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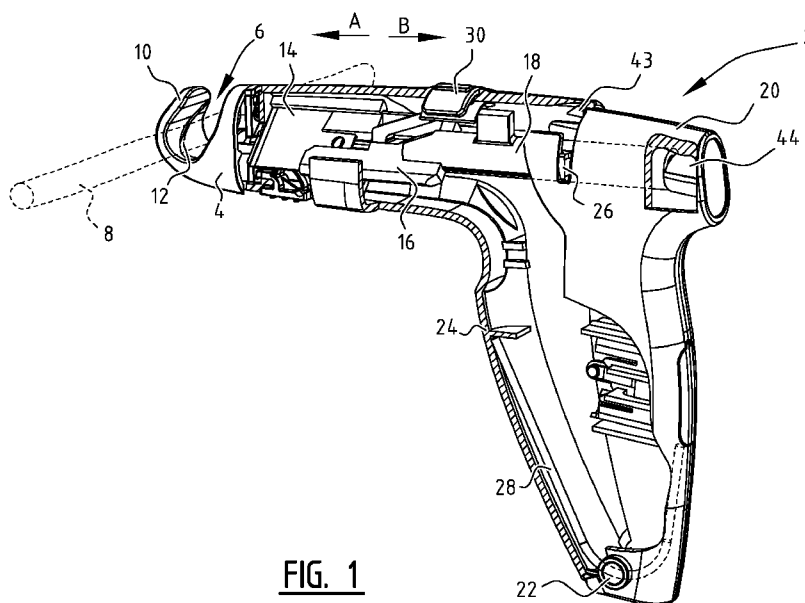


FIG. 1

(57) Abstract: The present invention relates to a cutting device and a method for cutting a plant stem. The cutting device comprises : - a handle (20, 24); a hook part (4, 10) coupled to the handle and defining a recess (6) which is open in a passage direction for the purpose of receiving the plant stem in the recess; and a blade (14) with a cutting surface displaceable in a cutting direction (A, B) substantially perpendicularly of the passage direction (C), relative to the hook part or with the hook part relative to the handle, wherein the cutting surface of the blade is arranged at an angle relative to the passage direction such that in use the plant stem is severed at an angle.

CUTTING DEVICE AND METHOD FOR CUTTING A PLANT STEM

The invention relates to a cutting device for cutting a plant stem, such as a flower stem. Such cutting devices are for instance used to separate flower and bulb during grafting of plants and for cutting a flower stem before it is placed in a vase.

Known in practice are cutting devices with a through-opening into which the plant stem has to be inserted. A blade of the cutting device then severs the stem. Such cutting devices have the drawback that, for the purpose of cutting a bunch of flowers, the bunch has to be taken apart for the purpose of inserting the flower stems one by one into the cutting device. The flowers thus have to be rearranged following cutting. In the case of a bouquet originally arranged by a florist, this will moreover generally produce a less professional result.

In addition, it has been found difficult to cut the individual plant stems to the same length. This results for instance in flowers of a bouquet protruding from a vase at different lengths, this producing an untidy appearance.

It has further been found difficult to cut the flower stem at an angle with conventional devices. It is generally known that cutting flower stems at an angle increases the lifespan of flowers considerably. The limitations of conventional cutting devices therefore result in an unnecessarily and undesirably short vase life of flowers.

An object of the invention is to obviate or in any case reduce the above stated problems and to provide a cutting device with which a plant stem forming part of a bunch of plant stems can be severed at an angle without the bunch having to be taken apart.

This object is achieved with a cutting device for cutting a plant stem according to the invention, comprising:

- a handle;

- a hook part coupled to the handle and defining a recess which is open in a passage direction for the purpose of receiving the plant stem for cutting in the recess; and

- a blade with a cutting surface displaceable in a cutting direction substantially perpendicularly of the passage direction, relative to the hook part or with the

hook part relative to the handle,

wherein the cutting surface of the blade is arranged at an angle relative to the passage direction such that in use the plant stem is severed at an angle.

The hook part makes it possible to select a flower stem in a bunch of flowers. For this purpose the hook part is hooked behind a stem such that the stem is carried into the recess. Each stem in the bunch can hereby be severed at an angle without the bunch having to be taken apart.

An additional advantage of the cutting device according to the invention is that the cutting direction lies substantially perpendicularly of the passage direction, whereby there is no force component acting in the passage direction during cutting. This prevents the plant stem displacing during cutting. This achieves that plant stems can be cut accurately to the desired length.

The angled position of the cutting surface enables a plant stem to be inserted straight in the recess, while the plant stem is nevertheless severed at an angle. This achieves that the cutting device need not be held at a non-right angle by a user. This makes the cutting device according to the invention practical in use. A good cutting angle is also guaranteed at all times in practice.

The invention can for instance be applied for cutting flower stems or for grafting plants such as vines. The invention is moreover found to be advantageous in separating a flower from its bulb. Conventional cutting devices are unsuitable for this purpose since the stem cannot be placed through the opening intended for the purpose due to the presence of the bulb. Because the cutting device according to the invention is equipped with a hook part, this problem is solved with the invention and the cutting device can also be utilized for this application.

The recess is for instance defined between the handle and the hook part, and the handle and hook part are displaceable relative to each other in the cutting direction. This displacement makes the recess smaller. In this embodiment the blade is arranged on the hook part of the handle, and cuts the plant stem during the movement.

The blade is however preferably arranged displaceably in or on the handle, wherein the handle and the hook part are preferably non-displaceable relative to each other, i.e. are connected rigidly to each other.

The cutting angle preferably lies between about 10° and 60° , and more preferably the cutting angle is 45° .

Severing plant stems at an angle enlarges the surface area for water uptake by the plant. An angle of 10° - 60° , more specifically an angle of 45° , is particularly found to realize an increased water uptake. The lifespan of cut plants is hereby increased.

In a preferred embodiment the cutting device comprises a drive coupled to the blade for displacing the blade relative to the hook part or for displacing the blade and the hook part relative to the handle.

The displacement is for instance realized by an electrical drive. Use is for instance made here of a

rechargeable battery or accumulator. The displacement is however preferably realized by a manual drive. A user-friendly and durable cutting device is hereby obtained which functions under all conditions.

5 The drive preferably comprises a squeeze mechanism as manual drive. An electrical drive is for instance activated by the squeeze mechanism. The drive is however preferably a fully manual drive, wherein the force exerted on the squeeze mechanism is transmitted for displacement of the blade
10 relative to the hook part or for displacement of the blade together with the hook part relative to the handle.

 In a preferred embodiment according to the invention the device has a type of pistol form.

 The hook part is located in this case at the outer end
15 of the barrel of the pistol form.

 The pistol form is particularly advantageous in combination with a drive comprising a squeeze mechanism. This combination provides for an intuitive and ergonomic operation of the cutting device.

20 In a preferred embodiment according to the invention the blade is disconnectable by means of an uncoupling mechanism.

 The blade can be coupled to and uncoupled from the cutting device in relatively simple manner using the
25 uncoupling mechanism. The blade can be removed and for instance replaced by means of the mechanism. The blade for instance comprises an opening and the cutting device comprises a resilient element which fits into this opening. When the blade is placed in the cutting device the resilient
30 element extends through the opening, whereby the blade is coupled to the cutting device. For the purpose of removing the blade the resilient element is pressed in so that it no

longer extends through the opening, and the blade can be removed.

In a further preferred embodiment the cutting device comprises a blade holder placeable over the cutting surface
5 of the blade, with an element configured for co-action with the uncoupling mechanism.

This enables safe removal of the blade from the cutting device. For the purpose of removal the blade holder is placed over the cutting surface of the blade. A user cannot
10 therefore cut him/herself on this cutting surface. The element configured for co-action with the uncoupling mechanism ensures that, when the blade holder is placed over the blade, the blade is uncoupled from the cutting device. The element is for instance a protruding part of the blade
15 holder co-acting with for instance a resilient element of the uncoupling mechanism.

In a further preferred embodiment the handle of the cutting device comprises a recess for removable placing of the blade holder therein.

20 The blade holder is accommodated in the handle. The user hereby has the blade holder ready to hand at all times. When a blade has to be removed, the user takes the holder out of the handle and removes the blade from the cutting device using the blade holder.

25 It is optionally possible to provide a spare blade in the blade holder.

In a preferred embodiment according to the invention the cutting device comprises releasable locking means for respectively locking the displacement of the blade relative
30 to the hook part and the displacement of the blade with the hook part relative to the handle.

The cutting device is safeguarded by being locked, so that a person cannot accidentally cut him/herself. The

cutting movement is after all blocked when the cutting device is locked. This is also important during cleaning of the blade. In addition, this is important during changing or removal of the blade in a currently preferred embodiment in which the blade is removable. A cutting movement is also undesirable in these cases, and is prevented with the locking.

The hook part is preferably also disconnectable from the cutting device. Because the hook part can be uncoupled, the blade of the cutting device can be replaced more easily. The blade is more easily accessible in the uncoupled position. In addition, the hook part itself can be replaced. A different hook part is for instance applied depending on the type of stem and the dimensions thereof.

The hook part is preferably substantially U-shaped.

In a preferred embodiment according to the invention the hook part has a decreasing width and/or thickness in the direction toward its free outer end.

This achieves that the free outer end of the hook part can be easily hooked behind a stem, even when the stem forms part of a bundled bunch of stems, such as in a bouquet. The free outer end for instance tapers or narrows to a point.

The invention further relates to a method for cutting a plant stem, comprising of providing a cutting device as described above, placing the plant stem in the recess, and displacing the blade such that the plant stem is severed at an angle.

The method according to the invention has the same advantages and effects as described above for the cutting device.

Further advantages, features and details of the invention are elucidated on the basis of preferred

embodiments thereof, wherein reference is made to the accompanying drawings, in which:

- figure 1 shows a partly cut-away view of a cutting device according to the invention;
- 5 - figures 2 and 3 show in detail the locking means of the cutting device of figure 1 in respectively locked and released position;
- figure 4 shows the cutting device of figure 1 with the blade in the extended position;
- 10 - figure 5 shows the coupling of the nose of the device in detail;
- figure 6 shows the device of figure 1, wherein the nose has been removed and the blade holder is shown separately;
- 15 - figure 7 shows the removal of the blade; and
- figure 8 shows a front view of the device, wherein the nose has been removed.

Cutting device 2 (figure 1) comprises a nose 4 which is substantially U-shaped and defines a recess 6. A flower stem
20 8 can be placed in recess 6. The U-shaped nose 4 comprises a contact surface on the side facing toward recess 6. In the shown embodiment the recess 6 provides space for a flower stem with a maximum diameter of 14 mm. Larger or smaller dimensions of recess 6 are however also possible, depending
25 on the desired application.

When flower stem 8 forms part of a bouquet, flower stem 8 can be placed in recess 6 by hooking the hook part 10, which forms the free outer end of nose 4, behind flower stem 8. Nose 4 moreover comprises a groove 12 for receiving blade
30 14.

The cutting surface of blade 14 lies at an angle relative to the longitudinal axis of flower stem 8. Blade 14 is coupled to a slide 16, 18. The front part 16 of the slide

takes a rectangular form, while the rear part 18 takes a tubular form. Parts 16 and 18 form one whole.

Device 2 comprises a rear handle part 20 which is connected via hinge 22 to the front handle part 24. Rear
5 part 18 of the slide comprises a protrusion 26 positioned in a recess of rear handle part 20. Handle 20, 24 further comprises a spring 28.

Cutting device 2 moreover comprises a locking element 30 (figures 2 and 3). The locking element co-acts with
10 protrusions 32 and 34 of the slide. In the locked position (figure 2) protrusion 32 comes into contact with stop surface 36, whereby sliding in direction A is blocked. In the released position (figure 3) protrusion 32 is no longer blocked and can move freely under dome-shaped element 38,
15 whereby the slide is movable as a whole in the cutting direction.

Protrusion 34 serves as stop for movement in the direction B. In both the locked position (figure 2) and the released position (figure 3) protrusion 34 comes into
20 contact with the underside of locking element 30, blocking further movement in the direction B.

In the released position a squeezing movement can move the rear handle part 20 in the direction of the front handle part 24 (figure 4) by rotation around hinge 22. This
25 squeezing movement acts counter to the spring force of spring 28. During the movement of the slide in direction A the slide is guided by guides 40, 42. Blade 14 moves through nose 4 and severs the flower stem 8 at an angle. In the shown embodiment the angle formed between the blade and the
30 stem is 45 degrees.

Figure 1 shows that a protrusion 44 of rear handle part 20 makes contact with slide 16, 18. When the handle is moved from the rest position (figure 1) to the squeezed position

(figure 4), protrusion 44 pushes the slide in direction A. Protrusion 26 of the slide here moves into the recess in rear handle part 20, as can be seen in figure 4. When no further force, or at least less force, is exerted by the user, the spring force of spring 28 moves the rear handle part 20 in direction B relative to handle part 24. Slide 16, 18 and blade 14 hereby also move in direction B until protrusion 34 rests against the underside of locking element 30.

Protrusion 26 prevents the rear handle part 20 detaching from handle part 24 due to the spring pressure of spring 28 in the situation with retracted blade 14 (figure 1). Protrusion 43 is moreover provided for this purpose on handle part 20, this protrusion 43 hooking into front handle part 24 as clearly shown in figure 5. There are in short three protrusions, protrusion 26, protrusion 34 and protrusion 43, which prevent handle part 20 detaching from handle part 24. Alternatively, fewer or more than three of such protrusions may be provided, for instance one or two of said protrusions.

Nose 4 (figure 5) comprises on its side facing toward handle 20, 24 chamfered plates 48, 50 between which an opening 52 for passage of blade 14 is present. The handle comprises an unlocking means 54 for uncoupling nose 4 from handle 20, 24. Unlocking means 54 comprises a protruding tongue 56 which fits into opening 58 of lower plate 48. The nose can be uncoupled from the handle by sliding the unlocking means. The uncoupling of nose 4 preferably takes place when the movement of blade 14 is blocked using locking element 30, as can also be seen in figure 5.

Slide 16, 18 is moreover lockable in the situation where blade 14 is extended (figure 6). Protrusion 32 is then situated on the left-hand side of locking element 30 in the

figure so as to block movement in direction B. In this situation blade 14 extends beyond handle 20, 24 so that blade 14 is easy to remove.

Handle 20, 24 comprises a recess 60 for a blade holder 5 62. Blade holder 62 can be uncoupled from device 2 as shown in figure 6. Blade holder 62 can then be used to remove the blade. Blade holder 62 is placed for this purpose over blade 14 (figure 7). Blade 14 is held in place by a tongue extending through an opening 64 in blade 14. The tongue of 10 the device can be pressed out of opening 64 by means of a second tongue 66 of blade holder 62 so that blade 14 is uncoupled. Force is exerted for this purpose on pressure point 68 of blade holder 62. Tongue 66 of blade holder 62 moreover ensures that the blade remains in the holder.

15 It is noted that for the removal of a blade the following steps are therefore performed: locking element 30 is operated so as to lock the cutting device in the situation according to figures 1 and 2, in which the blade is retracted. Nose 4 is then removed (figure 5). The cutting 20 device is then unlocked and brought into the situation with extended blade (figure 6). In this situation the device is blocked by operating locking element 30. Blade 14 is subsequently removed (figure 7), cleaned or replaced using blade holder 62. Finally, the blocking is once again 25 released.

It is optionally possible to accommodate a spare blade in blade holder 62. This spare blade has to be removed from the holder before blade 14 can be removed from the device with the holder. The spare blade can then be arranged in the 30 device using holder 62.

Finally, figure 8 shows a front view of cutting device 2 according to figure 6, i.e. without nose 4. It can be

clearly seen here that during use blade 14 forms an angle of 45 degrees with the flower stem (direction C).

The cutting of a flower stem will now be elucidated with reference to the figures. The outer end 10 of hook part 4 of device 2 is hooked for this purpose behind a flower stem 8 so that flower stem 8 is placed in recess 6 (figure 1). Flower stem 8 then lies in a direction C, perpendicularly of cutting direction A. If the cutting device is blocked, it is unblocked by operating the element 30. The user then squeezes the handle, as in figure 4, so that the rear handle part 20 is moved forward and thereby displaces slide 16, 18 in direction A. Blade 14 is hereby also displaced in direction A, wherein it moves through opening 52 and groove 12. Because the blade lies at an angle relative to the flower stem, the stem is severed at an angle (figure 8). The user then reduces the force with which the handle is being squeezed, whereby the blade is moved by means of spring 28 in direction B to the retracted position. Device 2 is then optionally locked again using element 30.

The invention is by no means limited to the above described preferred embodiments thereof. The rights sought are defined by the following claims, within the scope of which many modifications can be envisaged. The shown embodiments relate to flower stems for increasing vase life, but the invention can also be applied for the purpose of grafting plants and removing bulbs from plants.

CLAIMS

1. Cutting device (2) for cutting a plant stem (8),
comprising:

- 5 - a handle (20, 24);
- a hook part (4, 10) coupled to the handle and defining
 a recess (6) which is open in a passage direction for
 the purpose of receiving the plant stem for cutting in
 the recess; and
- 10 - a blade (14) with a cutting surface displaceable in a
 cutting direction (A, B) substantially perpendicularly
 of the passage direction (C) relative to the hook part
 or with the hook part relative to the handle,
- wherein the cutting surface of the blade is arranged at an
15 angle relative to the passage direction such that in use the
 plant stem is severed at an angle.

2. Cutting device as claimed in claim 1, wherein the angle
lies between about 10 and 60 degrees, and is preferably 45
20 degrees.

3. Cutting device as claimed in claim 1 or 2, comprising a
drive (20, 22, 24, 28) coupled to the blade for displacing
the blade relative to the hook part or with the hook part
25 relative to the handle.

4. Cutting device as claimed in claim 3, wherein the drive
comprises a squeeze mechanism (20, 24).

30 5. Cutting device as claimed in any of the claims 1-4,
 wherein the device has a pistol form.

6. Cutting device as claimed in any of the claims 1-5, wherein the blade is disconnectable by means of an uncoupling mechanism (64).

5 7. Cutting device as claimed in claim 6, comprising a blade holder (62) placeable over the cutting surface of the blade, with an element (66) configured for co-action with the uncoupling mechanism (64).

10 8. Cutting device as claimed in claim 7, wherein the handle comprises a recess (62) for removable placing of the blade holder therein.

15 9. Cutting device as claimed in any of the claims 1-8, comprising releasable locking means (30, 32) for respectively blocking the displacement of the blade relative to the hook part and the displacement of the blade with the hook part relative to the handle.

20 10. Cutting device as claimed in any of the claims 1-9, wherein the hook part is disconnectable.

11. Cutting device as claimed in any of the claims 1-10, wherein the hook part has a decreasing width and/or
25 thickness in the direction toward its free outer end (10).

12. Method for cutting a plant stem (8), comprising of providing a cutting device (2) as claimed in any of the claims 1-11, placing the plant stem in the recess (6), and
30 displacing the blade (14) such that the plant stem is severed at an angle.

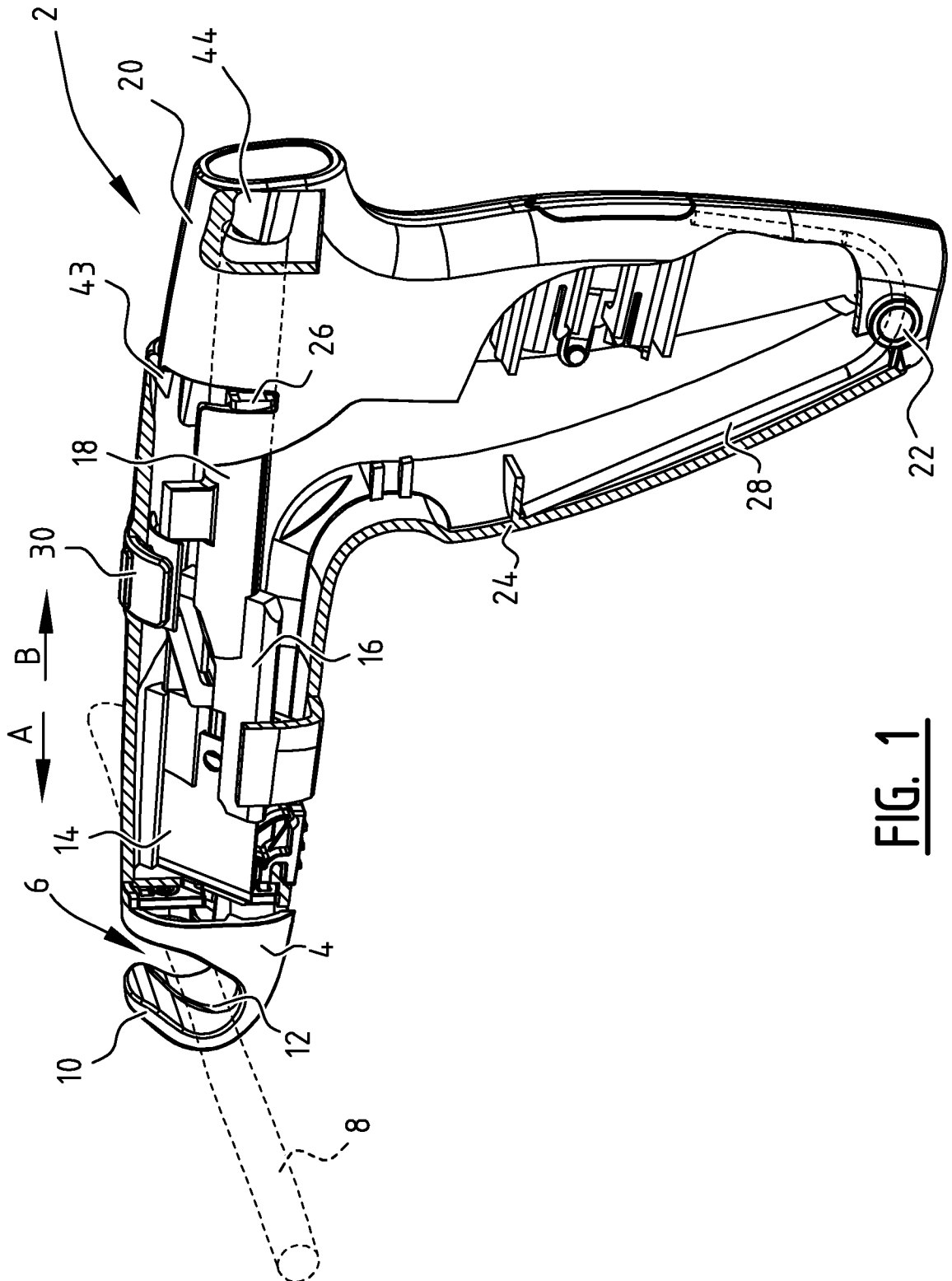
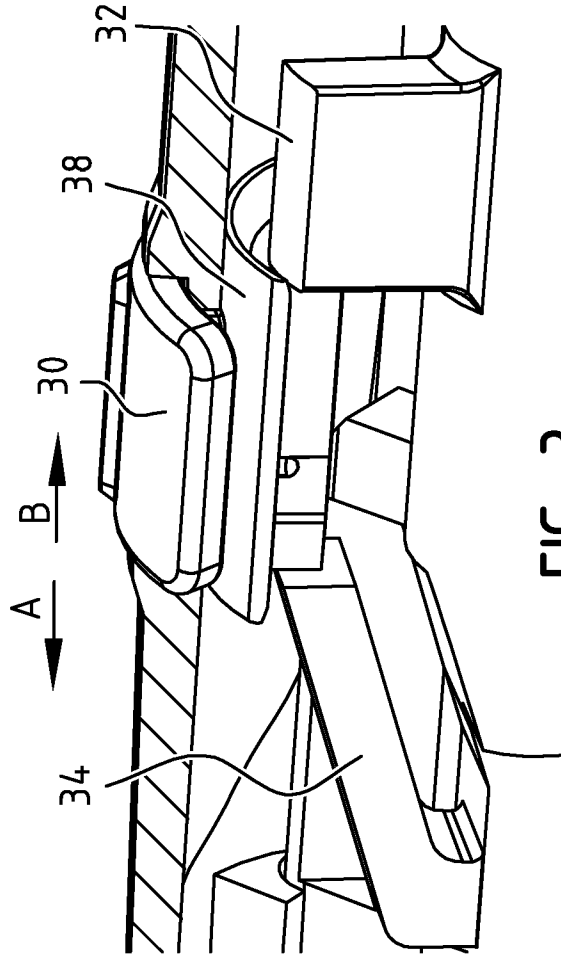
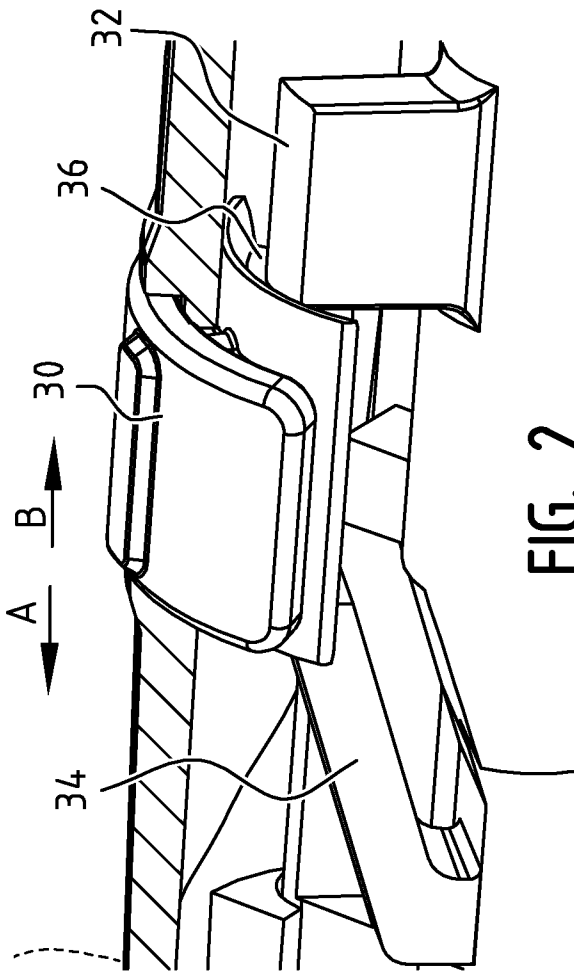
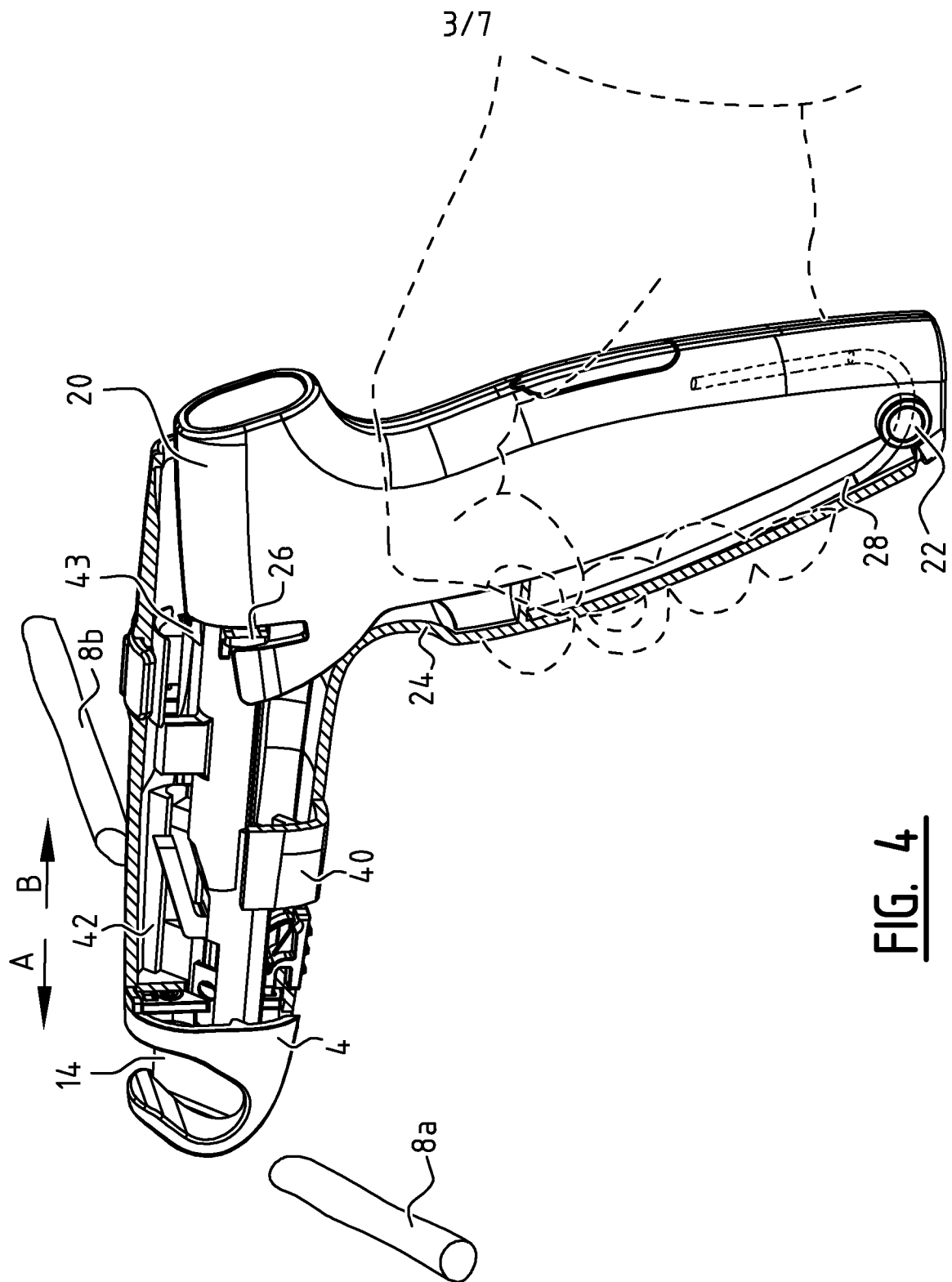
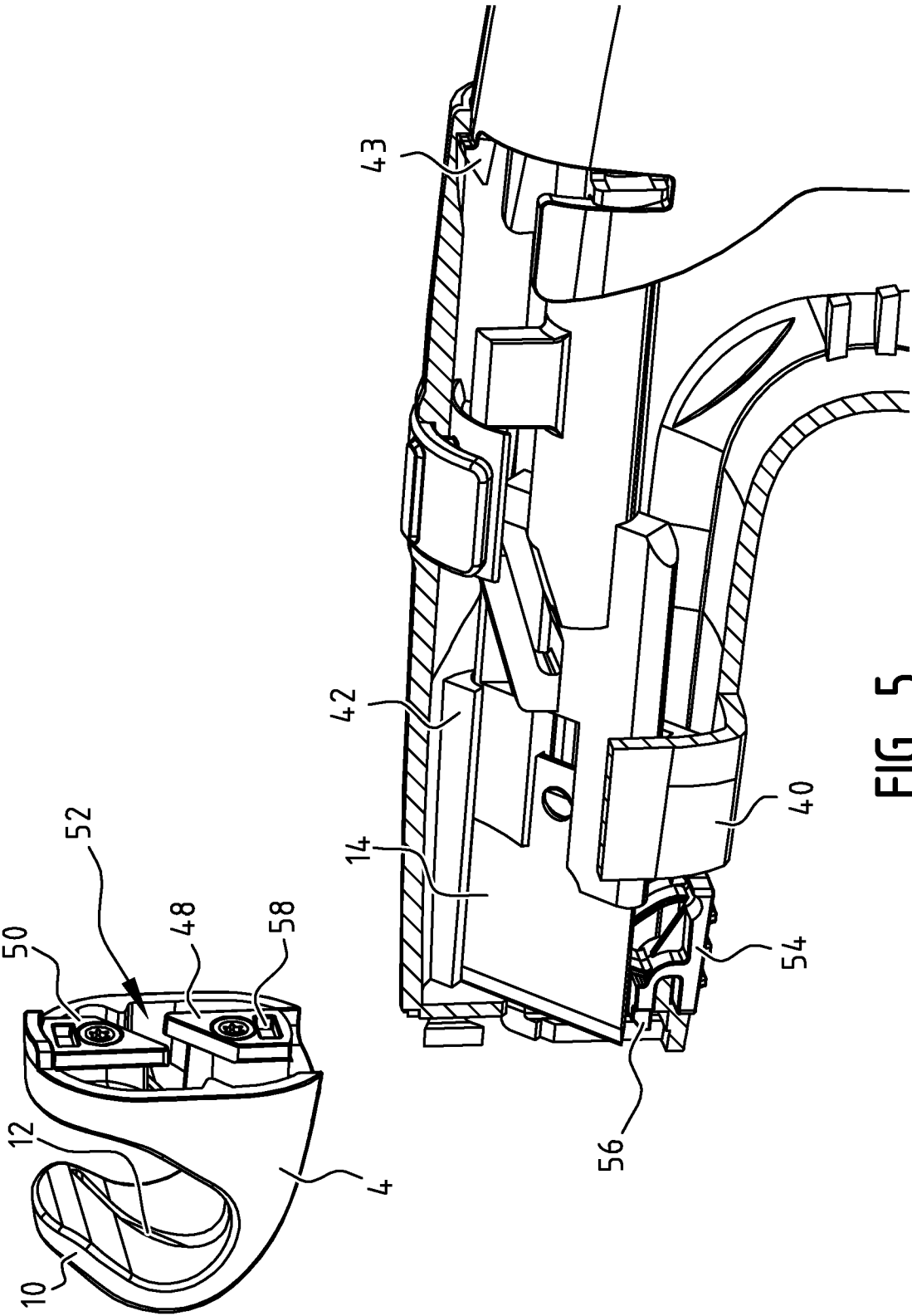


FIG. 1







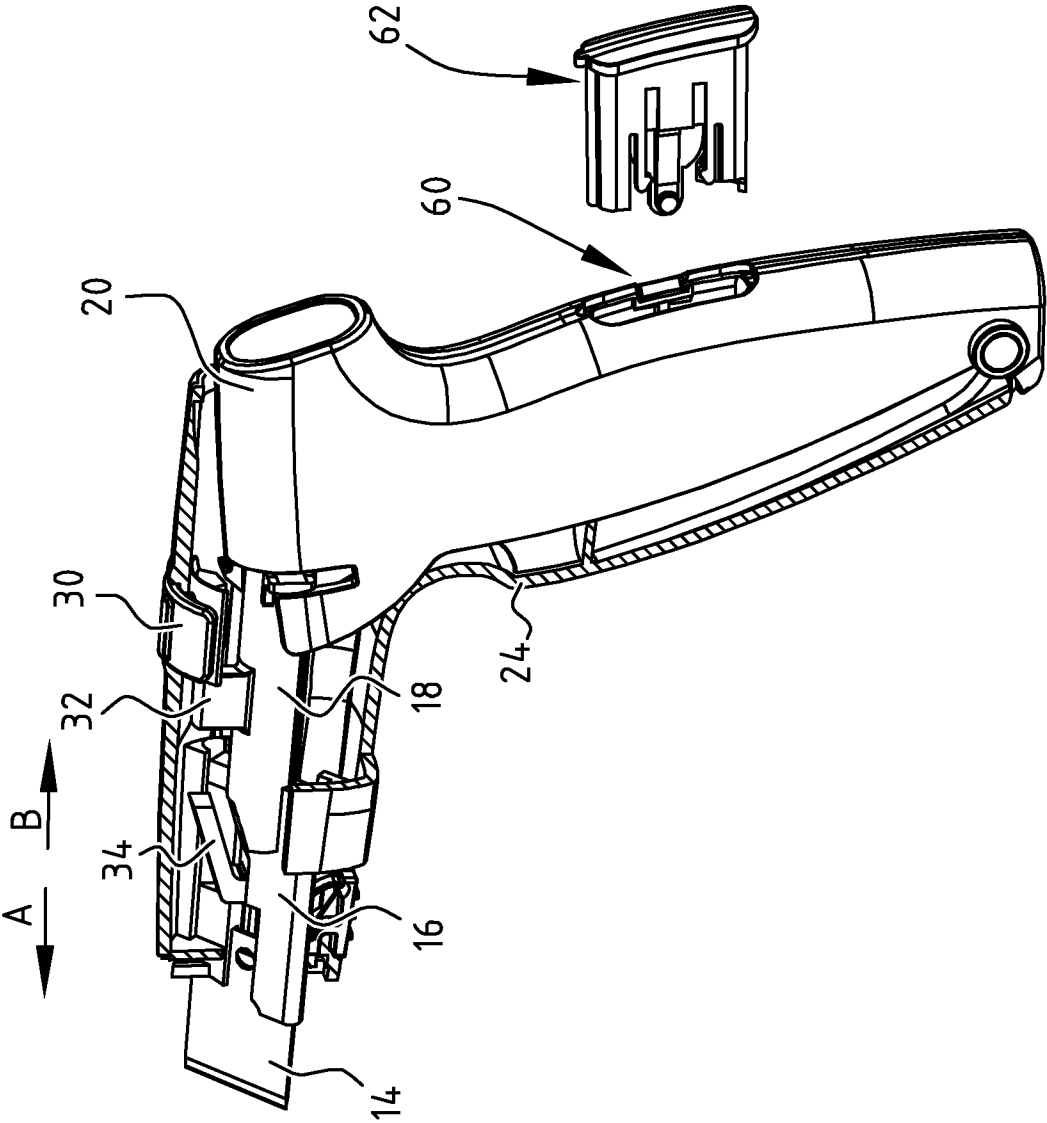


FIG. 6

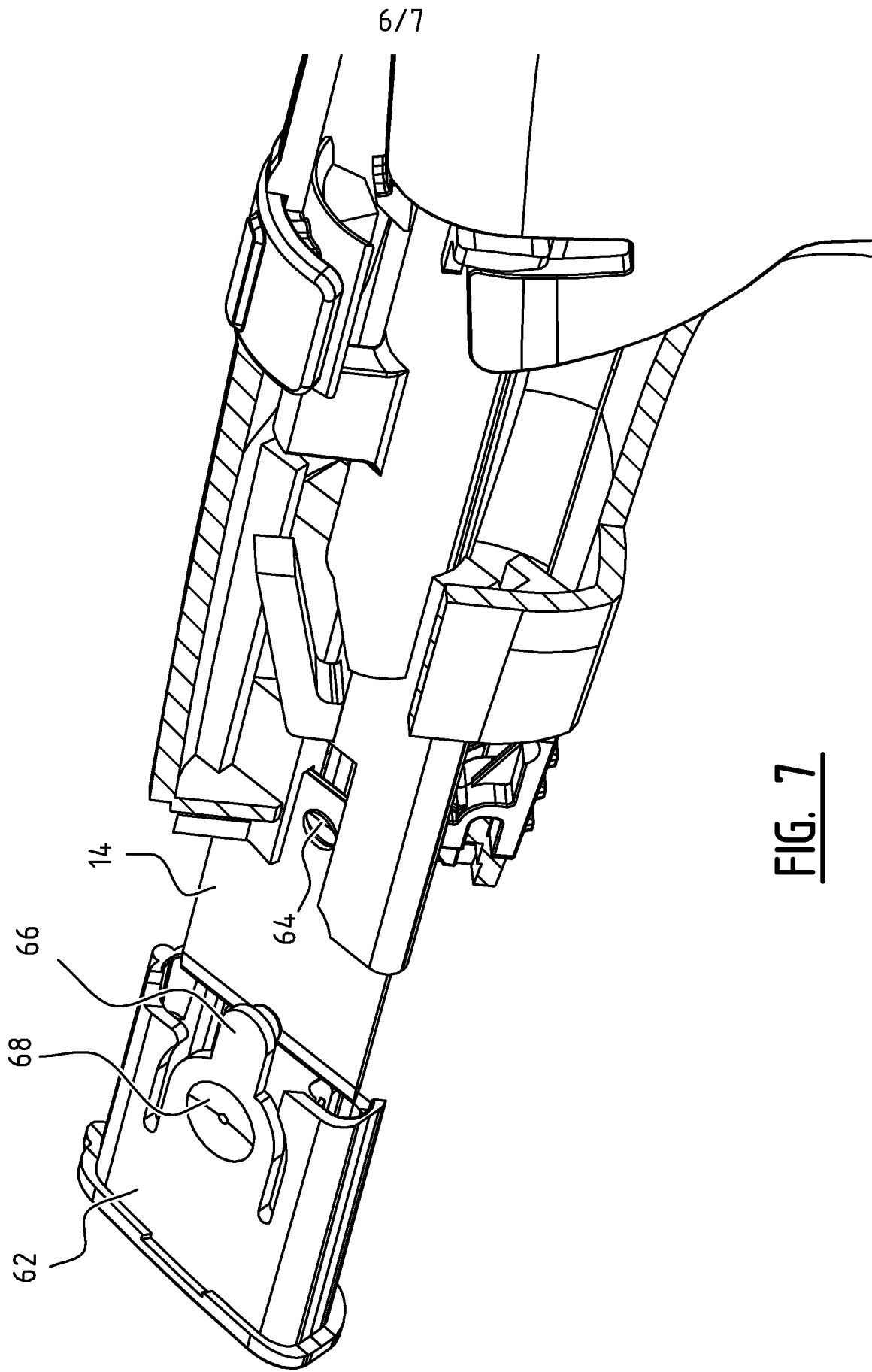


FIG. 7

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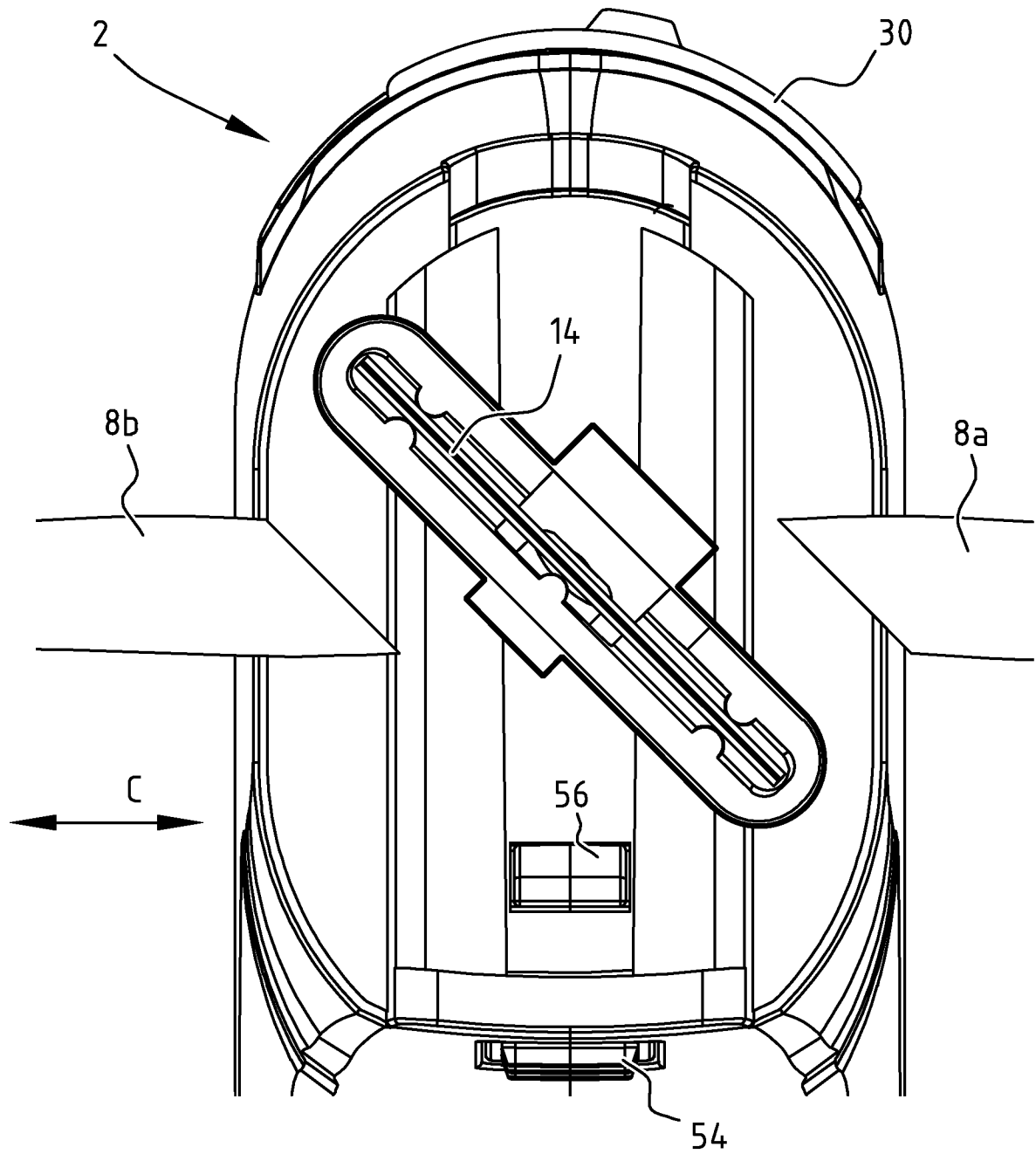


FIG. 8