

EXHAUST FAN INSTALLATION MEANS



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FIELD OF INVENTION

This invention relates to an improved means for mounting an appliance to an external wall or to a glass pane of a window, and in particular to a mounting system which allows an exhaust fan to be mounted to an existing pane of glass of a window.

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BACKGROUND OF THE INVENTION

The installation and sealing of exhaust fans to window panes has always been difficult to achieve, especially if it is required to install the fan from the inside without any outside assistance. In the past, this has generally required the presence of two installers, one on the outside, the other on the inside of the window in which the exhaust fan is to be installed. Another problem encountered with existing practices for installing exhaust fans to window panes is their inability to effectively seal against the faces of the glass pane as well as the external perimeter of the fan housing - it being appreciated that an exhaust fan, when installed, has a small portion of its body projecting outwardly from the pane of the window pane.

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It would be desirable therefore if a procedure was available which would allow an exhaust fan to be installed in a glass window pane by a single installer located on the inside of the window - particularly in situations where the installation is for high rise buildings, and for the fan to be mounted with an effective seal in a simple and convenient manner.

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It is the main object of the present invention to provide an improved mounting system which will enable an appliance, such as an exhaust fan, to be installed to a glass window pane in a simple and effective manner by a single installer.

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It is another object of the present invention to provide an improved sealing clamp system for use in mounting an exhaust fan in a prepared hole in a window glass pane and which allows the exhaust fan to be conveniently and effectively sealed when mounted.

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It is a further object of the invention to provide an improved sealing clamp system for an exhaust fan which allows fans to be installed in glass windows of varying thickness and of single and double glazing.

- 5 It is a still further object of the present invention to provide an improved exhaust fan mounting clamp system which permits the exhaust fan, when installed, to be serviced or cleaned without disturbing or replacing the components of the clamp system.

10 BRIEF DESCRIPTION OF THE INVENTION

According to this invention therefore, there is provided a mounting assembly for mounting an exhaust fan in a prepared hole formed in a planar wall member or window glass pane, wherein a portion of the exhaust fan housing or body projects outwardly from the plane containing said hole, comprising;

- 15 an inner clamp sub-assembly arranged to locate against the inside face of the mounting wall adjacent the perimeter region of said hole;
an outer clamp sub-assembly arranged to locate against the outside face of said mounting wall around a perimeter region adjacent said hole; and
fastening means for fastening said inner and outer clamp assemblies together
20 on opposite sides of said wall;
wherein said outer clamp sub-assembly comprises a flexibly hinged external clamp ring which can be hinged about a hinge axis which allows the external clamp assembly to be folded or hinged to a folded condition of reduced size to enable the ring to bodily pass through the prepared hole and thereafter returned to its normal
25 circular shape and engaged against the outside surface of the mounting wall surrounding said hole.

- The inner clamp assembly may provided with a sealing member which, when the clamp assembly is installed, is adapted to sealingly engage around the perimeter of
30 the projecting body of the exhaust fan.

Alternatively the outer mating annular seal may extend radially inwards to provide a seal around the perimeter of the projecting body of the exhaust fan when it is installed.

- 5 Preferably said external clamp ring is formed from two semi-circular halves each of moulded plastics material and connected by a hinge arrangement.

The hinge arrangement may be a pair of flexible hinge connectors each of which has a pair of tab portions respectively attached to mating ends of the ring halves and which
10 permit the ring halves to hinge relative to one another about a transverse hinge axis. Desirably each of the tab portions of each hinge connector attaches to an end portion of a respective said clamp ring half in a spigot and socket manner.

Preferably the outer annular seal is a point pressure gasket which is held captive in
15 the outer clamp assembly during the installation procedure. A foam seal on the inner face of the glass pane could be employed in lieu of the annular seal on the outer face of the pane.

Desirably the fastening means comprises a plurality of bolts which pass through
20 aligned apertures formed in the outer clamp ring and its mating annular seal, and in turn through aligned apertures formed in an inner clamp seal and an inner clamp plate of the inner clamp assembly, with said bolts lying on an imaginary circle having a diameter less than the diameter of said prepared hole.

25 Preferably the inner or internal clamp assembly comprises a rectangular clamp plate and a mating rectangular clamp seal, each of which is formed with a central circular opening having a diameter which is less than the diameter of said prepared hole. Desirably the inner clamp seal is arranged to sealingly engage against the inner face of the glass pane as well as sealingly engage around the perimeter of the duct
30 protruding from the exhaust fan.

With the inner and outer clamp assemblies fitted to the window or wall member, the exhaust fan can be removably fastened to the inner clamp plate and the mounting assembly can remain in place when the exhaust fan is removed for maintenance or the like.

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BRIEF DESCRIPTION OF THE DRAWINGS

In order to more fully explain the present invention, a preferred embodiment thereof is described hereunder in some further detail with reference to and as illustrated in the accompanying drawings wherein:

- 10 Fig 1 is an exploded perspective view of the outer clamp assembly of the exhaust fan mounting system;
- Fig 2 is an exploded perspective view of the inner clamp assembly which is adapted for securement to the outer clamp assembly by means of bolts which pass through the two assemblies;
- 15 Fig 3 is a sectional view taken through the mounting system which shows the inner and outer clamp assemblies in their fitted positions with the window glass pane clamped therebetween;
- Fig 4 is a fragmentary perspective view of the window glass pane with an aperture therein in which an exhaust fan is to be installed and which shows
- 20 the outer clamp assembly in a collapsed condition allowing it to pass through the hole in the glass pane; and
- Fig 5 is an exploded perspective view showing the fan unit and mounting clamps in the installed condition.

25 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, there is shown an exhaust fan 10 which is to be mounted to a glass window pane 11 which has a prepared hole 12 formed therein.

The fan 10 is mounted by means of an outer clamp sub-assembly 13 and an inner

30 clamp sub-assembly 14.

The outer clamp sub-assembly 13 as shown in Fig 1 comprises an external clamp ring 15 formed in two semi-circular halves 15', 15'' and which are flexibly hinged together by means of a pair of diametrically opposed hinge connectors 16, and an annular mating seal 17 which in this embodiment is a point pressure gasket held to the clamp ring 15 by means of a plurality of bolts 18 which pass through aligned openings formed within the clamp ring halves 15' 15'' and the annular seal 17. The hinge connectors 16 each have a plug 34 at each end which fit into sockets 35 in the two semi-circular halves 15', 15'' to facilitate assembly of the outer clamp sub-assembly 13.

The inner clamp assembly 14 is shown in Fig 2 of the drawings and comprises a rectangular clamp plate 20 and a mating rectangular clamp seal 21, each of which has formed centrally therein a circular aperture 23, 24 respectively, the diameter of which is slightly less than the diameter of the hole 12 formed in the glass pane 11. The clamp seal and clamp plate assembly are arranged to sealingly engage the inner face of the glass pane 11 and clampingly engage thereagainst by means of the clamping bolts 18 which pass through aligned openings 26 and 27 formed in the clamp plate 20 and clamp seal 21 respectively. In this embodiment the clamp plate 20 and clamp seal 21 locate together by means of a plurality of projecting apertured bosses 29 on the inner face of the clamp seal 21 and which respectively locate in aligned apertures 30 formed in the body of the clamp plate 20 in proximity to the corners thereof.

The peripheral wall of the aperture 24 makes sealing contact with the outer periphery of duct 32 which protrudes rearwardly from the exhaust fan.

In order to install the exhaust fan 10 to the window pane 11, the following procedure is carried out;

- (a) The external clamp ring 15 together with its mating seal 17 with the bolts 18 fitted are folded to the collapsed condition shown in Fig 4 and passed through the hole 12 in the glass pane 11 by the installer. When fully inserted through the hole 12, the clamp ring is returned to its planar circular condition and located against the outer surface of the window 11

so that it extends around the perimeter of the hole, with the clamping bolts 18 projecting inwardly through the hole 12.

5 (b) The inner clamp plate 20 and clamp seal 21 are then fitted against the inside of the glass pane 11 with the bolts 18 projecting through the aligned apertures 26, 27 formed in the clamp plate 20 and clamp seal 21 respectively. Nuts 33 are then put onto the bolts 18 to retain the mounting assembly onto the window pane.

10 (c) The exhaust fan is then attached to the inner clamp plate 20 by means of fasteners (not shown), with the duct 32 extending through the inner and outer clamp sub-assemblies 13, 14, so that the inner periphery of the clamp seal 21 sealingly engages the perimeter of the duct 32.

With the exhaust fan installed (which can be at any stage during building construction), the inner and outer clamp sub-assemblies are sealed to the glass pane 15 11 as well as to the projecting duct of the exhaust fan. No special tool or skill is required to create the seal, and service of the fan or cleaning can be executed without disturbing or replacing the inner and outer clamp sub-assemblies. Various thicknesses of glass and double glazing can be accommodated with the sealing system of this invention. The invention is also applicable for the installation of 20 exhaust fans and the like through apertures in other building materials such as fibreboard, brick and concrete.

It should of course be appreciated that the invention is not limited in terms of the precise constructional features described hereinabove and modifications may be 25 made without departing from the true spirit and scope of the invention.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS

1. A mounting assembly for mounting an exhaust fan in a prepared hole formed in a planar mounting wall, eg a window glass pane, wherein a portion of the exhaust fan housing or body projects outwardly from the plane containing said hole, comprising;

an inner clamp sub-assembly arranged to locate against the inside face of the mounting wall adjacent the perimeter region of said hole;

an outer clamp sub-assembly arranged to locate against the outside face of said mounting wall around a perimeter region adjacent said hole; and

fastening means for fastening said inner and outer clamp assemblies together on opposite sides of said wall;

wherein said outer clamp sub-assembly comprises a flexibly hinged external clamp ring which can be hinged about a hinge axis which allows the external clamp assembly to be folded or hinged to a folded condition of reduced size to enable the ring to bodily pass through the prepared hole and thereafter returned to its normal circular shape and engaged against the outside surface of the mounting wall surrounding said hole.

2. A mounting assembly according to claim 1, wherein the outer clamp sub-assembly also comprises an annular seal in mating engagement with said external clamp ring, said seal in use, sealingly engages against the mounting wall outside face.

3. A mounting assembly as in Claim 1 or claim 2 wherein the inner clamp sub-assembly comprises a clamp plate and a mating sealing member which, when the clamp assembly is installed, is adapted to sealingly engage around the perimeter of the projecting body of the exhaust fan, each of said clamp plate and said sealing member having a centrally formed circular aperture, the diameter of which is slightly less than the diameter of said hole.

4. A mounting assembly as in Claim 2 wherein the annular seal extends radially inwards to provide a seal around the perimeter of the projecting body of the exhaust fan when it is installed.

5 5. A mounting assembly as in Claim 1 wherein the external clamp ring is formed from two semi-circular halves each of moulded plastics material and connected by a hinge arrangement.

10 6. A mounting assembly as in Claim 5 wherein the hinge arrangement is a pair of flexible hinge connectors each of which has a pair of tab portions respectively attached to mating ends of the ring halves and which permit the ring halves to hinge relative to one another about a transverse hinge axis.

15 7. A mounting assembly as in Claim 6 wherein each of the tab portions of each hinge connector attaches to an end portion of a respective said clamp ring half in a spigot and socket manner.

20 8. A mounting assembly as in Claim 2 wherein the annular seal is a point pressure gasket which is held captive in the outer clamp assembly during the installation procedure.

25 9. A mounting assembly as in Claim 1 or claim 3 wherein the fastening means comprises a plurality of bolts which pass through aligned apertures formed in the inner and outer clamp sub-assemblies, the bolts lying on an imaginary circle having a diameter less than the diameter of said prepared hole.

10. A mounting assembly for mounting an exhaust fan in a prepared hole formed in a planar wall member or window glass pane substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.