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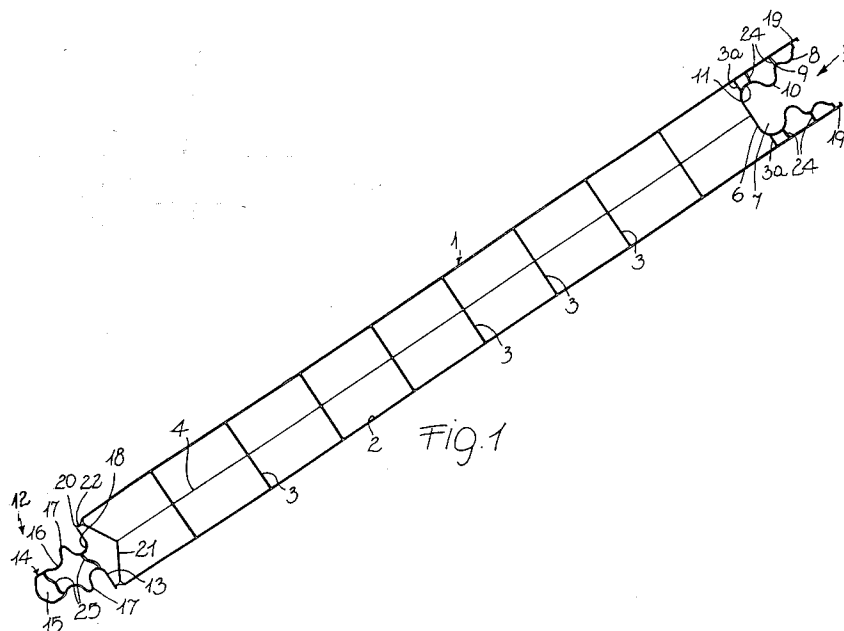
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I-20123 Milano(IT)(54) **Polycarbonate alveolate paneling strip.**

(57) Polycarbonate alveolate paneling strip, particularly for building curtain-walls and the like, constituted by a single body (1) which comprises a pair of spaced and mutually parallel panes (2) which are mutually connected by a plurality of transverse laminae (3) and are provided, along a female coupling side (5), with a longitudinal recess (7) which has two opposite walls, each of which is affected by a same sequence of longitudinal indentations and

protrusions, and has, along a parallel and non-adjacent male coupling side (12), a protruding longitudinal ridge (14) which has, along its sides, a sequence of longitudinal protrusions and indentations which is complementary to the one provided in the recess on the other coupling side, so that a male coupling side of one paneling strip can enter a female coupling side of an adjacent paneling strip for mutual water-tight engagement.

**EP 0 522 541 A1**

The present invention relates to a polycarbonate alveolate paneling strip particularly suitable to be used for curtain-walls of shelters and the like.

The building of greenhouses, shelters, garages and similar structures currently employs, to a considerable extent, polycarbonate paneling strips or panels which are arranged mutually side by side in order to obtain non-supporting walls or curtain-walls which combine high transparency and strength with extreme lightness and weatherability.

However, although they have been extensively used for some time, said alveolate paneling strips are not free from problems, among which one must mainly stress the fact that watertightness is often troublesome along the adjacent edges of known paneling strips, so that infiltrations of water inside the structure occur in case of rain, especially at walls facing the wind.

In order to obtain watertight walls, it has already been suggested to use, between one panel and the next, metallic connecting profiles, provided with appropriate gaskets, which mutually connect pairs of adjacent paneling strips along their edges.

It is evident that the use of these profiles, generally made of aluminum, considerably affects the overall cost of the structure.

The aim of the present invention is to provide an alveolate paneling strip which is constituted by a single polycarbonate body which can cooperate with adjacent paneling strips, providing a perfectly watertight connection along the edges where one paneling strip makes contact with the next.

A particular object of the present invention is to provide a paneling strip which can ensure high reliability and safety, although it is structurally very simple, and which can be obtained with conventional extrusion methods.

Another object of the present invention is to provide alveolate paneling strips whose mutual watertight connection can be performed rapidly and easily during installation, without having to use particular tools.

This aim, these objects and others which will become apparent hereinafter are achieved, according to the invention, by a polycarbonate alveolate paneling strip, particularly for building curtain-walls and the like, constituted by a single body which comprises a pair of spaced and mutually parallel panes which are mutually connected by a plurality of transverse laminae and being characterized in that it has, along a female coupling side, a longitudinal recess which has two opposite walls, each of which is affected by a same sequence of longitudinal indentations and protrusions, and has, along a parallel and non-adjacent male coupling side, a protruding longitudinal ridge which has, along its sides, a sequence of longitudinal protrusions and indentations which is complementary to the one

provided in the recess on the other coupling side, so that a male coupling side of one paneling strip can enter a female coupling side of an adjacent paneling strip for mutual watertight engagement.

The invention is further described hereinafter with reference to the accompanying drawing, wherein:

figure 1 is a perspective view of a paneling strip according to the invention; and

figure 2 is a view of the watertight coupling between two adjacent paneling strips.

With reference to the above figures, an alveolate paneling strip according to the invention, generally designated by the reference numeral 1, is constituted by a single body which is shaped like a parallelepiped with a predominantly longitudinal extension and which is obtained for example by extrusion of a suitable extrudible material, preferably a transparent synthetic material such as a polycarbonate or methacrylate resin.

The paneling strip 1 has an alveolate structure, since it is constituted by a pair of parallel and generally planar walls or panes 2 which are mutually connected by a plurality of transverse ribs 3, which are for example arranged at right angles thereto and which extend along the longitudinal dimension of the paneling strip 2.

For particular executions of the paneling strip it is advantageously possible to provide, in an intermediate position between the two panes 2, a thin lamina or strengthening sheet 4 which intersects and mutually joins all the ribs 3.

A longitudinal side 5 of the paneling strip 2 is shaped so as to define a female or recessed coupling and has a transverse back wall 6 which is connected to the two walls 2 by means of two terminal ribs 3a and delimits a recess or hollow 7 which extends along the entire length of the paneling strip.

More particularly, the recess 7 has an external flaring 8 which is formed by a curved protruding portion of the wall 6, followed by an intermediate neck 9 which is formed by a curved indented portion, in turn followed by a narrow intermediate neck 10 which is formed by a curved protruding portion beyond which the wall 6 delimits a wide opening or channel 11 with rounded sides.

A wall or male shaped laminar element 13 extends astride the two panes 2 on the other longitudinal side 12 of the paneling strip 1 and constitutes a protruding longitudinal ridge 14 whose transverse cross-section is shaped so that it can couple snap-together with a recess 7 provided on an adjacent paneling strip 1.

More particularly, if one views the ridge 14 in transverse cross-section, starting from the outermost portions and moving inwardly, it can be seen that it has a rounded terminal edge 15 which is

followed by a neck 16 and by an expansion constituted by two wings 17 which blend with the panes 2 by means of a second and larger neck 18. A transverse side wall 23 extends immediately adjacent to the base of the ridge 14, between the two planar walls or panes 2, has a curved or broken-line cross-section, and acts as terminal closure and stiffening element.

According to a preferred embodiment, each pane 2 has, at the female side 5, a portion 19 which slightly protrudes beyond the coupling of the wall 6 to the pane and ends with a flap or edge 20 which is directed inwardly and which is suitable to act as a shoulder, in the snap-together coupling of two or more paneling strips, for a respective raised portion which is present on the male side 12 of the adjacent paneling strip and which has a protruding longitudinal abutment edge or wing 21 which continues the wall 13 and a respective laminar portion 22 for coupling to the panes 2.

If required, it is possible to provide ribs or laminae 24 for connecting the wall 6 and the panes 2, mainly with a stiffening function. It is furthermore possible to provide shaped ribs 25, inside the ridge 14, which connect the opposite faces of the laminar element 13. The ribs 25 can conveniently have a curvilinear transverse cross-section and it is possible to connect regions or points which are not symmetrical with respect to the centerline of the paneling strip 1, in order to allow a moderate and controlled deformability of the ridge 14.

The above described paneling strips 1 are installed by mutually connecting them by means of the snug-fit coupling of ridges 14 and recesses 7. This operation can be obviously performed by making each paneling strip slide longitudinally with respect to the other or, in a much more practical and quick manner, by means of the snap-together coupling allowed by the partial deformability of the ridge 14, which is also facilitated by any laminae 25 with undulated cross-section.

As more clearly illustrated in figure 2, in the coupling between the recess 7 and the ridge 14 of two adjacent paneling strips 1 arranged side by side, the head 15 enters the channel 11, occupying it only partially, whereas the neck 16 and the wings 17 are closely in contact respectively with the curved region 10 and with the curved region 9 in the recess 7. Furthermore, the large neck 18 on the ridge 14 is only partially occupied by the curvature 8 of the laminar element 6, thus delimiting a duct 26.

It is thus evident that in case of rain or similar weather, the water that manages to pass beyond the first sealing element, constituted by the labyrinth formed by the insertion of the edges 20 in the seats 21, reaches the duct 26, along which it moves away toward the outside of the structure.

The subsequent large region of contact between the ridge 14 and the hollow 7 assuredly makes it very difficult for water to infiltrate inside the snug-fit coupling, and in any case the water which might manage to penetrate further would collect in the channel 11 in order to be removed toward the outside of the structure.

By means of practical tests it has been observed that a paneling strip according to the invention, despite being structurally very simple, is capable of ensuring effective watertightness without requiring additional sealing elements, so that it can be used advantageously for the rapid construction of watertight curtain-walls.

A containment wall built with paneling strips according to the invention has a flat surface which is practically not interrupted by the presence, on the joints, of elements made of another material, such as sealing gaskets and the like, and is thus extremely pleasant not only from the functional point of view but also from an aesthetic one.

In practice, the dimensions may be various, and obviously the described paneling strips may be either transparent, in order to exploit, as already normally occurs, the particular light-transmission characteristics of polycarbonate, or opaque or colored, depending on the specific requirements and applications.

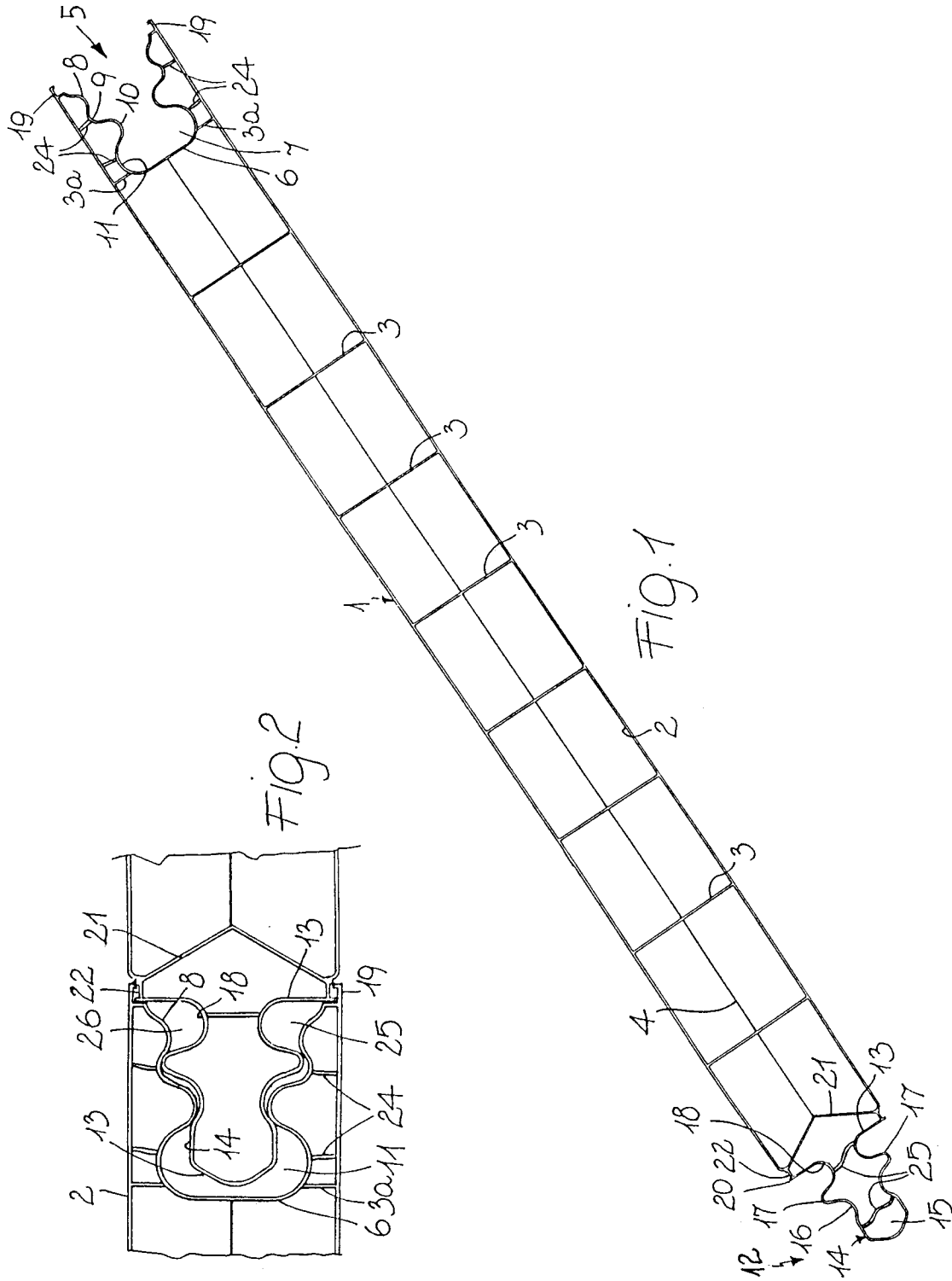
Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

Claims

1. Polycarbonate alveolate paneling strip, particularly for building curtain-walls and the like, constituted by a single body which comprises a pair of spaced and mutually parallel panes which are mutually connected by a plurality of transverse laminae and being characterized in that it has, along a female coupling side, a longitudinal recess which has two opposite walls, each of which is affected by a same sequence of longitudinal indentations and protrusions, and has, along a parallel and non-adjacent male coupling side, a protruding longitudinal ridge which has, along its sides, a sequence of longitudinal protrusions and indentations which is complementary to the one provided in the recess on the other coupling side, so that a male coupling side of one paneling strip can enter a female coupling side of an adjacent paneling strip for mutual water-

tight engagement.

2. Strip according to claim 1, characterized in that said recess is delimited by a recessed shaped laminar element which extends between said two opposite walls, and in that said longitudinal ridge is constituted by a laminar element which is shaped so that it protrudes between said opposite walls.
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3. Strip according to claim 1 or 2, characterized in that said walls end with a male or female winged edge at said male coupling side and end with a female or male winged edge at said female coupling side for snap-together coupling to the corresponding winged edge of an adjacent paneling strip, in order to ensure greater stability and better watertightness between one paneling strip and the next.
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4. Strip according to any one of the preceding claims, characterized in that it comprises laminae for internal connection between the opposite faces of said longitudinal ridge, said laminae being connected in positions which are not symmetrical with respect to the center-line of the ridge and have a curvilinear transverse cross-section in order to allow a given controlled deformability to said ridge.
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5. Strip according to any one of the preceding claims, characterized in that it has, in an intermediate position between said opposite walls, a strengthening lamina which is connected to the walls by means of a plurality of intermediate transverse ribs and of a transverse side wall which has a curved or broken-line cross-section at said ridge, as well as by means of the bottom of the recess and by two terminal ribs at said recess.
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EUROPEAN SEARCH REPORT

Application Number

EP 92 11 1613

DOCUMENTS CONSIDERED TO BE RELEVANT

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	DE-U-8 403 845 (OLTMANN'S ZIEGEL UND KUNSTSTOFFE GMBH) * page 8 - page 13; figures 1-3 *	1-3	E04C2/54 E04B1/61
A	---	4,5	
X	EP-A-0 006 431 (OLTMANN'S) * page 1 - page 15, paragraph 1; figure 1 *	1-3	
A	---		
A	EP-A-0 283 071 (LA/ES LAMINATI ESTRUSI TERMOPLASTICI S.P.A.) * claims 1-3 *	1	
A	---		
A	FR-A-2 623 228 (FAIVRE) * page 3, line 15 - line 29; figures 2,3 *	1	
A	---		
A	DE-U-8 528 006 (PROKUWA KUNSTSTOFF GMBH) * the whole document *	1	
A	---		
A	GB-A-2 106 159 (MONTEDISON SPA) * the whole document *	1	

The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			E04C E04B
Place of search		Date of completion of the search	Examiner
BERLIN		05 OCTOBER 1992	PAETZEL H.
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