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(54) **Elastomeric material frame-shaped joint, especially for oven doors**

(57) It is a joint of the type that is installed in a frame corresponding to the mouth of an oven or the like in order to insulate the inside chamber of said oven from the outside when the door of the same is closed.

The joint comprises:

A tube-shaped profile (1 and 1') that has at least one longitudinal cavity (4), with at least one joint flange (5, 6), as well as at least two cuts (18).

It also includes some coupling elements (12) for the connection in some holes on a surface where the tube-shaped profile is coupled. The coupling elements comprise a base placed in the inside of the longitudinal cavity and at least one elongated outside hook part that extends through the cuts. The cuts have a center part and two end parts that have a change of path of at least 90°, said cuts giving rise to some small overlaps.

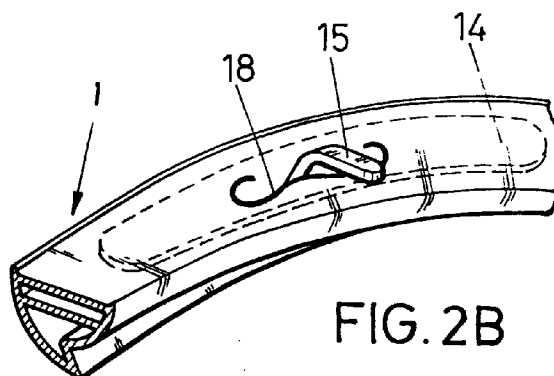


FIG. 2B

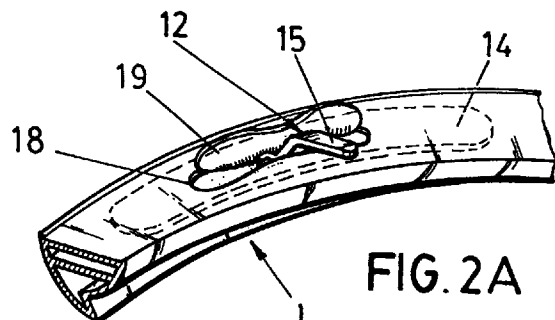


FIG. 2A

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Description

OBJECT OF THE INVENTION

As expressed in the title of this specification, the present invention refers to an elastomeric material frame-shaped joint, especially for oven doors.

The purpose of the joint is to seek insulation of the inside chamber of the oven with regard to the outside when said oven door is, naturally, closed. In this way, mainly leakage of the heat produced inside the inside chamber will be prevented.

For this purpose, the joint of the invention will preferably be fixed to the frame corresponding to the mouth of the oven where the respective door is coupled by means of some hinges or the like. Therefore, the joint will be fixed to the frame by means of some coupling means.

Therefore, the object of the invention is essentially centered on the connecting structure between the coupling elements and the joint itself, the joint and the coupling elements finally forming a single-piece body.

The joint of the invention can also be installed in the mouth of different containers that include a cover to close them and to insulate them from the outside.

BACKGROUND OF THE INVENTION

In the technological field of joints for doors and, particularly, for oven doors, joints made out of an elastomeric material frame, based on a tube-shaped profile that defines a longitudinal cavity and a flange that emerges from one of its surfaces, are known. This type of joints is applied to the door or to the surface against which the door abuts, in such a way that the door forms a frame all along the periphery of the door or, at least, along a substantial part of said periphery. For example, in the case of an oven door that closes a rectangular-shaped opening in a vertical plane, the joint is applied along the four sides of said opening or, alternately, along only one part of said sides, for example, along the top side and the two vertical sides, which are the ones that perhaps require better leak-tightness to prevent the leakage of heat and steam from the oven.

In order to be able to couple the tube-shaped profile to the door or to the abutment surface, use of a plurality of coupling elements formed from an elongated base that is housed inside the longitudinal cavity of the tube-shaped profile and at least one elongated hook part that extends towards the outside through cuts, holes or notches made in one surface of the tube-shaped profile, is frequent. These hook parts are coupled by stretching in complementary holes established in the door or in the wall against which the door abuts.

British patent application GB-A-2106974 describes a joint in accordance with the above mentioned characteristics, where the joint remains placed upon the abutment surface. This document proposes the use of a

simple elongated cut to allow the hook parts of the coupling elements to emerge towards the outside.

A disadvantage of the system described in GB-A-2106974 is that upon using a cut made by a simple elongated cut and without any type of particular ending, it is relatively easy for the material to tear, right in the areas of the ends of the cut, the same stretching out, which can give rise to a detachment of the coupling element from the tube-shaped profile or breakage of the profile itself, during assembly of the coupling elements on the tube-shaped element as well as once the joint is mounted upon the door or corresponding abutment surface. Deterioration of the leak-tightness that the joint must produce by the elevation of the lips resulting from the cut over the hook emerging outside may also be produced.

European patent application EP-A-0277098 showed another conventional system, but instead of the simple elongated cuts as the ones mentioned above, some elongated grooves or notches with a specific width, that is greater than the corresponding width of the hook part that must emerge through said notches, have been provided for. As an alternative, EP-A-0277098, also considers the possibility of using oval holes. The holes as well as the notches are established by means of eliminating the material of the wall of the tube-shaped profile, thus allowing the hook parts to emerge with a certain play.

The use of notches or holes made by means of eliminating material may imply certain advantages with regard to the solution based on simple cuts, since a better distribution of stress in the ends of the notches is obtained. This contributes to preventing the elastic material from tearing in said ends. In this way, the above cited disadvantages with regard to GB-A-2106974 are at least partially avoided.

However, the notches or holes proposed in EP-A-0277098 also imply certain disadvantages. First of all, elimination of material implies that the inside edges of the notches or holes remain out in the open, in such a way that they remain exposed to heat (of the oven) and/or to dirt deposits, which may give rise to a deterioration of the elastomeric material in the area of the edges. This process may cause detachment of the coupling element from the tube-shaped profile or premature breakage of the profile itself, or at least, deterioration of the leak-tightness that the joint must provide. Elimination of the material also implies that the joint provides worse insulation in the corresponding area, since the elastomeric strip that delimits the inside from the outside is reduced.

Secondly, the appearance of the profile is worse, since, by means of said notches or holes one can see the base of the coupling element, which can also give the purchaser the sensation that said coupling element is not adequately retained, but rather that it is liable to detach from the profile.

Besides, if glue is used to fix the coupling elements

in the cavity of the tube-shaped profile, there is a certain risk that said glue comes out through the notches or holes, deteriorating the contact surface between the profile and the surface to which the profile is coupled. Even in the event that the glue is prevented from coming out through the notches, it is possible that part of the glue remains visible from the outside, worsening the appearance of the profile.

Other documents related to this technological field and that reflect systems that imply disadvantages similar to or different from the ones that we have put forth above, are: Spanish utility model application ES-U-0288929, DE-A-3509928, DE-C-3413515, DE-C-3200652, US-A-2130017 and FR-A-2553170.

DESCRIPTION OF THE INVENTION

In order to overcome the problems and inconveniences mentioned in the previous section, the invention proposes a new elastomeric frame-shaped joint, especially for oven doors, that basically consists of a tube-shaped profile that will be fixed to a rectangular frame preferably on three of its sides, said frame corresponding to the mouth of a conventional oven. The fourth side of the rectangular frame normally remains free in order to allow jointed coupling of the respective door through which one will have access to the inside chamber of the oven. The frame of the oven could have any other shape.

Starting from this premise and for the purpose of achieving good insulation and tightness of the inside chamber of the oven when the door is closed, the joint of the invention that will also prevent any leakage of the heat or gases produced inside the oven has been provided for.

The joint basically consists of:

a tube-shaped profile with at least one longitudinal cavity, with at least one joint flange that extends along the tube-shaped profile and with at least two cuts.

The joint also includes a plurality of coupling elements for coupling by stretching in some holes established in the surface of the frame of the oven to which the tube-shaped profile is coupled. The coupling elements are comprised of a base or strip placed in the inside of the longitudinal cavity and by at least one elongated hook part that extends towards the outside through the corresponding cut.

These cuts give rise to a small overlap that will be advantageously glued to the cited base of the respective coupling element once the same has been installed in place. Besides, the rest of the surface of the base that contacts with the inside surface of said wall of the joint can also remain attached to the profile by means of glue.

The cited cuts in general comprise a center part

and two end parts where the cuts have a change of path of at least 90°. The change of path can also be of at least 135° or of at least 180°.

On the other hand, it should be pointed out that the surface of the joint that connects directly with the frame of the oven is capable of including one or several longitudinal ribs or lips in order to achieve greater insulation and tightness.

The joint includes at least one solid or tube-shaped flange which participates in the tightness of the door when it is closed.

The advantageous cuts of the joint to facilitate the fixing of the intermediate coupling means have different structures all of which have the center part and the two end parts. In some cases, the center part is straight and in other cases it is broken. It could also be defined by two inclined profiles. The end parts may be defined by straight or curved profiles.

There is also the possibility that once the attachment and installation of the coupling elements in the joint is completed, to seal the cuts by thermo-sealing or the like to prevent the accumulation of dirt in said cuts, which in the long run could wear out the joint.

The tube-shaped profile may have two ends placed in order to be connected. If they are connected, the profile defines a closed frame. The elastomeric material of the profile may be silicone or a material with similar characteristics.

Hereinafter to provide a better understanding of this specification and forming an integral part of the same, a series of figures in which the object of the invention has been represented in an illustrative and non-restrictive manner, is attached.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of the elastomeric material frame-shaped joint, especially for oven doors, object of the invention. It includes some elements for coupling to the mouth of the oven.

Figure 2a is a perspective view of one part of the joint of the invention. It mainly shows a cut through which a coupling element connected to the joint to facilitate fixing thereof to the mouth of an oven is introduced. The cut gives rise to an overlap that is collapsed upward.

Figure 2b is a view similar to the previous one where the overlap corresponding to the cut is placed in a coplanar way with the wall of the joint where said cut has been made.

Figure 3 is a perspective view of another joint that has a section different from the one shown in the previous figures. Aside from the cited coupling elements, there are others that are connected to the ends of the joint.

Figure 4 is a schematic view of an oven that includes the joint of the invention.

Figure 5 is a perspective view of a coupling element

that forms an integral part of the assembly of the joint of the invention.

Figures 6 to 17 are the representation of different cuts that are made in a wall of the tube-shaped joint of the invention in order to facilitate the attachment of the coupling elements to the joint itself.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Making reference to the numbering used in the figures, the elastomeric material frame-shaped joint, especially for oven doors comprises a tube-shaped profile (1, 1'), that in principle has a front surface (2), a rear surface (3), a longitudinal canal or cavity (4), as well as a flange that originates from the rear surface (3) and that may be tube-shaped (5), as represented in figures 1 and 2 or simply solid made from a fin (6) (see figure 3). In any case, the flanges (5) and (6) finish off in a longitudinal lip (7) or (8) that participates in the tightness of a door (9) of the oven (10) when the cited door is closed.

In a preferred embodiment, the joint will be essentially coupled to three of the four sides of a rectangular frame (11) corresponding to the mouth of the oven (10), leaving the fourth side free to facilitate jointed coupling of the door (9). For this purpose, the joint includes several coupling elements: some intermediate ones (12) and other end elements (13). The former comprise a strip or base (14) and a hook (15), both forming a single-piece body. The end elements (13) also comprise a strip or base (16) and a hook (17).

On the other hand, some advantageous cuts (18) through which the corresponding base (14) of the intermediate coupling element (12) will be introduced until it is located inside the longitudinal canal (4) of the joint, have been made in the front surface (2) of the tube-shaped profile (1), all of this being possible thanks to the elasticity of the material of said joint. Each one of the cited cuts (18) gives rise to an overlap (19) which when adjusting the intermediate elements (12) collapses slightly outward. Once each one of the cited intermediate coupling elements (12) has been introduced, the same may be definitively fixed by glue which will be poured on the corresponding base (14), the hook (15) of the intermediate coupling element (12) sticking out. In this way, the overlap (19) as well as the areas adjacent to the same will definitively connect to the joint. Hence, the assembly of the intermediate coupling element (12) will remain advantageously glued to the inside surface of a front wall (20), which has the different cuts (18).

Just as it is more clearly shown in figure 3, the end coupling elements (13) will be simply tightly introduced through the longitudinal canal (4), the strip (16) of the cited elements (13) also gluing to the inside surface of the front wall (20). The corresponding hook (17) will then remain arranged outside.

With the described arrangement, once the different coupling elements (12) and (13) have been correctly fixed to the elastic joint of the invention, assembly of the

same on the frame (11) corresponding with the mouth of the oven (10) will take place. For this purpose, the hooks (15) and (17) of the coupling elements will be introduced through some complementary holes (21) established in the cited frame (11) of the oven (10), it being necessary in this operation, to longitudinally stretch the joint, which will definitively remain stretched and correctly assembled, the front surface (2), as well as some small longitudinal lips or ribs (22) and (23) that emerge from the sides of said front surface (2) of the joint, being in contact with said frame (11). It is obvious that said lips (22) and (23) could be omitted, whereby the front surface would only be in direct contact with the frame of the oven (10).

Although the joint is normally installed on three of the four sides of the frame, it could also be installed on four sides, whereby, said joint would become a closed ring, whose ends would be connected by thermo-sealing or another type of welding, then omitting the end coupling elements (13).

It is also important to point out that the joint may have any closed or open contour.

Different forms of the cuts (18) made in the front surface (2) of the joint that give rise to both overlaps are shown in figures 6 to 17.

Said cuts comprise an elongated center part (24) connected to two end parts (25) where the cuts have a change of path of at least 90°.

The end parts of some cuts have an arched and semicircular shape and also a shape determined by different straight sections.

Finally, the elongated center part is in some cases straight and in other cases it has different breaks.

For example, in the cuts represented in figures 9, 10 and 11 the center part has a marked break (26) that is introduced towards the inside of the corresponding overlap. In figures 8, 12 and 13 the center part of the cuts has an arched break (27) that is also introduced towards the inside of the overlap limited by the respective cut. In the last four figures, some cuts where the center part thereof comprises two inclined sections (28) that are connected by means of a center curvi-concave (29) or curvi-convex (30) section, have been represented.

The coupling elements (12) are installed in correspondence with the angular corners of the frame (11) of the oven (10), said elements (12) forming corner sections (31) in the joint.

The most preferred cuts are shown in figures 8, 11 and 12. These embodiments are the preferred ones for the following reasons:

- the rounded shape of the ends of the corners prevent or avoid, even more, tearing in the stretching of the joint.
- better insertion of the intermediate coupling element (12) is provided.
- the hook (15) of the intermediate coupling element

(12) remains opposite the breaks (26) or (27) of the center part of said cuts, said breaks (26) and (27) serving as a mark for the workman for the correct centering of the corresponding intermediate coupling element (12), avoiding the elevation over the emerging hook (15), improving leak-tightness upon maintaining the horizontal plane of the front surface (2) of the joint.

Claims

1. Elastomeric material frame-shaped joint, especially for oven doors that comprises:

- a tube-shaped profile (1, 1') with a front surface (2), with a rear surface (3), with at least one longitudinal cavity (4), with at least one joint flange (5 or 6) that extends along said rear surface (3) and with at least two cuts (18) in the front surface (2), said tube-shaped profile being comprised of a continuous body with two ends;
 - a plurality of coupling elements (12) to couple by stretching in holes (21) established in a surface to which the tube-shaped profile is coupled, said coupling elements (12) being comprised of a base (14) placed in the inside of the longitudinal cavity and by at least one elongated hook part (15) that extends towards the outside through the corresponding cut (18);
- characterized in that:

said cuts have a elongated center part (24) that ends in the respective end parts (25) where the cuts have a change of path of at least 90°, said cuts forming respective overlaps (19).

2. Joint, according to the above claim, characterized in that the change of path is of at least 135°.

3. Joint, according to claim 1, characterized in that the change of path is of at least 180°.

4. Joint, according to claim 1, characterized in that the elongated center part (24) of the cuts extends in a substantially longitudinal direction.

5. Joint, according to claim 1, characterized in that the elongated center part (24) of the cuts has a break (26 or 27) towards the inside of the overlap (19).

6. Joint, according to claim 1, characterized in that the elongated center part (24) of the cuts is defined by two inclined profiles (28) that converge in a short center curvi-convex profile (30).

7. Joint, according to claim 1, characterized in that the

elongated center part (24) of the cuts is defined by two inclined profiles (28) that are connected to a center curvi-concave profile (29) that is introduced towards the inside of the overlap.

8. Joint, according to claim 1, characterized in that the end parts of the cuts have an arched shape.

9. Joint, according to claim 1, characterized in that the end parts of the cuts are defined by a straight profile.

10. Joint, according to claim 1, characterized in that the end parts of the cuts are defined by several straight profiles.

11. Joint, according to claim 1, characterized in that the elastomeric material of the joint is silicone.

12. Joint, according to claim 1, characterized in that the tube-shaped profile (1) has two ends prepared to be connected.

13. Joint, according to claim 1, characterized in that the tube-shaped profile has its ends connected.

14. Joint, according to claim 1, characterized in that there is a coupling element (13) placed in each end of the tube-shaped profile.

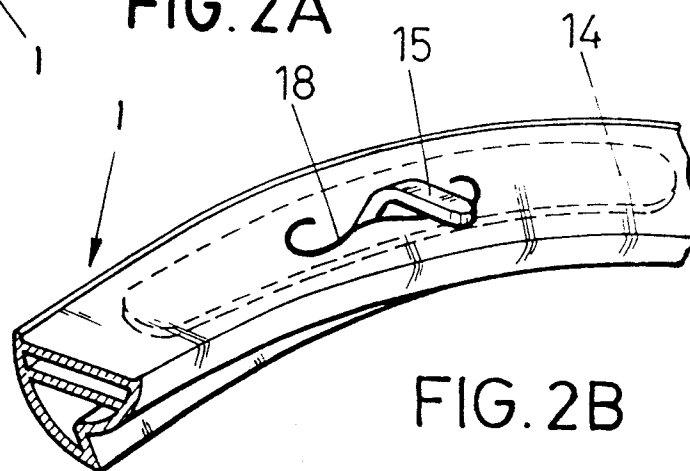
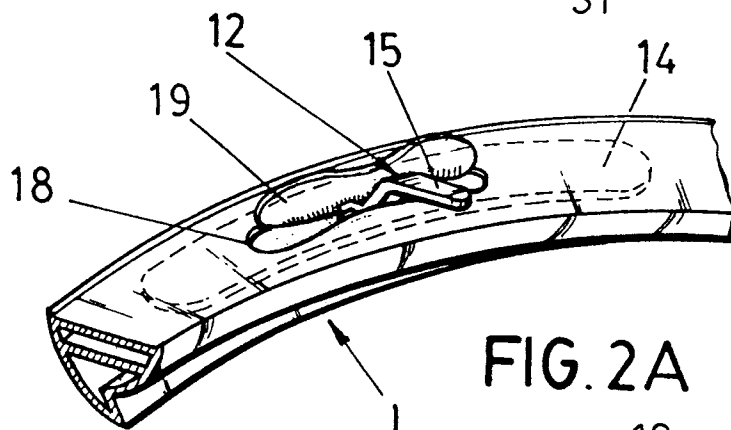
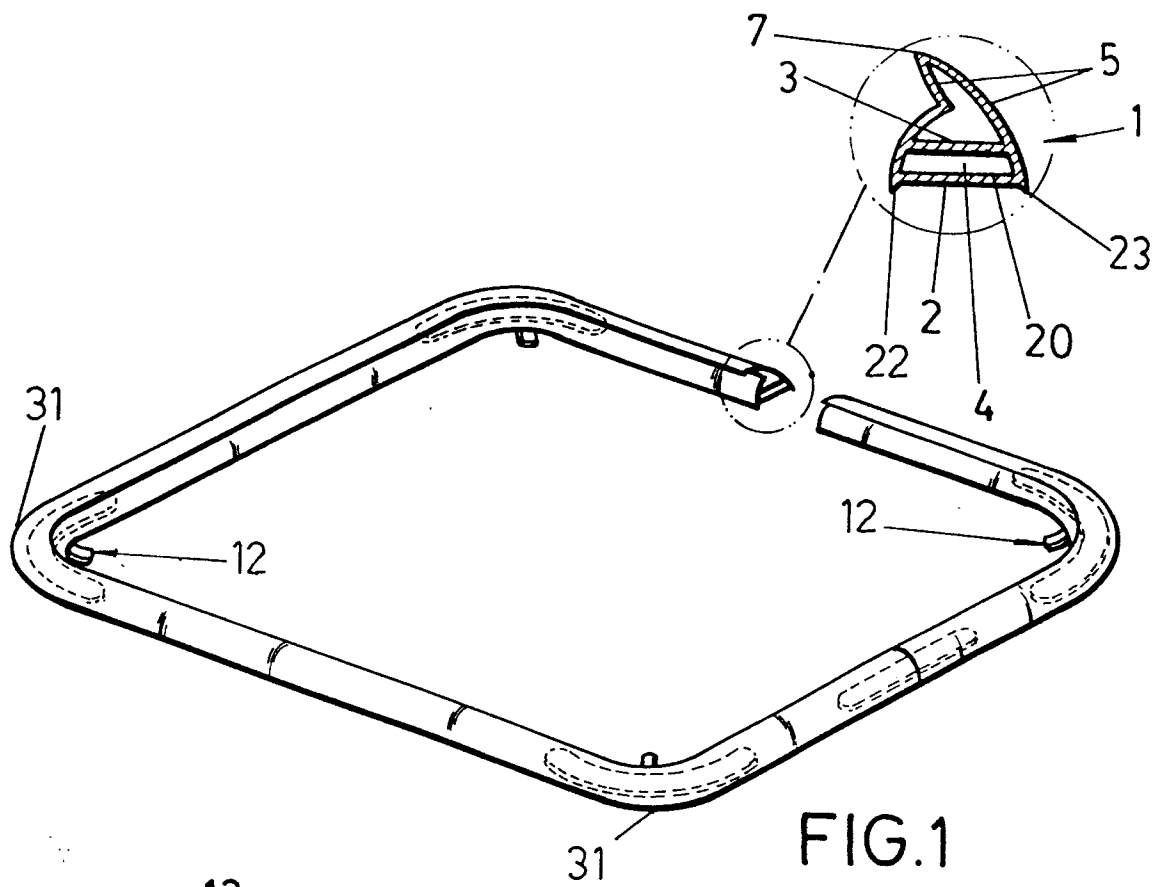
15. Joint, according to claim 1, characterized in that the tube-shaped profile (1) includes at least two corner profiles (31) and a coupling element (12) placed in each one of said corner profiles (31).

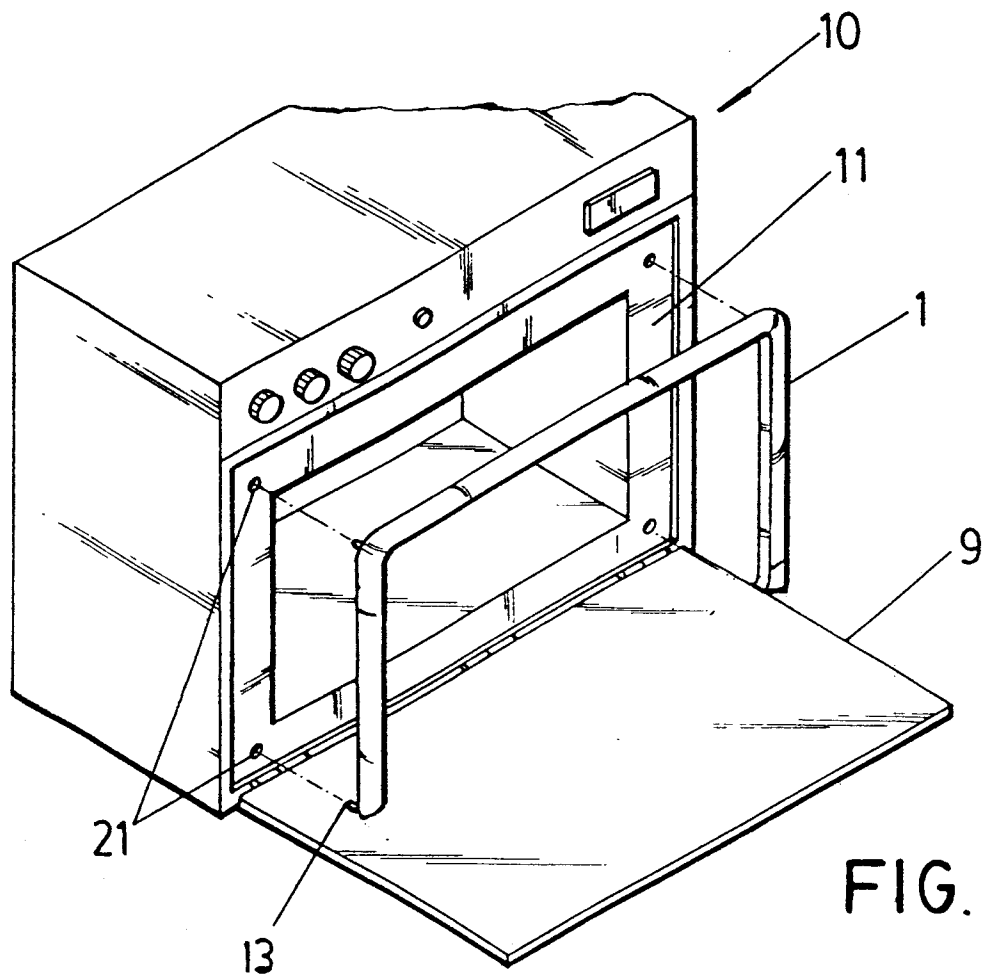
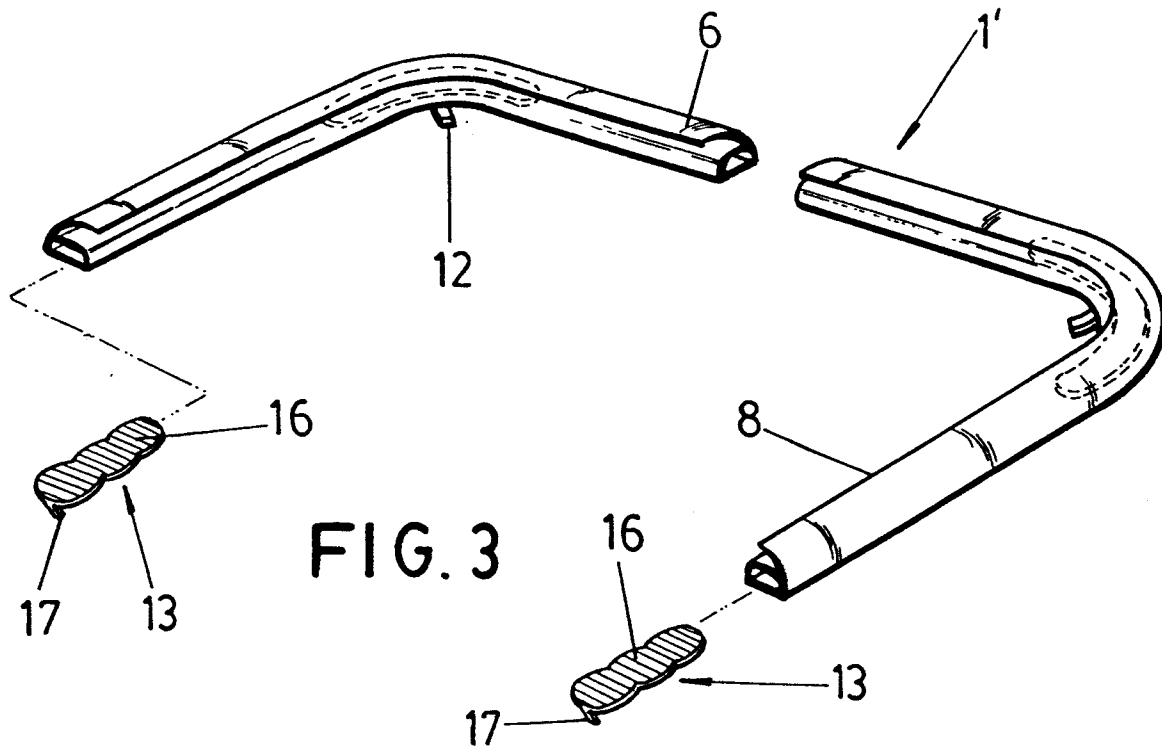
16. Joint, according to claim 1, characterized in that the joint flange is comprised of a simple compact flange (6) that extends in angle with the rear surface (3), from one of the edges of said rear surface.

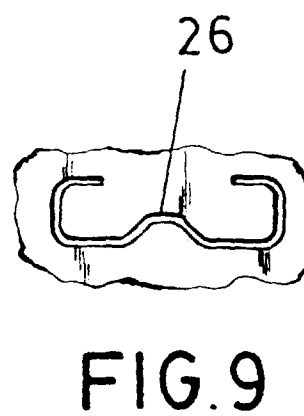
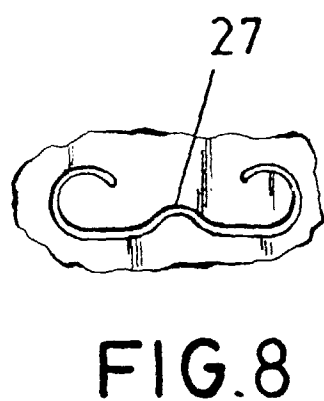
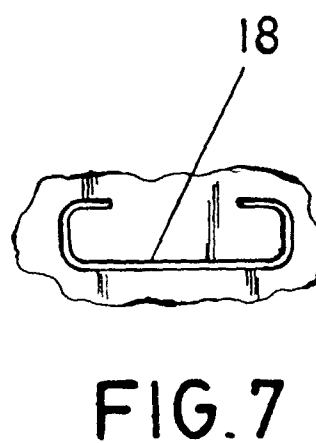
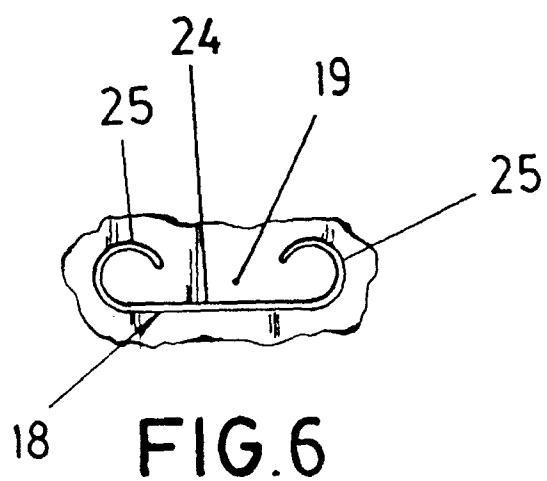
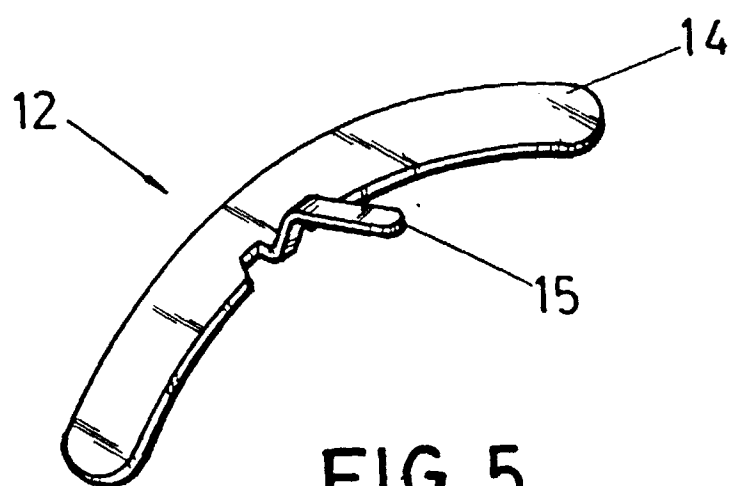
17. Joint, according to claim 1, characterized in that the joint flange is comprised of a hollow flange that comprises two side walls (5) connected at their ends, one of said walls emerging from one edge of the rear surface of the tube-shaped profile and the other wall from the other hollow edge of said rear surface.

18. Joint, according to claim 1, characterized in that the tube-shaped profile includes, on its front surface, at least one rib (22 or 23) that extends longitudinally along said tube-shaped profile.

19. Joint, according to claim 1, characterized in that the tube-shaped profile includes, on its front surface two ribs (22 and 23) that extend along said tube-shaped profile (1).







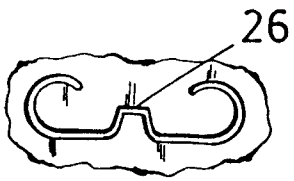


FIG. 10

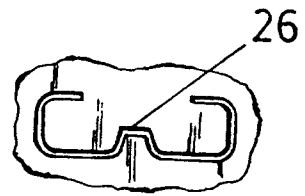


FIG. 11

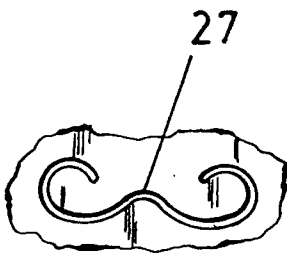


FIG. 12

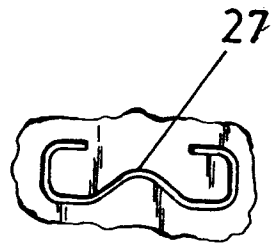


FIG. 13

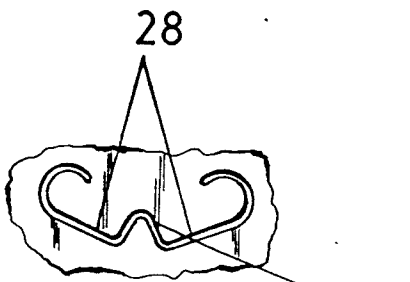


FIG. 14

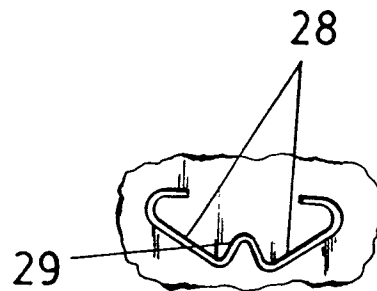


FIG. 15

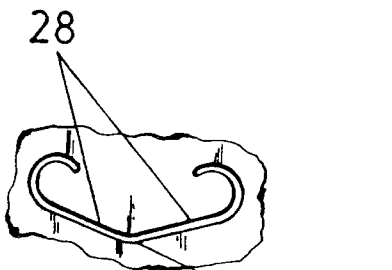


FIG. 16

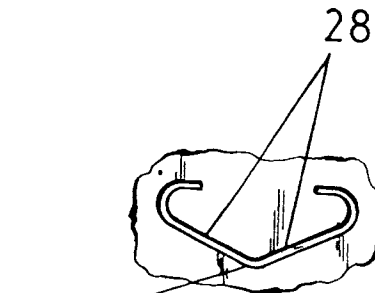


FIG. 17



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 97 20 3559

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.6)
D,A	EP 0 277 098 A (GIAT SRL) 3 August 1988 ---	1	F24C15/02
D,A	GB 2 106 974 A (SILICONE ALTIMEX LIMITED) 20 April 1983 ---	1	
A	GB 2 113 827 A (SILICONE FABRICATIONS LIMITED) 10 August 1983 -----	1	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.6) F24C F25D A47L A21B
Place of search THE HAGUE		Date of completion of the search 25 May 1998	Examiner Vanheusden, J
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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