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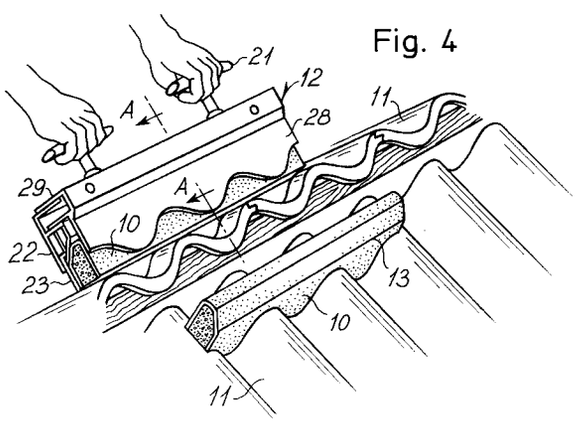
(54) A method and apparatus for applying an elongated body of a paste-like sealant to an outer roofing surface.

(57) An elongated body or strip (10) of a paste-like, sticky sealant has a cover sheet material (13) for example a film of foamed polyethylene, applied to a pair of opposite side surface parts. The body (10) is gripped along its opposite side surface parts by means of an apparatus (12) having a pair of substantially parallel, transversely spaced gripping means (23, 28), which may be moved transversely by manually operating a pair of hand grips (21). When an exposed, non-covered side surface part of the sealant strip (10) has been pressed into tight and adhering engagement with a roofing surface (11) the apparatus is released from the sealant strip (10), and the cover sheet material (13) is removed, whereafter the sealant body or sealant strip is sandwiched between the roofing surface (11) and a roofing element, such as a ridge tile.

A plurality of sealant bodies (10) may be packed in a container having two box-like container halves interconnected by a flexible connecting member or a hinge, so that the container halves each containing a plurality of sealant bodies may be positioned on either side of the ridge of a roof.

Fig. 4



EP 0 497 725 A1

The present invention relates to a method of applying an elongated body of a paste-like, sticky sealant to an outer roofing surface.

When a roof is made up by roofing tiles or other roofing elements it is well known to use a paste-like, sticky sealant or compound, which is sandwiched between overlapping parts of adjacent roofing elements so as to seal the space therebetween. As an example, strips or strings of a sticky sealant may be applied to a roofing surface and sandwiched between such surface and overlapping portions of a ridge tile or ridge element, for example as that disclosed in Danish patent No. 149,930, so as to obtain a wind-tight joint.

Conventionally, the paste-like sealant is delivered as a coherent mass contained in a plastic bag, and strips or strings having a suitable cross-sectional size and shape are cut from the coherent mass by means of a cutting hand tool. Thereafter, the sticky mass is manually applied to the roofing surface and pressed into contact therewith, before a ridge tile or another roofing element is placed in a position in which it overlaps the sealant string. Because of its sticky nature the sealant adheres to any surface with which it comes into contact, including the hands of the workers or builders applying the sealant. Therefore, the use of such sticky sealant is not only time consuming, but also very unpleasant.

The present invention provides a method by means of which an elongated body, such as a strip or string of a paste-like sticky sealant, may be applied to an outer roofing surface in a manner which is less time consuming and less unpleasant.

The present invention provides a method of applying an elongated body of a paste-like, sticky sealant to an outer roofing surface, said method comprising applying cover sheet material to at least a pair of opposite side surface parts of the elongated sealant body, gripping said opposite side surface parts and pressing an exposed side surface part of the sealant body into adhering contact with the outer roofing surface, removing the cover sheet material from the sealant body, and sandwiching the sealant body between the roofing surface and a roofing element.

The cover sheet material may be applied to the side surface parts of the sealant body immediately prior to gripping said body. Alternatively, the elongated sealant body or strip may be cut from a flat layer of a sealant composition having its opposite side surface parts covered with sheet material, such as paper or plastic material. However, the sticky sealant mass is preferably delivered to the builder or comsumer in the form of elongated sealant bodies or strips having opposite side surfaces provided with cover sheet materials and ready for use. This means, that no time for cutting and preparation of the elongated sealant body or strip should be spent at the building site, and the sealant material may be gripped and applied manually or by means of a gripping apparatus without smudging the hands of the builder or the apparatus with the sticky sealant. Since the elongated sealant bodies may be delivered ready for use, the method according to the invention may be considerably time saving compared to the conventional method.

The elongated sealant body may be applied not only to a plane roofing surface, but to a roofing surface of any profile or cross-sectional shape. As an example, the roofing surface may be corrugated, and in such case the elongated sealant body may be applied transversely to the corrugations of the roofing surface. The sealant body should then be pressed towards the roofing surface so as to establish adhering contact between the sealant body and the roofing surface in substantially the full length of the sealant body. This may be obtained by deforming the sealant body to comply with the shape of the roofing surface, or the elongated sealant body may be prefabricated with a contact surface having a shape, which is substantially complementary to the shape of the roofing surface.

The sealant body may be sandwiched between a roofing surface defined by roofing elements, such as roofing tiles, and a further roofing element. Such further roofing element, may, for example, be a ridge element of any type, such as a ridge element as that disclosed in Danish patent No. 149,930.

The cover sheet material may be any sheet material which is substantially impermeable to the sticky sealant and to any components thereof. Preferably, the sheet material is of a type which may relatively easily be removed from the elongated body of sticky sealant when the sealant has been applied to the roofing surface. This means that the cover sheet material should not adhere too strongly to the sealant. Therefore, some kind of release means, such as an adherence reducing powder, could be applied to the opposite side surface parts of the sealant body prior to applying the cover sheet material thereto. It has been found, however, that a film of foamed plastic, such as a film of foamed polyethylene, may relatively easily be stripped from the sealant body when it has been applied to the roofing surface. Other types of sheet material that could be contemplated are sheets of non-woven material, such as nonwoven sheets made from polyethylene or polypropylene fibres or of heat-bondable bicomponent fibres or mixtures thereof.

The present invention also provides an elongated body of a paste-like, sticky sealant for use in the method described above, at least a pair of opposite side surface parts of the sealant being covered by sheet material.

The sealant body may have any cross-sectional shape. Preferably, however, such cross-section is rectangular, and three side surfaces of the body may then be covered by sheet material, and one side surface may be exposed. The exposed side surface may

be plane, but could alternatively have a corrugated shape substantially complementary to the shape of an outer corrugated roofing surface.

The sticky, paste-like sealant compound may be any suitable sticky compound adapted to be applied on a roofing surface, for example a compound on the basis of oils and fibres and optionally fillers. One type of such materials is disclosed in Danish patent No. 120,301 and consists of vegetable oil, mineral oil, linseed oil, linseed oil varnish, asbestos fibres and optionally a hardener and is extended or made lighter by incorporation of expanded polystyrene beads having a diameter of between 0.1 and 13 mm in an amount of between 5 and 50 per cent of the weight of the sealant. It will be understood that similar materials may be made using other fibres than asbestos fibres, such as plastics fibres, for example polyester fibres or polyolefin fibres, including polypropylene fibres, or cellulose fibres. Specific examples of useful sealants are disclosed in Danish patent No. 120,301; they may be modified, for example by incorporation of fillers such as attapulgit and with substitution of the asbestos fibres by other fibres of the type mentioned above. Also, latex can be a useful constituent of such sealants.

The present invention also provides a container for containing elongated sealant bodies of the type described, and the container according to the invention may comprise a pair of container parts mutually interconnected by a hinge connection, said container being adapted to be positioned on the ridge of the roof with the upwardly open container parts positioned of either side of the ridge. The sealant bodies may then be transported to the top of the ridge in the closed container, whereafter the container may be opened and positioned on the ridge on the roof as indicated with the sealant bodies arranged easily accessible in the upwardly open container parts. The builders or workers may then remove a sealant body from the container at one time when the sealant body is to be used.

As mentioned above, the elongated sealant bodies may be applied to the roofing surface directly by hand. However, according to a further aspect the present invention provides an apparatus for applying an elongated body of a paste-like, sticky sealant to a surface, such as a roofing surface, said apparatus comprising a frame, a pair of substantially parallel extending gripping means mounted on said frame so as to be moveable transversely in relation to each other for gripping a pair of opposite side surface parts of the elongated body, and means for transversely moving said gripping means. The apparatus may be used for the application of an elongated body, for example as that described above having a pair of opposite side surface parts covered by sheet material. The apparatus may, however, also be used for the application of a sealant body without such covering sheet material. In the latter case, the contact surfaces of the gripping means and/or the opposite side surface parts of the elongated sealant body should be provided with some kind of release agent, such as release powder or release liquid. Alternatively, the gripping surfaces of the gripping means may be made from a material, which does not tend to adhere to the sticky sealant, such as moist wood, especially moist beech-wood. The opposite side surface parts of the sealant body may be arranged between the gripping means of the apparatus and gripped thereby, whereafter an exposed side surface of the elongated body extending beyond the gripping means is pressed into engagement with the outer roofing surface. The gripping means may then be moved transversely out of gripping contact with the sealant body applied.

The gripping means may be moved in any suitable manner. As an example, the gripping means may be power operated by means of a motor or by pressure fluid operated cylinders. In the preferred embodiment, however, the moving means are manually operatable and may, for example, comprise handles to be moved or rotated by the operator.

The gripping means may be moveable between a retracted position and an extended position, in which the spacing of the gripping means are increased. The moving means may then comprise spring means for biassing the gripping means towards one of these positions and means for forcing the gripping means in the opposite direction. In the preferred embodiment, the moving means comprise spring means for biassing the gripping means towards their retracted position, the moving means further comprising manually moveable cam means for forcing the gripping means to their extended position against the spring bias.

The cam means may for example be displaceable and define an inclined cam surface. In the preferred embodiment, however, the cam means comprise at least one rotatable cam disc, which may be rotated by means of a handle.

The apparatus may define a channel-like cavity for receiving the sealant body, and the opposite gripping means may define the side walls of the channel-like cavity. This cavity may have a shape corresponding to the shape of the sealant body to be received therein or to the desired final shape of the sealant body when it has been applied to the outer roofing surface, which means that the channel-like cavity may have a cross-sectional shape differing from the cross-sectional shape of the sealant body to be gripped thereby.

In order to obtain good contact between the sealant body and the roofing surface to which it is applied, the sealant body must to some extent project from the free edges of the gripping means gripping the sealant body in order to allow for a certain deformation of the sealant body when it is pressed towards the roofing surface. However, in order to support the opposite side surface parts of the sealant body as much as

possible so as to reduce uncontrolled deformation, the contour of the three edge portions of the opposite gripping means preferably corresponds to the outer cross-sectional shape of the surface to which the sealant body is to be applied. As an example, the free edge portions of the gripping means or members may be shaped substantially complementary to the corrugated shape of an outer roofing surface, such as a corrugated tile roofing surface.

In order to allow increased deformation of the sealant body while the deformation is controlled at least one of the gripping means may comprise an outer rim portion, which is moveable in relation to the frame and parallel with the channel side surface defined by said at least one gripping means. This means that the moveable rim portion may yield when a sealant body gripped by the apparatus is pressed towards the roofing surface. The outer rim portion, which is moveable between extended and retracted positions, may be spring biassed towards the extended position, so that it is automatically returned to the extended position when the pressure applied to the sealant body through the apparatus is removed.

Alternatively, at least one of the opposite gripping means may be made from a material or be constructed so that its free edge portions may yield and adapt itself to the outer contour of the surface to which the sealant body is to be applied, when the free edge portion is pressed into abutting engagement with said surface. As an example, the gripping member or gripping means may be made from an elastic or a deformable material. In the preferred embodiment, however, the contour of the free edge portion of the gripping means is defined by the free ends of a plurality of adjacent abutment elements, which are displaceable transversely to the free edge portion between extended and restracted positions, and which are biassed towards their extended position. Thus, the gripping member or gripping means may comprise a wall element defining channels or passages therein for receiving the abutment elements, and biassing means, such as spiral springs, for biassing the abutment elements towards their extended position, in which their free end portions extend from the wall element.

The invention will now be further described with reference to the drawings, wherein

Fig. 1 is a perspective view of an embodiment of the apparatus according to the invention,

Fig. 2 is a perspective and partially sectional view of a closed container containing a plurality of sealant bodies,

Fig. 3 illustrates how the container shown in Fig. 2 may be arranged on the ridge of a roof in its open condition,

Fig. 4 illustrates how an elongated sealant body or sealant strip may be applied to a roofing surface by means of the apparatus shown in Fig. 1,

Fig. 5 and 6 are cross-sectional views along the line A-A i Fig. 4 illustrating the apparatus in two different positions,

Fig. 7 illustrates withdrawal of a protective cover sheet from the sealant body,

Fig. 8 illustrates how elongated sealant bodies or strips may be cut from a flat sealant mass packed in a plastic bag,

Fig. 9 is a perspective view of an extruded wall element with a plurality of abutment elements displaceably received therein,

Fig. 10 is a cross-sectional view of a modified embodiment of the apparatus according to the invention, and

Fig. 11 is a perspective view illustrating the modified embodiment of Fig. 10 when in use.

An elongated body 10 of a sticky, paste-like sealant compound may be applied to an outer roofing surface 11, for example the outer surface of roofing tiles, by means of an apparatus 12, which is best illustrated in Figs. 1, 5, and 6. The elongated sealant body or sealant strip 10 may comprise a sealant of the type disclosed in Danish patent No. 120,301 and a cover sheet 13 covering three side surfaces of the sealant body, which has a substantially rectangular cross-sectional shape, so that one side surface of the sealant body or strip 10 remains exposed. A plurality of sealant strips 10 may be delivered in a sealant strip container 14 shown in Figs. 2 and 3. The container 14 comprises a pair of open, box-like container halves, which are interconnected by a connecting sheet portion 16 forming a hinge-connection. A plurality of sealant bodies or strips may be arranged side by side in each of the container halves, and in the closed position of the container the container halves are arranged in superposed relationship, so that one container half forms the lid portion of the other container half in a trunk-like manner. The container halves 15 may be retained in their closed position by means of a sealing tape 17, and a hand-opening 18 is formed in the connecting sheet portion 16 so that this portion may serve as a hand grip in the closed position of a container. When the contents of a container are to be used the container may be transported to the ridge of a roof and opened by removing the sealing tape 17. Thereafter, the container may be opened so that the container halves 15 are positioned on either side of the ridge of the roof, interconnected by the sheet portion 16 as illustrated in Fig. 3. The sealant bodies or sealant strips 10 are now readily accessible in the upwardly open container halves and may be removed directly from the container by means of the apparatus 12 as will be further described below.

The apparatus illustrated in Figs. 1, 5, and 6 may be used for gripping a sealant strip 10 and applying it to the roof surface 11. The apparatus comprises a frame part 19 having a transverse wall 20 in which a pair of T-shaped hand grips 21 are rotatably mounted,

and a side wall 22 extending at substantially right angles to the transverse wall 20. A gripping plate 23 is mounted in sliding engagement with the inner side surface of the side wall 22 by means of slot-pin connections 24 so that the gripping plate 23 is moveable between an extended position, in which the gripping plate 23 extends beyond the lower free edge 25 of the side wall 22 of the frame part 19, and a retracted position, in which the lower edges of the side wall 22 and the gripping plates 23 are substantially coinciding. A pair of compression springs 26 or other spring means arranged within a cavity 27 of the frame part 19 are biassing the gripping plate 23 towards its extended position.

The apparatus further comprises a second gripping plate 28, which extends in substantially parallel and transversely spaced relationship with the gripping plate 23. The gripping plate 28 comprises transverse guiding walls 29 and 30 for slidingly engaging with the upper surface of the transverse wall 20 and an upper transverse wall 31 defined by the frame part 19, respectively. A pair of telescopic devices 32 comprising a cylinder and a spring actuated rod extending therefrom, interconnect the side wall 22 of the frame part 19 and the gripping plate 28 so as to define extended and retracted positions between which the gripping plates 23 and 28 may be moved transversely in relation to each other. Cutouts 33 formed in the outer guiding wall 29 may each receive a shaft 34 of the adjacent hand grip 21 therein so as to allow for such movement. A cam disc 35 is fastened to the inner end of each hand grip shaft 34 and is adapted to engage with the inner side surfaces of the frame side wall 22 and the gripping plate 28, respectively, so that the gripping plates 23 and 28 may be moved to their extended position against the bias of the telescopic spring devices 32 by rotating the hand grip shaft 34.

The gripping plates 23 and 28 and the frame part 19 of the apparatus shown in the drawings define a channel-like structure defining a cavity for receiving a sealant body or sealant strip 10, and the use of the apparatus will now be further explained.

When the gripping plates 23 and 28 have been moved transversely to their extended position by rotating the hand grips 21, the apparatus may be plunged into one of the container halves 15 so as to position a sealant body 10 between the gripping plates 23 and 28. Thereafter, the hand grips are rotated to such a position that the gripping plates are spring biassed in engagement with opposite side surface parts of the sealant body 10. The apparatus and the sealant strip received therein may now be removed from the container 14, and the outer side surface part of the sealant body, which is not covered by the cover sheet 13, may then be pressed into engagement with the corrugated roofing surface 11 transversely to the corrugations as illustrated in Figs. 5 and 6. When a pressure is applied to the apparatus 12, the gripping plate 23, which is initially in its extended position under the bias of the spring 26, will move to its retracted position while the springs 26 are compressed. Such inward movement of the gripping plate 23 causes the sealant body or sealant strip 10 to be moved further into the apparatus, whereby the sealant body comes into contact with an inclined inner wall surface 36 formed in the frame part 19, whereby the originally rectangular cross-sectional shape of the body 10 is deformed or modified, and the exposed lower surface part of the sealant body 10 is pressed into intimate contact with the corrugated roofing surface 11. The gripping plates 23 and 28 may now be moved to their extended position by rotating the hand grips 21, whereby the apparatus is released from the sealant body 10 and may be removed therefrom. When the cover sheet 13 has been removed from the sealant mass as illustrated in Fig. 7, a ridge tile 37 may be placed in position so that the sealant is sandwiched between the roofing surface 11 and the bottom surface of the ridge tile 37. If desired, a sealant 38 may be applied to one end of each ridge tile 37 in a conventional manner.

Fig. 8 illustrates a cutting apparatus 39 by means of which elongated sealant bodies or sealant strips 40 for use in connection with the apparatus 12 may be cut from a flat, coherent sealant mass 41 packed in a bag 42, such as a bag made from plastic film, preferably a film of foamed plastic, such as polyethylene. The apparatus 39 comprises a support plate 43 and a cutting device 44 pivotally connected thereto by a pivot connection 45. The cutting device 44 comprises a frame 46 with a cutting wire or a cutting blade 47, such as a saw blade.

One of the exposed surface parts of the sealant strip 40 may be covered by a suitable cover sheet before or after insertion thereof into the apparatus 12, or the apparatus may be shaped so that the inner wall parts of the apparatus are brought into contact only with the covered opposite side surface parts of the strip 40.

Fig. 9 shows a wall element 50, which may, for example, be made from metal, such as aluminum, or from plastic material by extrusion. A plurality of parallel extending adjacent channels or passages 51 are formed in the wall element 50. Each channel or passage receives an elongated abutment element or finger 52, which may be moved in the channel between retracted and extended positions, and a spring member 53, such as a spiral spring, is arranged in channel 51 and is engaging with the inner end of the associated abutment element or finger 52 so as to bias the same towards its extended position in which the major part of the length of the abutment element 52 extends outwardly from the wall element 50 as shown in Fig. 9. A lug 54 formed on each of the abutment fingers 52 at the inner end thereof may engage with an abutment strip 55, which extends transversely

to and partly into the channels 51 so that the outward movement of the abutment fingers 52 are restricted and the extended position of the abutment fingers 52 is determined by the engagement of the logs 54 with the abutment strip 55.

The apparatus shown in Fig. 1 may be modified by replacing the side wall 22, the gripping plates 23 and/or the gripping plate 28 by one or more wall elements with abutment fingers as that shown in Fig. 9 so that the outer free ends 56 are engaging with the outer roofing surface 11 when the apparatus is used. Alternatively, wall elements of the type shown in Fig. 9 may be mounted on the inner or outer surface of the side wall 22 and/or the gripping plate 28. In such case the gripping plate 23 may be dispensed with.

Figs. 10 and 11 illustrate a modified embodiment of the apparatus shown in Fig. 1, wherein the gripping plate 23 has been dispensed with and wall elements 50 of the type shown in Fig. 9 have been mounted in abutting engagement with the inner surfaces of the side wall 22 and the gripping plate 28, respectively. One wall element 50 may be arranged between the inner surface of the gripping plate 28 and a transverse wall part 57 extending downwardly from the guiding wall 30. Similarly, a wall element 50 may be mounted between the inner surface of the side wall 22 and a wall 58 of an insert 59 defining the inclined wall surface 36. The wall 58 extends in spaced relationship with the side wall 22 so as to define a space therebetween for receiving the wall element 50. The abutment fingers 52 extend downwardly beyond the preferably rectilinear free edge portions of the side wall 22 and the gripping plate 28, respectively.

When the apparatus illustrated in Figs. 9-11 is used, the outer free ends 56 of the abutment fingers 52 are pressed into engagement with the roofing surface 11 to which the sealant body 10 is to be applied. Because the abutment fingers may be moved inwardly against the bias of the springs 53 the outer free end 56 of the abutment fingers 52 may in combination define an outline corresponding to the cross-sectional shape of the roofing surface 11 as illustrated in Fig. 11.

It should be understood that various modifications and changes of the embodiments shown in the drawings could be made within the scope of the present invention. As an example, the cover sheet 13 could be replaced by any other kind of release agent, such as release powder or a releasing liquid which could be applied before insertion of the sealant body into the apparatus, or the contacting walls of the apparatus could be adapted to apply such release agent.

Claims

1. A method of applying an elongated body (10) of a paste-like, sticky sealant to an outer roofing surface (11), characterized in comprising

applying cover sheet material (13) to at least a pair of opposite side surface parts of the elongated sealant body (10),

gripping said opposite side surface parts and pressing an exposed side surface part of the sealant body into adhering contact with the outer roofing surface,

removing the cover sheet material from the sealant body, and

sandwiching the sealant body (10) between the roofing surface (11) and a roofing element (37).

2. A method according to claim 1, wherein the outer roofing surface (11) is corrugated, the elongated sealant body (10) being applied transversely to the corrugations of the roofing surface.

3. A method according to claim 2, wherein the outer roofing surface (10) is defined by the outer surfaces of roofing tiles.

4. A method according to any of the claims 1-3, wherein the roofing element is a ridge element (37).

5. A method according to any of the claims 1-4, wherein the cover sheet material (13) is a film of foamed plastic.

6. A method according to claim 5, wherein the cover sheet material (13) is a film of foamed polyethylene.

7. An elongated body of a paste-like, sticky sealant for use in the method according to any of the claims 1-6, characterized in at least a pair of opposite side surface parts of the sealant body (10) being covered by sheet material (13).

8. A body according to claim 7, wherein the sheet material (13) is a film of foamed plastic.

9. A body according to claim 8, wherein the sheet material (13) is a film of foamed polyethylene.

10. A body according to any of the claims 7-9 comprising a side surface part having a corrugated shape.

11. A body according to any of the claims 7-10 having a substantially rectangular cross-section.

12. A body according to claim 11, wherein three side surfaces of the body are covered by sheet material (13) and one side surface being exposed.

13. A container for containing elongated sealant bodies according to any of the claims 7-12, characterized in comprising a pair of container parts (15) mutually interconnected by a hinge connection (16), said container (14) being adapted to be positioned on the ridge of a roof with the upwardly open container parts positioned on either side of the ridge.

14. A container according to claim 13, wherein each container part (15) defines an open receptacle for receiving a plurality of said elongated sealant bodies (10).

15. A container according to claim 13 or 14 further comprising locking means (17) for releasable retaining the container parts (15) in a mutually engaging closed position.

16. An apparatus for applying an elongated body (10) of a paste-like, sticky sealant to a surface, such as a roofing surface (11), characterized in comprising

a frame (19),

a pair of substantially parallel extending gripping means (23, 28; 50, 52) mounted on said frame (19) so as to be moveable transversely in relation to each other for gripping a pair of opposite side surface parts of the elongated body (10), and

means (21) for transversely moving said gripping means (23, 28; 50, 52).

17. An apparatus according to claim 16, wherein said moving means are manually operatable.

18. An apparatus according to claim 16 or 17, wherein the gripping means (23, 28; 50, 52) are moveable between a retracted position and an extended position, in which the spacing of the gripping means is increased.

19. An apparatus according to claim 18, wherein said moving means comprise spring means (32) for biassing the gripping means (23, 28; 50, 52) towards their retracted position, the moving means further comprising manually moveable cam means (35) for forcing the gripping means to their extended position against the spring bias.

20. An apparatus according to claim 19, wherein the cam means comprise at least one rotatable cam disc (35), which may be rotated by means of a handle (21).

21. An apparatus according to any of the claims 16-20 defining a channel-like cavity for receiving the sealant body (10) therein, the opposite gripping means (23, 28; 50, 52) defining the side walls of the channel-like cavity.

22. An apparatus according to claim 21, wherein the channel-like cavity has a cross-sectional shape differing from the cross-sectional shape of the sealant body (10) to be gripped.

23. An apparatus according to claim 21 or 22, wherein the contour of free edge portions (25) of the opposite gripping means (23, 28) corresponds to the outer cross-sectional shape of the surface (11) to which the sealant body (10) is to be applied.

24. An apparatus according to claim 23, wherein the free edge portions of the gripping means (23, 28) are shaped substantially complementary to the corrugated shape of an outer roofing surface (11).

25. An apparatus according to any of the claims 21-24, wherein at least one of the gripping means (22, 23) comprises an outer rim portion (23), which is moveable in relation to the frame (19) and parallel with the channel side surface defined by said at least one gripping means.

26. An apparatus according to claim 25, wherein said outer rim portion (23), which is moveable between extended and retracted positions, is spring biassed towards the extended position.

27. An apparatus according to claim 21 or 22, wherein at least one of the opposite gripping means (50, 52) is such that the contour of its free edge portion (56) may adapt itself to the outer contour of the surface (11) to which the sealant body (10) is to be applied, when the free edge portion (56) is pressed into abutting engagement with said surface (11).

28. An apparatus according to claim 27, wherein the contour of the free edge portion (56) of the gripping means is defined by the free ends (56) of a plurality of adjacent abutment elements (52), which are displaceable transversely to the free edge portion between extended and retracted positions, and which are biassed towards their extended position.

29. An apparatus according to claim 28, wherein the gripping means comprises a wall element (50) defining channels or passages (51) therein for receiving the abutment elements (52) and biassing means (53) for biassing the abutment elements (52) towards their extended position, in which their free end portions extend from the wall element (50).

Fig. 1

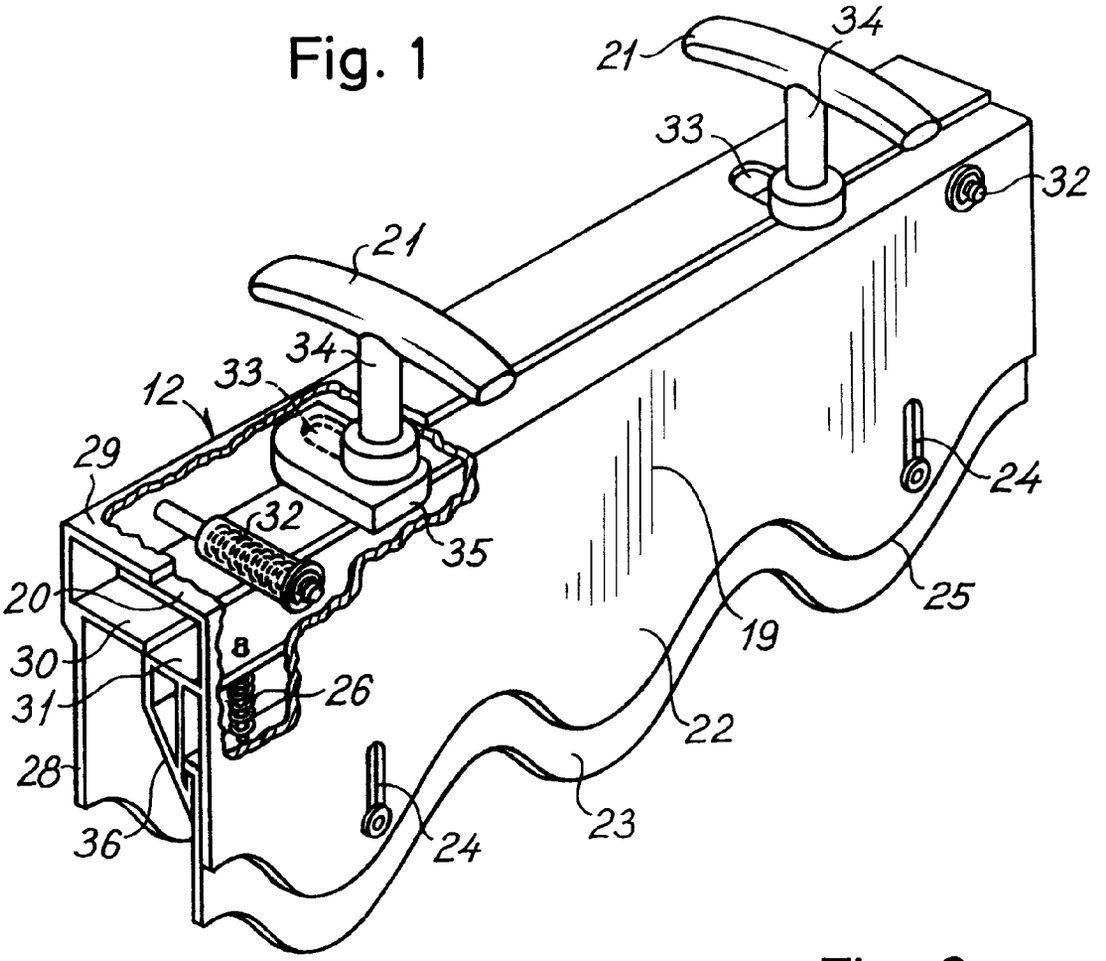

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Fig. 2

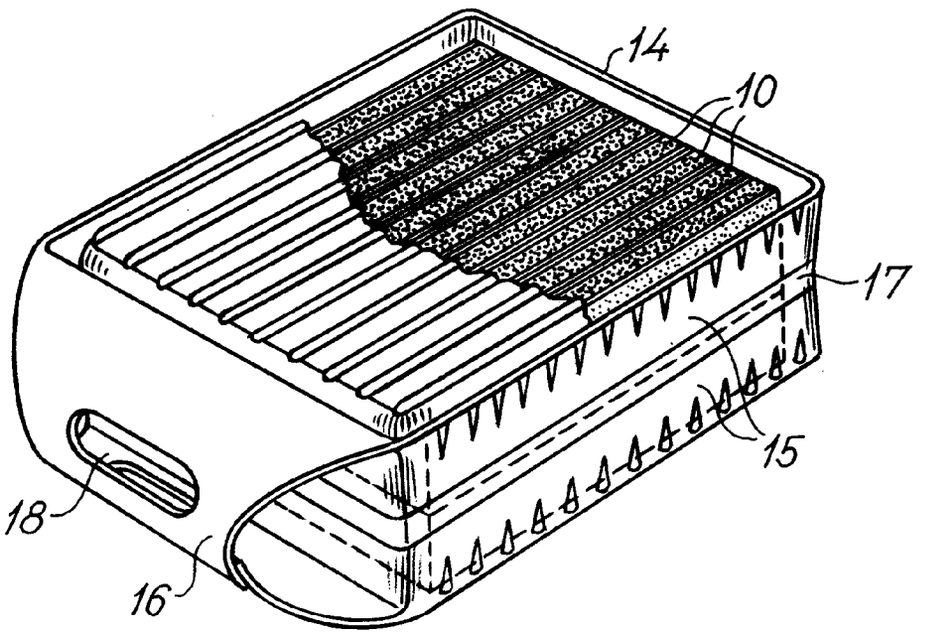
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Fig. 3

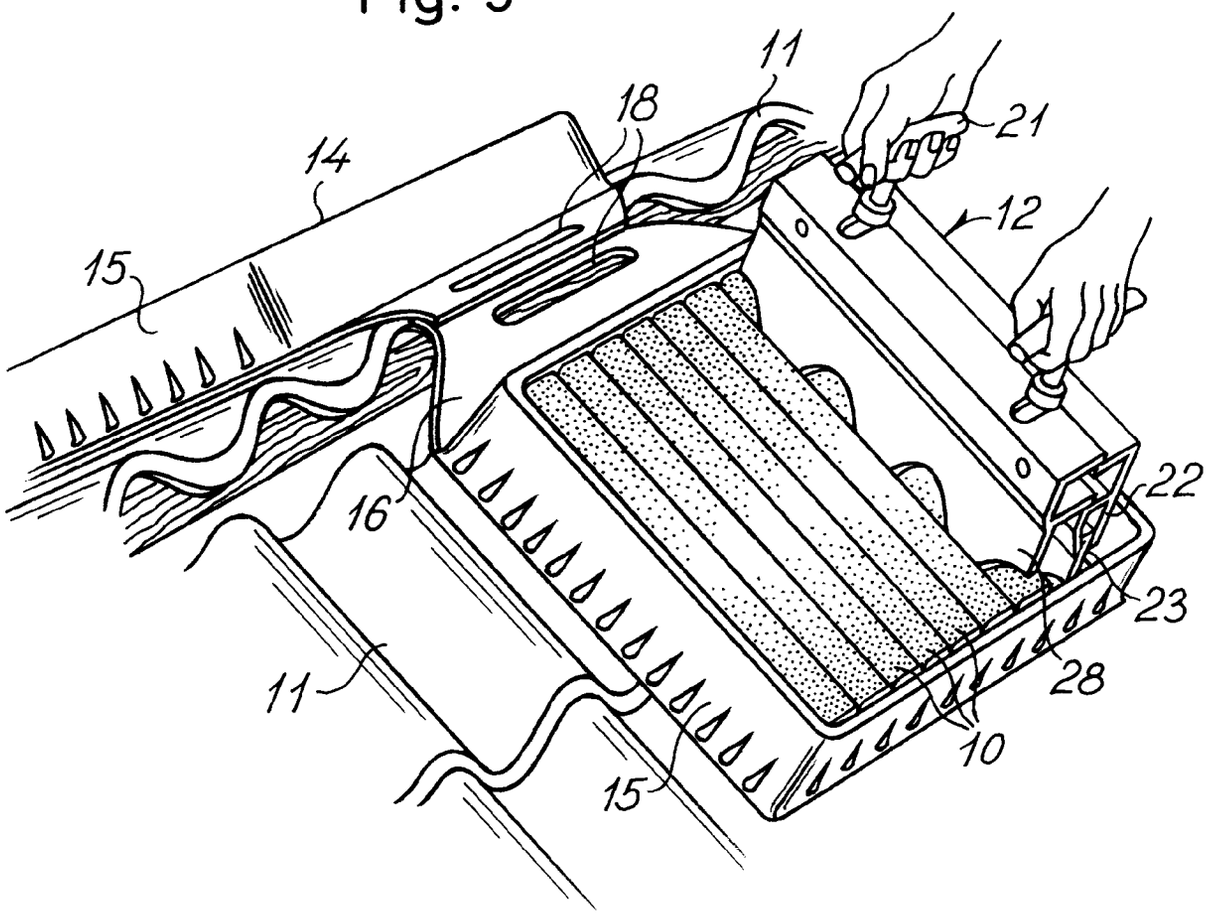
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Fig. 4

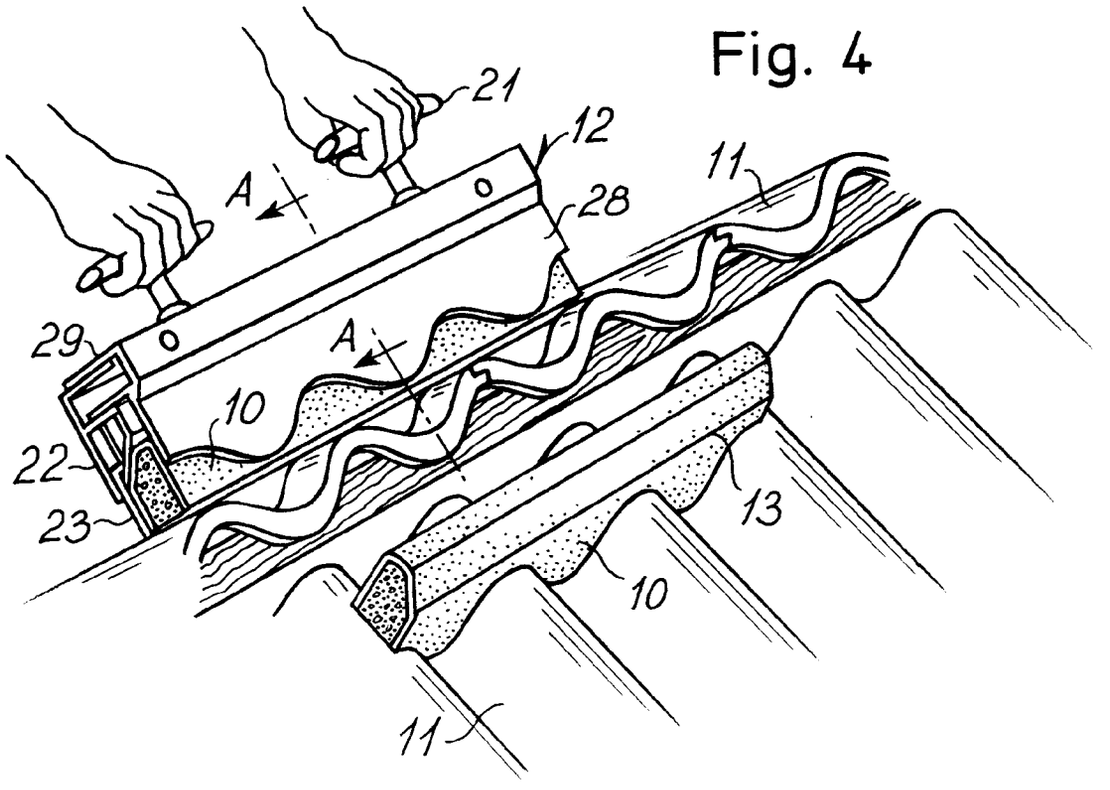
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Fig. 5

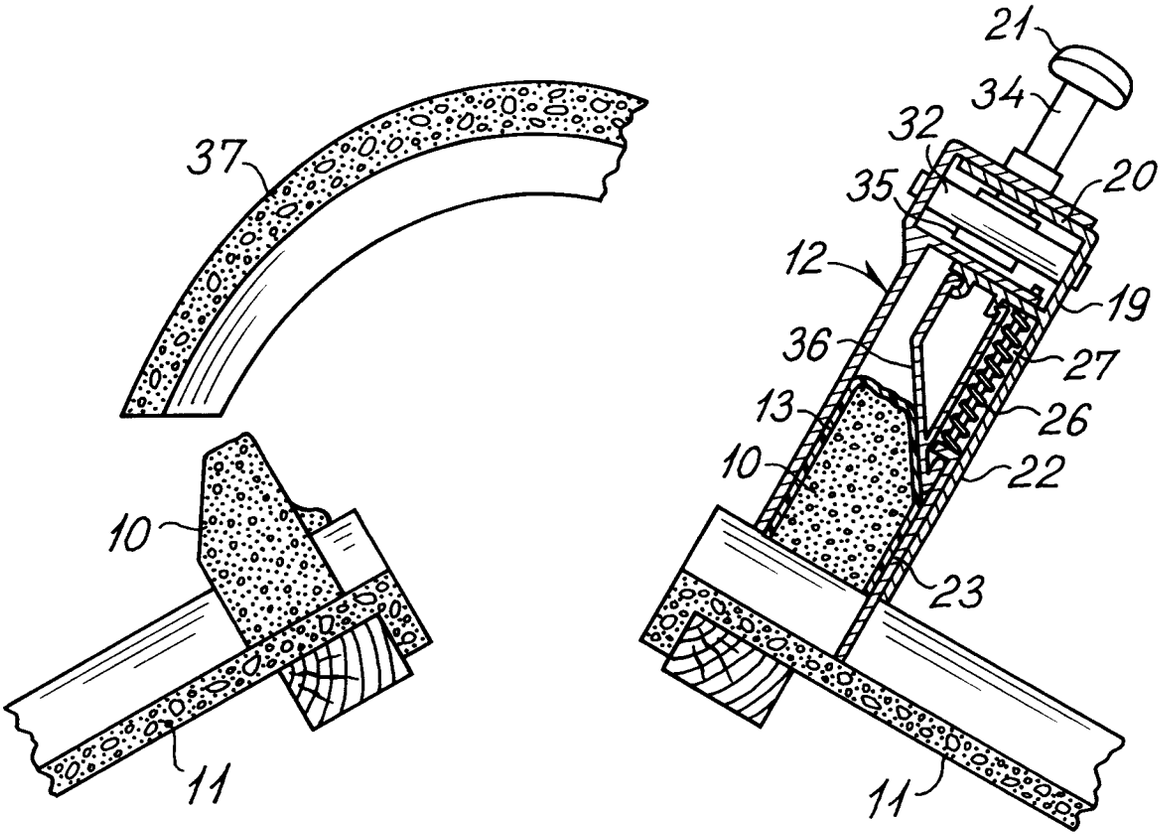
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Fig. 6

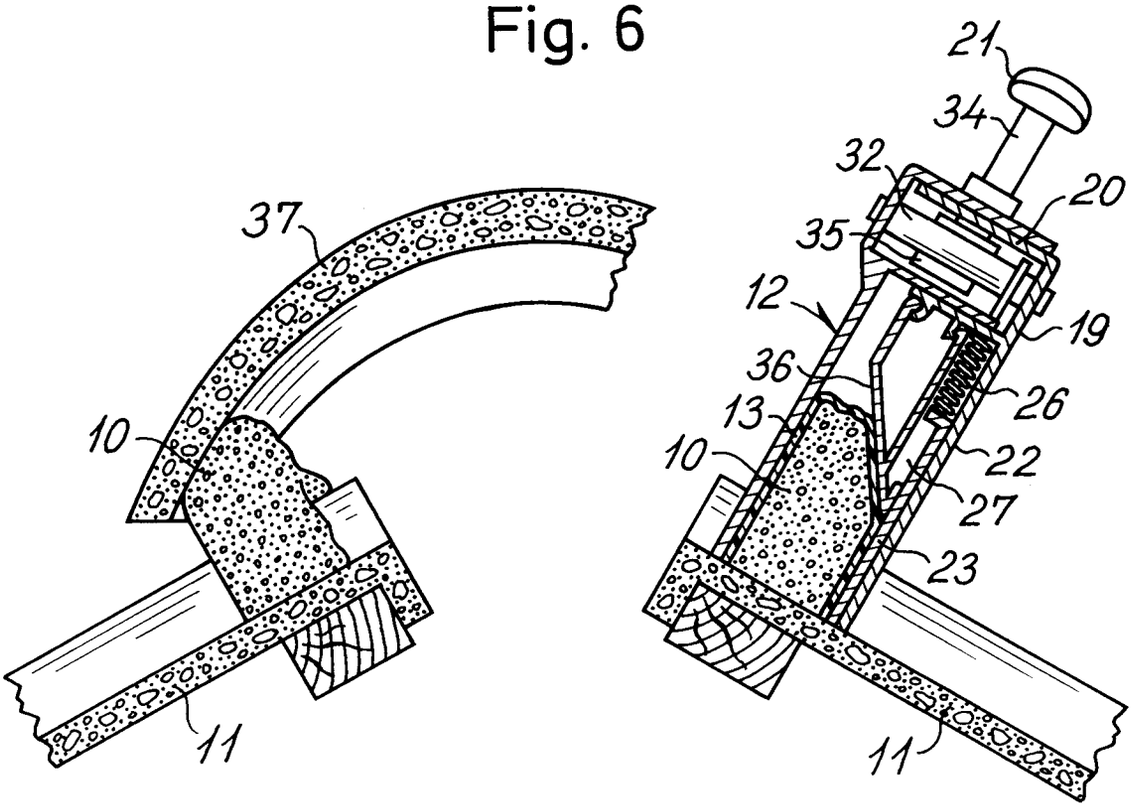
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Fig. 7

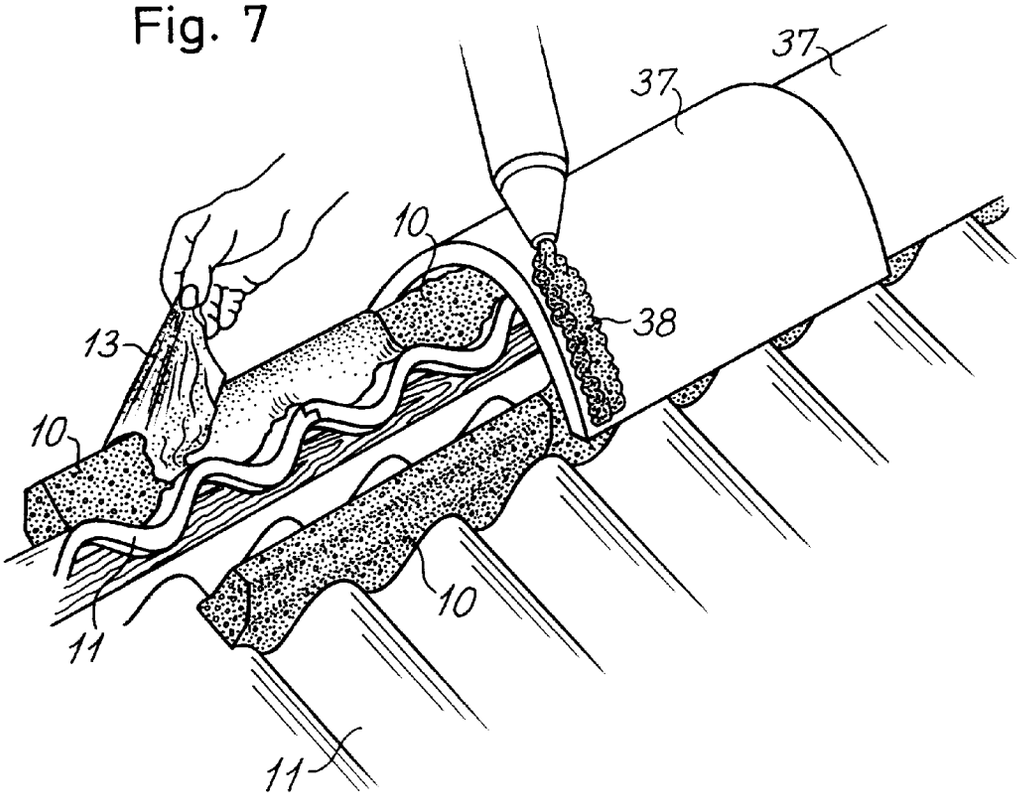


Fig. 8

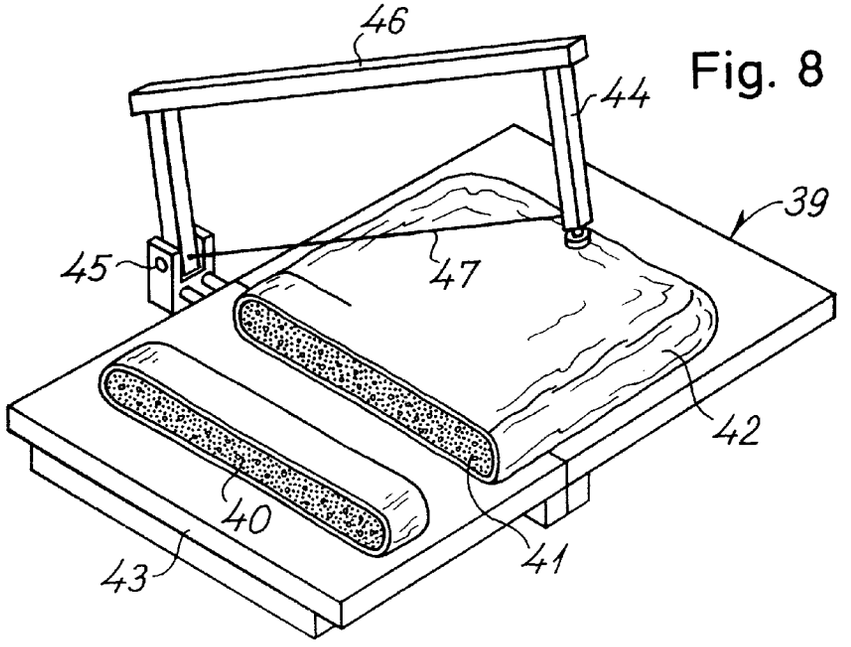
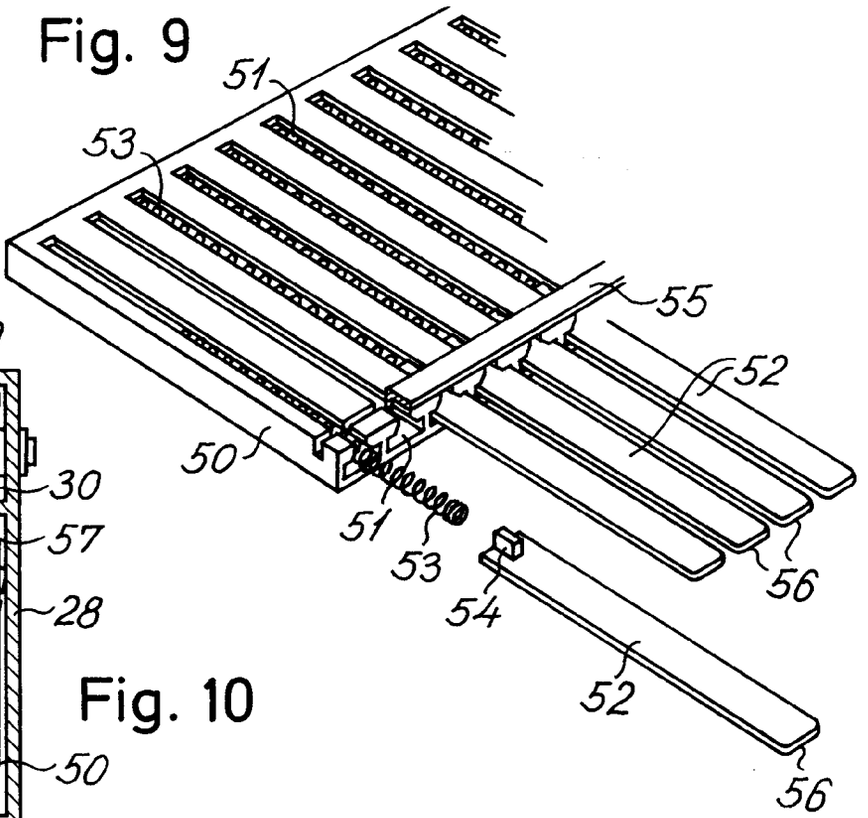


Fig. 9



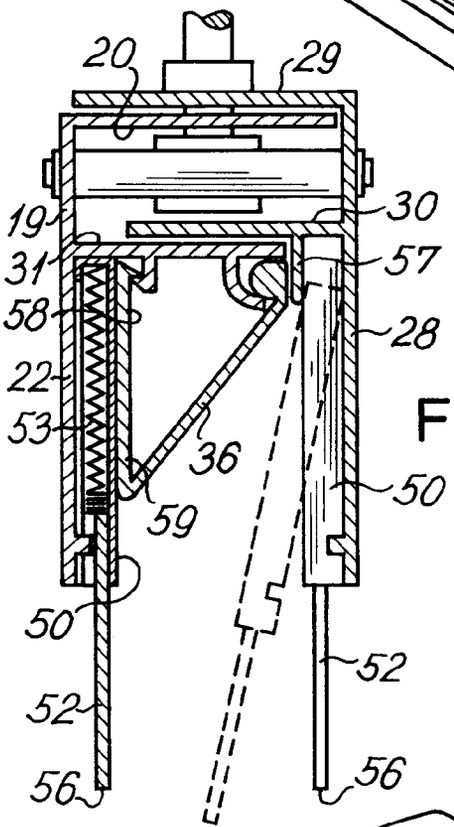
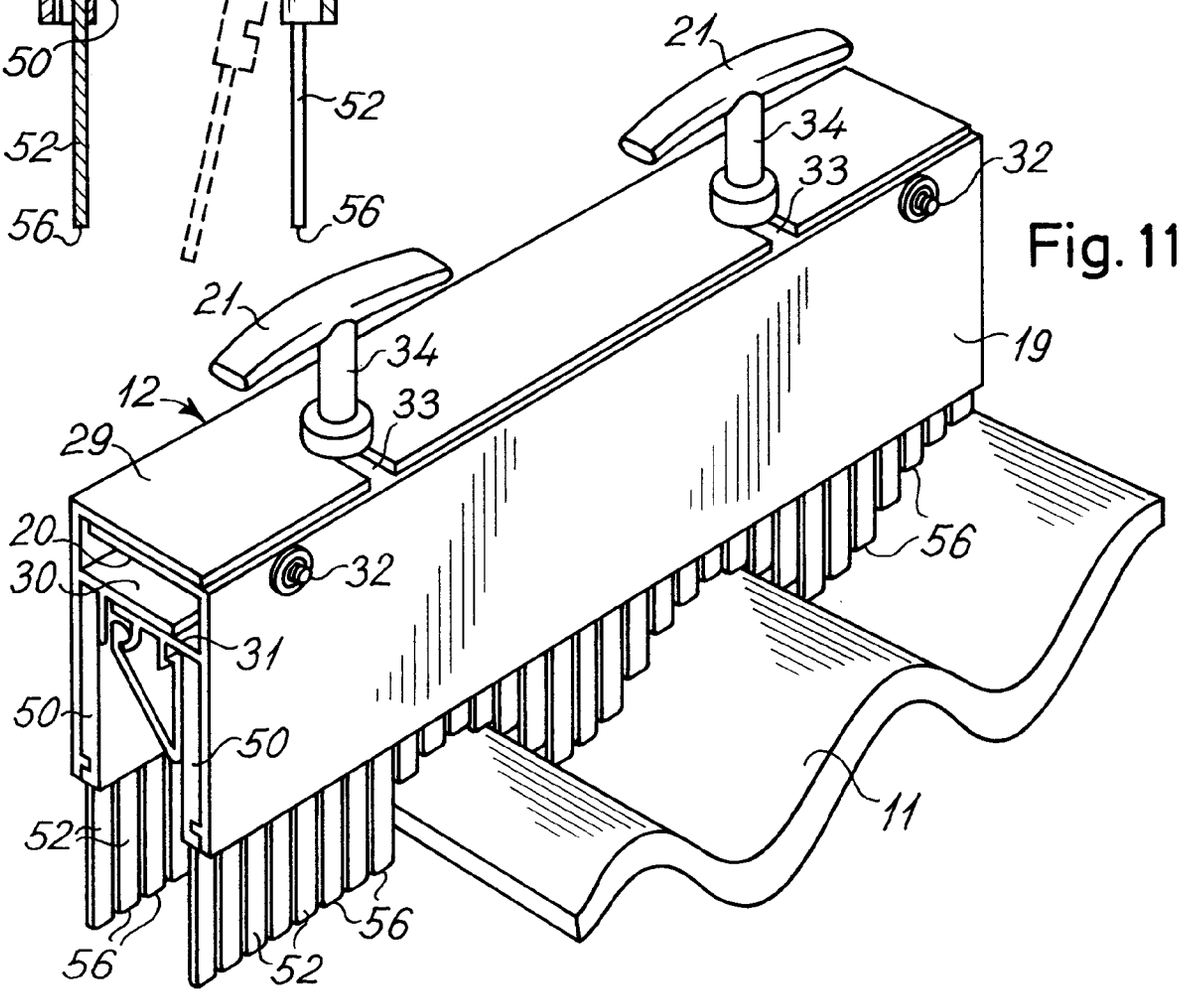


Fig. 10

Fig. 11



European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 92 61 0006

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	DE-A-1 914 435 (MULLEN) * page 8, paragraph 3 - page 9, paragraph 4; figures 2-5 *	1,7,11, 12	E04D1/36 E04B1/68
A	FR-A-2 540 920 (ETERNIT) * claims 1,6,7; figures 7-9 *	1,2,3,4	
A	FR-A-1 576 835 (CHEMIEFAC) * page 7, line 20 - page 8, line 22; figures 1-17 *	1,7	
A	DE-U-8 509 604 (KNOCHE) * page 7, paragraph 4; figure 1 *	1,2,3,4, 10	
A	GB-A-1 583 141 (KELSEAL LTD) * page 2, line 82 - page 2, line 122; figures 1-3 *	1,7	
A	FR-A-2 571 078 (ETERNIT)		
A	FR-A-2 150 006 (CHEMIEFAC)		

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

E04D
E04B
E04F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	21 APRIL 1992	HENDRICKX X.

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