

[54] **AIR CONDITIONER MOUNTING MEANS**

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[58] Field of Search.....62/262; 98/94 AC; 160/228, 160/372, 40; 49/168

[56] **References Cited**

UNITED STATES PATENTS

3,030,873	4/1962	Metcalf	98/94 AC
2,946,274	7/1960	Grimes, Jr.	62/262 X
3,378,957	4/1968	Freshe	49/487
3,415,074	12/1968	Metcalf	62/262

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[57] **ABSTRACT**

This invention produces readily adjustable and installable closure means for providing a fluid seal between a hollow casing of an air-conditioner unit, having top and bottom walls interconnected by a pair of spaced apart left and right side walls, and the left and right side and top walls of a generally vertically arranged opening, such as a window or the like, in which the casing is mounted with its bottom wall adjacent the bottom wall of the opening. Basically, the closure means comprises a telescopic pair of inverted generally U-shaped closure members. The first or bottom one of these two closure members includes a first pair of legs, whose left and right inner surfaces are respectively engageable with the casing left and right side walls and whose left and right outer surfaces are respectively engageable with the opening side walls, and a first bight portion, whose bottom is engageable with the casing top wall. The second or upper closure member includes a second pair of legs, which are mounted in track means provided on the first pair of legs for slideable movement relative thereto and whose left and right outer surfaces are respectively engageable with the opening side walls, and a second bight portion, whose bottom is engageable with the top of the first bight portion and whose top is engageable with the opening top wall.

3 Claims, 8 Drawing Figures

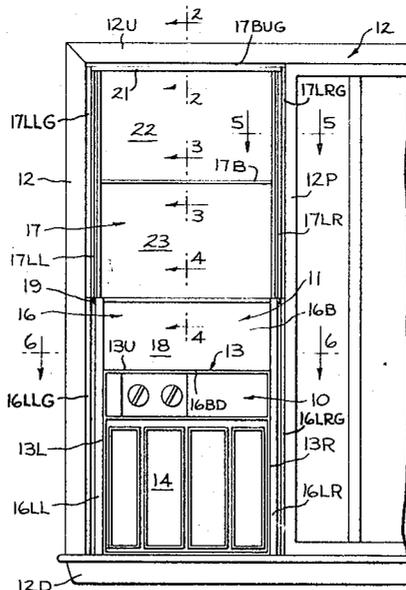


FIG. 6

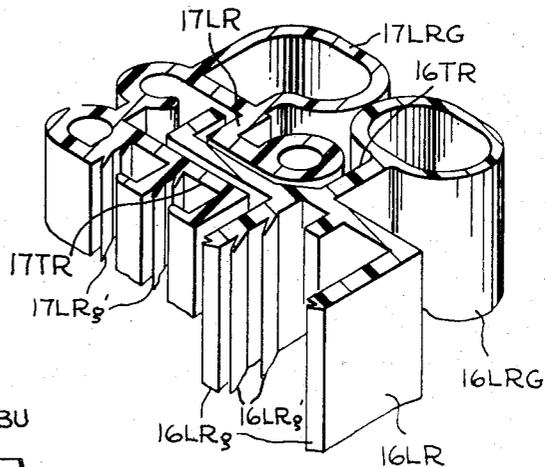
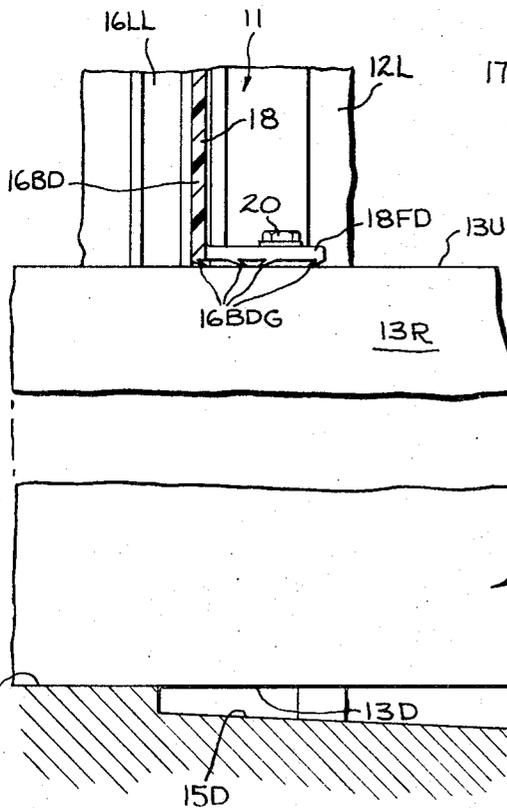
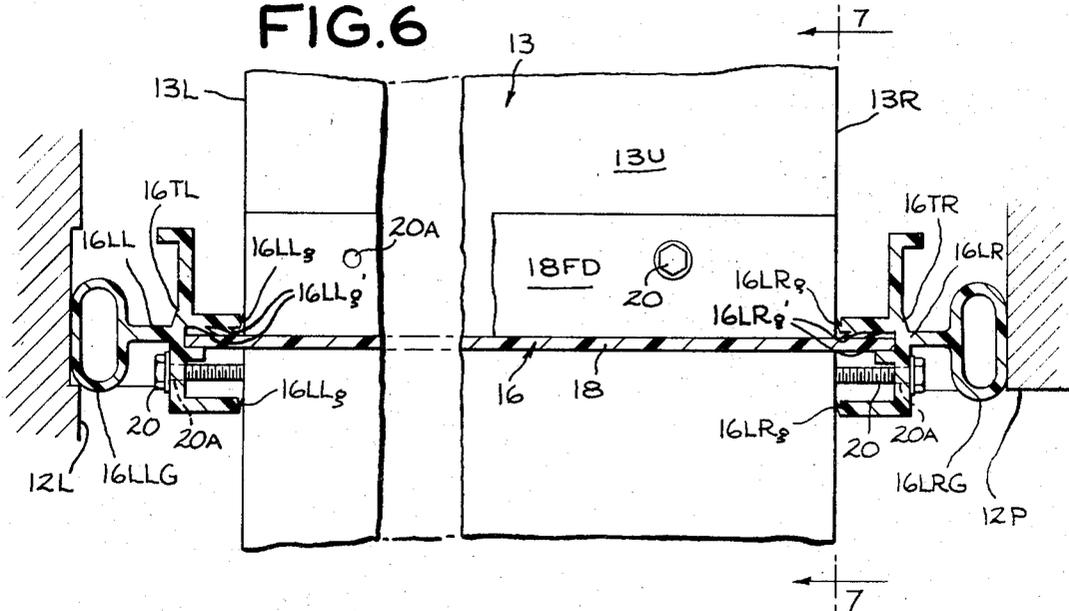


FIG. 8

FIG. 7

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AIR CONDITIONER MOUNTING MEANS

BACKGROUND OF THE INVENTION

This invention relates to air-conditioner units and, more particularly, to improved means for mounting an air-conditioner unit in a wall opening, such as a window or the like.

Still more specifically, the present invention is directed toward readily adjustable and installable closure means for providing a fluid seal between a hollow casing of an air-conditioner unit, having top and bottom walls interconnected by a pair of spaced apart left and right side walls, and the left and right side and top walls of a generally vertically arranged opening, such as a window or the like, in which the casing is mounted with its bottom wall adjacent the opening bottom wall.

While not limited in use thereto, the novel means provided by this invention are particularly adapted to provide a fluid seal between an air-conditioning unit casing and a so-called "slider-type" window opening wherein the window sash has its top and bottom edges mounted for slidable movement in a pair of generally horizontal channels.

U.S. Pat. No. 3,415,074 illustrates a typical form of the conventional means which have heretofore been utilized for mounting an air-conditioner unit casing in such a slider-type window. With such prior-art arrangements, the left and right side walls of the casing are respectively trapped between the right edge of the slidable window sash and the left edge of the fixed right wall of the window opening, while the considerable remaining open space between the casing top wall and the lower edge of the fixed top wall of the window opening is closed by a sealing panel that is typically made of composition board, such as Masonite or the like. And, because the height dimension of the opening to be sealed between the casing top wall and the window opening top wall may vary widely, such conventional sealing panels must be individually manually cut to size by field installation personnel or by the consumer.

SUMMARY OF THE INVENTION

The present invention provides readily adjustable and installable closure means for providing a fluid seal between a hollow casing of an air-conditioner unit, having top and bottom walls interconnected by a pair of spaced apart left and right side walls, and the left and right side and top walls of a generally vertically arranged opening in which the casing is mounted with its bottom wall adjacent the opening bottom wall. Basically, the novel closure means of the present invention comprises a pair of inverted generally U-shaped closure members. The first of these two closure members includes a first pair of legs, whose left and right inner surfaces are respectively engageable with the casing left and right side walls and whose left and right outer surfaces are respectively engageable with the opening side walls, and a first bight portion, whose bottom is engageable with the casing top wall. The second of these two closure members includes a second pair of legs, which are mounted in track means provided on the first pair of legs for slidable movement relative thereto and whose left and right outer surfaces are respectively engageable with the opening side walls, and a second bight portion, whose bottom is engageable with the top

of the first bight portion and whose top is engageable with the opening top wall.

The novel closure means of the present invention can be shipped to the installation site detached from, but co-packaged with, the air-conditioner unit casing, whereupon they can then be readily installed by the consumer and adjusted to the height of the remaining open space between the casing top wall and the lower edge of the fixed top wall of the opening. Preferably this is done by, first respectively fastening the left and right inner surfaces of the legs and the bottom of the bight portion of the first of the two closure members to the casing left and right side and top walls with fastener means, such as sheetmetal screws or the like. Next, the casing is mounted in the opening with its bottom wall adjacent the opening bottom wall. Then, the installer adjusts the height of the closure means to that of the remaining open space between the casing top wall and the opening top wall by simply pulling upward on the slidably mounted second closure member and fastening the top of the bight portion thereof to the opening top wall with fastener means, such as sheetmetal screws or the like. Finally, the closure means side walls are then trapped between the opening side walls. Typically, the only tool needed for this job is a screwdriver.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention is illustrated in the accompanying drawings, wherein:

FIG. 1 is a fragmentary front elevational view of an air-conditioner unit employing mounting means incorporating the novel closure means provided by the present invention;

FIG. 2 is an enlarged fragmentary sectional view taken along line 2—2 of FIG. 1;

FIG. 3 is an enlarged fragmentary sectional view taken along line 3—3 of FIG. 1;

FIG. 4 is an enlarged fragmentary sectional view taken along line 4—4 of FIG. 1;

FIG. 5 is an enlarged fragmentary sectional view taken along line 5—5 of FIG. 1;

FIG. 6 is an enlarged fragmentary, partly broken, sectional view taken along line 6—6 of FIG. 1;

FIG. 7 is a partly broken, sectional view taken along line 7—7 of FIG. 6; and

FIG. 8 is a greatly enlarged fragmentary elevational perspective view showing details of the construction of and slidable interconnection of the right legs of the two closure members which comprise the closure means of the present invention and the gasket means that are preferably integrally formed therewith.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, and more particularly to FIG. 1 thereof, there is illustrated a room air-conditioner unit 10 employing mounting means incorporating the novel closure means, generally designated 11, which are provided in accordance with the present invention to mount the unit 10 in a wall opening, such as that provided by a slider-type window 12 or other means.

The air-conditioner unit 10 includes a generally rectangular hollow box-like casing 13 in which are housed a refrigerant compressor, condenser, and

evaporator (not shown) that are interconnected in a well-known manner by means (not shown) to form a refrigeration system. The unit 10 is disposed within the wall opening such that the condenser is in communication with ambient air and the evaporator is in communication with the room or other space to be cooled or otherwise conditioned. Suitable fan means (not shown) are also provided in a well-known manner within the air-conditioner unit casing 13 to pass air over the evaporator and condenser respectively.

As best shown in FIGS. 1-2 and 5-7, the unit casing 13 has a pair of generally vertically arranged, spaced apart, left 13L and right 13R side walls, which are interconnected by a top wall 13U and a bottom wall 13D, and a front or room side wall that has an opening (not shown) that is provided with a cover or grille 14, which can be removed therefrom to permit access to the interior of the casing 13. The air-conditioner unit 10 is mounted within an opening that is defined by the fixed top 12U and bottom 12D and left 12L side walls of the slider-type window 12 and the left edge of the slider-type window's slideable sash 12P, which has its top and bottom edges respectively mounted for slideable (left-right; right-left) movement in a pair of generally horizontal upper 15U (FIG. 2) and lower 15D (FIG. 7) channels that are respectively mounted on the fixed top 12U and bottom 12D walls of the window 12, with the casing bottom wall 13D being mounted adjacent to the fixed bottom wall 12D of the opening (FIGS. 1 and 7).

Typically, the height dimension of the slider-type windows, such as the window 12, ranges between 24 and 40 inches, while a typical height dimension of the air-conditioner unit casing 13 is 10½ inches. Therefore, once the air-conditioner unit casing 13 is mounted in the wall opening that is provided by sliding the window sash 12P rightward as shown in FIG. 1, it is then necessary to provide closure means for providing a fluid seal for the open space which remains between the casing top wall 13U of the lower edge of the fixed top wall 12U of the opening. As noted above, the height dimension of this remaining open space may vary widely; typically ranging anywhere from 13½ to 29½ inches. Heretofore, as noted previously, it has been conventional to employ a panel made of composition board, such as Masonite or the like, for such closure means. And, because of the aforementioned wide variation of the height dimension of the remaining open space between the casing top wall 13U and the opening fixed top wall 12U, it has, in the past, been necessary for such prior-art sealing panels to be individually manually cut to the necessary dimension by field personnel or by the consumer at the installation site for the air-conditioner 10.

The present invention is particularly concerned with providing novel closure means, such as the closure means 11, for sealing such a remaining space between the casing top wall 13U and the opening fixed top wall 12U, which can be shipped to an installation site for the air-conditioner 10 from, but co-packaged with, the air-conditioner unit casing 13, whereupon they can then be readily installed by the consumer and adjusted to the height dimension of the remaining open space between the casing top wall 13U and the opening fixed top wall 12U.

The presently preferred form 11 of the novel closure means that are provided in accordance with the present

invention comprises a telescopic pair of inverted generally U-shaped closure members, including a first or bottom closure member, generally designated 16, and a second or upper closure member, generally designated 17 (FIG. 1). The first or bottom closure member 16 includes a first or bottom pair of legs, comprising a left leg 16LL and a right leg 16LR, and a first or bottom bight portion 16B, which is laterally interconnected between the first or bottom pair of legs 16LL and 16LR and whose bottom 16BD is engageable with the casing top wall 13U. The second or upper closure member 17 includes a second or upper pair of legs, comprising a left leg 17LL and a right leg 17LR, the lower portions of which are mounted in track means 16TL and 16TR (FIGS. 5, 6 and 8) provided on the first or bottom pair of legs 16LL and 16LR for slidable movement (up-down; down-up) relative thereto, and a second or upper bight portion 17B, which is laterally interconnected between the second or upper pair of legs 17LL and 17LR and whose bottom 17BD is engageable with the top 16BU of the first or bottom bight portion 16B and whose top 17BU is engageable with the opening fixed top wall 12U.

Preferably, the first or bottom bight portion 16B comprises a single panel 18 that is laterally interconnected between the left 16LL and right 16LR legs of the first or bottom pair of legs by fastener means, such as screws 19, which are pre-installed prior to shipment of the closure means 11 to the installation site for the air-conditioner unit 10. This single panel 18 has a laterally extending, rearwardly projecting bottom flange 18FD (FIGS. 6 and 7) that is, in turn, provided with a plurality of laterally spaced pre-formed apertures, such as aperture 20A, for receiving fastener means, such as sheetmetal screw 20, that are installed in the field to engage the first or bottom bight portion bottom 16BD to the casing to wall 13U, while the top of this single panel 18 has a rearwardly extending top flange 18FU (FIG. 4) that is adapted to engage means, which will be described in detail hereinafter, that are provided on the second or upper bight portion 17B. The lower portions of the left 16LL and right 16LR legs of the first or bottom pair of legs are also respectively provided with a plurality of vertically spaced pre-formed apertures, similar to the aperture 20A, for receiving fastener means, similar to the sheetmetal screw 20, that are installed in the field to respectively engage them to the left 13L and right 13R side walls of the air-conditioner unit casing 13 (FIG. 6).

The second or upper bight portion 17B preferably comprises a pair of top members including a cap portion 21 that extends laterally between the left 17LL and right 17LR legs of the second or upper pair of legs and is interconnected thereto by fastener means, such as screws 21S, which are pre-installed prior to shipment of the closure means 11 to the installation site for the air-conditioner unit 10, and has its bottom 21D (FIG. 2) interlocked with the flanged top 22U of another panel 22 which extends laterally between and has its left and right edges respectively interlocked with the left 17LL and right 17LR legs of the second or upper pair of legs (FIG. 5). Preferably, the second or upper bight portion 17B further comprises at least one other panel 23, forming its bottom 17BD, that extends laterally between the left 17LL and right 17LR legs of the

second or upper pair of legs and is mounted in second or upper track means 17TL and 17TR provided thereon for slidable movement (up-down; down-up) relative thereto.

And, as best shown in FIGS. 3-5, this slidably mounted panel 23 has its bottom portion provided with a laterally extending, forwardly projecting flange 23FD (FIG. 4) that is engageable with the rearwardly projecting flange 18FU on the top of the panel 18, while its top portion (FIG. 3) is provided with a laterally extending, rearwardly projecting flange 23FU that is engageable with a laterally extending, forwardly projecting flange 22FD that is provided on the bottom portion of the upper panel 22 of the second or upper bight portion 17B of the second or upper one 17 of the telescopic pair of closure members 16 and 17 which comprise the presently preferred form of the novel closure means 11 of the present invention.

As further illustrated, resilient gasket means 16LLG, 17LLG and 16LRG, 17LRG (FIGS. 6 and 8) are preferably included for respectively providing a fluid seal between the outer surfaces of the left legs 16LL and 17LL and right legs 16LR and 17LR of both the first or bottom one 16 and the second or upper one 17 of the telescopic pair of closure members 16 and 17 and left 12L and right 12P side walls of the opening in which the air-conditioner unit casing 13 is mounted, while other resilient gasket means 17BUG (FIG. 2) are included for providing a fluid seal between the top 17BU of the second or upper bight portion 17B of the second or upper closure member 17 of the closure means 11 and the opening fixed top wall 12U.

Also in accordance with the present invention, still other resilient gasket means 16LLg and 16LRg (FIGS. 5, 6 and 8) are preferably included for providing a fluid seal between the inner surfaces of the left 16LL and right 16LR legs of the first or bottom one 16 of the telescopic closure members 16 and 17 and the left 13L and right 13R side walls of the air-conditioner casing unit 13, while still other resilient gasket means 16LLg', 17LLg' and 16LRg', 17LRg' (FIGS. 5, 6 and 8) are preferably included for respectively providing a fluid seal between the inner surfaces of the left 16LL, 17LL and right 16LR, 17LR legs of the first or bottom one 16 and second or upper one 17 of the telescopic pair of closure members 16 and 17 and the adjacent outer peripheries of the three panels 18, 22 and 23.

As best shown in FIG. 7, yet other resilient gasket means 16BDG are included for providing a fluid seal between the casing top wall 13U and the bottom 16BD of the first or bottom bight portion 16B of the first or bottom one 16 of the telescopic pair of closure members 16 and 17.

As still further illustrated, the presently preferred form 11 of the novel closure means of the present invention still further includes even other resilient gasket means 23G (FIG. 4) for providing a fluid seal between the top 16BU of the first or bottom bight portion 16B of the first or bottom one 16 of the telescopic pair of closure members 16 and 17 and still other resilient gasket means 22G (FIG. 3) for providing a fluid seal between the top of the slidably mounted panel 23 and the bottom of the fixed panel 22 which comprise the second or upper bight portion 17B of the second or upper one 17 of the telescopic pair of closure members 16 and 17 that comprise the novel closure means 11.

In accordance with a particular aspect with the present invention, the gasket means 16LRG, 16LRg and 16LRg' and the right one 16TR of the first or bottom track means are integrally formed with the right leg 16LR of the first or bottom one 16 of the telescopic pair of closure members 16 and 17 which comprise the novel closure means 11, with the resilient gasket means 16LRG, 16LRg and 16LRg' and the rigid right bottom track 16TR and central parts of the right bottom leg 16LR being simultaneously extruded from generally similar compound materials, but with the compound material which forms the resilient gasket means 16LRG, 16LRg and 16LRg' having a cured durometer hardness rating that is softer than the cured durometer hardness rating of the compound material forming the rigid track 16TR and the central parts of the leg 16LR. The resilient gasket means 16LLG, 16LLg and 16LLg' are similarly integrally formed by simultaneous extrusion with the rigid left bottom track 16TL and central parts of the left bottom leg 16LL, as are also, respectively: (A) the resilient gasket means 17LRG and 17LRg' with the rigid right upper track 17TR and central parts of the right upper leg 17LR; (B) the resilient gasket means 16LLG and 17LLg' with the rigid left upper track 17TL and central parts of the left upper leg 17LL; (C) the resilient gasket means 17BUG with the rigid bottom 21D and central parts of the cap portion 21 of the bight portion 17B of the second or upper closure member 17; (D) the resilient gasket means 16BDG with the rigid flanges 18FU and 18FD and central parts of the panel 18 forming the bight portion 16B of the first or bottom one 16 of the telescopic pair closure members 16 and 17; (E) the resilient gasket means 23G with the rigid flanges 23FU and 23FB and central parts of the panel 23 forming the bottom of the bight portion 17B of the second or upper one 17 of the telescopic pair of closure members 16 and 17; and (F) the resilient gasket means 22G with the rigid top 22U and bottom 22FD flanges and central parts of the panel 22 forming the upper part of the bight portion 17B of the second or upper closure member 17.

Typically the compound material that is used for forming the rigid leg central parts and track means, panels and flanges has a cured durometer hardness rating of about 100 and includes the following parts of the following components:

Resin: 100 parts - polyvinylchloride
 Plasticizer: 20 parts - Dioctylphthalate
 Stabilizer: 2-5 parts - Cadmium Ricineoleate
 Pigment and Colorant: 1-5 parts - Titanium Dioxide
 Filler: 20 parts - Calcium Carbonate
 Modifier: 20 parts - Acrylic like Rohm and Haas No. 120

Whereas, the typical compound material that is used for forming the more resilient gasket means has a durometer hardness rating of about 65 and includes the following parts of the following components:

Resin: 100 parts - polyvinylchloride
 Plasticizer: 35-50 parts - Dioctylphthalate
 Stabilizer: 2-5 parts - Cadmium Ricineoleate
 Pigment and Colorant: 1-5 parts - Titanium Dioxide
 Filler: 20 parts - Calcium Carbonate

Good extrusions have been obtained using the aforescribed compounds in a National Rubber Machine Company extruder Model EH and curing both materials at 300° F.

Preferably, the width dimension of each of the three panels 18, 22 and 23 is made such that the inner surfaces of the lower portions of the left 16LL and right LR legs of the first or bottom one 16 of the telescopic pair of closure members 16 and 17 can be respectively, readily, tightly engaged with the left 13L and right 13R side walls of the air-conditioning unit casing 13, while the height dimension of the lower portions of these legs 16LL and 16LR is made generally similar to that of the casing (typically 10½ inches as previously noted). The height dimensions of the three panels 18, 22 and 23 and the cap portion 21 are sized such that the closure means 11 can be telescopically retracted and extended between a minimum height of 22 inches (with the upper closure member 17 fully retracted, as for shipment to the installation site for the air-conditioning unit 10 and a maximum height of 40 inches (with the upper closure member 17 fully extended as illustrated in FIG. 1).

The presently preferred form 11 of the novel closure means of the present invention can be shipped to an installation site for the air-conditioner unit 10 detached from, but co-packaged with, the air-conditioner unit casing 13, and adjusted to the height of the remaining open space between the casing top wall 13U and the lower edge of the opening fixed top wall 12U. Preferably, this is done by, first, respectively fastening the left and right inner surfaces of the lower portions of the left 16LL and right 16RL legs and the bottom 16BD of the bight portion 16B of the first or bottom one 16 of the telescopic pair of closure members 16 and 17 to the casing left 13L and right 13R and top 13U walls with fastener means, such as the sheetmetal screws 20. Next, the casing 13 is mounted in the opening with its bottom wall 13D adjacent the opening bottom wall 12D. Then, the consumer-installer adjusts the height of the closure means 11 to that of the remaining open space between the casing top wall 13U and the opening top wall 12U by simply pulling upwardly on the top of the bight portion 17B of the slidably mounted second or upper closure member 17 and fastening the cap portion 21 thereof to the opening top wall 12U with fastener means, such as the screws 20 or the like, which are passed through laterally spaced apertures, such as the aperture 20A, that have been pre-formed therein (FIG. 2). Finally, the left and right outer surfaces of the closure means left 16LL, 17LL and right 16LR, 17LR legs are then trapped between the opening side walls 12L and 12P. Typically, the only tool needed for this job is a screwdriver.

It should be apparent to those skilled in the art that, while there has been described what, at present, is considered to be a presently preferred embodiment of this invention in accordance with the Patent Statutes, changes may be made to the disclosed apparatus without actually departing from the true spirit and

scope of this invention. For example, resins other than polyvinylchloride might be used in the compound materials and elastomeric material might be substituted for resin. It is, therefore, intended that the appended claims shall cover such modifications and applications that do not depart from the true spirit and scope of the present invention.

What is claimed is:

1. Readily adjustable and installable closure means for providing a fluid seal between a hollow casing of an air-conditioner unit, having top and bottom walls interconnected by a pair of spaced apart left and right side walls, and the left and right side and top walls of a generally vertically arranged opening in which said casing is mounted with its bottom wall adjacent the bottom wall of said opening, said closure means comprising:

a first inverted generally U-shaped closure member including:

a first pair of legs of plastic material having rigid inner portions respectively engageable with said casing left and right side walls and integrally formed flexible outer gasket portions respectively engageable with said opening side walls, and

a first plastic panel secured to and joining said legs and having a flexible bottom edge engageable with said casing top wall; and

a second inverted generally U-shaped closure member including:

a second pair of legs of plastic material including rigid portions mounted in track means provided by the rigid inner portions on said first pair of legs for slidable telescopic movement relative to said first pair of legs and having flexible integrally formed gasket portions respectively engageable with said opening side walls; and

a second plastic panel bridging said second pair of legs in overlapping relationship to said first panel and a flexible upper member connecting said legs for engagement with said opening top wall;

said first and second pairs of legs being extruded from generally similar compound materials, one of which forms the flexible gasket portions and is softer than the compound material forming the rigid inner portions of said legs.

2. The invention of claim 1, wherein said second closure member comprises a second panel mounted in second track means provided in the rigid portions of said second pair of legs for slidable movement relative to the first panel of said second closure means, said second panel overlapping the panels in both of said closure members.

3. The invention of claim 2, further including gasket means for providing a fluid seal between the outer peripheries of said panels and surfaces adjacent thereto.

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