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(54) Title: CLAMPING ASSEMBLY

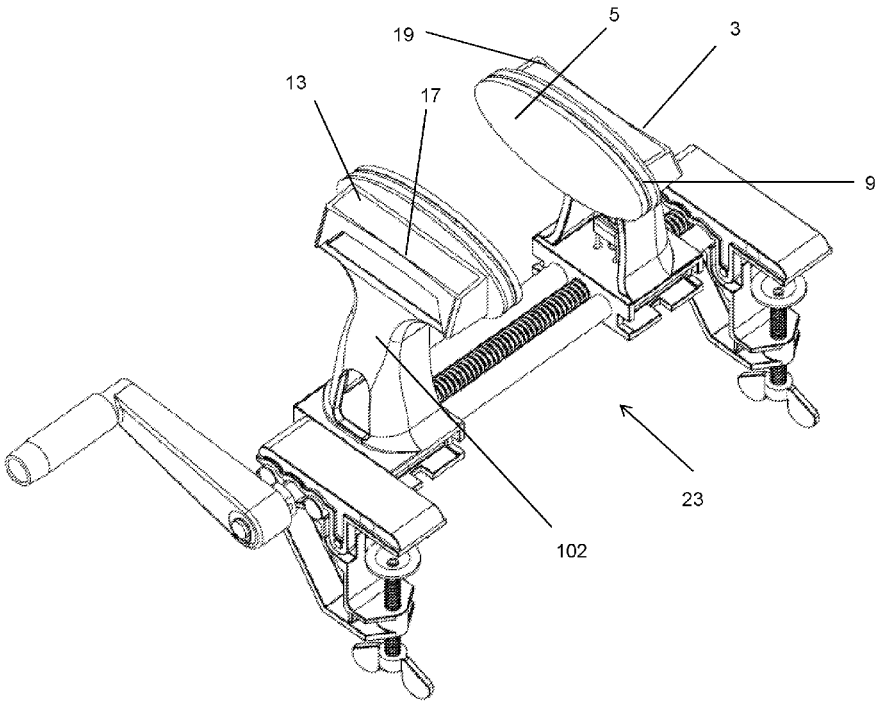

Fig. 6

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(57) Abstract: A clamping component for mounting to a jaw of a clamp. The clamping component comprising: a first portion and a second portion. The first portion configured to be releasably mounted to the jaw of the clamp. The second portion configured to be releasably mounted with respect to the first portion. The second portion having a face that, in use, is configured to contact a workpiece to be clamped at the jaw of the clamp.

CLAMPING ASSEMBLY

TECHNICAL FIELD

This disclosure relates to a clamping component able to be releasably mounted to the jaw of a clamp. The clamping component enables the jaws of the clamp to contact various materials.

BACKGROUND OF THE INVENTION

Clamps are used by home renovators, cabinet makers and others for the purpose of clamping a workpiece or multiple workpieces together to facilitate a particular work application. The above references to the background art do not constitute an admission that the art forms part of the common general knowledge of a person of ordinary skill in the art. The above references are also not intended to limit the application of the clamping component and clamp as disclosed herein.

SUMMARY

Disclosed herein is a clamping component for mounting to a jaw of a clamp. The clamping component may comprise a first portion configured to be releasably mounted the clamping component to the jaw of the clamp. The clamping component may also comprise a second portion configured to be releasably mounted with respect to the first portion, the second portion having a face that, in use, is configured to contact a workpiece to be clamped at the jaw of the clamp. In some forms, the clamping component may also comprise an intermediate portion to be disposed between the first and second portions, the intermediate portion able to be mounted to the first portion and configured to releasably mount the second portion to the first portion. Advantageously, the second portion may be releasably mounted directly to the first portion or the second portion may be mounted to the intermediate portion which is mounted to the first portion.

In some forms, the first portion may comprise a body defining an interior coupling recess, the coupling recess being open at a first end of the body such that in use the recess is able to receive a portion of the jaw of the clamp to releasably mount the clamping component to the jaw of the clamp.

In some forms, the body of the first portion may comprise a protrusion disposed on an interior wall of the coupling recess, the protrusion being configured to engage with a corresponding portion of the jaw when received in the recess to thereby inhibit relative movement between the clamping component and the jaw of the clamp in use.

In some forms, the wall of the coupling recess may be curved inwardly of the recess along its length, the curvature tending to bias the protrusion into latching engagement with the corresponding portion of the jaw when received in the recess.

In some forms, the intermediate portion may comprise a connection surface configured for releasably mounting the second portion to the intermediate portion.

In some forms, the intermediate portion may further comprise a base joined to the connection surface.

In some forms, the intermediate portion may further comprise a plate joined to the base, the plate, base and connection surface together forming a layered structure.

In some forms, the intermediate portion may include at least one aperture formed therethrough, each aperture adapted to receive a fastener to mount the intermediate portion to the first portion.

In some forms, the body may comprise at least one corresponding passage extending between the recess and a wall of the body that faces the intermediate portion in use such that, when the aperture and its corresponding passage are aligned, the fastener can extend therethrough to mount the intermediate portion to the first portion.

In some forms, the fastener is in the form of a rivet.

In some forms, the intermediate portion and the body each include three corresponding apertures and passages, each adapted to receive a respective fastener therethrough.

In some forms, the connection surface comprises one part of a hook and loop fastening system, and the second portion comprises the other part of the hook and loop fastening, the hook and loop fastening system adapted to releasably couple the second portion to the intermediate portion.

In some forms, the connection surface comprises the hook part of the hook and loop fastening system.

In some forms, the loop part of the hook and loop fastening system is joined to an opposing face of the second portion.

In some forms, the face of the second portion that in use contacts the workpiece is in the form of a sandpaper pad; a neoprene pad; a cork pad; an EVA foam pad; a nylon weave polishing (e.g. Scotchbrite) pad; or a leather pad.

Also disclosed herein is a clamp having at least one jaw, the jaw being configured to receive a clamping component as described above.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments will now be described by way of example only, with reference to the accompanying drawings in which

Fig. 1 shows a perspective view of an embodiment of the clamping component with a plurality of disconnected second portions;

Fig. 2 shows an isometric top front view of an embodiment of the first portion;

Fig. 3 shows a perspective view of the first portion and an embodiment of an intermediate portion of the clamping component shown in Fig. 1;

Fig. 4 shows an exploded view of the first and intermediate portions of the clamping component shown in Fig. 1;

Fig. 5 shows a cross sectional view through the first and intermediate portions at a second end of the clamping component shown in Fig. 1;

Fig. 6 shows the first and intermediate portions of the clamping component shown in Fig. 1 being mounted to a jaw of a clamp;

Fig. 7 shows the first and intermediate portions of a pair of clamping components shown in Fig. 1 mounted to an embodiment of a jaw of a clamp;

Fig. 8 shows the clamping component where the second portion is in the form of a soft EVA foam pad, the clamping component being mounted to the jaw of the clamp;

Fig. 9 shows the clamping component where the second portion is in the form of a soft cork pad, the clamping component being mounted to the jaw of the clamp;

Fig. 10 shows the clamping component where the second portion is in the form of a nylon weave polishing pad, the clamping component being mounted to the jaw of the clamp; and

Fig. 11 shows the clamping component where the second portion is in the form of a neoprene pad, the clamping component being mounted to the jaw of the clamp.

DETAILED DESCRIPTION

In the following detailed description, reference is made to accompanying drawings which form a part of the detailed description. The illustrative embodiments described in the detailed description, depicted in the drawings and defined in the claims, are not intended to be limiting. Other embodiments may be utilised and other changes may be made without departing from the spirit or scope of the subject matter presented. It will be readily understood that the aspects of the present disclosure, as generally described herein and illustrated in the drawings can be arranged, substituted, combined, separated and designed in a wide variety of different configurations, all of which are contemplated in this disclosure.

Disclosed herein is a clamping component 1 for coupling to a jaw 102 of a clamp. Referring firstly to Fig. 1, the clamping component will be described. Fig. 1 shows a pair of clamping components 1. The clamping component 1 comprises a first portion 3 configured to releasably mount the clamping component 1 to the jaw 102 of the clamp. The clamping component 1 also comprises a second portion 5 that is configured to be releasably mounted with respect to the first portion 3. The second portion has a face 7 that, in use, is configured to contact a workpiece (not shown) to be clamped at the jaw of the clamp. Fig. 1 shows numerous interchangeable second portions 5 that can be releasably attached to the first portion 3. The second portion may be mounted directly to the first portion or the second portion may be mounted indirectly to the first portion via an intermediate portion. In the illustrated embodiment, the clamping component 1 also comprises the intermediate portion 9 to be disposed between the first 3 and second 5 portions, the intermediate portion 9 able to be

mounted to the first portion 3 and configured to releasably mount the second portion 5 to the first portion 3.

The first portion 3 and the intermediate portion 9 of the clamping component 1 will now be described with reference to Figs. 2-5. The first portion 3 includes a body 11 defining an interior mounting recess 13. The interior mounting recess 13 releasably mounts the first portion 3 to the jaw 102 of the clamp. In the illustrated embodiment, the body 11 of the interior mounting recess 13 includes opposite side walls 10, 12, opposite end walls 14, 16, and, in the orientation shown in the Figures, is open at a top or first end 15 and a bottom or second end 18. In use, the recess 13 is able to receive a portion of the jaw 102 of the clamp 100 to releasably mount the clamping component 1 to the jaw 102 of the clamp 100.

As shown in Figs. 2 and 4, the body 11 of the first portion 3 includes a protrusion in the form of a latch 17 that may be disposed on an interior wall 19 of the mounting recess 13. The latch 17 is configured to latch with the portion of the jaw 102 when the jaw is positioned in the recess 13 to inhibit relative movement between the clamping component 1 and the jaw 102 of the clamp 100 in use. In the illustrated embodiment, the latch 17 is located on the interior wall 19 in the form of the interior end wall 10 facing the intermediate portion. It is understood that the latch may be located on any one of the interior walls, including the interior wall facing away from the intermediate portion or one of the side walls.

The interior end wall 10 of the mounting recess 13 is configured to bias the latch 17 into latching engagement with the jaw 102. In this regard, the interior end wall 10 has a length extending between the opposite side walls 14, 16, and has a height extending between the top end 15 and the bottom end 18. Along its length the end wall 10 tapers in height from the bottom end 18 towards the top end 15. The end result is that the shape of the end wall 10 includes a partial hexagonal-shaped cut-out. The end wall 10 also is curved inwardly towards the centre of the recess 13 along its length. The curvature tends to bias the latch 17 into its latching engagement with the portion of the jaw 102 when received in the recess 13.

The interior end wall 10 also includes the latch 17 that is located about its centre in relation to both the length and height. Both the latch 17 and the inward bias of the wall 10 allow the first portion 3 to engage the jaw 102 by a snap-fit. The latch 17 engages with a corresponding cut-out of the jaw 102. The wall 10 itself (and in some forms, the first portion 3) is formed of an elastic material (e.g., plastic) to allow the interlocking first portion 3 and

jaw 102 to push together. The jaw 102 may be formed of a more rigid material (e.g., aluminium) than the first portion 3 so that an effective mounting (e.g., coupling) is achieved between the first portion 3 and the jaw 102. In this regard, when the jaw 102 is pushed into engagement with the first portion 3, it is the wall 10 which bends to accommodate the jaw in the recess 13, and then is biased back to its original position to hold the jaw 102 in place. In use, the clamp 100 is positioned in many different orientations (including upside-down), and the snap-fit connection provides a reliable strong releasable mounting arrangement between the first portion and the jaw of the clamp to prevent the first portion unintentionally releasing from the jaw. It is understood that other methods may be used to releasably mount the intermediate portion to the first portion, such as interference fit, mechanical fastener (e.g. spring-loaded ball detents, magnetic arrangement, etc).

Referring to Figs. 4 and 5, the intermediate portion 9 is shown as being formed of several layers including a connection surface 25, a base 27, and a plate 29. The connection surface 25 is configured for releasably mounting the second portion 7 to the intermediate portion 9. In some embodiments, the connection surface 25 forms one part 39 of a hook and loop fastening system. The second portion 5 comprises the other part 41 of the hook and loop fastening system. The hook and loop fastening system 39, 41 is adapted to releasably mount the second portion 5 to the intermediate portion 9. For example, in the illustrated embodiment, the connection surface 25 is in the form of the hook part of the hook and loop fastening system, while the loop part of the hook and loop fastening system is secured (e.g. bonded) to the opposing other part 41 of the second portion 5. It is understood that the connection surface may also be in the form of an adhesive including adhesive tape, or a magnetic arrangement, etc.

The intermediate portion 9 further comprises a base 27 joined to the connection surface 25. The base 27 may be joined to the connection surface 25 by an adhesive or any suitable form of fastener. The base 27 is in the form of a cushioning material (e.g. a flexible pad). In this arrangement, the cushioning material 27 allows the intermediate portion to give when the clamp is in use clamping the workpiece. The workpiece does not need to be perfectly aligned between the pair of clamping components 1 because the cushioning material 27 will compress in parts to compensate for any misalignment and facilitate the clamping components 1 to tightly clamp the workpiece.

The intermediate portion 9 further comprises the plate 29 joined to the base 27. The plate 29 provides rigidity to support the clamping component 1. In the illustrated embodiment, the plate 29 is in the form of a metal plate 29. It is understood that any suitable rigid material may be used for the plate 29 (e.g. a fibre-reinforced polymer, ceramic composite, etc).

The intermediate portion 9 includes at least one and typically three apertures 31 formed therethrough. Each aperture is adapted to receive a fastener in the form of a rivet 35 to mount the intermediate portion 9 to the first portion 3. In the detailed embodiments, the fastener is in the form of a rivet. However, as will be appreciated by the skilled addressee, other fastener means and devices can be used (e.g. bolts, screws, adhesive, magnets, etc).

In the illustrated embodiment, the base 27 and the plate 19 include the apertures 31 to fasten the base 27 and the plate 29 to the first portion 3. The connection surface 25 is joined/secured (e.g., bonded) to the base by an adhesive, but may also be adapted to receive the rivet by including one or more apertures. The first portion 3 includes one or more corresponding passages 33 extending between the recess 13 and an end wall 16 of the body 11. In the illustrated embodiment, the intermediate portion 9 and the body 11 each include three corresponding apertures 31 and passages 33, each adapted to receive therethrough a respective fastener in the form of rivet 35. However, as will be appreciated by the skilled addressee, any number of fasteners could be used.

In operation, the apertures 31 of the base 29, the plate 19 and the corresponding passage of the end wall 16 are aligned such that the rivet 35 extends therethrough to mount the intermediate portion 9 to the first portion 3.

As discussed above, the second portion 5 includes the face 7 that is configured to contact the workpiece between the clamping components 1. The face 7 may take many different forms. For example, the face 7 can be in the form of an EVA foam pad (see Fig. 8), a cork pad (see Fig. 9), a nylon weave polishing pad (see Fig. 10), a neoprene pad (see Fig. 11), a sandpaper pad, a leather pad, etc. This allows the clamp to be used to clamp a multitude of different materials (i.e. different workpieces) without damaging the material. Sandpaper pads can be used for sanding and gripping objects, such as a piece of wood. Leather pads can be used for jewellery, and can also provide excellent grip for wood pieces, as they tend not to mark the object they are gripping (i.e., non-marking).

Fig. 8 shows a pair of EVA foam pads. EVA foam pads can be used for clamping unusually shaped or fragile objects.

Fig. 9 shows a pair of cork pads. Cork can be used for soft and delicate items. Cork is a good gripping surface and is non-marking.

Fig. 10 shows a pair of nylon weave polishing pads. A nylon weave polishing pad can also be known as a Scotchbrite™-type pad. These pads can be used for polishing.

Fig. 11 shows a pair of neoprene pads. Neoprene pads can also be used for clamping unusually shaped or fragile objects. They are ideal for highly polished surfaces, such as jewellery and are non-marking.

Figs. 7 to 11 show the pair of clamping components 1 in use with the clamp 100 having two moveable jaws 102. Each jaw 102 is configured to receive a clamping component 1. A projecting portion 104 of each jaw 102 is configured for engagement in the coupling recess 13 of the body 11 of the first portion 3. The projecting portion 104 includes a cut-out 106 formed therein into which the latch 17 is received. The cut-out 106 corresponds to the latch 17 and, when the latch 17 is received therein, it inhibits relative movement between the clamping component 1and the jaw 102 of the clamp 100 in use (e.g., in a snap-fit arrangement).

In order to clamp the workpiece between the clamping components 1, the jaws 102 can be moved towards and away from each other by winding a crank handle 108. The movement of the jaws 102 is driven by a threaded rod 110 which is activated by the crank handle 108. The jaws 102 are supported by and travel along the spaced support bars 112 and 114. The spaced support bars 112, 114 are mounted on either side of the threaded rod 110 substantially in parallel.

In use, a method of assembling the first portion 3, the intermediate portion 9 and the second portion 5 to the jaws 103 is as follows:

1. The first portion 3 and the intermediate portion 9 are joined together prior to mounting to the jaws 102.

2. The pre-assembled first portion 3 and intermediate portion 9 are mounted to the jaws 102.

3. The second portion 5 is coupled to the first portion 3. In this illustrated embodiment, this involves sticking the second portion 5 (e.g., the pad of choice) to the connection surface 25 of the first portion 3. The pad 5 remains in contact with the connection surface by the hook and loop fasteners 39, 41.

4. If a different second portion 5 is desired or required, then the second portion 5 is removed (e.g., torn off in the illustrated embodiment) and an alternative second portion 5 is coupled to the connection surface 25 of the first portion.

In the claims which follow and in the preceding summary except where the context requires otherwise due to express language or necessary implication, the words "comprise", "comprising" and variations thereof are used in the sense of "including", that is, the features as above may be associated with further features in various embodiments.

Variations and modifications may be made to the parts previously described without departing from the spirit or ambit of the disclosure.

CLAIMS

1. A clamping component for mounting to a jaw of a clamp, the clamping component comprising:

a first portion configured to be releasably mounted to the jaw of the clamp;

a second portion configured to be releasably mounted with respect to the first portion, the second portion having a face that, in use, is configured to contact a workpiece to be clamped at the jaw of the clamp;

an intermediate portion arranged to be disposed between the first and second portions, the intermediate portion configured to be mounted to the first portion and configured to releasably mount the second portion to the first portion;

wherein the intermediate portion comprises a connection surface being that surface which faces an opposing face of the second portion in use, the connection surface having a releasable mounting system arranged on the connection surface itself, the releasable mounting system configured to releasably mount the opposing face of the second portion to the releasable mounting system on the connection surface, to thereby releasably mount the second portion to the first portion.

2. A clamping component according to claim 1, wherein the first portion further comprises a body defining an interior mounting recess, the mounting recess being open at a first end of the body such that in use the recess is able to receive a portion of the jaw of the clamp to releasably mount the clamping component to the jaw of the clamp.

3. A clamping component according to claim 2, wherein the body of the first portion comprises a protrusion disposed on an interior wall of the mounting recess, the protrusion being configured to engage with a corresponding portion of the jaw when received in the recess to thereby inhibit relative movement between the clamping component and the jaw of the clamp in use.

4. A clamping component according to claim 3, wherein the wall of the mounting recess is curved inwardly of the recess along its length, the curvature tending to bias the protrusion into latching engagement with the corresponding portion of the jaw when received in the recess.

5. A clamping component according to any one of the preceding claims, wherein the intermediate portion further comprises a base.

6. A clamping component according to claim 5, wherein the intermediate portion further comprises a plate joined to the base, the plate, base and connection surface together forming a layered structure.

7. A clamping component according any one of the preceding claims, wherein the intermediate portion includes at least one aperture formed therethrough, each aperture adapted to receive a fastener to mount the intermediate portion to the first portion.

8. A clamping component according to claim 7, when dependent on any one of claims 2 to 4, wherein the body comprises at least one corresponding passage extending between the recess and a wall of the body that faces the intermediate portion in use such that, when the aperture and its corresponding passage are aligned, the fastener can extend therethrough to mount the intermediate portion to the first portion.

9. A clamping component according to claim 7 or 8, wherein the fastener is in the form of a rivet.

10. A clamping component according to any one of claims 7 to 9, wherein the intermediate portion and the body each include three corresponding apertures and passages, each adapted to receive a respective fastener therethrough.

11. A clamping component according to any one of the preceding claims, wherein the releasable mounting system comprises a hook and loop fastening system, with one part of the hook and loop fastening system being arranged at the connection surface, and the other part of the hook and loop fastening system

being arranged at the second portion, the hook and loop fastening system adapted to releasably couple the second portion to the connection surface of the intermediate portion.

12. A clamping component according to claim 11, wherein the hook part of the hook and loop fastening system is arranged at the connection surface.

13. A clamping component according to claim 11 or 12, wherein the loop part of the hook and loop fastening system is secured to the opposing face of the second portion.

14. A clamping component according to any one of the preceding claims, wherein the one face of the second portion that in use contacts the workpiece is in the form of:

a sandpaper pad;

a neoprene pad;

a cork pad;

an EVA foam pad;

a nylon weave polishing pad; or

a leather pad.

15. A clamp having at least one jaw, the jaw being configured to receive a clamping component as defined in any one of claims 1 to 13.

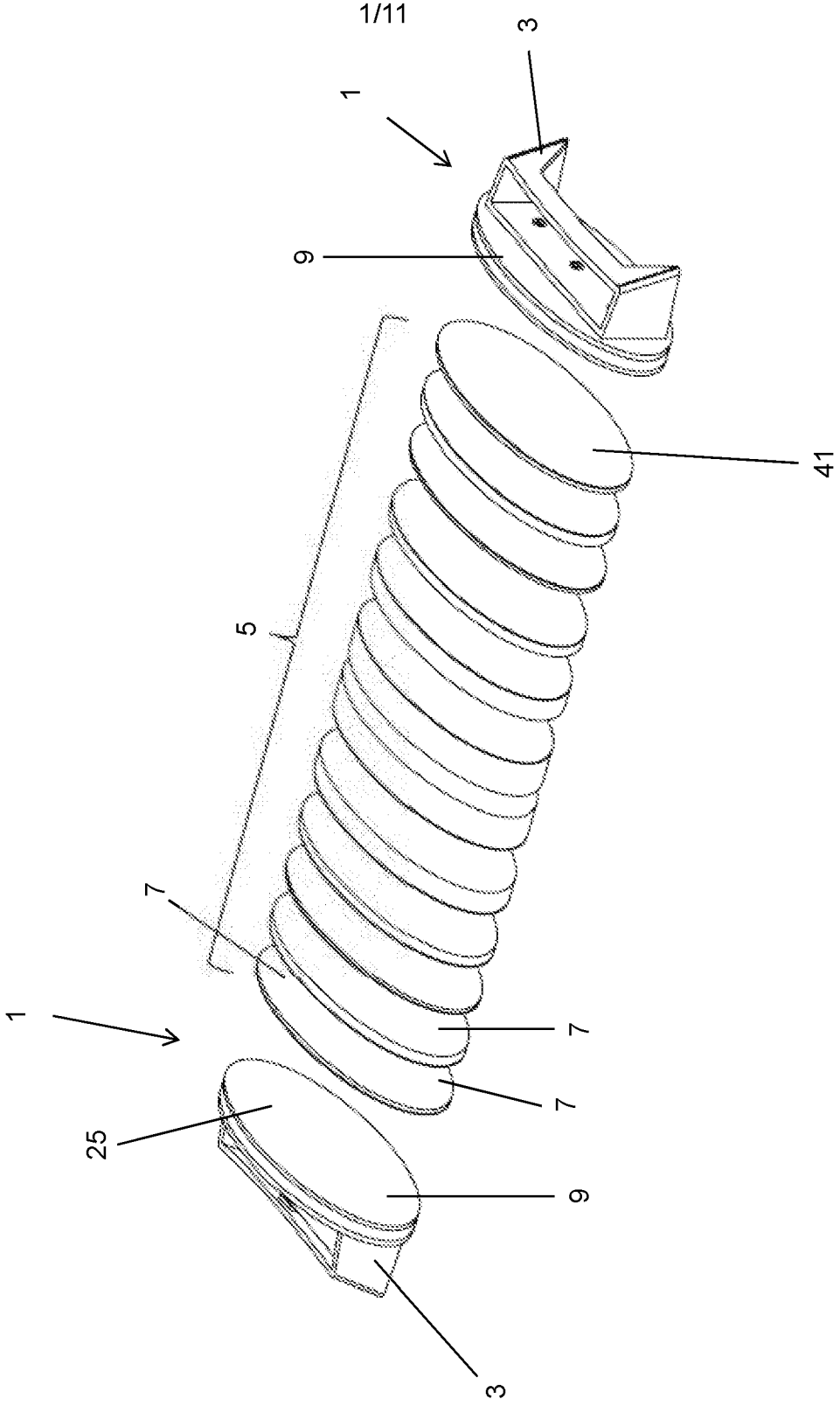

Fig. 1

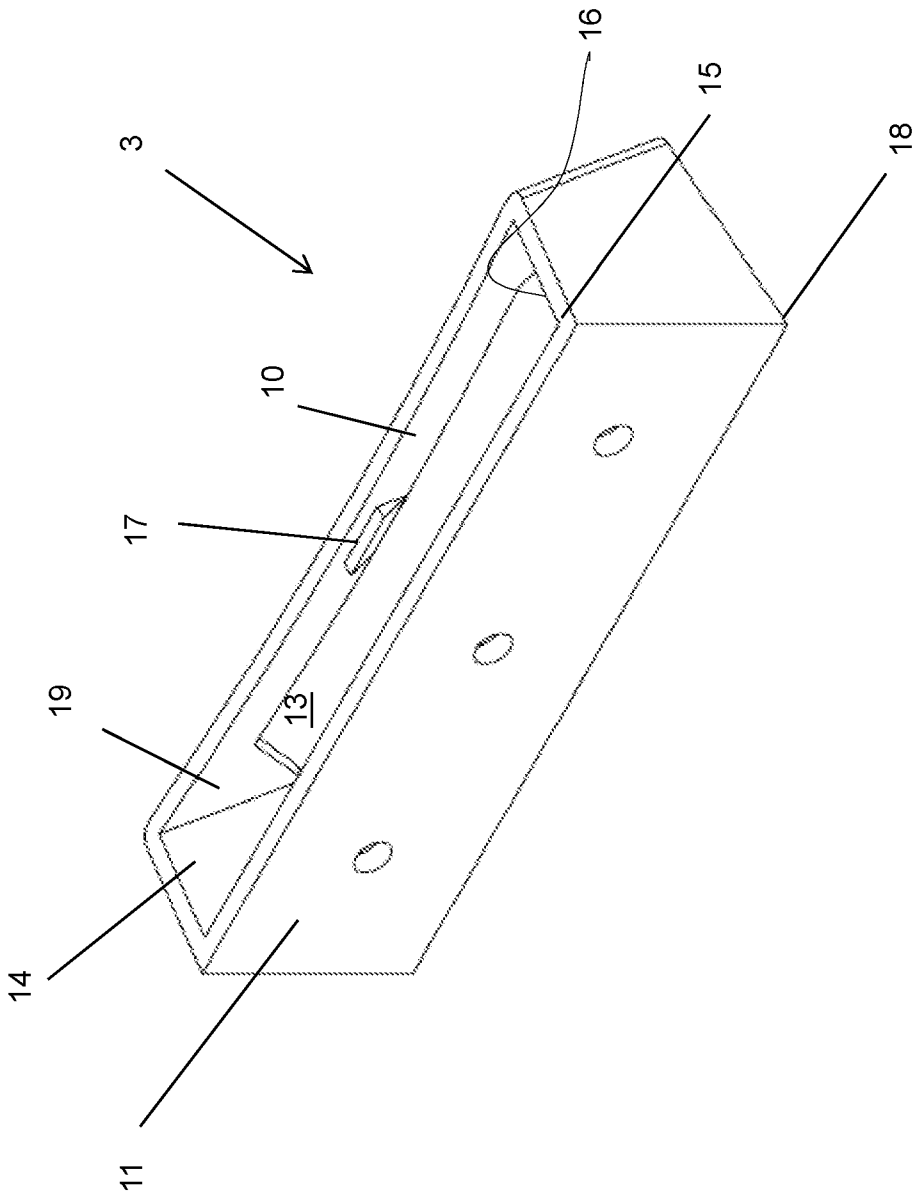

Fig. 2

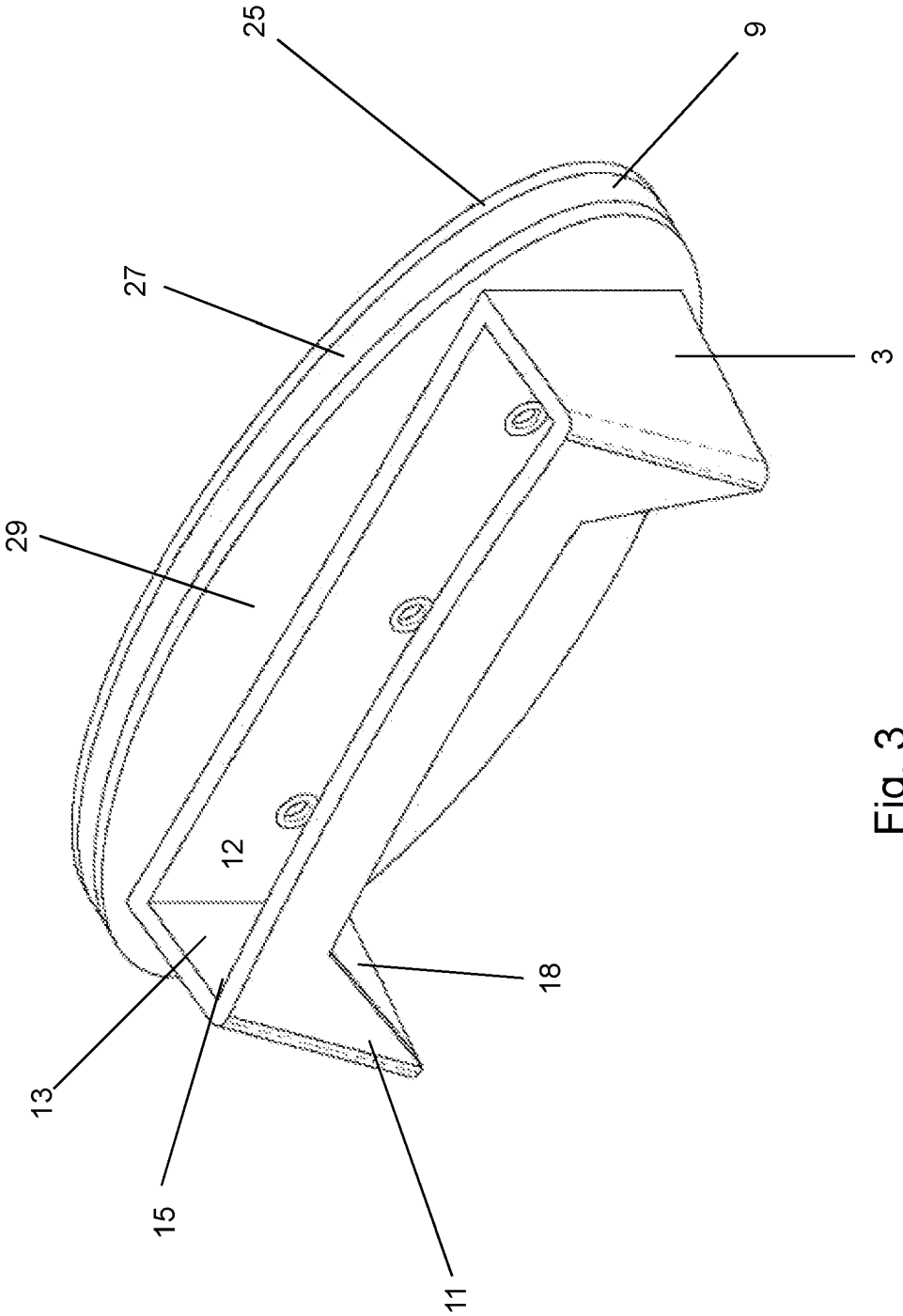

Fig. 3

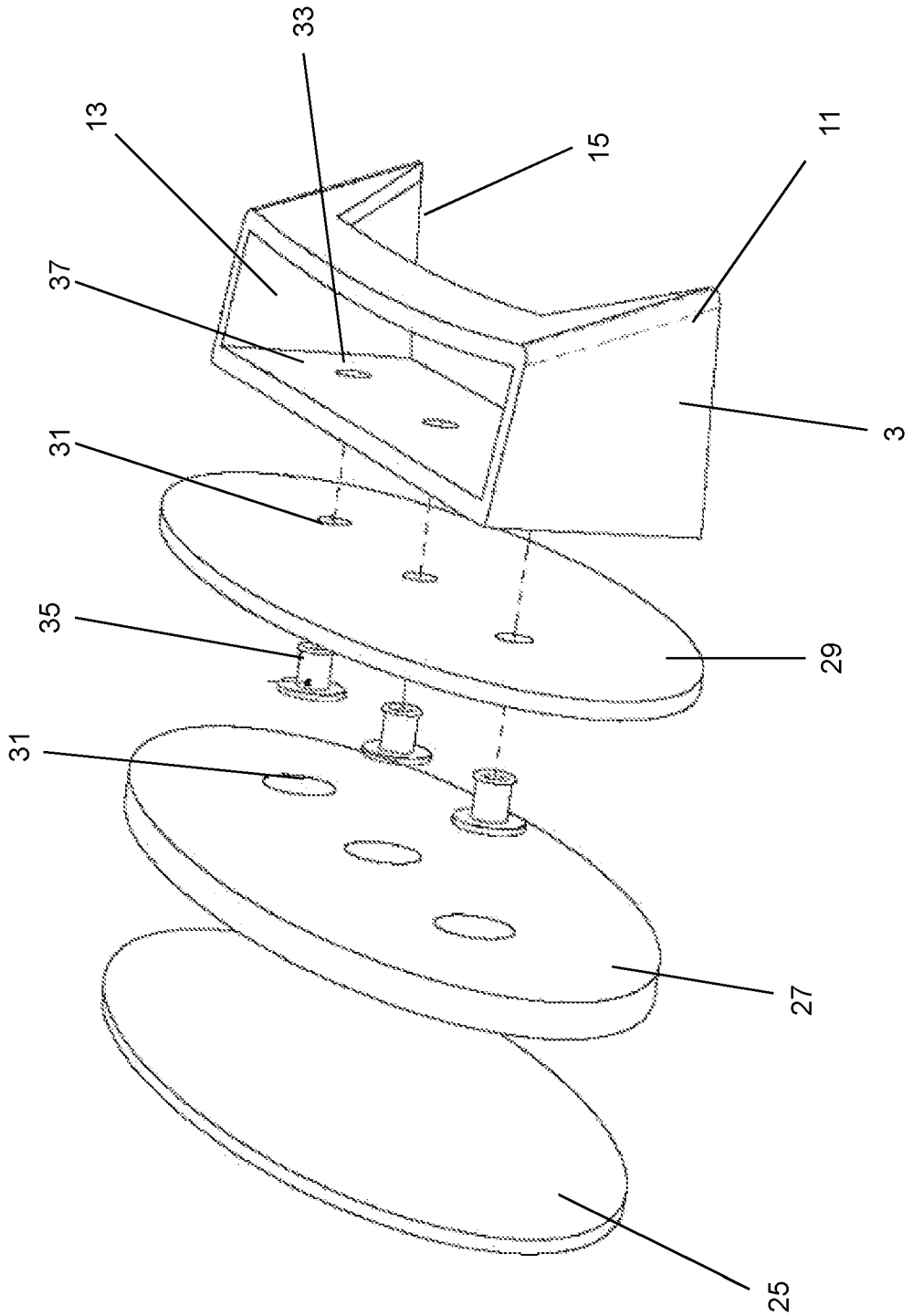

Fig. 4

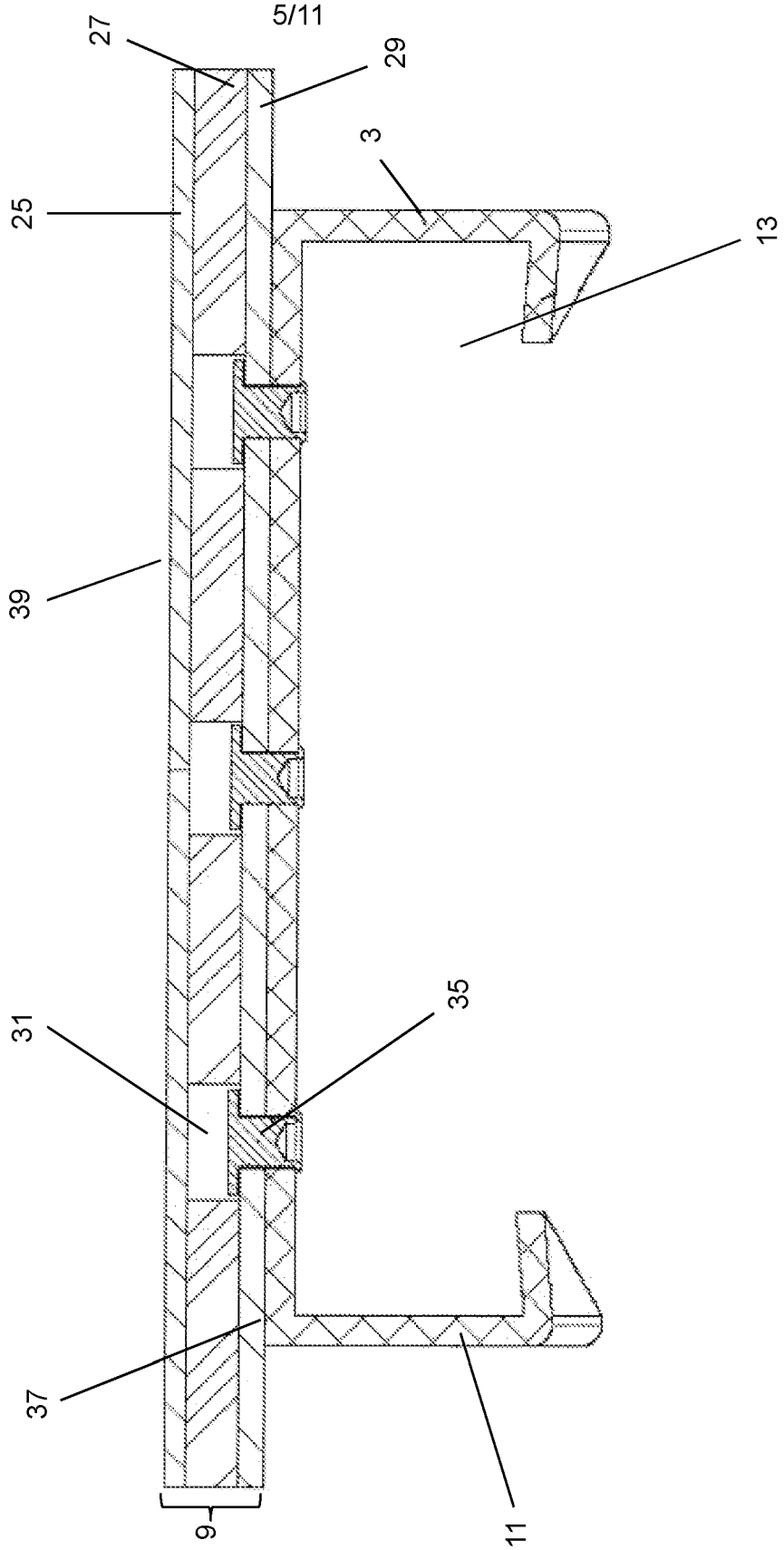

Fig. 5

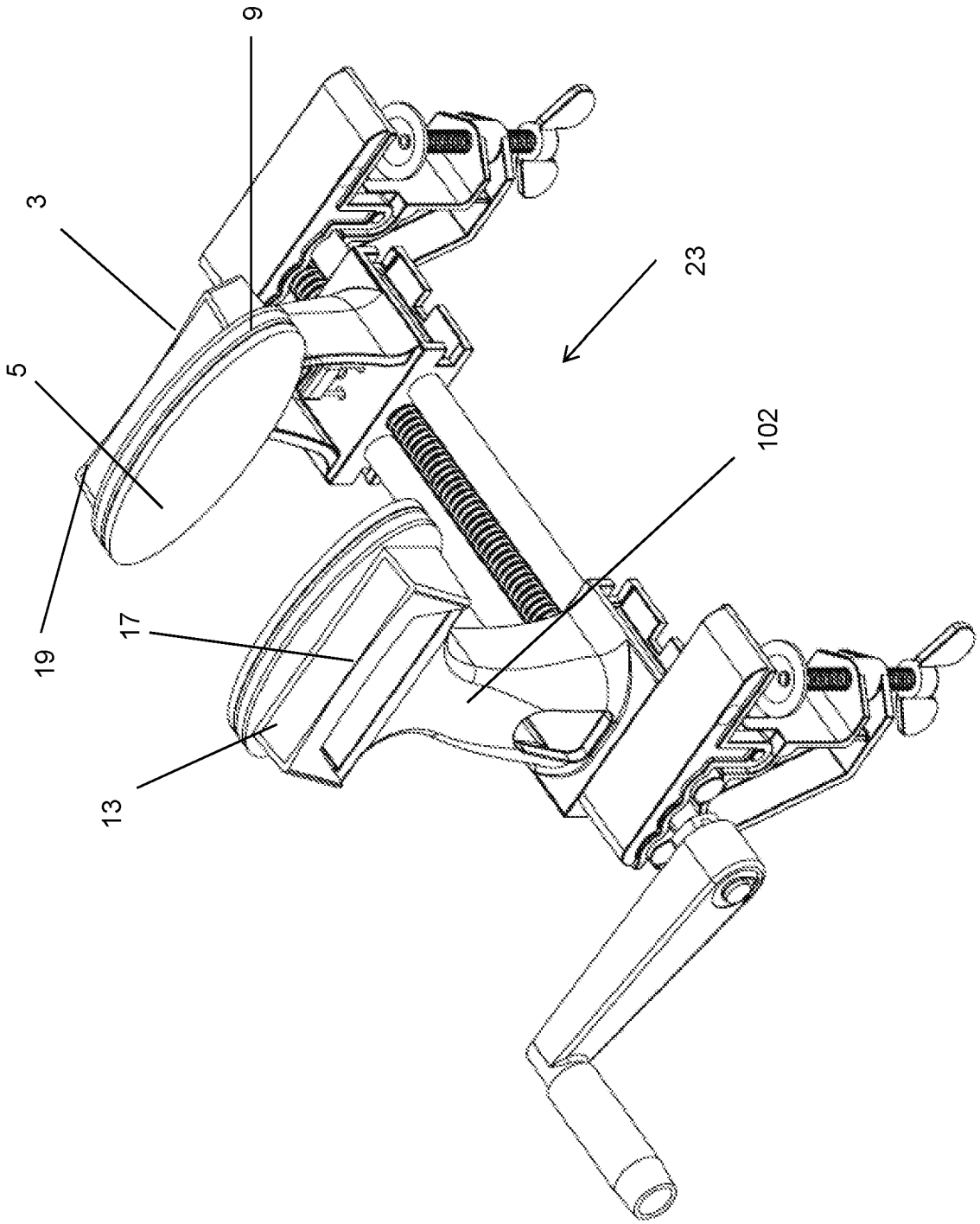

Fig. 6

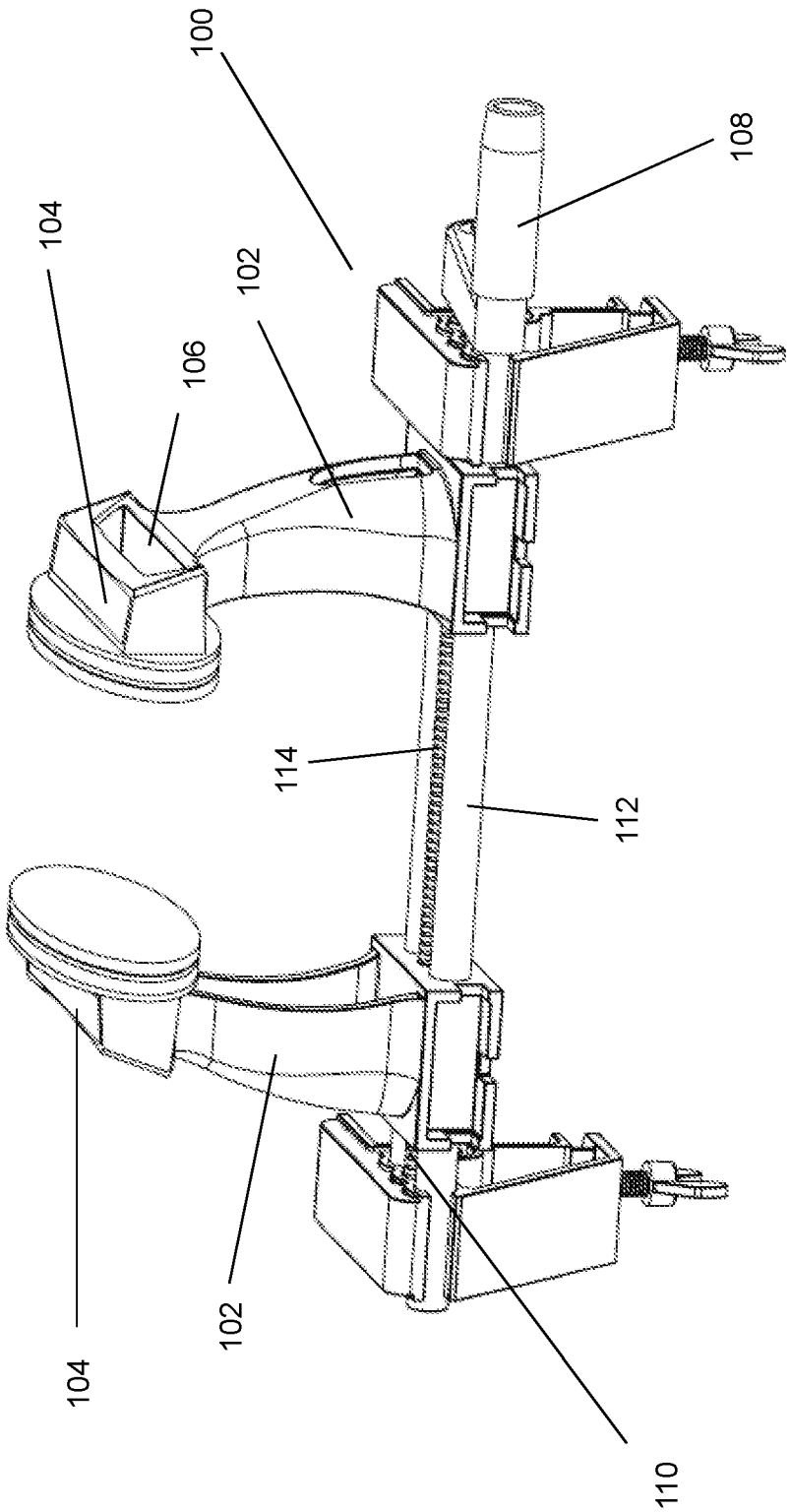

Fig. 7

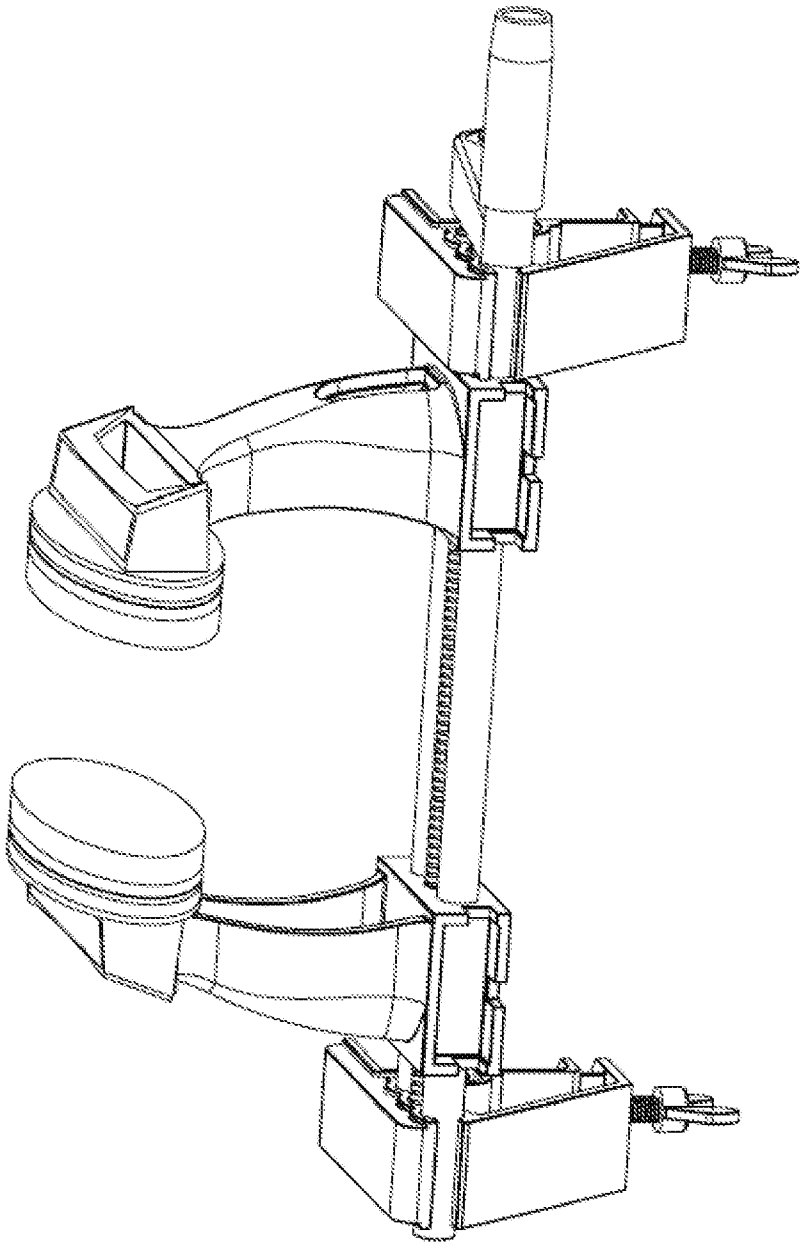

Fig. 8

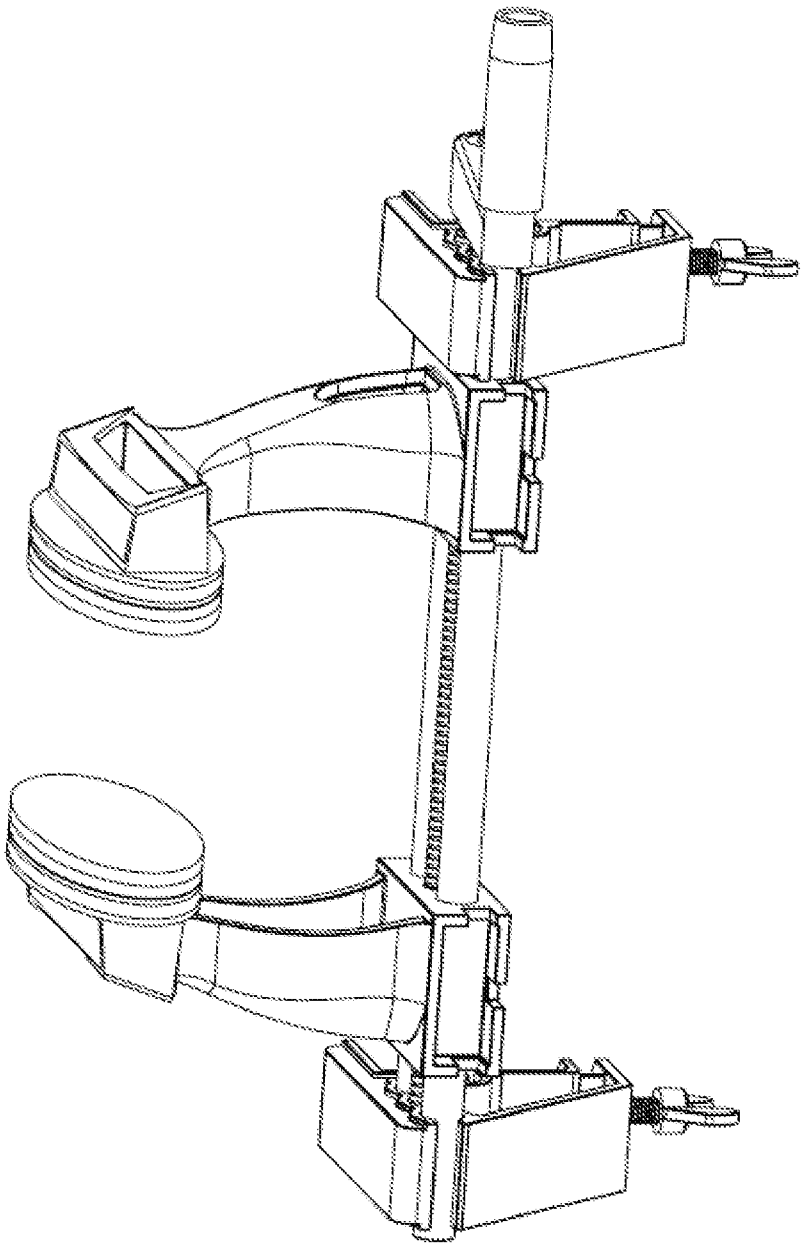

Fig. 9

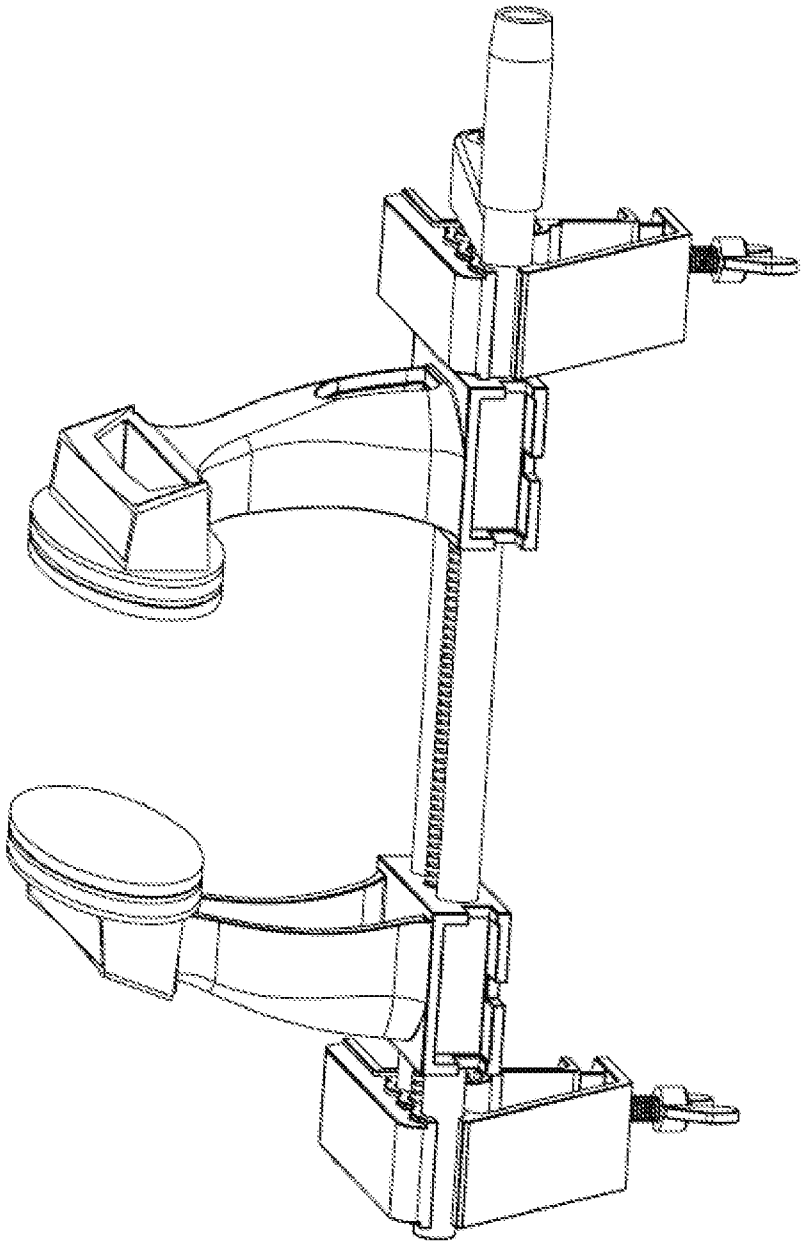

Fig. 10

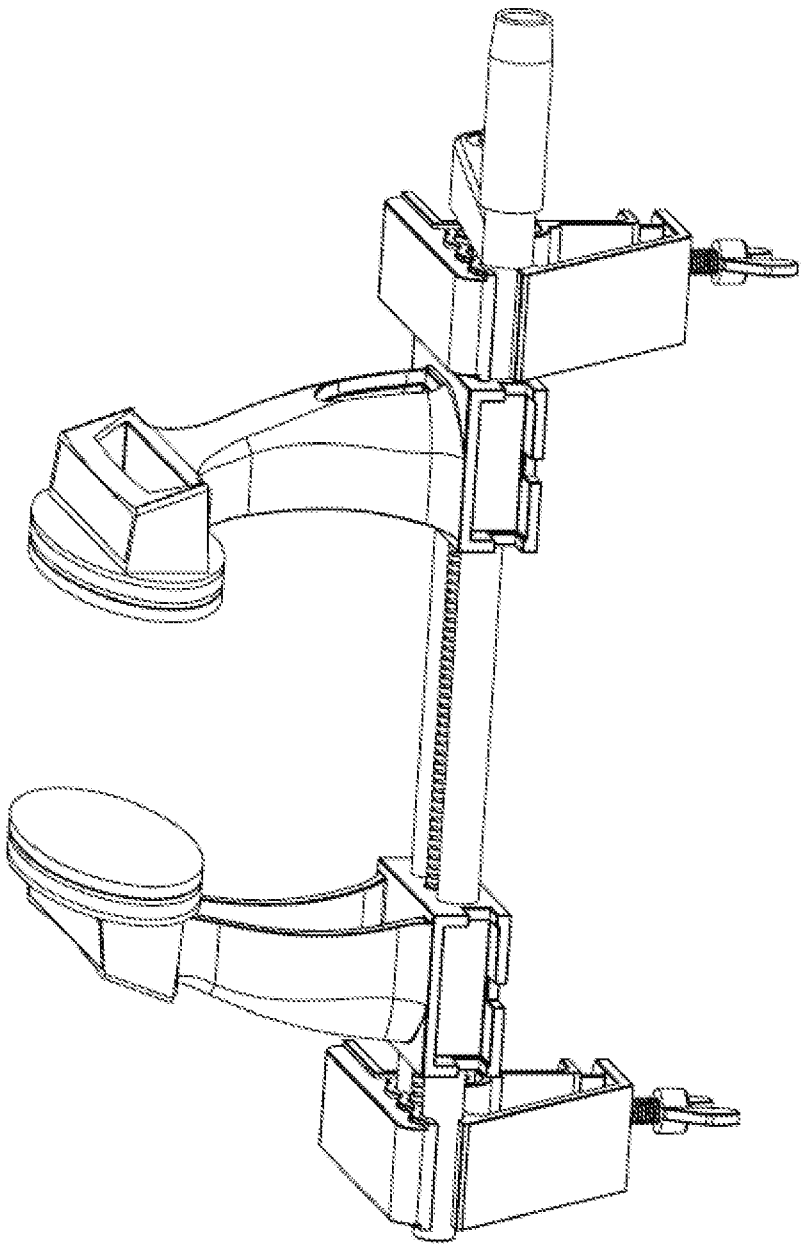

Fig. 11