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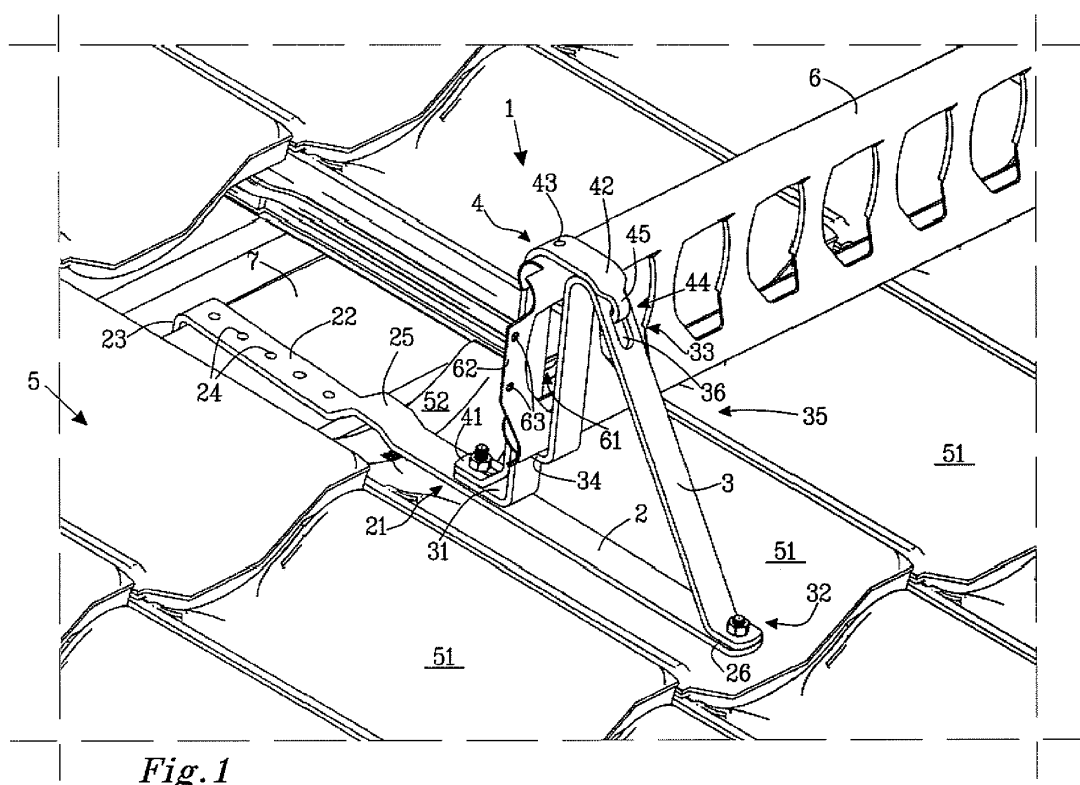
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(54) **System for the fixation of a roof rail**

(57) A roof rail system (1) comprising a first base element (2) for attachment to a roof (5), a rail support (3) and an attachment part (4) is disclosed. The rail support (3) comprises a first portion (31) and a second portion (32), wherein the first portion (31) is being arranged to be attached to the first base element (2) at a first position (21) of the first base element (2). The attachment part

(4) comprises a first end (41) and a second end (42). The first end (41) is being arranged to be attached to the first base element (2), and the second end (42) is being arranged to be attached to the rail support (3). The rail support (3) abuts against the first base element (2) at the first position (21), and the first end (41) of the attachment part (4) is arranged to be attached to the first base element (2) at the first position (21).



Description

TECHNICAL FIELD

[0001] The present invention relates to a roof rail system including an attachment assembly for attachment of a roof rail to a roof.

BACKGROUND

[0002] Roof rail systems are used for various purposes, such as securing persons moving about on a roof and preventing snow from sliding from slanted roofs. Roof rail systems may be mounded horizontally near the roof ridge or near the lower end of a roof. When a person works on a roof, e.g. to shovel snow or to replace roofing tiles, it may be associated with a risk if the person does not secure himself on the roof. Another possible risk occurs when snow or ice falls from the roof. Roof rail systems may provide securing points on a roof and/or may prevent ice and snow from falling from a roof.

[0003] A disadvantage associated with roof rail systems on the market is at least different that kinds of attachment arrangements are necessary for different kinds of roofs. This implies high production costs and a need to keep several different roof rail systems in stock. Another disadvantage manifests itself during the mounting of the roof rail system on a roof; several different parts have to be put together in a certain order and in several different mounting operations which means long mounting time.

[0004] SE 528464 discloses an armature for fastening a snow fence, wherein a locking arm holds the snow fence against a support arm. At an upper end of the locking arm there is arranged a pivotable locking member, by means of which the locking arm is attached to the support arm. It is mentioned that, at a lower end, the locking arm is attached to the support arm and/or an angled portion of a base part. However, no further information is provided relating to this attachment. This solution means that the locking arm and the pivotable locking member have to be assembled, either before the armature is mounted on a roof or during the mounting operation, which is time consuming. This may also be a fragile solution since a single locking arm with an additional locking member is keeping both the snow fence and the support arm in the desired position.

[0005] SE 510676 discloses an arrangement for attachment of roof equipment wherein a snow fence is snap-locked to a loop shaped section. The looped shaped section is fastened to a base part, and the base part is fastened to an attachment part adapted to be fastened to a roof. With this technical solution only a certain kind of snow fence may be used in order to fit the snap-lock. In addition, the snow fence and the loop shaped section have to be mounted in different operations.

SUMMARY

[0006] An object of the present invention is to provide an alternative roof rail system, which solves one or more of the aforementioned disadvantages with existing roof rail systems.

[0007] According to an aspect of the invention, the object is achieved by a roof rail system comprising a first base element for attachment to a roof, a rail support and an attachment part. The rail support comprises a first portion and a second portion wherein the first portion is arranged to be attached to the first base element at a first position of the first base element. The attachment part comprises a first end and a second end, the first end being arranged to be attached to the first base element, and the second end being arranged to be attached to the rail support. The rail support abuts against the first base element at the first position, and the first end of the attachment part is arranged to be attached to the first base element at the first position.

[0008] Since both the first portion of the rail support and the first end of the attachment part are arranged to be attached to the first base element at the first position, mounting of the rail support system is facilitated. In addition, the rail support system will be stable since the rail support abuts against the base element. As a result, the above mentioned object is achieved.

[0009] A roof rail system may be attached to various parts of a roof, inter alia depending on the purpose of the rail roof system. A roof rail system may be used in several different applications. When mounted on a slanted roof, the roof rail system, at least to some extent, may prevent snow or ice from sliding down from the roof. The roof rail system may provide attachment possibilities for persons working on or near the roof. A roof rail system may be attached to a roof e.g. by bolting, hanging, welding or a press fit. A roof rail system may be attached to a roof either during assembly of the roof or to an existing roof. A roof rail system may be attached to roofs having different kinds of roofing, such as tiles or tin plating.

[0010] The first base element may be arranged to be attached directly to a roof and/or the first base element may be arranged to be indirectly attached to a roof. In the latter case, an attachment member may be arranged to be attached to a roof, the first base element being attached to the attachment member. The attachment member may extend between a part of the first base element and the roof. Alternatively, a length of the attachment member that stretches substantially in parallel with the roof is equal to, or larger than the first base element. The first base element may be attached to the attachment member by bolts, projecting parts such as hooks, by a press fit, welding, soldering, or the like. The attachment member may be provided with attachment means such as through holes, bent portions or the like for attachment of the first base element and for attachment to the roof. The attachment member may provide support to a second base element. The attachment member may com-

prise different portions, such as a first end, a second end and a central portion arranged between the first end and the second end. For example, the first and/or the second end of the attachment member may be attached to battens, beams, laths or the like of the roof, and the central portion may be arranged to be attached to the first base element.

[0011] According to some embodiments, the rail support has an elongated shape which is extending in a curve from the first portion to the second portion. The curve may have any suitable shape, such as triangular, semi-circular or U-shaped.

[0012] According to some embodiments, the first end of the attachment part may abut against the first portion of the rail support. Thus, the first end of the attachment part and the first portion of the rail support may support each other in the first position of the first base element which may further strengthen the roof rail system.

[0013] According to some embodiments, the first portion of the rail support is provided with a first through hole. A through hole may be used for attachment to other parts and forms a cheap and reliable attachment arrangement.

[0014] According to some embodiments, the first end of the attachment part may be provided with a first attachment arrangement. An attachment arrangement may simplify attachment to other parts. Different attachment arrangements may be used, e.g. an attachment arrangement comprising a second through hole, and wherein the first through hole and the second through hole are arranged to receive a bolt extending from the first base element at the first position. The bolt may be an integral part of the first base element or a separate bolt, i.e. a bolt that is not an integral member of the base element. By inserting the bolt in the first and/or second through hole, the attachment part and/or the rail support may be guided to the right position prior to a fastening operation. The first through hole and/or the second through hole may have a cross section that is circular. Alternatively the first through hole and/or the second through hole may have an elongated cross section. Each of the features first through hole and second through hole encompass also a slot, i.e. a through hole, which extends to, and is open from, an edge portion of the first attachment part or the rail support.

[0015] According to some embodiments the second end of the attachment part is provided with a second attachment arrangement and the rail support is provided with a third attachment arrangement between the first portion and the second portion, and wherein the second attachment arrangement is arranged to interact with the third attachment arrangement. Different kinds of attachment arrangements may be used, the second attachment arrangement may comprise a projecting part, such as a hook, and the third attachment arrangement may comprise a through hole. Alternatively, the second attachment arrangement may comprise a through hole and the third attachment arrangement may comprise a projecting part. Both the second attachment arrangement and the

third attachment arrangement may form parts of a hinge with a pin arranged between the second and the third attachment arrangements. The second attachment arrangement and the third attachment arrangement may comprise through holes, arranged to be bolted together.

[0016] According to some embodiments the attachment part and the rail support are arranged to extend at least partially substantially in parallel with each other such that a longitudinal slot is formed between the attachment part and the rail support.

[0017] According to some embodiments the roof rail system further comprises a rail, wherein the rail may be arranged to extend through the longitudinal slot. The attachment part and the rail support may support the rail in the longitudinal slot. A longitudinal slot may be advantageous since a rail having a non-circular cross section arranged between the attachment part and the rail support may be locked in a desired position without risk of rotation. A longitudinal slot between the attachment part and the rail support may also be advantageous if the attachment part and the rail support are providing support to a rail having a circular cross section since the position of the rail may be adjusted within the longitudinal slot. A longitudinal direction of the rail is preferably substantially perpendicular to the longitudinal slot, but the angle between the longitudinal direction of the rail and the longitudinal slot may be other than perpendicular.

[0018] According to some embodiments, the rail may be arranged to face towards a roof ridge. That is, the rail support is formed to support the rail and arranged to be attached to the first base element such that, seen in a direction from the roof ridge towards an eaves of the roof, the rail is arranged before a top point of the curve of the rail support. Put differently, in a mounted state, the first position of the first base element, the first portion of the rail support, and the first end of the attachment part are arranged to be positioned closer to a ridge of a roof than the second portion of the rail support.

[0019] According to some embodiments a position of the rail in the longitudinal slot is defined by a positioning member attached to the rail support and/or the attachment part. A positioning member may keep the rail in a desired position within the slot and in addition may provide the rail support, the attachment part and/or the rail with further stability.

[0020] According to some embodiments the second portion of the rail support is provided with a fourth through hole. This through hole may be used for attachment to other parts and forms a cheap and reliable attachment arrangement.

[0021] According to some embodiments the fourth through hole is arranged to receive a bolt extending from the first base element at a second position. The bolt may form an integral part with the base element. The use of a bolt may be advantageous since the bolt may guide a rail support provided with through holes to the right position prior to a fastening operation. According to some embodiments it may be advantageous to use a separate

bolt, i.e. a bolt that is not an integral member of the base support.

[0022] According to some embodiments the first base element is provided with a second projecting part. The second projecting part is arranged to engage with the rail support in the fourth through hole. The second projecting part may be a hook.

[0023] According to some embodiments the roof rail system comprises a second base element. The second portion of the rail support may be arranged to be attached to the second base element. A second base element may simplify the mounting of the roof rail system on some kinds of roofs.

[0024] According to some embodiments the rail support comprises a third portion extending from the second portion to the first portion, and wherein the third portion is arranged to be attached to the base element at the first position. Since both the first portion of the rail support and the third portion of the rail support are attached to the base element at the first position the mounting of the roof rail system may be simplified. In addition the first portion of the rail support, the third portion of the rail support and the base element will support each other at the first position of the base element and therefore provide the roof rail system with further stability.

[0025] Further features of, and advantages with, the present invention will become apparent when studying the appended claims and the following detailed description. Those skilled in the art will realize that different features of the present invention may be combined to create embodiments other than those described in the following, without departing from the scope of the present invention, as defined by the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026] The various aspects of the invention, including its particular features and advantages, will be readily understood from the following detailed description and the accompanying drawings, in which:

Fig. 1 illustrates a perspective view of a roof mounted roof rail system according to embodiments.

Fig. 2 illustrates a perspective view of a roof rail system according to embodiments.

Fig. 3 illustrates a perspective view of a roof rail system according to embodiments.

Fig. 4 illustrates a side view of a roof rail system mounted on a roof.

Fig. 5 illustrates a perspective view of a roof mounted roof rail system according to embodiments.

DETAILED DESCRIPTION

[0027] The present invention will now be described more fully with reference to the accompanying drawings, in which example embodiments are shown. However, this invention should not be construed as limited to the

embodiments set forth herein. Disclosed features of example embodiments may be combined as readily understood by one of ordinary skill in the art to which this invention belongs. Like numbers refer to like elements throughout.

[0028] Well-known functions or constructions will not necessarily be described in detail for brevity and/or clarity.

[0029] Fig. 1 illustrates a perspective view of a roof mounted roof rail system 1 according to embodiments. The roof rail system 1 comprises a first base element 2 for attachment to a roof 5, a rail support 3, an attachment part 4, and a rail 6. The rail support 3 comprises a first portion 31 and a second portion 32. The first portion 31 is attached to the first base element 2 at a first position 21 of the first base element 2. The rail support 3 has an elongated shape, extending in a curve 35 from the first portion 31 to the second portion 32.

[0030] The attachment part 4 comprises a first end 41 and a second end 42. The first end 41 is attached to the first base element 2, and the second end 42 is attached to the rail support 3. The rail support 3 abuts against the first base element 2 at the first position 21, and the first end 41 of the attachment part 4 attached to the first base element 2 at the first position 21. According to these embodiments, the first end 41 of the attachment part 4 abuts against the first portion 31 of the rail support 3.

[0031] The second end 42 of the attachment part 4 is provided with a second attachment arrangement 44 and the rail support 3 is provided with a third attachment arrangement 33 between the first portion 31 and the second portion 32. The second attachment arrangement 44 interacts with the third attachment arrangement 33. The second attachment arrangement 44 comprises a projecting part 45 in the form of a hook and the third attachment arrangement 33 comprises a through hole 36. Alternatively, the second attachment arrangement 44 comprises a through hole 36 and the third attachment 33 arrangement comprises a projecting part 45.

[0032] The rail 6 is held in place between the rail support 3 and the attachment part 4. The rail support 3 extends at least partially substantially in parallel with the attachment part 4 such that a longitudinal slot 61 is formed between the attachment part 4 and the rail support 3.

[0033] The rail support 3 comprises a ledge 34 arranged between the first portion 31 and the second portion 32. The ledge 34 may provide support for the rail 6 arranged between the rail support 3 and the attachment part 4. The attachment part is provided with an aperture 43. The aperture 43 is arranged to receive a bolt or the like. The rail 6 may then be further positioned in the longitudinal slot 61 by the bolt (not shown) arranged in the aperture 43 of the attachment part 4.

[0034] A cross section of the rail 6, perpendicular to a longitudinal direction of the rail 6, has an outer circumference that substantially extends to all inner surfaces of the longitudinal slot 61. The dimension of this cross sec-

tion of the rail 6 in a direction substantially perpendicular to a roof 5 (a height of the cross section) is larger than the dimension of the cross section of the rail 6 in a direction substantially parallel to the roof 5 (a width of the cross section).

[0035] The first base element 2 is mounted on the roof 5. The first base element 2 has an elongated shape extending substantially perpendicularly to a ridge of the roof 5 and in a plane substantially parallel to the roof 5 and along roof tiles 51 arranged on the roof 5. A mounting end 22 of the first base element 2 is mounted on a horizontal batten 7. The first base element 2 is attached to the batten 7 by the mounting end 22 with a bent part 23 extending over the batten 7 and thus, is hanging on the batten 7. Further, screws (not shown) extending through screw holes 24 at the mounting end 22 may be used to secure the first base element 2 to the batten 7.

[0036] A bent portion 25 of the first base element 2 is shaped to correspond substantially to the contour of an underlying roof tile 51. The bent portion 25 is arranged just above an upper flange 52 of the underlying roof tile 51. Due to this shape of the bent portion 25, the first base element 2 will be close to the underlying roof tile 51 below the first base element 2. Further, a roof tile (not shown in Fig. 1) arranged above the mounting end 22 of the first base element 2 will have a close fit to the first base element 2 and the roof tile 51 below the first base element 2. Thanks to this particular shape of the first base element 2 with the bent portion 25, the roof tiles above and below the first base element 2 will be close to each other, which prevents wind and rain to enter between the roof tiles. The roof tiles will also lock each other's positions in a desired way.

[0037] In order to mount the roof rail system 1 on a roof 5, the first base element 2 is first attached to the batten 7. Then the second portion 32 of the rail support 3 is attached to the first base element 2 at the second position 26 of the first base element 2 e.g. by means of a bolt and a nut. Substantially simultaneously the first portion 31 of the rail support 3 is placed in abutment with the first base element 2 at the first position 21. The rail 6 is then placed on the ledge 34 and the second end 42 of the attachment part 4 is attached to the rail support 3 with attachment arrangements 44, 33. The first end 41 of the attachment part 4 is then positioned together with the first end 31 of the rail support 3 and thereafter fastened to the first base element 2 in the first position 21 e.g. by means of a bolt and a nut. The rail 6 is thus positioned in the longitudinal slot 61 between the rail support 3 and attachment part 4. The rail 6 may be further positioned in the longitudinal slot 61 by a bolt (not shown) arranged in the aperture 43 of the attachment part 4.

[0038] The rail 6 is kept in place on the roof 5 by two or more first base elements 2, rail supports 3 and attachment parts 4, these parts being mounted on the roof 5 as described above.

[0039] A number of first base elements 2 may be arranged with their elongated shapes extending substan-

tially in parallel to each other. The distance between two first base elements 2 may vary. The rail 6 may comprise one or more rail elements attached to each other in order to extend over a desired distance. The rail 6 comprises attachment members 62 provided with screw holes 63 for attachment of the rail elements to each other.

[0040] Fig. 2 illustrates a perspective view of a roof mounted roof rail system 1 according to embodiments. These embodiments resemble the embodiments illustrated in Fig. 1. In the following the main differences between the Fig. 2 embodiments and the Fig. 1. embodiments will be highlighted.

[0041] Again, the roof rail system 1 comprises a first base element 2 for attachment to a roof, a rail support 3, an attachment part 4, and a rail 6. The rail support 3 comprises a first portion 31 and a second portion 32. The first portion 31 is attached to the first base element 2 at a first position 21 of the first base element 2. The rail support 3 abuts against the first base element 2 at the first position 21, and the first end 41 of the attachment part 4 is attached to the first base element 2 at the first position 21. The rail 6 is held in a longitudinal slot 61 formed between the rail support 3 and the attachment part 4.

[0042] The first base element 2 is arranged to be attached on and/or receive support from a roof. The first base element 2 comprises a first section 2A and a second section 2B. The two sections 2A and 2B of the first base element 2 overlap each other. Thus, a width of the first base element 2 is adjustable. One advantage with adjustable width is the possibility to adjust the first base element 2 to an underlying roof, on to which the first base element 2 is arranged to be attached, such as corrugated tin roofing. The two sections 2A and 2B comprise mounting arrangements in the form of through holes 24. Screws 28 are arranged to extend through the through holes 24 and to be secured into the roofing.

[0043] The first portion 31 of the rail support 3 is provided with a first through hole 37 and the first end 41 of the attachment part 4 is provided with a first attachment arrangement. The first attachment arrangement is a second through hole 46. A bolt 77 extends through the first base element 2, the first through hole 37 and the second through hole 46 in the first position of the first base element 2. The rail support 3 and the attachment part 4 are clamped to the first base element 2 by means of the bolt 77 and a screw nut 76.

[0044] The second portion 32 of the rail support 3 is provided with a fourth through hole 38. A bolt 79 extends through the first base element 2 and the fourth through hole 38 in the second position 26 of the first base element 2. The rail support 3 is clamped to the first base element 2 by means of the bolt 79 and a screw nut 78.

[0045] Fig. 3 illustrates a perspective view of a roof rail system 1 according to embodiments. These embodiments resemble the embodiments illustrated in Figs. 1 and 2. In the following the main differences between the Fig. 3 embodiments and the Figs. 1 and 2 embodiments

will be highlighted.

[0046] Again, the roof rail system 1 comprises a first base element 2 for attachment to a roof, a rail support 3, an attachment part 4, and a rail 6. The rail support 3 comprises a first portion 31 and a second portion 32. The first portion 31 is attached to the first base element 2 at a first position 21 of the first base element 2. The rail support 3 abuts against the first base element 2 at the first position 21, and the first end 41 of the attachment part is attached to the first base element 2 at the first position 21. The rail 6 is held in a longitudinal slot 61 formed between the rail support 3 and the attachment part 4.

[0047] The first portion 31 of the rail support 3 is provided with a first through hole 37 and the first end 41 of the attachment part 4 is provided with a first attachment arrangement. The first attachment arrangement comprises a second through hole 46. A bolt 77 extends from the first base element 2, through the first through hole 37 and the second through hole 46 in the first position 21 of the first base element 2. The rail support 3 and the attachment part 4 are clamped to the first base element 2 by means of the bolt 77 and a screw nut 76.

[0048] In the embodiments illustrated in Fig. 3, the roof rail system 1 comprises a second base element 27. The second portion 32 of the rail support 3 is attached to the second base element 27. The second portion 32 of the rail support 3 is provided with a fourth through hole 38. A bolt 79 extends from the second base element 27 and through the fourth through hole 38. The rail support 3 is clamped to the second base element 27 by means of the bolt 79 and a screw nut 78.

[0049] The first base element 2 and the second base element 27 comprise mounting arrangements in the form of through holes 24. Screws (not shown) are arranged to extend through the through holes 24 and to be secured into the roofing. The first base element 2 and the second base element 27 are provided with gaskets 29 for preventing water to enter into the roof through screw holes of the screws (not shown).

[0050] In order to mount the roof rail system 1 to a roof, the first base element 2 and the second base element 27 are first attached to the roof by bolts (not shown) that extends through the through holes 24 and secure the base elements 2, 27 to the roof. The second portion 32 of the rail support 3 is attached to the second base element 27 by means of the bolt 79 and the screw nut 78. Substantially simultaneously, the first portion 31 of the rail support 3 is placed in abutment with the first base element 2 at the first position 21. The rail 6 is then placed on the ledge 34 and the second end 42 of the attachment part 4 is attached to the rail support 3 with attachment arrangements 44, 33. The first end 41 of the attachment part 4 is then positioned together with the first end 31 of the rail support 3 and fastened to the first base element 2 in the first position 21 by means of the bolt 77 and the screw nut 76. The rail 6 is thus positioned in the longitudinal slot 61 between the rail support 3 and attachment

part 4.

[0051] Fig. 4 illustrates a side view of a roof rail system 1 according to embodiments, mounted on a roof. These embodiments resemble the embodiments illustrated in Figs. 1, 2 and 3. In the following the main differences between the Fig. 4 embodiments and the Figs. 1, 2 and 3 embodiments will be highlighted.

[0052] Again, the roof rail system 1 comprises a first base element 2 for attachment to a roof 5, a rail support 3, an attachment part 4 and a rail 6. The rail support 3 comprises a first portion 31 and a second portion 32. The first portion 31 is attached to the first base element 2 at a first position 21 of the first base element 2. The rail support 3 abuts against the first base element 2 at the first position 21, and the first end 41 of the attachment part is attached to the first base element 2 at the first position 21. The rail 6 has a circular cross section and is held in a longitudinal slot 61 formed between the rail support 3 and the attachment part 4. A position of the rail 6 in the longitudinal slot 61 is defined by a positioning member 8 which is attached to the rail support 3 and/or the attachment part 4. The positioning member 8 provides the rail 6 with support, and may be permanently or detachably attached to the rail support 3 and/or the attachment part 4.

[0053] The second portion 32 of the rail support 2 is provided with a fourth through hole 38. A bolt 79 extends from the first base element 2 and through the fourth through hole 38 at the second position 26 of the first base element 2. A bolt 77 extends from the first base element 2 at the first position 21, through a first through hole 37 in the first portion 31 of the rail support 3 and an elongated second through hole 46 in the first end 41 of the attachment part 4.

[0054] When the roof rail system 1 is mounted on a roof 5, the base element 2 is first attached to the batten 7. The second end 32 of rail support 3 is clamped to the first base element 2 by means of the bolt 79 and a screw nut 78. The positioning member 8 is attached to the rail support 3 and the rail 6 is then placed on the positioning member 8. The second end 42 of the attachment part 4 is attached to the rail support 3 with attachment arrangements 44, 33. The attachment part 4 is rotated down such that the first end 41 is arranged in the first position 21 of the first base element 2 together with the first end 31 of the rail support 3. The rail support 3 and the attachment part 4 are clamped to the first base element 2 by means of the bolt 77 and a screw nut 76. Thus, the rail 6 is positioned in the longitudinal slot 61 between by the rail support 3, the attachment part 4, and the positioning member 8. The rail 6 may be further positioned in the longitudinal slot 61 by a bolt (not shown) arranged in the aperture 43 of the attachment part 4.

[0055] Fig. 5 illustrates a perspective view of a roof mounted roof rail system 1 according to embodiments. These embodiments resemble the embodiments illustrated in Fig. 1-4. In the following the main differences between the Fig. 5 embodiments and the Fig. 1-4. em-

bodiments will be highlighted.

[0056] The roof rail system 1 comprises a first base element 2 for attachment to a roof 5, a rail support 3, an attachment part 4, and a rail 6. The rail support 3 comprises a first portion 31, a second portion 32, and a third portion 39. The second portion 32 is attached to the first base element 2 at a second position 26 of the first base element 2. The rail support 3 abuts against the first base element 2 at the first position 21. The first portion 31 and the third portion 39 are attached to the first base element 2 at the first position 21. The rail support 3 comprises a ledge 34 between the first portion 31 and the second portion 32. The rail 6 is held in a longitudinal slot 61 formed between the rail support 3 and the attachment part 4.

[0057] A bolt 77 extends from the first base element 2 at the first position 21, through a first through hole 37 in the first portion 31 of the rail support 3 and an elongated second through hole 46 in the first end 41 of the attachment part 4.

[0058] When the roof rail system 1 is mounted on a roof 5, a mounting end 22 of the base element 2 is first attached to the batten 7. A projecting part 64 at the second position 26 of the first base element 2 is engaging the second portion 32 of the rail support 3 through a fourth through hole 38. Substantially simultaneously the third portion 39 of the rail support 3 is placed in abutment with the first base element 2 at the first position 21. The rail 6 is then placed on the ledge 34. A second end 42 of the attachment part 4 is attached to the rail support 3 with attachment arrangements 44, 33. A first end 41 of the attachment part 4 is then positioned against the first portion 31 of the rail support 3. The first portion 31 and the third portion 39 of the rail support 3, and the attachment part 4, are clamped to the first base element 2 by means of the bolt 77 and a screw nut (not shown). The projecting part 64 at the second position 26 of the first base element 2 is fixing the second portion 32 of the rail support 3. The rail 6 thus, is positioned in a longitudinal slot 61 formed between the rail support 3 and the attachment part 4.

[0059] Example embodiments described above may be combined as understood by a person skilled in the art. It is also understood by those skilled in the art that different materials may be used in the roof rail system. Iron, steel or alloys may be advantageous in many applications, but according to the invention any suitable material may be used.

[0060] The first base element 2 may be attached to the batten 7 by bolting, by gluing, by a press fit or by having an attachment devise such as one or several projecting parts or apertures that co-operates with one or several projecting parts or apertures on the batten 7 or the like. The upper mounting end 22 of the first base element 2 may be provided with a shape that interlocks with at least one batten 7 or the like when the first base element 2 is mounted on the roof. The projecting part 64 at the second position 26 of the first base element 2 may comprise a hook, a knob or the like.

[0061] Although the invention has been described with reference to example embodiments, many different alterations, modifications and the like will become apparent for those skilled in the art. A batten 7 may for instance be a crossbar, framework or any other supporting structure that is part of the roof 5.

[0062] Therefore, it is to be understood that the foregoing is illustrative of various example embodiments and the invention is not to be limited to the specific embodiments disclosed and that modifications to the disclosed embodiments, combinations of features of disclosed embodiments as well as other embodiments are intended to be included within the scope of the appended claims.

[0063] As used herein, the term "comprising" or "comprises" is open-ended, and includes one or more stated features, elements, steps, components or functions but does not preclude the presence or addition of one or more other features, elements, steps, components, functions or groups thereof.

Claims

1. A roof rail system (1) comprising a first base element (2) for attachment to a roof (5), a rail support (3) and an attachment part (4), wherein the rail support (3) comprises a first portion (31) and a second portion (32), the first portion (31) being arranged to be attached to the first base element (2) at a first position (21) of the first base element (2), and wherein the attachment part (4) comprises a first end (41) and a second end (42), the first end (41) being arranged to be attached to the first base element (2), and the second end (42) being arranged to be attached to the rail support (3) **characterized in that** the rail support (3) abuts against the first base element (2) at the first position (21), and the first end (41) of the attachment part (4) is arranged to be attached to the first base element (2) at the first position (21).
2. The roof rail system (1) according to claim 1, wherein the rail support (3) has an elongated shape, extending in a curve (35) from the first portion (31) to the second portion (32).
3. The roof rail system (1) according claim 1 or 2, wherein the first end (41) of the attachment part (4) abuts against the first portion (31) of the rail support (3).
4. The roof rail system (1) according to any one of the preceding claims, wherein the first portion (31) of the rail support (3) is provided with a first through hole (37).
5. The roof rail system according to any one of the preceding claims, wherein the first end (41) of the at-

achment part (4) is provided with a first attachment arrangement.

6. The roof rail system (1) according to claims 4 and 5, wherein the first attachment arrangement comprises a second through hole (46), and wherein the first through hole (46) and the second through hole (37) are arranged to receive a bolt (77) extending from the first base element (2) at the first position (21). 5
7. The roof rail system (1) according to any one of the preceding claims, wherein the second end (42) of the attachment part (4) is provided with a second attachment arrangement (44) and the rail support (3) is provided with a third attachment arrangement (33) between the first portion (31) and the second portion (32), and wherein the second attachment arrangement (44) is arranged to interact with the third attachment arrangement (33). 10 15 20
8. The roof rail system (1) according to any one of the preceding claims, wherein the attachment part (4) and the rail support (3) are arranged to extend at least partially substantially in parallel with each other such that a longitudinal slot (61) is formed between the attachment part (4) and the rail support (3). 25
9. The roof rail system (1) according to claim 8, further comprising a rail (6), wherein the rail (6) is arranged to extend through the longitudinal slot (61). 30
10. The roof rail system (1) according to claim 9, wherein a position of the rail (6) in the longitudinal slot (61) is defined by a positioning member (8) attached to the rail support (3) and/or the attachment part (4). 35
11. The roof rail system (1) according to any one of the preceding claims, wherein the second portion (32) of the rail support (3) is provided with a fourth through hole (38). 40
12. The roof rail system according claim 11, wherein the fourth through hole (38) is arranged to receive a bolt (79) extending from the first base element (2) at a second position (26). 45
13. The roof rail system (1) according to claim 11, wherein the first base element (2) comprises a second projecting part (64), and wherein the second projecting part (64) is arranged to engage with the rail support (3) in the fourth through hole (38). 50
14. The roof rail system (1) according to any one of claims 1-11, further comprising a second base element (27), wherein the second portion (32) of the rail support (3) is arranged to be attached to the second base element (27). 55

15. The roof rail system (1) according to any one of the preceding claims, wherein the rail support (3) comprises a third portion (39) extending from the second portion (32) to the first portion (31), and wherein the third portion (39) is arranged to be attached to the first base element (2) at the first position (21).

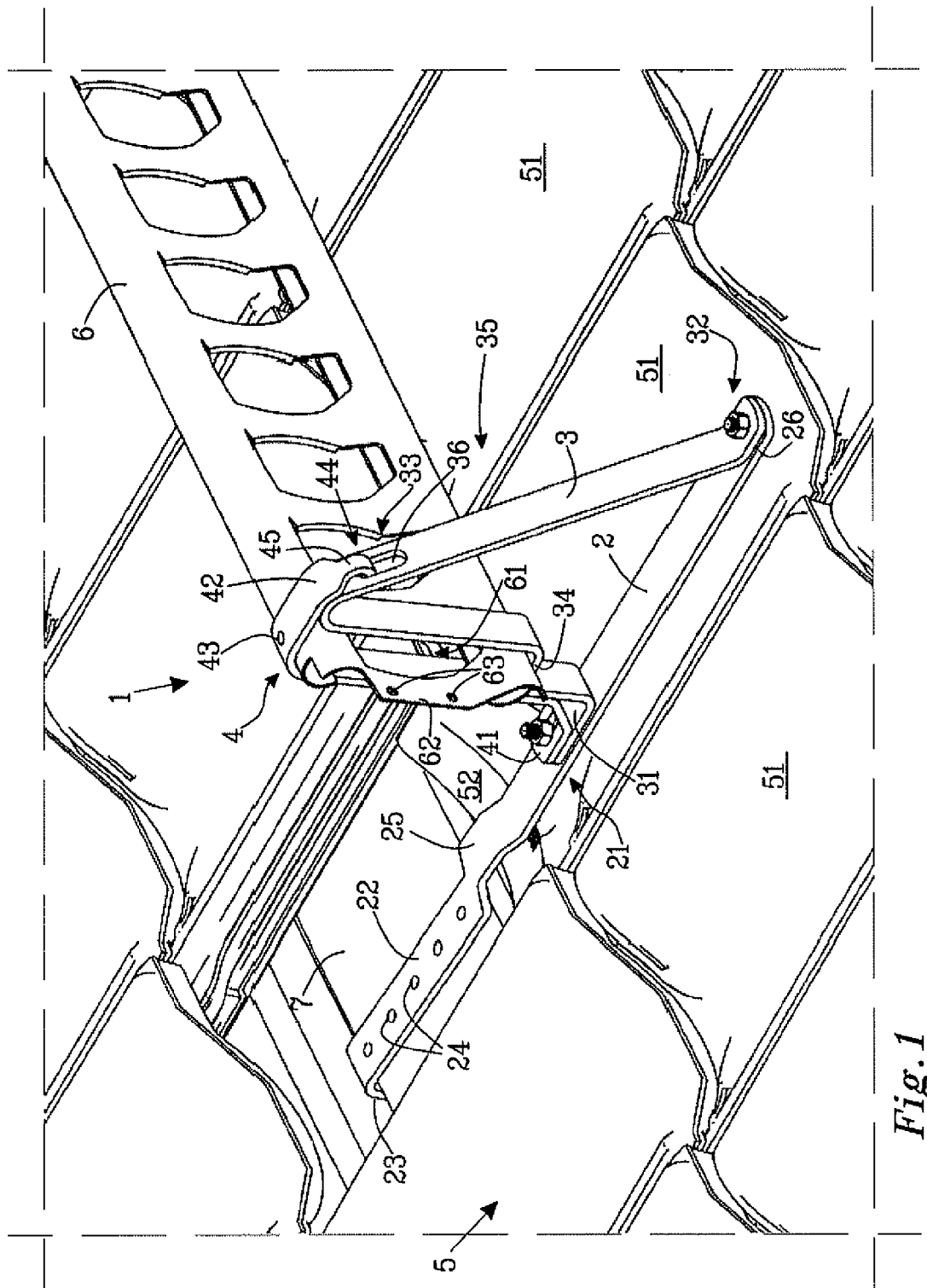


Fig. 1

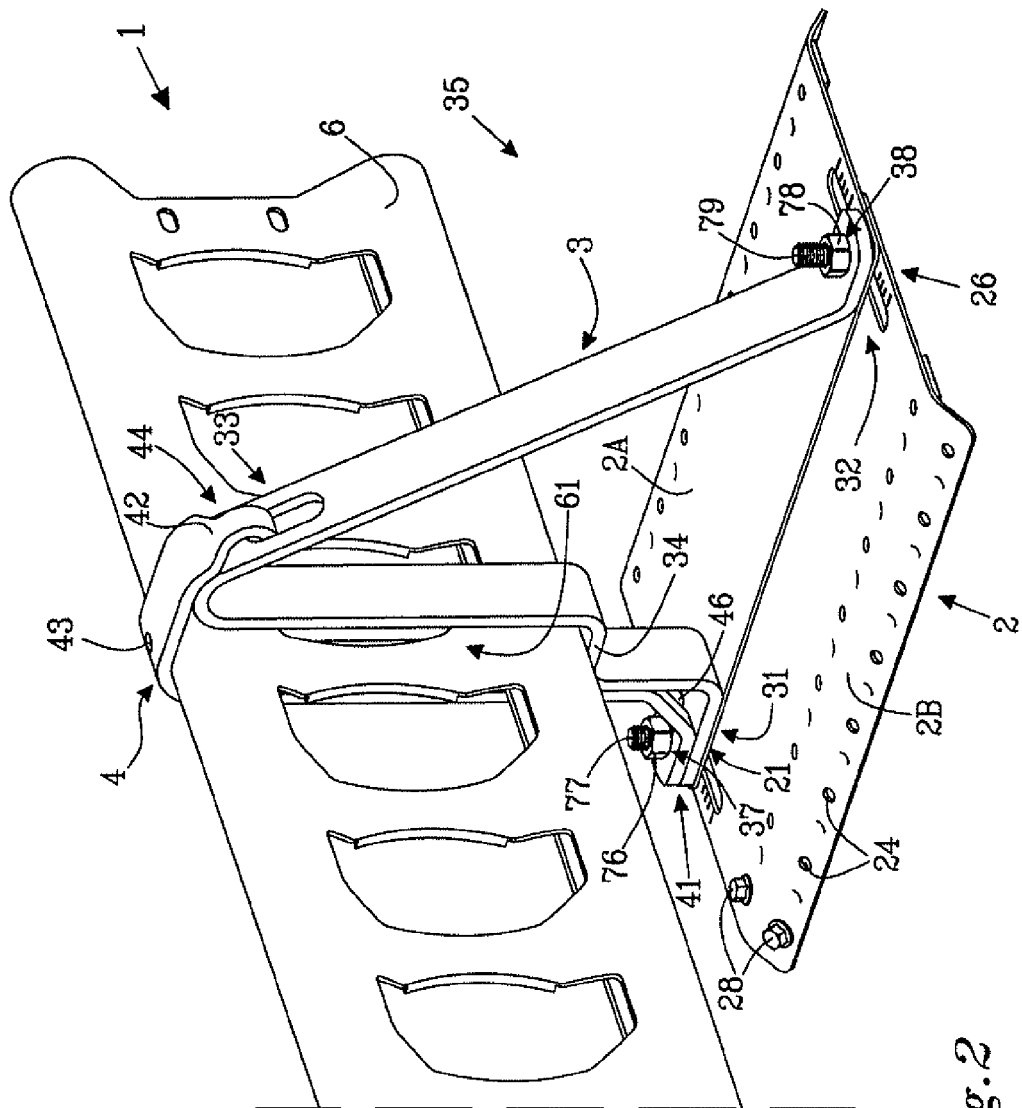


Fig. 2

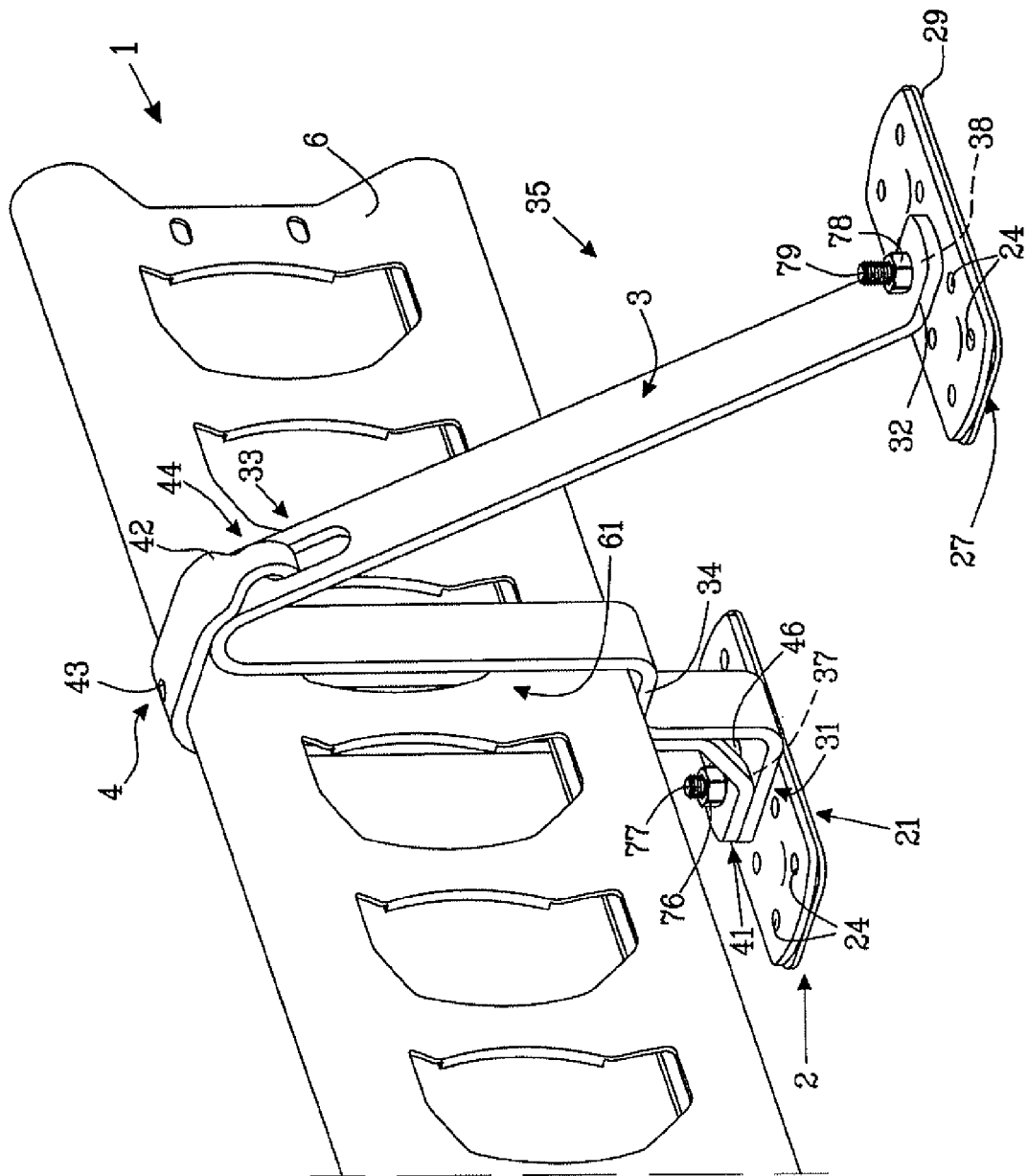
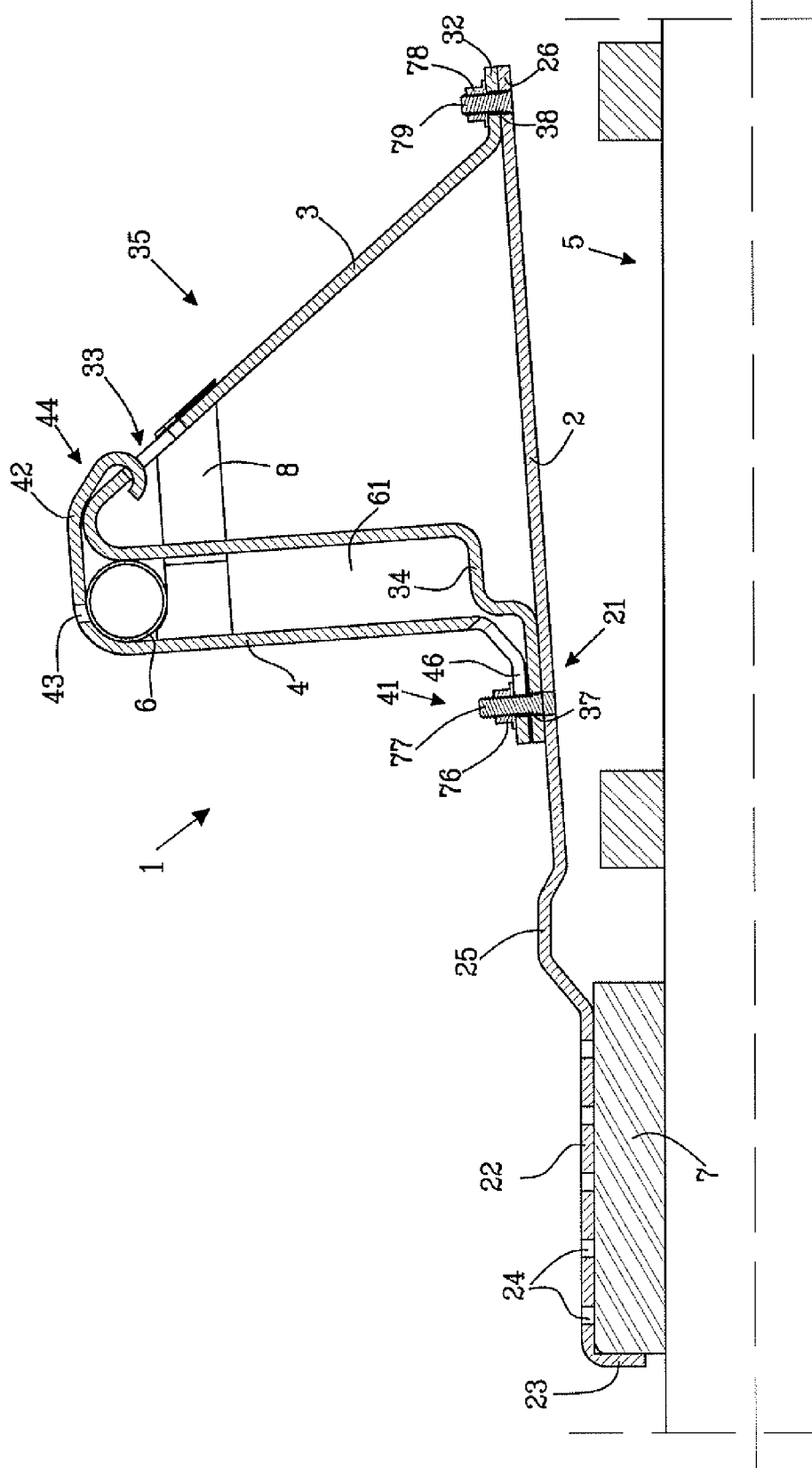


Fig. 3



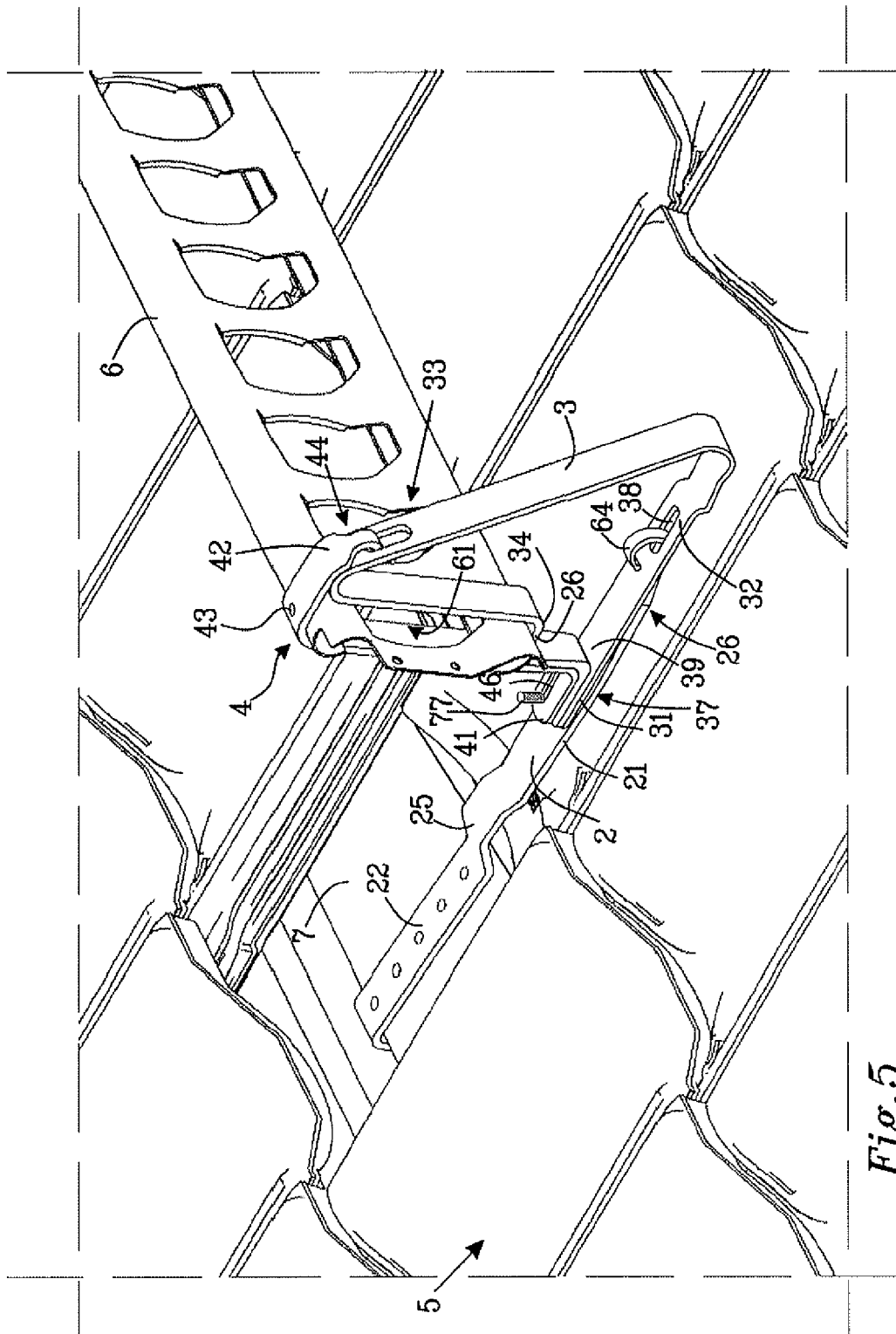


Fig. 5



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Application Number
EP 12 15 9838

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Place of search Munich		Date of completion of the search 13 August 2012	Examiner Giannakou, Evangelia
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