Dec. 15, 1959 F. TATAY 2,917,128

PORTABLE, EXTENSIBLE AIR CONDITIONER

Filed Nov. 17, 1958

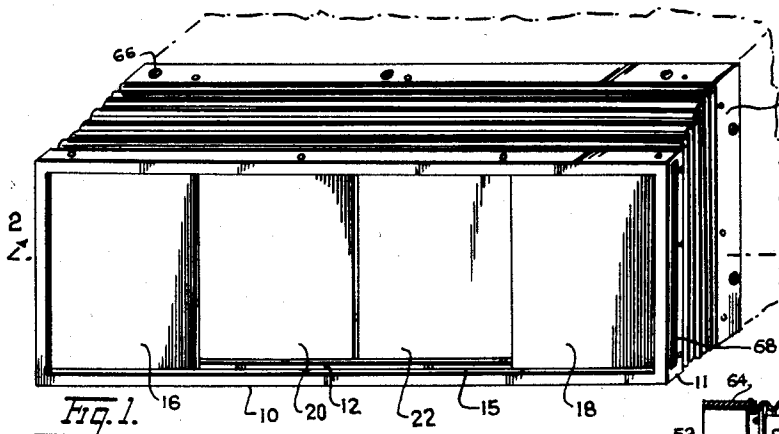


Fig. 1.

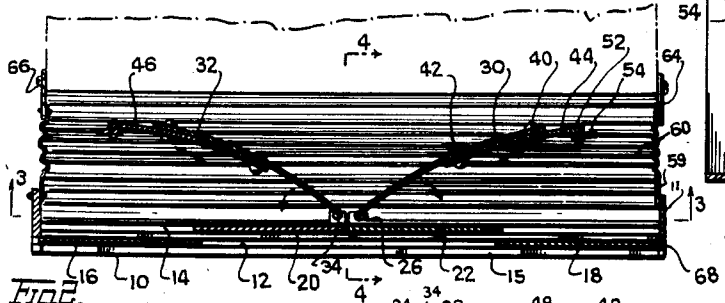


Fig. 2.

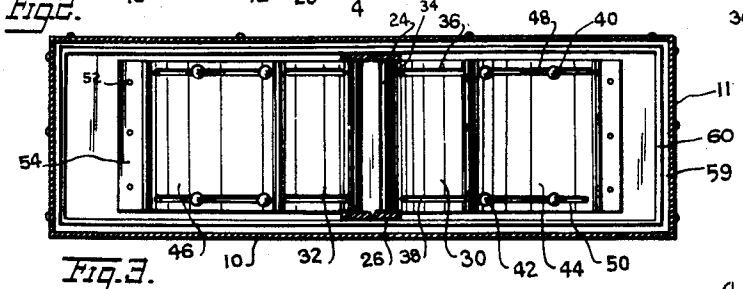


Fig. 3.

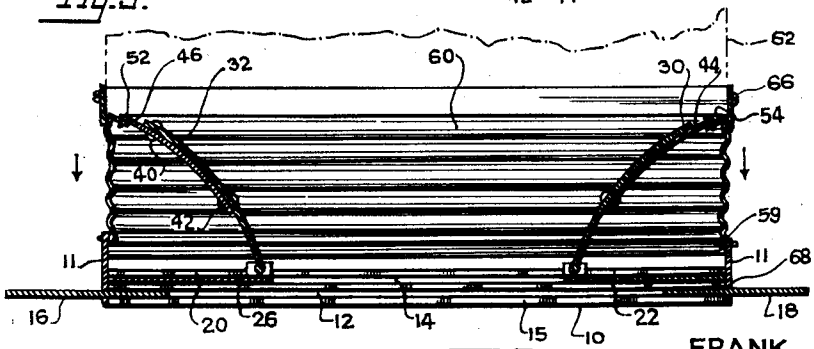


Fig. 5.

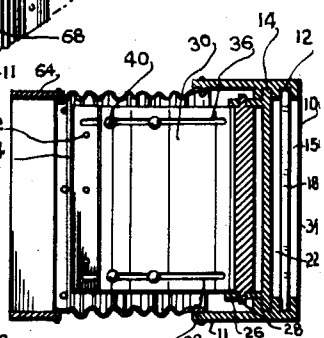


Fig. 4.

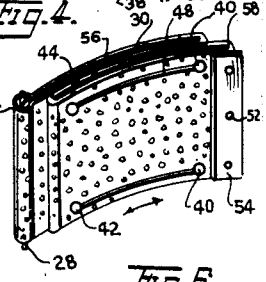


Fig. 6.

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PORTABLE, EXTENSIBLE AIR CONDITIONER

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10 Claims. (Cl. 181—36)

This invention relates to room air conditioners and particularly to an attachment for providing an extensible duct disposable between a window and the air conditioner.

It has been noted in the operation of conventional air conditioners, particularly those employing flexible air ducts, that a considerable amount of air turbulence develops in the ducts leading to the refrigeration unit of the air conditioner. Such air turbulence results in a loss of efficiency since the air suction devices such as fans must work against this air turbulence. In addition, the operation of such units have an objectionably high noise level. The present invention is directed at overcoming these and other difficulties.

According to the invention there is provided a rectangular bellows attached to a frame at one end. In the frame which is adapted to fit in a window there are provided movable panes for adjusting the fit of the frame in the window and for adjusting the size of the opening into the bellows. Certain of the panes are provided with pivotable, telescopic vanes so that the configuration of the air path from the window to the air conditioner can be set to obtain minimum turbulence in the air stream leading into the air conditioner and to accomplish a silencing effect during operation of the air conditioner.

It is, therefore, a principal object of the invention to provide a flexible bellows type of air duct for an air conditioner with adjustable slidable panes.

It is a further object to provide a flexible bellows type of air conditioner with an adjustable throat formed by pivotable and telescopic vanes.

It is a still further object to provide sound-absorbing and insulating vanes in an air conditioner air inlet duct.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is a perspective view of the duct embodying the invention.

Fig. 2 is a horizontal sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a front elevational sectional view taken on line 3—3 of Fig. 2.

Fig. 4 is a transverse sectional view taken on line 4—4 of Fig. 2.

Fig. 5 is a sectional view similar to Fig. 2 with bellows expanded.

Fig. 6 is a perspective view of one form of vane assembly usable in the duct.

Referring to Figs. 1–5, there is shown a rectangular metal frame 10 in which are provided two tracks 12 and 14 closely spaced and parallel to each other. In the forward track 12 is mounted a pair of rectangular plates 16 and 18. These plates are slidably positionable in the frame and constitute panes which can be used to adjust

the size of the rectangular opening 15 in the frame. Slidably mounted in the other track 14 is another pair of rectangular panes 20, 22 which supplement the panes 16, 18 for adjusting the size of the opening 15 in the frame.

Integrally formed with the inner sides of panes 20, 22 at their inner edges are bracket plates 24, 26. One pair of bracket plates is provided for each of the panes. The bracket plates are apertured to receive trunnions 28 extending vertically from vanes 30 and 32. The vanes are thus pivotally mounted on the bracket plates to move on vertical axes at their enlarged ends 34. Each vane is curved and has two spaced slots 36, 38. A double-headed pin 40 is secured at the outer end of each slot. Slidably juxtaposed to vanes 30, 32 are vanes 44, 46, respectively. These are curved plates provided with slots 48, 50 which are aligned with slots 36, 38, respectively. Double-headed pins 42 are secured at inner ends of slots 48, 50. Pins 40 and 42 pass through both vanes of each pair and provide a means whereby the vanes can be telescoped arcuately. Secured to the outer end of each of vanes 44, 46 by rivets 52 are flexible rubber flaps 54. Each vane is preferably made of metal. The metal vane can be covered with sponge rubber or other sound-absorbing material as shown by the rubber jackets 56 and 58 in Fig. 6.

Secured in the rectangular flange 11 of frame 10 is the forward rim 59 of a rectangular flexible, pleated duct 60. This duct is in the form of a rubber bellows which can be extended and retracted as necessary to provide a sealed air inlet between a window and the casing 62 of an air conditioner unit indicated by dotted lines in Figs. 1, 2 and 5. A rectangular frame 64 retains the rear end of the duct 60 and may be secured to the casing of the air conditioner unit by screws 66. Slots 68 are provided in the sides of flange 11 to permit passage of plates 16 and 18 therethrough.

In operation of the assembly, frame 64 will be attached to the casing 62 and the unit will be disposed at a window to provide an air inlet for the air conditioner. Bellows 60 will be suitably extended or retracted as necessary. Frame 10 will be inserted in the window and plates 16 and 18 can be adjusted outwardly as indicated in Fig. 5 to insure a snug fit in the window. The size of the opening at the throat of the duct 60 may be determined by adjustably positioning panes 20 and 22 in track 14. The vanes 30, 44 and 32, 46 may then be pivoted on brackets 24, 26 for a desired angular positioning with respect to the opening 15 in the frame. The vanes 44 and 46 will be telescoped inwardly or outwardly so that in the optimum arrangement flaps 54 will be positioned against the sides of the bellows as indicated in Fig. 5.

In Fig. 5, the bellows are extended to their maximum extent and the panes 18 and 20 are opened to their maximum extent. In Figs. 1–4, the vanes 20 and 22 are closed and the panes 16 and 18 are retracted. The arrows in Fig. 2 and Fig. 6 show how the vanes can be retracted and expanded slidably with respect to each other. Pins 42 slide freely in slots 36, 38 and pins 40 slide freely in slots 48, 50.

There has thus been provided means for seating the forward end of a frame attached to a flexible duct into a window and for adjusting the size of the air inlet to the duct. In addition, there has been provided a tapered throat for an air inlet to an air conditioner. The tapered throat providing a poor acoustic impedance coupling to the sound emitting air conditioner so that the sound is poorly conducted therefrom outwardly of the frame 10. In addition, the throat may be lined with acoustic-absorbent material to increase the muffling or silencing effect. The tapered passage provided by the curved vanes pro-

vides a smooth path for air flow inwardly without turbulence. The vanes, by means of their pivoted telescopic arrangement, can be adjusted to provide this smooth path in any position of extension and retraction of the flexible bellows-like duct. The laterally movable panes 18 and 22 permit various sizes of air inlets to be set within the frame opening with the curved vanes correspondingly adjusted to provide the smooth air path above mentioned.

While I have illustrated and described the preferred embodiment of my invention, it is to be understood that I do not limit myself to the precise construction herein disclosed and that various changes and modifications may be made within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

1. An air inlet duct for an air conditioner, comprising a rectangular, open frame having two spaced parallel tracks formed therein, a flexible pleated conduit connected to one open end of the frame, a first pair of panes slidably disposed in one of said tracks, a second pair of panes slidably disposed in the other of said tracks, and a pair of curved vanes pivotally carried by said second pair of panes to provide a flaring passage with smooth walls extending from the frame and through said conduit.

2. An air inlet duct for an air conditioner, comprising a rectangular, open frame having two spaced parallel tracks formed therein, a flexible pleated conduit connected to one open end of the frame, a first pair of panes slidably disposed in one of said tracks, a second pair of panes slidably disposed in the other of said tracks, and a pair of curved vanes pivotally carried by said second pair of panes to provide a flaring passage with smooth walls extending from the frame and through said conduit, said vanes being jacketed in a sound-absorbing material to muffle sound issuing from said air conditioner.

3. An air inlet duct for an air conditioner, comprising a rectangular, open frame having two spaced parallel tracks formed therein, a flexible pleated conduit connected to one open end of the frame, a first pair of panes slidably disposed in one of said tracks, a second pair of panes slidably disposed in the other of said tracks, and a pair of curved vanes pivotally carried by said second pair of panes to provide a flaring passage with smooth walls extending from the frame and through said conduit, and a second pair of curved vanes respectively juxtaposed to the first-named curved vanes and telescopically mounted therewith.

4. An air inlet duct for an air conditioner, comprising a rectangular, open frame having two spaced parallel tracks formed therein, a flexible pleated conduit connected to one open end of the frame, a first pair of panes slidably disposed in one of said tracks, a second pair of panes slidably disposed in the other of said tracks, and a pair of curved vanes pivotally carried by said second pair of panes to provide a flaring passage with smooth walls extending from the frame and through said conduit, and a second pair of curved vanes respectively juxtaposed to the first-named curved vanes and telescopically mounted therewith, said vanes being jacketed in a sound-absorbing material to muffle sound issuing from said air conditioner.

5. An air inlet duct for an air conditioner, comprising a frame having a track formed therein, a flexible pleated conduit connected to one end of the frame, a pair of rectangular panes slidably disposed in said track, a first pair of vanes pivotally carried by said panes respectively, and a second pair of vanes respectively juxtaposed to the first vanes and telescopically mounted therewith, to provide an adjustable flaring passage with smooth walls extending from the frame and through said conduit.

6. An air inlet duct for an air conditioner, comprising a frame having a track formed therein, a flexible pleated conduit connected to one end of the frame, a pair of rectangular panes slidably disposed in said track, a first pair of vanes pivotally carried by said panes respectively, and a second pair of vanes respectively juxtaposed to the first vanes and telescopically mounted therewith, to provide an andjustable flaring passage with smooth walls extending from the frame and through said conduit, said vanes being jacketed in a sound-absorbing material to muffle sound issuing from said air conditioner.

7. An air inlet duct for an air conditioner, comprising a frame having a track formed therein, a flexible pleated conduit connected to one end of the frame, a pair of rectangular panes slidably disposed in said track, a first pair of vanes pivotally carried by said panes respectively, and a second pair of vanes respectively juxtaposed to the first vanes and telescopically mounted therewith, to provide an adjustable flaring passage with smooth walls extending from the frame and through said conduit, said frame being laterally slotted and having a second track formed therein, and another pair of panes laterally slidable in said second track and through the slots in the frame for fitting the other end of said frame in a window.

8. An air inlet duct for an air conditioner, comprising a frame having a track formed therein, a flexible pleated conduit connected to one end of the frame, a pair of rectangular panes slidably disposed in said track, a first pair of vanes pivotally carried by said panes respectively, and a second pair of vanes respectively juxtaposed to the first vanes and telescopically mounted therewith, to provide an adjustable flaring passage with smooth walls extending from the frame and through said conduit, said frame being laterally slotted and having a second track formed therein, and another pair of panes laterally slidable in said second track and through the slots in the frame for fitting the other end of said frame in a window, there being flexible flaps secured to outer ends of said second pair of vanes for substantiamlly sealing opposite walls of said passage with opposite sides of said conduit.

9. An air inlet duct for an air conditioner, comprising a frame having a track formed therein, a flexible pleated conduit connected to one end of the frame, a pair of rectangular panes slidably disposed in said track, a first pair of vanes pivotally carried by said panes respectively, and a second pair of vanes respectively juxtaposed to the first vanes and telescopically mounted therewith, to provide an adjustable flaring passage with smooth walls extending from the frame and through said conduit, said frame being laterally slotted and having a second track formed therein, and another pair of panes laterally slidable in said second track and through the slots in the frame for fitting the other end of said frame in a window, there being flexible flaps secured to outer ends of said second pair of vanes for substantially sealing opposite walls of said passage with opposite sides of said conduit, each of said vanes being arcuate in form to provide a turbulence free air path through said passage and a mismatch in acoustic impedance between said passage and the opening in said frame.

10. An air inlet duct for an air conditioner, comprising a frame having a track formed therein, a flexible pleated conduit connected to one end of the frame, a pair of rectangular panes slidably disposed in said track, a first pair of vanes pivotally carried by said panes respectively, and a second pair of vanes respectively juxtaposed to the first vanes and telescopically mounted therewith, to provide an adjustable flaring passage with smooth walls extending from the frame and through said conduit, said frame being laterally slotted and having a second track formed therein, and another pair of panes laterally slidable in said second track and through the slots in the frame for fitting the other end of said frame in a window, there being flexible flaps secured to outer ends of said second pair of vanes for substantially sealing opposite walls of said passage with opposite sides of said conduit, each of said vanes being arcute in form

to provide a turbulence free air path through said passafe and a mismatch in acoustic impedance between said passage and the opening in said frame, each of said vanes being covered with sound-absorbing material to muffle sound issuing from said air conditioner and through said conduit.

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