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Hudson

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[54] **BLOWER HOUSING**

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[73] Assignee: **Molded Products Company**, Fort Worth, Tex.

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[52] **U.S. Cl.** **62/426**, 62/419, 165/121, 165/122, 415/219

[51] **Int. Cl.** **F25d 17/06**

[58] **Field of Search** 62/426; 165/121, 122; 415/219

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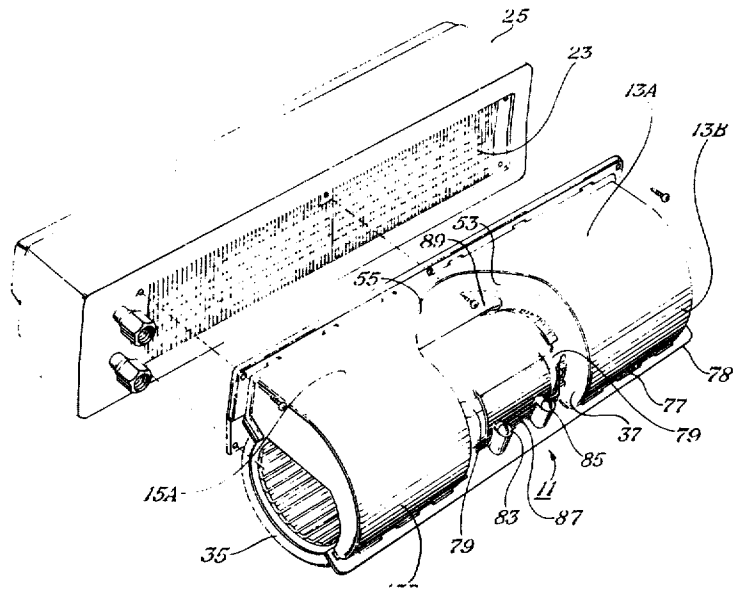
Primary Examiner—William J. Wye

Attorney, Agent, or Firm—Wofford, Felsman, Fails & Zobal

[57] **ABSTRACT**

The specification discloses a blower housing for dual squirrel cage blowers driven by an intermediately disposed motor for achieving even air distribution for the evaporator coil of an air conditioner. The housing has a front wall with an air egress region for each blower with a curved baffle located in the housing above and between the blowers for directing air toward the central region of the evaporator coil. In addition, there are provided curved deflectors located in the housing above each blower for deflecting air toward the central region of the evaporator coil. A horizontal slat also is provided in the front wall dividing each air egress region into upper and lower air openings for providing a back pressure to enhance flow of air toward the central region of the evaporator coil.

6 Claims, 9 Drawing Figures



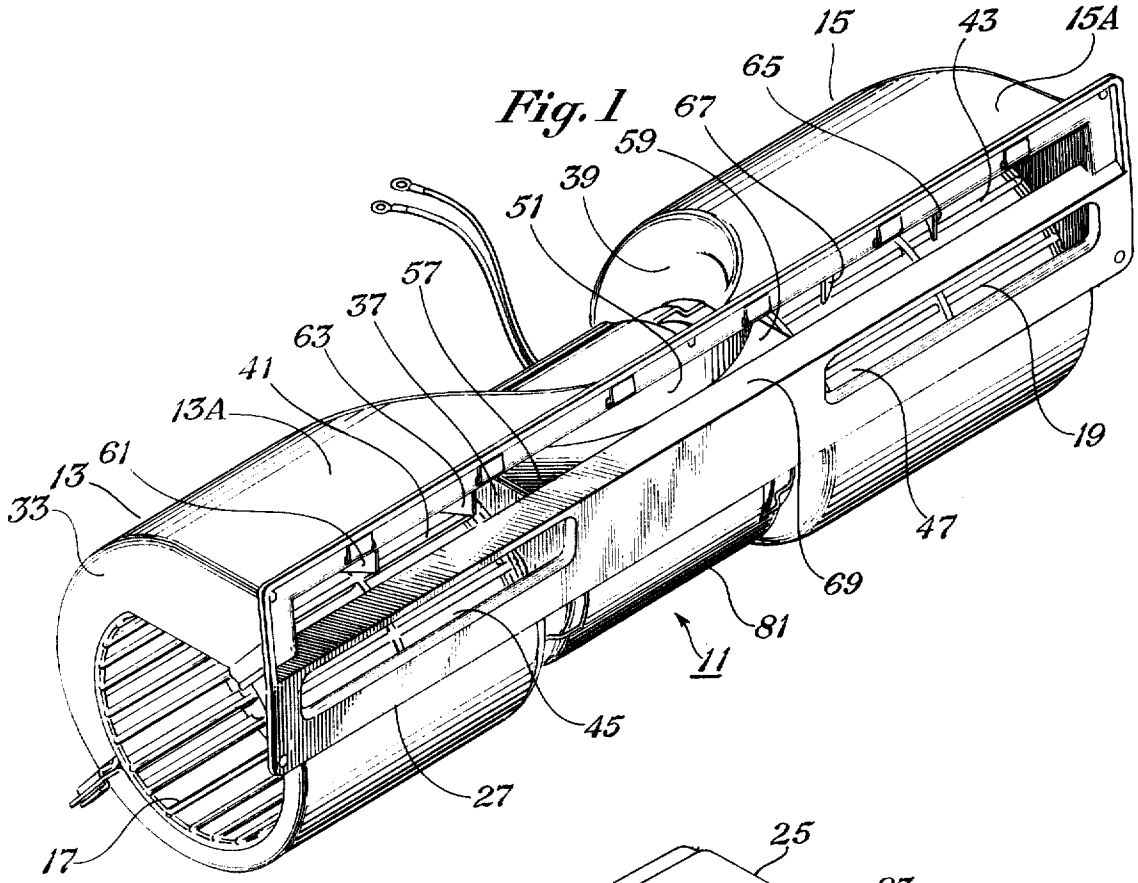

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43
15A
65
67
59
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13A
61
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33
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69
81
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45
27
17

Fig. 1

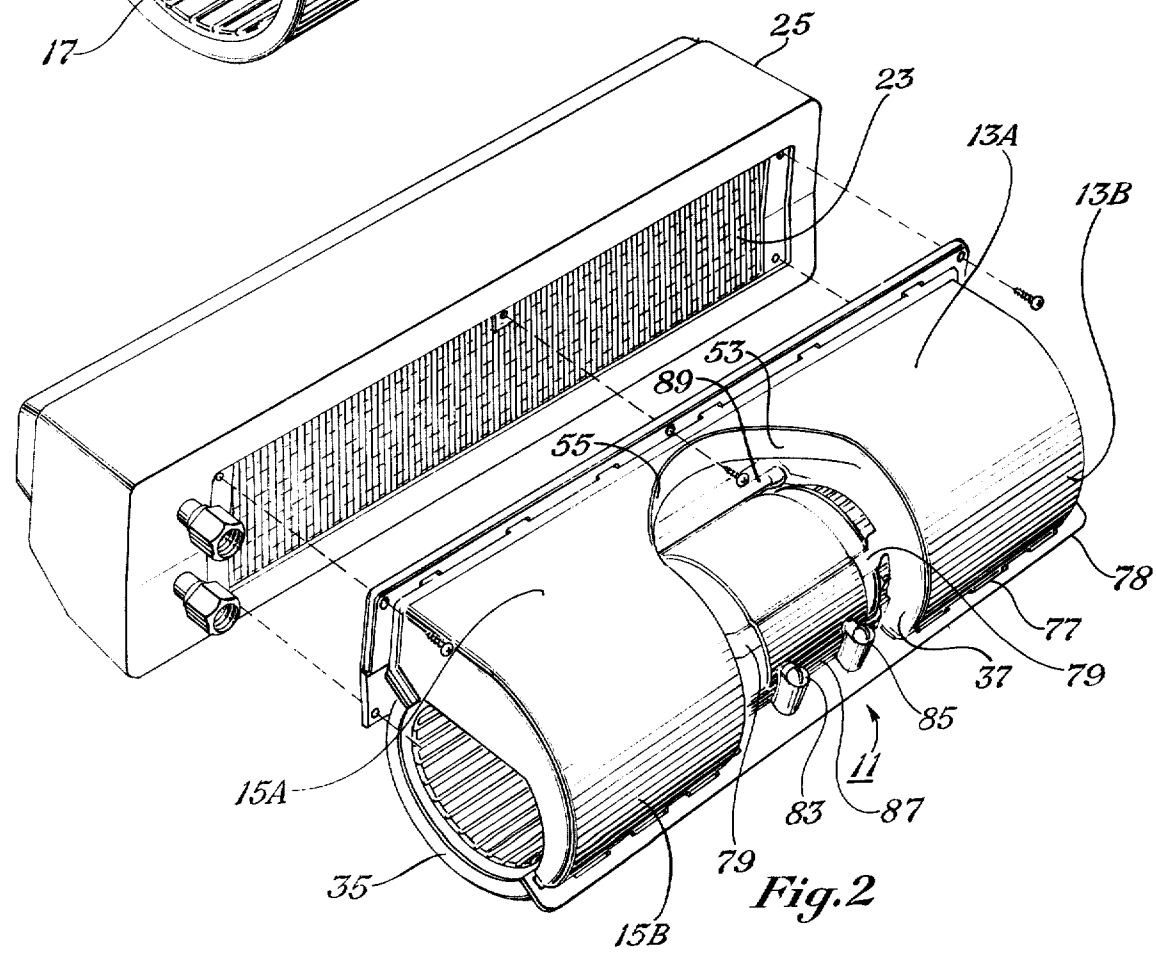

25
23
13A
13B
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89
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78
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37
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85
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15A
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87
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35
15B

Fig. 2

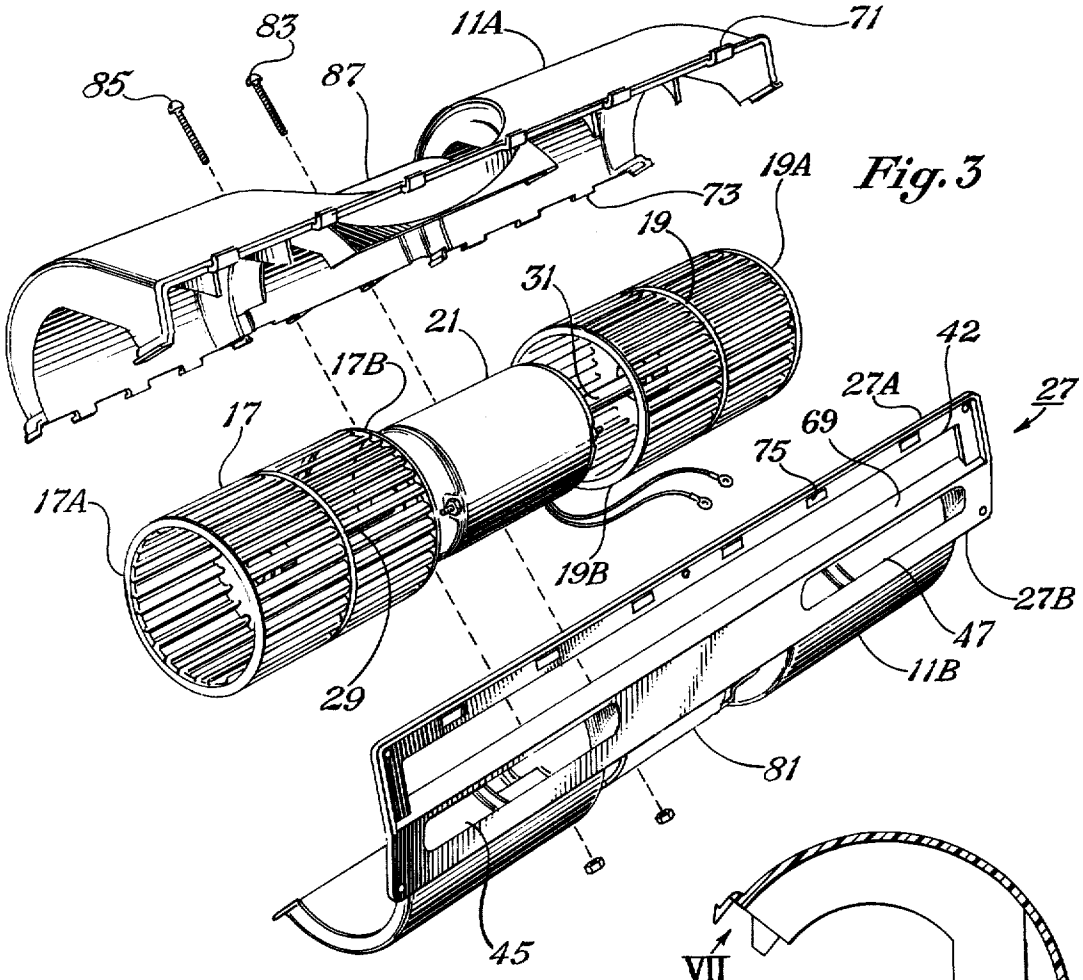


Fig. 3

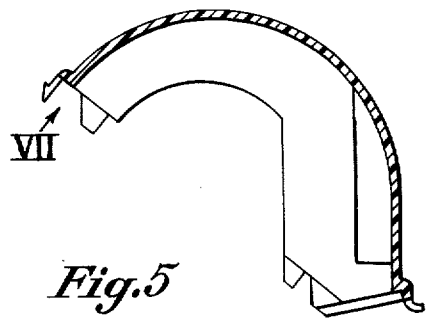


Fig. 5

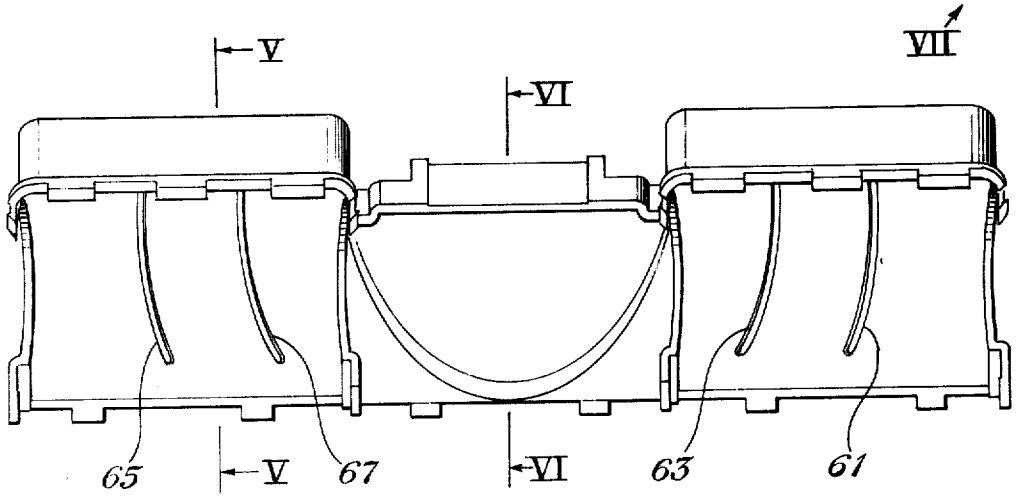


Fig. 4

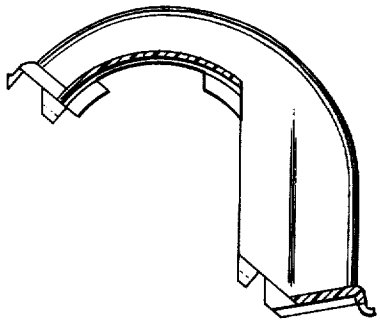


Fig. 6

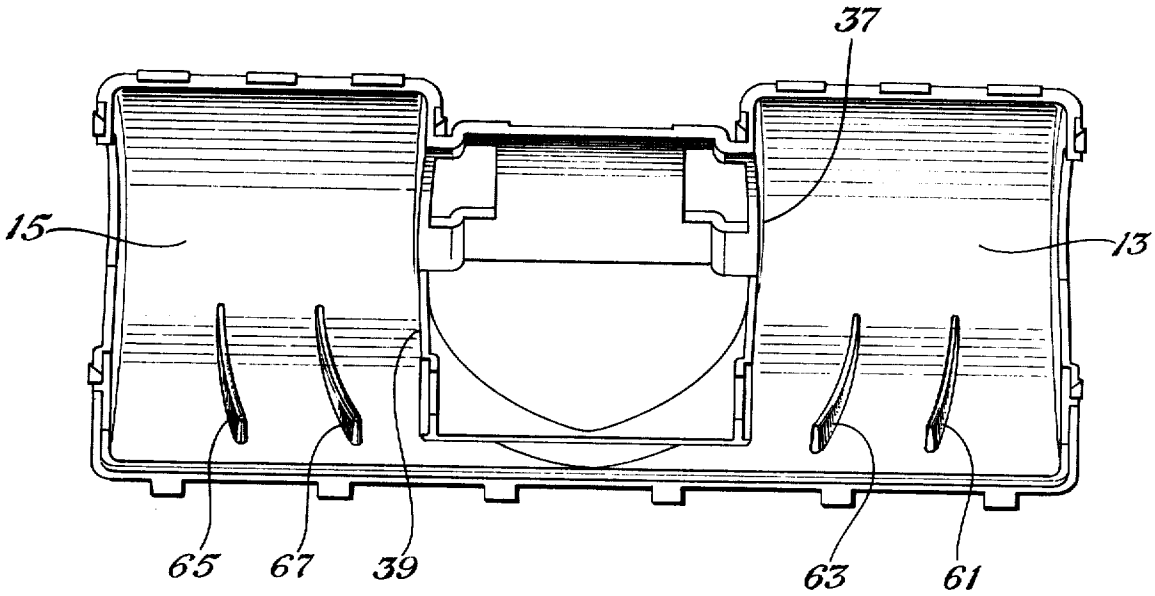


Fig. 7

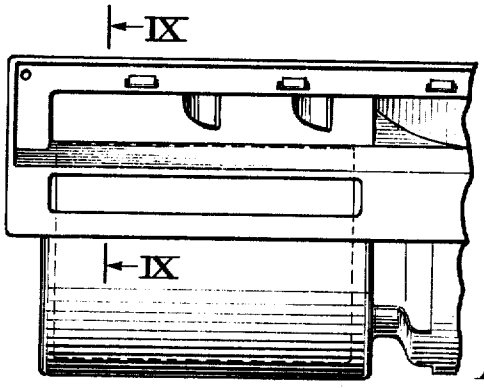


Fig. 8

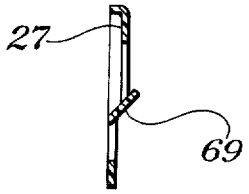


Fig. 9

BLOWER HOUSING

BACKGROUND OF THE INVENTION

This invention relates to a blower housing for dual squirrel cage blowers driven by an intermediately disposed motor for achieving even air distribution on the evaporator coil of an air conditioner.

In blowers which utilize dual squirrel cage blowers driven by an intermediately disposed motor for blowing air on the evaporator coil of an air conditioner, there has been a problem in achieving even air distribution on the evaporator coil. This has been due to the fact that the blower housing air outlets conventionally are disposed only in the areas adjacent to the squirrel cage blowers. Thus, air egresses from the blower housing in two distinct paths with little or no air flow from the housing in the region between the blowers. This results in the central region of the evaporator coil, which is between the dual squirrel cage blowers and opposite the motor, getting little or no air distribution.

SUMMARY OF THE PRESENT INVENTION

It is an object of the present invention to provide a housing for dual squirrel cage blowers for achieving an even air distribution on the evaporator coil of an air conditioner particularly at the central region of the coil.

The housing has a front wall with an air egress region for each blower through which air may be blown and which comprises an opening located at a level generally above each blower. A curved baffle is located in the housing above and between the blowers for directing air through the openings toward the central region of the evaporator coil. The curved baffle comprises curved walls located inwardly of the blowers on each side of a plane extending midway between the blowers and which extend forward toward the front wall and curve toward each other. Also provided are curved deflectors located in the housing above each cylindrical blower for deflecting air toward the central region of the evaporator coil. The deflectors extend forward toward the front wall and curve toward the plane which extends midway between the blowers.

In a further aspect, a horizontal slat is provided which separates each air egress region into two openings and enhances the flow of air toward the central region of the evaporator coil.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the front of the blower housing of the present invention;

FIG. 2 is a perspective view of the rear of the blower housing of FIG. 1 illustrating the manner in which its front face will be located adjacent the evaporator coil of an air conditioner;

FIG. 3 is an exploded view of the housing of FIG. 1 illustrating top and bottom portions which are attached together to form the housing for supporting a motor and dual squirrel cage blowers;

FIG. 4 is a view of the top portion of the housing of FIG. 3 as seen from the rear when looking up into the top portion;

FIG. 5 is a cross-sectional view of FIG. 4 taken through the lines 5—5 thereof;

FIG. 6 is a cross-sectional view of FIG. 4 taken through the lines 6—6 thereof;

FIG. 7 is another view of the top portion of the housing as seen when looking up into the top portion generally along the lines 7-7 of FIG. 5;

FIG. 8 is a front view of one side of the housing of the present invention; and

FIG. 9 is a cross-sectional view of the front wall of the housing taken through the lines 9-9 of FIG. 8.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to FIGS. 1–3 of the drawings, the housing is identified at 11 and comprises two spaced apart chambers 13 and 15 for housing dual squirrel cage cylindrical blowers 17 and 19 driven by a motor 21, for blowing air on the evaporator coil of an air conditioner. In FIG. 2, the coil of an air conditioner is illustrated at 23, supported in a housing 25. A front wall 27, having air egress regions, extends across the chambers 13 and 15. In use, the housing 11 will be positioned to locate the front wall 11 and its air egress regions next to the coil 23 of the air conditioner as illustrated in FIG. 2. The cylinders 17 and 19 are connected to shafts 29 and 31 extending from opposite sides of the motor 21 and are driven in a clockwise direction as viewed in FIGS. 1 and 3, for blowing air through the air egress regions formed through the front wall and hence onto the coil 23 of the air conditioner.

As illustrated in FIGS. 2 and 3, the front wall 27 extends across the chambers 13 and 15 to positions beyond the outer edges 17A and 19A of the blowers. The top portions of the front wall 27 is identified at 27A while its bottom portion is identified at 27B. Each chamber 13 and 15 includes a flat, top wall portion 13A and 15A which extends rearward from the top portion of the front wall 27 and which merges with and joins curved portions 13B and 15B which extend around the blowers 17 and 19 from 27B lower portion 27b of the front wall 27. Curved portions 13B and 15B are spirals in cross section which expand at a rate of 5° relative to the outside diameters of the blowers beginning at tangent lines to the blowers at the top, front portion of the housing. The chambers 13 and 15 have outer side wall portions 33 and 35 spaced outward from the outer edges 17A and 19A of the blowers and inner side wall portions 37 and 39 spaced from each other and inward from the inner edges 17B and 19B of the blowers 17 and 19.

The egress regions of the front wall 27 comprise upper openings 41 and 43 and lower openings 45 and 47. The upper openings 41 and 43 are located near the tops of the chambers and at levels above the cylindrical blowers of each chamber while the lower openings 45 and 47 are located in front of the blowers 17 and 19. A curved baffle 51 is located in the housing above and between the cylindrical blowers for directing air from the openings 41 and 43, towards the central region of the evaporator coil. The baffle 51 is formed by curved wall portions 53 and 55 coupled to the inner side wall portions 37 and 39 respectively at positions spaced rearward from the front wall 27 and extend forward, curving toward each other, and meet at or near the front wall in the plane extending midway between the inner side wall portions 37 and 39 and hence midway between the blowers 17 and 19. The midplane is identified by lines 6-6 in FIG. 4. Referring to FIG. 1, lower plate portions 57 and 59 are connected to the bottoms of the curved wall portions 53 and 57; to the inner side wall portions 37 and 39; and extend to the front wall 27

to prevent the air, following the curved wall portions **53** and **55** of the baffle **51**, from flowing downward and out of the housing behind the baffle. Plate portions **57** and **59** slant downward at an angle of about **10°**.

Also provided in the chambers **31** and **15** are curved deflectors **61**, **63** and **65**, **67** which are located immediately above the cylindrical blowers in line with the upper openings **41** and **43** and are curved to deflect and direct air toward the central region of the evaporator coil. As illustrated, the deflectors **61** and **63** are connected to the top wall portion **13A** of chamber **13** and extend downward to positions just above the top of blower **17**. Similarly, deflectors **65** and **67** are connected to the top wall portion **15A** of the chamber **15** and extend downward to positions just above the top of blower **19**. The deflectors **61** and **63** are spaced from each other between the curved wall **53** of baffle **51** and side wall **33** and divide the distance between the curved wall **53** and side wall **33** above blower **17** into approximately three equal parts. Similarly, the deflectors **65** and **67** are spaced from each other between the curved wall **55** of baffle **51** and side wall **35** and divide the distance between the curved wall **55** and side wall **35** above blower **19** approximately into three equal parts. Moreover, as illustrated, the deflectors **61**, **63** and **65**, **67** extend forward from a rear position toward the front wall terminating short of the front edges of top wall portions **13A** and **15A** and curve toward the midplane identified by lines **6—6** in FIG. **4**. The walls **53** and **55** of the baffle **51** and the deflectors **61**, **63**, **65**, and **67** are curved sufficient to direct and deflect air with a minimum of turbulence through the openings **41** and **43** toward the central region of the evaporator coil and hence provide a better distribution of air on the evaporator coil particularly at its central region thereby increasing the BTU output of the air conditioner.

In addition, there is provided a slat **69** which forms a part of the front wall **27** and separates the air egress regions in front of each blower into the upper and lower openings **41**, **45** and **43**, **47**. The purpose of the slat **69** is to restrict the flow of air out of the air egress regions formed through the front wall to provide a back pressure on the blowers which enhances the function of the deflectors in deflecting air toward the central region of the evaporator coil. In this respect, the back pressure prevents air from flowing down and around the lower edges of the deflectors and hence forces more air to follow the curvature of the deflectors toward the central region of the evaporator coil. Although the slat **69** reduces the cubic feet per minute flowing out of the housing, it enhances the distribution of air at the central region of the evaporator coil and hence results in an increase in BTU or cooling power of the air conditioner. By employing the slat **69**, there also is eliminated the problem of water being blown out through the front of the air conditioner. In this respect, in the heretofore conventional housing, high velocity air is blown out of the blower housing and through the evaporator coil in two distinct paths on each side of the center of the coil. This results in a low pressure on each side of the evaporator coil and a higher pressure at the center thereof which in turn results in a circulation pattern of air through the evaporator coil. This air circulation picks up condensed water at the center of the coil which is blown out through the front of the air conditioner. By the use of the curved baffle and the deflectors, a more even distribution of air flow from the housing to the evaporator coil is obtained as described above, however, it has been found that without the slat **69**, some water still is blown out from the front of the air conditioner. This problem has been completely eliminated, however, by use of the slat **69**. As seen in FIG. **9**, the slat **69** also is inclined downward and acts also to direct air downward, particularly, at higher speeds to provide a better overall air distribution on the evaporator coil portions opposite the blowers.

As seen in FIG. **3**, the housing **11** is formed in two parts **11A** and **11B** with the bottom of the front wall **27** attached to the top of the housing portion **11B**. The housing part **11A** has tabs **71** formed on its top edge and tabs **73** formed on its bottom edge and which are adapted to fit into matching slots **75** formed in the top of the wall **27** and matching slots **77** (see FIG. **2**) formed in edge **78** at the other end of the housing part **11B** whereby the two parts **11A** and **11B** may be held together by the tabs and slots. Connected between the chamber portions of housing parts **11A** and **11B** are curved sections which are adapted to fit around the motor **21** when the housing parts **11A** and **11B** are secured together. The curved section connected between the chamber portions of housing part **11A** is not illustrated, however, it is connected between the chamber portions of housing part **11A** by tab members **79** (see FIG. **2**). The curved section connected between the chamber portions of housing part **11B** is illustrated at **81** in FIGS. **1** and **3**. Also provided is a separate half cylindrical member **87** which is adapted to fit over the curved section connection between the chamber portions of housing part **11A**. Member **87** has a front tab (not shown) adapted to hook under member **89** of housing part **15A** and two apertures at its back end for receiving bolts **83** and **85**. These bolts are adapted to extend through these two apertures and through aligned apertures formed in the edge **78** of housing part **11B** whereby two nuts may be threaded to the bolts on the underside of edge **78** for securely attaching the housing to the motor **21**. As illustrated in FIG. **3**, the front wall **27** has a single opening **43** extending along its length which forms the two openings **41** and **43** when the housing parts **11A** and **11B** are attached together and the slat **69** is located against the front portion of the baffle **51**.

In one embodiment, the housing sections **11A** and **11B**, the front wall **27** and member **87** are formed of plastic. The housing has a length between outer side edges **33** and **35** of about **12½** inches. It is constructed to support blowers **17** and **19** having a length of about 3¾ inches and a maximum outside diameter of about 3 inches. The distance between side walls **33** and **37** and between side walls **35** and **39** is about 4⅛ inches. The opening **42** formed through the front wall **27** has dimensions of about 12½ inches × ¾ of an inch while each of the openings **45** and **47** have dimensions of about 4 inches × ½ of an inch. The slat **69** has a width in its flat plane of about one-half of an inch. Deflectors **61** and **65** follow circular curves each having a radius of **5.93** inches while deflectors **63** and **67** follow circular curves each having a radius of 4.10 inches. The curved walls **53** and **55** of the baffle **51** follow circular curves each having a radius equal to 2.64 inches. The curves of deflectors **61** and **63** and curved wall **53** have different center points on one side of plane **6—6** of FIG. **4** while the curves of deflectors **65** and **67** and

curved wall **55** have different center points on the other side of plane **6—6.**

Although the slat **69** has advantages as mentioned above, it may be eliminated between openings **41, 45** and **43, 47** in order to obtain a greater cubic feet per minute output air flow, if desired, although resulting in a lower BTU output. If the slat **69** is eliminated, openings **41** and **45** will merge into a single large opening as will openings **43** and **47.** In this embodiment, the baffle **51** and deflectors **61, 63, 65,** and **67** will be employed to direct and deflect the air towards the central region of the air conditioner coil as described previously.

I claim:

1. A housing for spaced apart cylindrical blowers located in axial alignment and driven by a motor located between the blowers for blowing air on the evaporator coil of an air conditioner, said blowers being coupled to shaft means of the motor on opposite sides thereof and having outer edges facing in opposite directions and inner edges facing each other, said outer and inner edges being located in planes transverse to the axes of said cylindrical blowers, said housing comprising:

a front wall, having top and bottom portions, extending across said housing to positions beyond the outer edges of said blowers,

top wall means extending rearward from the top portion of said front wall and which joins surrounding wall means extending around said cylindrical blowers from the lower portion of said front wall,

said front wall having an air egress region for each blower through which air may be blown,

each air egress region comprising an opening located at a level generally above its cylindrical blower,

curved baffle means located in said housing above and between said cylindrical blowers for directing air through said openings toward the central region of the evaporator coil,

said curved baffle means comprising curved walls located inward of said cylindrical blowers on each side of a plane extending midway between said blowers and which curved walls extend forward toward said front wall and curve toward each other, and

curved deflector means located in said housing above each cylindrical blower for deflecting air through said openings toward the central region of the evaporator coil,

said deflector means located above said blowers extending forward and curving toward said plane which extends midway between said blowers.

2. The housing of claim **1** comprising:

a slat extending across each air egress region separating each air egress region into two openings, one of which includes said opening located at a level generally above its blower and a lower opening located generally in front of its blower.

3. A housing for spaced apart cylindrical blowers located in axial alignment and driven by a motor located between the blowers for blowing air on the evaporator coil of an air conditioner, said blowers being coupled to shaft means of the motor on opposite sides thereof and having outer edges facing in opposite directions and inner edges facing each other, said outer and inner edges being located in planes transverse to the axes of said cylindrical blowers, said housing comprising:

separate chambers for each blower,

a front wall, having top and bottom portions extending across said chambers to positions beyond the outer edges of said blowers,

each chamber including top wall structure extending rearward from the top portion of said front wall and which joins surrounding wall structure extending around its cylindrical blower from the lower portion of said front wall,

said chambers having outer side wall portions spaced outward from the outer edges of said blowers and inner side wall portions spaced from each other and inward from the inner edges of said blowers,

said front wall having air egress region for each blower through which air may be blown,

each egress region including an opening near the top portion of said front wall and located at a level generally above the cylindrical blower of each chamber,

said openings being defined by top and bottom edges, outer side edges corresponding generally with the positions of said outer side wall portions of said chambers, and curved inner walls,

said curved inner walls being coupled to said inner side wall portions of said chambers at positions spaced rearward from said front wall and which extend forward, curve toward each other, and meet at or near said front wall in a plane extending midway between said blowers for directing air toward the central region of the evaporator coil,

at least one curved air deflector for each chamber located above its cylindrical blower and connected to and extending downward from said top wall structure in line with said opening of said chamber,

said air deflector of each chamber being located between said curved inner wall and said outer side wall of its chamber and extends forward from a rear position toward said front wall, curving toward the plane which extends midway between said blowers,

said curved inner walls and curved air deflectors being curved sufficient to direct and deflect air with a minimum of turbulence through said openings toward the central region of the evaporator coil.

4. The housing of claim **3** comprising:

a slat extending across each air egress region separating each air egress region into two openings, one of which includes said opening located at a level generally above its blower and a lower opening located generally in front of its blower.

5. The housing of claim **3** wherein:

said front wall has a generally flat forward face,

said top wall structure of each chamber comprises a generally flat top portion which extends rearward and joins surrounding wall structure extending around its blower from the lower portion of said front wall,

each chamber including two curved air deflectors located above its cylindrical blower and connected to and extending downward from its flat top portion in line with said opening of each chamber,

said air deflectors of each chamber being spaced from each other between said curved inner wall and said outer side wall of their chamber and extend forward from a rear position toward said front wall, curving toward the plane which extends midway between said blowers,

said curved inner walls and curved air deflectors being curved sufficient to direct and deflect air with a minimum of turbulence through said openings toward the central region of the evaporator coil.

6. The housing of claim **5** comprising:

a slat extending across each air egress region separating each air egress region into two openings, one of which includes said opening located at a level generally above its blower and a lower opening located generally in front of its blower.

* * * * *