

Anti-Condensation Air Diffusion Equipment

Field of the Invention

[001] The present invention relates to an air diffusing system. In particular, the device is provided for an anti-condensing air diffusion system.

5

Background

[002] Air diffusers are commonly used in heating, ventilation, and air-conditioning (HVAC) systems. HVAC refers to the technology of indoor or automotive environmental comfort. HVAC systems helps to maintain indoor air quality through adequate ventilation with filtration and provides thermal comfort in an enclosed space. The enclosed space may include buildings, houses, a room, an auditorium, etc.

[003] Typically, the air diffusers come in various shapes (e.g. rectangular, circular, etc.) or sizes. The variation in the shape or size may be dependent on the size or volume of the enclosed space, aesthetic reasons, etc. The air diffusers are fitted at the end of an air distribution duct in a ceiling or sidewalls of the enclosed space. The air distribution duct is installed to introduce the heated and/or cooled air into the enclosed space. The air diffusers alters the direction of the air flowing out of the air distribution duct, preventing the air from flowing straight down into the enclosed space and at right angles to the ceilings or sidewalls. As such, the air diffuser allows air to flow outwardly in all directions.

[004] As air flows out from the air diffuser, the surface of the air diffuser is may be cooler or warmer than its surroundings in the enclosed space. The difference in the temperature on the surface of the air diffuser and its surrounding, may lead to condensation which results in water droplets forming on the surface of the air
5 diffuser. The presence of condensation may promote growth of unhealthy and smelly mold, or even damage the structural or aesthetic outlook of the enclosed space.

Summary

[005] In one aspect of the present invention, there is provided an air diffusion equipment is adapted for a supply air outlet and/or an exhaust air inlet. The air
10 diffusion equipment comprises a frame, wherein the frame includes an elongated limb with a bracket angled perpendicularly on one end and a ledge, wherein one side of the ledge extends from the base of the bracket and along the other side of the ledge there is another mirroring bracket; and a panel, wherein the panel has a knob on each side, wherein the knobs are provided for snapping the panel onto a hook of each side of the
15 ledge; wherein a groove in center of the base of the ledge and a circular lip protruding upwards within the panel is provided, wherein the circular lip snaps firmly into the groove in the ledge; and an air gap surrounding the circular lip and the groove, in between the panel and the ledge, is provided..

[006] In one embodiment, the elongated limb has a hook on one end, along the
20 same side of the bracket. The hook is provided to fit the air diffusion equipment together with an air distribution duct.

[007] In another embodiment, the knob has a slight curvature that protrudes outwards.

[008] In another aspect of the present invention, the panel may also be clipped on, slotted into, etc., onto the ledge. The panel and the ledge are also snapped firmly together using various means that includes machine tools such as a machine press, etc.

[009] In yet another embodiment, the panel is insulated from the air flowing
5 out of the air diffusion equipment by the air gap.

[0010] In another embodiment, the air diffusion equipment is fitted into a ceiling, wall, etc., of an enclosed space.

Brief Description of the Drawings

[0011] This invention will be described by way of non-limiting embodiments
10 of the present invention, with reference to the accompanying drawings, in which:

[0012] **FIG. 1** illustrates a cross-sectional view of an air diffusion equipment as one embodiment of the present invention;

[0013] **FIG. 2** illustrates a closer view of a frame; and

[0014] **FIG. 3** illustrates a closer view of a panel.

15 Detailed Description

[0015] The following descriptions of a number of specific and alternative embodiments are provided to understand the inventive features of the present invention. It shall be apparent to one skilled in the art, however that this invention may be practiced without such specific details. Some of the details may not be described in
20 length so as to not obscure the invention. For ease of reference, common reference

numerals will be used throughout the figures when referring to same or similar features common to the figures.

[0016] **FIG. 1** illustrates a cross-sectional view of an air diffusion equipment **100** as one embodiment of the present invention. The air diffusion equipment **100** is adapted for a supply air outlet fitted at the end of an air distribution duct. The air diffusion equipment **100** may be located in the ceiling, walls or on the floors, etc., of an enclosed space.

[0017] The air diffusion equipment **100** may come in various shapes and sizes, such as rectangular, round, etc., according to a required performance or required aesthetic appeal of the air diffusion equipment **100** for the enclosed space. Some examples of enclosed spaces include offices, buildings, rooms, halls, etc.

[0018] In one embodiment of the present invention, the air diffusion equipment **100** comprises a frame **101** and a panel **102**. The frame **101** is provided for the overall outlook of the air diffuser **100** and is made of a metallic material such as aluminum, steel, etc. The panel **102** is made of plastic such as Acrylonitrile Butadiene Styrene (ABS), or any thermally insulating material. The exemplified ABS is known to those skilled in the art, and therefore, no further illustration is provided herewith.

[0019] The frame **101** includes an elongated limb **103** with a bracket **104** angled perpendicularly on one end. A ledge **105** extends from the base of the bracket **104** in one end, and has another mirroring bracket **104** along the other end. Each ends of the ledge **105** has a hook **112**. Further, there is a groove **107** in the center of the base of the ledge **105**. A knob **106** protrudes out of the base of the ledge **105**, on each corner of the groove **107**. Each knob **106** has a slight curvature that protrudes outwards.

Towards the other end of the elongated limb **103**, there is a “C”-shaped hook **108** along the same side of the bracket **104**. The “C”-shaped hook **108** is provided to fit the air diffusion equipment **100** together with the air distribution duct easily.

[0020] The panel **102** has sides that have the knobs **106** mirroring each other, protruding outwards within the sides of the panel **102**. There is another protrusion **109** on the outer side of the panel **102** above the knob **106**. In the center of the panel **102**, there is a circular lip **110** that protruding protrudes upwards within the panel **102**. The circular lip **110** further includes a slit **113** in the center.

[0021] In one embodiment of the present invention, the panel **102** may be snapped on, clipped on, slotted into, etc., firmly onto the ledge **105**. Each knob **106** on each side of the panel **102** snaps onto the hook **112** of each side of the ledge **105**. The circular lip **110** also snaps firmly into the groove **107** in the ledge **105**, in between the knobs **106** along the corners of the groove **107**. The panel **102** may be snapped on to the ledge **105** using various means that includes machine tools such as a machine press, etc. Such method prevents the panel **102** to be removed from the ledge **105**. When the panel **102** is snapped onto the ledge **105**, the outer side of the panel **102** with the protrusion **109** is on the same horizontal axis as the surface of the bracket **104**.

[0022] In another embodiment of the present invention, there is an air gap **111** between the panel **102** and the ledge **105**. A difference in the temperature of the air flowing out of the air diffusion equipment **100** and the temperature in the surroundings may lead to condensation on the surface of the panel **102**. Therefore, the panel **102** is insulated from the air flowing out of the air diffusion equipment **100** by the air gap **111**.

[0023] Typically, when the air diffusion equipment **100** is fitted into the ceiling, wall, etc., both brackets **104** is placed against the surface of the ceiling with the panel **102** protruding outward. The outer side of the panel **102** with the protrusion **109** also lies against the surface of the ceiling. In addition, the panel **102** may also be fitted
5 within the surface of the ceiling, depending on the aesthetic need of the air diffusion equipment **100**.

[0024] **FIG. 2** and **FIG. 3** illustrate a closer view of the frame **101** and the panel **102** separately.

[0025] The above description illustrates various embodiments of the present
10 invention along with examples of how aspects of the present invention may be implemented. While specific embodiments have been described and illustrated it is understood that many changes, modifications, variations and combinations thereof could be made to the present invention without departing from the scope of the present invention. The above examples, embodiments, instructions semantics, and drawings
15 should not be deemed to be the only embodiments, and are presented to illustrate the flexibility and advantages of the present invention as defined by the following claims:

Claims

1. An air diffusion equipment is adapted for a supply air outlet, the air diffusion equipment comprises:

5 a frame, wherein the frame includes an elongated limb with a bracket angled perpendicularly on one end and a ledge, wherein one side of the ledge extends from the base of the bracket and along the other side of the ledge there is another mirroring bracket; and

a panel, wherein the panel has a knob on each side, wherein the knobs are provided for snapping the panel onto a hook of each side of the ledge together;

10 wherein a groove in center of the base of the ledge and a circular lip protruding upwards within the panel is provided, wherein the circular lip snaps firmly into the groove in the ledge; and an air gap surrounding the circular lip and the groove, in between the panel and the ledge, is provided.

2. The air diffusion equipment according to claim 1, wherein the elongated limb
15 has a hook on one end, along the same side of the bracket.

3. The air diffusion equipment according to claim 2, wherein the hook is provided to fit the air diffusion equipment together with an air distribution duct.

4. The air diffusion equipment according to claim 1, wherein the knob has a slight curvature that protrudes outwards.

20 5. The air diffusion equipment according to claim 1, wherein the panel may also be clipped on, slotted into, etc., firmly onto the ledge.

6. The air diffusion equipment according to claim 1, wherein the panel and the ledge is snapped firmly together using various means that includes machine tools such as a machine press, etc.
7. The air diffusion equipment according to claim 1, wherein the panel is insulated
5 from the air flowing out of the air diffusion equipment by the air gap.
8. The air diffusion equipment according to claim 1, wherein the air diffusion equipment is fitted into a ceiling, wall, etc., of an enclosed space.