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⑳ **Alveolar sheet of polycarbonate.**

㉑ Alveolar sheet of polycarbonate comprising a first outer wall (2) and a second outer wall (3) jointed together by equidistant perpendicular baffles (4).
At least one of said two outer wall (2,3) and said perpendicular baffles (4) comprise a layer of polycarbonate to which an U.V. light neutralizing substance is added.

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"ALVEOLAR SHEET OF POLYCARBONATE"

The present invention relates to an alveolar sheet of polycarbonate comprising a first outer wall and a second outer wall, with both of said walls being horizontal and parallel, and joined with each other by perpendicular, equidistant baffles. At least one of said outer walls comprises a polycarbonate layer, to which a substance capable of neutralizing the action of U.V. light --which in the following is simply denominated "U.V.-protective substance" -- is added.

The alveolar sheets of polycarbonate are used above all in the industrial buildings for replacing glass when large luminous surfaces endowed with optimum characteristics of thermal insulation, impact strength, light-weight, easy assemblage and transportation, have to be accomplished.

However, polycarbonate is known to the particularly sensitive to U.V. light, the sun light is composed by.

Such U.V. light has the property of neutralizing the molecular bonds which endow the polycarbonate with the excellent mechanical characteristics it is provided with, causing it to rapidly decay. In the presence of such a phenomenon, those skilled in the art are used to speak in terms of "polycarbonate ageing".

In order to obviate such a drawback, it is known to blend a U.V.-protective substance to polycarbonate during the extrusion step. Said U.V.-protective substance performs its function by performing a filtering action, of random character, of U.V. light.

In other terms, the higher the concentration of particles of U.V.-protective substances per each unit of surface area to be protected, the higher the probability that a U.V. beam impinging on the same surface meets one of said particles, rather than a molecule of polycarbonate. The U.V. beam impinging against an U.V.-protective particle is obviously neutralized by the said particle.

A sheet as above described is already known from European patent No. 110,238.

According to such patent, in said sheet at least one of the two outer walls, kept bonded to the other outer wall by vertical baffles, is constituted by two overlapping polycarbonate layers.

The first, outermost, layer, is constituted by simple polycarbonate, and the second layer, underlying the first layer, and adherent to it, is constituted by polycarbonate to which an U.V.-protective substance is added.

Such a structure, although fulfils in a satisfactory way the tasks it was designed for, suffers from some drawbacks. Those skilled in the art know that the addition of the U.V.-protective substance im-

pairs the extrusion ability characteristics of a polycarbonate containing such an additive, and that, therefore, the higher the percentage of U.V.-protective substance, the more difficult the sheets to be obtained with no extrusion drawbacks.

Furthermore, from a probabilistic standpoint, the increase, beyond certain limits, of the concentration of U.V.-protective substances along one surface only of the sheet, does not result in a proportional increase in protection, but in an actual protection increase, which is proportionally lower and lower, until a saturation limit is reached.

One should furthermore bear in his mind that the U.V.-protective substance is particularly expensive, and that the manufacturers of the sheets are interested in keeping the used percentages thereof as low as possible.

The purpose of the present invention is to provide a sheet which makes it possible the above drawbacks to be obviated, and which is hence endowed with a good level of resistance to ageing, even if low percentages of U.V.-protective substance are used, and which, thanks to the use of limited percentages of U.V.-protective substance is also cheap and easily extrudable.

The alveolar sheet of polycarbonate of the present invention comprises a first outer wall and a second outer wall, both of which are horizontal and parallel, and are joined with each other by equidistant perpendicular baffles, with at least one of said two outer walls comprising a layer of polycarbonate to which an U.V. light neutralizing substance is added, and is characterized in that it comprises, associated with said layer of polycarbonate to which an U.V. light neutralizing substance is added, a set of layers perpendicular to said layer, which perpendicular layers also are made from polycarbonate to which an U.V.-protective substance is added.

The advantages obtained by means of the present invention are substantially those of producing a sheet which, with its resistance to ageing being the same, results cheaper, and more easily extrudable. The better extrusion ability of the sheet results in a reduction in the pieces affected by imperfections.

The invention is disclosed in greater detail in the following, with the aid of the hereto attached drawing table, wherein Figure 1 shows a perspective view of a piece of sheet manufactured according to the invention.

The sheet of the invention, generally indicated by the reference numeral 1, is a polycarbonate sheet of alveolar type.

It is constituted by a first outer wall 2 and a

second outer wall 3, which are joined with each other by a plurality of baffles 4 positioned perpendicularly to the same walls 2 and 3.

The first wall 2 is constituted by an outer layer 5 of pure carbonate adhering to an inner layer 6 of polycarbonate to which an U.V.-protective substance is added.

For indicative purposes, the inner layer 6 is constituted by 96% of polycarbonate and 4% of U.V.-protective substance.

The perpendicular baffles 4 have a thickness which is substantially equal to the thickness of the walls 2 and 3 and in the nearby of their middle axis, baffles 7 are provided, which are parallel to the walls 2 and 3, and have a thickness lower than the thickness of the perpendicular baffles 4.

The portions 10 of the perpendicular baffles 4 between the baffles 7 and the inner layer 6 are constituted by a structure having, for purely indicative purposes, a composition of 98% of polycarbonate, to which a 2% of U.V.-protective substance is added.

The sheet 1 is assembled in the building in such a way that the wall 2 is directed towards the light source generating the U.V. light. Nearly all of the U.V. light impinging of the wall 2 is neutralized by the inner layer 6, and the outer layer 5 performs a simple action of protection of the inner layer 6 from possible attacks of chemical, or mechanical nature, which may take place above all during the sheet extrusion process.

The U.V. light which succeeds in overcoming the inner layer 6 is neutralized by the baffle portions 10, with a particularly high effectiveness, precisely thanks to the perpendicular position of said baffle portions 10 relatively to the layer 6.

The overall effectiveness of the inner layer 6 associated with the plurality of portions of baffles 10 perpendicular to it, is generally higher than it would be obtained by means of a single layer, or of a plurality of parallel layers containing, in the overall, identical percentages of U.V.-protective substance.

The layer(s) of polycarbonate containing the U.V.-protective substance, and associated with the perpendicular baffles 4 can be also extended, of course, along the portions 6.

Claims

1. Alveolar sheet of polycarbonate comprising a first outer wall and a second outer wall, both of which are horizontal and parallel, and joined with each other by equidistant perpendicular baffles, with at least one of said two outer walls comprising a layer of polycarbonate to which an U.V. light neutralizing substance is added, and is characterized in that it comprises, associated with said layer

of polycarbonate to which an U.V. light neutralizing substance is added, perpendicular layers also made from polycarbonate to which an U.V.-protecting substance is added.

2. Sheet according to claim 1, characterized in that one only of the outer walls (2) comprises a layer of polycarbonate (6) to which an U.V.-light neutralizing substance is added, with the perpendicular layers of polycarbonate to which an U.V. light neutralizing substance is added being associated with the perpendicular baffles (4).

3. Sheet according to claim 2, characterized in that with each perpendicular baffle (4) one, and only one, layer of polycarbonate to which an U.V.-light neutralizing substance is added, is associated.

4. Sheet according to claim 3, characterized in that the layer of polycarbonate to which an U.V.-light neutralizing substance is added, is dispersed inside each perpendicular baffle (4).

5. Sheet according to claim 4, characterized in that the dispersion of polycarbonate to which an U.V.-light neutralizing substance is added, is carried out in one portion (10) only of the perpendicular baffles (4), which is comprised between the outer plane (2), comprising the layer (6) of polycarbonate to which a neutralizing substance is added, and the baffles (7) incident to the perpendicular baffles (4).

6. Sheet according to claim 5, characterized in that the incident baffles (7) have a thickness substantially lower than the thickness of the outer walls (2), (3) and than the thickness of the perpendicular baffles (4).

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Fig.1