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ROOM AIR CONDITIONER AIR DEFLECTOR MOUNTING ARRANGEMENT

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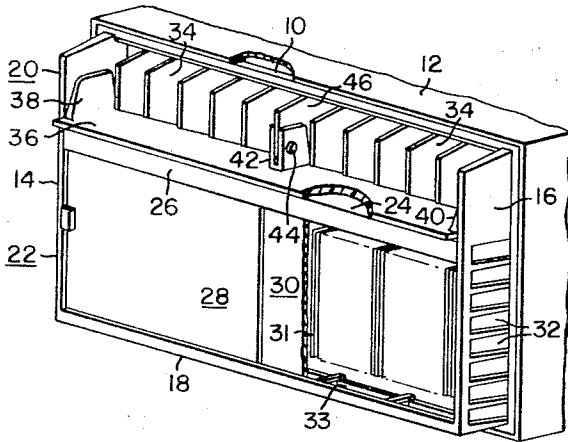


FIG. 1.

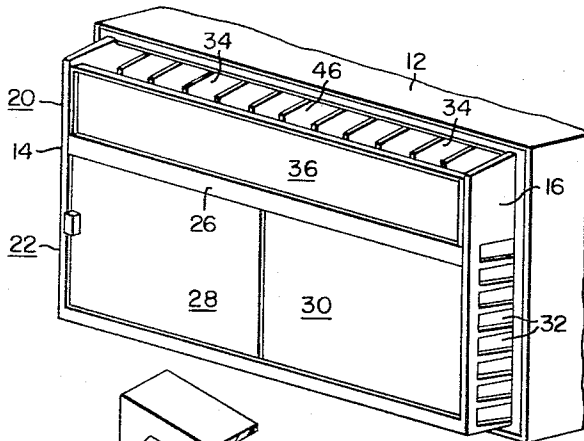


FIG. 2.

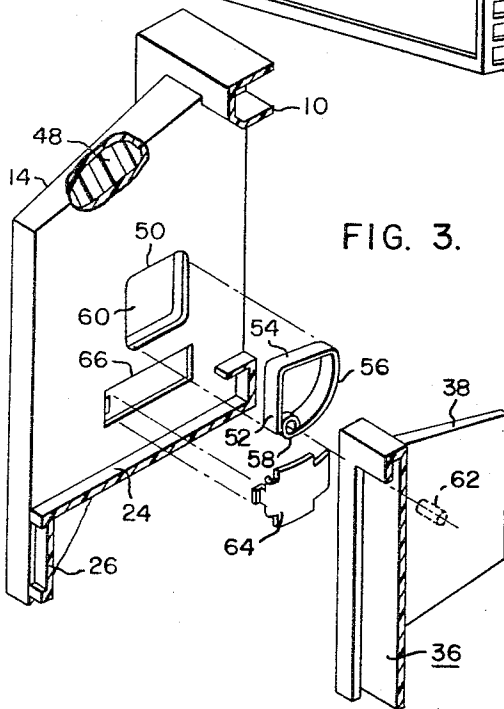


FIG. 3.

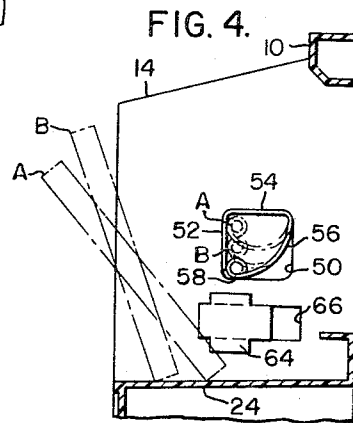


FIG. 4.

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## ROOM AIR CONDITIONER AIR DEFLECTOR MOUNTING ARRANGEMENT

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4 Claims. (Cl. 98—94)

This invention relates generally to a room air conditioner front assembly, and in particular to a mounting arrangement for an air deflecting panel associated with the conditioned air outlet of the air conditioner.

The front assembly to which my invention is most readily applicable is of the type which includes a single tiltable panel for effecting the desired degree of vertical deflection of the conditioned air being discharged from the room air conditioner outlet. The deflector in a unit of this character may be tilted between one extreme air deflecting position in which it is vertically disposed and a horizontal position in which it is substantially out of the outlet air stream. In intermediate positions and in the vertical position of the deflector, it is desirable that the bottom edge of the deflector rest firmly upon the wall defining the bottom side of the air outlet to prevent air from passing below the deflector. It is also desirable that the deflector, when adjusted to any selected position by the user, hold in that position without vibrating or chattering occurring due to the high velocity discharge air striking the deflector. Additionally, the deflector should be movable throughout its tiltable range in a smooth fashion, and should be capable of being adjusted to a great number of slightly different tilted angles to accord with the whims of the user.

Accordingly, the object of this invention is the provision of a specific type of deflector mounting arrangement which possesses the desiderata noted.

I achieve this object by the provision of a mounting arrangement utilizing a formed ribbon spring at each end of the deflector with the ribbon spring including a fixed portion carried by and bearing against the outlet end wall, and a yieldable portion extending in an arc and terminating in a loop supporting the end of the air deflector. The yieldable arcuate portion is flexed up and down into and out of a tighter arc as the loop is correspondingly moved upwardly and downwardly by the manual tilting movement of the deflector, with the spring being disposed to exert a downward force upon the deflector sufficient to maintain the deflector bottom edge against the bottom side of the air outlet.

The details of my mounting arrangement will be best perceived in connection with the accompanying drawing illustrating one form of room air conditioner embodying my invention by way of example, and wherein:

FIGURE 1 is a partly-broken isometric view of the front of a room air conditioner of the type having a deflector to which my invention is applicable, this view showing the deflector in a horizontal position;

FIG. 2 is a similar isometric view showing the deflector in a vertical position;

FIG. 3 is a fragmentary, partly-broken, exploded isometric view showing details of the mounting arrangement for an end of the deflector; and

FIG. 4 is an elevational view of an end wall of the outlet with the ribbon spring and leaf spring installed in a recess in the outlet end wall and further illustrating the ribbon spring in several alternate flexed positions.

Before proceeding with the description, it is to be understood that the general scheme of the front assembly structure illustrated and to which my invention is principally applicable is a result of the exercise of the inventive faculties of others than myself. However, a generalized

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description of the character of certain parts, and their relationship to each other will facilitate an appreciation of my invention.

The front assembly of FIGS. 1 and 2 includes a peripheral frame 10 suitably secured to the peripheral edge of the room-side face of the air conditioner casing 12. The side edges and the bottom edge of the frame 10 are provided with forwardly-projecting opposite side walls 14 and 16, and a forwardly-projecting bottom wall 18, respectively. The front assembly is generally divided into an upper portion designated 20, and a lower portion generally designated 22, by a horizontal wall 24 extending between the opposite end walls 14 and 16, and having a depending forward edge forming the cross-member 26. The bottom portion is provided with face panels 28 and 30 behind which the air conditioner controls, and the evaporator 31 are located. Room air is admitted to the face of the evaporator through appropriately located openings 32 in end wall 16, and other openings 33 in the bottom wall 18.

The upper portion defines the outlet opening for the discharge of conditioned air from the air conditioner unit, and includes a series of ganged, adjustable vanes 34 for controlling the horizontal pattern of the discharge air, and a single tiltable deflector 36 for controlling the vertical path of the air.

The deflector 36 includes an imperforate panel main portion (also designated 36), opposite ends 38 and 40, and a pair of flanges 42 which project rearwardly from the central part of the rear face of the main portion. The flanges 42 are fastened by pin 44 extending through a vertical slot in the stationary central vane 46 so that the central connection is pivotal and also movable in a vertical direction.

The deflector 36 is shown in FIG. 1 with its main portion in a horizontal position permitting the discharge air to pass horizontally into the room being conditioned without being deflected upwardly by the deflector. In FIG. 2 the deflector is shown in a vertical position causing the discharge air to be deflected more directly upwardly. The deflector may also be moved or tilted to numerous intermediate positions in which the air is deflected upwardly at some lesser angle from a horizontal plane by virtue of the pivotal connections between the deflector ends 38 and 40 and the respectively facing end walls 14 and 16 of the outlet.

Before passing to the details of the arrangement for pivotally mounting the deflector in accordance with the invention, it is noted that additional details regarding the front assembly are disclosed in Wegman copending U.S. patent application Serial No. 474,615, and Ulich copending U.S. patent application Serial No. 474,597, the inventions of those applications and of this application being assigned to a common assignee.

Those portions of the end walls 14 and 16 forming the ends of the upper portion 20 are provided with spaced apart walls so that the hollow interior may be filled with a thermal insulating material 48 (FIG. 3) fitted therein. The central part of the inner face of the end wall 14 is cut-out to provide a rectangular recess or niche 50. This niche receives a ribbon spring formed into the illustrated shape and which includes a straight, vertical, front leg 52, a straight, horizontal, top leg 54 and a downwardly-bowed, generally diagonally-extending leg 56 which terminates in a loop end 58. The straight legs are termed the fixed portion of the spring since they remain substantially stationary when installed in the niche, while the arcual portion is being flexed by movement of the loop in a vertical direction along a line indicated by the double-headed arrow 60.

The loop 58 pivotally receives the endwise-projecting pivot pin 62 on the deflector end 38. Movement of the

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deflector in its range of tiltable movement causes the loop 58 to move along its vertical path 60 at the front side of the niche. The ribbon spring in its initially formed, unrestrained shape is about as shown in FIG. 3 so that it may be simply pressed into the niche and will remain there without further fastening means. In this installed position the front leg 52 extends along the front side of the niche, the top leg 54 extends along the top side of the niche, and the flexible portion extends with a downwardly-directed bow from the top rear corner to a location adjacent the bottom front corner of the niche. When the deflector is moved to a position causing the loop to be displaced upwardly, the bowed portion of the spring yields by being flexed into a tighter arc, and this flexing results in the loop exerting a corresponding downwardly-directed force on the pivot pin 62 and hence through the deflector as a whole to press the bottom edge of the deflector against the outlet bottom wall 24.

Examples of two alternate flexed positions A and B of the yieldable portion 56 of the spring are shown in broken lines in FIG. 4, and correspond to the two broken-line outline positions of the deflectors correspondingly identified. As may there be seen, the spring is shaped so that as the loop is urged to successively higher positions by movement of the deflector, the yieldable portion flexes into progressively tighter arcs. Throughout this movement the loop rides against the inner face of the vertical leg 52 of the fixed portion of the spring. The position of the loop in the front lower corner of the niche, as shown in solid lines, corresponds to its location when the deflector is in either its vertical or horizontal position. The deflector may also be tilted backwardly to a limited degree beyond a vertical position to permit the installation or removal of a decorative facing panel by sliding it upwardly into channels extending along the top and end edges of the front face of deflector main wall portion, as disclosed in the Wegman copending application.

The friction between the circumference of the loop 58 and the leg 52 of the spring, coupled with the frictional engagement of the bottom edge of the deflector main wall portion 35 against the top face of the bottom wall 24 of the outlet may, in many cases, provide adequate resistance to movement of the deflector in any of its suggested positions. However, the provision of a separate leaf spring 64 carried by each end wall 14 and 16, and having its convex side frictionally bearing against the respective facing end of the deflector further ensures stability of the deflector in any of its adjusted positions. Accordingly, the inner face of the end wall 14 is shown with a short grooved recess 66 which carries the leaf spring 64 so that the bight of the spring engages the end of the deflector.

The force exerted by the ribbon spring as it is moved upwardly by tilting the deflector includes a forwardly-directed component as well as the downwardly-directed component ensures that the deflector pins 62 will be effectively guided in their travel in a vertical direction along the forward side of the niche.

The springs are preferably made from a noncorrosive material such as stainless steel. The deflector pivot pins are substantially freely rotatable in the loops which carry them and accordingly the main area of wear during movement of the deflector is between the loop and the face of the vertical leg 52 of the spring. Since these are of a material such as stainless steel any such wear may be neglected.

Having described my invention I claim:

1. In a room air conditioner having a conditioned air

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outlet bounded at its opposite ends by end walls and at its bottom by a bottom wall, and having a vertical air deflector in the outlet including a main deflecting panel and pivot-pin-carrying ends, the improvement of an arrangement for mounting said deflector for tilting movement from said end walls, comprising:

means defining a recess in the inner face of each end wall of said outlet; and

a ribbon spring in each recess, each said spring including a substantially fixed portion having a contour following a part of the periphery of said recess, and a yieldable portion extending in the form of an arc and terminating in a loop adjacent the front vertical side of said recess, said loop receiving said pivot pin projecting from the end of said deflector, said spring being so disposed that said loop is yieldable in an upward direction along said front vertical side of said recess with said yieldable portion flexing into a tighter arc upon said movement and correspondingly urging said loop downwardly.

2. In a room air conditioner according to claim 1: said recess is generally rectangular in outline;

said spring fixed portion includes a vertical leg extending upwardly along the front side of said recess, and a horizontal leg extending rearwardly along the top side of said recess, and said yieldable portion extends generally diagonally from the rear top corner to the front bottom corner in a downwardly-bowed arc, with said loop having a position adjacent said front bottom corner when said yieldable portion is in a substantially unstressed condition.

3. In a room air conditioner according to claim 1: a bowed leaf spring between each end wall of said outlet and the respective deflector end, said spring having its bight frictionally engaging said deflector and for stabilizing said deflector.

4. In a room air conditioner: a conditioned air outlet having end walls and a bottom wall;

a tiltable deflector for controlling the vertical direction of the air discharged out of said outlet, said deflector being pivotally connected at its ends to said outlet end walls;

said pivotal connection at each end including a recessed, formed, ribbon spring including a fixed portion bearing against said outlet end walls, and a bowed flexing portion having a loop at its free end, said spring being disposed for movement of said loop in a substantially vertical direction effected by selectively tilting adjustment of said deflector, said spring exerting a downwardly-directed force upon said deflector to increase the frictional engagement along the line of contact between said deflector and said outlet bottom wall.

#### References Cited by the Examiner

##### UNITED STATES PATENTS

3,035,421	5/1962	Halbeisen	62—262 X
3,252,398	5/1966	First	98—94 X
3,264,971	8/1966	Dangauthier	98—40 X

##### FOREIGN PATENTS

1,168,043	4/1964	Germany.
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