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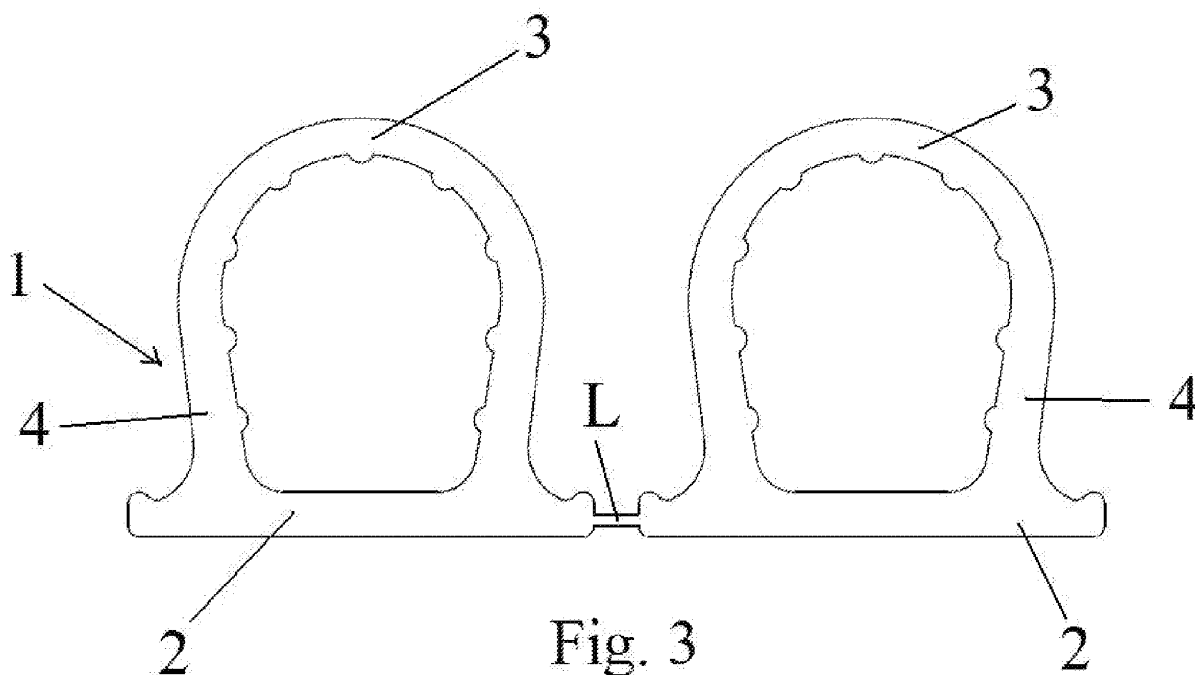
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(54) **A seal gasket for doors and windows made of thermoplastic material.**

(57) The present invention relates to a seal gasket (G) for doors and windows provided with elastically deformable monolithic structure obtained from extrusion of thermoplastic materials, provided on the front of a strip (2) adapted to adhere to the door or window with a tubular

section (1) with basically horseshoe cross-section, wherein the rounded front end (3), which is basically semicircular, is joined in the back with two rectilinear sides (4) that are symmetrically opposite and converge towards said strip (2).



Description

[0001] The present patent application relates to a seal gasket for doors and windows made of thermoplastic material.

[0002] The peculiarities and advantages of the invention will be more evident further to a brief description of the prior art.

[0003] Doors and windows are traditionally provided with perimeter gaskets to prevent penetration of micro air currents, the so-called "draughts", from outside of the building.

[0004] These gaskets, which are sometimes used also in the industrial field, are provided with an elastically deformable structure that allows them to be alternatively compressed and expanded.

[0005] In particular, compression of such a gasket - which corresponds to maximum seal capability - is produced when the door or window is closed, since the gasket is compressed between the mobile frame and the fixed secondary frame of the door or window.

[0006] However, as soon as the door or window is opened again, the gasket recovers its natural position in view of its intrinsic elasticity.

[0007] In such a context, an especially popular version of said gaskets is the one shown in Fig. 1 of a first drawing attached to the present description, which is particularly useful to show such a prior art.

[0008] A gasket of this type is provided with monolithic structure made of silicone by means of extrusion process.

[0009] Such a monolithic structure comprises a tubular section with basically circular section (10) protruding on the front of a flat strip (20) adapted to be fixed against the frame or secondary frame of the door or window.

[0010] To that end said strip (20) is provided with a back adhesive side, which is generally protected by an easily removable film.

[0011] When mounting such a gasket, it is simply necessary to remove said protective film. After such a simple operation, in fact, the back adhesive side of the strip (20) is fixed with sufficient energy on the frame or secondary frame on which it is applied.

[0012] As shown in Fig. 1, the tubular section (10) of a typical traditional gasket is provided with identical thickness for the entire circular development.

[0013] The aforesaid figure also shows that the extrusion process allows for producing multiple specimens of the gasket placed side-by-side.

[0014] The multiple side-by-side specimens are joined by means of a thin longitudinal joining line (L) that can be easily cut off to separate the various specimens of the gasket.

[0015] Although such a technology has been highly appreciated over time, achieving large commercial diffusion, it is impaired by significant drawbacks.

[0016] Firstly, it must be noted that traditional gaskets are rather expensive, in view of the raw material used to produce them, i.e. silicone.

[0017] Additionally, they are not completely satisfactory in terms of functional efficacy.

[0018] Given the fact that said tubular section (10) is provided with identical thickness along the entire semi-circular development, traditional gaskets have minimum resistant capacity during compression and are not very reactive during expansion.

[0019] Referring to the first problem, it can be otherwise said that traditional gaskets have a limited capacity of contrasting, before being completely compressed, the compression force exerted on them when closing the door or window.

[0020] Referring to the second problem, instead, it can be said that traditional gaskets have little capacity of immediately recovering their natural position when compression is eliminated.

[0021] Based on such a critical evaluation of the prior art, the gasket of the invention has been devised in order to overcome said drawbacks.

[0022] A first purpose of the invention is to devise a gasket for doors and windows provided with high resistance to compression and, consequently, excellent reaction at every expansion phase.

[0023] A second purpose is to devise a product that is less expensive than traditional gaskets.

[0024] Said first purpose has been achieved by giving an innovative configuration, in terms of shape and thickness, to the tubular section of the gasket of the invention.

[0025] The second purpose has been achieved by abandoning the use of traditional silicone and by using a material that is equally effective in terms of functionality, but certainly less expensive, such as TPE-S, i.e. a typical thermoplastic elastomer.

[0026] For purposes of clarity, the description of the invention continues with reference to a second drawing, which is intended for purposes of illustration only and not in a limiting sense, wherein:

- Fig. 2 is an axonometric view of a pair of side-by-side specimens of the gasket of the invention, which are still joined together;
- Fig. 3 is an enlarged cross-sectional view with a transversal vertical plane of the pair of gaskets of Fig. 2.

[0027] Referring to Fig. 3, the gasket of the invention (G) has a monolithic structure preferably obtained with TPE-S by means of a traditional extrusion process.

[0028] Such a gasket (G) normally comprises a flat strip (2) adapted to adhere against the frame of a door or window, from which a tubular section (1) protrudes, being the elastically deformable seal element of the gasket.

[0029] As anticipated, the main peculiarity of the invention consists in the configuration given to said tubular section (1).

[0030] In fact, it abandons the traditional circular shape, of the type shown in Fig. 1, in favor of an original

shape that can be described as "horse shoe".

[0031] As shown in Fig. 3, in such a tubular section (1), the basically semicircular front end (3) is joined in the back with two rectilinear sides (4) that are symmetrically opposite and converge towards the strip (2). 5

[0032] Therefore, said rounded front section (3) is provided, in correspondence of the connection point with said two rectilinear sides (4), with width higher than the distance between the two sides (4) in correspondence of the point where they are joined to the strip (2). 10

[0033] Moreover, it must be noted that said semicircular front section (3) has a basically constant thickness and, instead, the two rectilinear sides (4) have a different thickness. Said thickness is higher in the point where the two sides (4) are joined to said strip (2), and is progressively reduced towards the point where they are joined with the semicircular front section (3). 15

[0034] Because of the two aforementioned inventive ideas - i.e. "omega" configuration and different thickness of the rectilinear sides (4) - the tubular section (1) of the gasket of the invention (G) is capable of effectively withstanding without damage, including for long periods of time, the compression exerted on it when the door or window is closed. 20

[0035] At the same time the tubular section (1) guarantees an especially prompt energetic reaction at every expansion as soon as compression is eliminated. 25

[0036] It must be noted that, in said Figs. 2 and 3 letter (L) indicates the thin longitudinal joining line obtained during the extrusion process, which joins multiple side-by-side specimens of the gasket (G) and can be easily torn off to separate them. 30

Claims 35

1. A seal gasket for doors and windows provided with elastically deformable monolithic structure obtained from extrusion of thermoplastic materials, comprising a tubular section (1) protruding from the front of a flat strip (2), **characterized in that** said tubular section (1) has a basically horse-shoe shape, wherein the rounded front end (3), which is basically semicircular, is joined in the back with two rectilinear sides (4) that are symmetrically opposite and converge towards the strip (2). 40 45
2. A gasket as claimed in claim 1, **characterized in that** said front end (3) of the tubular section (1) has a constant thickness, whereas said rectilinear sides (4) have a lower thickness from the point where they are joined to the strip (2) towards the point where they are joined with said rounded front end (3). 50
3. A gasket as claimed in the preceding claims, **characterized in that** the thermoplastic material used to obtain it consists in TPE-S (thermoplastic elastomer). 55

PRIOR ART

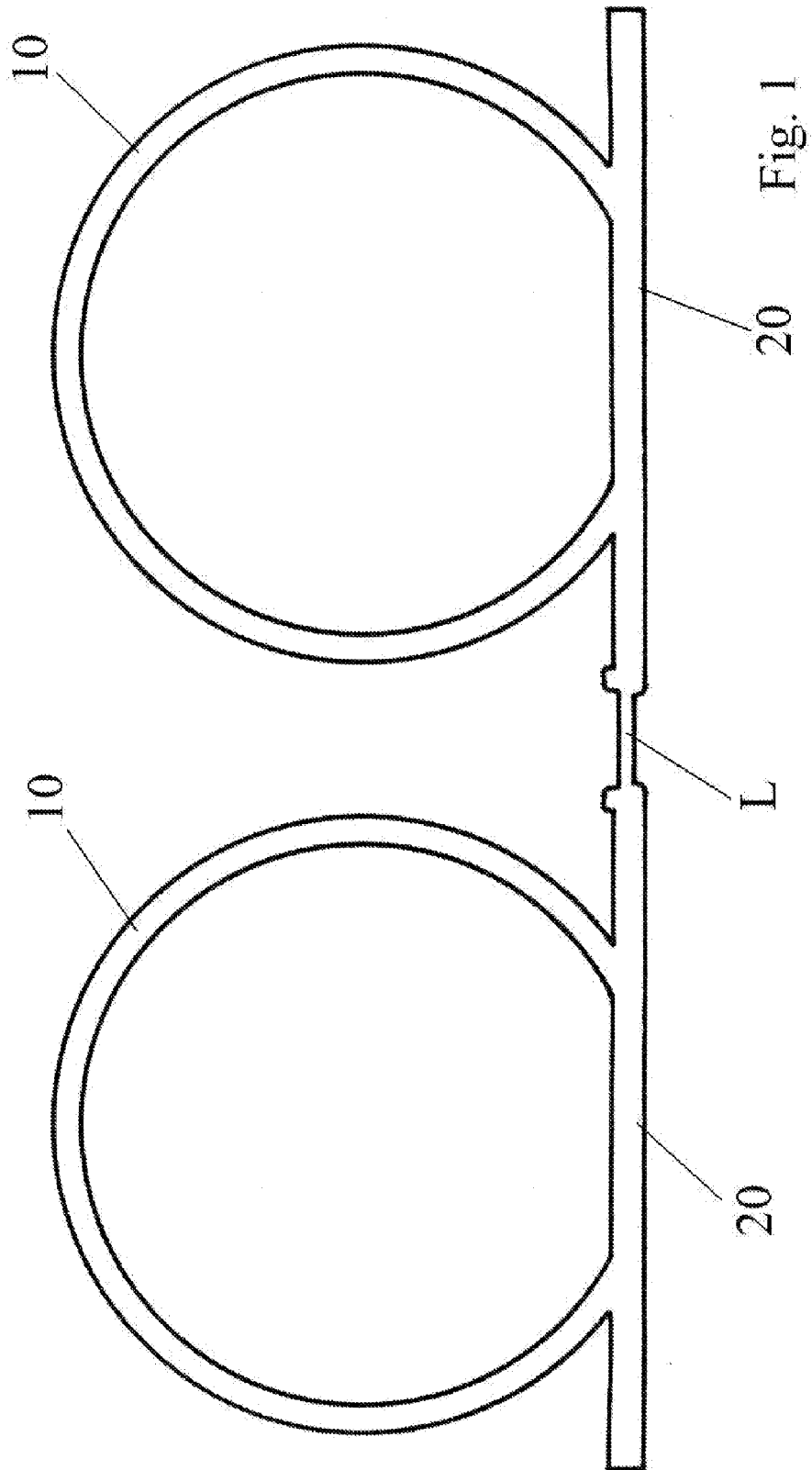


Fig. 1

