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(54) **ELASTOMERIC SEALING GASKET, PARTICULARLY FOR DOORS OF COOKING DOMESTIC OVENS OR HOUSEHOLD APPLIANCES IN GENERAL**

DICHTUNG AUS ELASTOMER, INSBESONDERE FÜR TÜREN VON BACKOFEN ODER ANDEREN HAUSHALTSGERÄTEN

JOINT D'ETANCHEITE ELASTOMERE, CONCU NOTAMMENT POUR DES PORTES DE FOURS DOMESTIQUES OU POUR DES APPAREILS MENAGERS EN GENERAL

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EP 1 147 342 B1

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Description

[0001] The present invention is directed to an elastomeric sealing gasket, in particular for doors of cooking domestic ovens and household appliances in general, of the type in which the rabbet frame for the door abutment has projecting members for anchoring the gasket, spaced apart from each other.

[0002] Elastomeric gaskets are known, adapted to provide a seal all around the shutting door e.g. of cooking ovens, which have metallic inserts with hooks protruding through slits (GB patent 2 106 974) or slots formed by removal of material (European patent No. 0 277 098 of the same applicant). The protruding, substantially hook-shaped portion of said metallic inserts is brought into corresponding holes formed in the abutment surface of the door, in particular of domestic gas ovens. Only with the second of the two above-mentioned patents the danger is prevented of rips or tearings being formed in the gasket, due to the contact between metal and elastomeric material, while also the application of adhesive in correspondence with each insert can be avoided or is substantially reduced. However, for certain applications, it is not practicable to form holes along the perimeter of the door backing surface, in particular when it is a matter of electric household appliances operating in presence of water such as the washing machines in general and, in particular, the dish-washing machines.

[0003] It is known from the European patent 0 096 745 to have the gasket seat all around an opening against which the door should be shut tight, being upraised in a number of zones to form projecting tongues, necessarily at least in the corner zones, such as to provide the anchoring members of a frame-closed gasket in elastomeric material, showing along its whole length a continuous transverse slit for housing said tongues. A first drawback of such a solution is the indefinite positioning of the frame with respect to the anchoring points and its resulting non-uniform stretch, and in addition the practical difficulties of coupling the gasket in the corner zones, due to the restricted room available for carrying out the required radial movement of the gasket to bring the anchoring tongues to be inserted in the corresponding slits.

[0004] It is also known that in some electric household appliances, such as dish-washing machines, the elastomeric gasket has a large size in the thickness direction, and consequently in the direction of the door closure and is inserted by pressing the same by hand in a narrow housing groove that extends along three sides around the door of the machine. This involves a heavy employment of labour, special care being required in the above-mentioned positioning of the gasket, with high costs of the latter due to its size and consequent weight.

[0005] From US-A-4417420 a frame-type sealing gasket is known having the features of the preamble of claim 1, without disclosing an elongated shape of the

opening, and teaching that the insert member to be plugged therein comprises, at the two opposite sides of a central joining flange, spaced apart flat elements having identical size and shape.

[0006] It is an object of the present invention to provide a gasket of the above-mentioned type with an asymmetrical shape of the insert member, with the internal element extending for a substantially greater length than the external element of the insert, thus forming a useful guide during insertion, particularly in the corner zones where the gasket has to assume a bent shape.

[0007] These and other objects which will be better clarified later on are achieved with a gasket having the features of claim 1.

[0008] Additional objects, advantages and characteristics of the present invention will be clearer from the following detailed description of a preferred embodiment thereof, given as a non-limiting example with reference to the annexed drawings in which:

FIGURE 1 shows a plan view of a gasket portion according to the present invention, taken from the back side facing the anchoring or door abutment surface;

FIGURE 1a shows a cross-section view of Fig. 1 along the transverse line A-A;

FIGURE 1b shows, in the same view of Fig. 1, the gasket without the insert 2 inside the slot 3;

FIGURES 2, 2a and 2b show insert 2 of Figs. 1 and 1a respectively in the same view of Fig. 1, in a front end view taken in the direction of arrow H and in a side view at right angle to the preceding view of Fig. 2a;

FIGURE 3 shows, in the same view of Fig. 2, a modified embodiment of the insert itself;

FIGURE 3a shows an embodiment of bent insert suitable for angular portions of gasket;

FIGURES 4 and 4a respectively show a first example of gasket according to the present invention with four bent inserts of the type represented in Fig. 3a and the corresponding position of the anchoring wings protruding from the abutment frame or counterdoor;

FIGURES 5 and 5a respectively show a three-side gasket according to the invention using only straight inserts of the type of Figs. 2 and 3, and the corresponding position of the anchoring tongues on the associate surface of door abutment; and

FIGURES 6 and 6a respectively show a three-side gasket according to the present invention that employs two straight inserts and two bent ones, these latter in the corner zones, and the corresponding abutment or door backing surface with the associate anchoring wings and tongues.

[0009] With reference to Figs. 1-1b, the gasket according to the present invention is formed of a usual tu-

bular elongated member 1, of elastomeric and preferably silicone-based material, with longitudinal inner hollow 10 and continuous peripheral wing 11 frontally protruding. This tubular element 1 shows, properly spaced apart from each other, elongated slots 3, formed by removal of material on the inner or rear wall 1a, opposed to the wing 11.

[0010] At the inside of each slot 3 there is plugged in a rigid insert 2 of shape similar to a fairlead and preferably formed of two substantially flat and parallel elements 21 and 22, spaced apart from each other and coupled at the central portion of the insert by a joining flange 20 forming at its periphery a groove or U-shaped gutter 4 between the two elements. These have a rounded shape at their ends and, according to the present invention, the lower or internal one, housed in the hollow 10 and bearing the reference number 22, extends mainly in the longitudinal direction with respect to the outer one 21, as is better seen in Fig. 2b. Furthermore sloped or beveled surfaces can be provided to make easier the plugging into the slot 3.

[0011] Insert member 2, of rigid material, such as metal or plastic material, is so sized and shaped to cause the edge of slot 3 to match with the groove 4 without slack. The elasticity of the material enables the insert member to pass through the slot by means of a temporary stretching of its contour until assuming the position indicated in Fig. 1a, wherein the rear wall 1a of the gasket is held in the groove 4 between the two elements 21 and 22 which are just spaced apart substantially by the thickness size of said surface.

[0012] The central flange 20 is pierced and the through hole 5, passing through both elements 21 and 22, is such to allow the insertion of an anchoring tongue protruding from the abutment surface, as it will be better explained in the following. This through hole 5 may have a shape reproducing, in a reduced scale, the slot 3 shape, as represented in Figs. 1-2, or a different one such as the "bayonet" shape of hole 5' as shown in Fig. 2. The insert member 2 can also have, instead of the straight shape represented in Figs. 1-3, the bent shape of Fig. 3a, particularly suitable when the members 2 are to be positioned in the corner zones of the gasket, as shown in Fig. 4. In this case the internal element 22 will extend along a substantially longer length with respect to the external element 21, with a length difference greater than that shown, preferably but not necessarily, by the straight insert of Figs. 2 and 3. Therefore element 22 forms a guide useful to make the gasket to assume the bent shape requested in the corner zones. With this angular bent insert the door backing frame 7, or abutment surface against which the door has to be shut tight by means of gasket 1, shows four wings 6 projecting to the outside to the corner zones of the frame itself, as shown in Fig. 4a. These wings are easily inserted, with a rapid radial movement towards the hollow space closed through the door and with slight stretch, into the through holes 5 of inserts 2 in their bent version of Fig.

3a, already plugged in the tubular element 1 to form a gasket. This gasket could be possibly closed by means of a blind insert (of known type) for butt-joining the two tips, formed for example merely by a strap slipped into both ends of the inner hollow 10 of the facing tips of the gasket.

[0013] With reference to Figs. 5 and 5a there is shown another possible example of anchoring the gasket, of the three-side type in this case, showing six straight insert members 2 to be coupled with six corresponding straight tongues 8 represented in Fig. 5a. In alternative, when it is wished to use a reduced number of inserts, the arrangement of Figs. 6 and 6a could be adopted wherein, for a three-side gasket, two straight inserts and two bent ones are sufficient, these latter in the two corner zones. The advantage of the solution of Fig. 5 is that of having only one type of inserts to be available, all of the straight type, which can be easily obtained for example by metal stamping or molding of plastic material, possibly thermoplastics. Of course all straight inserts could be used also in case of four-side gasket, thus replacing each bent insert with two straight ones placed on the two sides adjoining at the same corner, in the proximity thereof.

Claims

1. A frame-type sealing gasket, having three or four sides, in particular for doors of domestic cooking ovens or household appliances in general, comprising a tubular elongated element (1) of elastic material with longitudinal inner hollow (10) and frontally projecting continuous peripheral wing (11), the rear wall (1a) of which, opposed to said wing (11) being formed with elongated slots (3) spaced apart from each other and obtained by removal of material, each slot (3) having therein a rigid insert member (2) with central through hole (5, 5'), wherein said insert member (2) is comprised of two elements (21, 22) substantially flat and parallel, spaced apart from each other and coupled in the central zone by means of a joining flange (20) crossed by said through hole (5, 5') and having its periphery shaped as a U groove (4) for housing without clearance the inner edge of said slot (3), **characterized in that** said substantially flat and parallel elements (21, 22), forming the insert member (2) have different lengths, the lower one (22), housed in the inner hollow (10), being the more extended one.
2. A gasket according to claim 1, wherein the distance between said two elements (21, 22) corresponds substantially to the thickness of the rear wall (1a), opposite to the wing (11) of the elongated element (1).
3. A gasket according to claim 1 or 2, wherein said

slots (3) and said inserts (2) have rounded ends.

4. A gasket according to claim 3, wherein the central through hole (5) of the insert member (2) reproduces, in a reduced scale, the shape of said slot (3). 5
5. A gasket according to claim 3, wherein the through hole (5') in said insert (2) has a shape non homologous thereto, of the bayonet-type. 10
6. A gasket according to anyone of claims 1-5, wherein said inserts (20) are straight-lined for being coupled with corresponding tongues (8) protruding from the sides of a door abutment surface frame (7) against which the gasket is designed to provide tightness. 15
7. A gasket according to anyone of claims 1-6, wherein, in correspondence of both comers, if of the three-side type, or of at least two comers, if of the four-side type, said insert members (2) are bent for coupling with corresponding wings (6) radially projecting to the outside from the comer zones of a surface of door abutment (7). 20

Patentansprüche

1. Rahmenartige Verschlussdichtung mit drei oder vier Seiten, insbesondere für Türen von Backöfen oder Haushaltsgeräten im allgemeinen, umfassend ein rohrförmiges längliches Element (1) aus elastischem Material mit einer länglichen inneren Aushöhlung (10) und einem sich frontal erstreckenden, kontinuierlichen Umfangsflügel (11), wobei die Rückwand (1a) desselben gegenüber dem Flügel (11) mit Längsschlitz (3) gebildet ist, die voneinander beabstandet sind und durch Entfernung von Material erhalten werden, wobei jeder Schlitz (3) in sich ein starres Einselement (2) mit einem zentralen Durchgangsloch (5,5') besitzt, wobei das Einselement (2) im wesentlichen flache und parallele Elemente (21, 22) umfasst, die voneinander beabstandet sind und in der zentralen Zone mittels eines Verbindungsflansches (20) gekoppelt sind, der durch das Durchgangsloch (5,5') gekreuzt wird und mit seinem Umfang als eine U-Nut (4) zur Aufnahme der Innenkante des Schlitzes (3) ohne Spiel geformt ist, **dadurch gekennzeichnet, dass** die im wesentlichen flachen und parallelen, das Einselement (2) formenden Elemente (21, 22) unterschiedliche Längen besitzen, wobei das untere in der inneren Aushöhlung (10) aufgenommene Element (22) das sich weiter erstreckende Element ist. 30 35 40 45 50
2. Dichtung nach Anspruch 1, wobei der Abstand zwischen den zwei Elementen (21, 22) im wesentlichen der Dicke der Rückwand (1a) entspricht, die dem 55

Flügel (11) des länglichen Elementes (1) gegenüber liegt.

3. Dichtung nach Anspruch 1 oder 2, wobei die Schlitz (3) und die Einselemente (2) abgerundete Enden besitzen.
4. Dichtung nach Anspruch 3, wobei das zentrale Durchgangsloch (5) des Einselementes (2) in einem reduzierten Maßstab die Form des Schlitzes (3) wiedergibt.
5. Dichtung nach Anspruch 3, wobei das Durchgangsloch (5') in dem Einselement (2) eine hierzu nicht homologe Form vom Bajonetttyp umfasst.
6. Dichtung nach irgendeinem der Ansprüche 1 bis 5, wobei die Einselemente (2) geradlinig sind, um mit entsprechenden Zungen (8) gekoppelt zu werden, die von der Seiten eines Türanschlag-Oberflächenrahmens (7) hervorstehen, gegen den die Dichtung zur Dichtungsvorgabe dienen soll.
7. Dichtung nach irgendeinem der Ansprüche 1 bis 6, wobei entsprechend beiden Ecken beim Typ mit drei Seiten oder entsprechend wenigstens zwei Ecken beim Typ mit vier Seiten diese Einselemente (2) abgebogen sind zur Kopplung mit entsprechenden Flügeln (6), die radial zu der Außenseite von den Eckzonen einer Oberfläche des Türanschlages (7) hervorstehen.

Revendications

1. Joint d'étanchéité en forme de cadre, ayant trois ou quatre côtés, en particulier pour porte de four de cuisson domestique ou d'appareil électroménager en général, comprenant un élément allongé tubulaire (1) en matériau élastique avec un creux interne longitudinal (10) et une aile périphérique continue se projetant vers l'avant (11), la paroi arrière (1a) dudit élément allongé tubulaire (1), opposée à ladite aile (11), étant formé avec des fentes allongées (3) espacées les unes des autres et obtenues par retrait de matière, chaque fente (3) incorporant un élément d'insert rigide (2) avec un trou traversant central (5, 5'), dans lequel ledit élément d'insert (2) est constitué de deux éléments (21, 22) sensiblement plats et parallèles, espacés l'un de l'autre et couplés dans la zone centrale au moyen d'une bride de jonction (20) traversée par ledit trou traversant (5, 5') ayant sa périphérie réalisée sous la forme d'une rainure en U (4) pour loger sans jeu le bord interne de ladite fente (3), **caractérisé en ce que** lesdits éléments parallèles et sensiblement plats (21, 22) formant l'élément d'insert (2) ont des longueurs différentes, l'élément inférieur (22), logé dans le creux

interne (10), étant le plus long.

2. Joint selon la revendication 1, dans lequel la distance entre lesdits deux éléments (21, 22) correspond sensiblement à l'épaisseur de la paroi arrière (1a), opposée à l'aile (11) de l'élément allongé (1). 5
3. Joint selon la revendication 1 ou 2, dans lequel lesdites fentes (3) et lesdits inserts (2) ont des extrémités arrondies. 10
4. Joint selon la revendication 3, dans lequel le trou traversant central (5) de l'élément d'insert (2) reproduit à échelle réduite la forme de ladite fente (3). 15
5. Joint selon la revendication 3, dans lequel le trou central (5') dans ledit insert (2) a une forme non homologue à celui-ci, du type baïonnette.
6. Joint selon l'une quelconque des revendications 1 à 5, dans lequel lesdits inserts (20) sont rectilignes pour être couplés avec des langues correspondantes (8) saillantes à partir des côtés d'un cadre de surface de butée de porte (7) contre lequel le joint est destiné à fournir une étanchéité. 20 25
7. Joint selon l'une quelconque des revendications 1 à 6 dans lequel, en correspondance de deux coins, si le joint est du type à trois côtés, ou en correspondance d'au moins deux coins, si le joint est du type à quatre côtés, lesdits éléments d'insert (2) sont pliés pour se coupler avec des ailes correspondantes (6) se projetant radialement vers l'extérieur à partir des zones de coin d'une surface de butée de porte (7). 30 35

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Fig. 1

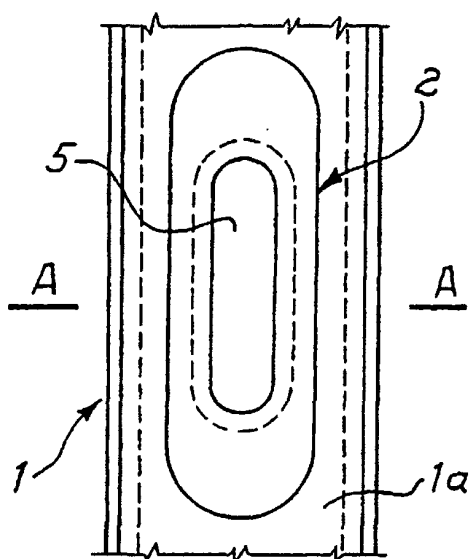


Fig. 1a

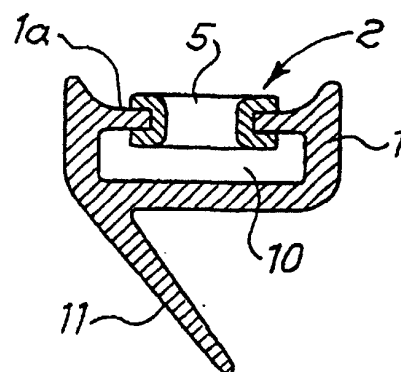


Fig. 1b

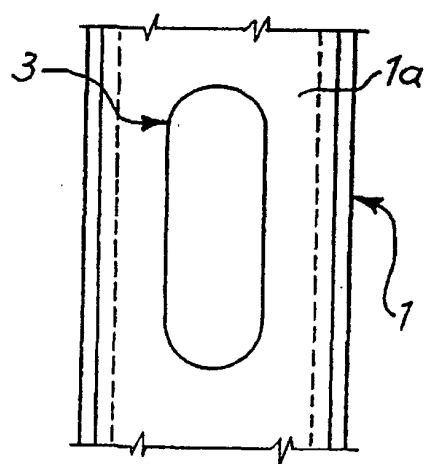


Fig. 2

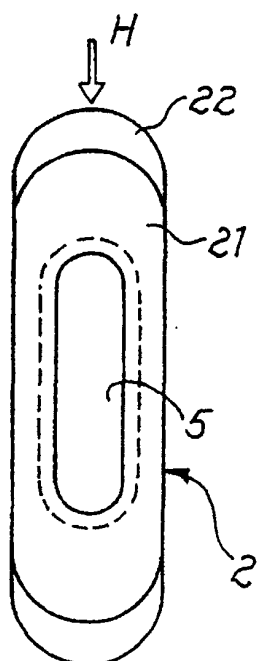


Fig. 2b

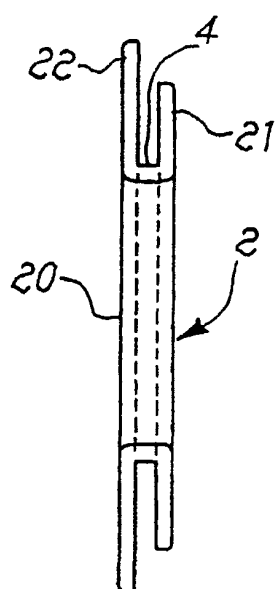


Fig. 2a

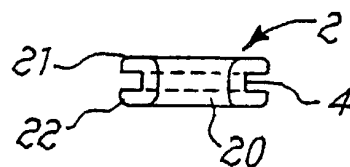


Fig. 3

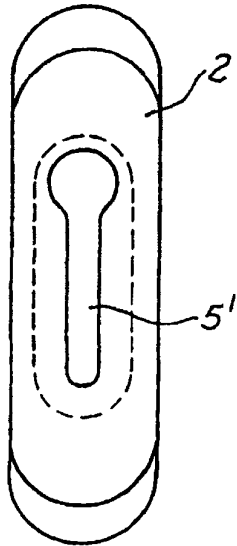


Fig. 4

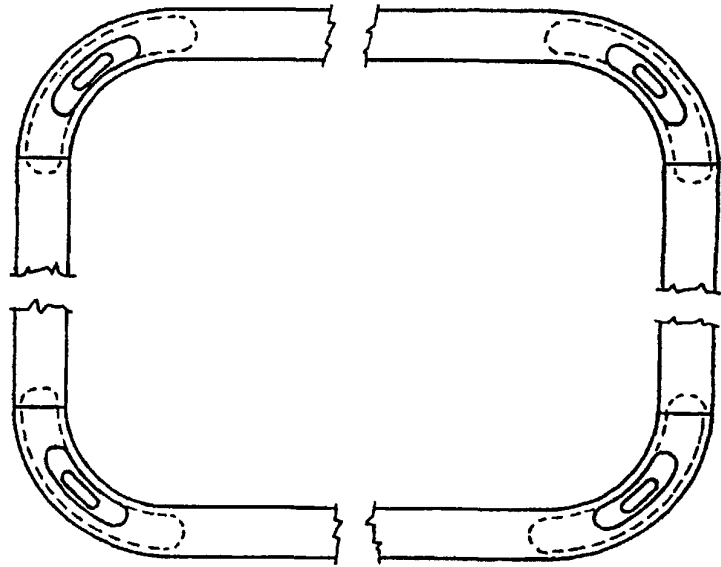


Fig. 3a

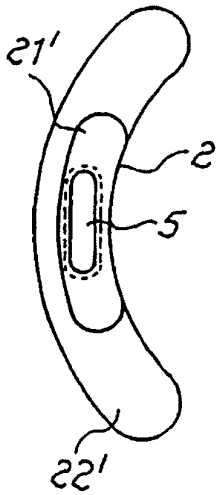


Fig. 4a

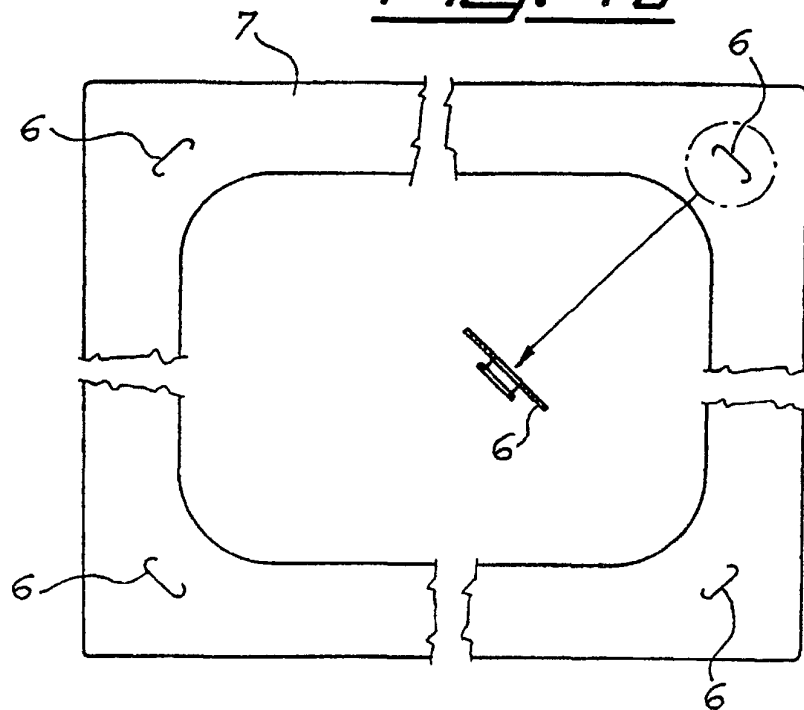


Fig. 6

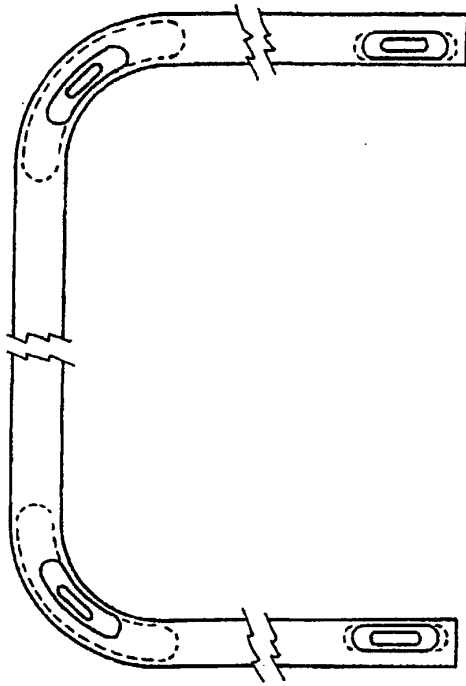


Fig. 5

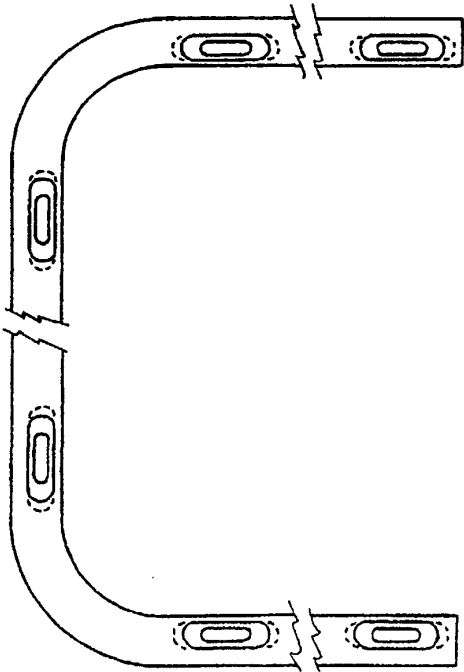


Fig. 6a

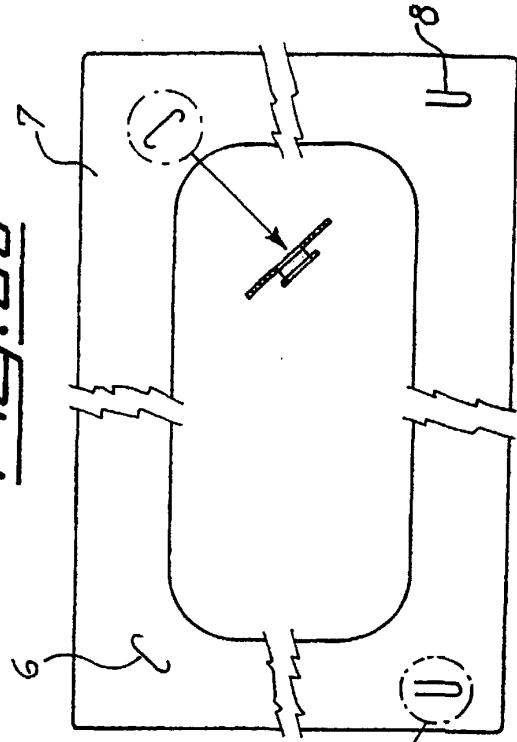


Fig. 5a

