

[54] **VESTIBULE AIR CURTAIN DOOR SYSTEM**

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[58] Field of Search.....**98/36, 33 R; 165/59, 53; 52/2**

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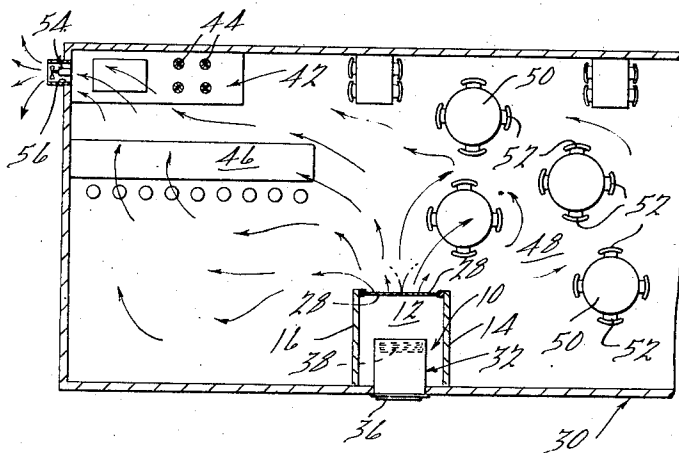
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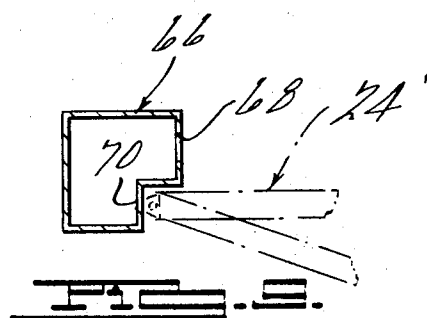
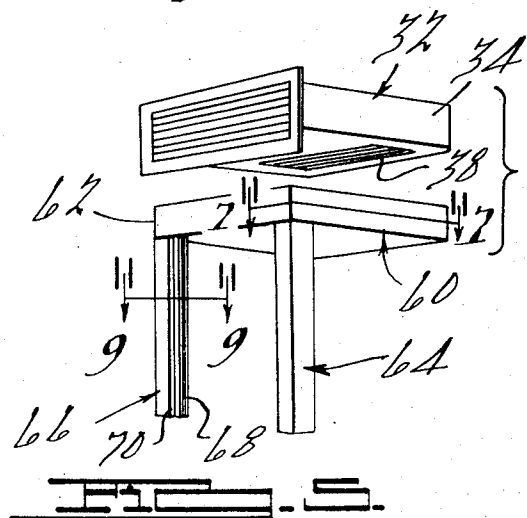
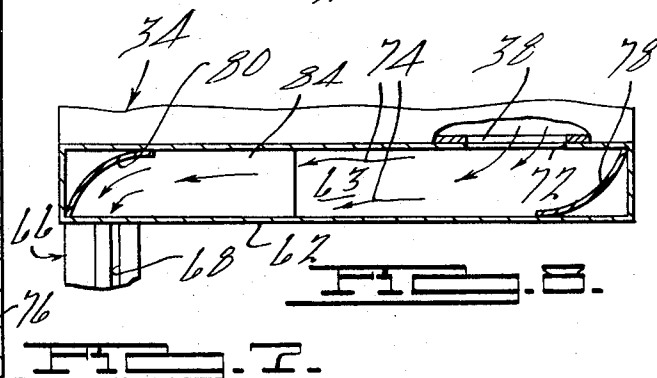
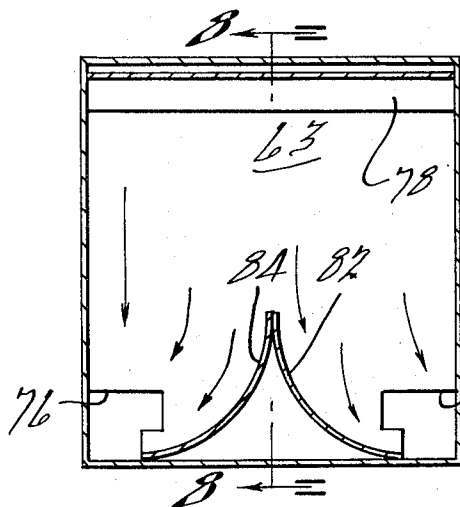
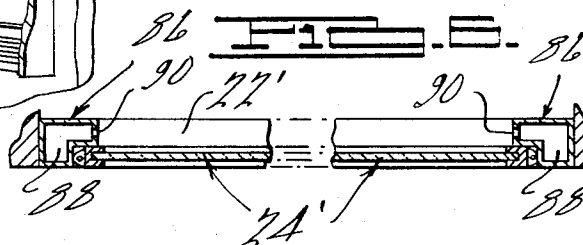
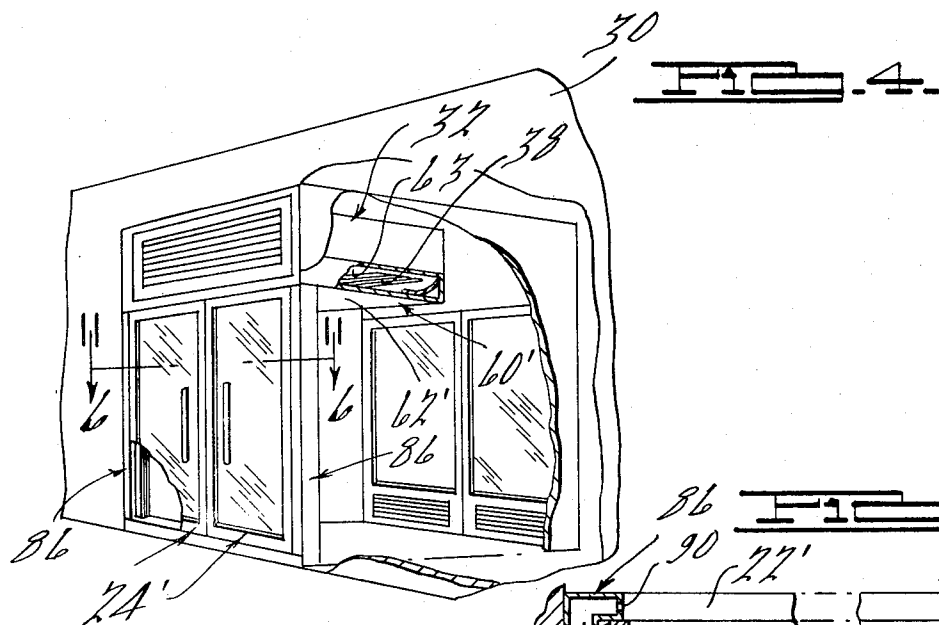
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[57] **ABSTRACT**

An air curtain door system adapted particularly for use in the vestibule and other variable volume pedestrian and other traffic areas of public facilities, such as restaurants, offices and the like, and adapted to utilize fresh outside air to provide a source of heated or otherwise conditioned air for environmental control of internal air circulation through pressurization of the facility.

36 Claims, 9 Drawing Figures





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VESTIBULE AIR CURTAIN DOOR SYSTEM

SUMMARY OF THE INVENTION

In general, the present invention relates to a system for providing heated or otherwise conditioned outside air in variable volume, as required, for vestibules or other areas of pedestrian traffic such as exists in the entranceways and exits to public facilities. More particularly, the present invention is directed toward a system of the above described character which is intended to introduce outside heated or otherwise conditioned air into a vestibule area in volume, as required, but without objectionable velocity and directional force, to provide a pleasant environment for customers or other persons passing through the vestibule. The system of the present invention is intended to provide a sufficient volume of conditioned air to replace the waste or contaminated air which is normally exhausted or otherwise extricated from a service facility and thereby also supplement the building heat (or cooled air) while protecting a doorway. Additionally, in accordance with the present invention, through proper design of the quantity or volume of air introduced into the vestibule and thus into the associated facility, such as a restaurant or other substantially enclosed area, careful control can be maintained over the circulation of contaminated air within the area. For example, careful control of odor contaminated air, fumes, smoke, etc., such as might be produced in the cooking area of the restaurant, may be achieved so as to prevent such contaminated air from circulating toward and around the customer dining area.

Further in accordance with the present invention, the subject system may be provided with means for directing all or a portion of the conditioned air discharged into the vestibule area toward a position in general planar relationship with the entranceway or access opening of either the vestibule or associated enclosed area, whereby to provide an air curtain closure to supplement or even replace the normal function of conventional entranceway doors. Thus, the present invention provides for external and internal environmental control. Such air curtain door system may be provided, in accordance with one feature of the present invention, by means of a unitized assembly adapted to be mounted in underlying relationship with the source of conditioned air, the assembly preferably comprising a plenum chamber for receiving conditioned air and directing the same toward the entranceway or access opening where the conditioned air is discharged through one or more ducts oriented in general planar relationship with the opening. These ducts may consist of a unitized part of the plenum chamber, or alternatively, may comprise part of the structural components of the vestibule, such as the hollow column-like members which are frequently utilized in vestibule door frame and jamb constructions, as will hereinafter be described in detail.

It is accordingly a general object of the present invention to provide a new and improved system for introducing conditioned air into vestibule areas of public facilities.

It is a more particular object of the present invention to provide a new and improved system of the above character which may function to control internal air circulation within the associated facility.

It is another object of the present invention to provide a system of the above character which may have an air curtain closure operatively associated therewith.

It is a related object of the present invention to provide a system of the above character wherein the air curtain door system is provided with a unitized adaptor assembly having means therein for controlling the flow of conditioned air toward a position providing an air curtain closure for the entranceway into a vestibule area or the like.

It is still another object of the present invention to provide a system of the above described type wherein the air curtain closure may be provided through the use of column-like structural elements of a vestibule area.

It is still a further object of the present invention to provide a system of the above described type which is adapted for use in both interior and exterior vestibule areas.

Other objects and advantages of the present invention will become apparent from the following detailed description taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an elevated perspective view, partially broken away, of an interior vestibule area and associated public facility having the vestibule air curtain door system of the present invention embodied therein;

FIG. 2 is a plan view of an exemplary operational installation of the present invention shown in association with a typical restaurant or the like;

FIG. 3 is a view similar to FIG. 1 and illustrates the applicability of the present invention to use with exterior vestibule areas and the like;

FIG. 4 is a view similar to FIG. 1 and illustrates one embodiment of the air curtain door system adaptor concept of the present invention;

FIG. 5 is an exploded assembly view of another embodiment of the air curtain door system adaptor concept of the present invention;

FIG. 6 is a transverse cross-sectional view taken substantially along the line 6—6 of FIG. 4;

FIG. 7 is a cross-sectional view taken substantially along the line 7—7 of FIG. 5;

FIG. 8 is a cross-sectional view taken substantially along the line 8—8 of FIG. 7; and

FIG. 9 is a cross-sectional view taken substantially along the line 9—9 of FIG. 5.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

For purposes of clarity of description, the following terms which are used throughout the specification and claims are defined as follows:

Conditioning of air or Air conditioning or derivatives thereof refers to any method or apparatus for performing an operation on fresh atmospheric air at ambient temperature to filter, purify, change the temperatures thereof and/or moisture content (humidity) preparatory to utilizing said air for some predetermined purpose.

Make Up air refers to the use of fresh outside ambient air, which is to be used for forced air heating or cooling and which is introduced in sufficient volume to more than make up for exhausted or

otherwise extricated waste air, whereby to pressurize the interior of the building or structure in order to minimize drafts and provide for preselected control of internal air circulation within the building.

Contaminated Air is any air which by reason of containing excessive quantities of moisture, pollutants, smoke, fumes, foreign particles, either visible or invisible and either odorless or non-odorless, is rendered undesirable for personal ingestion, inhalation or other normal biological or other activities.

Vestibule or vestibule area refers to any type of area, passageway, hallway or similar substantially enclosed area separating the interior of a building structure from the outside access opening or doorway, or between two areas of a building, and which is typically subjected to variable volume occupant or pedestrian traffic.

Referring now in detail to the drawings and in particular to FIG. 1, a vestibule air curtain door system 10, in accordance with an exemplary embodiment of the present invention, is shown in operative association with a vestibule area 12 which is defined in part by laterally spaced apart vertical side walls 14 and 16, a top or ceiling 18 and a bottom or floor 20. The vestibule area or vestibule 12 is provided with an outside access opening 22 which is normally closed by hingedly (or, if desired, slidable) mounted outside doors 24. Similarly, the vestibule 12 is provided with another access opening 26 which is normally closed by a pair of hingedly (or slidable) mounted doors 28 that separate the interior of the vestibule 12 from an associated building or structure 30 which may, for example, typically consist of a public facility, such as a restaurant or the like. As is well known in the art, the vestibule 12 functions to prevent the undesirable egress of heated warm air, or cool air, from the interior of the building 30 as occupants pass into and out of the building 30 through the openings 22, 26. This is accomplished primarily by virtue of the fact that one of the sets of doors 24, 28 remains in a relatively closed position when occupants or pedestrians are passing through the other of said sets of doors 24, 28, so that normally, there is always one of said sets of doors closed to prevent the ingress or egress of undesirable environmental elements.

In accordance with the present invention, the vestibule 12 is provided with an air conditioning apparatus, generally designated by the numeral 32, which functions to receive fresh ambient outside air and thereafter to subject said air to some predetermined conditioning operation, such as heating, cooling, filtering or the like, and to finally discharge said conditioned air into the interior of the vestibule 12 in order to render the interior of the vestibule 12 comfortable for pedestrians passing therethrough. More particularly, the air conditioning apparatus 32 comprises a generally parallelepiped shaped enclosure or housing 34 which is adapted to be mounted by any conventional means in underlying relationship to the ceiling or top 18 of the vestibule 12 so as to be in an interference-free location with respect to opening and closing movement of the doors 24, 28 and pedestrians or other objects passing therethrough. The housing 34 may typically contain or

house a suitable electrically energized drive motor (not shown) which is adapted to drive a blower which functions to draw in fresh outside air through a suitable louvered or otherwise apertured inlet grill 36 arranged directly above the access opening 22. Additionally, the enclosure 34 may typically be provided with a suitable heater or burner unit, such as a gas or oil burner, hot water heater, steam coils or the like (not shown) which function to heat air drawn into the enclosure 34 through the inlet grill 36. Alternatively, the apparatus 32 may be provided with suitable air cooling or refrigerating means for lowering the temperature of such air, depending upon the ambient temperature conditions and the desired environmental temperature within the vestibule 12. Air which is heated (or cooled), by the apparatus 32 is adapted to be communicated or discharged through a suitable outlet grill 38 formed in the lower or underside of the enclosure 34, whereby such air may be introduced into the vestibule 12 in volume, but without objectionable velocity and directional force so as to be injurious to the attire, appearance or anatomy of pedestrians passing therethrough.

In accordance with the principles of the present invention, the conditioned air discharged into the vestibule 12 from the outlet grill 38 of the apparatus 32 is intended to flow via any suitable means, such as perforated louvers 40 or the like provided in the closure doors 28, into the interior of the associated building 30 in sufficient volume so as to supplement the heated (or cooled) air therewithin, and also provide make up air in order to pressurize the interior of the building 30. As is known in the art, such pressurization of the interior of the building 30 functions to control and minimize undesirable drafts and the ingress of outside environmental elements in the event the interior of the building 30 is exposed to such elements, for example, through the opening of a window, door or the like, which might be caused by negative building conditions (partial vacuum) due to exhaust fans and the like.

The aforementioned pressurization of the interior of the associated building 30 has been found to be particularly advantageous when the system 10 of the present invention is operatively associated with a public service facility, such as a restaurant or the like. By way of example, in FIG. 2, the building 30 is depicted as a restaurant or the like including a cooking area 42 having a stove or burners 44, a service counter 46 and a customer dining area 48 having a plurality of conventional dining tables 50 and associated chairs 52. During normal business within the building 30, unpleasant, undesirable contaminated air, i.e., air containing undesirable cooking odors, grease, moisture, etc. is exhausted or extricated from the cooking area 42 by means of a conventional exhaust fan or the like 54 which is communicable with the exterior of the building 30 by means of a suitable air passage or duct 56, as is well known in the art. Conventionally, however, the capacity of the exhaust fan 54 is insufficient to prevent at least some of the contaminated containing air within the building 30 from circulating in and around the service counter 46 and customer dining area 48, whereby the dining customers are subjected to unpleasant odors, warm air or the like which, of course, has a deleterious affect on their dining enjoyment. In accordance with

the present invention, by properly controlling the volume of air discharged into the vestibule 12 and through louvers 40 into the interior of the building 30, a greater quantity of conditioned air may be introduced into the interior of the building 30 than is extricated by the exhaust fan 54, whereby the air mass within the building 30 circulates generally throughout the room, filling the area with conditioned air, whereby any contaminated air produced within the cooking area 42 will be forced or circulated away from the customer dining area 48 and service counter 46 and toward the exhaust fan 54, resulting in such air being eventually extricated from the building 30 via the exhaust fan 54 and exhaust duct 56. Thus, the air conditioning apparatus 32 not only functions to condition air for use in providing a comfortable environment in the vestibule 12, but said apparatus 32 also acts to supplement the warm or cool air within the interior of the associated building, and more importantly, functions to pressurize the interior of the building in order to effectively control the circulation of air therewithin.

It will be appreciated, of course, that the principles of the present invention are not limited to vestibules that are located interiorly of the associated building, such as is illustrated in FIGS. 1 and 2, since it will be readily apparent that the present invention may also find highly satisfactory application in exteriorly located vestibules, such as the vestibule 12' illustrated in FIG. 3 located exteriorly of a pair of entranceway doors 28' of a suitable public facility or the like 30', the vestibule 12' having an air conditioning unit 32' for conditioning air therewithin in the manner hereinabove described.

In accordance with further principles of the present invention, the vestibule air conditioning apparatus 32 hereinabove described, besides functioning to condition air within the vestibule 12, to supplement the warm or cool air within the associated building 30, and to pressurize said building 30 to control air mass circulation therein, is adapted to serve the further function of providing an air curtain door closure across the outside access opening 22 and thereby supplement the environmental excluding function of the doors 24 or, in certain instances, obviate the entire need for said doors 24 when an "open door" policy is desired. As is well known in the art, an air curtain closure may be achieved by discharging a relatively high velocity stream or flow of air across and in the general plane of an entranceway or access opening, which flow of air functions to prevent the ingress of drafts, cold or warm air and other undesirable inclement weather conditions. Toward this end, the assembly 32 is adapted to be provided with an air curtain closure adaptor assembly, best illustrated in FIG. 5 and generally designated by the numeral 60, which is designed to be arranged in generally underlying relationship with respect to the assembly 32 and provide for interference-free pedestrian traffic through the associated vestibule 12. More particularly, the assembly 60 is adapted to receive conditioned air discharged from the outlet grill 38 of the enclosure 34 and control and direct the circulation of said conditioned air to a position where it may be discharged across the access opening 22, thus providing for an air curtain closure thereacross. Generally speaking, the assembly 60 comprises a generally parallel-piped shaped enclosure 62 which defines an inter-

nal plenum chamber 63 and is of generally the same dimensions as the enclosure 34, whereby the enclosure 62 may be secured by any suitable fastening means to the underside of the enclosure 34 in the manner best illustrated in FIG. 7. Together with the enclosure 62, the assembly 60 comprises a pair of generally vertically oriented laterally spaced apart ducts 64, 66 which extend downwardly and are fixedly secured to the underside of the enclosure 62 adjacent the opposite sides of the access opening 22. The ducts 64, 66, which may be of any suitable construction, such as sheet metal or the like, are provided with suitable nozzle or discharge openings or means, representatively designated by the numeral 68, which extend longitudinally of the opening 22 and function to direct air communicated to the upper ends of the ducts 64, 66 from the plenum chamber 63 across the opening 22 to provide the desired air curtain closure effect. A more detailed description of a typical air curtain closure system may be found in U.S. Letters Pat. No. 3,308,740 issued Mar. 14, 1967, assigned to the assignee of the present application. By way of example, the ducts 64, 66 may each be provided with a generally vertically oriented offset edge portion 70 within which the laterally outer edge of the associated closure door 24 may be hingedly mounted, as representatively designated by the door 24' in FIG. 9.

With reference to FIG. 8, it will be seen that conditioned air is designed to be discharged from the outlet grill 38 of the enclosure 34 and be communicated through a suitable inlet opening or passage 72 formed in the upper side of the enclosure 62, which conditioned air will thus enter the plenum chamber 63 and flow in the direction of the arrows 74 toward the outer or exterior end of the enclosure 62. This conditioned air will then pass downwardly through suitable openings 76 formed at the laterally opposite sides of the bottom of the enclosure 62, which openings 76 are arranged in registry with the upper ends of the ducts 64, 66 so that conditioned air introduced to the plenum chamber 63 via the outlet grill 38 and passage 72 will flow downwardly into the ducts 64, 66 where it may be discharged through the opposed nozzle means 68 across the access opening 22. In order to facilitate efficient conditioned air circulation through the plenum chamber 63, the adaptor assembly 60 may be provided with internal baffle means within the plenum chamber 63. Such baffle means is best illustrated in FIGS. 7 and 8 and may, for example, comprise a generally arcuate shaped baffle element 78 arranged subjacent the passage 72 and adapted to direct conditioned air forwardly or toward the left in FIG. 8 from the passage 72. A similar arcuate shaped baffle element 80 may be provided adjacent the exterior end of the enclosure 62 for directing conditioned air downwardly through the openings 76 into the ducts 64, 66. As shown in FIG. 7, a pair of generally bifurcated or diverging baffle elements 82, 84 may also be provided adjacent the exterior end of the enclosure 62 for deflecting conditioned air downwardly through the openings 76 into the ducts 64, 66. As shown in FIG. 7, a pair of generally bifurcated or diverging baffle elements 82, 84 may also be provided adjacent the exterior end of the enclosure 62 for deflecting conditioned air laterally outwardly toward the openings 76. It will be appreciated, of

course, that various alternative baffle arrangements may be used for directing the flow of conditioned air between the opening 72 and the ducts 64, 66, as will be apparent to those skilled in the art.

In accordance with a preferred embodiment of the present invention, the adaptor assembly 60 is preferably fabricated in the form of a generally unitized assembly and may thereby be merchandised and conveniently installed as an "after market" item or accessory for use with existing vestibule air conditioning assemblies. Toward this end, the entire assembly 60 is preferably constructed of easily fabricated sheet metal or the like which may be formed on readily available tooling and may be cut, fitted and installed with a minimum amount of time and effort.

It will be appreciated, of course, that various alternate types of air curtain closure systems may be incorporated in the adaptor assembly 60 instead of the laterally opposed ducts 64, 66. For example, a single overhead discharge duct could be provided across the upper end of the access opening 22 for discharging air downwardly from the plenum chamber 63 across and in generally the same plane as the opening 22.

By way of illustration, another embodiment of the present invention is shown in FIGS. 4 and 6 wherein the air conditioning assembly 32 is provided with an air curtain closure adaptor assembly 60' that is of substantially the same construction and operation as the aforescribed assembly 60, with the exception that instead of the enclosure 62' being provided with a pair of discharged ducts, such as the ducts 64, 66, the interior of the plenum chamber 63' defined by the enclosure 62' is communicable with a pair of generally hollow structural or frame members 86 which extend vertically along the laterally opposite sides of the closure doors 24' for an access opening 22' defined between the members 86. The structural members 86 may typically consist of a pair of hollow extruded aluminum or other metal members which define internal air circulating passages 88 that are coextensive of the members 86 and are communicable at the upper ends thereof with the interior of the plenum chamber 63' via suitable openings, such as the openings 76, formed in the lower side thereof. The structural members 86 are provided with longitudinally extending discharge openings or nozzle means 90 which confront one another and are adapted to function in discharging and directing conditioned air across the access opening 22' to provide the desired air curtain closure effect to supplement or obviate the environmental excluding function of the doors 24'. It will thus be seen that the adaptor assemblies 60 or 60' may be completely self-contained, such as in the embodiment shown in FIG. 5, or alternatively, may be integrated with existing structural components of a building per se or structural components thereof associated with a vestibule area, whereby to provide for universality of application.

It may be noted that while particular reference has been made herein to the air conditioning apparatus 32 discharging conditioned air downwardly through an outlet grill 38 located adjacent the interior end thereof, the present invention is in no way intended to be limited to this particular construction since the outlet grill 38 may be located adjacent the forward or exterior end of the enclosure 34, or alternatively, along one side

or the other thereof. Of course, there may be more than a single outlet grill 38, as will be apparent. Accordingly, the adaptor assembly 60 may be changed commensurate with the location of the outlet grill 38 to provide for preselected communication of conditioned air from the enclosure 34 to the interior of the enclosure 62.

While it will be apparent that the preferred embodiments illustrated herein are well calculated to fulfill the objects above stated, it will be appreciated that the present invention is susceptible to modification, variation and change without departing from the scope of the invention.

We claim:

1. In a system for conditioning the air for a substantially enclosed area having undesirable contaminants in the atmosphere thereof, means adjacent the area defining a vestibule, said vestibule having an access opening for enabling occupant entry into and egress from said area; closure means located in said opening having a first position separating said vestibule from said area and a second position enabling occupant entry from said vestibule to said area and vice-versa; air passage defining means for communicating said vestibule and said area irrespective of the position of said closure means; means for extricating contaminant containing waste air from said area; and means including heat transfer means for conditioning fresh outside air and for discharging a sufficient volume of said conditioned air into said vestibule for more than compensating for extricated waste air from said area and thereby pressurizing said area so as to prevent undesirable circulation of said contaminant within said area.
2. The invention as set forth in claim 1 wherein said vestibule is located remote from said means for extricating said contaminant containing waste air.
3. The invention as set forth in claim 1 wherein said means for extricating contaminant containing waste air comprises an exhaust fan.
4. The invention as set forth in claim 1 wherein said enclosed area includes a kitchen producing undesirable cooking odors and a patron seating area, and wherein said last mentioned means prevents circulation of said cooking odors toward said seating area.
5. The invention as set forth in claim 1 wherein said vestibule includes a second access opening and wherein said last mentioned means provides an air curtain closure at least partially across said opening.
6. The invention as set forth in claim 1 which includes means communicating air discharged from said last mentioned means toward said extricating means.
7. The invention as set forth in claim 5 which includes means for communicating air discharged from said air conditioning means to a position along at least one side of said second access opening and for discharging said air conditioning air across and in substantially the same plane as said second opening.
8. The invention as set forth in claim 1 wherein said enclosed area is defined by the building structure and wherein said vestibule is located exteriorly of said structure.
9. The invention as set forth in claim 1 wherein said enclosed area is defined by the building structure and wherein said vestibule is located interiorly of said structure.

10. In combination with a substantially enclosed area, a vestibule adjacent the area, said vestibule including an access opening for enabling occupant entry into and egress from said area; closure means located in said opening having a first position separating said vestibule from said area and a second position enabling occupant entry from said vestibule to said area and vice-versa; means providing for air circulating between said vestibule and said area irrespective of the position of said closure means, and means including heat transfer means for conditioning fresh outside air and for introducing a sufficient volume of said conditioned air into said vestibule for pressurizing said vestibule and thereby assuring unidirectional air circulating from said vestibule toward said area.

11. The invention as set forth in claim 10 which includes a second access opening into said vestibule and wherein said last mentioned means provides an air curtain closure across said second opening.

12. The invention as set forth in claim 11 which includes means for communicating air discharged from said air conditioning means to a position along at least one side of said second access opening and for discharging said air conditioning air across and in substantially the same plane as said second opening.

13. The invention as set forth in claim 10 which includes means extricating air from said enclosed area and wherein said air conditioning means introduces a greater quantity of air into said area than is extricated therefrom.

14. In combination with a relatively enclosed area, a vestibule adjacent the area enabling occupant entry into and egress from said area; means defining a first access opening into said vestibule, means defining a second access opening between said vestibule and said area; closure means located in said opening having a first position separating said vestibule from said area and a second position enabling occupant entry from said vestibule to said area and vice-versa; means providing for air circulating between said vestibule and said area irrespective of the position of said closure means; and means including heat transfer means for conditioning fresh outside air and for discharging a sufficient volume of said conditioned air into said vestibule and along at least one side of one of said access openings for providing an air curtain closure substantially in the plane of said opening and for at least in part pressurizing said area.

15. The invention as set forth in claim 14 which includes means for discharging conditioned air along the opposite sides of one of said access openings to provide said air curtain closure.

16. The invention as set forth in claim 14 which includes an adaptor unit cooperable with said air conditioning means for receiving conditioned air therefrom and communicating said air to a position providing said air curtain closure.

17. The invention as set forth in claim 14 which includes at least one generally hollow column disposed adjacent and extending vertically of one of said access openings, and which includes means defining a discharge opening in said column for directing conditioned air across said opening to provide said air curtain closure, and which further includes a plenum chamber for communicating conditioned air from said air conditioning means to said column.

18. The invention as set forth in claim 16 wherein said adaptor unit comprises means defining a plenum chamber for receiving conditioned air from said air conditioning means.

19. The invention as set forth in claim 18 which includes at least one generally vertically oriented duct located adjacent one of said opening for directing air across said opening and providing said air curtain closure.

20. The invention as set forth in claim 19 which includes a pair of laterally spaced apart ducts communicable with said plenum chamber and including discharge openings for directing conditioned air across said one opening to provide said air curtain closure.

21. The invention as set forth in claim 20 which includes baffle means located within said plenum chamber for directing conditioned air toward said ducts.

22. The invention as set forth in claim 20 wherein said ducts are arranged in substantially the same plane as said one opening.

23. In combination with a vestibule enabling occupant entry into and egress from a relatively enclosed area and including an access opening and means including heat transfer means for conditioning fresh outside air and discharging conditioned air into the interior of said vestibule, an adaptor unit including means for receiving conditioned air discharged from said air conditioning means, said adaptor unit comprising a housing defining a plenum chamber communicable with said air conditioning means; and means providing a discharge opening arranged in the plane of said opening for providing an air curtain closure across said opening; said discharge opening being defined by an air duct extending along one side of said access opening and having a discharge opening for directing conditioned air across said opening to provide said air curtain closure.

24. The invention as set forth in claim 23 which includes a pair of ducts located along opposite sides of said access opening and having discharge openings for directing conditioned air across said opening to provide said air curtain closure.

25. The invention as set forth in claim 24 which includes baffle means located within said plenum chamber for directing conditioned air toward said ducts.

26. The invention as set forth in claim 25 wherein said housing and said ducts comprise a unitized assembly.

27. The invention as set forth in claim 26 wherein said unitized assembly is adapted for operative mounting in underlying relation to said air conditioning means.

28. In the method for conditioning the air for a preselected substantially enclosed area having means therein introducing undesirable contaminants into the atmosphere within the area, means for extricating such contaminated air, a heat transfer apparatus, and a vestibule enabling occupant entry into and egress from the area, the steps which include, introducing fresh outside air into the heat transfer apparatus, conditioning said air introduced into the heat transfer apparatus, separating said vestibule from said area while simultaneously maintaining air flow therebetween; and discharging a sufficient volume of said conditioned air

into said vestibule for more than compensating for extricated contaminated air and thereby pressurizing said area so as to prevent undesirable circulation of said contaminants within said area.

29. The method as set forth in claim 28 which includes the step of discharging conditioned air across an access opening for providing an air curtain closure across said opening.

30. The method as set forth in claim 29 which includes the step of discharging said air across said opening from the opposite sides thereof.

31. The method as set forth in claim 28 which includes the step of continuously extricating air from said vestibule enclosed area and discharging a greater quantity of conditioned air from said air conditioning means than is extricated from said enclosed area.

32. The method as set forth in claim 28 which includes the step of discharging conditioned air from said air conditioning means into a unitized adaptor assembly disposed in underlying relation to said air conditioning means and thereby transferring said conditioned air to a position along at least one side of an access opening into said vestibule, and thereafter discharging said conditioning air across said opening to provide an air curtain closure across said opening.

33. The method as set forth in claim 28 which includes the step of discharging conditioned air from said air conditioning means into a hollow element disposed along one side of said opening, and thereafter discharging said conditioning air from said element across said opening to provide an air curtain closure across said

opening.

34. In combination with a relatively enclosed area, vestibule means located adjacent to said area for providing occupant entry thereto and egress therefrom; said vestibule including a first opening providing occupant access to said vestibule and a second opening providing access between said vestibule and said area; closure means located in one of said openings having a first position separating opposite sides thereof and a second position enabling occupant entry thereacross; air passage defining means connecting opposite sides of said one opening for communicating air thereacross; and means including heat transfer means for conditioning fresh outside air and for introducing a sufficient volume of said conditioned air into said vestibule to at least partially pressurize said area, said means further including an air curtain closure located in the other of said openings for introducing said sufficient volume.

35. The combination as recited in claim 34 further comprising second closure means located in the other of said openings, and at least one generally hollow column supporting said second closure means and extending vertically of said other opening, said column having a discharge opening for directing conditioned air across said other opening to provide said air curtain closure.

36. The combination as recited in claim 35 further comprising a plenum chamber for communicating conditioned air from said air conditioning means to said column.

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