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

(11) Publication number: 0 240 161 B1

(12) EUROPEAN PATENT SPECIFICATION

(45) Date of publication of patent specification: 09.01.91 Bulletin 91/02

(51) Int. Cl.[5]: E04C 2/26

(21) Application number: 87301777.6

(22) Date of filing: 27.02.87

(54) Sandwich panel.

(30) Priority: 02.04.86 GB 8608045

(43) Date of publication of application: 07.10.87 Bulletin 87/41

(45) Publication of the grant of the patent: 09.01.91 Bulletin 91/02

(84) Designated Contracting States: BE DE ES FR GB IT NL

(56) References cited:
DE-A- 2 435 003
FR-A- 2 411 281

(73) Proprietor: HUNTER DOUGLAS INDUSTRIES B.V.
Piekstraat 2
NL-3071 WL Rotterdam (NL)

(72) Inventor: Landheer, Hugo Arie Jan
Krekelveen 204
Spijkenisse (NL)

(74) Representative: Allen, William Guy Fairfax et al
J.A. KEMP & CO. 14 South Square Gray's Inn
London WC1R 5EU (GB)

EP 0 240 161 B1

Description

The present invention relates to sandwich panels.

Sandwich panels have been used for a considerable time now in the building trade and incorporate a front and rear sheet, usually formed of metal, and sandwiched between these sheets is an insulating core which can be formed of a variety of materials such as cellular or foam plastic, reconstituted wood, fibrous materials or the like or a mixture of all of these.

Many different proposals have been made for joining the edges of such panels and one such proposal is in GB-A-1072595. Here one abutting panel edge is provided with a profiled strip, which includes two edge flanges around which are bent the ends of the front and rear sheets respectively, and a protruding tongue portion. The interior of the tongue portion and the space between the front and rear sheets is filled with the insulation. The other cooperating member has both a front and rear sheet bent first inwardly and then longitudinally parallel to the main surfaces of the sheet material to provide free edges, the tongue of the first panel being inserted between these free edges to provide a joint. A clamp is provided by which the assembly can be secured to a supporting structure, the clamp engaging one of the flanges of the profiled edge member.

FR-A-2411281 discloses a sandwich panel comprising an insulating material core sandwiched between first and second spaced sheets, at least one edge of the panel being closed by a connection profile in the form of an elongate channel member of constant cross section, said cross section including a web portion, having first and second flanges extending parallel to one another from opposite edges to define, with the web, a channel shape, said first and second sheets being bent around the free edges of said first and second flanges respectively, with the opposite face of the web abutting the insulating core.

While such a construction is generally satisfactory, it does have a number of problems. Firstly, particularly if the sandwich panel arrangement is used for cladding the exterior of a building, and to a lesser extent on internal partitioning, the result of wind on the outside of the structure can produce a suction effect. This puts the sheet material which projects beyond the second panel edge and engages the exterior surfaces of the tongue under considerable loading, the sheet material not really having sufficient strength to support any substantial loading. Secondly there is a significant reduction in the insulating effect in the vicinity of the junction between two panels.

It is now proposed, according to the present invention, to provide a third flange extending from said web parallel to and between said first and second flanges and spaced from said first flange by a distance sufficiently to accommodate in said space the clamping part of a support clamp and a tongue of an adjacent panel, the third flange being positioned to engage an outer face of said tongue, a fourth flange extending from said web parallel to and between said first and third flanges, said fourth flange being positioned and shaped to co-operate with and extend into a recess formed in the end of said tongue, so that a part of said tongue and the clamping portion of said support clamp are between the fourth flange and the first flange when the clamping portion of said clamp is engaged with the inner surface of said first flange to hold said panel.

With such a construction the provision of the third and fourth flanges greatly rigidifies the connection profile and enables the fourth flange to extend into a recess formed in the end of the tongue of the co-operating panel. This also allows the insulating core material to enter to immediately adjacent the end of the tongue. These provisions both increase the rigidity of the structure and improve the insulating effect. Furthermore, it enables one to use a sandwich panel construction which is very similar to that already available and is shown in GB-A-1072595 with very little modification. Thus the construction of the present invention allows one to use identical first and second sheets, one on each face of the panel, and it enables one to maintain the same thickness of panels and the same clamps while overcoming the problems previously mentioned.

Preferably the first, third and fourth flanges have a sufficient length to allow for adjustable telescorping interlocking with the tongue of an adjacent panel and/or to allow compressible sealing to be accommodated between the third and fourth flanges this again helping to rigidify the junction and improve the insulation effect.

In a most convenient construction, the fourth flange is positioned substantially centrally between the first and second flanges. It can therefore engage substantially centrally in the tongue of the adjacent panel so that this tongue is equally strong in either direction should a lateral load be put on the panels, for example, by the wind or some other external force.

Desirably the fourth flange is tapered towards its free end to facilitate insertion into the recess during construction of a panelling wall with the sandwich panels of the invention.

In order to ensure that the connection profile is firmly secured to the insulating core, to distribute the load and to rigidify the structure, at least one achoring portion is preferably provided to project from the face of the web portion opposite to face from which the flanges project, to be engaged by the insulating material, which is preferably a cellular material.

In order to make up a series of panels, preferably the edge of the panel opposite to the one edge, which carries the connecting profile, may include a thinned down tongue configuration with a sheet extending along each of the opposite faces of the tongue con-

figuration, the front edge of the tongue having an axially extending recess formed therein, to accommodate the fourth flange of an adjacent similar panel. It is also contemplated that any given panel could have two connection profiles on opposite edges to co-operate with a tongue on an adjacent panel which may itself be provided with two tongues if this is appropriate. Normally the connection profiles will be provided on at least one side edge but it is also contemplated that they could be provided on the top and/or bottom edge when one is building a structure which has several panels one above the other.

The anchoring portion preferably comprises two L-section ribs extending parallel to one another and to the flanges and having a first arm extending away from the face of the web portion opposite to the face from which the flanges project, and a second arm angled to said first arm, said second arms extending towards one another. This enables a strip of rigid material to be inseeted between the arms of the anchoring portions to join two adjacent connection profiles end to end and also improve the anchoring of the correction profile to the insulating core.

Further to improve the seal between adjacent panels, the third flange may include a resilient sealing lip extending from adjacent the free end of the third flange, on the side thereof nearer said fourth flange, the free end of the sealing lip being spaced from the web. The third fiange may be provided, on its side facing the fourth flange, with a recess in which said sealing lip can be accommodated and the face of the sealing lip facing the fourth flange may be ribbed.

Preferably the connection profile is extruded from a relatively hard plastics material and said sealing lip is simultaneously extruded from a relatively soft plastics material.

In order that the present invention may be more readily understood, the following description is given, merely by way of example, reference being made to the accompanying drawing, in which :

Figure 1 is a cross section which shows a junction between two sandwich panesl according to one embodiment fo the invention ;

Figure 2 is a section on the line A-A of Figure 1 ;

Figure 3 is an end view of the connection profile of the panel of Figure 1 ; and

Figure 4 is a view similar to Figure 3 of a modified connection profile.

Referring first to Figure 1 there is illustrated a first sandwich panel 10 and an adjacent second sandwich panel 11. The first panel 10 includes rear and front sheets 12, 13 of metal, eg aluminium, and which are preferably parallel. Between these is sandwiched an insulating material 14, which may for example be cellular foam polystyrene material, which can adhere firmly to the sheets 12,13. The insulating material is thinned down, on the right, to provide a tongue 15, and the sheets 12, 13 continue to cover this tongue at 16 and 17 respectively. The tongue is substantially centrally of the thickness of the panel 10.

The second panel 11 has rear and front sheets 18 and 19 respectively sandwiching therebetween further similar insulating material 20. The edge of the panel 11 is provided with a connection profile indicated by the general reference numeral 21, this being of a generally channel cross section having a web 22 and first and second flanges 23 and 24 extending generally parallel to one another and to the left, in Figure 1, of the web 22. The profile connection 21 is secured to the insulation by anchoring portions 25 and 26 which extend in the opposite direction from the web from the flanges 23 and 24. Free edge portions 27 and 28 of the front and rear sheets 19 and 18 are bent around the free edges of the first and second flanges 23 and 24. A third flange 29 extends from the web portion 22 parallel and between the first and second flanges 23 and 24. The flange is spaced from the first flange by a distance sufficiently to accommodate in the space the whole of the tongue portion 15 and the clamping part 30 of a support clamp 31 to be described further later. The third flange is then positioned to engage the outer face of the sheet 16 defining the outer face of the tongue 15.

A fourth flange 32 extends from the web 22 parallel to, and between, the first flange 23 and the third flange 29, the fourth flange 32 being positioned and shaped to co-operate with, and extend into a recess 33 formed in the end of the tongue 15, so that part of the tongue and the clamping portion of the support clamp are between the fourth flange 32 and the first flange 23 when the clamping portion 30 fo the clamp 31 is engaged with the inner surface of the first flange to hold the panel. The panel is in fact held by the clamp 31, which includes a bolt 34B and a nut 34A, to a support member 35 and is engaged and disengaged by turning the clamp 31 about the axis of the bolt 34B so that the clamping portion 30 can engage and disengage the flange 23.

A compressible sealing element 39 is inserted between the third and fourth flanges 29 and 32.

If reference is made to Figure 3 it will be seen that the first flange 23, the second flange 24, the third flange 29 and the fourth flange 32 of the connection profile 21 are all substantially of the same length. The first and second profiles 23 and 24 are provided, on their inner face, with grooves 36 and 37 respectively, to receive the free ends of the inturned portions 27, 28. The inner surface of third flange 29 is serrated at 38 to improve engagement with the sheet 16 of the tongue 15 and the fourth flange 32 is tapered to facilitate insertion into the recess 33.

The dimensioning of the first, third and fourth flanges, particularly their length, is adequate to allow adjustable telescoping and interlocking with the tongue 15 of the adjacent panel and also allows the compressible sealing element 39 to be inserted and

accommodated between the third and fourth flanges.

Figure 4 illustrates a similar embodiment to that Figure 3 and like parts have been indicated by like reference numerals with the addition of 100. It will be noted that the two major changes involve the addition to the third flange 129 of a sealing lip and a modification of the anchoring portions 125 and 126.

With regard to the third flange 129, this has attached to it a flexible sealing lip 140 which is formed of a relatively soft material such as a PVC having a Shore hardness of 75. Preferably this is extruded at the same time as the remainder is extruded for example from a rigid, high impact resistant PVC.

It will be seen that the outer face of the sealing lip 140, facing the fourth flange 132, is provided with ribs 141 and that the face of the third flange 129 facing the fourth flange 132 is provided with a recess 142 of a sufficient size to accommodate the sealing lip, at least partially.

It will be understood that this sealing lip provides a better seal against the tongue 15.

With regard to the anchoring portions 125, 126, these are both L-shaped having arms 125a, 126a, extending towards one another. The purpose of this is two-fold. Firstly it provides a better anchoring with the insulating material and secondly it enables one to insert a rigid element 150 adjacent the ends of two profiles so that the profiles can be held together in end to end relationship. Thus one can provide a stock of standard length profiles and these can be made up into longer profiles by use of this expedient.

Claims

1. A sandwich panel (10, 11) comprising an insulating material core (14, 20) sandwiched between first and second spaced sheets (12, 13, 18, 19), at least one edge of the panel being closed by a connection profile (21) in the form of an elongate channel member of constant cross section, said cross section including a web portion (22), having first and second flanges (23, 24) extending parallel to one another from opposite edges to define, with the web, a channel shape, said first and second sheets (18, 19) being bent around the free edges of said first and second flanges (23, 24) respectively, with the opposite face of the web (22) abutting the insulating core (20), characterised in that a third flange (29) extends from said web (22) parallel to and between said first and second flanges (23, 24) and spaced from said first flange (23) by a distance sufficiently to accommodate in said space the clamping part (30) of a support clamp (31) and a tongue (15) of an adjacent panel, the third flange (29) being positioned to engage an outer face (16) of said tongue (15), and in that a fourth flange (32) extends from said web (22) parallel to and between said first and third flanges (23, 29), said fourth flange (32) being positioned and shaped to co-operate with and extend into a recess (33) formed in the end of said tongue (15), so that a part of said tongue (15) and the clamping portion (30) of said support clamp (31) are between the fourth flange (32) and the first flange (23) when the clamping portion (30) of said clamp (31) is engaged with the inner surface of said first flange (23) to hold said panel.

2. A sandwich panel according to claim 1, characterised in that the first, third and fourth flanges (23, 29, 32) have a sufficient length to allow adjustable telescoping interlocking with the tongue (15) of an adjacent panel and/or to allow a compressible sealing element (140) to be accommodated between the third and fourth flanges (29, 32).

3. A sandwich panel according to claim 1 or 2, characterised in that said fourth flange (32) is positioned substantially centrally between said first and second flanges (23, 24).

4. A sandwich panel according to claim 1, 2 or 3, characterised in that said fourth flange (32) is tapered towards its free edge to facilitate insertion in said recess (33).

5. A sandwich panel according to any preceding claim, characterised in that at least one anchoring portion (25, 26) projects from the face of said web portion (22) opposite to said face from which the flanges (23, 24, 29, 32) project, to be engaged by said insulating core (20).

6. A sandwich panel according to claim 5, characterised in that at least one anchoring portion comprises two L-section ribs (125, 126) extending parallel to one another and to the flanges and having a first arm extending away from the face of the web portion opposite to the face from which the flanges project, and a second arm (125A, 126A) angled to said first arm, said second arms extending towards one another.

7. A sandwich panel according to any preceding claim, characterised in that the edge of said panel opposite said one edge includes a thinned down tongue configuration (15) with the sheets extending along each of the opposite faces of the tongue configuration, the front edge of said tongue having a generally axially extending recess (33) formed therein, to accommodate the fourth flange (32) of an adjacent similar panel

8. A sandwich panel according to any preceding claims, characterised in that the third flange (129) further comprises a resilient sealing lip (140) extending from adjacent the free end of the third flange (129), on the side thereof nearer said fourth flange (132), the free end of the sealing lip (140) being spaced from the web (122).

9. A sandwich panel according to claim 8, characterised in that the third flange (129) is provided, on its side facing the fourth flange (132), with a recess (142) in which said sealing lip (140) can be accommodated.

10. A sandwich panel according to claims 8 or 9, characterised in that the face (141) of the sealing lip (140) facing said fourth flange is ribbed.

11. A sandwich panel according to claims 8, 9 or 10, characterised in that said connection profile (22) is extruded from a relatively hard plastics material and said sealing lip is simultaneously extruded from a relatively soft plastics material.

Ansprüche

1. Ein Verbundpaneel (10, 11), enthaltend einen Isolierstoffkern (14, 20), der zwischen ersten und zweiten, in Abständen zueinander angeordneten Platten (12, 13, 18, 19) eingebettet ist, wobei wenigstens eine Kante des Paneels durch ein Anschlußprofil (21) in Form eines länglichen Kanalelements mit konstantem Querschnitt verschlossen ist, während der genannte Querschnitt einen Steg (22) mit ersten und zweiten Flanschen (23, 24) enthält, die von gegenüberliegenden Kanten aus parallel zueinander verlaufen, um zusammen mit dem Steg eine Kanalform zu bilden, wobei die genannten ersten und zweiten Platten (18, 19) um die freien Kanten der genannten ersten bzw. zweiten Flansche (23, 24) herumgebogen sind, während die gegenüberliegende Seite des Stegs (22) am Isolierkern (20) anschlägt, **dadurch gekennzeichnet,** daß von dem genannten Steg (22) ein dritter Flansch (29) parallel zu und zwischen den genannten ersten und zweiten Flanschen (23, 24) verläuft und zu dem genannten ersten Flansch (23) einen Abstand aufweist, der ausreicht, um in diesem Zwischenraum das Klemmelement (30) einer Halteklemme (31) und eine Lasche (15) eines angrenzenden Paneels unterzubringen, während der dritte Flansch (29) so angeordnet ist, daß er mit einer Außenfläche (16) der genannten Lasche (15) in Eingriff steht, und daß sich ein vierter Flansch (32) vom genannten Steg (22) parallel zu und zwischen den genannten ersten und dritten Flanschen (23, 29) erstreckt, während der genannte vierte Flansch (32) so angeordnet und ausgebildet ist, daß er mit einer Aussparung (33) zusammenwirkt und sich in diese hinein erstreckt, die im Endstück der genannten Lasche (15) ausgebildet ist, so daß ein Teil der genannten Lasche (15) und das Klemmelement (30) der genannten Halteklemme (31) sich zwischen dem vierten Flansch (32) und dem ersten Flansch (23) befinden, wenn das Klemmelement (30) der genannten Klemme (31) mit der Innenfläche des genannten ersten Flanschs (23) in Eingriff steht, um das genannte Paneel festzuhalten.

2. Ein Verbundpaneel nach Anspruch 1, **dadurch gekennzeichnet,** daß der erste, dritte und vierte Flansch (23, 29, 32) eine ausreichende Länge haben, um eine verstellbare Teleskopverriegelung mit der Lasche (15) eines angrenzenden Paneels zu ermöglichen und/oder die Unterbringung eines zusammendrückbaren Dichtelements (140) zwischen dem dritten und vierten Flansch (29, 32) zu erlauben.

3. Ein Verbundpaneel nach Anspruch 1 oder 2, **dadurch gekennzeichnet,** daß der genannte vierte Flansch (32) im wesentlichen in der Mitte zwischen dem genannten ersten und zweiten Flansch (23, 24) angeordnet ist.

4. Ein Verbundpaneel nach Anspruch 1, 2 oder 3, **dadurch gekennzeichnet,** daß der genannte vierte Flansch (32) zur freien Kante hin verjüngt ist, um die Einführung in die genannte Aussparung (33) zu erleichtern.

5. Ein Verbundpaneel nach einem der vorherigen Ansprüche, **dadurch gekennzeichnet,** daß wenigstens ein Verankerungsteil (25, 26) an der Vorderseite des genannten Flanschteils (22) gegenüber der genannten Fläche, an der die Flansche (23, 24, 29, 32) überstehen, zum Eingriff mit dem genannten Isolierkern (20) vorspringt.

6. Ein Verbundpaneel nach Anspruch 5, **dadurch gekennzeichnet,** daß wenigstens ein Verankerungsteil zwei L-Profil-Rippen (125, 126) enthält, die parallel zueinander und zu den Flanschen verlaufen, mit einem ersten Arm, der sich von der Fläche des Stegteils weg erstreckt, die der Fläche gegenüberliegt, an der die Flansche überstehen, sowie einem zweiten Arm (125A, 126A) im Winkel zu dem genannten ersten Arm, wobei die genannten zweiten Arme aufeinander zu verlaufen.

7. Ein Verbundpaneel nach einem der vorherigen Ansprüche, **dadurch gekennzeichnet,** daß die Kante des genannten Paneels, die der genannten einen Kante gegenüberliegt, eine verdünnte Laschenkonfiguration (15) enthält, wobei sich die Platten jeweils längs den gegenüberliegenden Seiten der Laschenkonfiguration erstrecken und die Vorderkante der genannten Lasche eine im allgemeinen axial verlaufende Aussparung (33), die darin vorgesehen ist, enthält, um den vierten Flansch (32) eines angrenzenden ähnlichen Paneels aufzunehmen.

8. Ein Verbundpaneel nach einem der vorherigen Ansprüche, **dadurch gekennzeichnet,** daß der dritte Flansch (129) weiterhin eine federnde Dichtungslippe (140) aufweist, die von einem Punkt in der Nähe des freien Endes des dritten Flanschs (129) auf der Seite ausgeht, die dem genannten vierten Flansch (132) näher gelegen ist, wobei das freie Ende der Dichtungslippe (140) einen Abstand zum Steg (122) aufweist.

9. Ein Verbundpaneel nach Anspruch 8, **dadurch gekennzeichnet,** daß der dritte Flansch (129) auf der Seite, die dem vierten Flansch (132) gegenüberliegt, mit einer Aussparung (142) versehen ist, die die genannte Dichtungslippe (140) aufnehmen kann.

10. Ein Verbundpaneel nach Anspruch 8 oder 9, **dadurch gekennzeichnet,** daß die Vorderseite (141) der Dichtungslippe (140), die dem genannten vierten

Flansch gegenüberliegt, mit Rippen versehen ist.

11. Ein Verbundpaneel nach Anspruch 8, 9 oder 10, **dadurch gekennzeichnet,** daß das genannte Anschlußprofil (22) aus einem relativ harten Kunststoff und die genannte Dichtungslippe gleichzeitig aus einem relativ weichen Kunststoffstrang gepreßt wird.

Revendications

1. Panneau en sandwich (10, 11) comprenant une partie centrale en matériau isolant (14, 20) placée en sandwich entre des première et seconde feuilles espacées (12, 13, 18, 19), au moins un bord du panneau étant fermé par un profilé de connexion (21) sous forme d'un élément de canal allongé de section transversale constante, la section transversale comportant une âme (22), ayant des première et seconde ailes (23, 24) qui s'étendent parallèlement l'une à l'autre à partir des côtés opposés pour définir, avec l'âme, la forme d'un canal, les première et seconde feuilles (18, 19) étant cambrées autour des bords libres des première et seconde ailes (23, 24) respectivement, avec la face opposée de l'âme (22) en aboutement avec la partie centrale isolante (20), caractérisé en ce qu'une troisième aile (29) s'étend à partir de l'âme (22) parallèlement aux première et seconde ailes (23, 24) et entre celles-ci en étant espacée de la première aile (23) d'une distance suffisante pour recevoir dans ledit espace la partie de fixation (30) d'une bride de support (31) et une languette (15) d'un panneau adjacent, la troisième aile (29) étant mise en place pour venir en contact avec une face extérieure (16) de la languette (15), et en ce qu'une quatrième aile (32) s'étend à partir de l'âme (22) parallèlement aux première et troisième ailes (23, 29) en étant entre elles, la quatrième aile (32) étant mise en place et façonnée de manière à coopérer avec et s'étendre dans un évidement (33) ménagé dans l'extrémité de la languette (15), de sorte qu'une partie de la languette (15) et la partie de fixation (30) de la bride de support (31) se trouvent entre la quatrième aile (32) et la première aile (23) lorsque la partie de fixation (30) de la bride (31) est en contact avec la surface intérieure de la première aile (23) de manière à maintenir le panneau.

2. Panneau en sandwich selon la revendication 1, caractérisé en ce que les première, troisième et quatrième ailes (23, 29, 32) ont une longueur suffisante pour permettre un blocage ajustable par emboîtement avec la languette (15) d'un panneau adjacent et/ou pour permettre à un élément compressible d'étanchéité (140) d'être reçu entre les troisième et quatrième ailes (29, 32).

3. Panneau en sandwich selon la revendication 1 ou 2, caractérisé en ce que la quatrième aile (32) est placée sensiblement au centre entre les première et seconde ailes (23, 24).

4. Panneau en sandwich selon la revendication 1, 2 ou 3, caractérisé en ce que la quatrième aile (32) est conique vers son extrémité libre de manière à faciliter l'insertion dans l'évidement (33).

5. Panneau en sandwich selon l'une quelconque des revendications précédentes, caractérisé en ce qu'au moins une partie d'ancrage (25, 26) est en saillie sur la face de l'âme (22) opposée à la face à sur laquelle les ailes (23, 24, 29, 32) sont en saillie, de manière à s'engager dans la partie centrale isolante (20).

6. Panneau en sandwich selon la revendication 5, caractérisé en ce qu'au moins une partie d'ancrage comprend deux nervures à section en L (125, 126) s'étendant parallèlement l'une à l'autre et aux ailes, et présentant un premier bras qui s'étend en s'éloignant de la face de l'âme opposée à la face sur laquelle les ailes sont en saillie, et un second bras (125A, 126A) formant un angle avec le premier bras, les seconds bras s'étendant l'un vers l'autre.

7. Panneau en sandwich selon l'une quelconque des revendications précédentes, caractérisé en ce que le bord du panneau opposé audit bord présente une configuration à languette amincie vers le bas (15) avec les feuilles s'étendant le long de chacune des faces opposées de la configuration en languette, le bord avant de la languette présentant un évidement (33) s'étendant dans le sens général axial, afin de recevoir la quatrième aile (32) d'un panneau adjacent similaire.

8. Panneau en sandwich selon l'une quelconque des revendications précédentes, caractérisé en ce que la troisième aile (129) comprend en outre une lèvre élastique d'étanchéité (140) s'étendant à partir d'un endroit contigu à l'extrémité libre de la troisième aile (129), sur son côté le plus proche de la quatrième aile (132), l'extrémité libre de la lèvre d'étanchéité (140) étant espacée de l'âme (122).

9. Panneau en sandwich selon la revendication 8, caractérisé en ce que la troisième aile (129) comporte, sur son côté en regard de la quatrième aile (132), un évidement (142) dans lequel la lèvre d'étanchéité (140) peut être reçue.

10. Panneau en sandwich selon les revendications 8 ou 9, caractérisé en ce que la face (141) de la lèvre d'étanchéité (140) en regard de la quatrième aile est nervurée.

11. Panneau en sandwich selon les revendications 8, 9 ou 10, caractérisé en ce que le profilé de connexion (22) est extrudé à partir d'un matériau plastique relativement dur et la lèvre d'étanchéité est extrudée simultanément à partir d'un matériau plastique relativement tendre.

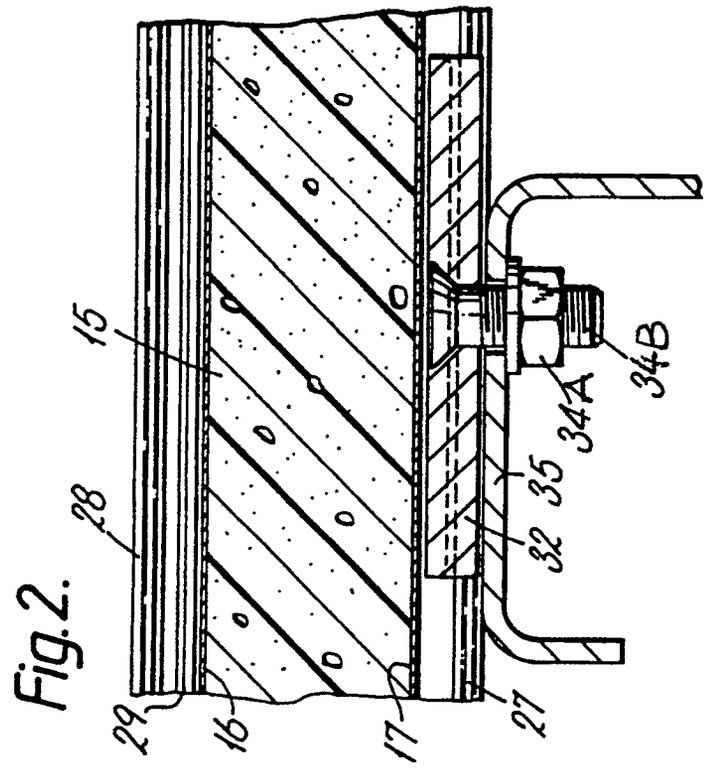

Fig.2.

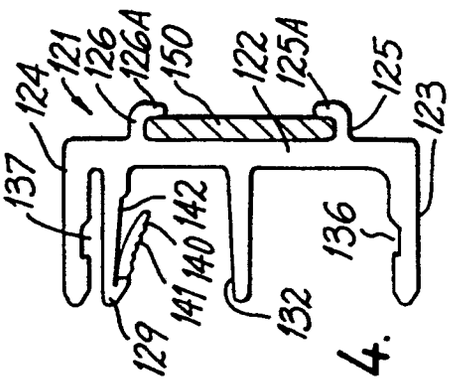

Fig.4.

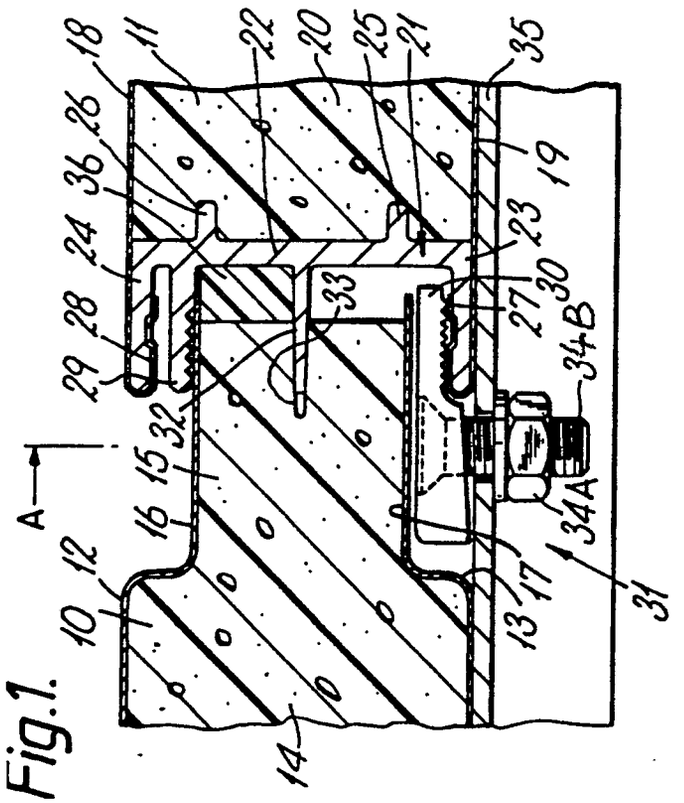

Fig.1.

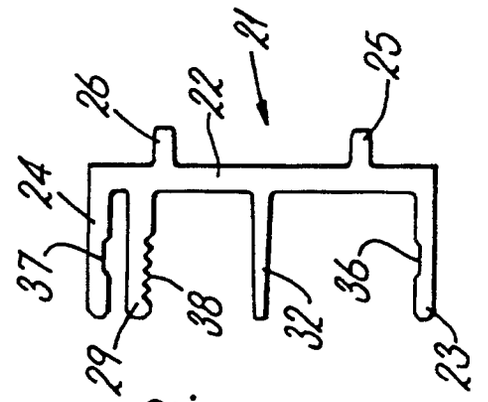

Fig.3.