(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 4 474 608 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
11.12.2024 Bulletin 2024/50

(21) Application number: **24206263.6**

(22) Date of filing: **11.10.2024**

(51) International Patent Classification (IPC):
E06B 3/62 *(2006.01)* ***E06B 7/23*** *(2006.01)*

(52) Cooperative Patent Classification (CPC):
E06B 3/62; E06B 7/2309; E06B 2003/6208; E06B 2003/6211; E06B 2003/6223; E06B 2003/6264

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
GE KH MA MD TN

(30) Priority: **11.10.2023 NL 2036009**

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(54) **RETROFIT INSULATION STRIP AND METHOD FOR RETROFITTINGLY INSULATING A FRAME**

(57) The invention concerns a retrofit insulation strip configured for retrofittingly insulating an uneven gap between a frame and an element such as a door or window which is pivotably suspended therein. The retrofit insulation strip comprises an elongate carrier with a groove which extends in a lengthwise direction of the elongate carrier and an elongate flexible element. This elongate flexible element comprises an attachment part which extends in a cross direction relative to a lengthwise direction of the elongate flexible element and is arranged or arrangeable in the groove of the elongate carrier, a tube part which is connected with the attachment part and which defines a first hollow space which extends in the lengthwise direction of the elongate flexible element and further a first removable cap part which is connected with the tube part and which defines a second hollow space which extends in the lengthwise direction of the elongate flexible element between an inside of the first removable cap part and an outside of the tube part.

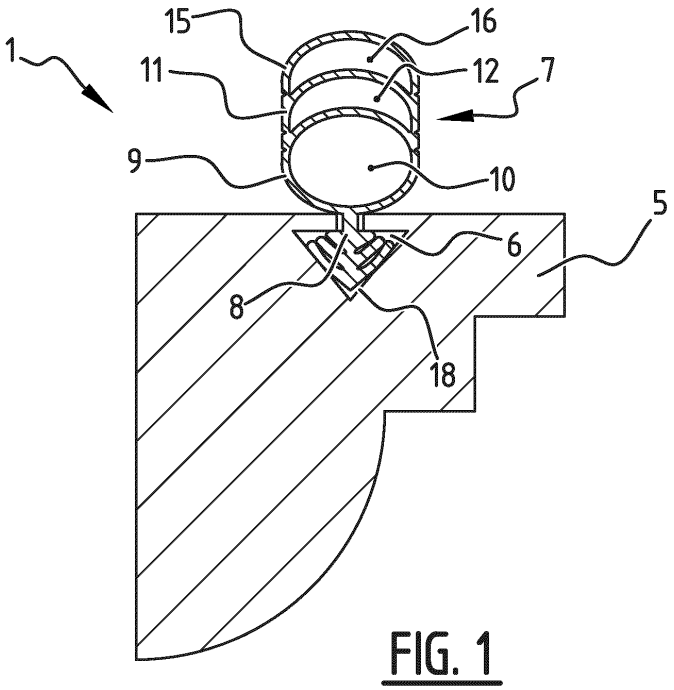

FIG. 1

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Description

[0001] The present invention concerns a retrofit insulation strip and method for retrofittingly insulating (i.e. insulating in retrofit of) a frame. It also concerns a frame provided with such a retrofit insulation strip, preferably by application of the method.

[0002] Insulating existing frames in retrofit meets present desires of improved insulation and sustainability. In practice, one experience obstacles with this. For example, a gap between the frame and the element that is suspended therein, such as a door or window, can be very uneven. Furthermore, a frame can be out of plumb, for example because of subsidence. In particular for monumental properties, known technologies lead to unsatisfactory results.

[0003] It is an objective of the invention to provide a retrofit insulation strip and a method for retrofittingly insulating a frame which address problems of known technologies and in particular are suitable for an uneven frame gap and/or a frame that is out of plomb.

[0004] To this end, the invention provides a retrofit insulation strip configured for retrofittingly insulating an uneven gap between a frame and an element that is pivotably suspended therein such as a door or window. The retrofit insulation strip comprises:

- an elongate carrier with a groove which extends in a lengthwise direction of the elongate carrier; and
- an elongate flexible element comprising:
    - an attachment part which extends in a cross direction relative to a lengthwise direction of the elongate flexible element and which is arranged or arrangeable in the groove of the elongate carrier;
    - a tube part which is connected with the attachment part and which defines a first hollow space which extends in the lengthwise direction of the elongate flexible element; and
    - a first removable cap part which is connected with the tube part and which defines a second hollow space which extends in the lengthwise direction of the elongate flexible element between an inside of the first removable cap part and an outside of the tube part.

[0005] This retrofit insulation strip is particularly suitable for an uneven frame gap and/or an out of plomb frame because the first removable cap part of elongate flexible element can be removed in those places where the uneven frame gap makes this necessary. Because the retrofit insulation strip is further composed of elongate components, it can be made to measure for frames which are out of plomb, for example by mitre sawing. At the same time, the elongate carrier can be arranged at a fixed distance from an edge of the frame such that irregularities in the gap and/or plumb position of the frame are mitigated by the retrofit insulation strip. The elongate flexible element thereby bridges the gap.

[0006] One or multiple removable cap parts of the elongate flexible element ensure a higher adaptability to varying gap sizes. Though a retrofit insulation strip would even be possible without removable cap parts, a tube part of such large size must then be applied that it will appears unsightly between frame and elongate carrier with strongly varying gap sizes.

[0007] In the context of the present invention, the term insulating is used for the sealing or bridging of the gap in a frame, such that no or less air can flow between interior side and exterior side of the frame.

[0008] The first removable cap part is preferably arranged opposite the attachment part on the tube part.

[0009] The removable cap part can be cut away with a knife or can be removed with another tool. However, the first removable cap part is preferably manually peelable connected with the tube part. Removing of the removable cap part is then possible even without tools and the installation of retrofit insulation strip is thereby also strongly simplified.

[0010] A waist (for example first waist) can be provided in a wall thickness of the elongate flexible element where the first removable cap part is connected with the tube part.

[0011] The waist of the wall thickness preferably comprises an elongate recess or a series of recesses which is arranged at the outside of the elongate flexible element and which extends in the lengthwise direction of the elongate flexible element. Because of this, the cap part is more readily removable, for example because a tool or a fingernail can engage easily on the cap part to remove it from the elongate flexible element, in particular by peeling. This also enables the visibility, from the exterior of the elongate flexible element, up to what height the cap part continues to measure or estimate whether and where one or multiple cap parts must be removed to make the retrofit insulation strip fit to the frame gap.

[0012] The elongate flexible element preferably comprises further a second removable cap part which is connected with the first removable cap part and which defines a third hollow space which extends in the lengthwise direction of the elongate flexible element between an inside of the second removable cap part and an outside of the first removable cap part.

[0013] The second removable cap part is preferably manually peelable connected with the first removable cap part. This in addition to or as an alternative of the first removable cap part being manually peelable or not.

[0014] A waist (for example second waist ter differentiate it from the abovementioned waist at the first removable cap part) is provided in a wall thickness of the elongate flexible element where the second removable cap part is connected with first removable cap part.

[0015] This waist of the wall thickness preferably comprises an elongate recess or a series of recesses which are arranged at the outside of the elongate flexible ele-

ment and which extend in the lengthwise direction of the elongate flexible element.

[0016] The first and/or second waist can be arranged at both sides of the elongate flexible element, preferably in the form of a pair of elongate recesses or two series of recesses, one at each side of the respective cap part.

[0017] Preferably, the tube part comprises a larger wall thickness than the first and/or second removable cap part. This ensures a higher stability and also ensures an easier removability, in particular manual peelability, of cap parts.

[0018] The first and/or second removable cap part preferably comprises a convex shape. A convex shape can better connect to an irregular surface. The curvature of this convex shape for example extends away from the tube part, the curvature is then convex.

[0019] The first and/or second removable cap part preferably comprises one or more than one protrusion. Protrusions can, separate from or more particularly in combination with a convex shape, ensure a better connection of the cap parts on an irregular surface. The protrusions such as herein described can, in additionally to or as alternatively, also be are arranged on the tube part. The protrusions are located at the outside of these parts.

[0020] The one or more than one protrusion preferably extends in the lengthwise direction of the elongate flexible element.

[0021] The one or more than one protrusion can form or comprise a plurality of ridges arranged in parallel. Such a configuration optimises the connection and thereby the insulation. The ridges can thus extend in the lengthwise direction of the elongate flexible element.

[0022] The elongate flexible element preferably has a constant shape as seen in cross-section.

[0023] The elongate flexible element is preferably implemented monolithically.

[0024] The elongate flexible element can be manufacture from a resilient polymer material, preferably comprising a natural rubber, a synthetic rubber or a silicone.

[0025] Preferably, the exterior contour of the attachment part of the elongate flexible element is formfitting with or clampable in the interior contour of the groove, as seen in a direction cross to the lengthwise direction of both the elongate carrier as well as the elongate flexible element. The elongate flexible element can hereby be held in the carrier.

[0026] The attachment part of the elongate flexible element preferably comprises one or more than one interior hollow space. Such an interior hollow space facilitates deformation of the attachment part, for example during clamping thereof in the groove.

[0027] Preferably, the one or more than one interior hollow space of the attachment part extends in the lengthwise direction of the elongate flexible element. The or each interior hollow space can extend parallel to the first hollow space of the tube part.

[0028] Alternatively or additionally, the or each interior hollow space of the attachment part extends in a cross direction relative to the lengthwise direction, in particular the cross direction in which the attachment part extends relative to the lengthwise direction of the elongate carrier.

[0029] The attachment part of the elongate flexible element preferably comprises a central shaft at which one or more than one cross flap is arranged which extend in a direction cross to the lengthwise direction the elongate flexible element from the central shaft.

[0030] The one or more than one cross flap can also extend towards the tube part of the elongate flexible element.

[0031] As alternative or additionally, the one or more than one cross flap can engage or be engageable as barbs on an inner surface of the groove of the elongate carrier.

[0032] Preferably, the groove comprises an access opening at the surface of the elongate carrier. The groove provide access to a cavity which lies deeper in the interior of the elongate carrier.

[0033] The central shaft of the attachment part and the access opening of the groove are preferably correspondingly dimensioned. As alternative or additionally, the one or more than one cross flap of the attachment part and the cavity of the groove can be correspondingly dimensioned.

[0034] The access opening preferably comprises a smaller dimension than the cavity, as seen in a direction cross to the lengthwise direction of the elongate carrier.

[0035] Preferably, the width of the cavity reduces, more preferably tapers, from the access opening towards the interior of the elongate carrier.

[0036] The groove or the cavity thereof can comprise an interior contour or shape which is selected from:

- a triangle, preferably with a side of the triangle at or near the surface of the elongate carrier and an angle of the triangle on the deepest point of the groove;
- a dovetail, preferably with the broadest flat side of the dovetail on the deepest point of the groove;
- a quadrilateral, preferably with a flat side of the quadrilateral on the deepest point of the groove;
- a pentagon, preferably with a flat side of the pentagon on or near the surface of the elongate carrier and an angle of the pentagon on the deepest point of the groove;
- an oval, preferably with the longest axis of the oval parallel to the surface of the elongate carrier; and
- a circle.

[0037] The groove can be direct arranged in the elongate carrier, wherein the elongate carrier exist of one base part. The groove can than for example be milled out of this base part. However, other implementations are also foreseen. For example, the elongate carrier can be constructed from multiple parts to form the groove therebetween. These multiple parts are preferably elongate and/or parallel arranged to each other. Such a construction simplifies arranging the groove, in particular

when it comprises a interior contour which is more difficult to manufacture, such as the abovementioned access opening with a cavity behind it.

[0038] As alternatively or additionally to this, an elongate insert element can be arranged or arrangeable between the elongate carrier and the elongate flexible element. This elongate insert element forms the groove of the elongate carrier. In this case, the elongate carrier can comprise a base groove, wherein the elongate insert element is arranged or arrangeable in the base groove. The elongate insert element can then define or form an interior contour of the groove, which in dimensions and/or shape deviates from the interior contour of the base groove. The elongate insert element and the elongate carrier can be made of the same material or of different materials. For example, metal, plastic or another deformable material can be chosen for the elongate insert element, which is easier to deform as starting material into a groove with the desired interior contour, and the elongate carrier can be manufacture of wood into which only an simple (for example rectangular) base groove then has to be arranged for attaching the elongate insert element therein.

[0039] The elongate insert element can be provided with engagement edges, preferably in the form of barbs, which are arranged on at least one of the inside of the elongate insert element, preferably to engage with the attachment part of the elongate flexible element, and the outside of the elongate insert element, preferably to engage with the elongate carrier, in particular the base groove thereof. The inside of the elongate insert element determines the interior contour of the groove.

[0040] The groove of the elongate carrier is preferably arranged in a first flat side of the carrier. The elongate carrier can further comprise a second flat side, wherein the first flat side and the second flat side preferably touch each other under an angle of 90°. The remaining sides of the elongate carrier can define a decorative profile.

[0041] The elongate carrier in cross-section preferably has a constant shape. If both the elongate carrier as well as the elongate flexible element exhibit a constant shape or cross-section, the retrofit insulation strip as a whole can also have a constant cross-section.

[0042] The elongate carrier is preferably manufactured of wood. Other materials are in principle possible, such as plastics, metals or composites. For the wood, preferably consideration is given to hardwood, such as African or Asian hardwood. In particular, mansonia and meranti wood types have been found suitable for this application.

[0043] The elongate carrier preferably comprises an attachment side where the groove is not arranged for attachment to the frame, in particular an inner surface of the frame. The attachment side can be the second flat side such as described hereabove.

[0044] An adhesive band can be arranged on the attachment side of the elongate carrier. Alternatively or additionally, one or more than one magnet can be arranged on or in the attachment side of the elongate carrier. The one or more than one magnet preferably comprises a magnet band.

[0045] The retrofit insulation strip, or the elongate carrier thereof, is further preferably provided with an adjustment mechanism which comprises one or more than one through hole, wherein the through hole extends in a direction cross to the groove through the elongate carrier and comprise an elongate cross-section in a direction cross to both the groove as well as the extension of the through hole. The through hole preferably extends through the second flat side or the attachment side.

[0046] The elongate carrier can comprise, next to the first groove already present, comprise an additional groove which is arranged at a distance cross relative to the lengthwise direction of the elongate carrier next to the first groove. An additional elongate flexible element can be arranged in the additional groove. The additional groove preferably conforms to the features of the (first) groove such as herein described. The additional elongate flexible element preferably conforms to the features of the (first) elongate flexible element such as herein described.

[0047] Further, the invention provides a frame in which a suspended element, such as a door or window, is pivotably attached and which is provided with one or more than one retrofit insulation strip such as described herein, wherein the elongate carrier of the retrofit insulation strip is arranged at an inner surface of the frame and the elongate flexible element of the retrofit insulation strip is, in a closed position of the suspended element, in contact with an outer surface of the suspended element facing the frame. If the retrofit insulation strip also comprises the additional elongate flexible element, the additional elongate flexible element is preferable also in contact with the frame-facing outer surface of the suspended element in the closed position of the suspended element.

[0048] The first removable cap part and/or the second removable cap part is preferably present or absent based on a gap to be bridged between the frame and the suspended element in the closed position.

[0049] The elongate carrier of the retrofit insulation strip can be attached to the inner surface of the frame by adhesive.

[0050] Alternatively or additionally, the elongate carrier of the retrofit insulation strip can be attached to the inner surface of the frame by magnetic force.

[0051] Alternatively or additionally, the elongate carrier of the retrofit insulation strip can be attached to the inner surface of the frame by staples, nails or screws.

[0052] Further, the invention provides a method for retrofittingly insulating a frame in which a suspended element, such as a door or window, is pivotably attached. The method comprises:

- providing one or more than one retrofit insulation strip such as described herein;
- determining a gap to be bridged between the frame and the suspended element in the closed position

thereof;

- locally removing, preferably peeling, the first removable cap part and/or the second removable cap part dependent on the determined gap to be bridged;
- arranging the elongate carrier of the retrofit insulation strip to an inner surface of the frame such that the elongate flexible element of the retrofit insulation strip, in a closed position of the suspended element, is in contact with an outer surface of the suspended element facing the frame.

[0053] The gap to be bridged between frame and suspended element is not always constant and can vary. By locally removing or peeling the cap parts depending on the local variation in gap depth, the gap can be bridged by the retrofit insulation strip(s). A frame often has multiple sides with a gap, which can each be bridged by one or multiple subsequent retrofit insulation strips. By sawing off ends of the strips under an appropriate angle, an inset frame can be provided to bridge the gap all around. Because the elongate flexible element is implemented as peelable, the carrier can be arranged on a constant position relative to the frame, in particular an interior side thereof, irrespective of the variation in the gap to be bridged. This results in a better finishing, which can cause a reduction in possible resistance with users for retrofit insulation.

[0054] The method preferably provides a frame such as is described herein, which is thereby thus provided with the one or more than one retrofit insulation strip.

[0055] Finally, the elongate flexible element such as shown and described herein can also be applied on its own separate from the retrofit insulation strip described herein. An elongate flexible element conforming to the embodiments described herein can in particular be subject of potential divisional patent applications. The elongate carrier such as shown and described herein can also be applied on its own separate from the retrofit insulation strip described herein and can be subject of potential divisional patent applications.

[0056] Aspects of the invention are further elucidated in conjunction with the following figures.

FIG. 1 shows a retrofit insulation strip in cross-section.

FIG. 2 shows an interior view of a frame provided with retrofit insulation strips conform FIG. 1. The frame is here in closed state.

FIG. 3-5 show cross-sections of the frame of FIG. 2 on different positions in the frame with different frame gap sizes.

FIG. 6 shows an exterior view of the frame of FIG. 2 in opened state.

FIG. 7 shows a detailed view of two retrofit insulation strips of FIG. 6.

FIG. 8A - 8C show cross-sections of an elongate flexible element such as applied in the retrofit insulation strip of FIG. 1 - 7.

FIG. 9 shows a variant of an elongate flexible element in cross-section.

FIG. 10 - 12 show attachment possibilities of a retrofit insulation strip to a frame.

FIG. 13A - 13B show a variant of slidable magnetic attachment of a retrofit insulation strip to a frame in cross-section.

FIG. 14 shows a cross-section of a variant of slidable attachment of a retrofit insulation strip to a frame by means of cross grooves.

FIG. 15 shows a partial view of FIG. 14 on the retrofit insulation strip.

FIG. 16 - 17 show further variants of the retrofit insulation strip with an elongate flexible element in which the tube part and the attachment part are arranged under an angle.

FIG. 18 - 23 show cross-sections of variants of retrofit insulation strips, in particular of elongate carriers and elongate flexible elements thereof.

FIG. 24A - 25B show variants of an elongate carrier of multiple parts.

[0057] The following reference numbers are used.

1	retrofit insulation strip
2	gap
3	frame
4	suspended element
5	elongate carrier
6	groove
7	elongate flexible element
8	attachment part
9	tube part
10	first hollow space
11	first removable cap part
12	second hollow space
13	distance
14	waist
15	second removable cap part
16	third hollow space
17	exterior contour
18	interior contour
19	central shaft
20	cross flap
21	third removable cap part
22	fourth hollow space
23	protrusion
24	interior hollow space
25	nail
26	magnet
27	adhesive
28	attachment side
29	inner surface
30	groove side
31	distance
32	adjustment mechanism
33	through hole or cross groove

34 screw
35 cover element
36 decorative profile
37 access opening
38 cavity
39 base part
40 auxiliary part
41 insert element
42 base groove
43 engagement edge

[0058] FIG. 1 shows a cross-section of a retrofit insulation strip 1 which is configured for retrofittingly insulating an uneven gap 2 between a frame 3 and an element 4 such as a door or window which is pivotably suspended in said frame. The retrofit insulation strip 1 comprises an elongate carrier 5 with a groove 6. The groove 6 extends in a lengthwise direction of the elongate carrier 5. This lengthwise direction extends cross to the plane of the drawing. Further, the retrofit insulation strip 1 comprises an elongate flexible element 7. The elongate flexible element 7 comprises an attachment part 8 which extends in a cross direction relative to a lengthwise direction of the elongate flexible element 7. This lengthwise direction also extends cross to the plane of the drawing. The attachment part 8 is arranged in the groove 6 of the elongate carrier 5, or at least arrangeable therein. The elongate flexible element 7 further comprises a tube part 9 which is connected with the attachment part 8. The tube part 9 defines a first hollow space 10 which extends in the lengthwise direction of the elongate flexible element. The elongate flexible element 7 also comprises a first removable cap part 11 which is connected with the tube part 9. The first removable cap part 11 defines a second hollow space 12 which extends in the lengthwise direction of the elongate flexible element 7 between an inside of the first removable cap part 11 and an outside of the tube part 9.

[0059] The elongate carrier 5 is here made from wood while the elongate flexible element 7 is made from a resilient polymer material, such as a natural rubber, a synthetic rubber or a silicone. Whatever the material choice is, it is advantageous to implement the elongate carrier 5 with a stiffer material than the elongate flexible element 7.

[0060] In the illustrated examples, the elongate flexible element 7 has a constant shape in cross-section. That is to say, along the lengthwise direction in which the elongate flexible element 7 extends, it is even in shape (unless of course cap parts have been partially removed). The elongate flexible element 7 is preferably monolithic in the case. The illustrated examples exist out of one piece.

[0061] Aspects of the elongate flexible element 7 are further elucidated in FIG. 8A - 8C.

[0062] FIG. 2 shows an interior view of a frame 3 provided with retrofit insulation strips 1 such as shown in FIG. 1. In the frame 3, a suspended element 4, such as a door or window, is pivotably attached. The frame 3 is provided with one or more than one retrofit insulation strip 1, wherein the elongate carrier 5 of the retrofit insulation strip 1 is arranged at an inner surface of the frame 3 and the elongate flexible element 7 of the retrofit insulation strip 1, in a closed position of the suspended element 4, is in contact with an outer surface of the suspended element 4 facing the frame 3. The or each retrofit insulation strip 1 can be arranged at the inner surface of the frame 3 in different ways. Examples are shown in FIG. 10 - 15.

[0063] The frame 3 is here shown in closed state, that is to say, the suspended element 4 is closed towards the frame 3 wherein a gap 2 is formed between the frame 3 and the suspended element 4.

[0064] This gap 2 is insulated by five retrofit insulation strips 1, such as is also depicted in the cross-sections of FIG. 3-5. The elongate carrier 5 is attached at the frame 3 on a constant distance 13, while the elongate flexible element 7 is adapted to the size of the gap 2 to bridge it at all positions.

[0065] In FIG. 3, the suspended element 4 closes onto the first removable cap part 11 of the elongate flexible element 7 with little compression thereof. In FIG. 4, the gap 2 is smaller, whereby the elongate flexible element 7, in particular the first removable cap part 11 thereof, is compressed. In FIG. 5, the gap 2 is even smaller and the first removable cap part 11 is removed.

[0066] FIG. 6 shows an exterior view of this frame 3 in opened state. The suspended element 4, here a window, is pivoted open from the frame 3. While FIG. 2 shows a view from an interior side of the frame 3, FIG. 6 offers a perspective from an exterior side of the frame 3. The retrofit insulation strips 1 are visible here. FIG. 7 shows a detailed view of two retrofit insulation strips 1 such as are visible in FIG. 6 in an angle of the frame 3. The two retrofit insulation strips 1 form an angle, here about perpendicular, to fit into the frame 3. The retrofit insulation strips 1 can be sawed off at different angles to be mounted correspondingly into a frame 3, also when the frame 3 is out of plomb and the angles between subsequent retrofit insulation strips 1 are not perpendicular.

[0067] With that, FIG. 2-7 also illustrate a method for retrofittingly insulating a frame 3 in which a suspended element 4, such as a door or window, is pivotably attached. The method comprises providing one or more than one retrofit insulation strip 1, determining a gap to be bridged 2 between the frame 3 and the suspended element 4 in the closed position thereof, locally removing (preferably peeling) the first removable cap part 11 and/or the second removable cap part dependent on the determined gap to be bridged 2 and arranging the elongate carrier of the retrofit insulation strip at an inner surface of the frame such that the elongate flexible element of the retrofit insulation strip in a closed position of the suspended element is in contact with an outer surface of the suspended element facing the frame.

[0068] Locally removing of the first removable cap part 11 can also, dependent on the determined gap to be

bridged 2, comprise removing one or more than one further removable cap part (for example the second cap part such as described below). The removing of cap parts preferably comprises the peeling thereof.

[0069] With such a method, a frame 3 can be provided which is provided with one or more than one retrofit insulation strip 1, wherein the elongate carrier 5 of the retrofit insulation strip 1 is arranged at an inner surface of the frame 3 and the elongate flexible element 7 of the retrofit insulation strip 1 in a closed position of the suspended element 4 is in contact with an outer surface of the suspended element 4 which is facing the frame 3. Preferably, the first removable cap part 11, possibly also one or more than one further removable cap part, is here present or absent based on a gap to be bridged 2 between the frame 3 and the suspended element 4 in the closed position.

[0070] FIG. 8A - 8C show cross-sections of an elongate flexible element 7 such as applied in the retrofit insulation strip 1 of FIG. 1. In this elongate flexible element 7, the first removable cap part 11 is arranged opposite the attachment part 8 on the tube part 9. Other positions are also possible, for example such as shown in FIG. 16 and 17.

[0071] The first removable cap part 11 is manually peelable connected with the tube part 9. This can be implements in different ways. In the illustrated example, a waist 14 is provided in a wall thickness of the elongate flexible element 7 where the first removable cap part 11 is connected with the tube part 9. The waist 14 of the wall thickness is, for example, an elongate recess or a series of recesses which is arranged at the outside of the elongate flexible element 7 and which extends in the lengthwise direction of the elongate flexible element 7.

[0072] The elongate flexible element 7 can also comprise additional cap parts in addition to the first removable cap part 11. In this example, the elongate flexible element 7 further comprises a second removable cap part 15 which is connected with the first removable cap part 11. The second removable cap part 15 defines a third hollow space 16 which extends in the lengthwise direction of the elongate flexible element 7 between an inside of the second removable cap part 15 and an outside of the first removable cap part 11.

[0073] The second removable cap part 15 is manually peelable connected with the first removable cap part 11, because here waist 14 is also provided in a wall thickness of the elongate flexible element 7 where the second removable cap part 15 is connected with first removable cap part 11. This waist 14 of the wall thickness can also comprise an elongate recess or a series of recesses which is arranged at the outside of the elongate flexible element 7 and which extend in the lengthwise direction of the elongate flexible element 7.

[0074] Such a waist 14 is also shown in the tube part 9, which can thereby be taken apart in two parts. This waist 14 is optional and in some cases even undesirable because the tube part 9 could be ripped open accidentally. However, also if the tube part 9 is ripped open, it can still connect to the suspended element 4 of the frame 3 and an insulating hollow space (similar to the first hollow space 10) can form between oppositely arranged walls of the tube part 9 and the suspended element 4.

[0075] In FIG. 8C, the exterior contour 17 of the attachment part 8 of the elongate flexible element 7 is indicated. This exterior contour 17 is preferably formfitting with, or at least clampable in, the interior contour 18 of the groove 6 of the elongate carrier 5. Here, both the exterior contour 17 as well as the interior contour 18 are regarded in a direction cross to the lengthwise direction of both the elongate carrier 5 as well as the elongate flexible element 7. In FIG. 1 can be seen how the exterior contour 17 of the attachment part 8 fits in the interior contour 18 of the groove 6.

[0076] The attachment part 8 of the elongate flexible element 7 can comprise a central shaft 19 at which one or more than one cross flap 20 is arranged. Such cross flaps 20 extends in a direction cross to the lengthwise direction the elongate flexible element 7 from the central shaft 19. As is shown, the cross flaps 20 are preferably symmetrically arranged relative to the central shaft 19.

[0077] The one or more than one cross flap 20 in the illustrated example also extends towards the tube part 9 of the elongate flexible element 7. Hereby, the one or more than one cross flap 20 can engage as barbs, or at least be engageable, with an inner surface or interior contour 18 of the groove 6 of the elongate carrier 5.

[0078] FIG. 9 shows a variant of an elongate flexible element 7 in cross-section. This variant also comprises the tube part 9, the first cap part 11 and the second cap part 15 with the associated hollow spaces 10, 12, 16. The waists 14 are also provided. This aspects can correspond with the embodiments described above. As was mentioned before, the second removable cap part 15 is optional in all embodiments. The illustrated example further comprises the attachment part 8 with the optional cross flaps 20.

[0079] However, aspects (a) to (d) mentioned below are different from the embodiment of FIG. 1. These are optional and can be applied separately from each other, but also in combination, in the elongate flexible element 7.

(a) The tube part 9 comprises a larger wall thickness than the first and/or second removable cap part 11, 15.

(b) A third removable cap part 21 is provided, which is attached at the second removable cap part 15, preferably by means of a waist 14 such as described above. The third removable cap part 21 defines a fourth hollow space 22 between the inside of the third removable cap part 21 and the outside of the second removable cap part 15.

(c) At least one of the tube part 9, the first removable cap part 11, the second removable cap part 15 and

the third removable cap part 21 comprises one or more than one protrusion 23. In FIG. 9, all four of these mentioned parts 9, 11, 15, 21 are provided with protrusions 23. In the illustrated example, the protrusions 23 extend in the lengthwise direction of the elongate flexible element 7 and form a plurality of ridges arranged in parallel.

(d) The attachment part 8 of the elongate flexible element 7 comprises an interior hollow space 24. In general, one or more than one interior hollow space 24 can be provided in the attachment part 8, in particular in the central shaft 19 thereof. In the illustrated example, the interior hollow space 24 extends in the extension direction of the attachment part 7. This extension direction corresponds to the cross direction in which the attachment part 8 extends relative to the lengthwise direction of the elongate flexible element 7. In addition to this or as alternative, the interior hollow space 24 extends in the lengthwise direction of the elongate flexible element 7. For example, multiple interior hollow spaces 24 can be arranged in the attachment part 8 which extend in parallel.

[0080] FIG. 10 - 15 show attachment possibilities of a retrofit insulation strip at a frame. The variants of FIG. 13A - 15 have an advantageous shifting possibility.

[0081] FIG. 10 shows attachment by means of a nail 25. A screw or staple is also conceivable in stead of the nail 25. These and the other illustrated attachment possibilities preferably lead to an attachment of the attachment side 28 of the elongate carrier 5 at the frame 3, in particular an inner surface 29 of the frame 3. The attachment side 28 is to be distinguished from a groove side 30 of the elongate carrier 5 in which the groove 6 is arranged. The elongate carrier 5 is in this context further elucidated using FIG. 18 - 25B.

[0082] FIG. 11 shows attachment by means of magnets 26. On the one hand, a first magnet 26 is recessed into the frame 3, on the other hand, a second magnet 26 is recessed into the elongate carrier 5 of the retrofit insulation strip 1. The first and second magnet 26 attract each other. The magnets 26 can also be implemented without recess or only partially recessed. It is also possible to arrange one or both magnets 26 in the frame 3 and/or the elongate carrier 5 with a cover, wherein the magnets 26 and the cover are chosen such that the magnetic force is still sufficient to attach the retrofit insulation strip 1 to the frame 3.

[0083] In FIG. 12, the elongate carrier 5 of the retrofit insulation strip 1 is attached to the inner surface of the frame 3 attached by a layer of adhesive 27. The layer of adhesive 27 can be implemented as an adhesive band which is arranged on the attachment side 28 of the elongate carrier 5.

[0084] FIG. 13A - 13B show a variant of slidable magnetic attachment of a retrofit insulation strip 1 at a frame 3 in cross-section. A first magnet 26 in the form of a magnet band is attached at the attachment side 28 of the elongate carrier 5 and a second magnet 26, also in the form of a magnet band, is attached at the inner surface 29 of the frame 3. The magnet band 26 preferably covers practically the complete attachment surface 28, that is to say, at least 80%, more preferably at least 90% thereof.

[0085] The retrofit insulation strip 1 in this embodiment can be shifted easily towards the gap 2 between the frame 3 and the suspended element 4. Hereby, the distance 31 between the elongate carrier 5 and the suspended element 4 is easily adjustable. In FIG. 13B, the elongate carrier 5 is shifted relative to FIG. 13A towards the suspended element 4.

[0086] A variant of such a slidable attachment of the retrofit insulation strip 1 at the frame 3 is shown in FIG. 14 - 15. Use is here made of cross grooves. FIG. 14 shows a cross-section and FIG. 15 shows a partial top view onto the retrofit insulation strip 1.

[0087] In this example, the elongate carrier 5 is provided with an adjustment mechanism 32 which comprises one or more than one through hole 33, wherein the through hole 33 extends through the elongate carrier 5 in a direction cross to the groove 6 and comprises an elongate cross-section in a direction cross to both the groove 6 as well as the extension of the through hole 33. The through hole 33 thereby forms a so-called cross groove. The through hole 33 preferably extends through the second flat side or attachment side 28. A screw 34 or other replaceable attachment means can be used to fix the elongate carrier 5 on the desired position in the cross groove 33. Cover elements 35 can be applied to cover the through holes or cross grooves 33.

[0088] FIG. 16 - 17 show further variants of the retrofit insulation strip 1 with an elongate flexible element 7 in which the tube part 9 and the attachment part 8 are arranged under an angle. In FIG. 16, the tube part 9 comes into contact with the elongate carrier 5 asymmetrically around the groove 6, in particular towards the frame 3. Hereby, possible protrusions of the elongate flexible element 7 outside the gap 2 and/or over the suspended element 4 are further reduced. In FIG. 17, the attachment part 8 comprises a kink and the groove 6 is correspondingly shaped. In this configuration, the elongate flexible element 7 can be anchored even more strongly into the elongate carrier 5.

[0089] FIG. 18 - 23 show cross-sections of variants of retrofit insulation strips 1, in particular of elongate carriers 5 and elongate flexible elements 7 thereof. The elongate carrier 5 comprises an attachment side 28 for attachment at the frame 3. In this attachment side 28, the groove 6 is not arranged. The groove 6 is arranged in a groove side 30 of the elongate carrier 5.

[0090] In the illustrated embodiments, the groove 6 of the elongate carrier 5 is arranged in a first flat side 30 of the carrier. Here, this first flat side 30 is the groove side 30. The elongate carrier 5 further comprises a second flat side 28, here the attachment side 28, wherein the

first flat side 30 and the second flat side 28 touch each other under an angle of 90°. The remaining sides 36 of the elongate carrier 5 preferably define a decorative profile 36, for example such as shown in FIG. 18 and 19.

[0091] The elongate carrier 5 is shown in cross-section and preferably has a constant cross-section or shape over the lengthwise direction of the elongate carrier 5.

[0092] FIG. 18 shows the elongate carrier 5 such as is also visible in FIG. 1. The exterior contour 17 of the attachment part 8 of the elongate flexible element 7 is here formfitting with or clampable in the interior contour 18 of the groove 6, as seen in a direction cross to the lengthwise direction of both the elongate carrier 5 as well as the elongate flexible element 7 (which corresponds to the view in cross-section of FIG. 1 and 18, for example).

[0093] The groove 6 of FIG. 18, 20, 21 and 23 has an access opening 37 at the surface (for example the first flat side or groove side 30) of the elongate carrier 5 which provided access to a cavity 38 which lies deeper in the interior of the elongate carrier 5. The access opening 37 forms an overhang relative to the cavity 38, such that the attachment part 8 of the elongate flexible element 7 can engage with the groove 6 from within. The elongate flexible element 7 is thus more strongly anchored in the groove 6. To this end, the access opening 37 can comprise a smaller dimension than the cavity 38, as seen in cross-section onto the lengthwise direction of the elongate carrier 5.

[0094] The central shaft 19 of the attachment part 8 and the access opening 37 of the groove 6 are preferably correspondingly dimensioned. The one or more than one cross flap 20 of the attachment part 8 and the cavity of the groove 6 are also correspondingly dimensioned.

[0095] FIG. 18, 20 and 21 further show a cavity 38 of which the width is reducing, preferably tapering, from the access opening 37 towards the interior of the elongate carrier 5. The groove 6, preferably the cavity 38, comprises an interior contour 17 which can comprise diverse shapes in cross-section.

[0096] For example, FIG. 18 shows a triangle with a side of the triangle at or near the surface 30 of the elongate carrier 5 and an angle of the triangle on the deepest point of the groove 6 or cavity 38.

[0097] FIG. 20 shows a dovetail with the broadest flat side of the dovetail on the deepest point of the groove 6 or cavity 38.

[0098] FIG. 21 shows a pentagon with a flat side of the pentagon on or near the surface 30 of the elongate carrier 5 and an angle of the pentagon on the deepest point of the groove 6 or cavity 38. Because the elongate carrier 5 in this example further has a symmetric shape (here rectangular or even square), a first or second attachment side 28 can serve for attachment at the frame 3 here.

[0099] This aspect of symmetry can be applied to all variants of the elongate carrier 5 irrespective of other features.

[0100] FIG. 22 shows a quadrilateral with a flat side of the quadrilateral on the deepest point of the groove. In FIG. 22, the groove 6 is implemented not completely formfitting with the attachment part 8 of the elongate flexible carrier 7. Though this variant is sufficiently functional, it is preferred to use a formfitting groove 6.

[0101] Other shapes are, for example, an oval, preferably with the longest axis of the oval parallel to the surface of the elongate carrier, and a circle. These shapes are readily understood and not further illustrated.

[0102] FIG. 19 shows a variant of the elongate carrier 5 with an additional groove 6 which is arranged next to the groove 6 at a distance cross relative to the lengthwise direction of the elongate carrier. An additional elongate flexible element 7 can be arranged in the additional groove 6. The additional groove 6 preferably corresponds with the groove 6, but can also exhibit other features such as shown or described herein. The additional elongate flexible element 7 preferably corresponds with the elongate flexible element 7, but can also exhibit other features such as shown or described herein. In the illustrated example of FIG. 19, the groove 6 and the additional groove 6 have the shape of the groove in FIG. 18.

[0103] The elongate flexible element 7 in FIG. 22 corresponds with that of FIG. 1 and 8A - 8C, while FIG. 23 shows a further variant of the elongate flexible element 7. In this variant, the cap parts 11, 15 are not implemented as convex but flat. In the other embodiments the first and/or second removable cap part 11, 15 as well as the tube part 9 comprise a convex shape. Though the cross flaps 20 also extend from a central shaft 19, these only extend horizontally here, not towards the tube part 9. Nevertheless, the exterior contour 17 of the attachment part 8 and the interior contour 18 of the groove 6 are formfitting here, at least in the sense that the elongate flexible element 7 engages in the groove 6.

[0104] FIG. 24A - 25B show variants of an elongate carrier 5 which is assembled from multiple parts. The groove 6 of the elongate carrier 5 can be formed between these multiple parts.

[0105] The elongate carrier 5 of FIG. 24A - 24B is here constructed form a base part 39 and two auxiliary parts 40. Voor the rest, it corresponds to the elongate carrier 5 of FIG. 18. The base part 39 comprises the cavity 39 of the groove 6 and the two auxiliary parts 40 define the access opening 37 of the groove 6. The groove 6 is here thus formed between the base part 39 and the two auxiliary parts 40. Here, the auxiliary parts 40 are implemented as plates which mutually leave open a gap which forms the access opening 37.

[0106] The elongate carrier 5 of FIG. 25A - 25B is also constructed from multiple parts. The base part 39 and an auxiliary part 40, here implemented as an elongate insert element 41. In this example, the base part 39 of the elongate carrier 5 comprises a base groove 42 in which the elongate insert element 41 can be arranged. The elongate insert element 41 is then arranged between the elongate carrier 5, at least the base part 39 thereof, and the elongate flexible element 7. The interior contour 18 of the groove 6 of the elongate carrier 5 is now determined

by the elongate insert element 41. All properties of the groove 6 such as here described can thereby also be properties of the elongate insert element 41. For example, the elongate insert element 41 can form the access opening 37 and the cavity 38. The outside of the elongate insert element 41 can be configured as illustrated to be arranged or fitted into the base groove 42 of the elongate carrier 5.

[0107] As is illustrated, the elongate insert element 41 can be provided with engagement edges 43. An engagement edge 43 preferably extends parallel to the lengthwise direction of the elongate insert element 41 and extends in a direction cross to this lengthwise direction.

[0108] One or more engagement edges 43 can be arranged at the outside of the elongate insert element 41 but, as an alternative or in addition, can also be arranged at the inside of the elongate insert element 41. An engagement edge 43 at the outside of the elongate insert element 41 serves to engage in the base groove 42 of the elongate carrier 5 while an engagement edge 43 at the inside of the elongate insert element 41 serves to engage on the attachment part 8 of the elongate flexible element 7.

[0109] Preferably, engagement edges 43 are formed at the inside such that these come into engagement with cross flaps 20 of the attachment part 8, such as interlock in and between each other, when the attachment part 8 is inserted into the groove 6. Such engagement edges 43 preferably extend inwardly and in a depth direction of the groove 6. The engagement edges 43 can forms barbs in this way.

[0110] Similarly, engagement edges 43 are formed at the outside such that these can come into engagement with the base groove 42 when the elongate insert element 41 is placed in the elongate carrier 5. Such engagement edges 43 preferably extend outwardly and away from the depth direction of the groove 6, thus towards the opening of the groove 6, such as the access opening 37. In this case, the engagement edges 43 can also form barbs.

[0111] The elongate insert element 41 can be implemented as part of the elongate carrier 5, but can also be provided as a separate part of the retrofit insulation strip 1.

[0112] The elongate flexible element 7 such as shown and described herein can also be applied on its own, separate from the retrofit insulation strip 1 described herein. The following list of numbered examples are in particular provided here.

[0113] 1.1. An elongate flexible element, in particular for insulation and/or being an insulation element, comprising:

- an attachment part which extends in a cross direction relative to a lengthwise direction of the elongate flexible element and which is arrangeable in a groove;
- a tube part which is connected with the attachment part and which defines a first hollow space which extends in the lengthwise direction of the elongate flexible element; and
- a first removable cap part which is connected with the tube part and which defines a second hollow space which extends in the lengthwise direction of the elongate flexible element between an inside of the first removable cap part and an outside of the tube part.

[0114] 1.2. Elongate flexible element according to example 1.1, wherein the first removable cap part is arranged opposite the attachment part on the tube part.

[0115] 1.3. Elongate flexible element according to example 1.1 or 1.2, wherein the first removable cap part is manually peelable connected with the tube part.

[0116] 1.4. Elongate flexible element according to any of the examples 1.1 to 1.3, wherein a waist is provided in a wall thickness of the elongate flexible element where the first removable cap part is connected with the tube part.

[0117] 1.5. Elongate flexible element according to example 1.4, wherein the waist of the wall thickness comprises an elongate recess or a series of recesses which is arranged at the outside of the elongate flexible element and which extends in the lengthwise direction of the elongate flexible element.

[0118] 1.6. Elongate flexible element according to any of the examples 1.1 to 1.5, wherein the elongate flexible element further comprises a second removable cap part which is connected with the first removable cap part and which defines a third hollow space which extends in the lengthwise direction of the elongate flexible element between an inside of the second removable cap part and an outside of the first removable cap part.

[0119] 1.7. Elongate flexible element according to example 1.6, wherein the second removable cap part is manually peelable connected with the first removable cap part.

[0120] 1.8. Elongate flexible element according to example 1.6 or 1.7, wherein a waist is provided in a wall thickness of the elongate flexible element where the second removable cap part is connected with the first removable cap part.

[0121] 1.9. Elongate flexible element according to example 1.8, wherein the waist of the wall thickness comprises an elongate recess or a series of recesses which is arranged at the outside of the elongate flexible element and which extends in the lengthwise direction of the elongate flexible element.

[0122] 1.10. Elongate flexible element according to any of the examples 1.1 to 1.9, wherein the tube part comprises a larger wall thickness than the first and/or second removable cap part.

[0123] 1.11. Elongate flexible element according to any of the examples 1.1 to 1.10, wherein the first and/or second removable cap part comprises a convex shape.

[0124] 1.12. Elongate flexible element according to any of the examples 1.1 to 1.11, wherein at least one of the tube part, the first removable cap part and the second

removable cap part comprises one or more than one protrusion.

[0125] 1.13. Elongate flexible element according to example 1.12, wherein the one or more than one protrusion extends in the lengthwise direction of the elongate flexible element.

[0126] 1.14. Elongate flexible element according to example 1.12 or 1.13, wherein the one or more than one protrusion forms or comprises a plurality of ridges arranged in parallel.

[0127] 1.15. Elongate flexible element according to any of the examples 1.1 to 1.14, wherein the elongate flexible element has a constant shape in cross-section.

[0128] 1.16. Elongate flexible element according to any of the examples 1.1 to 1.15, wherein the elongate flexible element is monolithic.

[0129] 1.17. Elongate flexible element according to any of the examples 1.1 to 1.16, wherein the elongate flexible element is manufactured from a resilient polymer material, preferably comprising a natural rubber, a synthetic rubber or a silicone.

[0130] 1.18. Elongate flexible element according to any of the examples 1.1 to 1.17, wherein the attachment part of the elongate flexible element comprises one or more than one interior hollow space.

[0131] 1.19. Elongate flexible element according to example 1.18, wherein the one or more than one interior hollow space of the attachment part extends in the lengthwise direction of the elongate flexible element.

[0132] 1.20. Elongate flexible element according to example 1.18 or 1.19, wherein the one or more than one interior hollow space of the attachment part extends in the cross direction in which the attachment part extends relative to the lengthwise direction of the elongate carrier.

[0133] 1.21. Elongate flexible element according to any of the examples 1.1 to 1.20, wherein the attachment part of the elongate flexible element comprises a central shaft at which one or more than one cross flap is arranged which extends in a direction cross to the lengthwise direction the elongate flexible element from the central shaft.

[0134] 1.22. Elongate flexible element according to example 1.21, wherein the one or more than one cross flap also extends towards the tube part of the elongate flexible element.

[0135] The elongate carrier 5 such as shown and described herein can also be applied on its own, separate from the retrofit insulation strip 1 described herein. The following list of numbered examples is in particular foreseen.

[0136] 2.1. An elongate carrier with a groove which extends in a lengthwise direction of the elongate carrier, wherein the groove preferably is configured to receive an attachment part of an elongate flexible carrier according to any of the examples 1.1 to 1.22.

[0137] 2.2. Elongate carrier according to example 2.1, wherein the interior contour of the groove, as seen in a direction cross to the lengthwise direction of the elongate carrier, is formfitting with the exterior contour of the attachment part of an elongate flexible element such as described herein, in particular according to any of the examples 1.1 to 1.22.

[0138] 2.3. Elongate carrier according to example 2.1 or 2.2, wherein the groove comprises an access opening at the surface of the elongate carrier which provided access to a cavity which lies deeper in the interior of the elongate carrier.

[0139] 2.4. Elongate carrier according to example 2.3, wherein the access opening of the groove is dimensioned corresponding with a central shaft of the attachment part of an elongate flexible element according to any of the examples 1.1 to 1.22.

[0140] 2.5. Elongate carrier according to example 2.3 or 2.4, wherein the cavity of the groove is dimensioned corresponding with one or more than one cross flap of the attachment part of an elongate flexible element according to any of the examples 1.1 to 1.22.

[0141] 2.6 Elongate carrier according to any of the examples 2.3 to 2.5, wherein the access opening comprises a smaller dimension than the cavity, as seen in a direction cross to the lengthwise direction of the elongate carrier.

[0142] 2.7. Elongate carrier according to any of the examples 2.3 to 2.6, wherein the width of the cavity reduces, preferably tapers, from the access opening towards the interior of the elongate carrier.

[0143] 2.8. Elongate carrier according to any of the examples 2.1 to 2.7, wherein the groove, preferably the cavity thereof such as with the examples 2.3 to 2.7, comprises an interior contour in cross-section which is selected from:

- a triangle, preferably with a side of the triangle at or near the surface of the elongate carrier and an angle of the triangle on the deepest point of the groove;
- a dovetail, preferably with the broadest flat side of the dovetail on the deepest point of the groove;
- a quadrilateral, preferably with a flat side of the quadrilateral on the deepest point of the groove;
- a pentagon, preferably with a flat side of the pentagon on or near the surface of the elongate carrier and an angle of the pentagon on the deepest point of the groove;
- an oval, preferably with the longest axis of the oval parallel to the surface of the elongate carrier; and
- a circle.

[0144] 2.9. Elongate carrier according to any of the examples 2.1 to 2.8, wherein the elongate carrier is constructed from multiple parts is to form the groove therebetween.

[0145] 2.10. Elongate carrier according to any of the examples 2.1 to 2.9, provided with an elongate insert element which forms the groove of the elongate carrier and in which the elongate flexible element, at least the attachment part thereof, is arrangeable.

[0146] 2.11. Elongate carrier according to example

2.10, wherein the elongate carrier comprises a base groove and wherein the elongate insert element is arranged or arrangeable in the base groove.

[0147] 2.12 Elongate carrier according to example 2.10 or 2.11, wherein engagement edges are provided on at least one of:

- the inside of the elongate insert element to engage with the attachment part of the elongate flexible element; and
- the outside of the elongate insert element to engage with the elongate carrier, in particular the base groove thereof conform example 2.11.

[0148] 2.13 Elongate carrier according to example 2.12, wherein at least one of the engagement edges is in the form of a barb.

[0149] 2.14. Elongate carrier according to any of the examples 2.1 to 2.13, wherein the groove of the elongate carrier is arranged in a first flat side of the carrier.

[0150] 2.15. Elongate carrier according to example 2.14, wherein the elongate carrier further comprises a second flat side, wherein the first flat side and the second flat side preferably touch each other under an angle of 90°.

[0151] 2.16. Elongate carrier according to example 2.14 or 2.15, wherein the remaining sides of the elongate carrier define a decorative profile.

[0152] 2.17. Elongate carrier according to any of the examples 2.1 to 2.16, wherein the elongate carrier has a constant shape in cross-section.

[0153] 2.18. Elongate carrier according to any of the examples 2.1 to 2.17, wherein the elongate carrier is manufactured of wood.

[0154] 2.19. Elongate carrier according to any of the examples 2.1 to 2.18, wherein the elongate carrier comprises an attachment side where the groove is not arranged for attachment at a frame, wherein the attachment side is preferably the second flat side according to example 2.15.

[0155] 2.20. Elongate carrier according to example 2.19, provided with an adhesive band arranged on the attachment side of the elongate carrier.

[0156] 2.21. Elongate carrier according to example 2.19 or 2.20, provided with one or more than one magnet arranged on or in the attachment side of the elongate carrier.

[0157] 2.22. Elongate carrier according to example 2.21, wherein the one or more than one magnet forms or comprises a magnet band.

[0158] 2.23. Elongate carrier according to any of the examples 2.1 to 2.22, provided with an adjustment mechanism which comprises one or more than one through hole, wherein the through hole extends in a direction cross to the groove through the elongate carrier and comprises an elongate cross-section in a direction cross to both the groove as well as the extension of the through hole, wherein the through hole preferably extends through the second flat side according to example 2.15 and/or the attachment side according to example 2.19.

[0159] 2.24. Elongate carrier according to any of the examples 2.1 to 2.23, wherein the elongate carrier comprises an additional groove which is arranged at a distance cross relative to the lengthwise direction of the elongate carrier next to the groove, wherein the additional groove preferably complies with the features of the groove according to any of the examples 2.1 to 2.23.

[0160] The elongate carrier 5 and a matching elongate flexible element 7 can together form an assembly for a retrofit insulation strip 1, without requiring that these are actually coupled to each other. A kit or parts can also be provided which at least consists of one elongate carrier 5 and one elongate flexible element 7.

[0161] Though preferred examples of the invention are shown in the figures and associated description, the concept of the invention is not limited to these examples but defined by the following claims.

Claims

1. Retrofit insulation strip configured for retrofittingly insulating an uneven gap between a frame and an element such as a door or window pivotably suspended therein, wherein the retrofit insulation strip comprises:

    - an elongate carrier with a groove which extends in a lengthwise direction of the elongate carrier; and
    - an elongate flexible element comprising:

        - an attachment part which extends in a cross direction relative to a lengthwise direction of the elongate flexible element and which is arranged or arrangeable in the groove of the elongate carrier;
        - a tube part which is connected with the attachment part and which defines a first hollow space which extends in the lengthwise direction of the elongate flexible element;
        - a first removable cap part which is connected with the tube part and which defines a second hollow space which extends in the lengthwise direction of the elongate flexible element between an inside of the first removable cap part and an outside of the tube part; and
        - optionally, a second removable cap part which is connected with the first removable cap part and which defines a third hollow space which extends in the lengthwise direction of the elongate flexible element between an inside of the second removable cap part and an outside of the first remov-

able cap part.

2. Retrofit insulation strip according to claim 1, wherein the tube part comprises a larger wall thickness than the first and/or second removable cap part.

3. Retrofit insulation strip according to claim 1 or 2, wherein at least one of the tube part, the first removable cap part and the second removable cap part comprises one or more than one protrusion, wherein the one or more than one protrusion forms or comprises a plurality of ridges arranged in parallel which preferably extend in the lengthwise direction of the elongate flexible element.

4. Retrofit insulation strip according to any of the preceding claims, wherein the attachment part of the elongate flexible element comprises one or more than one interior hollow space, wherein the one or more than one interior hollow space of the attachment part optionally extends in at least one of:

- the lengthwise direction of the elongate flexible element; and
- the cross direction in which the attachment part extends relative to the lengthwise direction of the elongate carrier.

5. Retrofit insulation strip according to any of the preceding claims, wherein the groove comprises an access opening at the surface of the elongate carrier which provides access to a cavity which lies deeper in the interior of the elongate carrier, wherein the access opening comprises a smaller dimension than the cavity, as seen in a direction cross to the lengthwise direction of the elongate carrier.

6. Retrofit insulation strip according to claim 5, wherein the attachment part of the elongate flexible element comprises a central shaft at which one or more than one cross flap is arranged which extends from the central shaft in a direction cross to the lengthwise direction of the elongate flexible element, and wherein at least one of:

- the central shaft of the attachment part and the access opening of the groove are correspondingly dimensioned; and
- the one or more than one cross flap of the attachment part and the cavity of the groove are correspondingly dimensioned.

7. Retrofit insulation strip according to claim 5 or 6, wherein the width of the cavity reduces, preferably tapers, from the access opening towards the interior of the elongate carrier.

8. Retrofit insulation strip according to any of the preceding claims, wherein the groove, preferably the cavity thereof when dependent on at least claim 5, comprises an interior contour in cross-section which is selected from:

- a triangle, preferably with a side of the triangle at or near the surface of the elongate carrier and an angle of the triangle on the deepest point of the groove;
- a dovetail, preferably with the broadest flat side of the dovetail on the deepest point of the groove;
- a quadrilateral, preferably with a flat side of the quadrilateral on the deepest point of the groove;
- a pentagon, preferably with a flat side of the pentagon on or near the surface of the elongate carrier and an angle of the pentagon on the deepest point of the groove;
- an oval, preferably with the longest axis of the oval parallel to the surface of the elongate carrier; and
- a circle.

9. Retrofit insulation strip according to any of the preceding claims, wherein the elongate carrier is composed of multiple parts to form the groove there between.

10. Retrofit insulation strip according to any of the preceding claims, further comprising an elongate insert element which is arranged or arrangeable between the elongate carrier and the elongate flexible element and which forms the groove of the elongate carrier, wherein the elongate carrier comprises a base groove and wherein the elongate insert element is arranged or arrangeable in the base groove, wherein optionally engagement edges, preferably in the form of barbs, are provided on at least one of:

- the inside of the elongate insert element to engage with the attachment part of the elongate flexible element; and
- the outside of the elongate insert element to engage with the elongate carrier, in particular the base groove thereof.

11. Retrofit insulation strip according to any of the preceding claims, wherein the groove of the elongate carrier is arranged in a first flat side of the carrier, wherein the elongate carrier further comprises a second flat side, wherein the first flat side and the second flat side touch each other under an angle of 90°, wherein the remaining sides of the elongate carrier define a decorative profile.

12. Retrofit insulation strip according to any of the preceding claims, wherein the elongate carrier at least one of:

- has a constant shape in cross-section;
- comprises an attachment side where the groove is not arranged for attachment to the frame, wherein the attachment side is preferably the second flat side according to claim 11, further optionally comprising an adhesive band arranged on the attachment side of the elongate carrier and/or one or more than one magnet arranged or in the attachment side of the elongate carrier, wherein the one or more than one magnet preferably comprises or forms a magnet band;
- is provided with an adjustment mechanism which comprises one or more than one through hole, wherein the through hole extends in a direction cross to the groove through the elongate carrier and comprises an elongate cross-section in a direction cross to both the groove as well as the extension of the through hole, wherein the through hole preferably extends through the second flat side according to claim 11 and/or said attachment side; and
- comprises an additional groove which is arranged at a distance cross relative to the lengthwise direction of the elongate carrier next to the groove and an additional elongate flexible element is arranged in the additional groove, wherein preferably the additional groove conforms to the features of the groove and/or the additional elongate flexible element conforms to the features of the elongate flexible element according to any of the preceding claims.

13. Frame in which a suspended element, such as a door or window, is pivotably attached and which is provided with one or more than one retrofit insulation strip according to any of the claims 1 to 12, wherein the elongate carrier of the retrofit insulation strip is arranged at an inner surface of the frame and the elongate flexible element of the retrofit insulation strip, in a closed position of the suspended element, is in contact with an outer surface of the suspended element facing the frame, wherein optionally at least one of:

- the first removable cap part and/or second removable cap part is present or absent based on a gap to be bridged between the frame and the suspended element in the closed position;
- the elongate carrier of the retrofit insulation strip is attached at the inner surface of the frame by adhesive;
- the elongate carrier of the retrofit insulation strip is attached to the inner surface of the frame by magnetic force;
- the elongate carrier of the retrofit insulation strip is attached to the inner surface of the frame by staples, nails or screws.

14. Method for retrofittingly insulating a frame in which a suspended element, such as a door or window, is pivotably attached, wherein the method comprises:

- providing one or more than one retrofit insulation strip according to any of the claims 1 to 12;
- determining a gap to be bridged between the frame and the suspended element in the closed position thereof;
- locally removing, preferably peeling, the first removable cap part and/or the second removable cap part dependent on the determined gap to be bridged;
- arranging the elongate carrier of the retrofit insulation strip at an inner surface of the frame such that the elongate flexible element of the retrofit insulation strip, in a closed position of the suspended element, is in contact with an outer surface of the suspended element facing the frame, wherein preferably a frame according to claim 13 is provided.

15. Elongate flexible element and/or elongate carrier conform the elongate flexible element and/or the elongate carrier, respectively, of a retrofit insulation strip according to one of the claims 1 to 12.

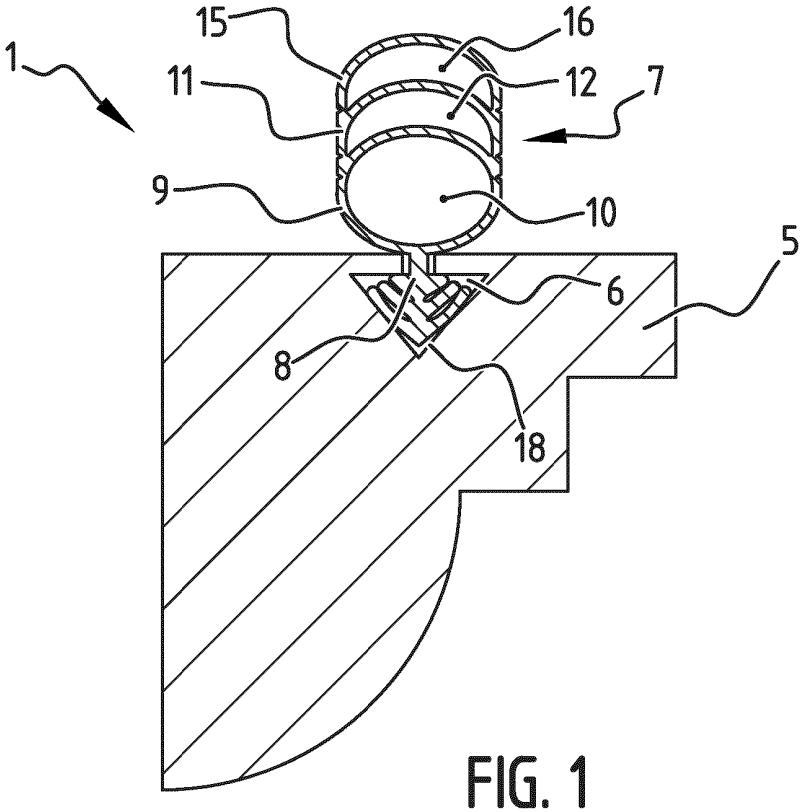

FIG. 1

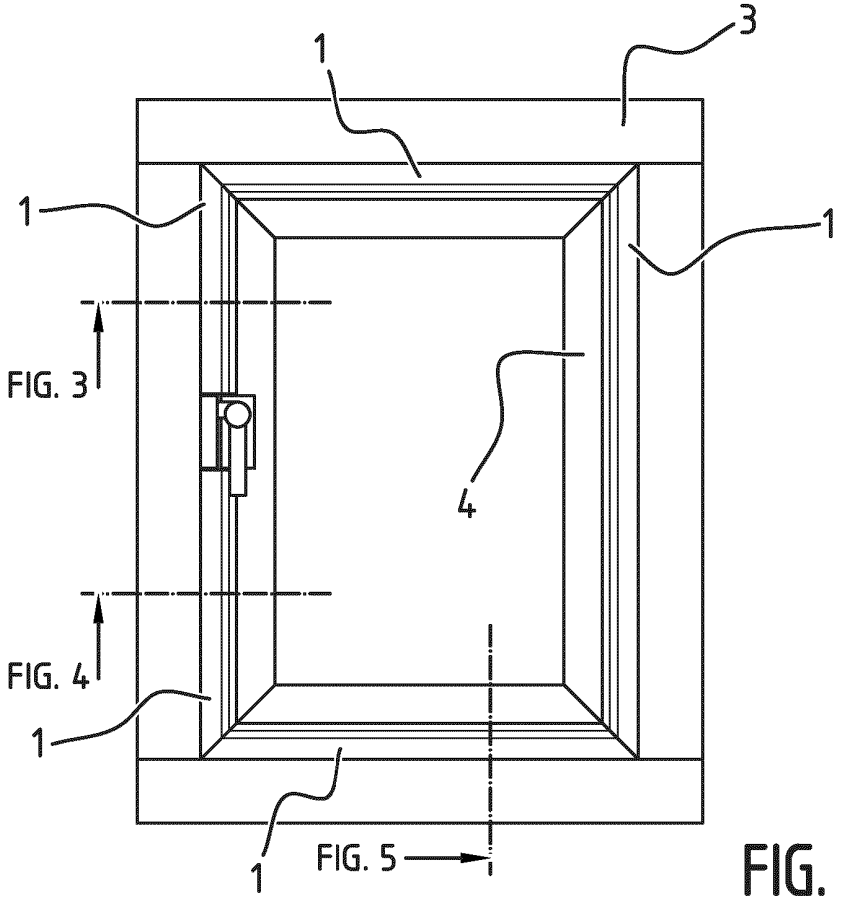

FIG. 2

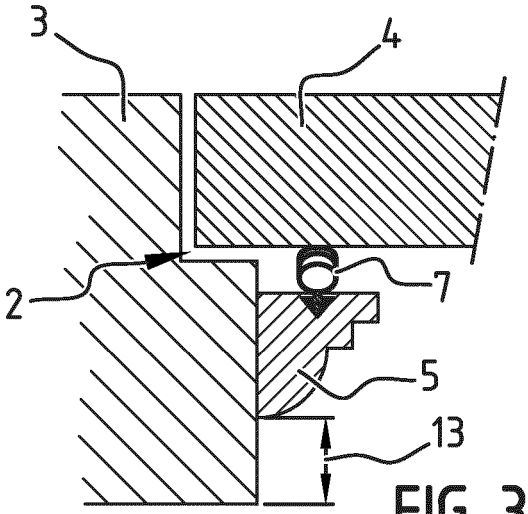

FIG. 3

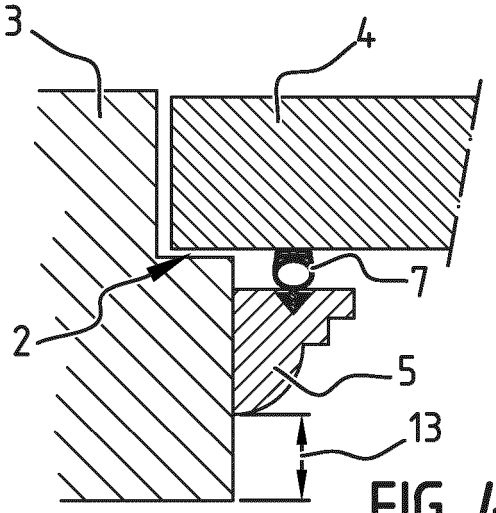

FIG. 4

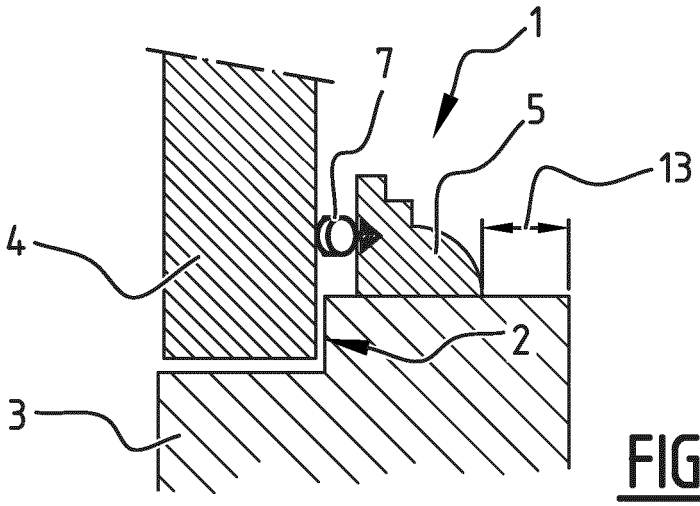

FIG. 5

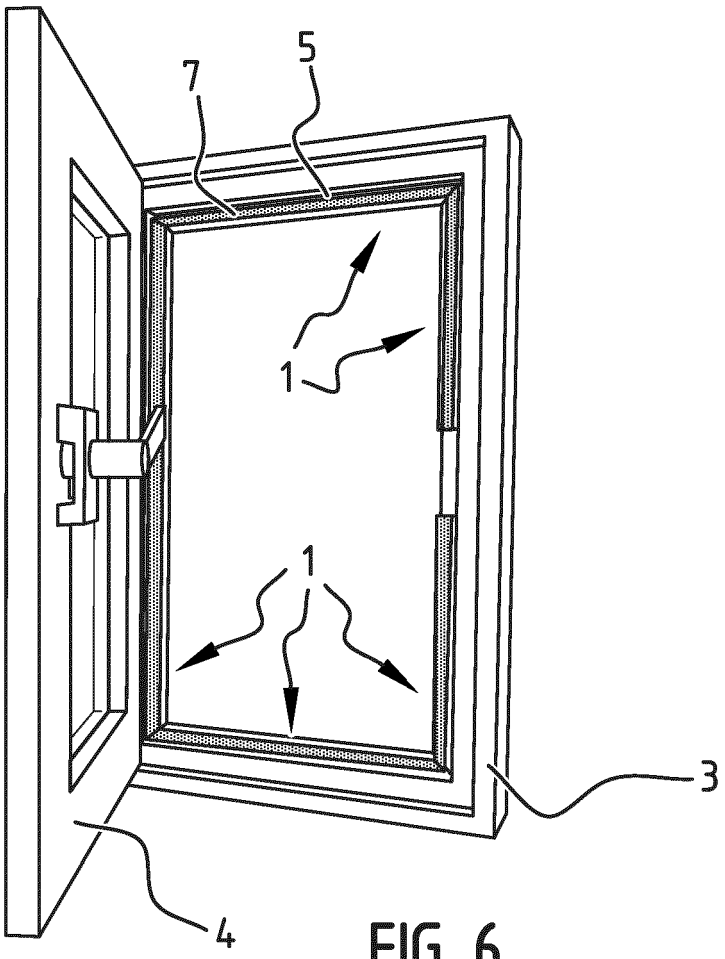

FIG. 6

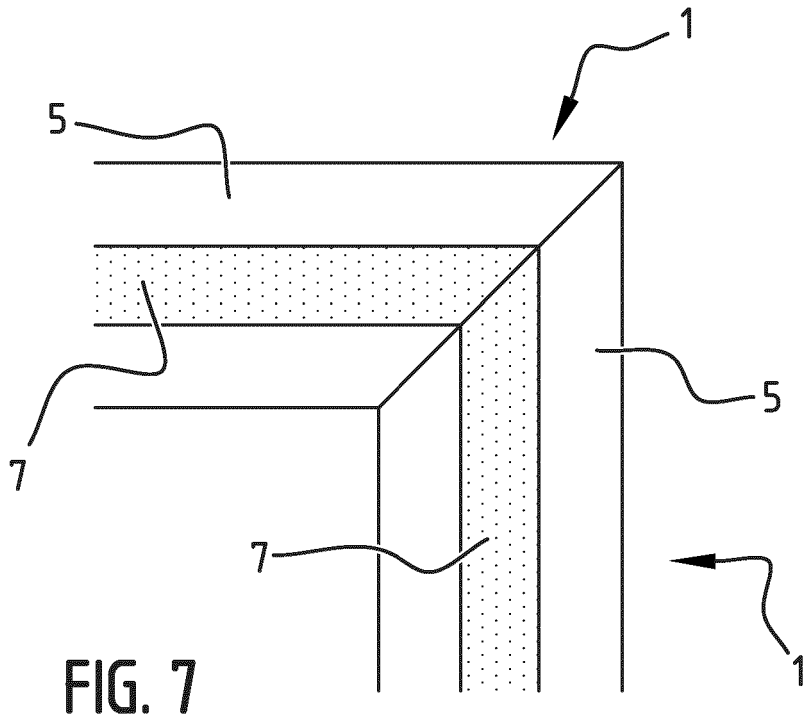

FIG. 7

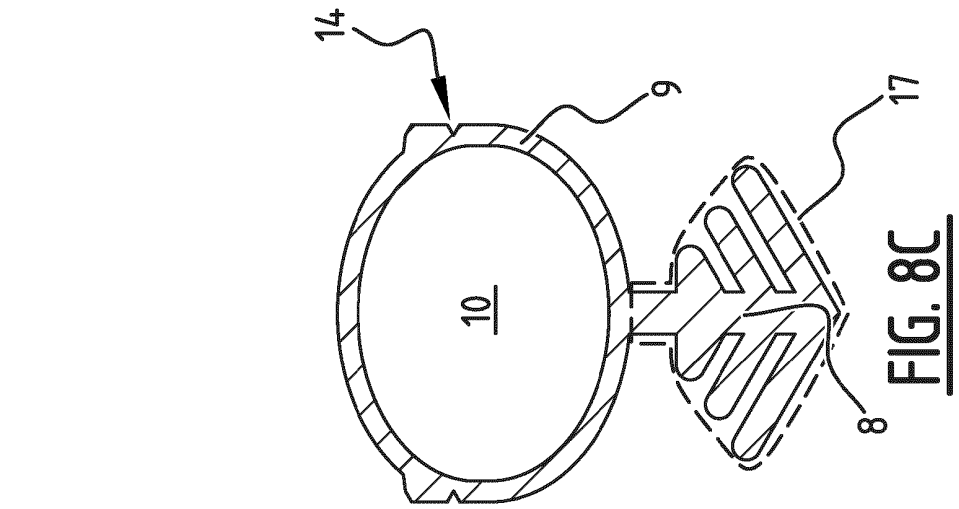

FIG. 8C

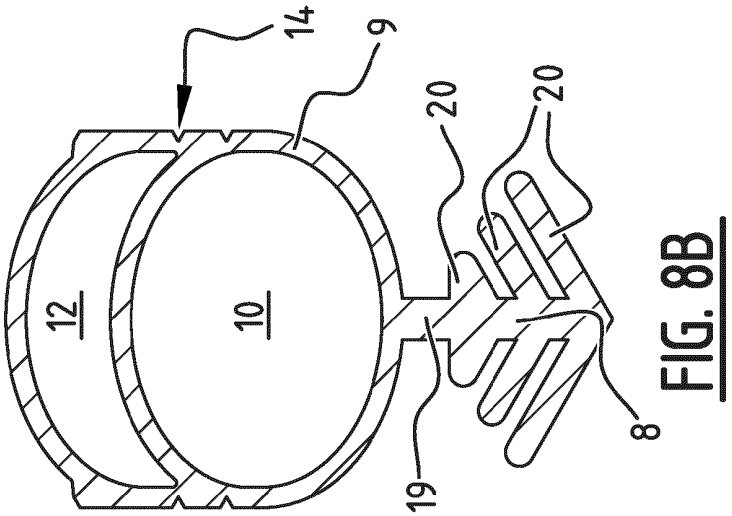

FIG. 8B

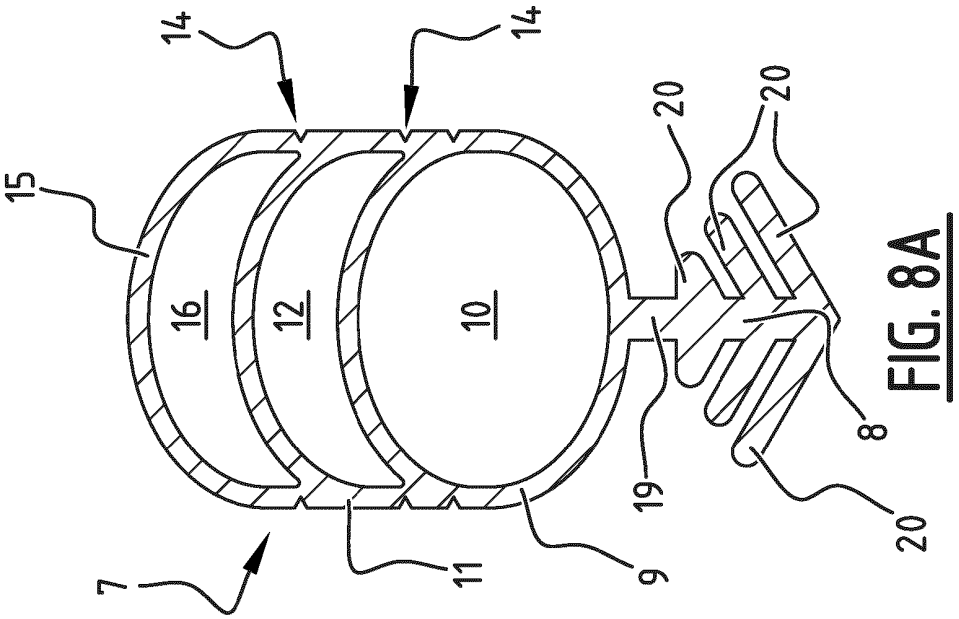

FIG. 8A

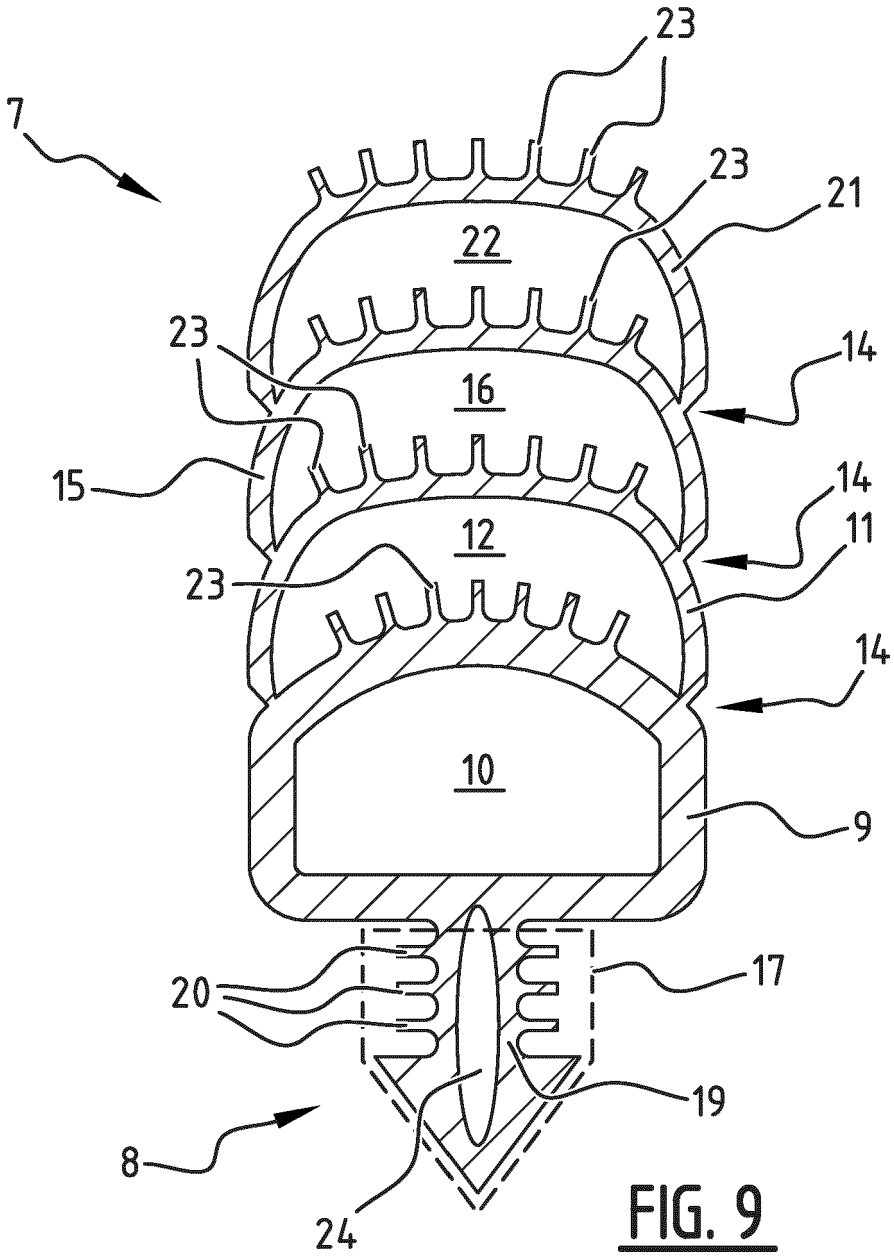

FIG. 9

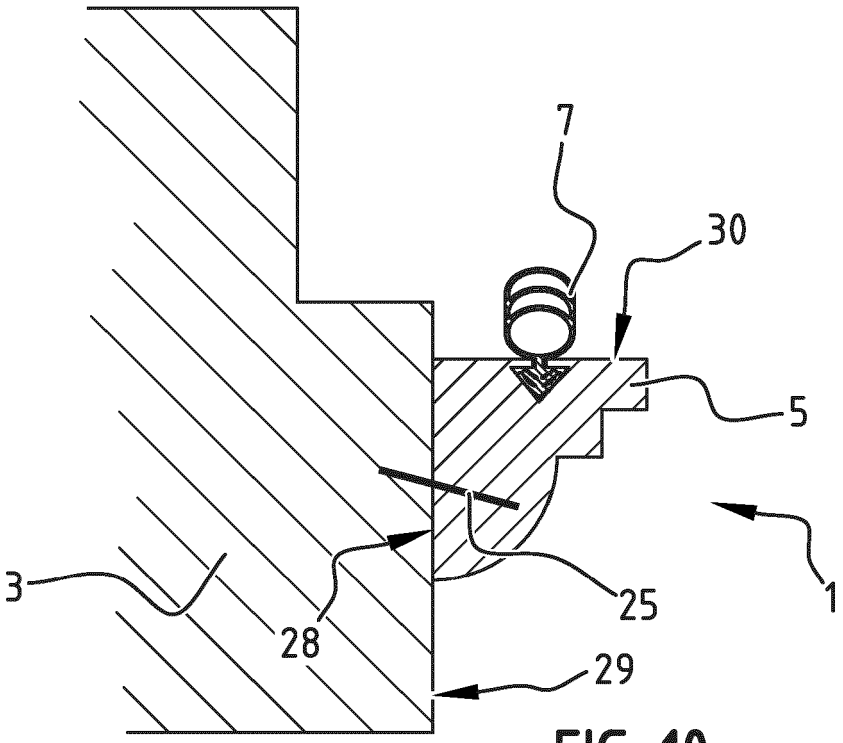

FIG. 10

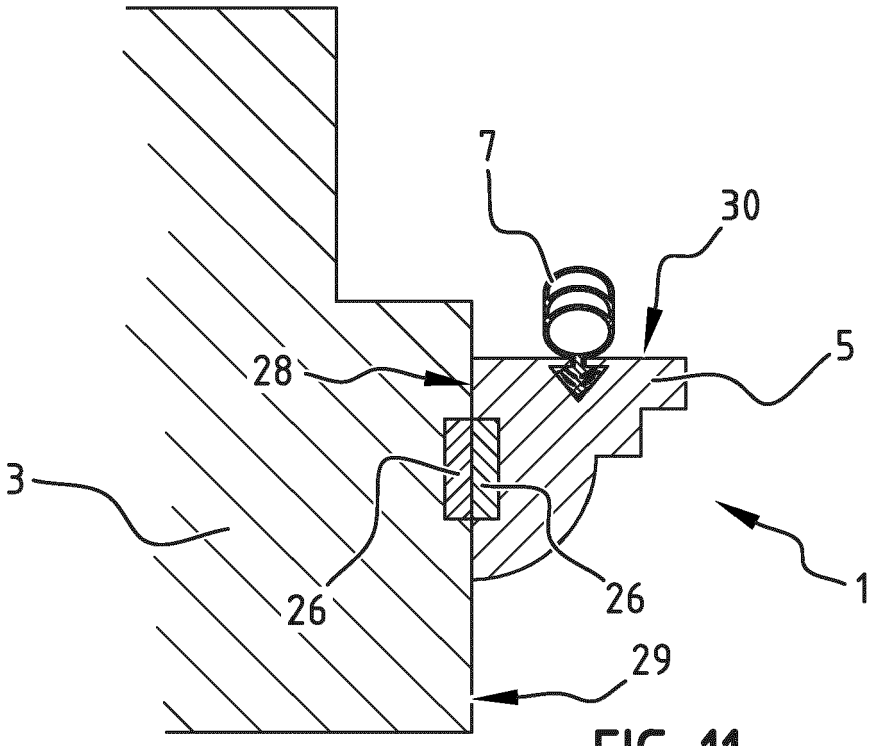

FIG. 11

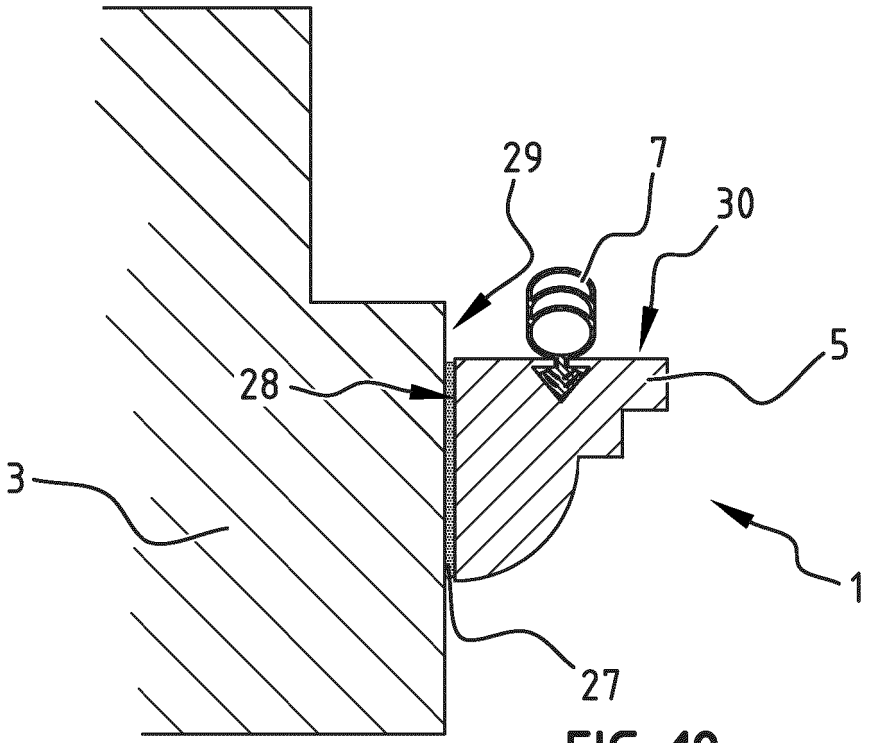

FIG. 12

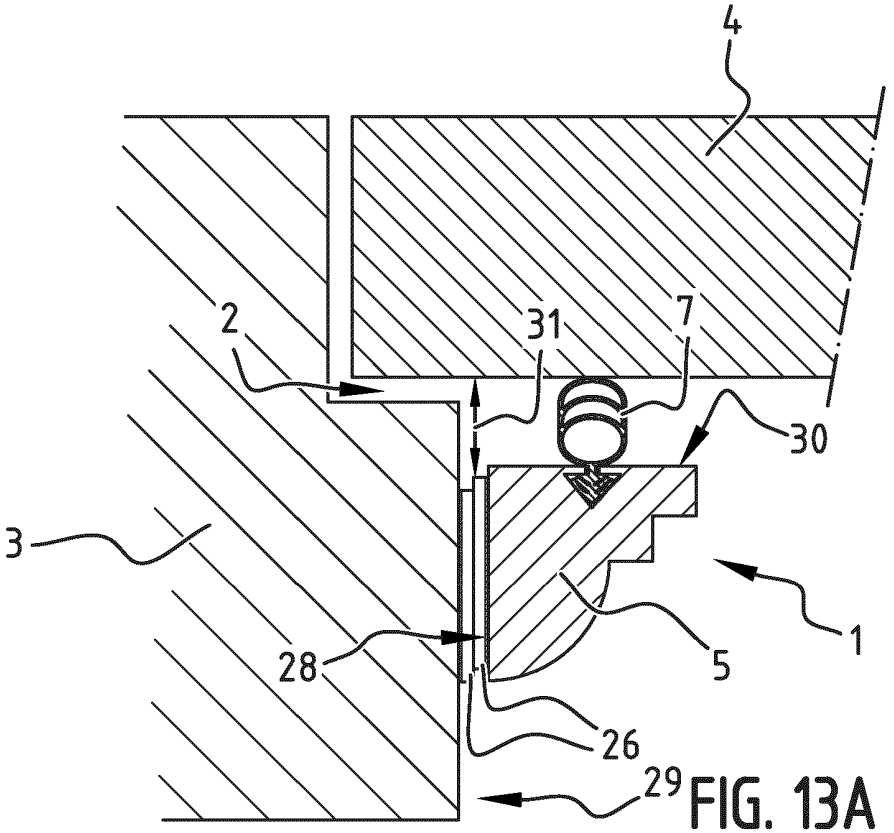

FIG. 13A

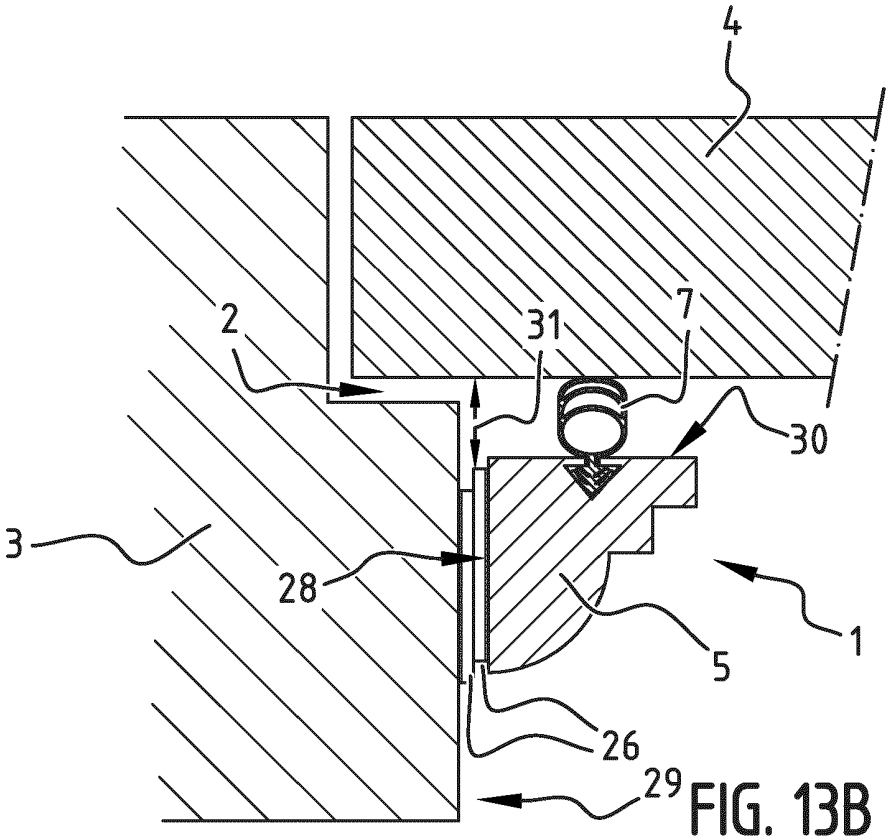

FIG. 13B

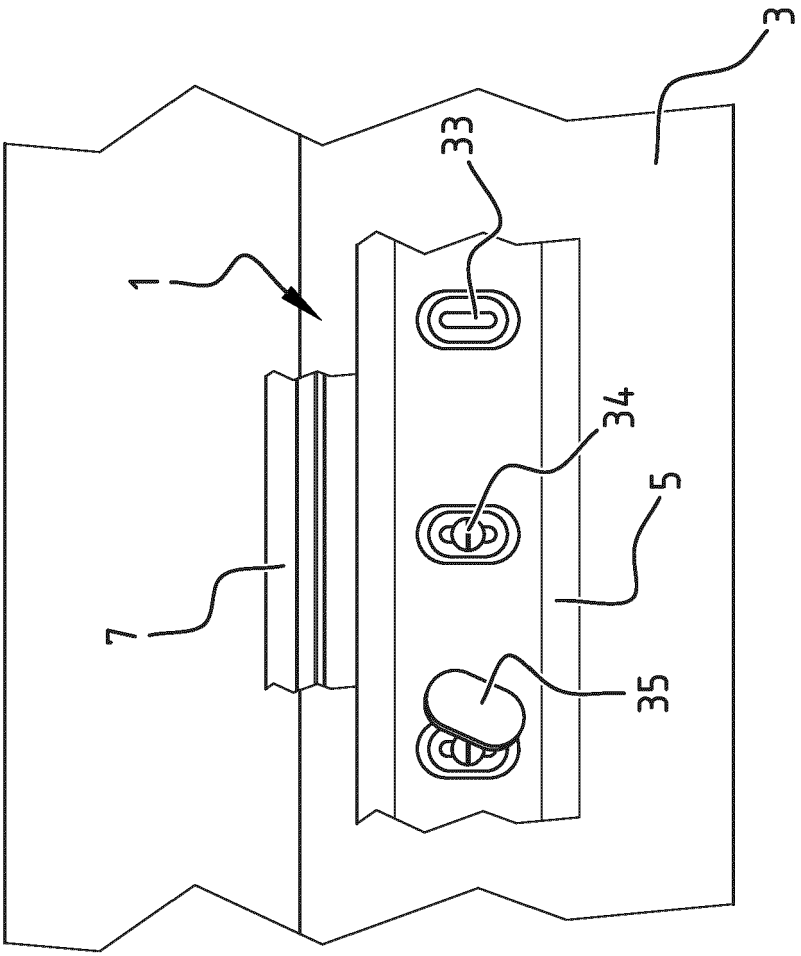

FIG. 15

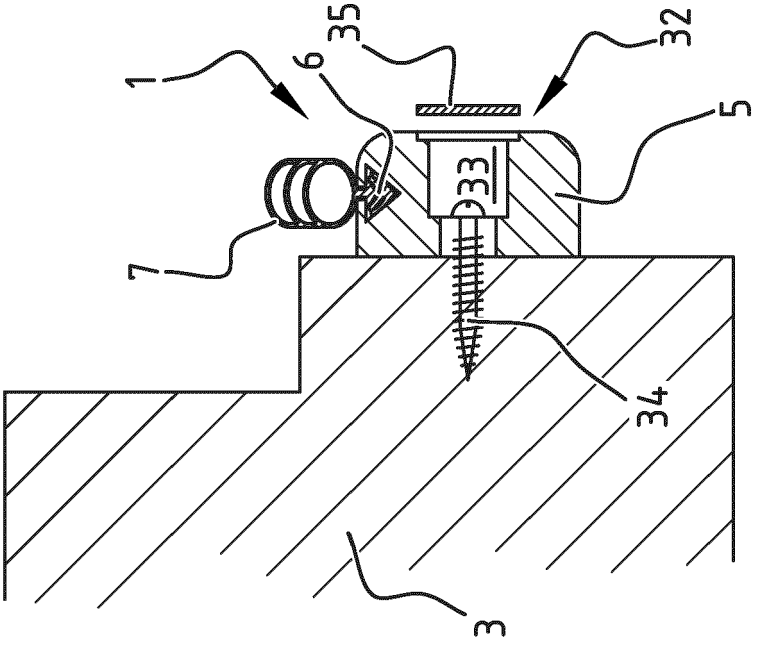

FIG. 14

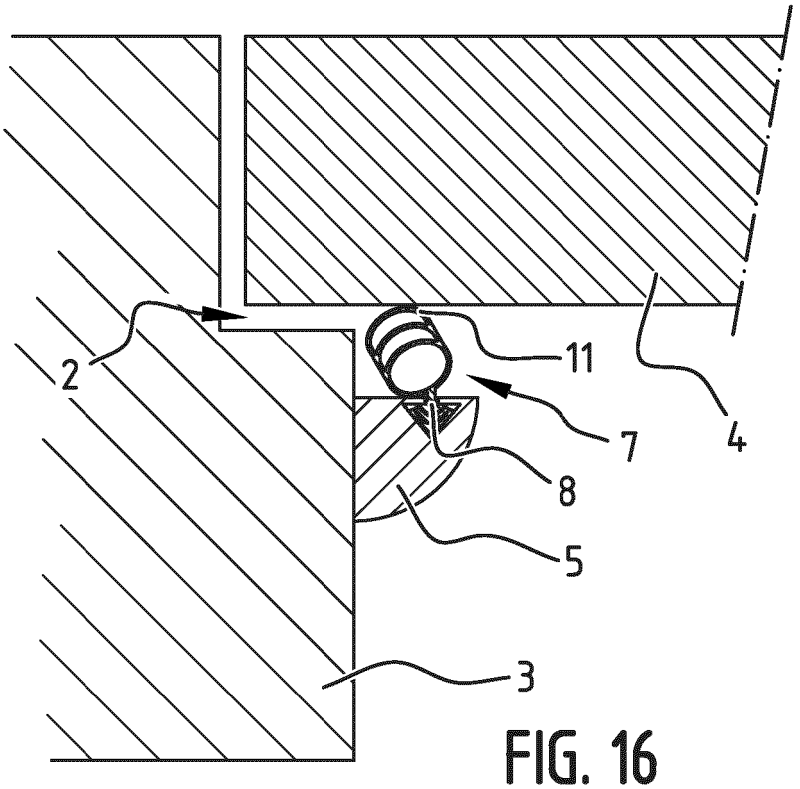

FIG. 16

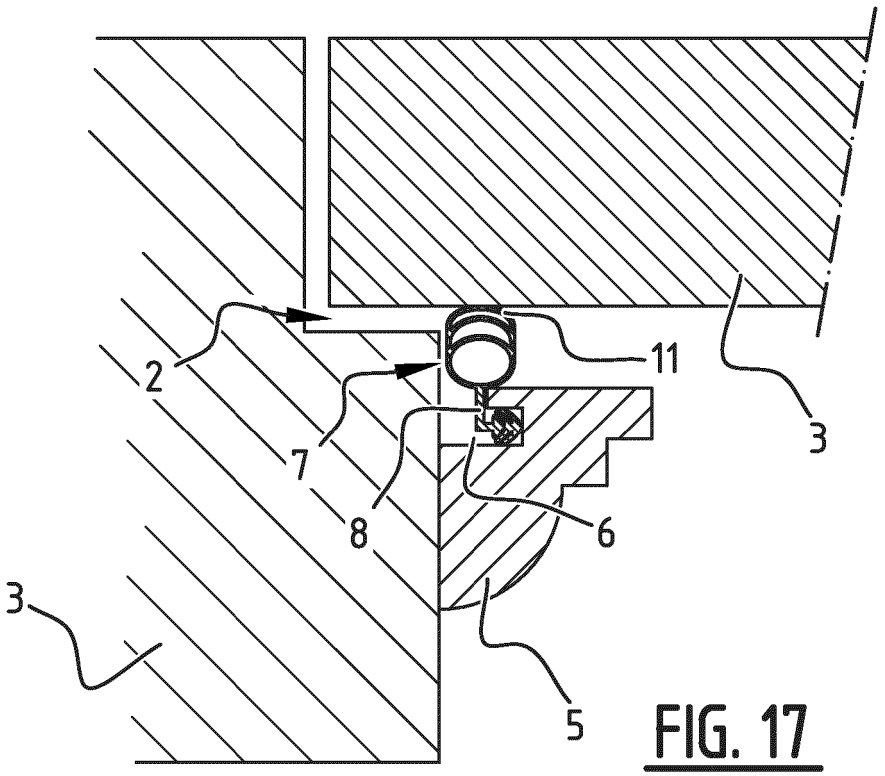

FIG. 17

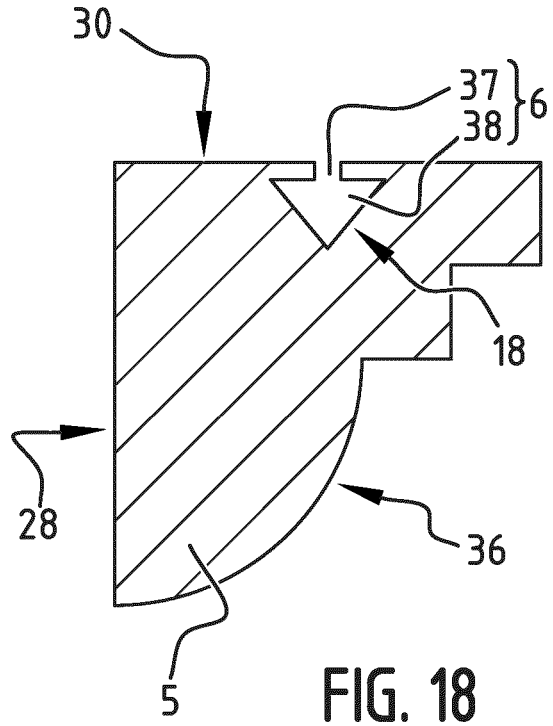

FIG. 18

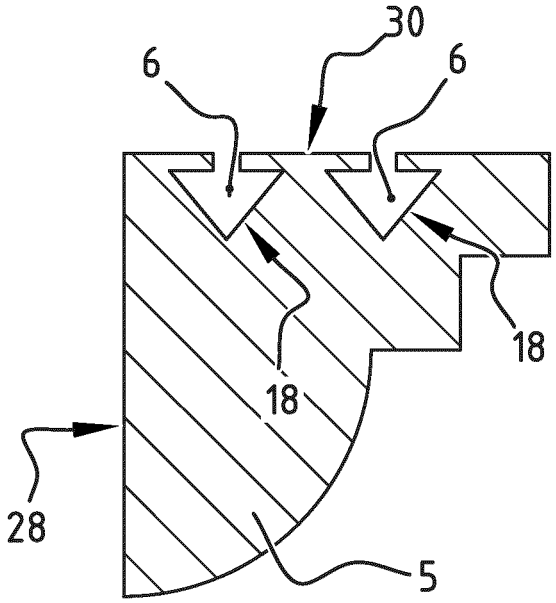

FIG. 19

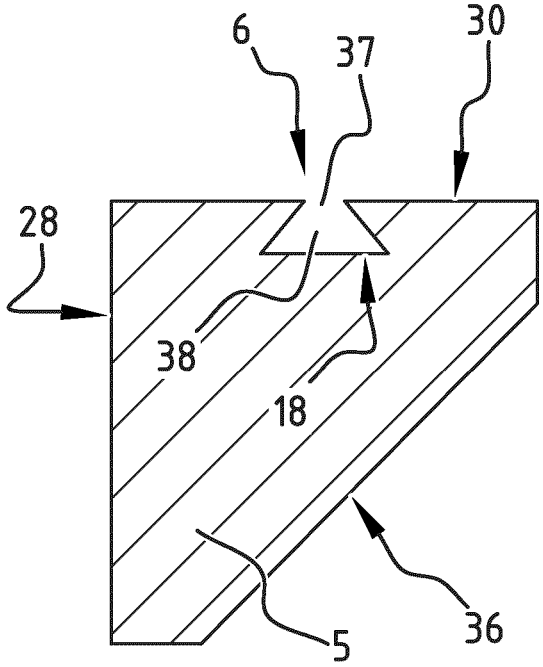

FIG. 20

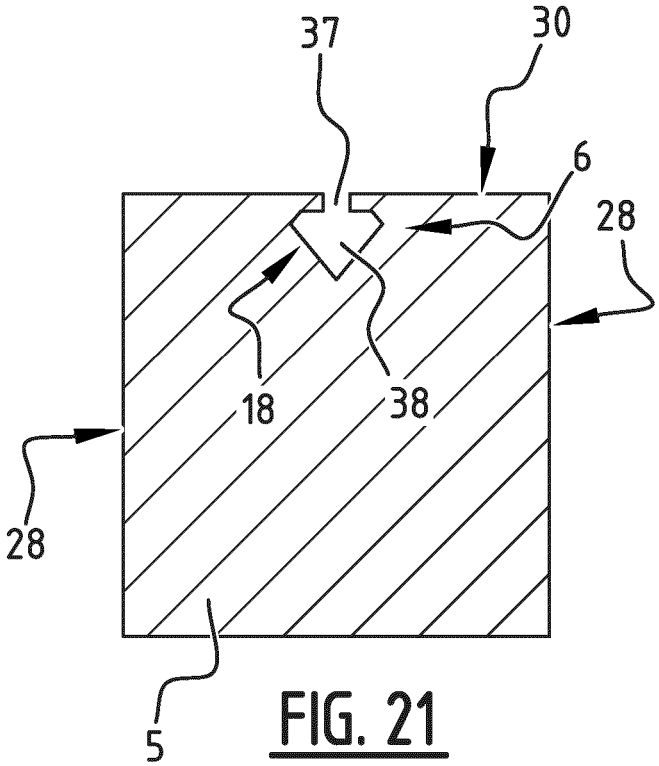

FIG. 21

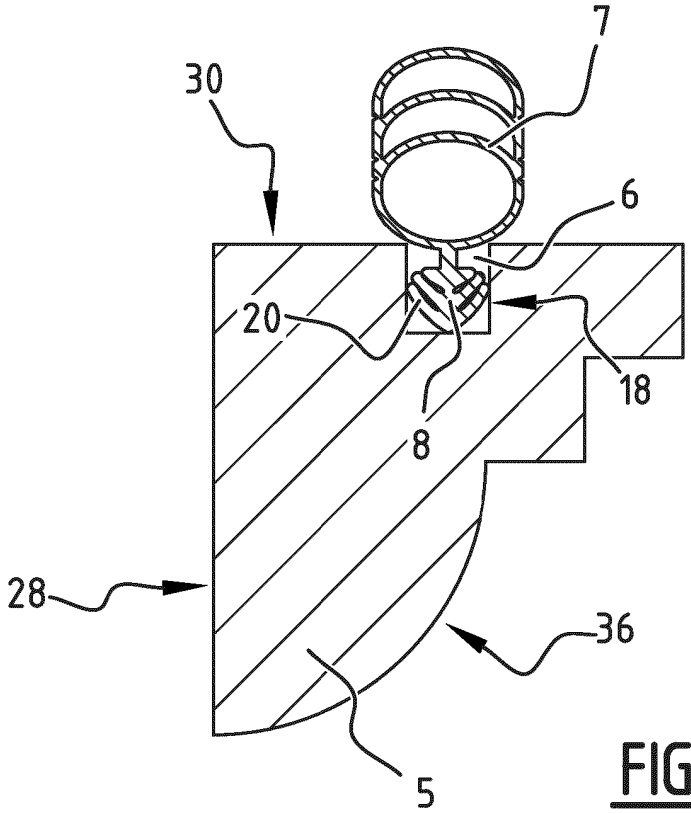

FIG. 22

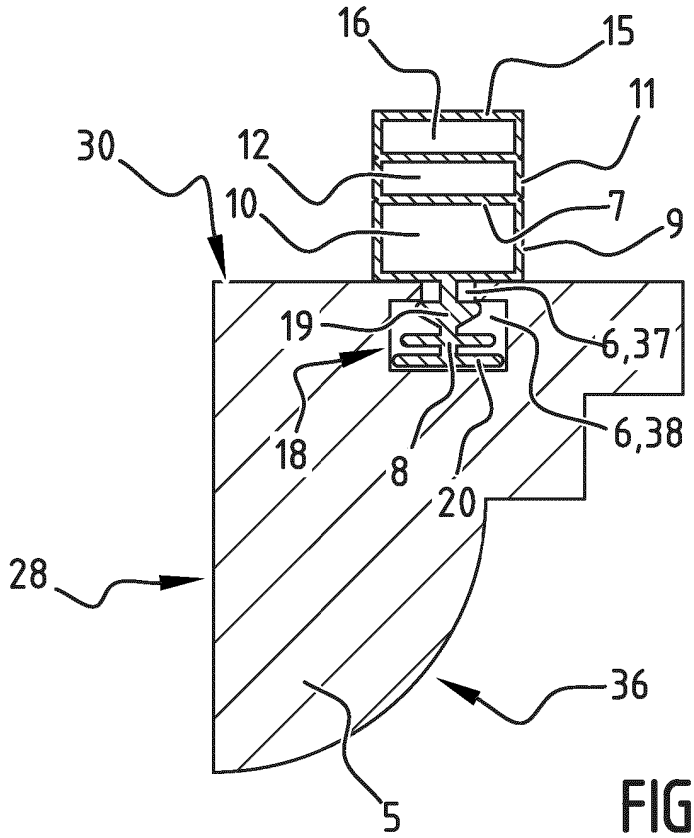

FIG. 23

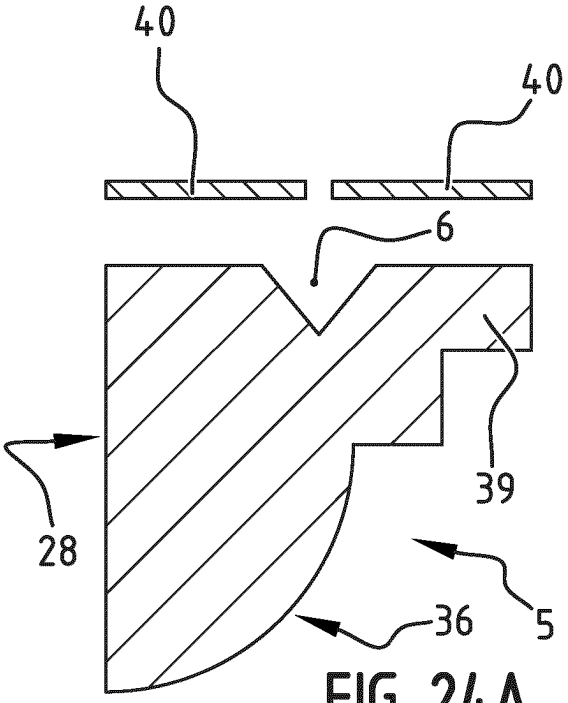

FIG. 24A

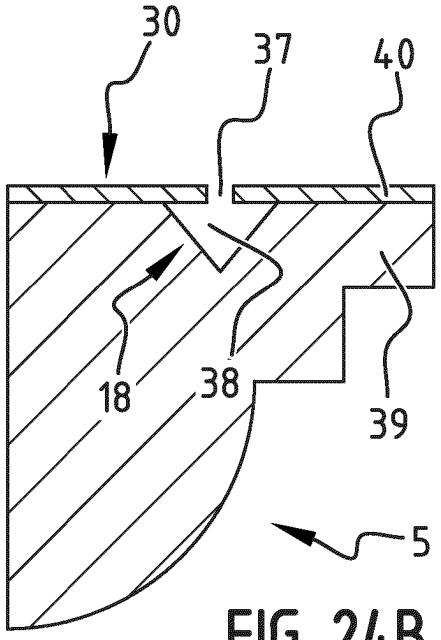

FIG. 24B

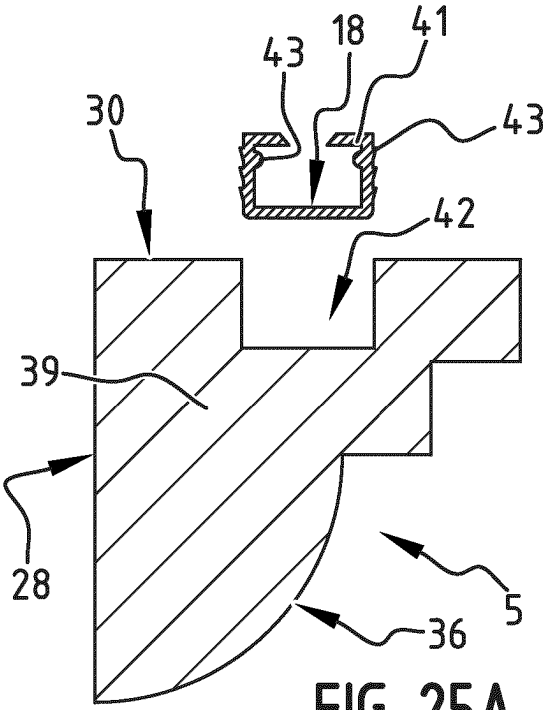

FIG. 25A

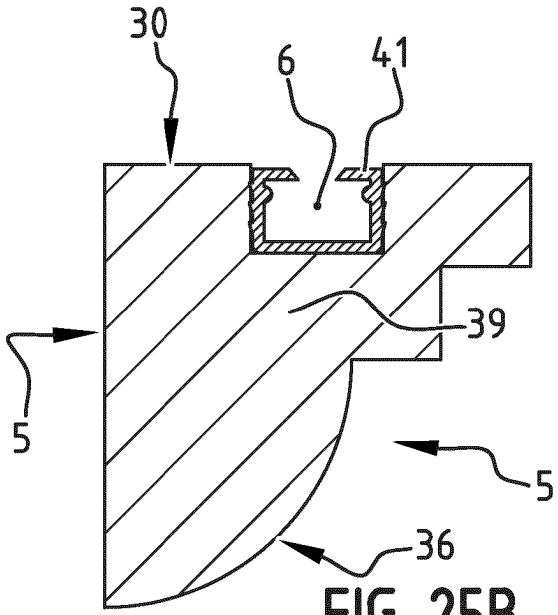

FIG. 25B