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INDUCTION-TYPE ROOM TERMINAL

Filed July 28, 1967

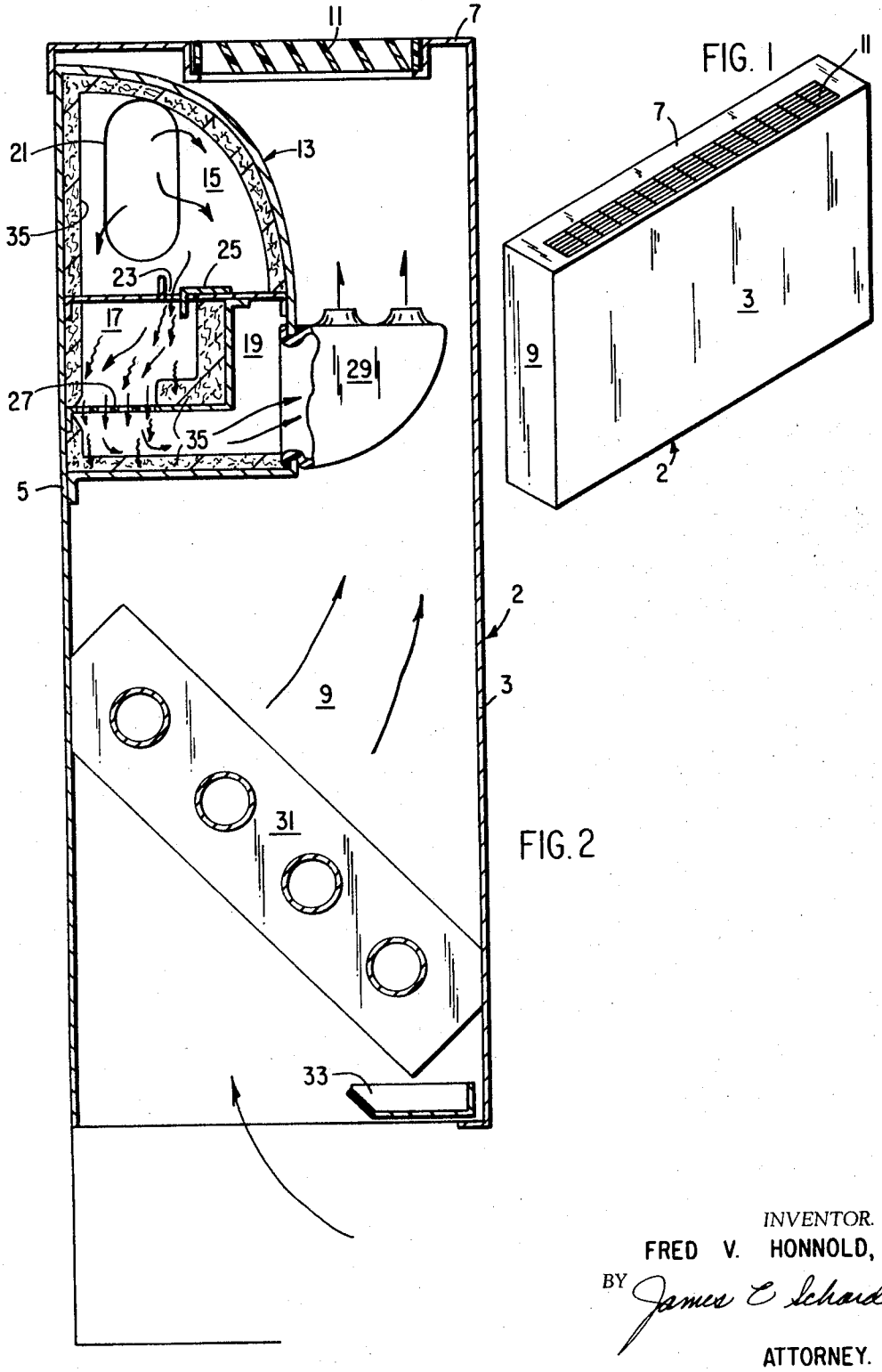


FIG. 2

FIG. 1

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INDUCTION-TYPE ROOM TERMINAL

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ABSTRACT OF THE DISCLOSURE

A room terminal for use in an air distribution system employing conditioned air from a central source. An improved air plenum in the terminal is adapted to convert midfrequency sound waves generated by a balancing damper therein into high frequency sound waves which are attenuated by sound absorbing material within the plenum.

BACKGROUND OF THE INVENTION

This invention relates to air conditioning units. More particularly, this invention relates to air conditioning units wherein air is conditioned at a central station and distributed to a plurality of air conditioning units for discharge into the area to be conditioned. Each unit is normally provided with a damper for regulating the air flow through the unit to meet the air requirements of the area served thereby. One of the problems encountered with units of this type is that an undesirable amount of noise is generated by the air flowing through the unit, the most objectionable of which is midfrequency sound which is difficult to attenuate.

SUMMARY OF THE INVENTION

In accordance with the preferred embodiment of the invention, a room terminal is provided having a novel internal configuration including a perforated plate downstream of the balancing damper to convert midfrequency sound waves into high frequency waves. Sound attenuating means opposite the perforated plate are utilized to dissipate the high frequency sound waves resulting in a room unit having a very low noise level.

BRIEF DESCRIPTION OF THE DRAWING

FIGURE 1 is a perspective view of an induction type air conditioning terminal; and

FIGURE 22 is a sectional end view of the terminal of FIGURE 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawing there is illustrated a room terminal **2** having a front panel **3**, a rear panel **5**, a top panel **7** and end panels **9** so as to provide a box-like enclosure for passage of air therethrough. A grille **11** is disposed in top panel **7** for discharge of air into the area being conditioned. A plenum **13** having a first chamber **15**, a second chamber **17** and a third chamber **19** is adapted for receiving conditioned air from a central source (not shown) through opening **21** in one end of first chamber **15**. An opening **23** between chambers **15** and **17** is provided with an adjustable damper **25** for regulating the quantity of air supplied to chamber **17** from chamber **15**. A perforated plate **27** between chambers **17** and **19** provides a passageway for air flow into chamber **19**.

A plurality of air discharge nozzles **29** communicating with chamber **19** are provided for discharging conditioned air from chamber **19**, within the terminal to induce a flow of room air through the bottom of the unit across a heat exchanger **31** and out discharge grille **11** into the area being conditioned. The heat exchanger **31** is provided with a suitable heat exchanger medium such as chilled water or hot water for cooling or heating the room air induced through the terminal. A pan **33** is provided for accumulating moisture which may condense on heat exchange coil **31** when the coil is provided with chilled water.

Sound attenuating material **35** such as glass fiber blanket is provided in chambers **15**, **17** and **19** to dissipate the acoustic energy generated by passage of air through the terminal. The sound attenuating material of this type is most effective on high frequency sound waves. However, the passage of air through damper **25**, as illustrated, generates midfrequency sound waves. The perforated plate **27** is therefore utilized to convert the midfrequency sound waves into high frequency sound waves which can be effectively dissipated by the sound attenuating material in chamber **19**.

While I have described a preferred embodiment of my invention, it is to be understood the invention is not limited thereto but may be otherwise embodied within the scope of the following claim.

I claim:

1. In a room terminal for use in an induction-type air conditioning system the combination of an enclosure having an inlet for secondary air adjacent its face and an outlet for a mixture of secondary air and primary air adjacent its upper surface, a heat exchanger in said enclosure through which heat exchange medium is passed in heat exchange relation with secondary air induced in the terminal, means in said enclosure forming a first plenum chamber connected to a source of supply of primary air, a second plenum chamber placed below and connected to said first plenum chamber to receive primary air therefrom, and a third plenum chamber connected to said second chamber to receive primary air therefrom, each of said chambers being lined substantially with sound-absorbing material, a pluraility of spaced nozzles extending the length of and connected to said third chamber through which primary air is discharged upwardly in the enclosure at a velocity sufficient to induce secondary air through a heat exchanger, the mixture of primary and secondary air being discharged through the outlet, each nozzle containing a plurality of openings through which the primary air is discharged from the third chamber, an adjustable damper placed between the first chamber and the second chamber to discharge primary air from the first chamber downwardly into the second chamber and a perforated plate member placed in the lower wall of said second chamber to discharge primary air from the second chamber into the third chamber, said perforated plate member being offset from the adjustable damper, thereby preventing direct discharge of primary air from the first chamber through the damper and the plate member, primary air being discharged downwardly through said chamber and upwardly through the nozzles into the enclosure.

References Cited

UNITED STATES PATENTS

2,850,242	9/1958	Newton	165—123 XR
2,932,956	4/1960	Chieregatti	165—135 XR
2,937,588	5/1960	Masin et al.	98—38
3,014,496	12/1961	Chieregatti	98—38 XR
3,186,327	6/1965	Giurlando et al.	98—38

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98—38