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(54) **Sealing strip**

(57) A sealing strip (1) for sealing a gap (42) between a first element (2) and a second element (4), which elements are movable relative to each other, comprises a sealing part (10) of elastomeric material, which is adapted to be fastened to the first element (2). The sealing part (10) supports a slide strip (24) of plastic material

extending along the sealing strip (1). A fold-back sealing lip (20) projects from the sealing part (10) towards the second element (4). The slide strip (24) is arranged, when folding back the sealing lip (20), to come into engagement with and form a sliding surface for said second element (4).

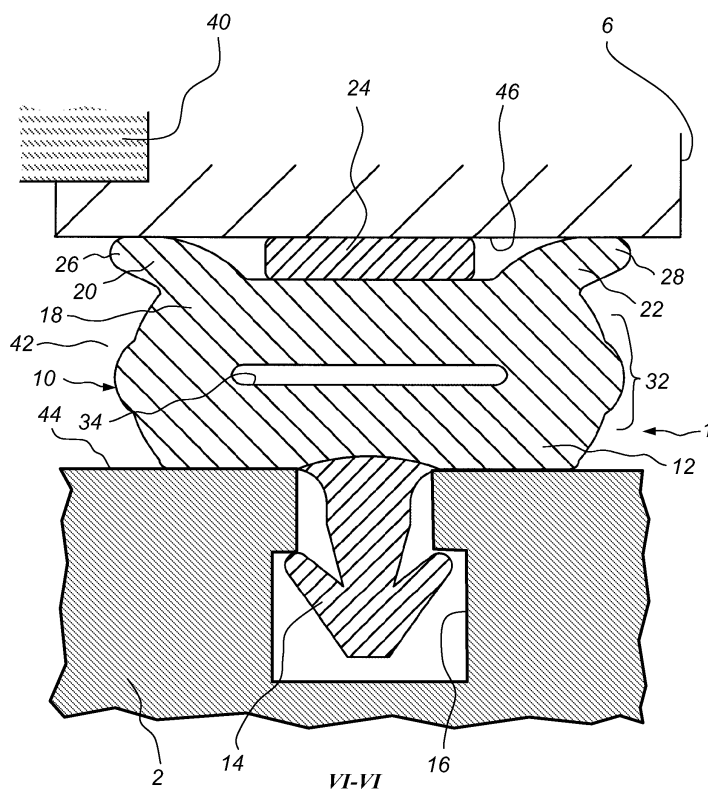


Fig. 6

Description

Field of the Invention

[0001] The present invention relates to a sealing strip for sealing a gap between a first element and a second element, which elements are movable relative to each other, said sealing strip comprising a sealing part of elastomeric material, which is adapted to be fastened to the first element.

Background Art

[0002] When sealing a gap, which is formed between, for example, a frame and an associated window or door, use is often made of a sealing strip. The sealing strip frequently comprises a sealing part of an elastomeric material. In, for example, sliding doors or windows which via a link mechanism are arranged to be moved in parallel relative to their frame, the sealing strip will be subjected to wear as the window or the sliding door is moved along the sliding strip. The wear will cause the sealing function of the sealing strip to be reduced and the sealing strip must be frequently replaced.

[0003] EP 0 209 453 in the name of Hutchinson discloses a sealing strip intended for car windows. The sealing strip is provided with beads of a rigid plastomer having a small friction coefficient. This type of sealing strip certainly reduces the friction between sealing strip and window, and thus also the wear on the sealing strip, but also causes the sealing function to be reduced.

Summary of the Invention

[0004] An object of the present invention is to provide a sealing strip which eliminates or significantly reduces the problems of prior art and, thus, to provide a sealing strip which has a long life and good sealing capability when sealing a gap between two relatively movable elements.

[0005] This object is achieved with a sealing strip according to the preamble, which sealing strip is characterised in that the sealing part supports a slide strip of plastic material extending along the sealing strip, the sealing strip also comprising at least one fold-back sealing lip which projects from the sealing part towards the second element, the slide strip being arranged, when folding back the sealing lip, to come into engagement with and form a sliding surface for said second element when this is moved relative to said first element and folds back the sealing lip.

[0006] An advantage of this sealing strip is that it has low friction thanks to the slide strip of plastic material, which means that a second element can slide along the sealing strip fastened to the first element without requiring much force and without causing much wear on the sealing strip. A further advantage of this sealing strip is that the slide strip, which usually is relatively rigid, per-

forms the sliding function and absorbs the forces transmitted to the sealing strip, while the sealing lip, which can be folded back, performs the fine sealing against the second element.

[0007] Suitably the sealing part has a compression part extending along the sealing strip, the slide strip being arranged between the compression part and the free end of the sealing lip. The compression part absorbs and distributes the forces transmitted to the slide strip and ensures that this is pressed against the second element by a suitable force. According to a more preferred embodiment, the compression part has such an elasticity relative to the sealing lip that the force required to fold back the sealing lip is less than the force required to compress the compression part. An advantage is here that when subjected to a small load, the sealing lip will be folded back and expose the slide strip. The compression part will not be compressed until greater forces act on the sealing strip. This ensures on the one hand good sealing and, on the other, that the slide strip will constitute the surface on which the second element mainly slides. Preferably, the force required to fold back the sealing lip is less than half the force required to compress the compression part. According to a still more preferred embodiment, the compression part takes up more than half the distance over which the sealing strip can be maximally compressed.

[0008] Further properties and advantages of the present invention will be evident from the following description and the claims.

Brief Description of the Drawings

[0009] The invention will now be described in more detail with reference to the accompanying drawings.

[0010] Fig. 1 is a side view and shows a window in an open position and a frame supporting a sealing strip according to a first embodiment of the present invention.

[0011] Fig. 2 is a cross-sectional view and shows the sealing strip illustrated in Fig. 1, seen along the sectional line II-II.

[0012] Fig. 3 is a side view and shows the window illustrated in Fig. 1 when closing of the same has started.

[0013] Fig. 4 is a cross-sectional view and shows the sealing strip illustrated in Fig. 3, seen along the sectional line IV-IV.

[0014] Fig. 5 is a side view and shows the window illustrated in Fig. 1 in a closed position.

[0015] Fig. 6 is a cross-sectional view and shows the sealing strip illustrated in Fig. 5, seen along the sectional line VI-VI.

[0016] Fig. 7 is a side view and shows a sliding door arrangement which is provided with sealing strips according to a second embodiment and a third embodiment of the invention.

[0017] Fig. 8 is a cross-sectional view and shows the sealing strip according to the second embodiment of the invention as illustrated in Fig. 7, seen along the sectional line VIII-VIII.

[0018] Fig. 9 is a cross-sectional view and shows the sealing strip according to the second embodiment of the invention as illustrated in Fig. 7, seen along the sectional line IX-IX.

[0019] Fig. 10 is a cross-sectional view and shows the sealing strip according to the third embodiment of the invention as illustrated in Fig. 7, seen along the sectional line X-X.

[0020] Fig. 11 is a cross-sectional view and shows the sealing strip according to the third embodiment of the invention, seen in the cross-section illustrated in Fig. 10, but with a sliding door moved to a position closed against the frame.

Description of Preferred Embodiments

[0021] By "elastomeric material" is here meant a material having a quick and great elastic stretchability, which is at least 2 times, but usually 5-10 times, the original length. Elastomeric materials can be divided into rubber and thermoplastic elastomers, which can both be used in the present invention.

[0022] By "plastic material" is here meant a polymer material which at the temperature of use, that is usually room temperature, is rigid with little elastic stretchability. Plastics are divided into thermoplastic materials and thermosetting plastics, which can both be used in the present invention.

[0023] Fig. 1 is a side view and shows a sealing strip 1 according to a first embodiment of the present invention. The sealing strip 1 is fastened to a first element in the form of a vertically extending window frame 2. A second element in the form of a swing-out type window 4, which window 4 thus is movable relative to the frame 2, has a window casement 6, which via a schematically illustrated link mechanism 8 is attached to the frame 2. In the position shown in Fig. 1, the window 4 is open, for example for airing, and is not in contact with the frame 2 or the sealing strip 1.

[0024] Fig. 2 is a cross-sectional view of the sealing strip 1 and part of the frame 2 along the sectional line II-II in Fig. 1. The sealing strip 1 has a central sealing part 10, which is made of expanded cellular rubber. At a first (in Fig. 2 lower) end portion 12, the sealing part 10 has a fastening part 14, which suitably is made of a solid elastomeric material, such as massive rubber. The fastening part 14, which is arrow-shaped, is pressed into a groove 16 in the frame 2 and secures the sealing strip 1 to the frame 2. At a second (in Fig. 2 upper) end portion 18, opposite the first end portion 12, the sealing part 10 has a first fold-back sealing lip 20 and a second fold-back sealing lip 22, which sealing lips 20, 22 project from the sealing part 10 away from the frame 2 and, thus, towards the window 4. The sealing lips 20, 22 are formed integrally with the sealing part 10 and are thus also made of cellular rubber. A slide strip 24 of plastic material is attached to the second end portion 18 of the sealing part 10 between the sealing lips 20, 22. The slide strip 24 has a thickness

T of about 0.5 mm, which gives it a certain flexibility and allows it to be bent when subjected to pressure at a point somewhere along the length of the sealing strip 1. The slide strip 24 has a sliding surface 25 which is flat and has a width B of about 5 mm. Also the slide strip 24 projects from the sealing part 10 towards the window 4, although a shorter distance than the fold-back lips 20, 22, which means that the free ends 26, 28 of the sealing lips 20, 22 are the parts of the sealing strip 1 which will first contact the window 4. As shown in Fig. 2, the free ends 26, 28 extend a distance L1, which is about 1 mm, above the sliding surface 25. The lips 20, 22 are at their free ends 26, 28 coated with a thin layer 30 of a material to facilitate sliding, for example talc, silicone, glycerine or a permanent antifriction varnish.

[0025] The central portion of the sealing part 10 has a compression part 32 which has a cavity 34 surrounded by cellular rubber 36. Both the cellular rubber 36 and the cavity 34 can be compressed during compression. The compression part 32 can be maximally compressed over a length L2 which is indicated in Fig. 2. The length L2 is the maximum distance over which the underside 27 of the slide strip 24, in non-destructive compression of the compression part 32, can be moved towards the frame 2. The position of the underside 27 in such maximal compression is illustrated in Fig. 2 with a dashed underside 27. The length L2 is about 3 mm, that is greater than L1. Thus the sealing strip 1 can be totally compressed maximally $L1+L2=1+3=4$ mm, where the compression part 32 represents the major part, more specifically 75%.

[0026] Fig. 3 illustrates the sealing strip 1 when closing of the window 4 has started. The upper corner 38, facing the frame 2, of the window casement 6 has contacted the sealing strip 1 and slides upward along the sealing strip 1 as indicated by an arrow A. Thus, the corner 38 of the casement 6 is movable in a direction, A, which is parallel to the longitudinal direction of the sealing strip 1.

[0027] Fig. 4 is a cross-sectional view along the sectional line IV-IV in Fig. 3, that is the appearance of the sealing strip 1 at the point where the corner 38 of the window casement 6 is in contact with the sealing strip 1. As is evident from Fig. 4, the corner 38 of the window casement 6, which supports the actual window pane 40, presses down the fold-back sealing lips 20, 22. The sealing lips 20, 22 are more elastic than the compression part 32 and have therefore been folded back completely and exposed the slide strip 24 while the compression part 32 is still substantially unaffected. When the corner 38 of the window casement 6 is moved in the direction indicated by the arrow A shown in Fig. 3 along the frame 2, the corner 38 will be in contact with the slide strip 24 and easily slide along the sliding surface 25. The lips 20, 22 are folded back and absorb practically nothing of the force by which the corner 38 affects the sealing strip 1. Thanks to the layer 30, also the free ends 26, 28 of the lips 20, 22 will not brake the movement of the corner 38 along the sealing strip 1. As the corner 38 moves along the frame 2, the corner 38 will thus easily slide in contact with

the slide strip 24, which results in only little force being required to move the corner 38, and thus the window 4, in the direction of the arrow A. The slide strip 24 will also protect the sealing part 10 from wear during this movement.

[0028] Fig. 5 shows the window 4 when fully closed against the frame 2. In the position shown in Fig. 5, the window 4 thus is not moving but has reached its normal rest position, in which the sealing strip 1 seals the elongate vertical gap 42, as is more distinctly to be seen in Fig. 6, which is formed between the frame 2 and the window casement 6.

[0029] Fig. 6 is a cross-sectional view along the sectional line VI-VI in Fig. 5. It will be appreciated that the gap 42 is elongated and that the section VI-VI will look essentially the same along the entire length of the frame 2 in the vertical direction. As is evident from Fig. 6, the gap 42 is formed between the surface 44 of the frame 2 facing the window casement 6 and the surface 46 of the window casement 6 facing the frame 2. When closing the window, an extra force has been applied to ensure that the sealing strip 1 seals the gap 42 along the entire length thereof. This force has resulted in the surface 46 of the window casement 6 pressing the slide strip 24 towards the surface 44 of the frame 2 and compressing the cavity 34 of the compression part 32. In the position shown in Fig. 6, the compression part 32 keeps the first end portion 12 of the sealing part 10 pressed against the surface 44. The compression part 32 also keeps the second end portion 18 with the fold-back lips 20, 22 fastened thereto, the free ends 26, 28 of the lips being in direct contact with the surface 46 of the window casement 6, pressed against the surface 46 and thus provides effective sealing of the gap 42.

[0030] Fig. 7 illustrates a sliding door arrangement 150 which has three sliding doors 152, 154, 156. The sliding doors 152, 154, 156 are individually movable, as indicated by dashed arrows A, along a horizontal upper door frame 102 and a horizontal lower door frame 103 between a first vertical frame 202 and a second vertical frame 203.

[0031] Fig. 8 illustrates, in the cross-section VIII-VIII, two sealing strips 100, 101 according to a second embodiment of the present invention. The sealing strips 100 and 101, which are each fastened to a vertical wall 158, 160 in a door groove 162 in the horizontal frame 102, have the same construction and appearance except that the strip 101 is mirror-inverted relative to the strip 100. For this reason only the strip 100 will be described in detail below. The sealing strip 100 has a central sealing part 110 which is made of massive rubber. At a first (in Fig. 8 right) end portion 112, the sealing part 110 has a fastening part 114. The fastening part 114, which is arrow-shaped, is pressed into a groove 116 in the wall 158 of the door groove 162 and thus secures the sealing strip 100 to the frame 102. At a second (in Fig. 8 left) end portion 118 opposite the first end portion 112, the sealing part 110 has a fold-back sealing lip 120 which projects from the sealing part 110 towards the sealing strip 101

and, thus, towards the door 152, as will be described below. The sealing lip 120 is formed integrally with the sealing part 110 and thus is also made of massive rubber. A slide strip 124 of plastic material is attached to the second end portion 118 of the sealing part 110. Also the slide strip 124 projects from the sealing part 110 towards the sealing strip 101, although a shorter distance than the fold-back lip 120, which means that the free end 126 of the sealing lip 120 is that part of the strip 100 which is closest to the free end 128 of a corresponding sealing lip 122 included in the sealing strip 101. The lips 120, 122 are at their free ends 126, 128 coated with a layer of material to facilitate sliding (not shown in Fig. 8).

[0032] Fig. 9 is a cross-sectional view along the sectional line IX-IX in Fig. 7. In this cross-section, it is shown how the casement 106 of the door 152, in which a door window 140 is inserted, is received in the groove 162. The elongate, horizontal gap 142 which is formed between the wall 158 and a vertical surface 146 of the casement 106 is sealed by the sealing strip 100, and more specifically by the free end 126 of the fold-back sealing lip 120, which free end is in direct contact with the surface 146. Correspondingly, the elongate horizontal gap 143 which is formed between the wall 160 and a vertical surface 147 of the casement 106 is sealed by the sealing strip 101, and more specifically by the free end 128 of the fold-back sealing lip 122, which free end is in direct contact with the surface 147. When horizontally moving the door 152 as indicated by the arrow A in Fig. 7, that is a movement in a direction, A, which is parallel to the longitudinal direction of the sealing strip 100, 101, the vertical surfaces 146, 147 of the casement 106 will slide on the slide strip 124, 125 of the respective sealing strips 100, 101. The sealing part 110 and the slide strip 124 ensure that the door 152 is kept in a correct, upright position during this movement, and the slide strip 124 allows the movement to take place with low friction. The shortest distance D between the slide strips 124 and 125, which distance D is to be seen in Fig. 8, is slightly greater than the width W of the casement 106, which is to be seen in Fig. 9, in order for the slide strips 124 and 125 not to offer resistance to the casement 106 but to allow the casement to run freely. When moving the door 152 in the horizontal direction, A, according to Fig. 7, from the position shown in Fig. 7 towards the section VIII-VIII as shown in Fig. 8, the casement 106 will in this movement fold back the fold-back sealing lips 120, 122 and slide on the slide strips 124, 125. The respective free ends 126, 128 of the fold-back sealing lips 120, 122 will, however, always be in contact with the casement 106 and thus ensure that the gaps 142, 143 are sealed. Consequently the sealing strips 100, 101 provide effective sealing between the door frame 102 and the casement 106 and nevertheless make it possible for the door 152 to be moved horizontally with low friction and without significant wear on the sealing strips 100, 101.

[0033] Fig. 10 is a cross-sectional view along the sectional line X-X in Fig. 7 of a vertically extending sealing

strip 200 according to a third embodiment of the present invention. The sealing strip 200 is fastened to a vertical surface 244 of the vertically extending frame 202. The sealing strip 200 has a central sealing part 210 which is made of expanded cellular rubber. At a first (in Fig. 10 lower) end portion 212, the sealing part 210 has a fastening part 214, which suitably is made of massive rubber. The fastening part 214, which is arrow-shaped, is pressed into a groove 216 in the frame 202 and secures the sealing strip 200 to the frame 202. At a second (in Fig. 10 upper) end portion 218 opposite the first end portion 212, the sealing part 210 has a fold-back sealing lip 220 which projects from the sealing part 210 away from the surface 244. The sealing lip 220 is formed integrally with the sealing part 210 and is thus also made of cellular rubber. The free end 226 of the lip 220 is coated with a thin layer of material to facilitate sliding (not shown in Fig. 10).

[0034] The central portion of the sealing part 210 has a compression part 232 which comprises a cavity 234 surrounded by cellular rubber 236. As shown in Fig. 10, the compression part 232, and thus also the sealing part 210, is wedge-shaped with the tip 233 of the wedge pointing to the door 152. A slide strip 224 of plastic material extending along the sealing strip 200 is attached to the sealing part 210 at the second end portion 218 thereof. The slide strip 224 forms, since it is attached to the wedge-shaped sealing part 210, an angle α of about 30° with the vertical surface 246 of the casement 106. When the door 152 is horizontally moved as indicated by the arrow A, and thus perpendicular to the longitudinal direction of the sealing strip 200, the corner 238 of the casement 106 will come into contact with the slide strip 224 and slide across the same while at the same time the compression part 232 is being compressed. Finally, the corner 238 will pass over the free end 226 of the lip 220 and stay in his position against a stop 262 included in the door frame 202.

[0035] Fig. 11 shows what the cross-section X-X of Fig. 10 would look like with the door 152 moved all the way to the stop 262. In the position shown in Fig. 11, the door 152 thus is not moving but has reached its position closed against the frame 202, in which the sealing strip 200 seals the elongate vertical gap 242 which forms between the surface 244 of the frame 202 facing the casement 106 and the surface 246 of the casement 106 facing the frame 202. When closing the door 152, an extra force is applied to ensure that the sealing strip 200 seals the gap 242 along the entire length thereof. This force has resulted in the surface 246 of the casement 106 pressing the slide strip 224 against the surface 244 of the frame 202 and compressing the cavity 234 of the compression part 232. The compression part 232 thus keeps the first end portion 212 of the sealing part 210 pressed against the surface 244 and the second end portion 218, with the fold-back lip 220 fastened thereto, the free end 226 of the lip being in direct contact with the surface 246 of the casement 106, pressed against the surface 246 and thus

provides effective sealing of the gap 242. As will be seen, the force by which the surface 246 compresses the compression part 232 is absorbed by the slide strip 224, which transmits the force to the compression part 232. During the latter part of the movement of the door 152, the door having folded back the lip 220, the surface 246 will slide on the upper corner 225 of the slide strip 224. The sealing strip 200 thus provides effective sealing of the gap 242 and, thanks to the slide strip 224, reduces the friction that must be overcome to be able to close the door 152.

[0036] The above described sealing strips 1, 100, 101, 200 can suitably be made by extrusion of a continuous blank of elastomeric material in a conventional extruder, which comprises a nozzle, also referred to as a die, which has been designed with the appropriate cross-section for the sealing part 10, 110, 210. Uncured polymer, which if cellular rubber is to be produced has been mixed with an expanding agent, is supplied to the extruder, which discharges the material through the die in the desired shape. The uncured extruded sealing part is drawn through a vulcaniser in a conventional way and cured. A sealing part 10, 110, 210 of cellular rubber is suitably extruded in the same operation as a fastening part 14, 114, 214 of massive rubber, which will thus be an integral part of the sealing strip 1, 100, 101, 200. After vulcanisation, the sealing part 10, 110, 210 is kept extended while molten plastic material, which is adhesively compatible with the elastomeric material, is applied to the sealing part to form the slide strip. The plastic material is allowed to cool, and thus solidify, after which the sealing strip 1, 100, 101, 200 is ready for use.

[0037] It will be appreciated that many modifications of the above described embodiments are conceivable within the scope of the invention.

[0038] Thus, for example the arrow-shaped fastening part 14, 114, 214 can be replaced by a piece of adhesive tape which makes the sealing strip adhere to the base.

[0039] The compression parts 32, 232 shown in Fig. 2 and Fig. 10 comprise a cavity 34, 234 surrounded by cellular rubber. This type of compression part 32, 232 is compressed on the one hand by compression of the cavity 34, 234 and, on the other hand, above all after compression of the cavity, by compression of the cellular rubber 36, 236 surrounding the cavity. It will be appreciated that a compression part can also be made in other ways. For example the compression part may consist of only an elongate cellular rubber body without a marked cavity, in which case this cellular rubber body is compressed during compression, or the compression part can be a cavity surrounded by massive rubber, in which case practically only the cavity is compressed during compression.

[0040] The elastomeric material, from which the sealing part 10, 110, 210, and suitably also the fastening part 14, 114, 214 if present, is made, can be, for instance, EPDM (ethylene-propylene-diene terpolymer), EPM (ethylene-propylene-copolymer), EVA (ethylene-vinyl acetate), SBR (styrene-butadiene rubber) or a suitable thermoplastic elastomeric material. If the compression

part is to contain cellular rubber, the uncured elastomeric material is mixed with an expanding agent before being supplied to the extruder. The cellular rubber can be expanded rubber, foam rubber or sponge rubber. Expanded cellular rubber is usually preferred since its closed cellular structure does not absorb water.

[0041] The plastic material, from which the slide strip 24, 124, 224 is made, is suitably a thermoplastic material. In a preferred embodiment, the plastic material is in the form of a hot-melt adhesive which is applied to the sealing strip after vulcanisation. Another preferred embodiment involves applying the plastic material to the sealing strip by a plastic extruder, either in a sequence directly following the vulcanisation sequence or in a separate process.

[0042] The plastic material can be, for instance, PE (polyethylene plastic), PP (polypropylene plastic) or PVC (polyvinyl chloride plastic).

[0043] As described above, the plastic material is suitably adhesively compatible with the elastomeric material. By adhesively compatible is meant, as used in this context, that the plastic material adheres so strongly to the elastomeric material that they cannot be separated or pulled apart without damaging one or both of the materials. It is particularly preferred for the elastomeric material to be cellular rubber since this has been found to result in especially good adhesion with the plastic material when applying the plastic material in molten form. With good adhesion of the slide strip to the sealing part, the slide strip may also serve as longitudinal stiffening of the sealing strip, so that the sealing strip does not stretch significantly in the longitudinal direction, which simplifies correct mounting of the sealing strip.

[0044] It has been described above how the slide strip is produced by molten plastic material being applied to the vulcanised sealing part. However, it is also possible for a completed slide strip of plastic material to be glued, or secured by adhesive tape, to a vulcanised sealing part. It is also possible to form a groove in the sealing part, into which groove a slide strip of plastic material can be snapped to be secured.

[0045] In a particularly preferred embodiment, the slide strip 24, 124, 224 is made by a completed plastic strip, preferably made of a thermoplastic material, being made to contact the vulcanised sealing part 10, 110, 210 just after vulcanization. On this occasion, the sealing part will have a high temperature, typically about 130-160°C, which results in the plastic strip adhering by melting to the sealing part and forming the slide strip. The sealing part with the slide strip applied thereto can advantageously be passed through a series of rolls while the sealing part is still hot to provide further improved adhesion of the slide strip. After rolling, the sealing part with the slide strip applied thereto is passed through a water bath intended for cooling, after which the completed sealing strip 1, 100, 101, 200 is ready for use. It is also possible, as a further alternative, to insert a completed plastic strip into a die in an extruder which is used to produce the sealing part. In this alternative, the plastic strip will

already be applied to the sealing part in the die and follow the sealing part during the entire vulcanisation process and, due to the high temperature, about 190-230°C, during vulcanisation, adhere by melting to the sealing part during vulcanisation and form the slide strip. The completed sealing strip, made by application of a completed plastic strip to a just vulcanised and still hot sealing part, or, as an alternative, made by already applying a completed plastic strip to the sealing part in the die of the extruder will have substantially the same appearance as described above, with reference to, for example, Fig. 2 or Fig. 8. According to this preferred embodiment, a sealing strip is thus produced by a completed plastic strip being made to contact the sealing part at an increased temperature, about 130-230°C, and suitably just after vulcanisation, that is in about 0-3 s after the sealing part has left the vulcanisation, or already in the die of the extruder. A special advantage of using a completed plastic strip which is applied to a just vulcanised sealing part, or which is inserted into the die of the extruder, is that a slide strip with very small tolerances in terms of thickness and width can be obtained, compared with the above described technique of extruding a molten plastic material on the sealing part. The narrow tolerances when using a completed plastic strip are achieved due to the fact that it is relatively easy to produce a plastic strip with narrow tolerances since production occurs separate from the production of the sealing strip. The completed plastic strip can be made of, for example, polypropylene plastic (PP) or polyethylene plastic (PE) and have a thickness of about 0.1-1 mm, and a width of 2-50 mm. The completed plastic strip is suitably stored on a bobbin, from which the plastic strip is continuously unwound to be made to contact and adhere by melting to the sealing part which is continuously discharged from vulcanisation.

[0046] The slide strip 24 shown in Fig. 2 has a thickness T of 0.5 mm. This thickness T can be varied in wide ranges to provide sufficient mechanical strength with maintained flexibility. A thickness T of about 0.1-1 mm, still more preferred 0.15-0.5 mm, has been found convenient in many applications. The width B of the sliding surface 25 is adjusted to the current application. As a rule, a width B in the range 2-50 mm is suitable. The width B of the sliding surface 25 should be greater than the thickness T of the slide strip 24 to provide good sliding properties without making the slide strip too rigid. The sliding surface 25 can be flat, as shown in Fig. 2 for instance, but can also be provided with flutes or a pattern.

[0047] About 55-95%, preferably about 65-85%, of the total distance, that is L1 + L2 according to Fig. 2, over which the sealing strip 1 can be maximally compressed without being permanently deformed suitably is the distance L2 over which the compression part 32 can be compressed, the distance L1 over which the fold-back sealing lips 20, 22 are folded back thus constituting the remainder up to 100%.

Claims

1. A sealing strip for sealing a gap (42; 142; 242) between a first element (2; 102; 202) and a second element (4; 152), which elements are movable relative to each other, said sealing strip (1; 100; 200) comprising a sealing part (10; 110; 210) of elastomeric material, which is adapted to be fastened to the first element (2; 102; 202), **characterised in that** the sealing part (10; 110; 210) supports a slide strip (24; 124; 224) of plastic material extending along the sealing strip (1; 100; 200), the sealing strip also comprising at least one fold-back sealing lip (20, 22; 120; 220) which projects from the sealing part (10; 110; 210) towards the second element (4; 152), the slide strip (24; 124; 224) being arranged, when folding back the sealing lip (20, 22; 120; 220), to come into engagement with and form a sliding surface for said second element (4; 152) when this is moved relative to said first element (2; 102; 202) and folds back the sealing lip (20, 22; 120; 220). 5
2. A sealing strip as claimed in claim 1, in which the sealing lip (20, 22; 120; 220) and the sealing part (10; 110; 210) are made in one piece. 10
3. A sealing strip as claimed in claim 1 or 2, in which the sealing part (10; 210) comprises a compression part (32; 232) extending along the sealing strip (1; 200), the slide strip (24; 224) being arranged between the compression part (32; 232) and the free end (26; 226) of the sealing lip (20; 220). 15
4. A sealing strip as claimed in claim 3, in which the compression part (32; 232) is at least partly made of cellular rubber. 20
5. A sealing strip as claimed in claim 3 or 4, in which the compression part (32; 232) has such an elasticity relative to the sealing lip (20; 220) that the force required to fold back the sealing lip (20; 220) is less than the force required to compress the compression part (32; 232). 25
6. A sealing strip as claimed in any one of the preceding claims, in which the sealing part (10; 110; 210) is formed integrally with a fastening part (14; 114; 214). 30
7. A sealing strip as claimed in any one of the preceding claims, in which the slide strip (24; 124; 224) is made of a plastic material, preferably a thermoplastic material, which is adhesively compatible with said elastomeric material, 35
8. A sealing strip as claimed in any one of the preceding claims, in which the slide strip (24; 124; 224) is made by a band of thermoplastic material being made to contact the sealing part (10; 110; 210) at an in- 40

creased temperature.

9. A sealing strip as claimed in claim 8, in which the slide strip (24; 124; 224) is made by the band of thermoplastic material being made to contact the sealing part (10; 110; 210) after vulcanisation of the same. 45
10. A sealing strip as claimed in claim 8, in which the slide strip (24; 124; 224) is made by the band of thermoplastic material being inserted into a die through which the sealing part is extruded. 50
11. A sealing strip as claimed in any one of the preceding claims, in which the sealing part (10; 110; 210) is made of a material selected from the group consisting of EPDM, EPM, SBR, EVA and thermoplastic elastomeric materials. 55

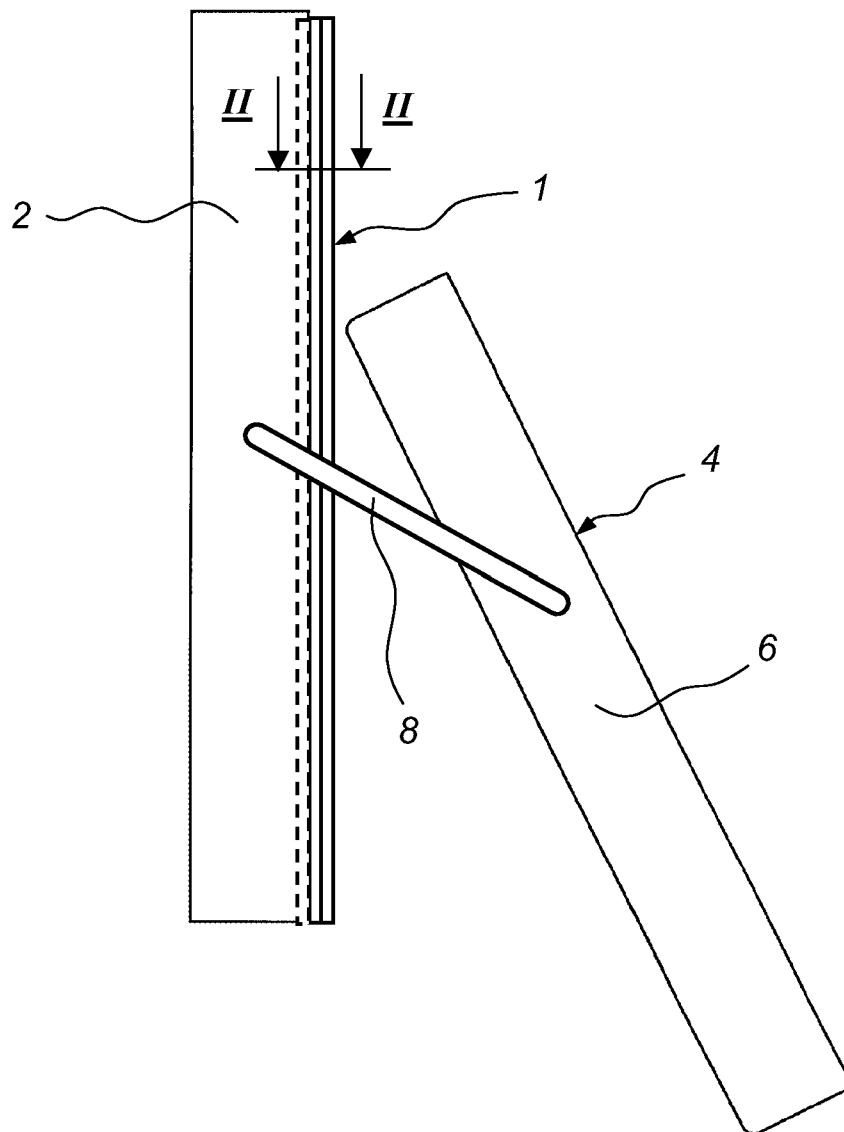
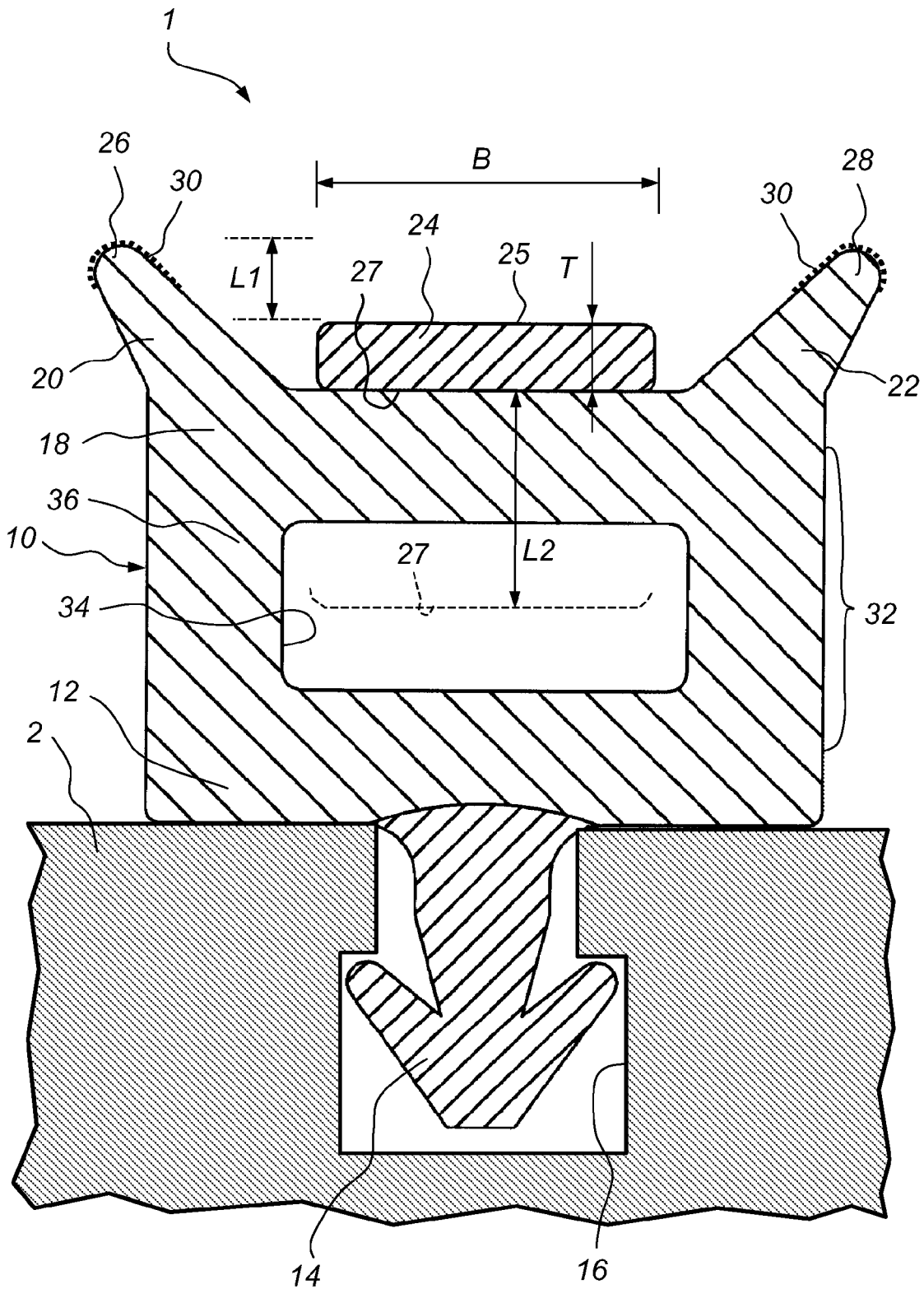


Fig. 1



II-II

Fig. 2

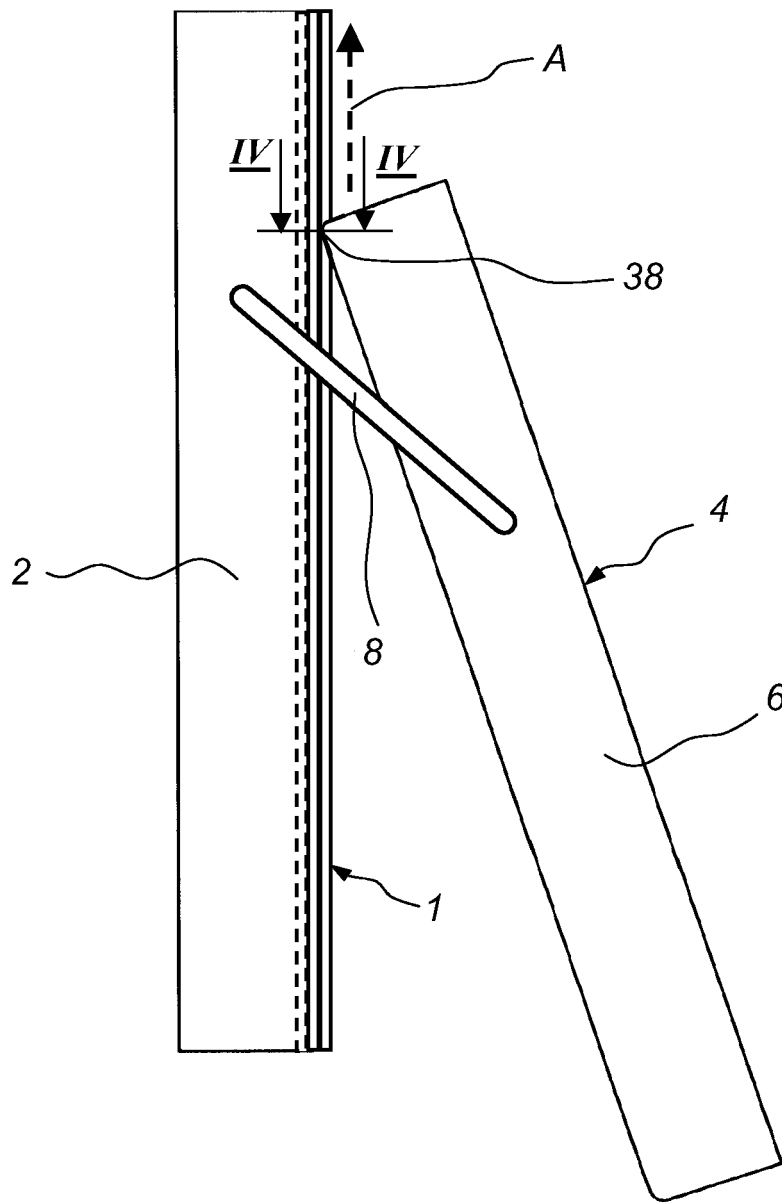


Fig. 3

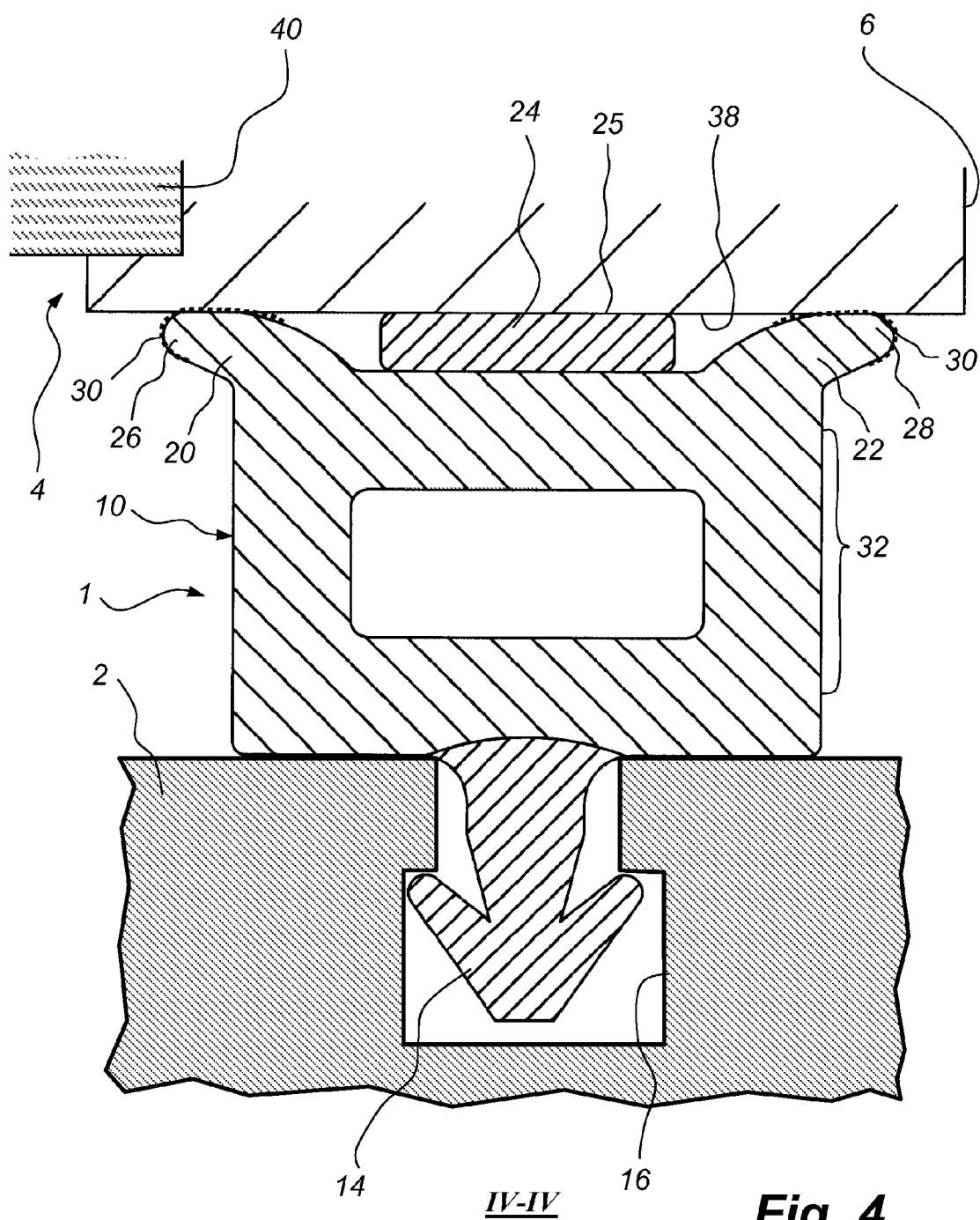


Fig. 4

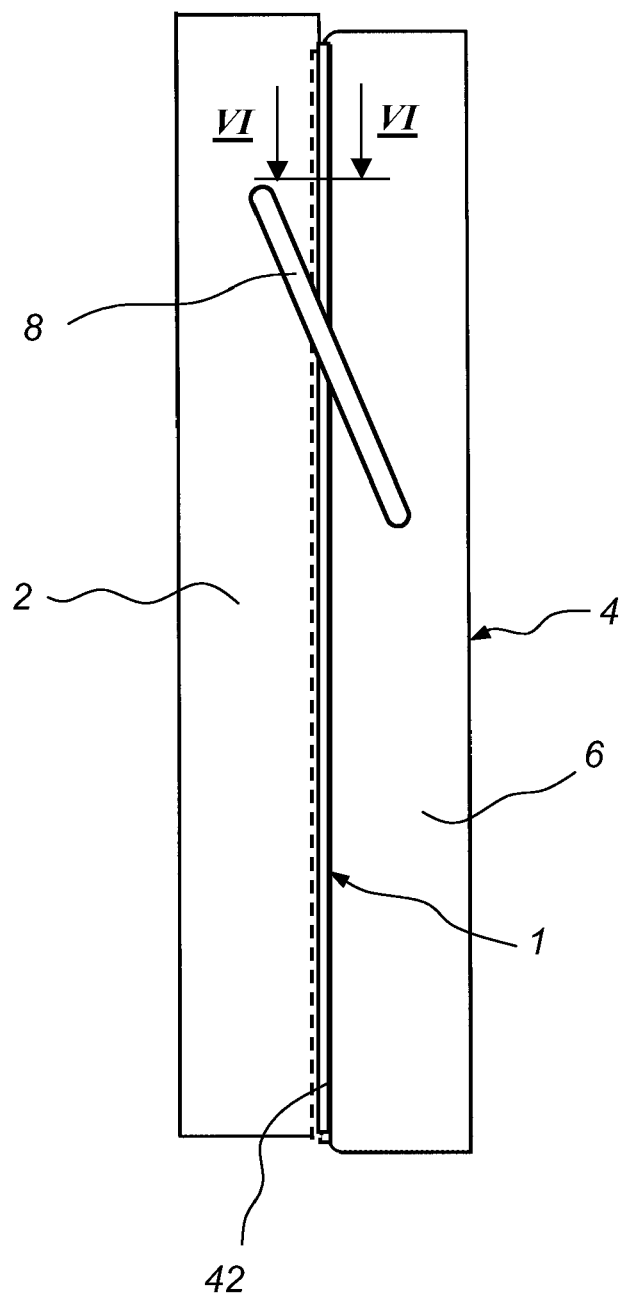


Fig. 5

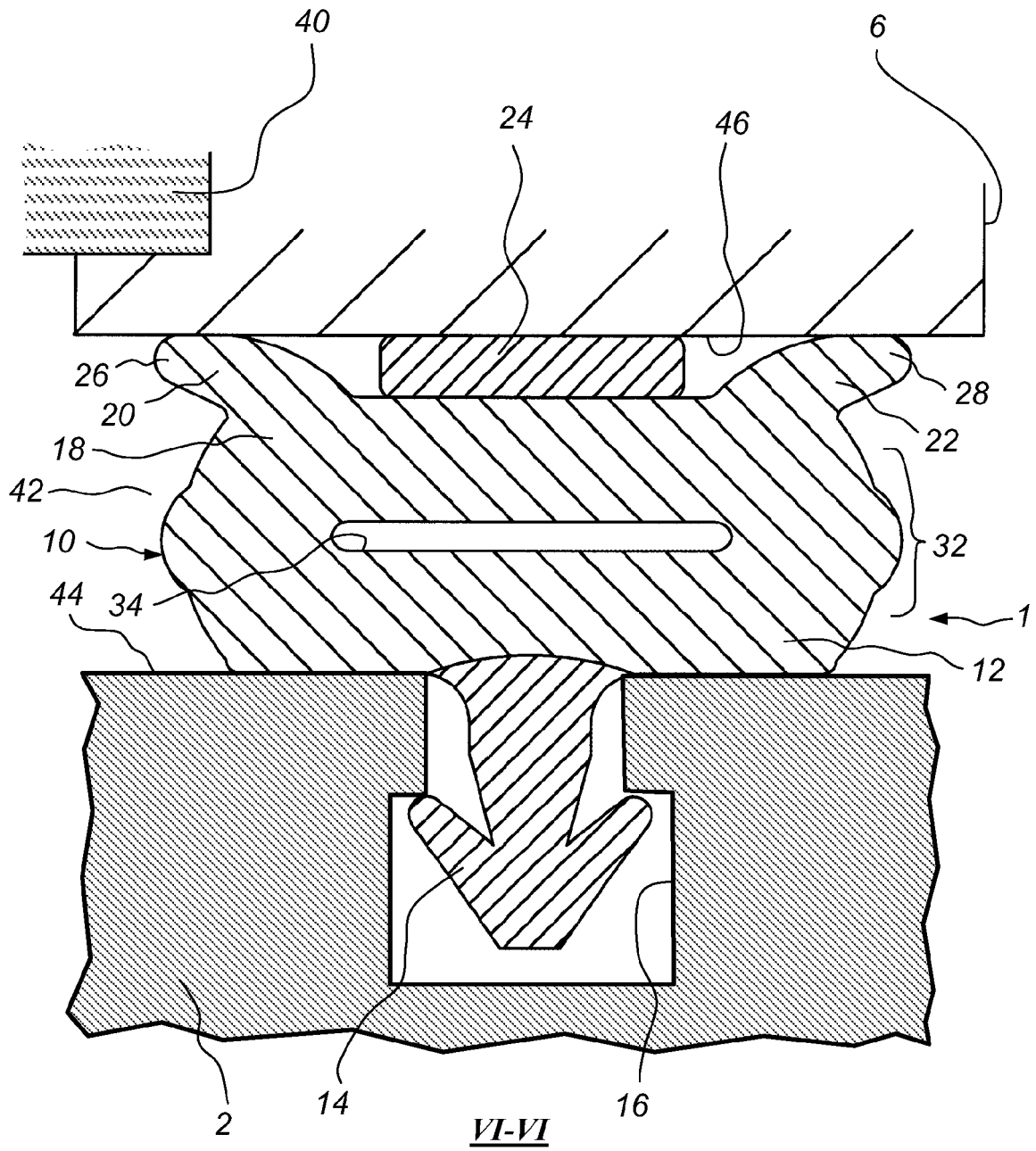


Fig. 6

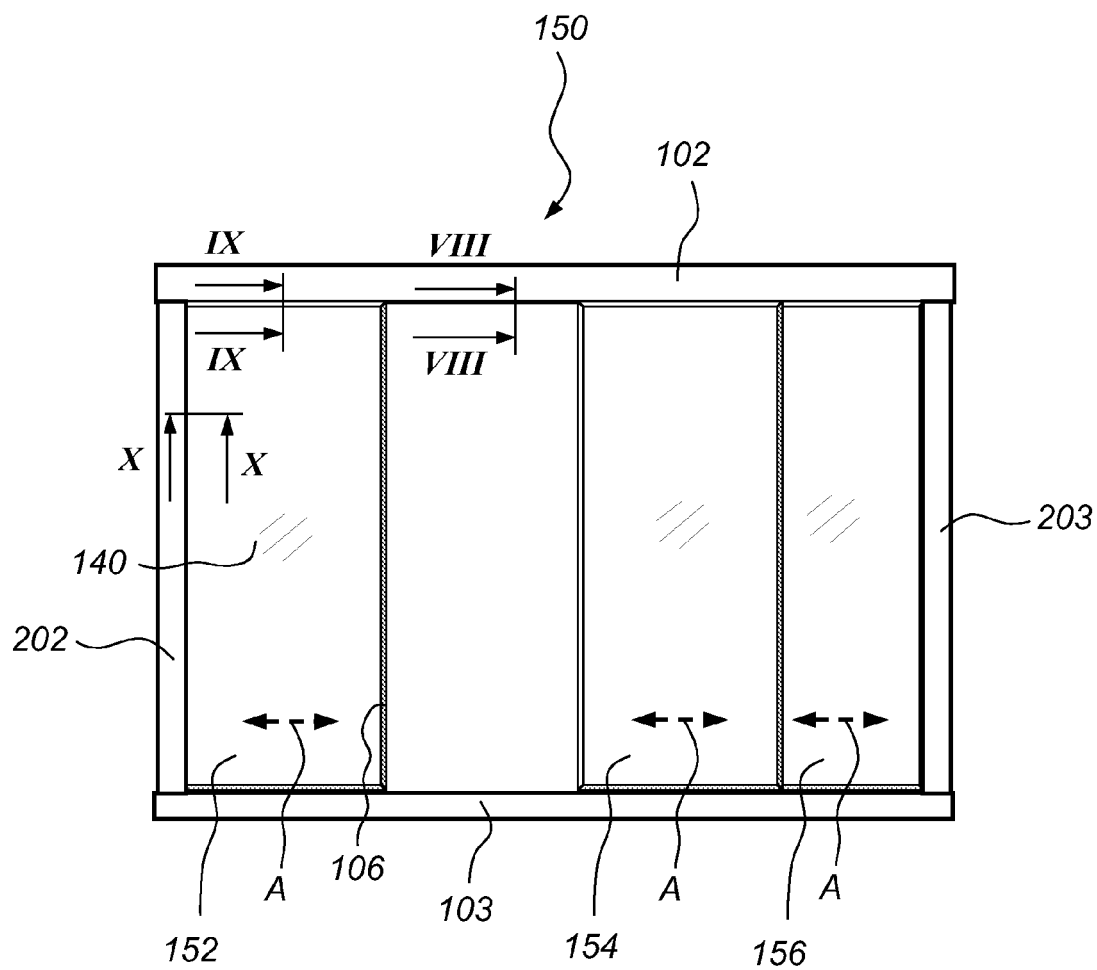
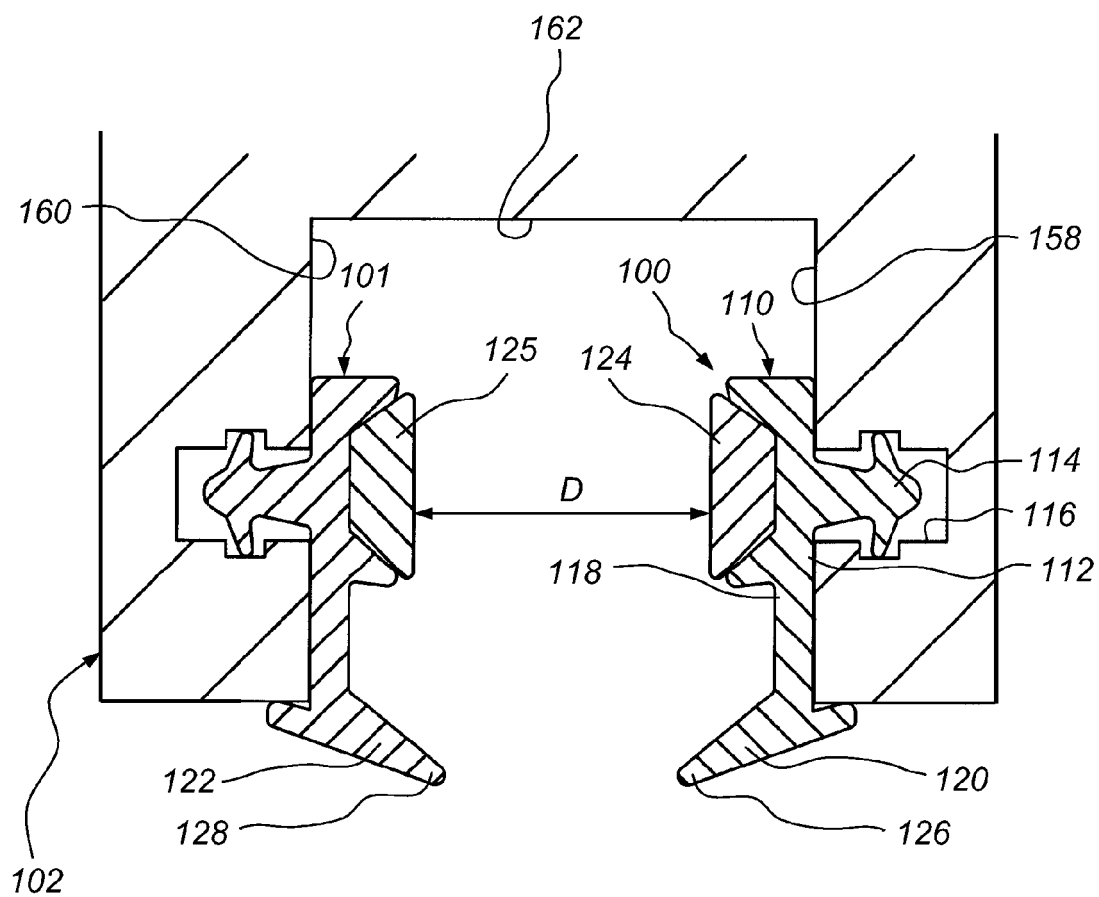
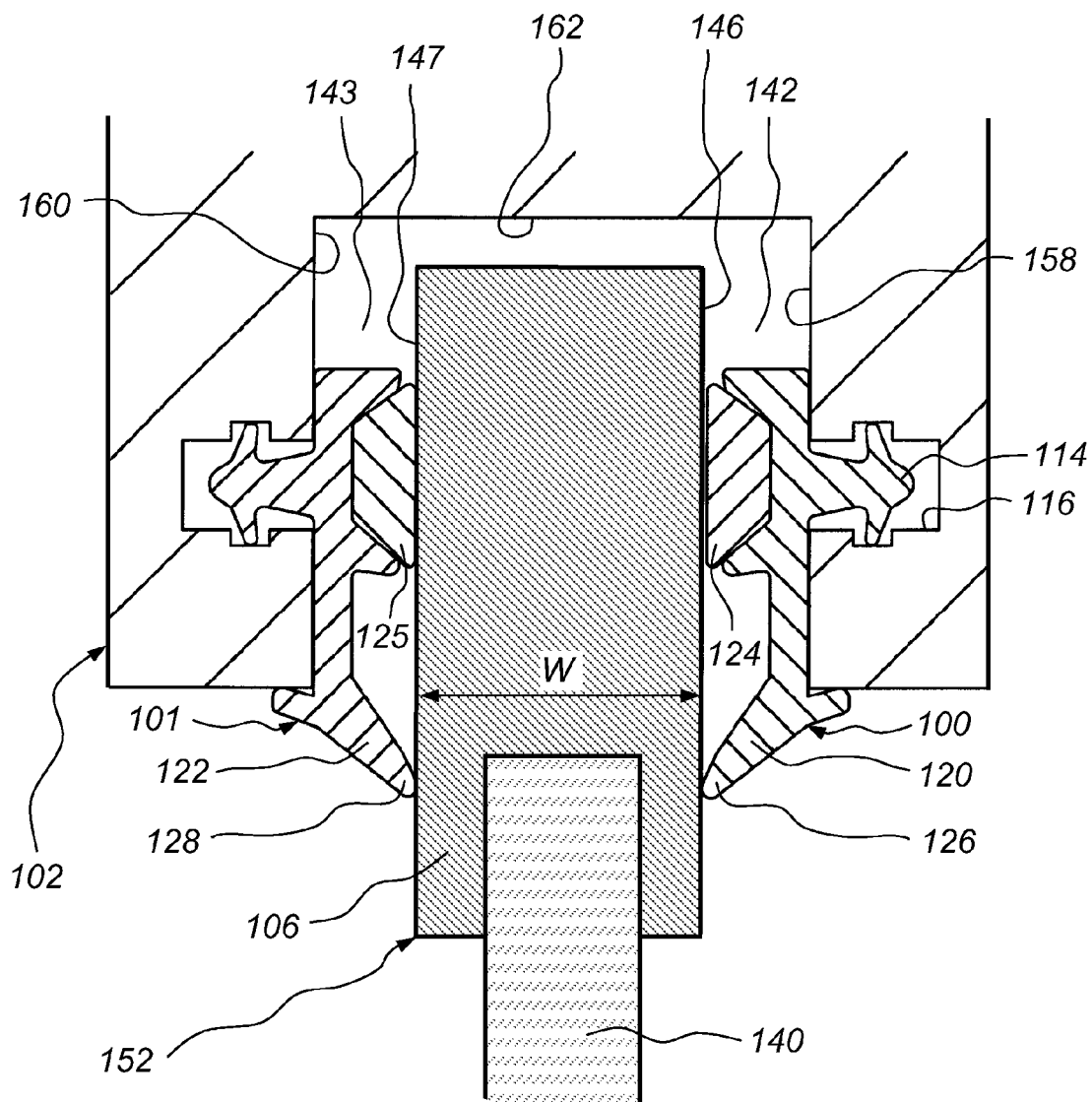


Fig. 7



VIII-VIII

Fig. 8



IX-IX

Fig. 9

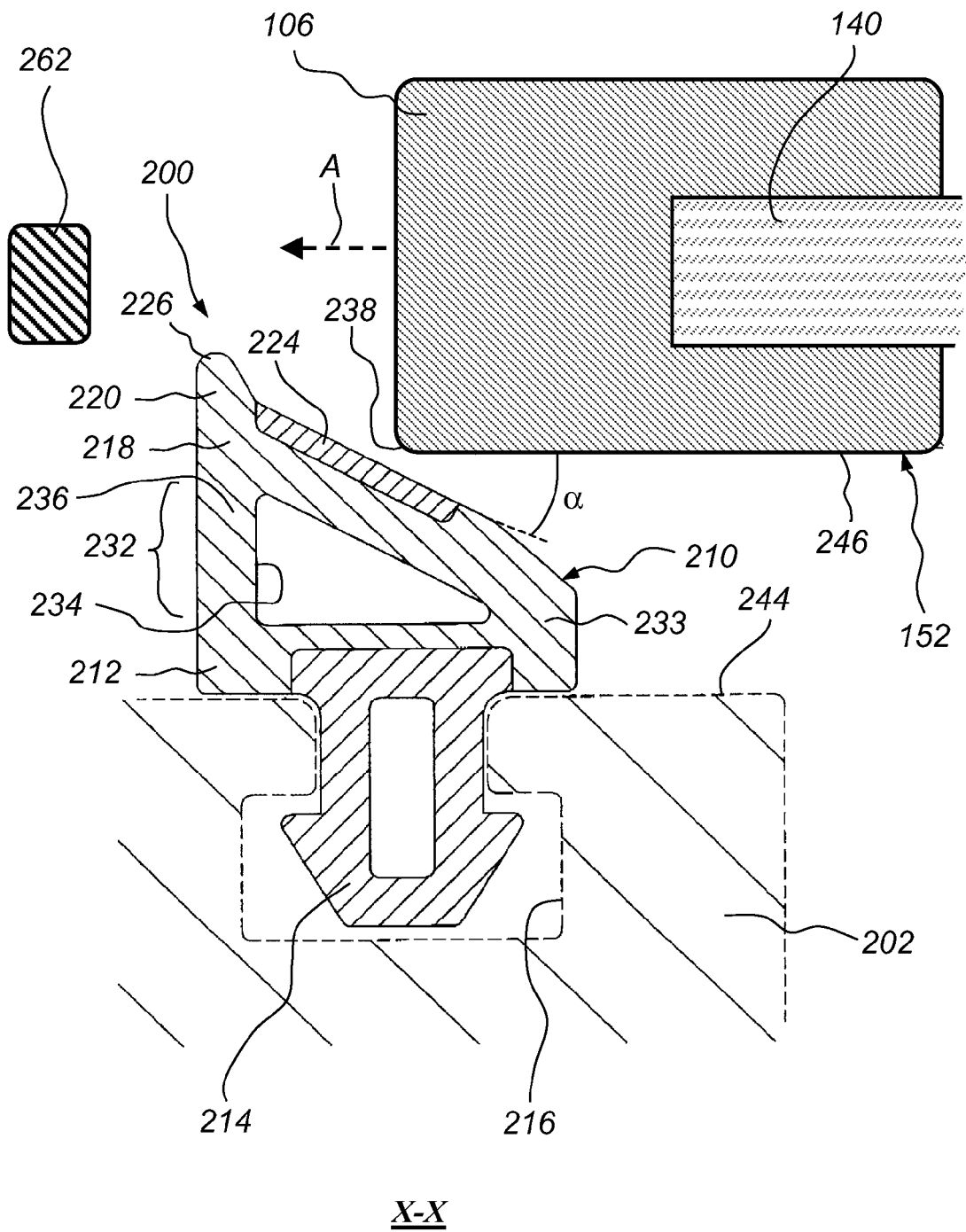


Fig. 10

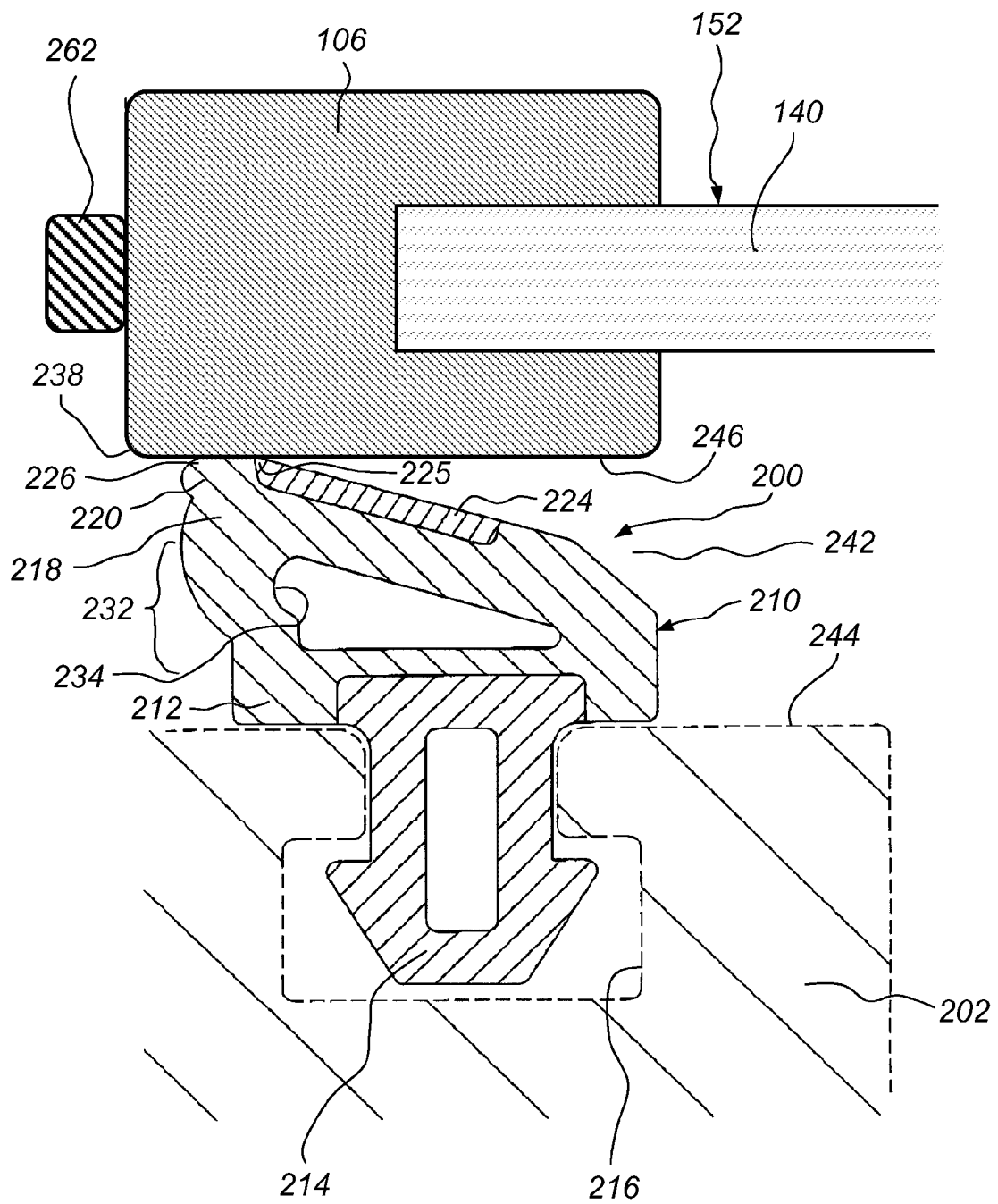


Fig. 11

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 0209453 A [0003]