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E. G. SWICK

3,074,522

THERMALLY ISOLATING SPACER BRACKET

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Fig. 1

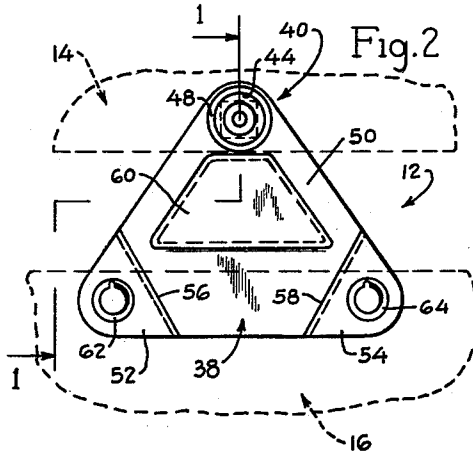
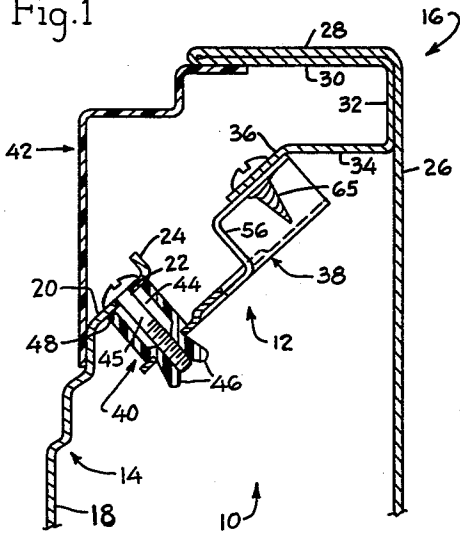


Fig. 3

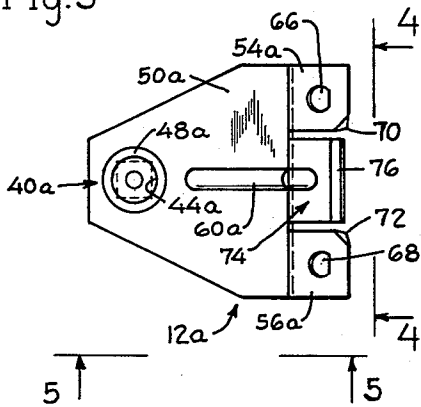


Fig. 4

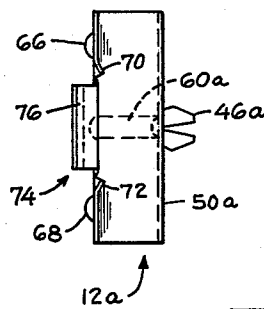


Fig. 5

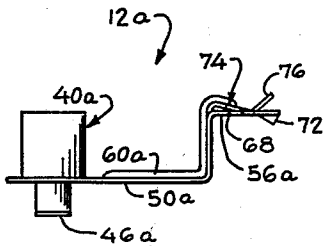
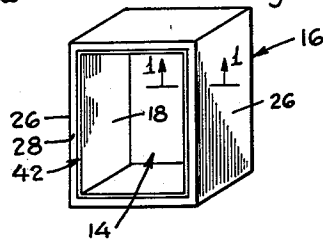


Fig. 6



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THERMALLY ISOLATING SPACER BRACKET

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This invention relates to a thermally isolating spacer bracket and more particularly relates to a bracket means for rigidly interconnecting two spaced panel members in thermally isolating relationship and to the assembly so formed.

In the manufacture of various appliances such as refrigerators, freezers, and the like, it is often desirable to have two metallic panel members rigidly interconnected in spaced apart relationship. For example, in a refrigerator the outer casing of the refrigerator is conventionally formed of metal with a porcelain or other hard coating thereon and the interior of the refrigerator is also often made of metal provided with a porcelain or other hard coating. These two casings are spaced apart and insulation means of various types are disposed therebetween.

This invention is concerned with a clip means for connecting two panel members in spaced apart relation while maintaining a thermo isolation therebetween.

More particularly it is an object of this invention to provide a structural fastening relationship between two panel members which is rigid, stable, and utilizes a small number of parts while providing the above described function.

It is a further object of this invention to provide a clip means for association with two panel members which is easy to manufacture, is easy to assemble, has easy access for initial assembly and later disassembly for maintenance and repair, and is otherwise well adapted for the purposes for which it was designed.

The novel features which are characteristic of the invention are set forth with particularity in the appended claims. The invention itself, both as to its organization and its method of operation together with additional objects and advantages thereof, will best be understood by the following description of specific embodiments when read in connection with the accompanying drawings in which:

FIG. 1 is a sectional view through a clip and panel arrangement, said view being taken approximately along lines 1-1 of FIG. 6 and along the lines 1-1 of FIG. 2 the sectional view through the clip of FIG. 1 being rotated 180° from the position shown in FIG. 2 when the clip shown in FIG. 1 is assembled to a work panel;

FIG. 2 is a full line top plan view of the clip means shown in FIG. 2, the panels being shown in dotted line;

FIG. 3 is a top plan view of an alternate clip;

FIG. 4 is a right hand end view of the clip shown in FIG. 3, said view being taken along lines 4-4 of FIG. 3;

FIG. 5 is a front elevational view of the clip taken along lines 5-5 of FIG. 3; and

FIG. 6 is a semidiagrammatic perspective view of an insulated box.

The assembly 10 shown in FIG. 1 of the drawings essentially comprises a clip means 12, a first panel means 14 (which may be the inner housing or liner of the refrigerator), and a second panel means 16 (which may be the outer housing of a refrigerator or the like) as shown in FIG. 6. The inner liner 14 has a first substantially straight portion 18 which is connected to an angularly offset portion 20 by a series of steps as suitable and desired. The offset portion 20 has a through aperture 22 and may or may not have an upturned lip portion 24.

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The outer panel means 16 has a first substantially straight portion 26 which is parallel with portion 18 and a right angle offset portion 28 interconnected thereto to form a corner. Reversely bent portions 30 and 32 are formed back upon portions 28 and 26 respectively for purposes of strengthening the corner area. At right angle to portion 32 is a straight portion 34 which is generally parallel with portions 28 and 30. Angularly offset from portion 34 is a panel edge portion 36 which is disposed generally parallel and coplanar with portion 20 of the inner panel member 14 and disposed at 45° to the corner formed by portions 30-32 and 26-28. Thus straight panel portions 26 and 18 respectively are adapted to form spaced wall portions of a refrigerator, it being realized that the panels have an overall boxlike configuration with the mouth of the box having a suitable door.

When the inner and outer liners 14 and 16 are assembled as shown in FIGS. 1 and 6, they are held in spaced apart relation by the clip means 12 which comprises a metallic portion 38 and a thermally insulating grommet member 40. A plastic facia strip or covering member 42 is coextensive with the panel means 14 and 16 and is configured to close off the area where the clips 12 are located to provide a thermally nonconducting seal therebetween.

The clip per se as aforementioned, comprises the metallic portion 38 and the insulating grommet member 40 which is assembled on to the clip. The grommet member 40 is generally hollow having a small bore 43 and a large counter bore 44. Diverging leg portions 46, which are flexible to a degree, surround bore 43. The legs are adapted to be inserted through an aperture in one corner of the metallic portion 38 and are spread apart by a screw fastener member 45 inserted in the aperture 22 in panel portion 20. The top surface 48 of the grommet member 40 is spaced above the surface of the major plane of the metallic portion 50 of the clip member a predetermined distance as shown. It will be appreciated that when the screw fastener 45 is mounted in the grommet bore 43, the legs 46 serve the various functions of acting as a nut like member which retains the screw member 45, they insulate the fastener 45 from metal portion 50 of the clip, and they simultaneously fasten the entire clip to the panel portion 20. Since the grommet member 40 is formed of plastic and since the leg portions 46 thermally insulate the fastener member 45 from the metallic portion 50, there is no good heat transfer between the panel 20 and the metallic clip means 38.

The metallic clip means 38 as here shown is essentially triangular in plan view and has a major portion 50 which is essentially coplanar and is offset from raised corner portions 52 and 54. The corner portions 52 and 54 are coplanar and are offset from portion 50 by upstanding portions 56 and 58 respectively a distance which is sufficient to make corner portions 52 and 54 essentially coplanar with top surface 48 of the grommet member 40. Strengthening means 60 in the form of an upset may be formed in the portion 50 to rigidify the member. The corner portions 52 and 54 are adapted to be fastened to suitable spaced apertures in panel portion 36 and as here shown have a fastening means in the form of helical screw impressions 62 and 64. Thus a nut cage is not required on the underside of the portions 52 and 54. Suitable screw members such as 65 (see FIG. 1) may be fastened to the impressions 62-64 and panel portion 36 to complete a rigid assembly. There is easy access to both types of fastener members 45-65 in original assembly as will be readily apparent. It will be noted that removal of the plastic portion 42 allows easy access to the fastener members 45 and 65 for disassembly of the original assembly for repair.

The alternate clip shown in FIGS. 3 through 5 is substantially similar to the one above described. Similar parts shall be given similar reference numerals with the addition of the suffix "a." The clips shown in FIGS. 3 through 5 have a modified means of attaching to the spaced apertures in panel portion 36. More particularly, upstanding corner portions 54a and 56a have upwardly directed tangs 66 and 68 respectively, which are adapted to cooperate with the prepunched holes in the panel 36. The inboard corners of the coplanar upstanding corner portions 54a and 56a are respectively bent downwardly at 70 and 72 to provide an easy entry of portions 54a and 56a beneath the panel. A central tongue portion 74 has a reversely bent lip portion 76 which is adapted to slide over the top of the panel to aggressively retain the tang portions 66 and 68a in place in the respective apertures in panel portion 36. To mount the clip 12a one tang such as for example, 66 is placed within a panel aperture with the tongue being on the top side of the panel portion 36 and then the clip is rotated until the tang portion 68 fits within the second aperture.

From the foregoing, it is seen that a compact, rigid, thermally insulating clip means of few parts is provided for structurally interconnecting two panels in thermally isolated relation.

Although specific embodiments of the invention have been shown and described, it is with full awareness that many modifications thereof are possible. The invention, therefore, is not to be restricted except as insofar as is necessitated by the prior art and by the spirit of the appended claims.

What is claimed as the invention is:

1. An assembly including clip means adapted for mounting two panel members in physically and thermally spaced relation comprising in combination, a first panel member having an aperture adjacent an edge portion thereof, a second panel member having an aperture in a panel portion disposed in spaced parallel relation to said first panel edge portion, clip means connecting said first and second panel members, said clip means comprising an apertured first portion of substantial extent and disposed in a plane parallel to the plane of said first and second panel portions and offset therefrom, a second clip portion parallel with said first clip portion and offset from the latter and disposed adjacent to said second panel portion, screw retaining aperture means in said offset second portion of said clip means, and a thermally nonconductive member disposed in the aperture of said first clip portion having a central aperture to receive a fastener member associated with said first panel portion, said thermally nonconductive retaining member having a surface for engaging said first panel portion and being spaced from said first portion of said clip means a distance substantially equal to the offset of said second portion of said clip means from said first portion, whereby said second panel member and said first panel member may be joined by said clip means in a physically rigid and thermally nonconductive manner.

2. An assembly including clip means adapted for mounting two panel members in physically and thermally spaced relation comprising in combination, a first panel member having an aperture adjacent an edge portion thereof, a second panel member having a pair of spaced apertures in a panel portion disposed in spaced parallel relation to said first panel edge portion clip means connecting said first and second panel members, said clip means comprising an apertured first portion of substantial extent and disposed in a plane parallel to the plane of said first and second panel portions and offset therefrom, a pair of second clip portions parallel with said first clip portion and offset from the latter and disposed adjacent to said second panel portion, detachable retaining means in each of said offset second portions of said clip means, and a thermally nonconductive member having a hollow

neck portion with an open mouth and a base portion disposed through the aperture in said first clip portion, said base portion having an aperture to receive a fastener member associated with said first panel portion, the margin of said neck portion surrounding said mouth having a surface for engaging said first panel portion, said neck surface being spaced from said first portion of said clip means a distance substantially equal to the offset of said second portions of said clip means from said first portion, whereby said second panel member and said first panel member may be joined by said clip means in a coplanar, physically rigid, and thermally nonconductive manner.

3. Clip means adapted for mounting two panel members in physically and thermally spaced coplanar relation comprising a first portion of substantial extent and adapted to be disposed in a plane parallel to the plane of said first and second panel portions and offset therefrom, a second clip portion parallel with said first clip portion and offset from the latter and adapted to be disposed adjacent to said second panel portion, fastener means in said offset second portion of said clip means for association with said second panel portion, said first portion of said clip means having an aperture, and a thermally nonconductive member disposed in said aperture of said first clip portion, said thermally nonconductive member being apertured to rotatably receive a fastener member associated with said first panel portion, said thermally nonconductive member having a stop surface spaced from said first clip portion for engaging said first panel portion, said stop surface being spaced from said first portion of said clip means a distance substantially equal to the offset of said second portion of said clip means from said first portion, whereby said second panel portion and said first panel portion may be joined by said clip means in a physically rigid, spaced, coplanar, and thermally nonconductive manner.

4. Clip means adapted for mounting two panel members in physically and thermally spaced coplanar relation comprising a first metallic portion of substantial extent and adapted to be disposed in a plane parallel to the plane of said first and second panel portions and offset therefrom, a strengthening upset in said first clip portion, a pair of corner second clip portions parallel with said first clip portion and offset from the latter by integral substantially right angle upright portions, said corner portions being adapted to be disposed adjacent to said second panel portion, fastener means integral with said offset second corner portions of said clip means for association with said second panel portion, said first portion of said clip means having an aperture, and a plastic thermally nonconductive member disposed in said aperture of said first clip portion, said thermally nonconductive member being apertured to rotatably receive a fastener member associated with said first panel portion, said thermally nonconductive member having a stop surface spaced from said first clip portion for engaging said first panel portion, said stop surface being spaced from said first portion of said clip means a distance substantially equal to the offset of said second corner portions of said clip means from said first portion, whereby said second panel portion and said first panel portion may be joined by said clip means in a physically rigid, spaced, coplanar, and thermally nonconductive manner.

5. Substantially polygonal clip means essentially triangular in plan view adapted for mounting two panel members in physically and thermally spaced coplanar relation comprising a first portion of substantial extent and adapted to be disposed in a plane parallel to the plane of said first and second panel portions and offset therefrom, said first portion having a first corner area, second and third corner area clip portions parallel with said first clip portion and offset from the latter and adapted to be disposed adjacent to said second panel portion, fastener means in each said offset second and third corner portions of said clip means for association with said second panel portion, said first corner portion of said clip means having

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an aperture, and a thermally nonconductive plastic grommet member fixedly disposed in said aperture of said first corner area, said thermally nonconductive member being apertured to rotatably receive a fastener member associated with said first panel portion, said thermally nonconductive member having a stop surface spaced from said first corner area of first clip portion for engaging said first panel portion, said stop surface being spaced from said first corner area of said clip means a distance substantially equal to the offset of said second and third corner areas of said clip means from said first portion, whereby said second panel portion and said first panel portion may be joined by said clip means in a physically rigid, spaced, coplanar, and thermally nonconductive manner.

6. The clip means set forth in claim 5 wherein the fastener means in each of said second and third corner areas are in the form of helical screw impressions.

7. The clip means set forth in claim 5 wherein the fastener means in each of said second and third corner areas is in the form of upstanding tangs, the clip means further having a tongue member intermediate said second and third corner areas adapted to engage the second panel and aggressively urged the tangs into association with spaced apertures in said second panel.

8. An assembly including clip means adapted for mounting the mouth of two wall metallic panel members in physically and thermally spaced relation comprising in combination, a first inner wall panel member having a straight portion and a 45° angularly offset portion having an aperture therein, a second outer wall panel member having a straight portion parallel with the inner panel straight portion and spaced therefrom, said second panel portion having a 45° angularly offset portion having a pair of spaced apertures therein, said second angularly offset panel portion being disposed in spaced parallel relation to said first angularly offset panel edge portion, clip means connecting said first and second angularly offset panel portions, said clip means comprising an apertured first portion of substantial extent and disposed in a plane parallel to the plane of said first and second angularly offset panel portions and offset therefrom, a pair of second clip portions parallel with said first clip portion and offset from the latter and disposed adjacent to said second panel angularly offset portion, detachable retaining means in each of

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said offset second portions of said clip means, and a thermally nonconductive member having a hollow neck portion with an open mouth and a base portion disposed through the aperture in said first clip portion, said base portion having an aperture to receive a fastener member associated with said first panel offset portion, the margin of said neck portion surrounding said mouth having a surface for engaging said first panel offset portion, said neck surface being spaced from said first portion of said clip means a distance substantially equal to the offset of said second portions of said clip means from said first portion, whereby said second panel member and said first panel member may be joined by said clip means in a coplanar physically rigid and thermally nonconductive manner.

9. An assembly including clip means adapted for mounting two panel members in physically and thermally spaced relation comprising in combination, a first panel member having an aperture adjacent an edge portion thereof, a second panel member having an aperture in a panel portion disposed in spaced relation to said first panel edge portion, clip means connecting said first and second panel members, said clip means comprising an apertured first portion of substantial extent and disposed in a plane parallel to the plane of one of said first and second panel portions and offset therefrom, a second clip portion offset from said first clip portion and disposed adjacent to said second panel portion, fastening means in said offset second portion of said clip means, and a thermally nonconductive member disposed in the aperture of said first clip portion having a central aperture to receive a fastener member associated with said first panel portion, said thermally nonconductive retaining member having a surface for engaging said first panel portion and being spaced from said first portion of said clip means a substantial distance, whereby said second panel member and said first panel member may be joined by said clip means in a physically rigid and thermally nonconductive manner.

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