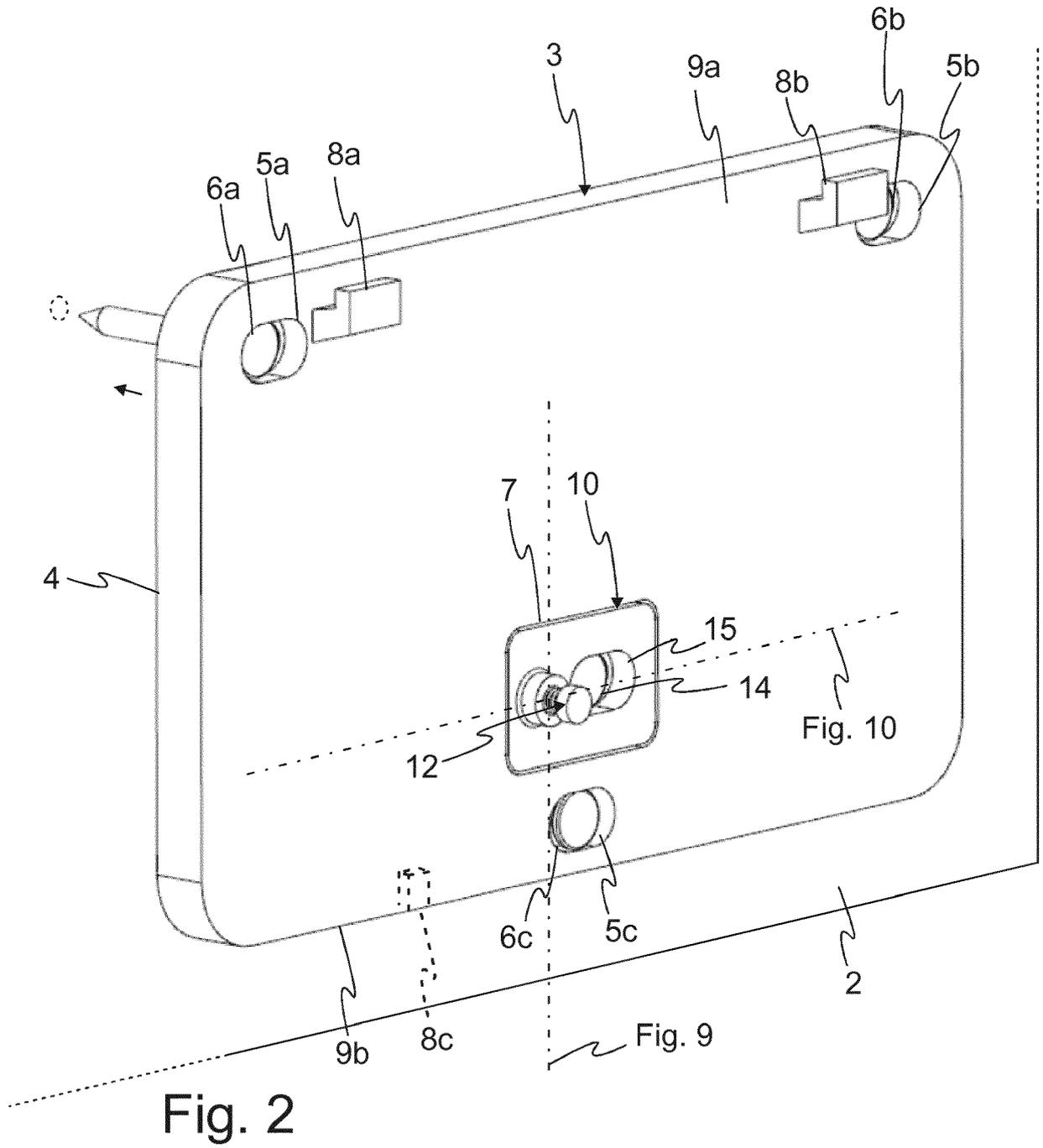


Fig. 1



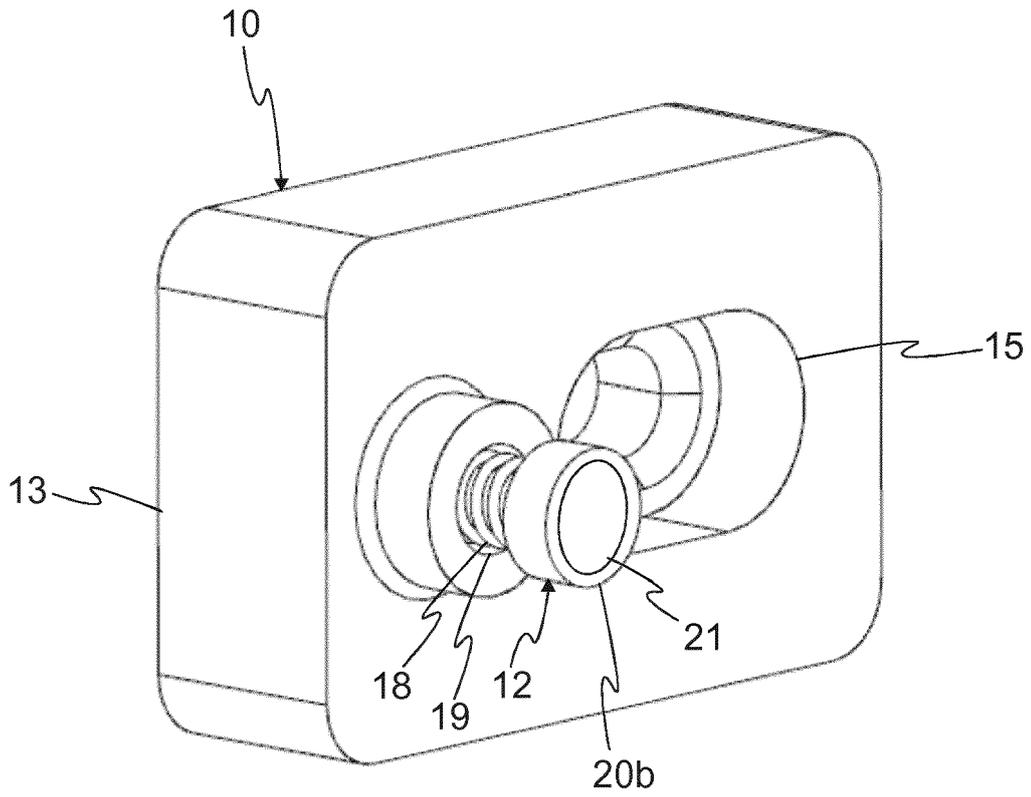


Fig. 3

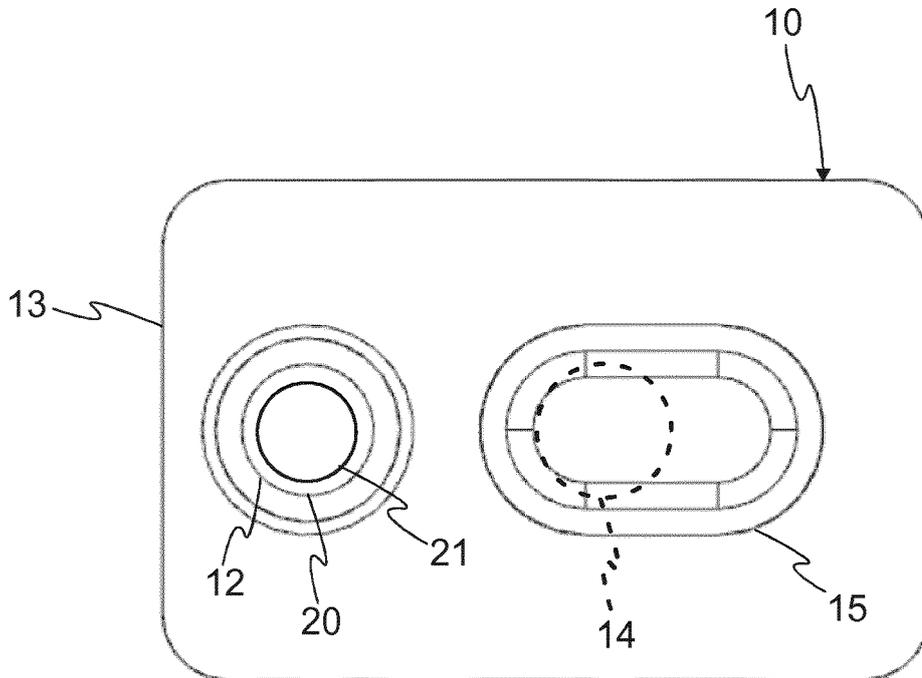


Fig. 4

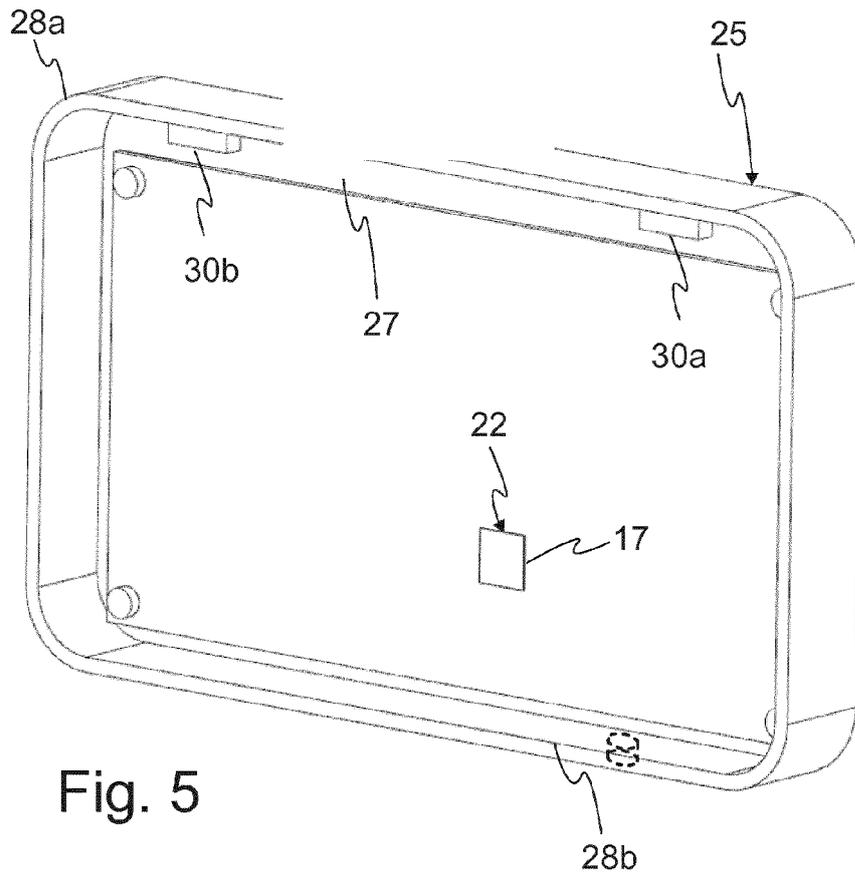


Fig. 5

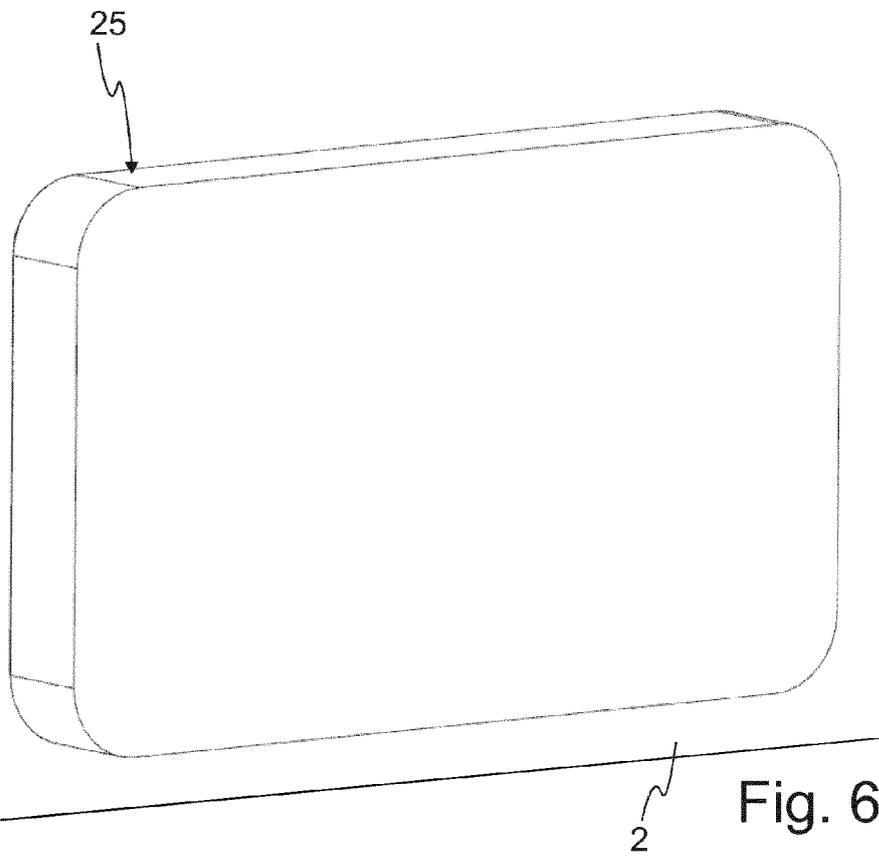


Fig. 6

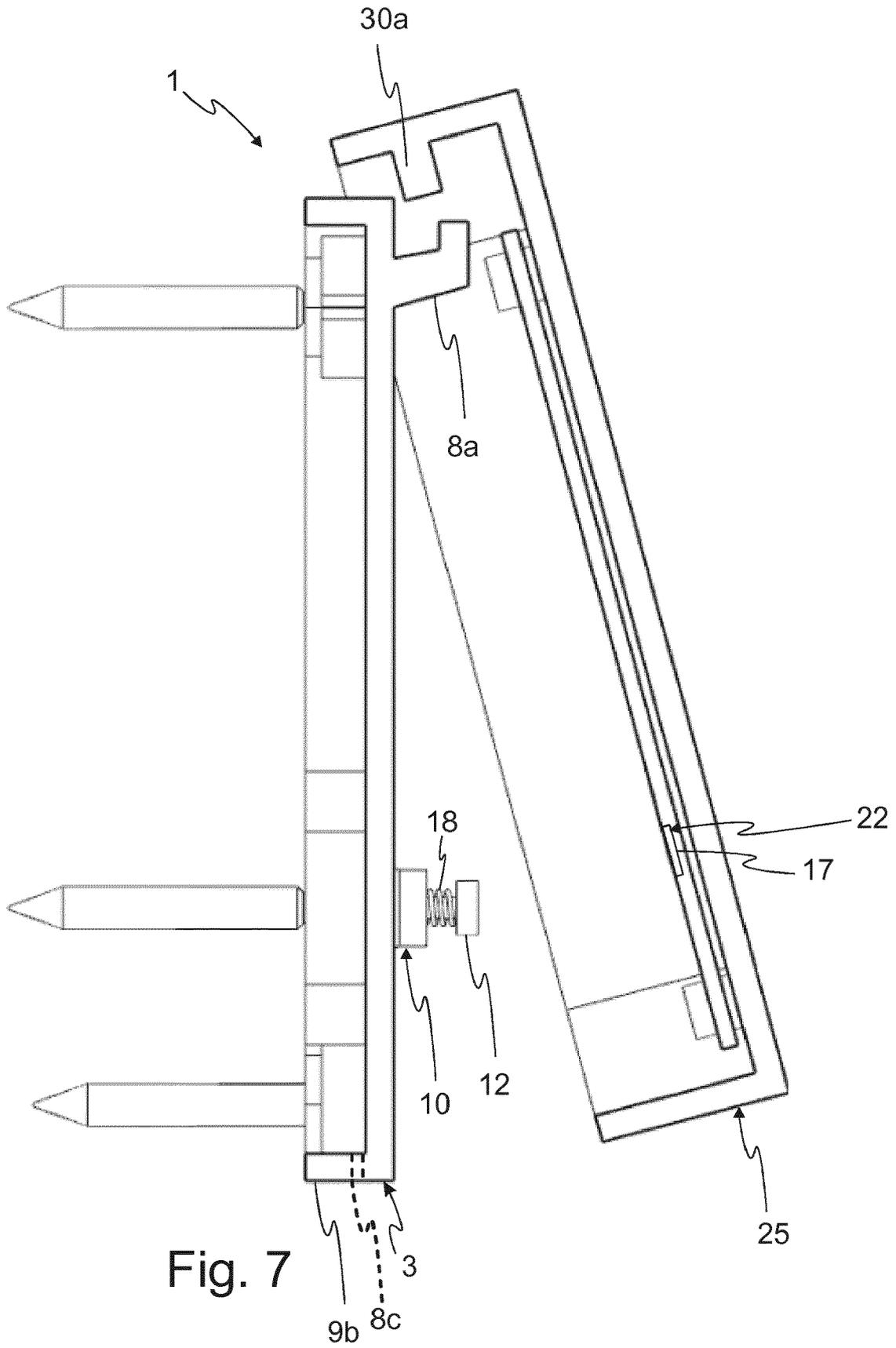


Fig. 7

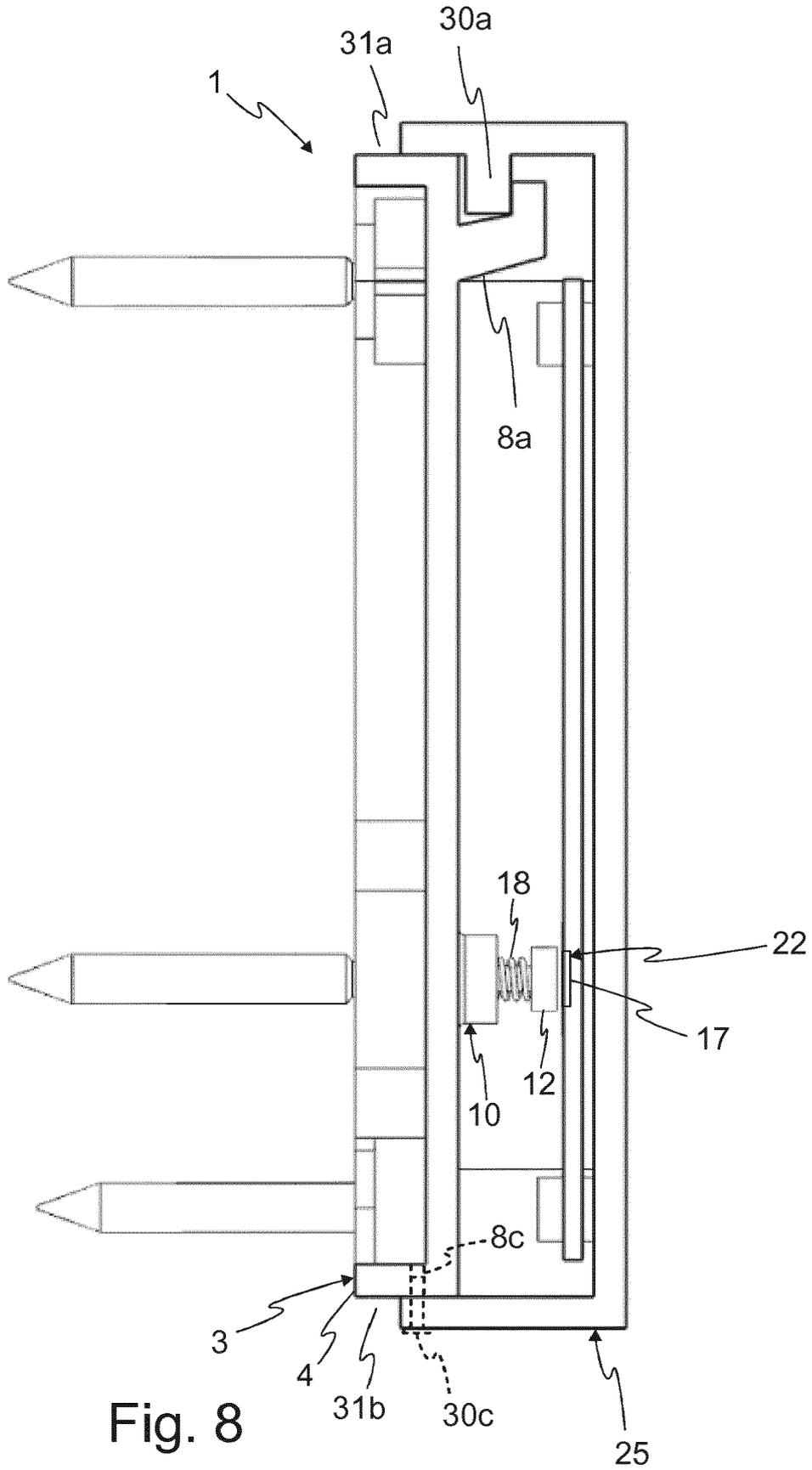


Fig. 8

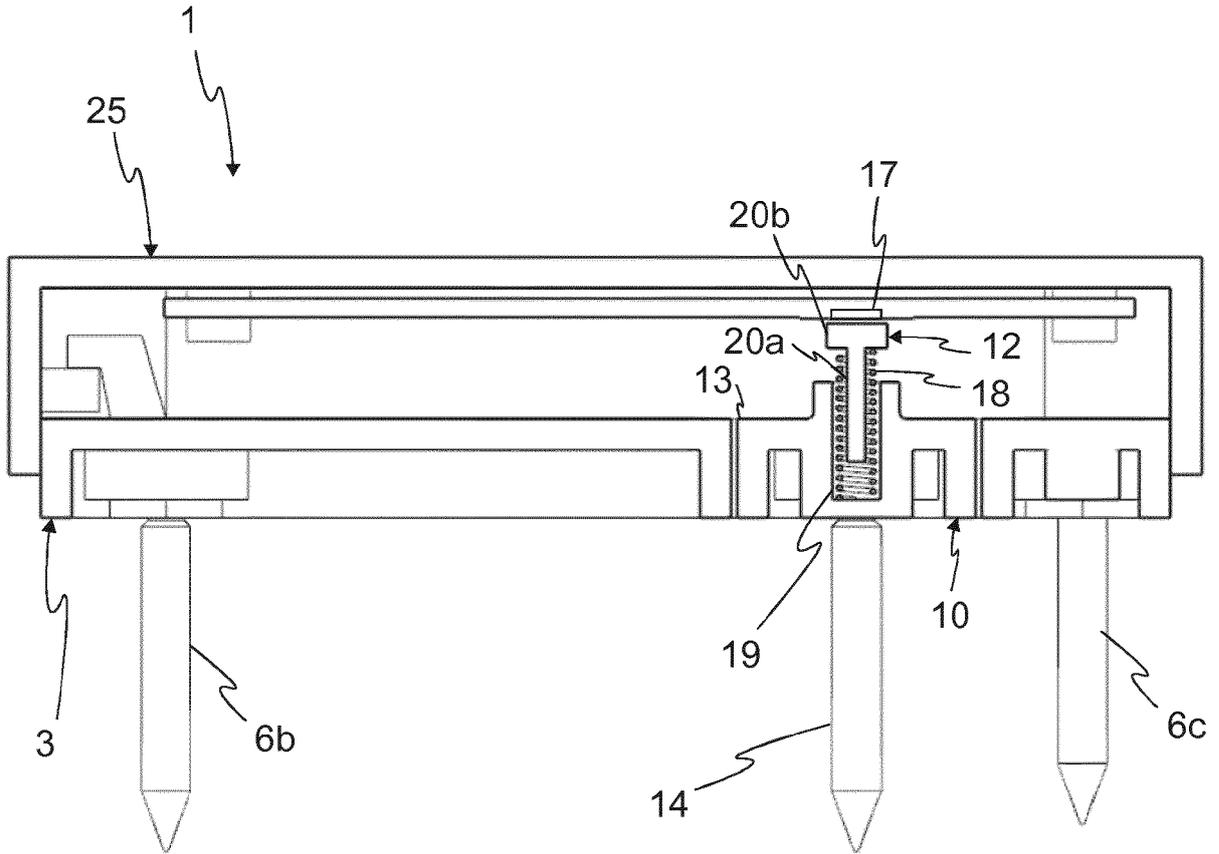


Fig. 9

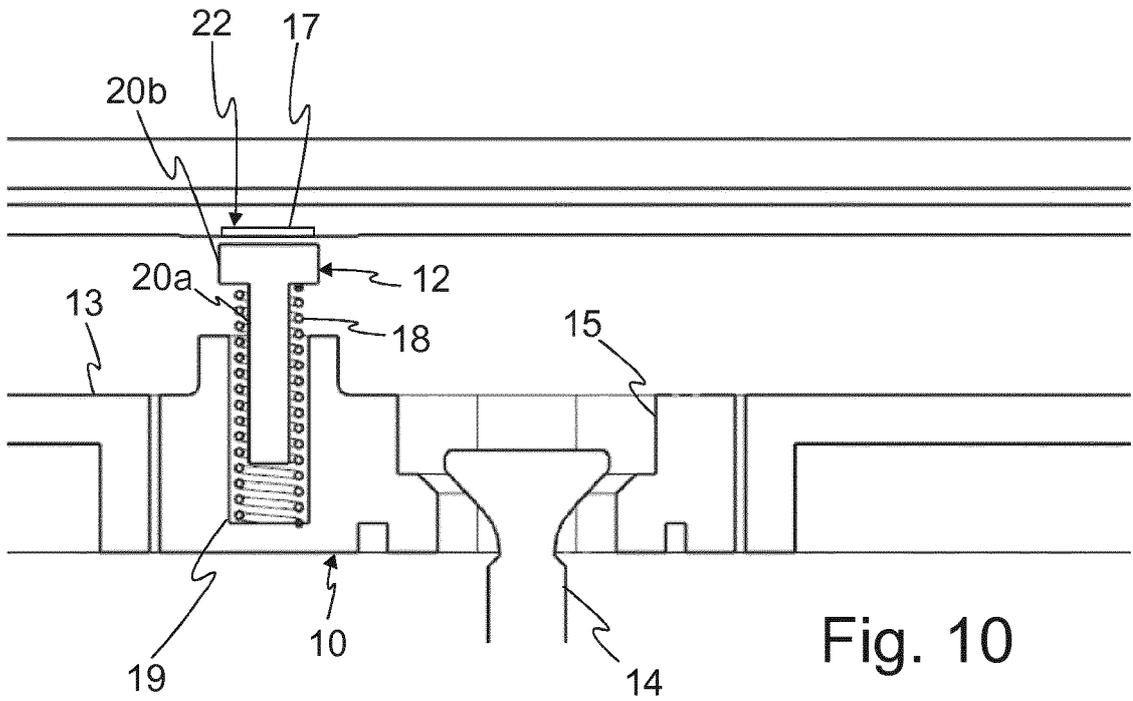


Fig. 10



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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search <b>Munich</b>		Date of completion of the search <b>12 December 2018</b>	Examiner <b>Dascalu, Aurel</b>
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document	

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