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A request for correction of the description has been filed pursuant to Rule 139 EPC. A decision on the request will be taken during the proceedings before the Examining Division (Guidelines for Examination in the EPO, A-V, 3.).

(54) END PIECE FOR A RAFTER TO BE USED TO SPAN BETWEEN A VEHICLE SIDE AND AN EXTENDED SIDE OF A RETRACTABLE AWNING

(57) The invention relates to an end piece for a rafter to be used to span between a vehicle side and an extended side of a retractable awning. The end piece has a rafter end and a mounting end. According to the invention it comprises a body comprising the mounting end, the body having a first engagement element and a second engagement element, the first and second engagement elements being arranged at a distance along a spacing direction from each other and defining a plane between them, wherein the body is recessed towards the rafter end of the end piece with respect to said plane. The invention also relates to a kit of parts comprising a such an end piece and support elements and/or a rafter.

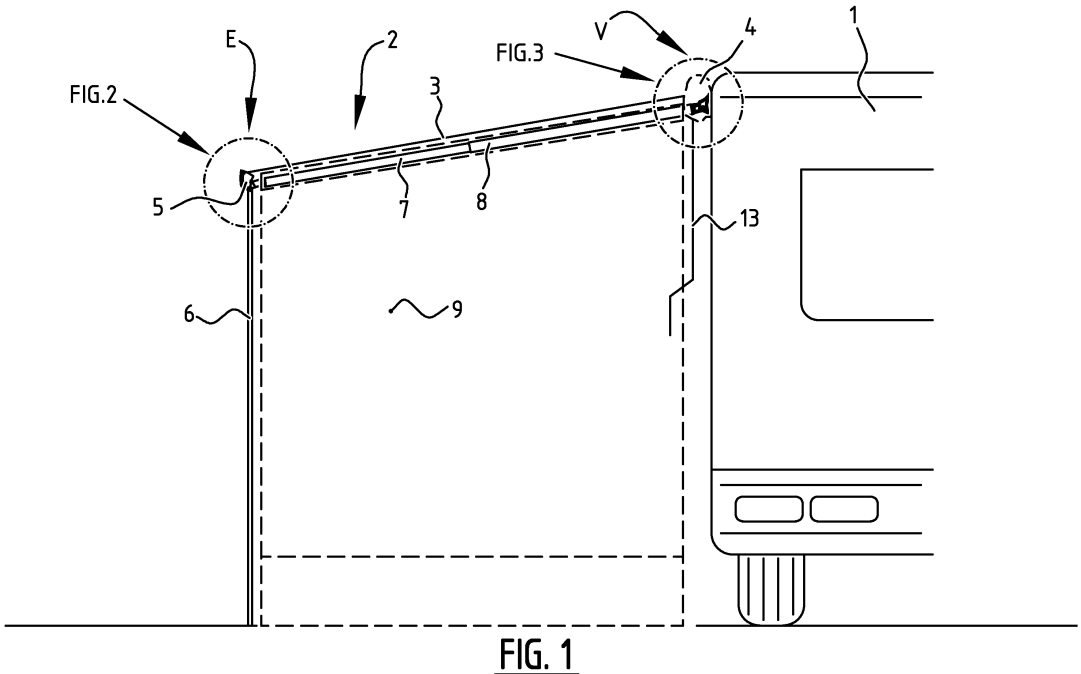

FIG. 1

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Description

[0001] The invention relates to an end piece for a rafter to be used to span between a vehicle side and an extended side of a retractable awning, comprising a rafter end, for connecting to a rafter, and a mounting end, opposite the rafter end, for mounting the end piece to a vehicle, such a as a recreational vehicle.

[0002] Retractable awnings are used commonly in certain types of vehicles, in order to create a shaded or otherwise protected area where the user can reside in. Different kinds of retractable awnings exist. Two main categories can be distinguished, amongst which one category consists of "bagged" awnings, which when retracted are stored in a bag, and are of relatively light construction. Awnings of a second category employ a cassette, which is of rigid material, to provide a more permanent structure. In all cases however, awnings stretch from the vehicle side to an outward side. Usually, the vehicle side includes a storage space, with for instance a roller for rolling up a sheet that makes up the main part of the awning when retracting it. Some sort of rigid profile is present at the outward end, and spans along that end to keep the awning straight. In most cases, the corners of the outward end are supported by e.g. poles. It is however principally possible to support the outward end, for instance via the profile, from the vehicle side by one or more retractable arms. A combination between arms and poles is also sometimes applied.

[0003] Rafters exist that can span from the vehicle side to the outward side of the awning. Rafters may be used for a variety of purposes. Firstly, the rafter can be used to create a minimal distance between the vehicle and the outward side. In that case, a sheet of the awning may be retracted with the rafter in place, thereby tensioning the sheet. The rafter may in this case be used as a means of tensioning the awning. A second application exists in providing a connection point for side walls. In this case, the rafter is placed along the sides of the awning, which extend from the vehicle side to the outward side. Since the rafters are generally rigid, they can provide an attachment point for a side wall made up of e.g. a sheet, that can be suspended from the rafter. Accordingly, the space under the awning may be even more protected, e.g. against wind, by the presence of a side wall.

[0004] Since awnings come in different types, different rafters have been made available. In fact, many brands have marketed different types of awnings, some of which require different rafters due to the varying designs of the awnings. It is noted that not only the type of awning varies amongst these brands, but also the design and construction of awnings of the same type may vary, within or across product ranges of brands.

[0005] The solutions on the market so far have consisted in manufacturing rafters that can be fitted to a limited number of awnings, sometimes only to one awning. These rafters include end pieces for connecting to the awning(s) for which they are intended. However, since the rafters are made specifically for that or those awnings, the end pieces are not very versatile, meaning that they cannot be used for different awnings.

[0006] As a result, rafters, and by extension end pieces, come in various shapes, sizes and connection types tailored to the awning for which they are intended. This leads to a wide variety of end pieces that have to be used. For end-users, this means a lot of hassle, as they need to ensure that when acquiring a rafter, it needs to be the type that is tailored to his or her awning specifically. If later the awning is replaced by another type, the rafter becomes useless. Moreover, for retailers the challenge exists that to be able to service many customers, a large variety of rafters must be offered. This puts significant requirements on the total amount of stock that must be held, and also often requires in-store advice to make sure customers acquire the right rafter for their awning.

[0007] It is an object of the invention to at least partially address one or more of these problems. More specifically, it is an object of the invention to provide a relatively versatile rafter.

[0008] The object is achieved by an end piece according to the preamble, which has a body comprising the mounting end, the body having a first engagement element and a second engagement element, the first and second engagement elements being arranged at a distance along a spacing direction from each other and defining a plane between them, wherein the body is recessed towards the rafter end of the end piece with respect to said plane.

[0009] Such an end piece is versatile, in that it can connect to relatively large number of awnings of different types and construction, even across different brands. **In** particular, the recessed body allows space between the engagement elements for e.g. parts of a body of a cassette, so that the end piece can be used for awnings having such a design. At the same time, the end piece can also connect to a flat and arched surface. The same end piece may thus be used to provide a connection point for a rafter, which can therefore be relatively versatile in and of itself.

[0010] It is noted that depending on the shape of the awning to which the end piece is to connect, the end piece may be positioned in a different orientation, e.g. in a different angular position around the axis of the rafter. Accordingly, even if the awning presents e.g. a curved surface along a substantially horizontal line, the end piece as described herein can be rotated to accommodate that surface.

[0011] In particular, one or both of the engagement elements can define an engagement surface, and a support surface at a substantially perpendicular angle thereto.

[0012] While the engagement surface is used to engage the vehicle side of the awning, or even the vehicle itself, the support surface may provide a surface to support the end piece, and thereby the rafter, in the substantially vertical direction. The end piece may therefore lie

against e.g. a side wall of the awning cassette, while it also lies on a support. A reliable connection may be thus obtained.

[0013] In an embodiment of the end piece the recess has an arched contour spanning the distance between the first and second engagement elements.

[0014] This arched contour may provide more versatility, and may additionally or alternatively aid in providing a particularly rigid construction of the end piece.

[0015] In particular, a crown of the arch can be located closer to the first engagement element than to the second engagement element.

[0016] Placing the crown out of center allows to create more space to one specific side of that crown, thereby increasing versatility. Additionally or alternatively, the out of center position of the crown influences the way forces from the rafter are transmitted through the end piece, thereby allowing optimization of said force to obtain a mechanically efficient design.

[0017] In another embodiment of the end piece, the first engagement element and/or the second engagement element is longitudinally shaped, and extends in a longitudinal direction substantially perpendicular to the spacing direction.

[0018] Longitudinally shaped engagement elements may aid in distributing force across the area of engagement, whilst at the same time still allowing a versatile connection. By making use of the sideways direction, a positive connection can therefore be obtained, preferably without reducing versatility. Longitudinally shaped engagement elements may additionally or alternatively aid in preventing rotation or translation of the rafter.

[0019] In yet another embodiment of the end piece the end piece further includes a second body comprising the rafter end.

[0020] By making the rafter end its own separate body, additional functionalities can be added to it more easily. The freedom of design of the end piece may thus be improved, which may be used to provide e.g. even more versatility and adaptability.

[0021] In particular the second body may be configured for rotatably coupling to the aforementioned body, the rotation defining an axis of rotation which is substantially perpendicular to the spacing direction.

[0022] The rotatable coupling allows for a hinging action within the end piece, so that the rafter can be attached under a variety of angles with respect to the body of the end piece. Accordingly, the end piece is not specific to awnings having a tilt of a certain degree. Further, the hinge may allow movement to facilitate installation, and/or may allow repositioning the awning with the rafter installed.

[0023] Preferably, the axis of rotation is closer to the first engagement element than to the second engagement element.

[0024] The position of the axis of rotation closer to one engagement element allows the rafter to extend a little higher, i.e. closer to the sheet of the awning. Accordingly, the rafter is less likely to contact e.g. a casing for the awning, and/or more usable space may be created under the rafter.

[0025] If a second body is present in the end piece, the second body can possibly be detachably attachable or detachably attached to the aforementioned body.

[0026] Accordingly, a possibility is created for using the end piece with both the aforementioned body and the second body, or only one of the two. In particular, the second body may be shaped so that it is also usable as a complete end piece without the aforementioned body. The second body can then be designed to accommodate vastly different connection points as those with which the aforementioned body is compatible, so that the end piece as a whole becomes particularly versatile.

[0027] In particular, the second body can have a frustoconical exterior.

[0028] The frustoconical exterior may allow using the second body without the aforementioned body to mate with substantially cylindrical supports or receivers, optionally of varying sizes.

[0029] It is advantageous if the second body further comprises a further rafter end facing away from the aforementioned rafter end, the second body being selectively couplable with a rafter using the rafter end or the further rafter end respectively.

[0030] The second body can thus be used in two different directions, wherein it presents a different end for mating. Accordingly, the versatility is further improved.

[0031] In another embodiment of the end piece, the body defines, on a side opposite the second engagement element, a concave external contour.

[0032] The concave external contour can be used to create a recess, so that the end piece can also connect to awnings having a cassette with an upright edge at the position of the body.

[0033] The invention also relates to a kit of parts for arranging a rafter to a vehicle side of a retractable awning, the kit of parts comprising the end piece according to any of the preceding claims, and at least one or two supports, each shaped to receive a respective engagement element.

[0034] In some cases, no particular support is present on the vehicle side of the awning. **In** such a case, a support can be used to provide a suitable anchor point for the end piece. The support(s) may advantageously be provided as separate element, so that their use is optional, thereby further improving versatility. In most cases, a single support is sufficient, but it is possible to provide two or more supports.

[0035] In particular each of the supports may comprise a back plate and a substantially perpendicularly arranged support plate for receiving the respective engagement element thereon, and optionally side walls for maintaining the respective engagement element.

[0036] This way the supports can be attached through e.g. the back plate, while having support for the engagement element. By introducing side walls, the engagement

elements can be held in place easier, thus increasing the stability of the system. This may reduce the risk of failure, and thus increases the safety of the system. Additionally or alternatively, the back plate may provide a surface for the engagement elements to engage upon, so that the awning and vehicle itself are protected from wear that might otherwise occur from interaction with the engagement elements.

[0037] At least one support being configured as described herein, may provide the advantage that it can be attached to an awning in different orientations in order to receive its respective engagement element.

[0038] Practically, the end piece or kit of parts can be combined with a rafter. Accordingly, the invention also relates to a kit of parts comprising a rafter to be used to span between a vehicle side and an extended side of a retractable awning, the kit of parts further comprising an end piece as described above, or a kit of parts as described above wherein the rafter end is configured to be attached to the rafter.

[0039] In particular the kit of parts may further comprise at least one further end piece for connecting to the rafter, wherein the further end piece has a body which comprises an end, wherein the body is configured for connection to the rafter with the end facing away from the rafter.

[0040] In particular the end of each of the at least one further end piece:

- has a substantial frustoconical exterior shape, and/or
- defines a pin, optionally protruding from a flat surface.

[0041] The further end piece may be used to connect to the awning on a side of the rafter opposite the end piece, i.e. a side facing away from the vehicle, being the outward or extended side of the awning.

[0042] If there are two of these further end pieces present in the kit of parts, it may be possible for them to have one with a substantial frustoconical exterior shape, and one of them defining a pin, optionally protruding from a flat surface. Other shapes could of course be used.

[0043] Including the ability to have a multitude of shapes in the same kit increases the versatility of the kit of parts drastically.

[0044] In particular, two such further end pieces may be connected to different ends of a section of rafter, so that depending on the rafter section's orientation, the suitable end piece can be chosen.

[0045] If at least one of the further end pieces has the frustoconical exterior shape, that shape may further define a recess therein which extends along the height direction defined by the frustoconical shape.

[0046] This recess allows for a connection to certain types of awnings, which require the rafter to connect over a side wall. In that case, the recess can be shaped to at least partially receive the side wall. The recess allows arrangement over the side wall, whilst the same end piece can be received in a semi-cylindrical support, without use of the recess. The recess thus further adds to the versatility.

[0047] In particular, the kit of parts may further comprise a support having a back plate and a semi-cylindrical support, for receiving and supporting the further end piece, preferably in a form-fitting manner.

[0048] In case the awning does not have its own mount for connecting the further end piece through said further end piece, a support in accordance with said frustoconical further end piece natlakmay be provided, to ensure that every combination of parts and connections is available to the end user.

[0049] The invention will be further elucidated with reference to the attached drawings, in which:

Figure 1 shows schematically a side view of a retractable awning connected to a vehicle and a rafter;
Figures 2 and 3 show respectively schematically the extended side of the rafter and the vehicle side and associated end pieces in more detail;
Figures 4A and 4B show schematically perspective views of the end piece of figure 3;
Figures 5 - 6B show schematically perspective views of a further end piece;
Figures 7A and 7B respectively show different ways of using the end piece schematically;
Figures 8 - 10C show more details of the end piece; and
Figure 11 schematically shows a perspective view of a rafter with multiple end pieces.

[0050] Throughout the figures, like elements will be referred to using like reference numerals.

[0051] Figure 1 shows a vehicle 1, in this case a recreational vehicle, such as a mobile home or caravan. An awning 2 is attached to a side wall of the vehicle 1. The awning 2 comprises a sheet 2 which forms the roof of the awning 2. The sheet 3 spans from a vehicle side V to an extended side E. The awning 2 is retractable, and for that purpose comprises a casing 4 which is attached to the vehicle 1. The casing 4 comprises (not shown) a retraction/extension mechanism, such as a roller for rolling up the sheet 3. As an example, a lever 13 is shown that can be used to drive such a roller. The casing 4 also has a cover 5 which is arranged on the opposite side of the sheet 4, and thus extends at a distance from the casing 4 when the awning 2 is extended. The cover 5 and the casing 4 together create a housing for the awning 2 when it is collapsed or retracted. The cover 5 also provides rigidity to the free end of the sheet 3, so that it can be tensioned and held in place. The cover 5 is in this example supported by a pole 6, but awning exist that require no poles for support.

[0052] A rafter 7, 8 is shown to extend from the vehicle side V to the extended side E. The rafter 7, 8 in this

example consists of two rafter parts 7, 8 but could of course be configured differently. The rafter parts 7, 8 are collectively referred to as rafter 7, 8. The rafter 7, 8 is attached to the awning 2, on the vehicle side V it is attached inside the casing 4 and on the extended side it is attached to the cover 5. Of course on the vehicle side, it could alternatively be attached to the vehicle itself if desired. The rafter 7, 8 extends along the sheet 3 below that sheet 3, and is in this case used to suspend a side wall 9. The side wall 9 is made from a flexible sheet of material, for instance similar to that of the sheet 3 of the awning 2. Accordingly, more shelter is created under the awning 3. The rafter 7, 8 can also be used to keep a minimum distance between the cover 5 and the casing 4. Accordingly, it becomes possible to tension the sheet 3 by slightly retracting it (e.g. using lever 13) after the rafter 7, 8 has been installed.

[0053] Figures 2 and 3 show more clearly how the rafter 7, 8 is attached to the awning 2. The rafter parts 7, 8 are interconnected tube sections, and an alternative rafter could also comprise or consist of one or more tube sections. The connection with the awning 2 is made using end pieces 10, 18 configured specifically for that purpose. In line with the language used in the claims, the end piece 18 in figure 2 will be referred to as further end piece 18 and the end piece 10 in figure 3 will be referred to as end piece 10.

[0054] Further end piece 18 is connected to the rafter 7 and has a body comprising an end facing away from the rafter 7, 8. The exterior of the body of the further end piece 18 as shown is of frustoconical shape, but other shapes could be used. Referring now to figure 5, the further end piece 18 includes a connection 31 configured for connection with the rafter 7, 8. The connection 31 consists of a cylindrical main part with external ribs along the height direction of the cylinder, so that the connection 31 can be inserted in a tube section forming the rafter 7, 8 under some friction. The body of the further end piece 18 also has a recess 31 along its length, i.e. along the height direction of the conus defined by the frustoconical shape of the body. Moving now to figures 6A and 6B, the further end piece 18 is received in a support 19 which has a form fitting shape with the further end piece 18. The form fitting shape in this case is created using a back plate 28, which is provided with a through hole 32 for attachment to the cover 5. A semi-cylindrical support 29 extends from the backplate 28 to carry the further end piece 18.

[0055] Referring now to figures 3 and 4A - 4B, the end piece 10 is described in more detail. The end piece 10 is connected to a rafter 7, 8, and has an opposite free end, called the mounting end. A body 11 of the end piece 10 comprises the mounting end, and a further body 12 includes the rafter end. The body 11 and the further body 12 are hingeably fixed to each other, in this example by providing a bolt through both parts along rotation axis R. The axis of rotation R extends perpendicular to the spacing direction S, and also perpendicular to the longitudinal direction defined by the rafter 7, 8. The body 11 has two engagement elements 20, 21 at a distance from each other along a spacing direction S. The engagement elements 20, 21 define a plane P between them. The body 11 is recessed towards the rafter end of the end piece with respect to the plane P. In figure 3, this can be seen by the body being arched backwards from the plane P by a distance C, in between the engagement elements 20, 21. The arched shape follows from the body 11 having an arched contour 17, which has a crown relatively close to the first engagement element 20. Accordingly, a distance d_1 from the location of the crown along spacing direction is smaller than said distance d_2 to the second engagement element. The axis of rotation R is also relatively close to the first engagement element 20, as compared to the second engagement element 21. The engagement elements 20, 21 have a longitudinal shape perpendicular to the spacing direction, and for example also substantially perpendicular to a longitudinal direction defined by the rafter 7, 8. The engagement elements 20, 21 each have an engagement surface which lies in the plane P, and a support surface 22, 23 which extends at a perpendicular angle with respect to the engagement surface. The engagement elements 20, 21 can rest on their support surfaces 22, 23 whilst bearing against e.g. the casing 4 with their engagement surfaces. It is noted that in some cases, the use of only support 14 would be sufficient (i.e. no support 15 is necessary in that case). Moreover, whilst the end piece 10 is oriented so that engagement elements 20, 21 are substantially above and below each other, it is also possible to rotate the end piece 10 to position the engagement elements 20, 21 e.g. next to each other. A rotation around the longitudinal axis of the rafter 7, 8 is thus envisioned. This contributes to an even more versatile end piece 10. The rotation may be made together with the rafter 7, 8 (i.e. the rafter 7, 8 is also rotated) or with respect to the rafter 7, 8, but rotating the second body 12 with respect to the rafter 7, 8.

[0056] Figures 4A and 4B also show two supports 14, 15, which each comprise a back plate 24, a support plate 25 and side walls 26. Further, an optional top plate 27 is provided. The plates 24, 25, 27 and side walls 25 together define a receiving space for receiving the engagement elements 20, 21 in a form-fitting manner. The end piece 10 can be connected to the awning by fixing the supports 14, 15 in the awning, and by having the receive and support the end pie 10. Although two supports 14, 15 are used in the figure, it is in some cases advantageous to provide only one support 14, preferably for the uppermost engagement element 20.

[0057] Reference is now made to figure 7A, where the body 11 is shown to lie against a vertical wall 40 of a variant of the casing 4 discussed with reference to figure 1, now labelled casing 4'. In this case, the casing 4' requires no supports 14, 15 so that the end piece 11 lies directly against the casing 4'. Although not shown, the casing 4' could be provided with suitable supporting means, or no supporting means may be required. Figure 7A also shows that the casing 4' further comprises an

outside vertical wall 33 facing away from the vehicle side V. The rafter 7, 8 and the end piece 10 have to clear the casing 4', in particular the outside vertical wall 33. The body 11 defines for this purpose, on a side facing away from the second engagement element 21 a concave contour 16.

[0058] In figure 6B yet another casing variant 4" is shown. In this variant the casing 4" comprises supporting means configured for receiving the second body 12. Accordingly, the body 11 is in this figure left out so that the rafter 7, 8 is supported via second body 12 only. Various ways of supporting the second body 12 are possible. In the illustrated variation, an aperture (not shown) in the vertical side wall 33 allows carrying the second body 12. To allow selective use of the second body 12, it is detachable and reattachable to the body 11, using the previously described bolt along the axis of rotation R.

[0059] Reference is now made to figures 8 - 10B. In these figures, it is shown that the second body 12 comprises two rafter ends, each formed by corresponding bodies 35, 36 which extend away from each other and are separated by a flange 34. The flange 24 acts as a stop for a tube forming a rafter 7, 8 to bear against. One of the rafter ends 35, 36 can be arranged in the rafter 7, 8, so that the other rafter end 35, 36 sticks out from the rafter 7, 8, and is available for mating with an awning 2. In figure 8, the second body 12 is shown detached from the rafter 7, 8. Attachment can be made using a through holes 37 in the second body, on both sides of the flange 34, and a corresponding set of holes 39 in the rafter 7, 8. A bolt can be used to fix the connection when made (see fig. 9), but it is of course possible to use any other connection or fixing technique, as long as the second body 12 can be used in two orientations. It is noted that once connected, the end of second body 12 facing away from the rafter 7, 8 would not normally be referred to as "rafter end", however in this application it is identified as such, because it is configured to mate with the rafter 7, 8 just as well as the other end. Of course, since the second body 12 can be used in two opposed orientations, both ends are in a sense rafter ends, and both ends are not, depending on the orientation after fixation. To allow mating with another kind of casing, one of the rafter ends 36 is provided with a specific exterior shape, in this case including a hook, although other shapes could be used.

[0060] As explained before, the end piece 10 can be used with or without the body 11. For receiving the aforementioned bolt, the body 11 is provided with a through hole 40 which is configured to align with a through hole 38 in the second body 12, as shown in figure 10B.

[0061] Referring to figure 11, the rafter 7, 8 is shown to consist of two parts 7, 8 in this example. The rafter part 7 configured to connect to the extended side E of the awning is provided with a further end piece 18 on one side, and another further end piece 42 on the other. The first further end piece 18 is configured as explained hereabove. The other further end piece 42 is configured similarly, but includes a pin 43 that can be used to connect to the cover 5 of different kinds of awnings 2. It is principally possible to connect the rafter part 7 to the other rafter part 8 whilst the further end pieces 18, 42 are connected, but this is not required. It may be advantageous if the further end pieces 18, 42 serve as a connection point for the other rafter part 8, for instance by providing a form fitting connection. In any case, by selecting the further end piece 18, 42 at the free end of the rafter 7, 8, it becomes possible to mate with awnings 2 of a different design.

[0062] The present invention is not limited to the embodiment shown, but extends also to other embodiments falling within the scope of the appended claims.

Claims

1. End piece for a rafter to be used to span between a vehicle side and an extended side of a retractable awning, the end piece comprising:

   - a rafter end, for connecting to a rafter, and;
   - a mounting end, opposite the rafter end, for mounting the end piece to a vehicle, such as a recreational vehicle,

   characterized by

   a body comprising the mounting end, the body having a first engagement element and a second engagement element, the first and second engagement elements being arranged at a distance along a spacing direction from each other and defining a plane between them,
   wherein the body is recessed towards the rafter end of the end piece with respect to said plane.

2. End piece for a rafter according to the previous claim, wherein one or both of the engagement elements defines an engagement surface, and a support surface at a substantially perpendicular angle thereto.

3. End piece for a rafter according to any of the preceding claims, wherein the recess has an arched contour spanning the distance between the first and second engagement elements.

4. End piece for a rafter according to the previous claim, wherein a crown of the arch is located closer to the first engagement element than to the second engagement element.

5. End piece for a rafter according to any of the preceding claims, wherein the first engagement element and/or the second engagement element is longitudinally shaped, and extends in a longitudinal direction

substantially perpendicular to the spacing direction.

6. End piece for a rafter according to any of the preceding claims, further including a second body comprising the rafter end, wherein optionally the second body is configured for rotatably coupling to the aforementioned body, the rotation defining an axis of rotation which is substantially perpendicular to the spacing direction, wherein optionaly the axis of rotation is closer to the first engagement element than to the second engagement element.

7. End piece for a rafter according to -the previous claim, wherein the second body is detachably attachable or detachably attached to the aforementioned body, and/or wherein the second body further comprises a further rafter end facing away from the aforementioned rafter end, the second body being selectively couplable with a rafter using the rafter end or the further rafter end respectively.

8. End piece for a rafter according to any of claims 6 - 7, wherein the second body has a frustoconical exterior.

9. End piece for a rafter according to any of the preceding claims, wherein the body defines, on a side opposite the second engagement element, a concave external contour.

10. Kit of parts for arranging a rafter to a vehicle side of a retractable awning, the kit of parts comprising the end piece according to any of the preceding claims, and at least one or two supports, each shaped to receive a respective engagement element, wherein optionally each of the supports comprises a back plate and a substantially perpendicularly arranged support plate for receiving the respective engagement element thereon, and optionally side walls for maintaining the respective engagement element.

11. Kit of parts comprising a rafter to be used to span between a vehicle side and an extended side of a retractable awning, the kit of parts further comprising:

an end piece according to any of the claims 1 - 9 or a kit of parts according to any of claim 10, wherein
the rafter end is configured to be attached to the rafter, for instance in a form-fitting manner.

12. Kit of parts according to the previous claim, further comprising at least one further end piece for connecting to the rafter, wherein the further end piece has a body which comprises an end, wherein the body is configured for connection to the rafter with the end facing away from the rafter.

13. Kit of parts according to the previous claim, wherein the end of each of the at least one further end piece:

- has a substantial frustoconical exterior shape, and/or
- defines a pin, optionally protruding from a flat surface.

14. Kit of parts according to claim 12 or 13, comprising two such further end pieces having different ends, such as those defined in claim 17.

15. Kit of parts according to any of claims 12 - 14, the further end piece having the frustoconical exterior shape, said shape further defining a recess therein which extends along the height direction defined by the frustoconical shape, optionally further comprising a support having a back plate and a semi-cylindrical support, for receiving and supporting the further end piece, preferably in a form-fitting manner.

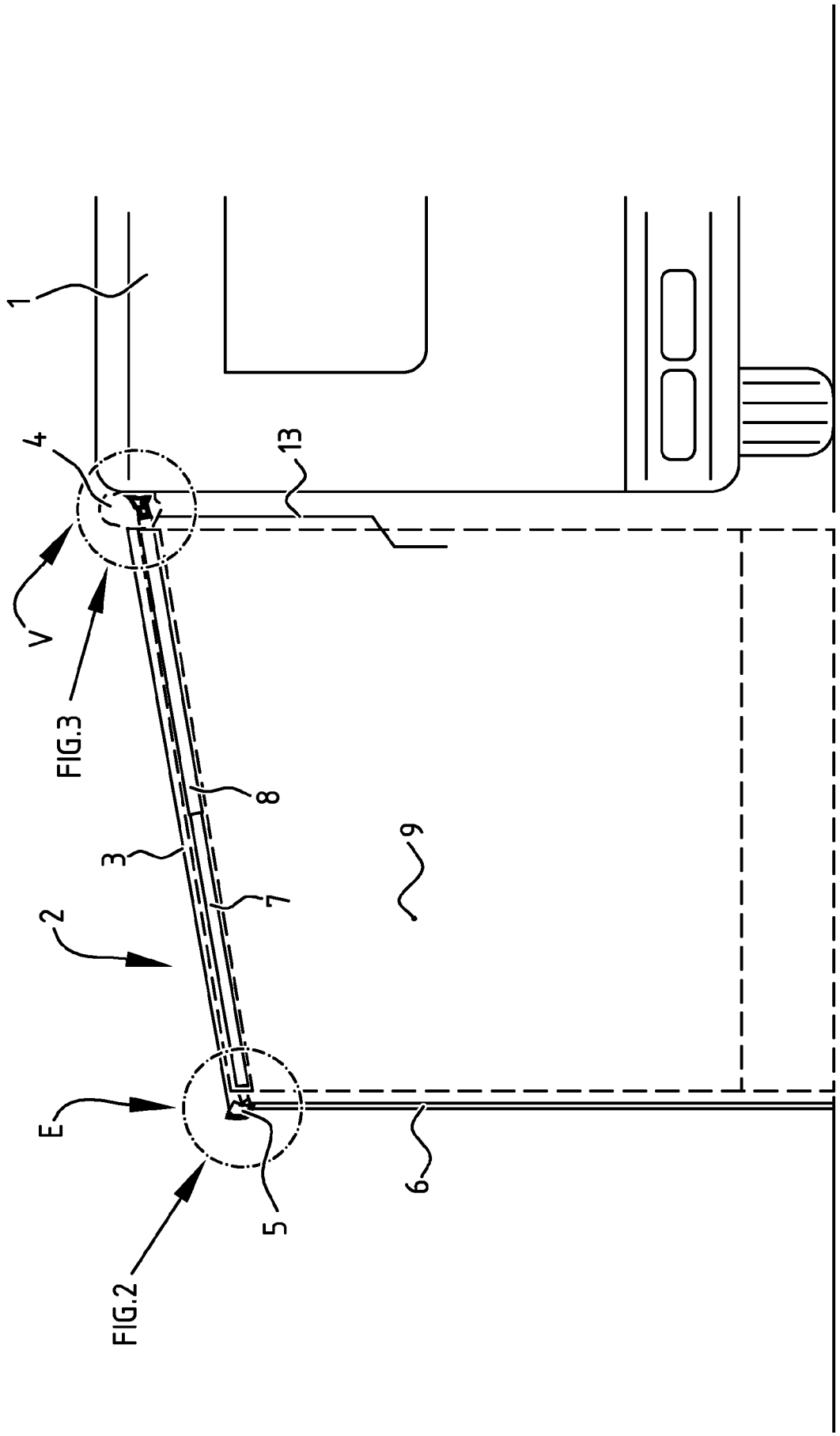

FIG. 1

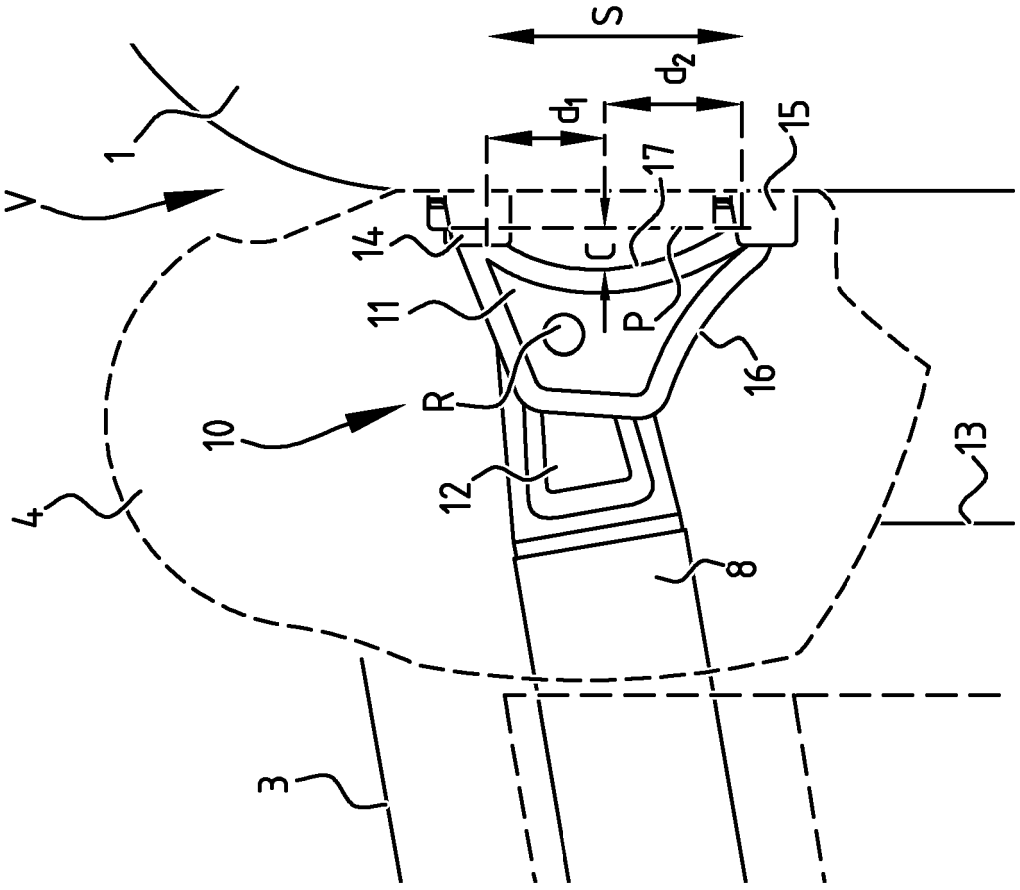

FIG. 3

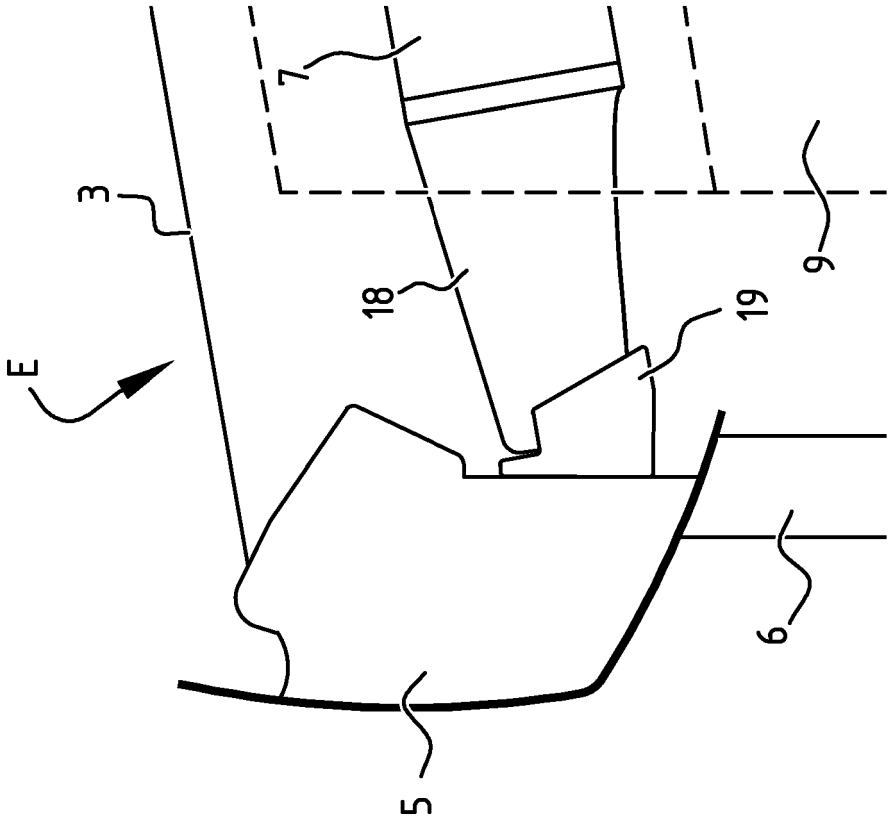

FIG. 2

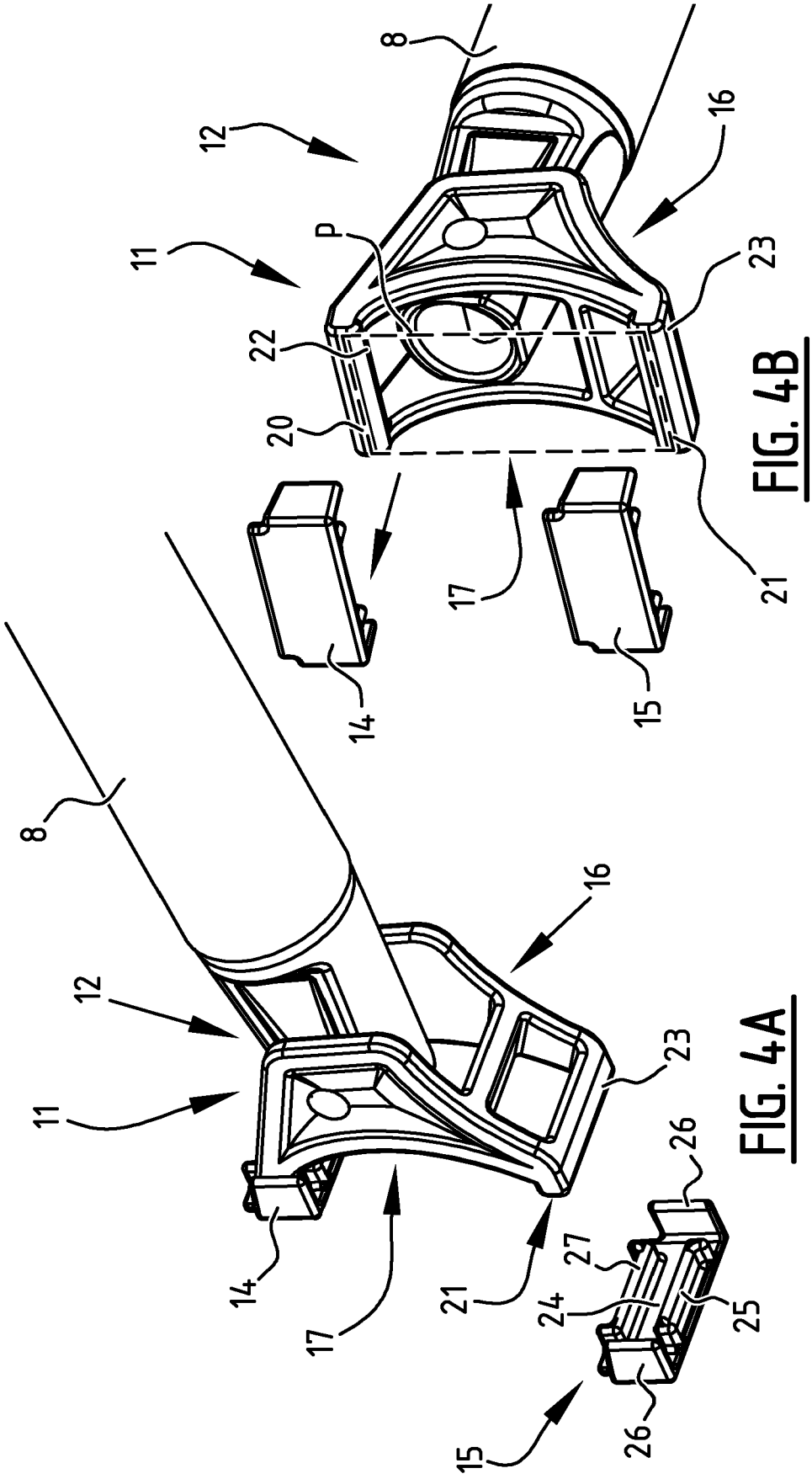

FIG. 4B

FIG. 4A

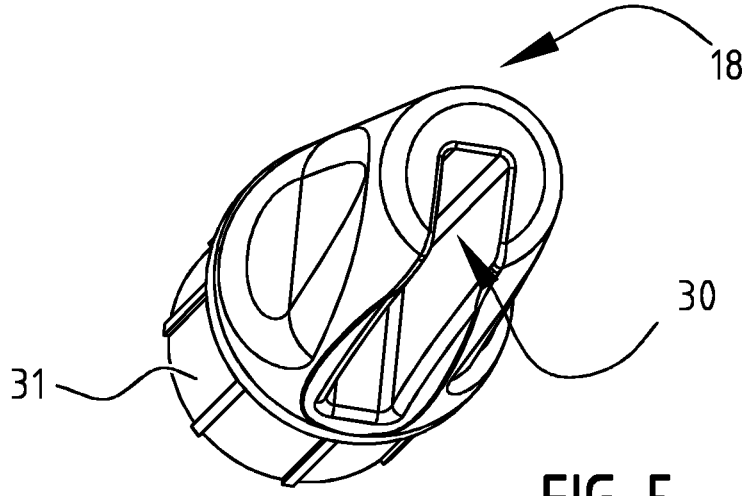

FIG. 5

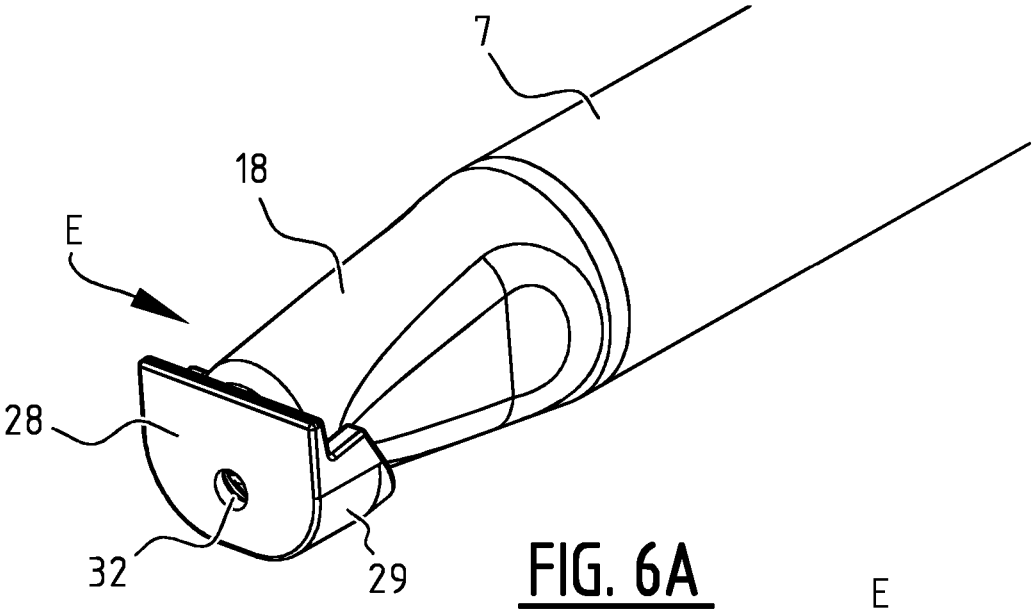

FIG. 6A

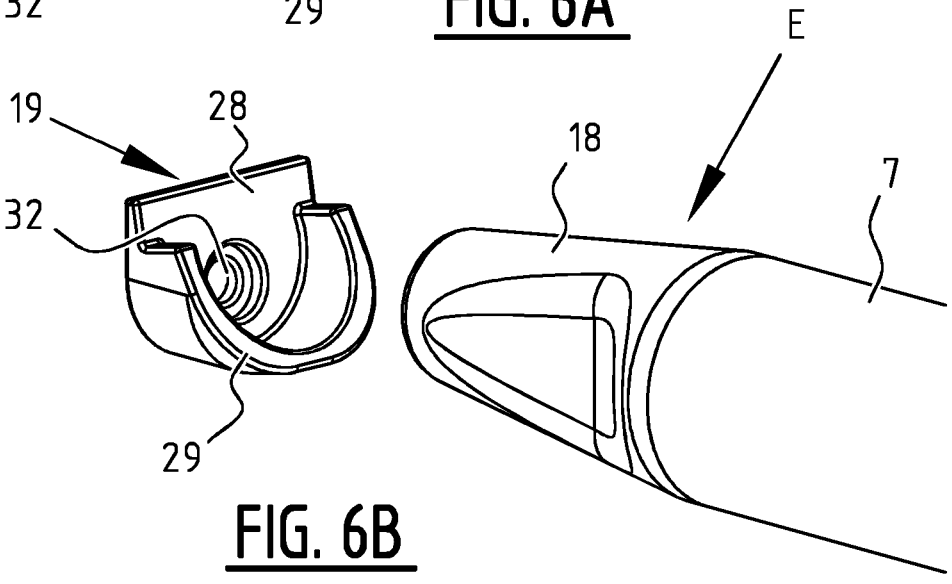

FIG. 6B

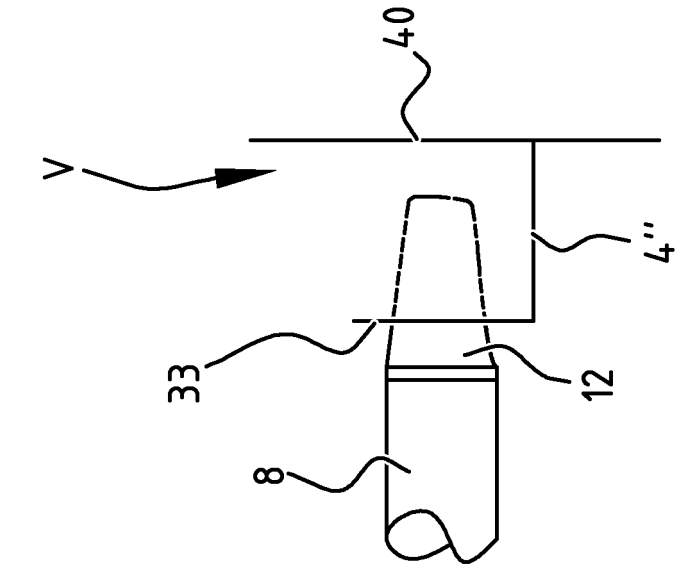

FIG. 7B

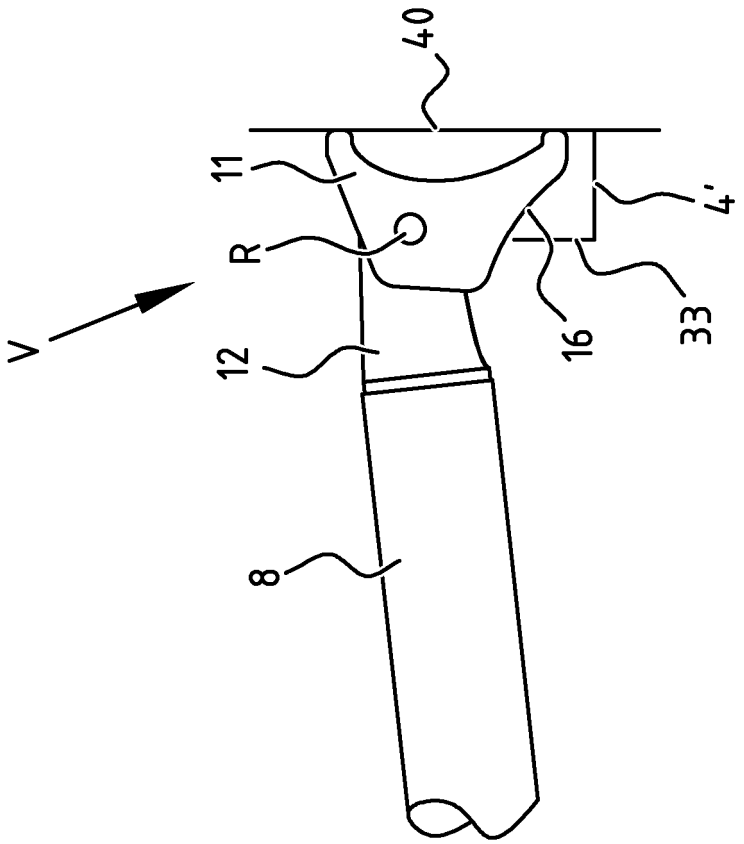

FIG. 7A

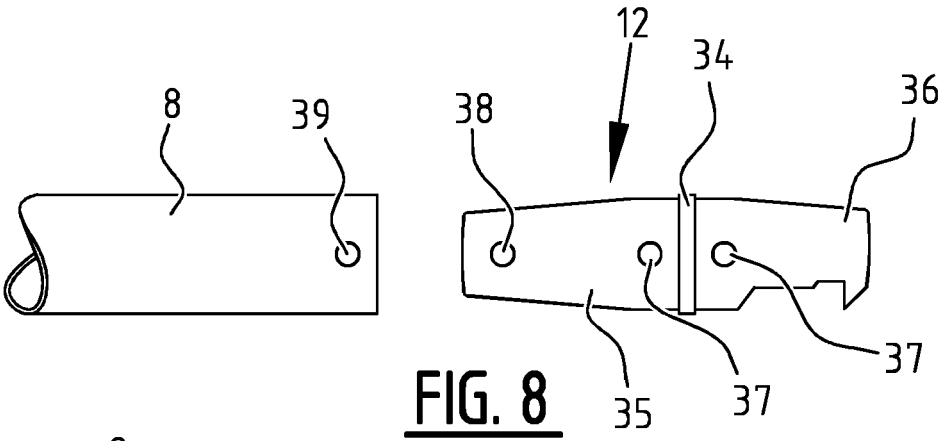

FIG. 8

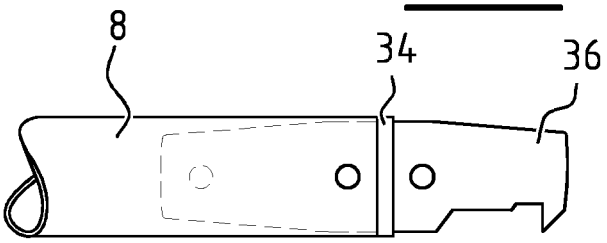

FIG. 9

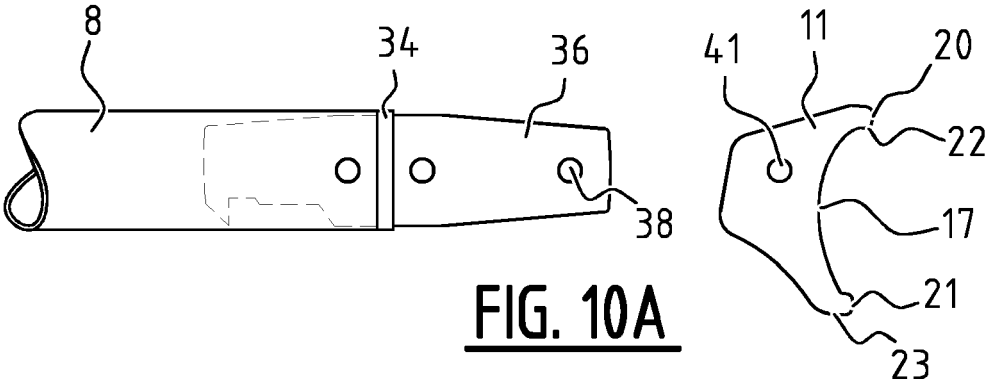

FIG. 10A

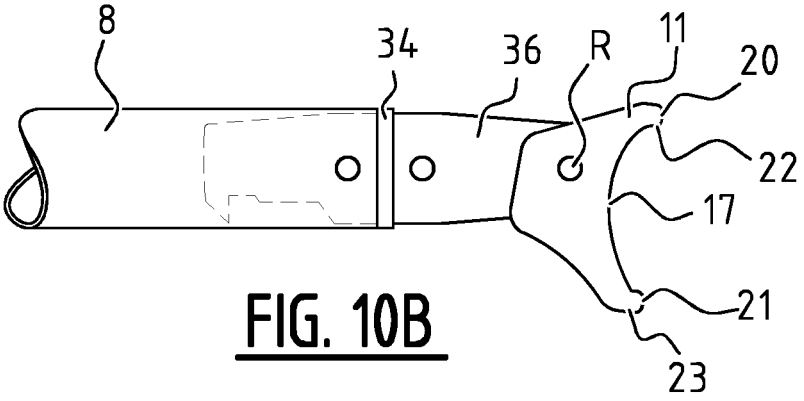

FIG. 10B

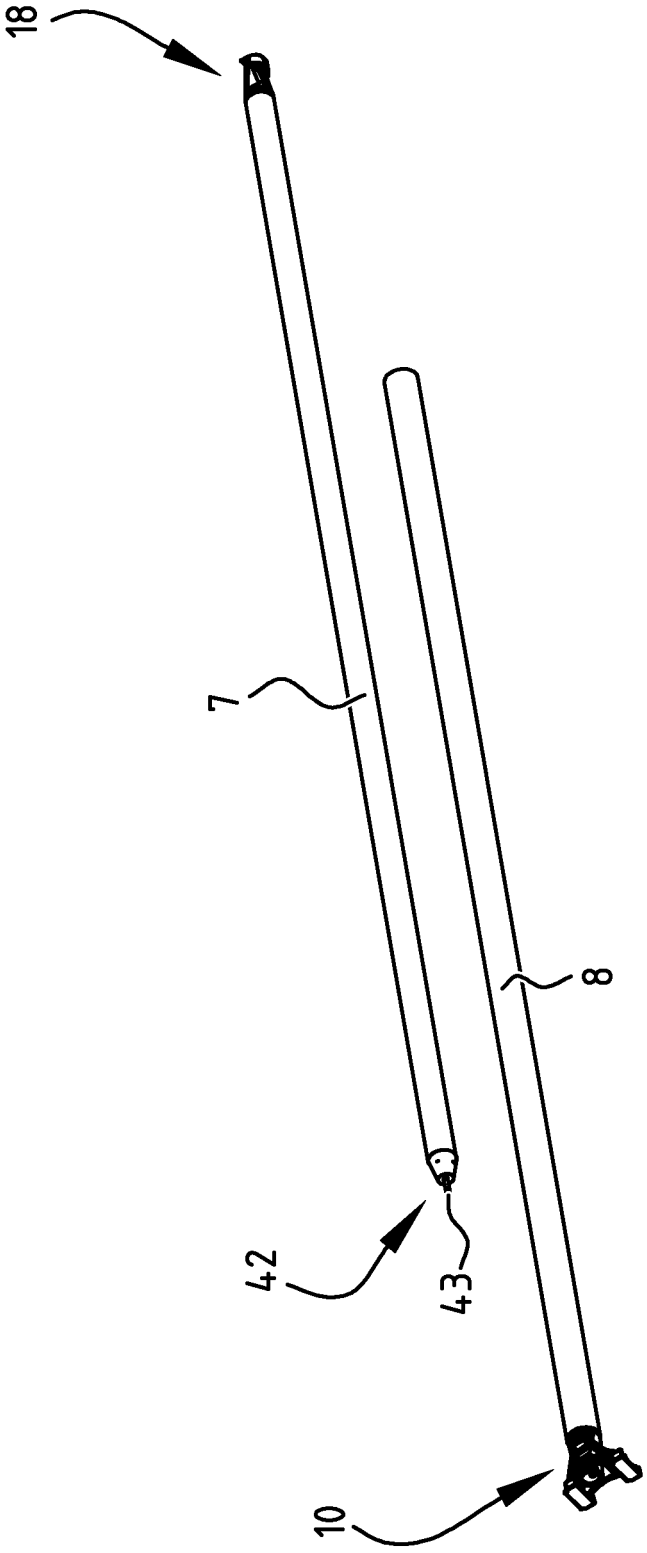

FIG. 11

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EUROPEAN SEARCH REPORT

Application Number
EP 24 22 0221

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 20 2011 052388 U1 (FIAMMA SPA [IT]) 3 February 2012 (2012-02-03) * abstract; figures 1,7,8,15 *	1-8, 10-15	INV. E04F10/06
X A	US 5 732 756 A (MALOTT DALE G [US]) 31 March 1998 (1998-03-31) * abstract; figures 7,8 *	1 2-15	
A	BE 1 006 646 A6 (RENOROL S A [BE]) 8 November 1994 (1994-11-08) * abstract; figures 2-3 *	1-15	
			TECHNICAL FIELDS SEARCHED (IPC)
			E04F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	11 April 2025	Wehland, Florian

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11-04-2025

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