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(54) **DEVICE FOR CONNECTION WITH ROOF PENETRATING DEVICES**

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(73) Proprietor: **CREATON GmbH**
86637 Wertingen (DE)

(72) Inventors:
• **BALKENHOL, Rainer**
89312 Günzburg (DE)
• **PETERSEN, Malte**
89312 Günzburg (DE)

• **STEINBACH, Klaus**
86368 Gersthofen (DE)

(74) Representative: **Mammel, Ulrike**
Mammel & Maser
Patentanwälte
Tilsiter Strasse 3
71065 Sindelfingen (DE)

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Description

[0001] The present invention relates to a device for connection of roof penetrations to the respective sub-roof.

[0002] The connection of the pipe of a sanitary ventilation and/or room ventilation to the vapour pipe of a passage tile happens generally by cutting an aperture in the sub-roof sheeting, guiding the vapour pipe through the aperture, normally sealing by means of a tape or the like and sliding onto the vapour pipe from below a flexible hose connector for a connection with the ventilation pipe.

[0003] In the rulebook of the German Roofing Trade in the leaflet named "Merkblatt für Un-terdächer, Unterdeckungen, Unterspannungen", the requirement is found that mounting parts and penetrations in sub-roofings and sub-roofs have to be surrounded in a waterproof manner and connected to the additional measure.

[0004] In case of round pipe passageways, this is not easy to establish, since sticking the sub-roof sheeting on such a pipe is relative complicated and provides leakage possibilities.

[0005] DE 44 30 657 A1 teaches a device for sealing the transition between the lateral surface and a roof-passageway, consisting of a foil collar and a connecting portion to be connected with the sealing foil (roof sub-sheeting) and made from a prefabricated formed component that can be pulled over the pipe with the foil collar. For this purpose, the middle portion of the foil is formed as cylindrical ring whose internal diameter corresponds to the outer diameter of the vapour pipe.

[0006] Furthermore, a connector ring is known that consists of a base element having a first cylindrical pipe section with a flange connecting to the pipe end, and an elastic ring that is pulled onto the pipe and engages in a circumferential groove on the outside of the pipe section. The elastic ring can be folded upwards and downwards. The connector ring is now first screwed in the cut-out in the sub-roof sheeting, with a folded up ring by means of a slot provided in the flange of the first pipe section, until the flange is situated below the sub-roof sheeting. Then, the elastic ring is folded down, such that it rests on the sub-roof sheeting with the underside of its edge, and the sub-roof sheeting is clamped between the flange and the ring. The outwardly facing end of the pipe section is sealed with a sealing lid.

[0007] This device enables, due to the flexibility of the ring, a repeated up and down folding. It is, however, disadvantageous that the tightness of the device reduces over time due to weather conditions and in the case of standing water.

[0008] Another device, according to the preamble of claim 1, is known from DE 29721602 U1.

[0009] The object of the present invention is to provide a flexible device for connection of roof passages or penetrations, that maintains its tightness for a long period of time, also with standing water. The object is solved by the features of claim 1.

[0010] According to a first aspect of the invention, a device for connection of roof penetrations is provided with a base element comprising a pipe having a flange at its one end and a ring element comprising a pipe with a flange at its one end, wherein the pipe of the ring element encompasses the pipe of the base element and is slidable relative thereto. Both flanges are oriented in the same direction and at the lateral surface of the pipe of the base element at least one first latching element and at the internal side of the pipe of the ring element at least one second latching element is provided and by the cooperation of the first latching element with the second latching element a latching connection between the base element and the ring element is achieved, wherein the flange of the base element comprises a radially extending slot.

[0011] According to some embodiments, the ring element may comprise a circumferential outwardly directed web at its end opposite the flange. According to other alternative embodiments, the ring element may additionally or alternatively comprise a screw thread.

[0012] In a preferred embodiment, a sealing lid may be provided. Sealing is to be understood as watertight sealing.

[0013] This sealing lid is adapted to close the end of the pipe of the ring element, which end is opposite to the one end of the a pipe with one end comprises the flange.

[0014] According to some embodiments, the sealing lid may accommodate the circumferential outwardly oriented web of the ring element, e.g. in a circumferential bag or recess at its underside. In a further alternative embodiment, the sealing lid may comprise an internal thread corresponding to the screw thread at the ring element.

[0015] According to some embodiments, the sealing lid may comprise at its upper side various circular cutting guides.

[0016] According to some embodiments, circular sealing webs may be arranged at the underside of the sealing lid.

[0017] According to some embodiments of the device provides, the sealing lid may comprise various outwardly oriented ears.

[0018] Preferably, the length L₁₂ of the pipe of the base element measured in longitudinal direction L is equal or smaller than the length L₂₂ of the sum of the length of the pipe and the length of the web of the ring element.

[0019] According to some embodiments, the sealing lid is elastic, especially from a thermoplastic elastomer. According to some embodiments, the base element and the ring element may be made of plastic, especially of polypropylene, polyethylene or PVC.

[0020] A lid has several advantages. The provision of a lid allows the device according to the invention to be installed while temporarily not being used to provide a roof penetration, still keeping its water tightness. Once used to allow a piping or alike to penetrate through the device, in particular through the lid while removing a circle

out of the lid by using a circular cutting guide, the device may easily be taken out of service or modified to allow a piping with different diameter. Either a new lid is used to close the pipe, hence the device is taken out of service in a watertight way, or a new lid with an opening adapted to the new piping is used to make a new watertight roof penetration.

[0021] According to some embodiments, the at least one first latching element may be a circumferential groove and the at least one second latching element may be a circumferential protrusion or vice versa.

[0022] According to some embodiments, the angle β between the lateral surface of the base element and the surface of the flange in the direction opposed to the flange may be smaller than the angle γ between the lateral surface of the ring element and the surface of the flange in the direction opposite to the flange and the angles β , γ are obtuse angles.

[0023] The angle β is preferably between 93° and 140° , preferably between 95 and 120° such as between 100° and 120° . E.g. β may be between 95° and 105° . The angle γ is preferably between 93° and 140° , preferably between 95 and 120° such as between 100° and 120° . E.g. γ may be between 95° and 105° .

[0024] The invention provides that the flange of the base element comprises a radially extending slot.

[0025] The slot is preferably nothing more but a slit in the flange of the base element, such as a slit from the outer edge of the flange up to the interference of the flange and the pipe of the base element. Most preferably, such slit is provided, while except for the width of this slit, all along the radial circumference of the interface between the flange and the pipe, the flange and pipe are continuously interconnected.

[0026] This slot, preferably a slit in the flange, serves to enable the base element to be rotated into a hole made in the underroof, such that the pipe of the base element projects through the hole. A hole with diameter approximately the outer diameter of the pipe is provided in the underroof, through which the device according to the invention is to be provided. The edge of this hole is inserted in the slot, such that at one side of the slot, the flange is positioned under the underroof, while at the opposite side, the flange is located above the underroof. The base element is rotated around its axis in a direction towards the side of the slot where the flange is above the underroof. Gradually, the flange will rotate into the hole, such that gradually the flange becomes positioned under the underroof. When the rotation is finished, the whole flange will be positioned under the underroof, while the pipe sticks through the hole in the underroof.

[0027] The fact of a flange which, while except for the width of a slit, all along the radial circumference of the interface between the flange and the pipe, the flange and pipe are continuously interconnected, cause that only along the minor width of the slit, danger of water ingress is possible, in the unlikely case the base element and the ring element would not fit each other in a watertight man-

ner.

[0028] The width of the slit is preferably less than about 4mm, such as less than 4mm, e.g. less than 3mm, even less than 2.5mm, e.g. less than or equal to 2mm or 1mm.

5 The minimum width needed is minor. Just a cut through with about 0 mm width is suitable. Hence the minimum with is more than 0mm, or more than 0.01mm.

[0029] Furthermore, according to some embodiments of the device, the first latching element and/or the second latching element may comprise an inclined flank and a steep flank.

[0030] Preferably, the angle between the inclined flank and the steep flank is an acute angle.

10 **[0031]** According to some embodiments of the device, the latching elements may be provided at the upper end of the base element and the ring element and/or in the middle of the pipes or rather at the lower end of the pipes.

[0032] The inventive connector device comprises a base element having a pipe and a flange and a ring element having a pipe and a flange, wherein the pipe of the ring element encompasses the pipe of the base element and is slidable relative thereto and at the lateral surface of the pipe of the base element one first latching element and at the internal side of the pipe of the ring element one second latching element is provided. During shifting the one latching element now engages with the other latching element, the latching elements cooperate and a latching connection between the base element and the ring element is achieved.

20 **[0033]** In the position in which both latching elements engage, the flange of the ring element is simultaneously pressed against the base element, such that the sub-roof sheeting positioned between both flanges is sealed.

[0034] Since the pressing of the flange of the ring element against the flange of the base element of the claimed device happens through the latching connection and not through folding down elastic parts, the disadvantages of the known connector ring due to the material fatigue of the elastic ring and the loss of elasticity of the elastic part can be avoided and an enduring tightness can be achieved.

30 **[0035]** Moreover, the device according to the invention with the latching elements has a higher flexibility, since more than two latching elements or more than one latching connection may be provided. This has the advantage that the contact pressure of the flange of the ring element on the flange of the base element is selectable and the connector device can thus be used for sub-roof sheetings of different thicknesses.

40 **[0036]** The latching elements may be a groove or a correspondingly formed protrusion or elevation. Preferably, the latching connection is not releasable, such that a material weakening due to repeated opening and closing can be avoided.

50 **[0037]** The latching connection may also be denoted as snap or click connection.

[0038] In order to achieve that the flange of the ring element is permanently pressed against the flange of the

base element and that the connection to the sub-roof sheeting is thus tight, the angle β between the lateral surface and the surface of the flange of the base element in the direction opposed to the flange is smaller than the angle γ between the lateral surface of the ring element and the surface of the flange in the direction opposite to the flange, wherein the angles β, γ are obtuse angles.

[0039] In the upper section of the device, the tightness may be achieved in that a web is provided, which extends rectangularly from the pipe of the ring element and is accommodated in a bag of the sealing lid. Hereby, a liquid-tight connection of the sealing lid via the ring element up to the upper side of the sub-roof sheeting is achieved. Unlike in the state of the art, the tightness in the device according to the invention is achieved via the ring element and not via the base element.

[0040] In another alternative embodiment, the ring element comprises a screw thread in the upper section of its outside and the sealing lid a corresponding internal thread, such that a liquid-tight connection is achieved.

[0041] The connector device according to the invention can be used universally for all roof penetrations, not only for the connection of ventilation or vapour pipes, but also for the connection of photovoltaic systems, antenna masts, solar heating systems or gas boilers.

[0042] The sealing lid at its upper side comprises different circular cutting guides. Cutting knives can be put on the edges of the cutting guides to be able to cut the desired circular aperture for the respective desired pipe diameter in the correct size in the sealing lid in a simple way. For sealing the sealing lid at its underside comprises circular sealing webs corresponding to the circular cutting guide and only marginally offset outwards with respect to the circular cutting guide, the sealing webs serve for resting on the lateral surface of the pipe, connector, mast, etc., which is inserted in the sealing lid aperture.

[0043] Likewise, weak circular means may be provided at the sealing lid.

[0044] In the following, the invention is described in more detail by reference to embodiments. The following is shown:

Fig. 1: a perspective view of the base element from diagonal above,

Fig. 2: the base element from Figure 1 in section,

Fig. 3: the detail A from Figure 2,

Fig. 4: a perspective view of the ring element from diagonal above,

Fig. 5: the ring element from Figure 4 in section,

Fig. 6: the section B from Figure 5,

Fig. 7: a perspective view of the sealing lid from diagonal above,

Fig. 8: the section through the lid from Figure 7,

Fig. 9: the detail C from Figure 8,

Fig. 10: the left region of the ring element before the engagement of the protrusion in the groove of the base element,

Fig. 11: the left region of the ring element after the engagement of the protrusion in the groove of the base element,

Fig. 12: a perspective exploded view of the inventive connection device and

Fig. 13: a perspective view of the (assembled) connection device from Figure 12.

[0045] The connection device comprises a base element 12 and a ring element 22 that can be latched or clipped onto the base element 12, see Figure 1, Figure 4, Figure 12.

[0046] The base element 12 consists of a cylindrical pipe 13 that at its one end 16 comprises a flange 14 extending at an obtuse angle β of 98° with respect to the lateral surface 15 of the pipe 13.

[0047] The flange 14 has a radially extending slot 18. During assembly the edge of the cut-out of the sub-roof sheeting is inserted in this slot 18 and the device is then screwed in the sub-roof sheeting around its longitudinal centre line L as long as the whole flange 14 comes to rest below the sub-roof sheeting.

[0048] At the other end 17 of the pipe 13 of the base element 12, in its lateral surface 15, a first latching element is located, namely a circumferential groove 19, serving as an engagement of a corresponding second latching element 31 at the ring element 22. The groove 19 comprises an inclined flank 19.1 and a steep flank 19.2, the angle between the inclined flank 19.1 and the steep flank 19.2 is an acute angle, see Figure 3. The steep flank 19.2 runs at an angle of $\alpha = 90^\circ$ to the longitudinal centre line L of the base element 12, the inclined flank 19.2 extends in direction to the flange 14.

[0049] The ring element 22 also consists of a cylindrical pipe 23 that at its one end 26 also comprises a flange 25 extending at an obtuse angle of $\gamma = 110^\circ$, thus an angle γ being greater than the angle β of the base element 12, with respect to the lateral surface 25 of the pipe 23 of the ring element 22, see Figure 4 to 6.

[0050] At the internal side 30 of the pipe 23 near the other end 27 the second latching element, namely a rotationally symmetrical circumferential protrusion 31, is provided having an inclined flank 31.1 and a steep flank 31.2. The steep flank 31.2 runs at an angle α of preferably 90° to the longitudinal centre line L of the ring element 22. The angle between the inclined flank 31.1 and the steep flank 31.2 is acute and corresponds to the angle between the inclined flank 19.1 and the steep flank 19.2

of the circumferential groove 19 of the base element 12.

[0051] The pipe 23 of the ring element 22 encompasses the pipe 13 of the base element 12, wherein the lateral surface 15 of the base element 12 extends along the internal side 30 of the ring element 22 and the ring element 22 is slidable along the longitudinal centre line L with respect to the base element 12.

[0052] When the ring element 22 is now shifted according to arrow D in Figure 10 in the direction of roof truss 39, the ring element 22 slides with its internal side 30 along the lateral surface 15 of the base element 12 until the inclined flank 31.1 reaches the inclined surface 20 at the upper end 17 of the base element 12. The inclined surface 20 at the end 17 of the base element 12 is curved lightly convexly and ends in the steep flank 19.2 of the groove 19. The inclined flank 31.1 slides along the inclined surface 20 of the base element 12, wherein the ring element 22 is lightly pushed outwardly at its upper end 27 until the circumferential protrusion 31 then engages and snaps, respectively, or clips in the groove 19.

[0053] Depending on the dimensions of the groove 19 and the protrusion 31, the wall thicknesses of the pipes 13, 23 and the material of the base element 12 and the ring element 22, the latching connection between the protrusion 31 and the groove 19 may be releasable or not.

[0054] Preferably, the ring element 22 once engaged is no longer releasable from the base element 12, i.e. the latching connection is permanent, such that the outer edge 36 of the underside 34 of the flange 24 of the ring element 22 is permanently pressed against the upper side 21 of the flange 14 of the base element 12 under preload.

[0055] This can be achieved by forming the protrusion 31 and the corresponding groove 19 in a barbed-like fashion, the angle α between the steep flanks 19.2 and 31.2 and the longitudinal centre line being an acute angle and the distance E (Figure 5) between the steep flank 31.2 and the lower outer edge 36 of the flange 24 being slightly greater than the distance F (Figure 2) between the outer edge 49 of the upper side 21 of the flange 14 and the steep flank 19.2 of the first latching element 19.

[0056] The preload is achieved by the angle β at the base element 12 being smaller than the angle γ at the ring element 22. By the latching connection 19, 31 the outer lower edge 36 of the flange 24 is pressed against the upper side of the flange 14 of the base element 12. In the assembled state, the sub-roof sheeting is between the upper side 21 of the flange 12 and the underside 34 of the flange 24, such that a tight connection is achieved.

[0057] At the other end 27 of the ring element 22 a rectangular web 35 extends rectangular to the lateral surface 25 of the pipe 23. This web 35 serves for fastening of a sealing lid 40.

[0058] After the ring element 22 resting with its flange 24 on the sub-roof sheeting and the flange 24 via the pipe 23 passes over in the web 35 which is accommodated in a bag in the sealing lid 40 in a liquid-tight fashion, as described further below, - different from the connector

devices known so far - no standing water can get into the passage.

[0059] The sealing lid 40 is preferably made of a thermoplastic elastomer and elastic.

[0060] The base element 12 and the ring element 22 are preferably made of plastic, especially made of polypropylene. Preferably, the stability of the base element 12 is higher than that of the ring element 22, such that the ring element can be slid onto the base element 12 under a slight deformation.

[0061] The sealing lid 40, see Figures 8 to 10, has the form of a circular disc and at its upper side comprises various circular cutting guides 41, 41.1, 41.2 that indicate different pipe diameters and that serve for guiding of the cutting knife when cutting out the desired circular aperture, if necessary. At the underside 42 of the sealing lid 40 - corresponding to the concentric circles 41, 41.1, 41.2, but slightly further out, there are sealing webs 43 that also run in concentric circles and serve for a lateral sealing when a pipe of a perimeter corresponding to a concentric circle 41.1 is pushed into the sealing lid 40.

[0062] At the underside 42 of the sealing lid 40 near the outer edge 44 of the sealing lid 40 runs an L-shaped web 45 comprising a web section 45.1 running perpendicular to the underside 42 and a web section 45.2 running parallel to the underside 42, such that, between the underside 42 and the web section 45.2, there is a circumferential bag 46 serving for accommodation of the web 35 of the ring element 22.

[0063] The length L12 of the pipe 13 of the base element 12 is smaller than or at most equal to the whole length L22 of the pipe 23 and the web 35, see Figure 10. When the ring element 22 is engaged in the base element 12 (see Figure 11), the upwardly facing side of the web 35 is above or on the same level as the end 17 of the base element 12, such that no water can get to the base element 12 from the outside. By the upward sealing of the ring element 22 by means of the sealing lid 40, the downward sealing of the ring element 22 via the flange 24 and by only the ring element 22 and not also the base element 12, as it is the case in the prior art, comprising an outwardly open lateral surface 25, a higher tightness is achieved.

[0064] The elastic sealing lid 40 is put on the ring element 22 and then radially outwardly pulled over the web 35 of the ring element 22, whereby the web 35 of the ring element 22 slides in the radial circumferential bag 46.

[0065] In order to allow a better pulling of the sealing lid 40 over the ring element 22, the sealing lid 40 comprises various outwardly protruding ears 47, by means of which the sealing lid 40 can be easier grasped and pulled over the ring element 22.

[0066] Upon assembly of the connector device at first a circular cut-out, preferably by means of a template, is cut into the sub-roof sheeting. Then the edge of the cut-out of the sub-roof sheeting is put in the slot 18 in the flange 14 of the base element 12 and the device is then screwed in the sheeting until the sub-roof sheeting is

above the flange 14.

[0067] Now, the ring element 22 that is slidable on the base element 12, is slid downward until the circumferential groove 31 engages the circumferential groove 19 running at the internal side of the pipe 13. Hereby, the outer edge 36 at the underside 34 of the flange 24 of the ring element 22 is simultaneously pressed from above onto the upper side of the sub-roof sheeting, such that a tight connection is achieved.

[0068] Now, the sealing lid 40 is put on the ring element 22 and the sealing lid 40 is pulled over the horizontal circumferential web 35 at the upper end 27 of the ring element 22 by pulling on the ears 47, such that the web 35 slides in the bag 46 in the sealing lid 40.

[0069] Hereby, a tight connection is achieved in a simple way, even in case of standing water no water can get in the aperture.

[0070] The device according to the invention can be used for roof passages of different diameters and different pipe diameters.

[0071] Since the device seals effectively by means of both flanges 14, 24 on both sides of the sub-roof sheeting, the device according to the invention cannot only be put and mounted on the sub-roof sheeting from the outside, but in principle also from the top floor through the sub-roof sheeting outwardly.

[0072] The aperture for the pipe is preferably cut into the sealing lid before an assembly, but the cut is also possible after the assembly.

[0073] In a further alternative embodiment, the arrangement of the grooves/protrusions is inverse. The circumferential groove 19 is not arranged at the base element 12, but at the ring element 22, at the point where in the embodiment described above the circumferential protrusion 31 is located, and the circumferential protrusion 31 is not provided on the ring element 22, but on the base element 12.

[0074] In a further alternative embodiment, the base element 12 and the ring element 22 comprise multiple latching positions, such that the device can be used with sub-roof sheetings of different thicknesses. Thus, the base element 12 for example comprises multiple grooves 19 and the ring element 22 a circumferential protrusion 31 (or vice versa), such that the ring element 22 with its protrusion 31 upon depressing engages in the first groove 19, then in the second, etc. until it abuts with its flange 24 on the upper side of the sub-roof sheeting and cannot be further depressed.

[0075] Generally, the latching elements 19, 31 can be provided at the upper end of the base element 12 and the ring element 22 as well as in the middle of the pipes 13, 23 or rather at their lower end.

Claims

1. Device for connection of roof penetrations, said device comprising a base element (12) comprising a

pipe (13) having a flange (14) at its one end (16), said device comprising a ring element (22) comprising a pipe (23) with a flange (24) at its one end (26), whereby the pipe (23) of the ring element (22) encompasses the pipe (13) of the base element (12) and is slidable relative thereto, both flanges (14, 24) are oriented in the same direction, at the lateral surface (15) of the pipe (13) of the base element (12) at least one first latching element (19) is provided, at the internal side (30) of the pipe (23) of the ring element (22) at least one second latching element (31) is provided, by the cooperation of the first latching element (19) with the second latching element (31) a latching connection between the base element (12) and the ring element (22) is achieved, **characterized in that** the flange (14) of the base element (12) comprises a radially extending slot (18).

2. Device according to claim 1, **characterized in that** the ring element (22) comprises a circumferential outwardly directed web (35) or a screw thread at its end (27) opposite to the flange (24).

3. Device according claim 2, **characterized in that** additionally a sealing lid (40) is provided.

4. Device according to claim 3, **characterized in that** the sealing lid (40) accommodates the circumferential outwardly oriented web (35) of the ring element (22) in a circumferential bag (46) at its underside (42) or comprises an internal thread corresponding to the screw thread at the ring element (22).

5. Device according to any of claims 3 to 4, **characterized in that** the sealing lid (40) comprises at its upper side various circular cutting guides (41).

6. Device according to any of claims 3 to 5, **characterized in that** circular sealing webs (43) are arranged at the underside (42) of the sealing lid (40).

7. Device according to claim 2 to 6, **characterized in that** the length L₁₂ of the pipe (13) of the base element (12) measured in longitudinal direction L, is equal or smaller than the length L₂₂ of the sum of the length of the pipe (23) and the length of the web (35) of the ring element (22).

8. Device according to any of claims 3 to 7, **characterized in that** the sealing lid (40) is elastic, especially from a thermoplastic elastomer.

9. Device according to any of claims 3 to 8, **characterized in that** the sealing lid (40) comprises various outwardly oriented ears (47).

10. Device according to any one of the preceding claims, **characterized in that** the at least one first latching

element (19) is a circumferential groove and the at least one second latching element (31) is a circumferential protrusion or vice versa.

11. Device according to any one of the preceding claims, **characterized in that** the angle β between the lateral surface (15) of the base element (12) and the surface of the flange (14) in the direction opposed to the flange (14) is smaller than the angle γ between the lateral surface (32) of the ring element (22) and the surface of the flange (24) in the direction opposite to the flange (24) and that the angles β , γ are obtuse angles.
12. Device according to any one of the preceding claims, **characterized in that** the first latching element (19) and/or the second latching element (31) comprise an inclined flank (19.1, 31.1) and a steep flank (19.2, 31.2).
13. Device according to claim 12, **characterized in that** the angle between the inclined flank (31.1, 19.1) and the steep flank (31.2, 19.2) is an acute angle.
14. Device according to any one of the preceding claims, **characterized in that** the base element (12) and the ring element (22) are made of plastic, especially of polypropylene, polyethylene or PVC.
15. Device according to any one of the preceding claims, **characterized in that** the latching elements (19, 31) are provided at the upper end of the base element (12) and the ring element (22) and/or in the middle of the pipes (13, 23) or else at the lower end of the pipes (13, 23).

Patentansprüche

1. Vorrichtung zum Anschluss von Dachdurchdringungen umfassend ein Grundelement (12), das ein Rohr (13) mit einem Flansch (14) an seinem einen Ende (16) umfasst, und ein Ringelement (22), das ein Rohr (23) mit einem Flansch (24) an seinem einen Ende (26) umfasst, wobei das Rohr (23) des Ringelements (22) das Rohr (13) des Grundelements (12) umgreift und gegenüber diesem verschiebbar ist und die beiden Flansche (14, 24) in dieselbe Richtung weisen und an der Mantelfläche (15) des Rohrs (13) des Grundelements (12) wenigstens ein erstes Rastelement (19) und an der Innenseite (30) des Rohrs (23) des Ringelements (22) wenigstens ein zweites Rastelement (31) vorgesehen ist, und durch das Zusammenwirken des ersten Rastelements (19) mit dem zweiten Rastelement (31) eine Rastverbindung zwischen dem Grundelement (12) und dem Ringelement (22) erreicht wird, **dadurch gekennzeichnet, dass** der Flansch (14) des Grundelements (12) ei-

nen sich radial erstreckenden Schlitz (18) umfasst.

2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** das Ringelement (22) an seinem dem Flansch (24) gegenüberliegenden Ende (27) einen umlaufenden, nach außen gerichteten Steg (35) oder ein Schraubgewinde umfasst.
3. Vorrichtung nach Anspruch 2, **dadurch gekennzeichnet, dass** zusätzlich ein Dichtungsdeckel (40) vorgesehen ist.
4. Vorrichtung nach Anspruch 3, **dadurch gekennzeichnet, dass** der Dichtungsdeckel (40) in einer umlaufenden Tasche (46) an seiner Unterseite (42) den umlaufenden, nach außen gerichteten Steg (35) des Ringelements (22) aufnimmt oder ein Innengewinde umfasst, das zu dem Schraubgewinde am Ringelement (22) korrespondiert.
5. Vorrichtung nach einem der Ansprüche 3 bis 4, **dadurch gekennzeichnet, dass** der Dichtungsdeckel (40) an seiner Oberseite verschiedene kreisförmige Schneidführungen (41) umfasst.
6. Vorrichtung nach einem der Ansprüche 3 bis 5, **dadurch gekennzeichnet, dass** an der Unterseite (42) des Dichtungsdeckels (40) kreisförmige Dichtungsstege (43) angeordnet sind.
7. Vorrichtung nach einem der Ansprüche 2 bis 6, **dadurch gekennzeichnet, dass** die in Längsrichtung L gemessene Länge L₁₂ des Rohrs (13) des Grundelements (12) gleich oder kleiner ist als die Länge L₂₂ der Summe aus der Länge des Rohrs (23) und der Länge des Stegs (35) des Ringelements (22).
8. Vorrichtung nach einem der Ansprüche 3 bis 7, **dadurch gekennzeichnet, dass** der Dichtungsdeckel (40) elastisch, insbesondere aus einem thermoplastischen Elastomer, ist.
9. Vorrichtung nach einem der Ansprüche 3 bis 8, **dadurch gekennzeichnet, dass** der Dichtungsdeckel (40) verschiedene nach außen weisende Ohren (47) umfasst.
10. Vorrichtung nach einem der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** das wenigstens eine erste Rastelement (19) eine umlaufende Nut und das wenigstens eine zweite Rastelement (31) ein umlaufender Vorsprung ist oder umgekehrt.
11. Vorrichtung nach einem der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** der Winkel β zwischen der Mantelfläche (15) des Grundelements (12) und der Oberfläche des Flanschs (14) in die dem Flansch (14) entgegengesetzte Richtung

kleiner als der Winkel γ zwischen der Mantelfläche (32) des Ringelements (22) und der Oberfläche des Flanschs (24) in die dem Flansch (24) entgegengesetzte Richtung ist und die Winkel β , γ stumpfe Winkel sind.

12. Vorrichtung nach einem der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** das erste Rastelement (19) und/oder das zweite Rastelement (31) eine schräge Flanke (19.1, 31.1.) und eine steile Flanke (19.2, 31.2) umfassen.
13. Vorrichtung nach Anspruch 12, **dadurch gekennzeichnet, dass** der Winkel zwischen der schrägen Flanke (31.1, 19.1) und der steilen Flanke (31.2, 19.2) ein spitzer Winkel ist.
14. Vorrichtung nach einem der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** das Grundelement (12) und das Ringelement (22) aus Kunststoff, insbesondere aus Polypropylen, Polyethylen oder PVC sind.
15. Vorrichtung nach einem der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** die Rastelemente (19, 31) am oberen Ende des Grundelements (12) und des Ringelements (22) vorgesehen sind und/oder in der Mitte der Rohre (13, 23) oder aber am unteren Ende der Rohre (13, 23).

Revendications

1. Dispositif destiné à raccorder des passages à travers la toiture, comprenant un élément de base (12) qui comprend un tube (13) pourvu, à son extrémité (16), d'une collerette (14) et un élément annulaire (22) qui comprend un tube (23) pourvu, à son extrémité (26), d'une collerette (24), le tube (23) de l'élément annulaire (22) entourant le tube (13) de l'élément de base (12) et pouvant être déplacé par rapport à celui-ci, et les deux collerettes (14, 24) étant tournées dans la même direction, et au moins un premier élément d'enclenchement (19) étant prévu sur la surface latérale (15) du tube (13) de l'élément de base (12), et au moins un deuxième élément d'enclenchement (31) étant prévu sur la face intérieure (30) du tube (23) de l'élément annulaire (22), et un assemblage à enclenchement étant obtenu entre l'élément de base (12) et l'élément annulaire (22) grâce à l'interaction entre ledit premier élément d'enclenchement (19) et ledit deuxième élément d'enclenchement (31), **caractérisé en ce que** la collerette (14) de l'élément de base (12) comprend une fente (18) qui s'étend de manière radiale.
2. Dispositif selon la revendication 1, **caractérisé en ce que** l'élément annulaire (22) comprend, sur son extrémité (27) située à l'opposé de la collerette (24), un méplat (35) circonférentiel dirigé vers l'extérieur ou un filet de vissage.
3. Dispositif selon la revendication 2, **caractérisé en ce qu'il** est prévu en outre un couvercle d'étanchéité (40).
4. Dispositif selon la revendication 3, **caractérisé en ce que** le couvercle d'étanchéité (40) abrite dans une poche (46) circonférentielle située sur sa face inférieure (42) le méplat (35) circonférentiel, dirigé vers l'extérieur, de l'élément annulaire (22) ou comprend un filetage intérieur qui correspond au filet de vissage situé sur l'élément annulaire (22).
5. Dispositif selon l'une quelconque des revendications 3 à 4, **caractérisé en ce que** le couvercle d'étanchéité (40) comprend, sur sa face supérieure, différents guides de coupe (41) de forme circulaire.
6. Dispositif selon l'une quelconque des revendications 3 à 5, **caractérisé en ce que** des joints d'étanchéité (43) de forme circulaire sont disposés sur la face inférieure (42) du couvercle d'étanchéité (40).
7. Dispositif selon l'une quelconque des revendications 2 à 6, **caractérisé en ce que** la longueur L_{12} du tube (13) de l'élément de base (12) mesurée en sens longitudinal L est égale ou inférieure à la longueur L_{22} correspondant à la somme de la longueur du tube (23) et de la longueur du méplat (35) de l'élément annulaire (22).
8. Dispositif selon l'une quelconque des revendications 3 à 7, **caractérisé en ce que** le couvercle d'étanchéité (40) est élastique, en particulier est réalisé en un élastomère thermoplastique.
9. Dispositif selon l'une quelconque des revendications 3 à 8, **caractérisé en ce que** le couvercle d'étanchéité (40) comprend plusieurs oreilles (47) tournées vers l'extérieur.
10. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** ledit au moins un premier élément d'enclenchement (19) est une rainure circonférentielle et ledit au moins un deuxième élément d'enclenchement (31) est une saillie circonférentielle, ou vice-versa.
11. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** l'angle β entre la surface latérale (15) de l'élément de base (12) et la surface de la collerette (14) dans le sens opposé à ladite collerette (14) est inférieur à l'angle γ entre la surface latérale (32) de l'élément annulaire (22) et la surface de la collerette (24) dans le sens opposé

à ladite collerette (24), et que les angles β , γ sont des angles obtus.

12. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le premier élément d'enclenchement (19) et/ou le deuxième élément d'enclenchement (31) comprennent un flanc à pente douce (19.1, 31.1) et un flanc à pente raide (19.2, 31.2). 5
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13. Dispositif selon la revendication 12, **caractérisé en ce que** l'angle entre le flanc à pente douce (31.1, 19.1) et le flanc à pente raide (31.2, 19.2) est un angle aigu. 15
14. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** l'élément de base (12) et l'élément annulaire (22) sont en matière plastique, en particulier en polypropylène, polyéthylène ou en PVC. 20
15. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** les éléments d'enclenchement (19, 31) sont prévus à l'extrémité supérieure de l'élément de base (12) et de l'élément annulaire (22) et/ou au centre des tubes (13, 23) ou bien à l'extrémité inférieure desdits tubes (13, 23). 25
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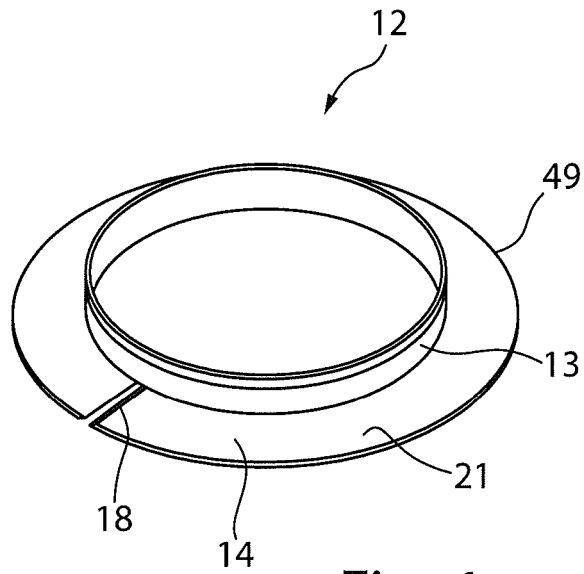


Fig. 1

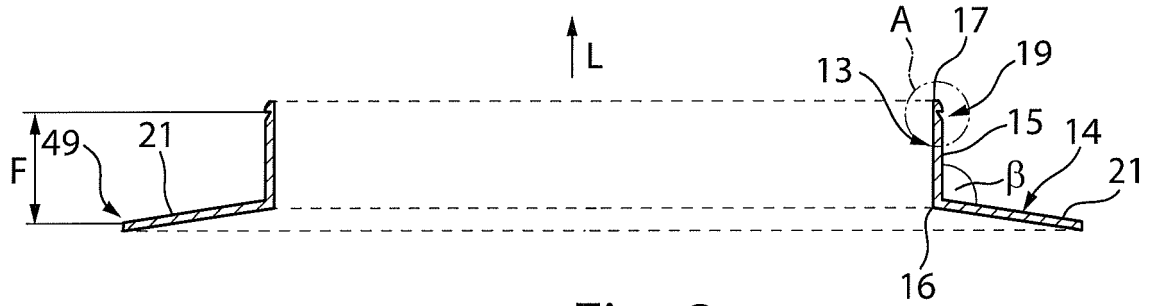


Fig. 2

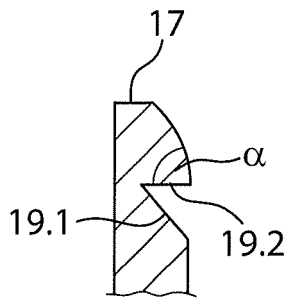


Fig. 3

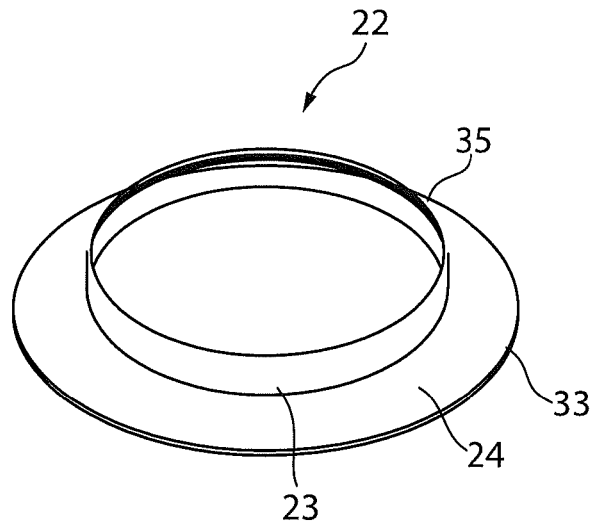


Fig. 4

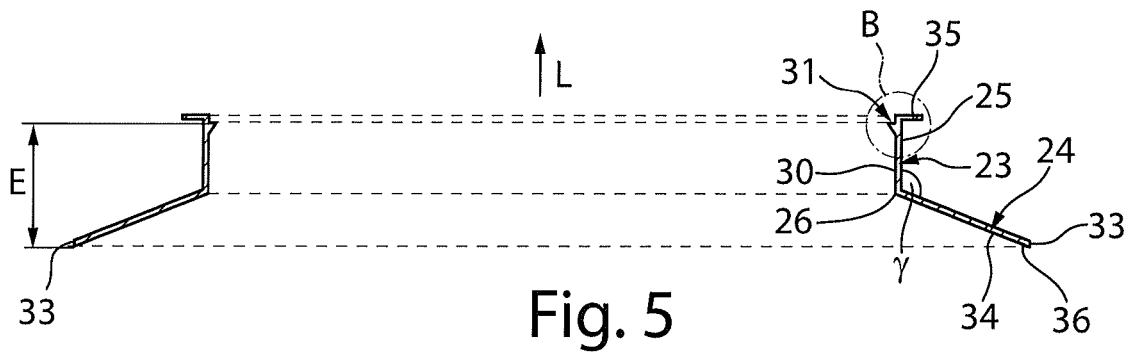


Fig. 5

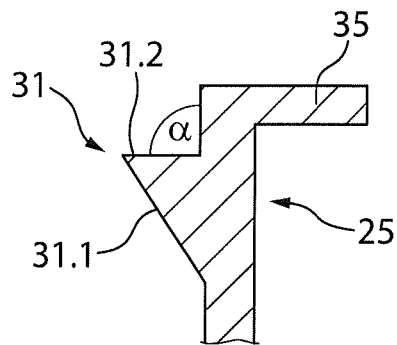


Fig. 6

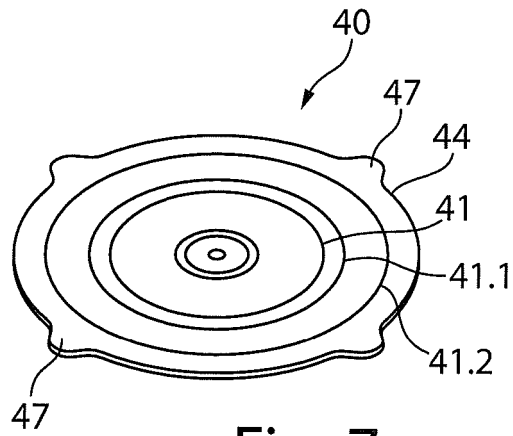


Fig. 7



Fig. 8

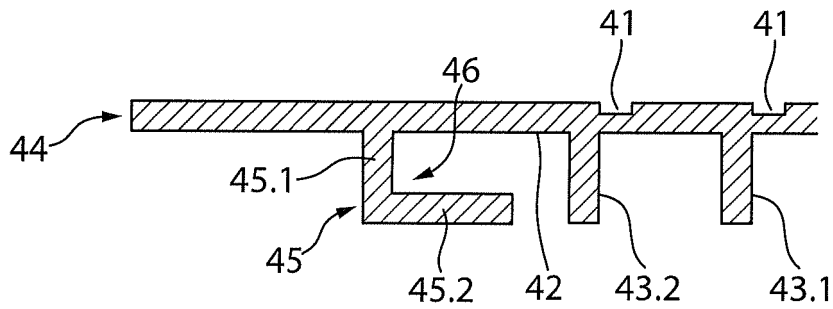


Fig. 9

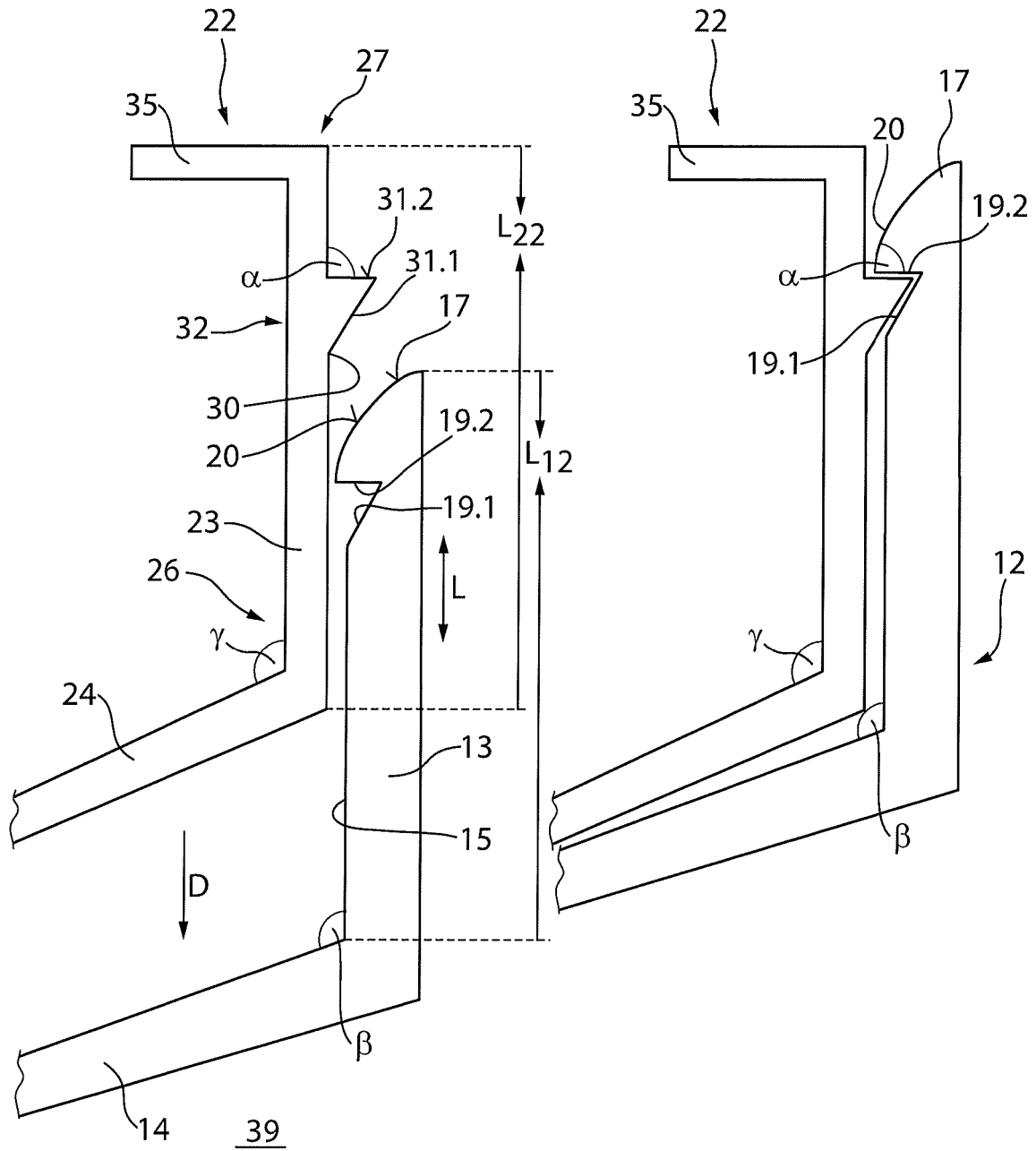


Fig. 10

Fig. 11

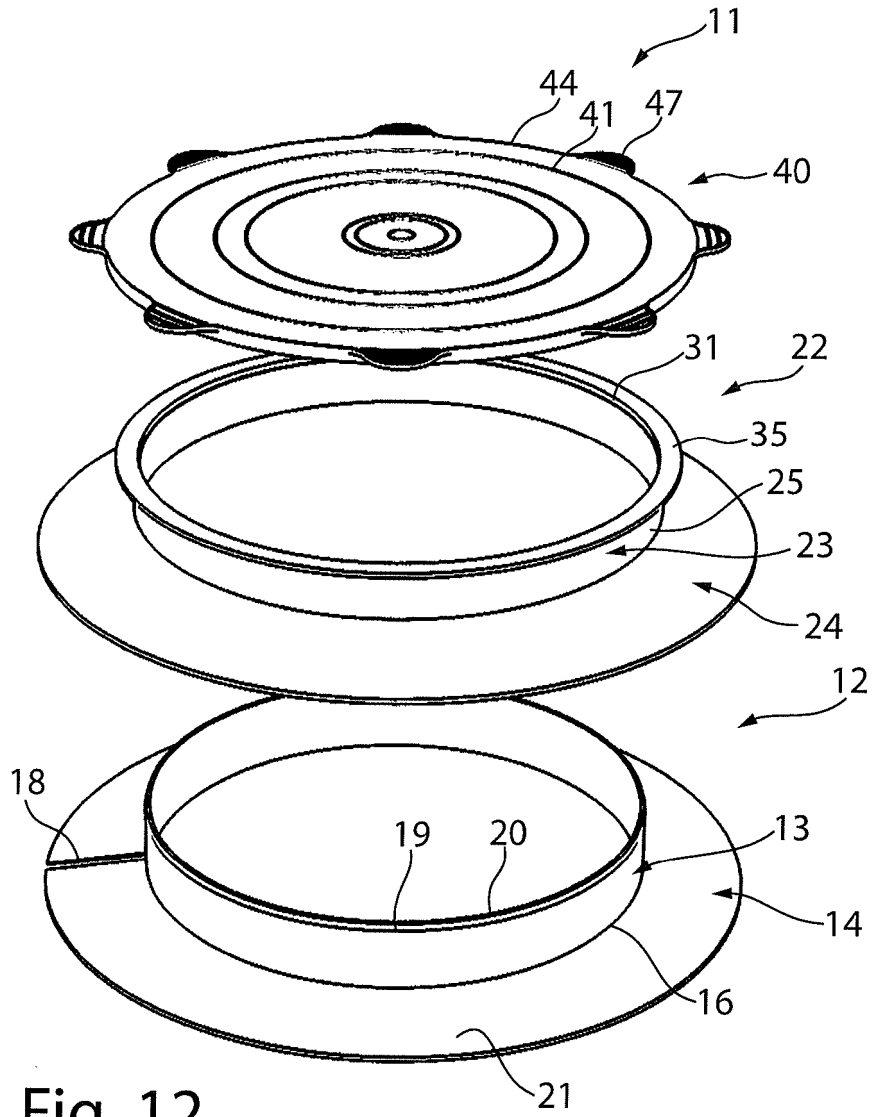


Fig. 12

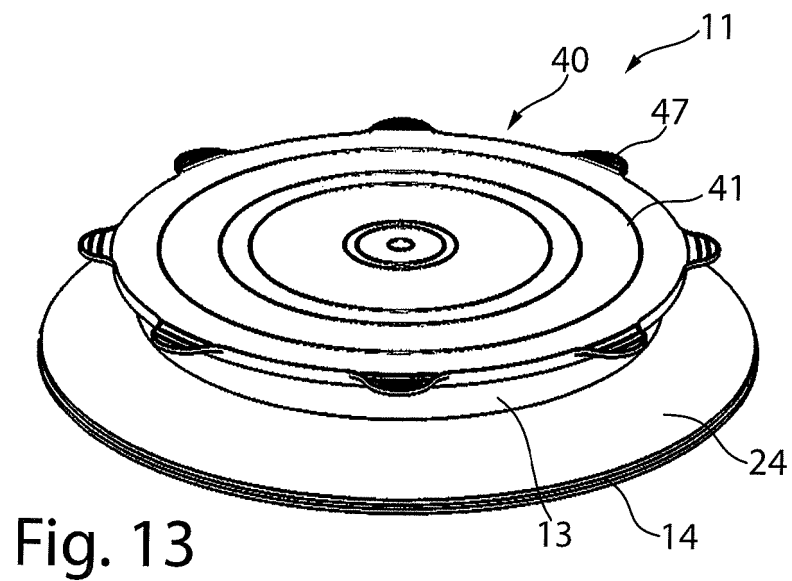


Fig. 13

REFERENCES CITED IN THE DESCRIPTION

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