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(54) **Sealing joint for a refrigerator door**

Abdichtungsvorrichtung für Kühlschranktür

Joint d'étanchéité pour porte de réfrigérateur

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Description

OBJECT OF THE INVENTION

[0001] The present invention refers to a joint for a refrigerator door such as refrigerating apparatus and the like, for the purpose of achieving airtightness in the closing of said door on the corresponding front of the refrigerator itself. The joint has some particular characteristics of structure and shape in order to achieve optimum performance qualities in the operation for which it has been provided.

[0002] The object of the invention is to provide a sealing joint in order to easily replace the original joint that the door of the refrigerator includes, and that due to any circumstance has become worn or that is unserviceable, in such a way that the joint of the invention may replace the worn or unserviceable one with the required maximum guarantee and effectiveness.

[0003] Another object of the invention is to provide a new joint that is prevented from overturning by the force that has to be made when the door of the refrigerator is closed and opened, as well as to achieve greater resistance for the separation of the joint in its connection to the door.

BACKGROUND OF THE INVENTION

[0004] There are various types of joints that doors for refrigerators include, in order to achieve the airtightness in the closing of refrigerators, in such a way that in all cases the joint includes an outside part with a perimetric housing in which some magnetic strips are arranged, strips which keep the door closed by traction between them and some metallic pieces provided for this purpose in the front of the refrigerator, in such a way that the part supporting the magnetic strips, called the head, is complemented with another part functioning as the base and through which the fastening of the joint to the door is carried out.

[0005] Now then, the fastening is done in any case by the material itself that constitutes the foam as the inside insulating component of the door, said base of the joint having for this purpose a housing wherein the foam enters in order to retain the joint so that it will not be able to separate from the door.

[0006] In this case, the inconvenience that the joint has is that when it is worn, it is not possible to replace it by another spare joint, but rather it is necessary to replace the entire door.

[0007] On other occasions, the base of the joint has a special shape in which the spare joint can be coupled after replacing the rest of the joint, in other words, the part supporting the magnetic strips.

[0008] On the other hand, European patent 0713067 A2 describes an airtight joint for refrigerator doors, whose fastening to the door is done by means of gluing of the base of the joint after removal of the original joint,

although the type of joint described in this patent has problems of effectiveness and use. Consequently, it has not been marketed.

[0009] The fact should also be pointed out that in joints of refrigerator doors, the basic problem resides in the edge that is located on the hinging side of the door, since on the free side the force that is produced is practically perpendicular to the front surface, while on the side or edge corresponding to the hinging, the force is oblique which results in a side force that makes the joint tend to overturn, giving rise to the joint being pinched in the closure of the door, which causes poor closing and consequently poor insulation.

[0010] U.S.-American patent 5,309,680 which discloses a sealing joint according to the preamble of claim 1 discloses a magnetic seal for releasably sealing two a magnetic seal for releasably sealing two doors arranged side by side on a thermally insulated cabinet, such as a refrigerator or a freezer. A retainer gasket is affixed to the inner edge of each door. One of the retainer gaskets encloses a magnet and retains the magnet fixed in place relative to the door. Another retainer gasket is affixed to the other door and is formed of a base, a sleeve enclosing a second magnet, and two flexible webs connecting the sleeve to the base.

DESCRIPTION OF THE INVENTION

[0011] The object of the invention is a sealing joint according to claim 1.

[0012] The sealing joint object of the invention has as a first novel characteristic the fact that the base of the joint in question is materialized by a rear fastening plate with a fastening surface shaped in a smooth and preferably flat manner in the most part, in such a way that the base or fastening base is connected to the corresponding head supporting the magnetic strips, by means of some connecting walls displaced backward from the side edges of the fastening plate itself, on the side of the head of the joint.

[0013] The fastening plate is provided, on the side of the head, with a reinforcing wall with a shape similar to that of a vault, with respect to its cross section, and whose reinforcing wall is connected to the fastening plate in a manner displaced backward from the side edges of the plate, through whose reinforcing wall the connecting walls are connected to the fastening plate.

[0014] The cited connecting walls have approximately the same length and are connected to the reinforcing wall in the near area corresponding to the connection of said reinforcing wall with the fastening plate.

[0015] One of the cited connecting walls, specifically the one directed towards the free end of the inside covering, has a section whose thickness is reinforced.

[0016] The reinforcing wall rests against the fastening plate with a reinforcing wall located inside the inside space delimited by said reinforcing wall and the fastening plate itself.

[0017] On its part, the fastening plate may be equipped in its section directed towards the free edge of the inside covering with a covering strip.

[0018] The fastening of the described joint to the corresponding refrigerator door will be done by any conventional system, such as adhesive, glue, and even a double surface band.

[0019] In virtue of the design and shape of the described joint, this joint complies with two basic functions in a totally effective manner, one of these functions consisting of the joint not overturning due to the force produced in the closing and opening of the door, and a second function consisting of the joint in question not gripping laterally to the glued area, but rather it causes a distribution of the pulling force through the vault shape and the inside reinforcing wall, giving rise to the forces being distributed on the part of the surface of the base or fastening plate, thus pulling by the area of the ends of the arch of the glued area, thus achieving that the glued connection offers greater resistance against separation.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] In order to complete the description that is going to be made hereinafter and in order to provide a better understanding of the characteristics of the invention, the present specification is accompanied by a single sheet of drawings in which a sectional view of the assembly corresponding to the sealing joint object of the invention has been represented.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0021] As it can be seen in the cited figure, the sealing joint applicable to refrigerator doors, comprises two well differentiated parts, although they define a monobloc body. One of the parts, generally referred to as number (1) and corresponding to the outside part of the joint, constitutes a head with a housing (2) for magnetic strips, while the other part, considered as internal and referred to as number (3), carries out the function of a base, by means of which the corresponding refrigerator door (5) will be fastened, the airtight closing being carried out by the pressed support of the part or head (1) of the joint on the front of the body of the refrigerator in question.

[0022] The constituent part of the base is materialized by a fastening plate (6), with its bottom surface smooth, which may or may not be flat and provided with a layer of adhesive, by means of which precisely the fastening on the respective surface of the door (5) is carried out, thus permitting replacement of the original joint by the cited sealing joint, with total ease, since it suffices to remove the original joint and put the cited sealing joint in its place, fastening it in the described manner.

[0023] As of these characteristics, the fact is noteworthy that the connection between the fastening plate (6) corresponding to the base (3) and the head (1) of the

joint, is done by means of a pair of connecting walls (4) and (4'), which are projected in a diverging manner from a vault-shaped reinforcing wall (8), connected by its ends to the fastening plate (6), close to the edges of this fastening plate. In other words, walls (4) and (4') that constitute the connecting means between the fastening plate (6) and the head (1) of the joint, emerge from the reinforcing wall (8) close to the connection of reinforcing wall with said fastening plate (6).

[0024] On the other hand, it has been provided for that between the fastening plate (6) and the vault-shaped reinforcing wall (8), there is another inside reinforcing wall (9), with an oblique projection, that extends from one area or point close to the half length of the fastening plate (6) up to a point close to the connection of the wall (4') with the vault-shaped reinforcing wall itself (8).

[0025] As one can see in the cited figure, the connecting wall (4') has a section considerably thicker than the opposite wall (4), the wall (4') with a thickened section being oriented towards the free end of the inside covering.

[0026] It can also be verified how these connecting walls (4) and (4'), independently from their different thickness, have approximately the same length.

[0027] Finally, it should be said that the fastening plate (6), in correspondence with its inside edge, has an extension or covering strip (10), with a special shape, in order to seal the hollow (11) of the door itself, defining an element with optical closing functions to prevent movements from being produced.

Claims

1. Sealing joint for a refrigerator door, comprising a joint head (1) and a joint base (3) being connected to said joint head (1) by means of connecting walls (4, 4'); said joint head (1) including permanent magnetic strips and said joint base (3) being configured to be fastened to the door of the refrigerator (5) by surrounding its inside covering by means of an adhesive connection, said joint base (3) having a fastening plate (6) with a fastening surface being shaped flat at least to a great extent, in which fastening surface said connecting walls (4, 4') are connected, and said connecting walls (4, 4') being displaced backward from the side edges of said fastening plate (6) on the side of said joint head (1), **characterized in that** said fastening plate (6) is provided on the side of said joint head (1) with a reinforcing wall (8), which has a shape similar to that of a vault in its cross section and which is connected to said fastening plate (6) in a manner displaced backward from the side edges of said fastening plate (6) and by means of which said connecting walls (4, 4') are connected to said fastening plate (6).

2. Sealing joint for a refrigerator door according to claims 1, **characterized in that** said connecting walls (4, 4') are dimensioned at least approximately of the same length.

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3. Sealing joint for a refrigerator door according to claim 2, **characterized in that** said connecting walls (4, 4') are connected to said reinforcing wall (8) in the area close to the connecting position of said reinforcing wall (8) to said fastening plate (6).

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4. Sealing joint for a refrigerator door according to claim 2 or 3, **characterized in that** said connecting wall (4'), that is directed towards the free end of said inside covering, has a section reinforced as to the thickness of its wall with which said connecting wall (4') is to be connected to said reinforcing wall (8).

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5. Sealing joint for a refrigerator door according to claim 4, **characterized in that** said reinforcing wall (8) rests against the fastening plate (6) with a reinforcing wall (9) located inside the inside space delimited by the reinforcing wall (8) and said fastening plate (6) being directed approximately from the center of said fastening plate (6) in the direction of the reinforced section of said connecting wall (4').

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6. Sealing joint for a refrigerator door according to claims 1 to 5, **characterized in that** said fastening plate (6) is equipped with a covering strip (10) in its section directed towards the free edge of said inside covering.

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Patentansprüche

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1. Abdichtungsvorrichtung für eine Kühltür, umfassend einen Vorrichtungskopf (1) und eine Vorrichtungsbasis (3), die mithilfe von Verbindungswänden (4, 4') mit dem Vorrichtungskopf (1) verbunden ist; wobei der Vorrichtungskopf (1) Permanentmagnetstreifen beinhaltet und die Vorrichtungsbasis (3) so konfiguriert ist, dass sie durch Umgeben seiner Innenabdeckung mithilfe einer Klebeverbindung an der Tür des Kühlschranks befestigt ist, wobei die Vorrichtungsbasis (3) eine Befestigungsplatte (6) mit einer Befestigungsfläche aufweist, die zumindest in einem großen Ausmaß flach geformt ist, wobei die Verbindungswände (4, 4') in der Befestigungsfläche verbunden sind und die Verbindungswände (4, 4') von den Seitenkanten der Befestigungsplatte (6) auf der Seite des Vorrichtungskopfs (1) nach hinten verschoben sind, **dadurch gekennzeichnet, dass** die Befestigungsplatte (6) auf der Seite des Vorrichtungskopfs (1) mit einer Verstärkungswand (8) versehen ist, die eine Form, die in ihrem Querschnitt der eines Gewölbes ähnelt, aufweist und die auf eine von den Seitenkanten der Be-

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festigungsplatte (6) nach hinten verschobene Art und Weise mit der Befestigungsplatte (6) verbunden ist und mit deren Hilfe die Verbindungswände (4, 4') mit der Befestigungsplatte (6) verbunden sind.

2. Abdichtungsvorrichtung für eine Kühltür nach Anspruch 1, **dadurch gekennzeichnet, dass** die Verbindungswände (4, 4') mit zumindest ungefähr derselben Länge bemessen sind.

3. Abdichtungsvorrichtung für eine Kühltür nach Anspruch 2, **dadurch gekennzeichnet, dass** die Verbindungswände (4, 4') in dem Bereich mit der Verstärkungswand (8) verbunden sind, der sich eng an der Verbindungsposition der Verstärkungswand (8) mit der Befestigungsplatte (6) befindet.

4. Abdichtungsvorrichtung für eine Kühltür nach einem der Ansprüche 2 oder 3, **dadurch gekennzeichnet, dass** die Verbindungswand (4'), die zum freien Ende der Innenabdeckung hin gerichtet ist, einen Abschnitt aufweist, der bezüglich der Stärke seiner Wand verstärkt ist, mit der die Verbindungswand (4') mit der Verstärkungswand (8) verbunden sein soll.

5. Abdichtungsvorrichtung für eine Kühltür nach Anspruch 4, **dadurch gekennzeichnet, dass** die Verstärkungswand (8) an der Befestigungsplatte (6) ruht, wobei eine Verstärkungswand (9), die innerhalb des Innenraums, der durch die Verstärkungswand (8) und die Befestigungsplatte (6) begrenzt ist, angeordnet ist, ungefähr von der Mitte der Befestigungsplatte (6) in Richtung des verstärkten Abschnitts der Verbindungswand (4') gerichtet ist.

6. Abdichtungsvorrichtung für eine Kühltür nach einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, dass** die Befestigungsplatte (6) in ihrem Abschnitt, der zur freien Kante der Innenabdeckung hin gerichtet ist, mit einem Abdeckungsstreifen (10) ausgestattet ist.

Revendications

1. Joint d'étanchéité pour porte de réfrigérateur, qui comprend une tête de joint (1) et une base de joint (3) qui est reliée à ladite tête de joint (1) au moyen de parois de liaison (4, 4'), ladite tête de joint (1) comprenant des aimants permanents en forme de bande et ladite base de joint (3) étant configurée de manière à pouvoir être fixée sur la porte du réfrigérateur (5) en entourant son revêtement intérieur d'une liaison adhésive, ladite base de joint (3) présentant une plaque de fixation (6) dont au moins

une grande partie de la surface de fixation a une forme plate, lesdites parois de liaison (4, 4') étant reliées dans cette surface de fixation et lesdites parois de liaison (4, 4') étant en retrait par rapport aux bords latéraux de ladite plaque de fixation (6) situés sur le côté de ladite tête de joint (1), **caractérisé en ce que** ladite plaque de fixation (6) est dotée sur le côté de ladite tête de joint (1) d'une paroi de renforcement (8) dont la section transversale a une forme similaire à celle d'une voûte, qui est reliée à ladite plaque de fixation (6) en retrait par rapport aux bords latéraux de ladite plaque de fixation (6) et au moyen de laquelle lesdites parois de liaison (4, 4') sont reliées à ladite plaque de fixation (6).

2. Joint d'étanchéité pour porte de réfrigérateur selon la revendication 1, **caractérisé en ce que** lesdites parois de liaison (4, 4') ont au moins sensiblement la même longueur.
3. Joint d'étanchéité pour porte de réfrigérateur selon la revendication 2, **caractérisé en ce que** lesdites parois de liaison (4, 4') sont reliées à ladite paroi de renforcement (8) dans la zone proche de l'emplacement de la liaison entre ladite paroi de renforcement (8) et ladite plaque de fixation (6).
4. Joint d'étanchéité pour porte de réfrigérateur selon la revendication 2 ou 3, **caractérisé en ce que** ladite paroi de liaison (4'), laquelle est dirigée vers l'extrémité libre dudit recouvrement intérieur, a une partie renforcée en ce qui concerne l'épaisseur de sa paroi avec laquelle ladite paroi de liaison (4') doit être reliée à ladite paroi de renforcement (8).
5. Joint d'étanchéité pour porte de réfrigérateur selon la revendication 4, **caractérisé en ce que** ladite paroi de renforcement (8) repose contre la plaque de fixation (6), une paroi de renforcement (9) étant située à l'intérieur de l'espace intérieur délimité par la paroi de renforcement (8), ladite plaque de fixation (6) étant orientée approximativement depuis le centre de ladite plaque de fixation (6) dans la direction de la partie renforcée de ladite paroi de liaison (4').
6. Joint d'étanchéité pour porte de réfrigérateur selon les revendications 1 à 5, **caractérisé en ce que** dans sa partie orientée vers le bord libre dudit recouvrement intérieur, ladite plaque de fixation (6) est dotée d'une bande de recouvrement (10).

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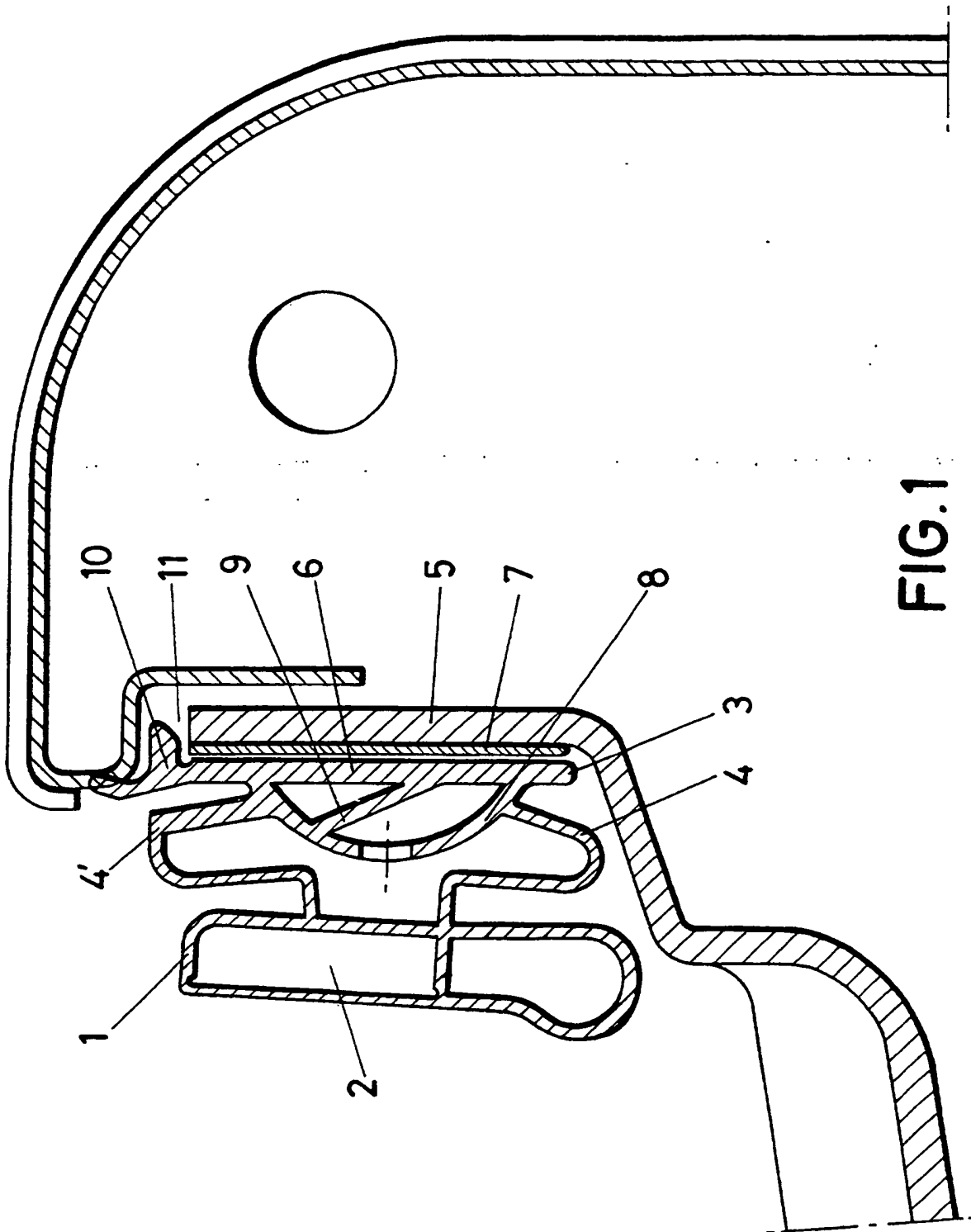


FIG.1