March 12, 1968 R. E. DYAS ET AL 3,372,557

AIR CONDITIONING UNIT

Filed Sept. 12, 1966 3 Sheets-Sheet 1

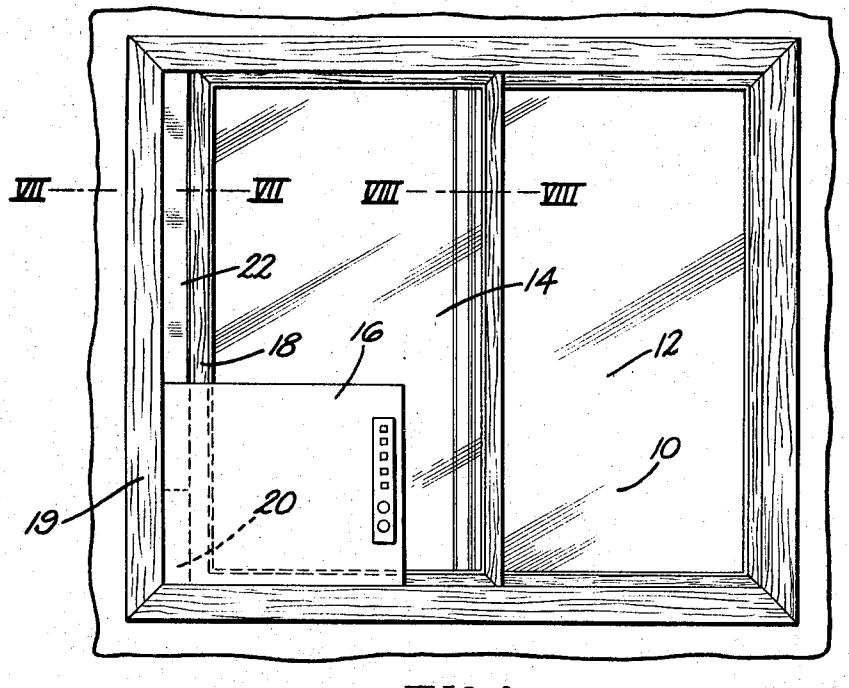


FIG. 1

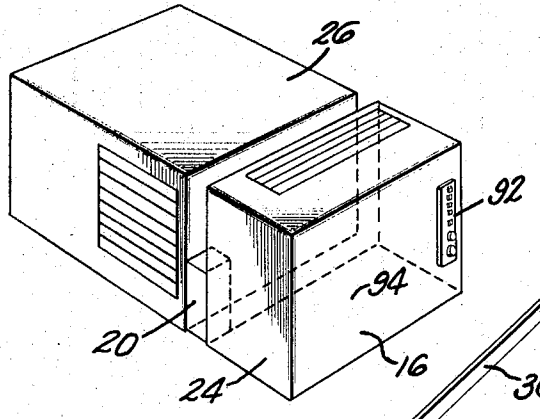


FIG. 2

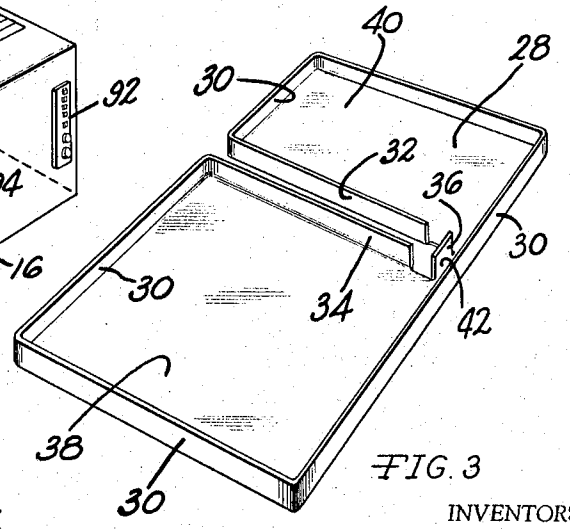


FIG. 3

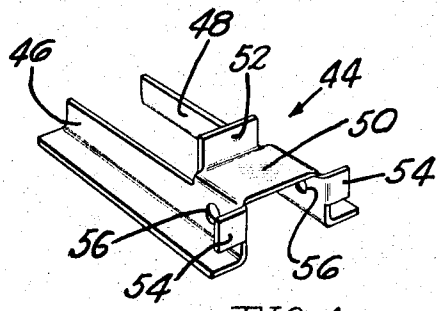


FIG. 4

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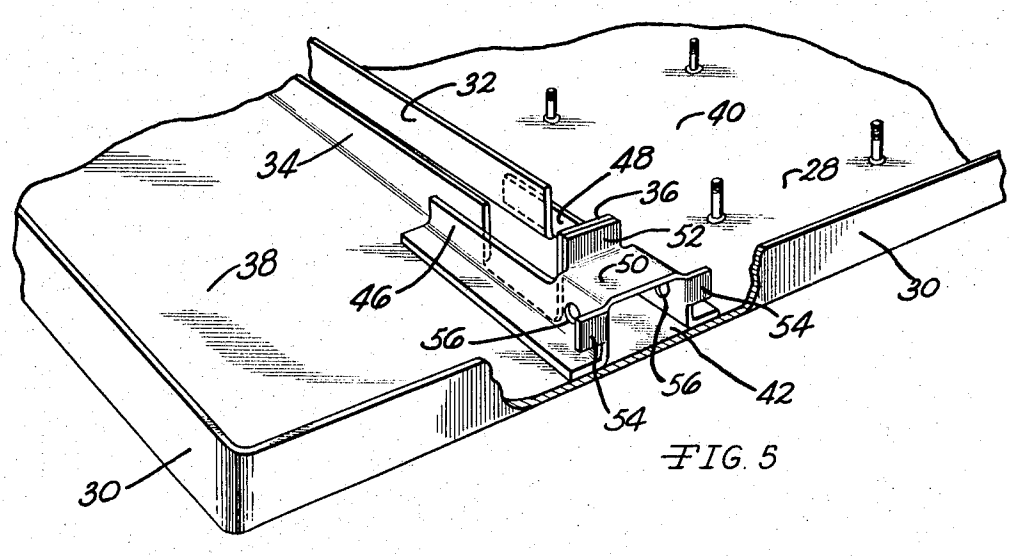


FIG. 5

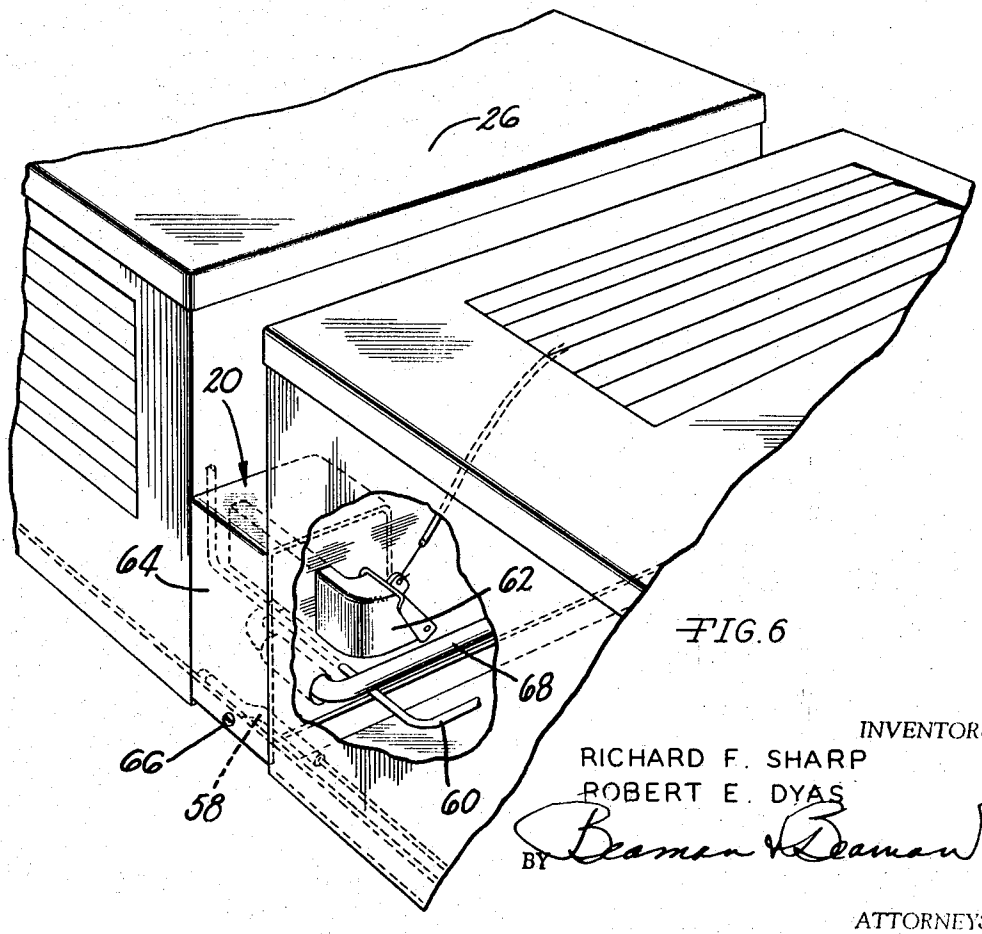


FIG. 6

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AIR CONDITIONING UNIT

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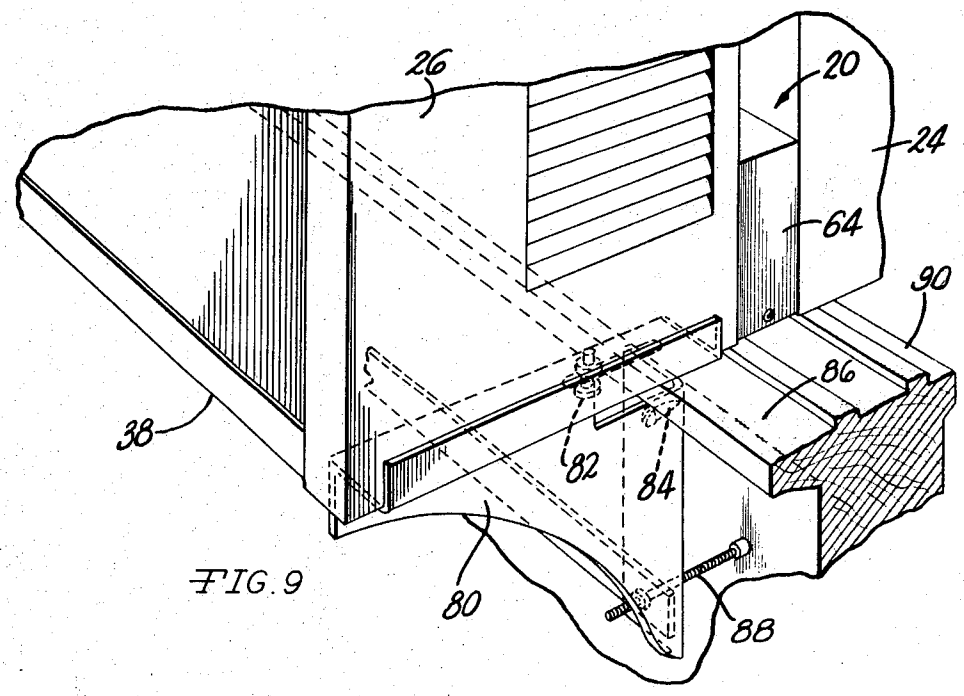


FIG. 9

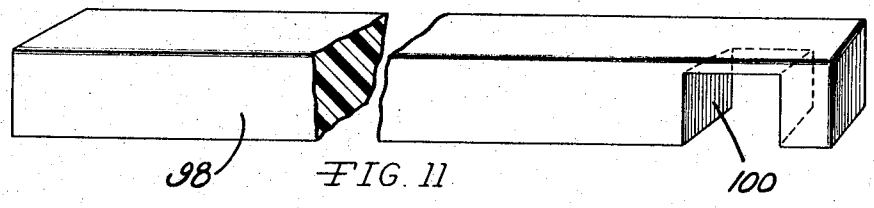


FIG. 11

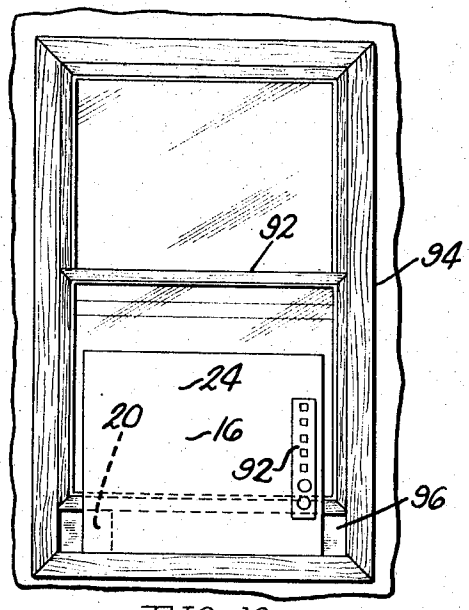


FIG. 10

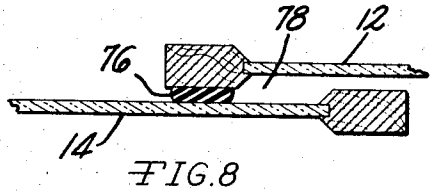


FIG. 8

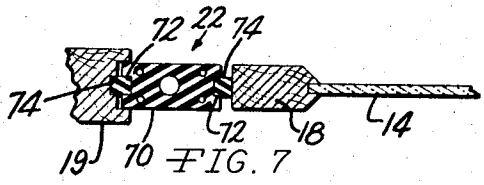


FIG. 7

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United States Patent Office 3,372,557 Patented Mar. 12, 1968

3,372,557

AIR CONDITIONING UNIT

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Filed Sept. 12, 1966, Ser. No. 578,702
7 Claims. (Cl. 62—262)

ABSTRACT OF THE DISCLOSURE

The invention resides in an air conditioning unit for installation in both sliding and double-hung windows in which a common base is provided for evaporator and compressor cabinet structures located on opposite sides of the window. A slot in the common base terminates at a narrow, reinforced corner common to the sections spaced by the slot. The evaporator and compressor cabinet structures are carried upon the two sections and functionally connected to each other across the common reinforced corner by conduit structure.

Heretofore, it has been proposed to partially divide the cabinet structure of a window air conditioning unit in such a manner that a part of the window structure could be disposed within the profile of the cabinet. In the Lipman Patent No. 2,604,763 such a unit is shown adapted to a double-hung window. The Deering Patent No. 2,610,483 shows a unit for a casement window in which the condenser section is partially divided to accommodate a vertical mullion between two unglazed lights. However, the arrangements of these two patents are not adaptable to horizontally sliding windows.

According to the invention, the advancement in the art of window air conditioners is characterized by a split chassis having a condenser section and an evaporator section in spaced relation except for a narrow relatively rigid common connector located between said sections and disposed adjacent the corners thereof. When installed in a window having a sliding sash, the sliding sash, when substantially closed, is located between the condenser and evaporator sections and abuts the common connector. A suitable filler seals the narrow opening between the sliding sash and the window frame which results from the interference of the common connector. In the vertical projection of the common connector are housed the electrical, refrigerant, condensation and air connections extending between the evaporator and condenser sections.

More specifically, the invention takes the form of a relatively flat, rigid sheet metal chassis or base having two spaced pan sections each having a rigid reinforcing common connector in one corner. The edges of the spaced sections are flanged for rigidity, as are the edges of the common connector which is preferably a box section. The spaced pan sections provide support for the evaporator condenser structure and the housings therefor.

Thus, an object of the invention is to provide an air conditioning unit specially adapted for horizontally sliding windows which is sufficiently rigid to enable the same to be handled during transportation and to be installed by homeowners and other unskilled persons, with the overhanging condenser section capable of being conveniently supported from the sill.

Another object is to provide an air conditioning unit which lends itself to installation in both horizontally sliding and double-hung windows.

A further object is to provide an air conditioning unit which is conveniently adapted for use with sliding windows as well as being adapted for installation in walls and bulkheads and is of such a design that maximum heat and

sound insulation takes place between the evaporator and condenser sections.

A still further object of the invention resides in the provision of a "split," two-section, sheet metal base, each section having a common connector at one corner which reinforces the spaced sections of the base upon which the evaporator and condenser housing and associated mechanism of an air conditioning unit are carried.

These and other objects and advantages will more fully appear from the following specification and appended claims:

In the drawings,

FIG. 1 is an elevational view of a conventional sliding window with wooden sash showing the air conditioning unit installed as viewed from the inside,

FIG. 2 shows the unit of FIG. 1 in perspective, as removed from the window,

FIG. 3 is a perspective view of the sheet metal base of the unit shown in FIG. 2 prior to attachment of the reinforcement structure to the common connector,

FIG. 4 is a perspective view of the reinforcement for the common connector of the base sections,

FIG. 5 is a fragmentary view of the reinforcement of FIG. 4 welded into the base structure of FIG. 2,

FIG. 6 is an enlarged fragmentary perspective view of the unit showing the duct and vent structure disposed in the vertical projection of the common connector,

FIG. 7 is a sectional view of the filler and seal taken on line VII—VII of FIG. 1,

FIG. 8 is a view similar to FIG. 7 taken on line VIII—VIII of FIG. 1 showing the seal between the fixed and sliding sashes of the window.

FIG. 9 shows the sill mounting detail of the unit shown in FIG. 1,

FIG. 10 shows the unit of FIG. 1 mounted in a double-hung window, and

FIG. 11 shows the sealing strip used when the unit of FIG. 1 is installed in a double-hung window.

Referring to FIG. 1, a conventional sliding window **10** is shown having a fixed sash **12** and a horizontally sliding sash **14**. An air conditioning unit **16** is shown positioned in the window **10** with the sash **14** substantially closed, the narrow vertical opening between the end **18** of the sash **14** and the frame **19**, caused by the interference of the reinforcing corner structure, generally designated **20**, of the unit **16** being shown sealed by a suitable filler means, generally indicated at **22**.

As shown in FIG. 2, the unit **16** comprises an evaporator housing **24** and a condenser housing **26** carried upon a chassis or base structure having a common connector which partially defines a reinforcing corner structure generally designated **20** in FIGS. 1 and 2.

The main structural base member for the support of the housings **24** and **26** and the conventional refrigerating apparatus disposed therein preferably takes the form of a one-piece sheet metal "split" pan **28** having drawn flanges **30** and lanced and turned flanges **32**, **34** and **36**. The sections **38** and **40** of the pan **28** are attached by a common connector portion **42** disposed at one corner of each of the rectangular sections **38** and **40**, the portion **42** being one of the structural elements of the reinforcing corner structure of sections **38** and **40**.

To reinforce the portion **42** and the flanges **30** and **36** directly adjacent thereto, a sheet metal part, generally designated **44**, of the shape shown in FIG. 4 is provided. As shown, the part **44** comprises two similar parallel angle portions **46** and **48** having a common connecting web **50** with a vertical flange **52**. Integral with the portions **46** and **48**, and located on the vertical legs thereof, are attachment flanges **54**.

In FIG. 5 the part **44** of FIG. 4 is shown welded in position, the flanges **54** being welded to the adjacent flange

30, the flange 52 being welded to the flange 36 and the angle portions 46 and 48 being welded to the flanges 32 and 34 as well as to the pan 28. In this manner, a rigid, six-sided box section is provided in the region of the common connector portion 42 of the pan 28.

As shown in FIG. 4, the part 44 is preferably provided with opening 56 to accommodate the condenser drain tube 58 extending between the evaporator and condenser sections of the unit 16 (see FIG. 6).

Substantially within the vertical projection of the web 50 of the reinforced corner structure is preferably located the refrigerant tube 60 and the air vent conduit 62. A suitable inverted U-shape cover 64 is shown masking the tube 60 and conduit 62 as well as the part 44, the cover 64 also functioning to fill the space between the housings 24 and 26 in the region of the reinforced corner structure. A screw 66 is shown holding the cover 64 to the flange 30.

To reduce the vertical dimension of the structure above the portion 42 of the pan 28 to a minimum, the air vent 62 may be omitted and the refrigerant tube 60 may be inserted in holes provided in the part 44 in the same manner as the drain tube 54. Similarly, the conduit 68 for the electrical conduit may be lowered into the profile of the part 44. For a more complete disclosure of the air vent 62 and its associated adjustment structure, reference may be had to copending application Ser. No. 586,865, filed Oct. 14, 1966.

To seal the openings between the sash 14 and the frame 19, as well as between the sashes 12 and 14, caused by the interference of the corner structure 20, a suitable filler strip 70 is provided with grooves 72 in which to receive and support the sealing strips 74 which engage with the edge 18 and frame 19 (see FIG. 7), the lower end of the strip 70 resting on the top of the cover 64 and the strips 74 extending along both sides of the cover 64. As shown in FIG. 8, a vertical sealing strip 76 seals the vertical space 78 between the sashes 12 and 14. A sealing strip is also provided between the portion 42 of the pan 28 and the channel of the window frame in which the sliding sash operates.

FIG. 9 shows one manner of supporting the unit 16 on the window sill. As illustrated, support brackets 80 are located at opposite sides of the condenser portion and attached to the pan section 38 by a cap screw 82. Lag-screws 84 attach the brackets 80, at the proper height, to the sill 86 while each adjusting screw 88, threaded in the brackets 80, abuts the sill 86 to take the torque. In practice, the entire weight of the unit 16 may be carried on the brackets 80 with the evaporator portion of the unit 16 slightly spaced above the stool 90.

By retaining the vertical dimension of the reinforcing corner 20 to a minimum, the unit 16 is well adapted for installation in double-hung windows as well as horizontally sliding windows. Such use is shown in FIG. 10 wherein the lower sash 92 of the double-hung window 94 is shown lowered between the condenser and evaporator housings 24 and 26 with the opening 96 between the window stool and the lower edge of the sash 92 approximating the vertical dimension of the reinforcing corner 20. In FIG. 11 is shown a sealing and filler member 98 having a clearance portion 100 to accommodate the reinforcing corner 20 and fill the opening 96.

It should be understood that the controls 102 for the unit 16 may be located on either the right side of the front panel 104, as shown, or on the left side. Also, the structure constituting the reinforcing corner 20 may be located at the left end of the space between the sections 24 and 26, as shown in FIG. 2, to accommodate a window which slides to the left to close, as shown in FIG. 1, or at the right end for use in a window which slides to the right to close.

What is claimed is:

1. An air conditioning unit comprising a "split" two-section base, each section of the base being generally rectangular and having a common connector extending between opposed corner portions of said section to provide a common reinforcing corner structure for said sections, said sections being disposed in substantially the same horizontal plane and horizontally separated from each other except at said common connector, condenser structure supported on one of said sections and evaporator structure supported on the other of said sections, and conduit means connecting said condenser and evaporator structures and extending between said sections, said means being substantially disposed within the vertical projection of said reinforcing corner structure.

2. An air conditioning unit as defined in claim 1, wherein said reinforcing corner structure is of box-like form and at least one of said conduit means is housed by said corner structure.

3. An air conditioning unit as defined in claim 1, wherein housings are provided for said condenser and evaporator structures, and means for supporting said housings on said sections in spaced horizontal relation whereby a vertical insulating wall such as the sash of a horizontally sliding window may be disposed between said housings and their supporting base sections.

4. An air conditioning unit as defined in claim 1, wherein said base is of one-piece construction with flanged edges with said corner structure being partially defined thereby.

5. An air conditioning unit as defined in claim 4, wherein said reinforcing corner structure comprises a reinforcing member imposed upon said base and being in the form of spaced parallel angular portions attached to said flanged edges and connected by a common web in spaced relation to said base to define a box section therewith.

6. An air conditioning unit as defined in claim 3, wherein conduit means for the venting of air between said housings is directly imposed upon said reinforcing corner structure and between the vertical projection of the sides thereof spanning said structure.

7. An air conditioning unit as defined in claim 3, wherein clearance is provided for vertical insulating wall structure between said housings except in the immediate area of said reinforcing corner structure whereby either a vertically or horizontally sliding window sash may be substantially disposed between said housings with a minimum of interference to the closing of the sash.

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WILLIAM J. WYE, *Primary Examiner.*