

MOUNTING ASSEMBLY FOR DOOR OR WINDOW AND DOOR OR WINDOW ASSEMBLY EMPLOYING SAME

Field of the Invention

5 The present invention relates, in general, to door and window systems and more particularly to a mounting assembly for a door or a window and a door or window assembly employing the same.

Background of the Invention

10 In conventional door systems employing conventional hinges, a sizeable gap is present between a hinged portion of a door and a door frame to which the door is attached when the door is in an open position. Injuries occur when fingers are caught in the gap when the door moves into a closed position. There is therefore a need for a mounting assembly for a door or a window and a door or window assembly that can prevent the occurrence of such injuries.

Summary of the Invention

15 Accordingly, in a first aspect, the present invention provides a mounting assembly for a door or a window. The mounting assembly includes a jamb arranged to define a casing to conceal a hinged portion of the door or the window. A support structure is coupled to the jamb and is arranged to provide a surface of attachment within the casing.

20 In a second aspect, the present invention provides a door or window assembly including a jamb arranged to define a casing to conceal a hinged portion of a door or a window. A support structure is coupled to the jamb and is arranged to provide a surface of attachment within the casing. A hinge is attached to the support structure, and a leaf of the door or the window is
25 attached to the hinge.

Other aspects and advantages of the invention will become apparent from the following detailed description, taken in conjunction with the accompanying drawings, illustrating by way of example the principles of the invention.

5 Brief Description of the Drawings

Embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

FIGS. 1A and 1B are schematic cutaway top plan views of a mounting assembly to which a door or window is mounted in accordance with an
10 embodiment of the present invention;

FIGS. 2A through 2C are schematic cutaway perspective views of a door or window assembly in accordance with an embodiment of the present invention;

FIGS. 3A through 3C are schematic cutaway top plan views of a door or
15 window assembly in accordance with another embodiment of the present invention;

FIGS. 4A through 4C are schematic cutaway top plan views of a door or window assembly in accordance with yet another embodiment of the present invention;

FIGS. 5A through 5C are schematic cutaway top plan views of a door or
20 window assembly in accordance with still another embodiment of the present invention;

FIGS. 6 through 9 are schematic cutaway top plan views showing various applications of a mounting assembly in accordance with various
25 embodiments of the present invention; and

FIGS. 10A and 10B are schematic cutaway top plan views showing an application of a door or window assembly in accordance with an embodiment of the present invention.

Detailed Description of Exemplary Embodiments

5 The detailed description set forth below in connection with the appended drawings is intended as a description of presently preferred embodiments of the invention, and is not intended to represent the only forms in which the present invention may be practiced. It is to be understood that the same or equivalent functions may be accomplished by different embodiments that are intended to
10 be encompassed within the scope of the invention.

Referring now to FIGS. 1A and 1B, a mounting assembly 10 to which a door or window 12 is mounted is shown. The door or window 12 is shown in a closed position in FIG. 1A and in an open position in FIG. 1B. In the embodiment shown, a stop 14 is provided at a distal end of the door or window
15 12 to limit rotation of the door or window 12.

The mounting assembly 10 includes a jamb 16 arranged to define a casing 18 to conceal, accommodate and/or house a hinged portion of the door or window 12. A support structure 20 is coupled to the jamb 16 and is arranged to provide a surface of attachment within the casing 18.

20 The jamb 16 of the present embodiment includes a first wall 22 and a second wall 24 adjacent to the first wall 22, the first wall 22 having a first protrusion 26 and the second wall 24 having a second protrusion 28. The first and second protrusions 26 and 28 serve to reduce the presence of gaps between the mounting assembly 10 and the door or window 12 when the door
25 or window 12 is in an open or closed position and also when the door or window 12 is rotating between the open and closed positions.

The support structure 20 of the present embodiment includes a first support member 30 extending from the first wall 22 of the jamb 16 in a direction parallel to a plane of the second wall 24 of the jamb 16 and a second support member 32 extending from the first support member 30 in a direction parallel to
5 a plane of the first wall 22 of the jamb 16.

In the present embodiment, a hinge 34 is attached to the second support member 32 of the support structure 20. In the embodiment shown, a first leaf 36 of the hinge 34 is attached to the second support member 32 in a direction parallel to the plane of the first wall 22. Consequently, the hinge 34 is in an
10 open position when the door or window 12 is in the closed position and the hinge 34 is in a closed position when the door or window 12 is in an open position. Advantageously, this increases the durability and lifespan of the hinge 34. This is because when in the open position, the door or window 12 is hanging freely with no support provided by any structure and hence this position
15 exerts the most force on the hinge 34, whereas when in the closed position, there may be multiple sources of support for the door or window 12 in the form of, for example, bolt and latches of a door lock or seal on a door frame and these help distribute the force off the hinge 34. Therefore, it is advantageous to have the hinge 34 in a closed position when the door or window 12 is in the
20 open position and to have the hinge 34 in an open position when the door or window 12 is in the closed position.

The mounting assembly 10 may serve as a stand-alone door frame. Alternatively, the mounting assembly 10 may be mounted onto an existing door frame and become an add-on to the door frame.

25 Referring now to FIGS. 2A through 2C, a door or window assembly 50 is shown. The door or window assembly 50 is shown in a first position in FIG. 2A, in an intermediate position in FIG. 2B and in a second position in FIG. 2C.

The door or window assembly 50 includes a jamb 52 arranged to define a casing 54 to conceal, accommodate and/or house a hinged portion of a door or window 56. A support structure 58 is coupled to the jamb 52 and is arranged to provide a surface of attachment within the casing 54. A hinge 60 is attached to the support structure 58 and a leaf 62 of the door or window 56 is attached to the hinge 60.

The jamb 52 of the present embodiment includes a first wall 64 and a second wall 66 adjacent to the first wall 64, the first wall 64 having a first protrusion 68 and the second wall 66 having a second protrusion 70.

10 The support structure 58 of the present embodiment includes a first support member 72 extending from the first wall 64 of the jamb 52 in a direction parallel to a plane of the second wall 66 of the jamb 52 and a second support member 74 extending from the first support member 72 in a direction parallel to a plane of the first wall 64 of the jamb 52.

15 In the present embodiment, a first leaf 76 of the hinge 60 is attached to the second support member 74 in a direction parallel to the plane of the first wall 64. In the embodiment shown, a second leaf (not shown) of the hinge 60 is attached to an edge 78 of the leaf 62 of the door or window 56 and a knuckle 80 of the hinge 60 abuts the edge 78 of the leaf 62 of the door or window 56.

20 The leaf 62 of the door or window 56 in the present embodiment includes a first extended surface 82 and a second extended surface 84 opposite to the first extended surface 82, each of the first and second extended surfaces 82 and 84 extending beyond the edge 78 of the leaf 62 of the door or window 56.

25 As can be seen from FIG. 2A, the first extended surface 82 in the present embodiment is received in a first space between a distal surface 86 of the first protrusion 68 and an inner surface 88 of the second support member 74 and

the second extended surface 84 is aligned with the second protrusion 70 when the leaf 62 of the door or window 56 is in the first position.

Similarly, and as can be seen from FIG. 2C, the second extended surface 84 is received in a second space between a distal surface 90 of the second protrusion 70 and an outer surface 92 of the first support member 72 and the first extended surface 82 is aligned with the first protrusion 68 when the leaf 62 of the door or window 56 is in the second position.

The first and second extended surfaces 82 and 84 may be part of or an add-on to the leaf 62 of the door or window 56. In the embodiment shown, the second extended surface 84 is removably attached to the leaf 62 of the door or window 56. This may be by use of a clipping system as shown or other known means of securement. Provision of at least one extended surface that may be externally removed advantageously allows ease of installation of the door or window assembly 50 and also facilitates the performance of future maintenance work on the door or window assembly 50. To increase aesthetic appeal of the door or window assembly 50, the first and second extended surfaces 82 and 84 are preferably secured to the leaf 62 of the door or window 56 without any visible screws and may be of the same or a similar material and/or colour as the jamb 52 and the leaf 62 of the door or window 56 to provide visual uniformity.

Gaps between the jamb 52 and the leaf 62 of the door or window 56 are reduced through the provision of the first and second protrusions 68 and 70 on the jamb 52 and the first and second extended surfaces 82 and 84 of the leaf 62 of the door or window 56. As can be seen from FIGS. 2A and 2C, in the first and second positions, there is only a minimal gap between the first and second protrusions 68 and 70 on the jamb 52 and the first and second extended surfaces 82 and 84 of the leaf 62 of the door or window 56. During rotation as shown in FIG. 2B, the first and second extended surfaces 82 and 84 move along with the rotation of the leaf 62 of the door or window 56 in a circular

manner within the jamb 52. A minimal gap that is smaller than a finger width may be exposed on both sides of the leaf 62 of the door or window 56 during rotation. Consequently, injuries to fingers from being crushed by a rotating door or window may be eliminated with the door or window assembly 50.

5 Furthermore, as can be seen from FIGS. 2A through 2C, the hinge 60 of the door or window assembly 50 and any screws (not shown) used on the hinge 60 are concealed at any orientation of the leaf 62 of the door or window 56, thus improving the overall aesthetics of the door or window assembly 50. With the door or window assembly 50, there would not be any visible unsightly hinge or
10 pivot point on one or both internal and external sides of the door or window assembly 50. Accordingly, the hinge 60 may be of any colour or material as necessary without affecting the appearance of the door or window assembly 50. Further advantageously, any wiring or additional components such as, for example, sensors and alarms that are to be provided with the door or window
15 assembly 50 may also be similarly concealed.

Referring now to FIGS. 3A through 3C, another embodiment of a door or window assembly 100 is shown. The door or window assembly 100 is shown in a first position in FIG. 3A, in an intermediate position in FIG. 3B and in a second position in FIG. 3C.

20 The door or window assembly 100 includes a jamb 102 arranged to define a casing 104 to conceal, accommodate and/or house a hinged portion of a door or window 106. A support structure 108 is coupled to the jamb 102 and is arranged to provide a surface of attachment within the casing 104. A hinge 110 is attached to the support structure 108 and a leaf 112 of the door or
25 window 106 is attached to the hinge 110.

The jamb 102 of the present embodiment includes a first wall 114 and a second wall 116 adjacent to the first wall 114, the first wall 114 having a first protrusion 118 and the second wall 116 having a second protrusion 120.

The support structure 108 of the present embodiment includes a first support member 122 extending from the first wall 114 of the jamb 102 in a direction parallel to a plane of the second wall 116 of the jamb 102 and a second support member 124 extending from the first support member 122 in a direction parallel to a plane of the first wall 114 of the jamb 102.

In the present embodiment, a first leaf 126 of the hinge 110 is attached to the second support member 124 in a direction parallel to the plane of the first wall 114. In the embodiment shown, a second leaf 128 of the hinge 110 is attached to an edge 130 of the leaf 112 of the door or window 106 and a knuckle 132 of the hinge 110 abuts the edge 130 of the leaf 112 of the door or window 106.

The leaf 112 of the door or window 106 in the present embodiment includes a first extended surface 134 and a second extended surface 136 opposite to the first extended surface 134, each of the first and second extended surfaces 134 and 136 extending beyond the edge 130 of the leaf 112 of the door or window 106.

As can be seen from FIG. 3A, the first extended surface 134 in the present embodiment is received in a first space between a distal surface 138 of the first protrusion 118 and an inner surface 140 of the second support member 124 and the second extended surface 136 is aligned with the second protrusion 120 when the leaf 112 of the door or window 106 is in the first position.

Similarly, and as can be seen from FIG. 3C, the second extended surface 136 is received in a second space between a distal surface 142 of the second protrusion 120 and an outer surface 144 of the first support member 122 and the first extended surface 134 is aligned with the first protrusion 118 when the leaf 112 of the door or window 106 is in the second position.

The present embodiment differs from the previous embodiment in that both the first and second extended surfaces 134 and 136 have curved surfaces corresponding to their respective circumferences of rotation. Advantageously, and as can be seen from FIG. 3B, the curved surfaces further reduce the gaps
5 between the leaf 112 of the door or window 106 and the jamb 102 as the leaf 112 of the door or window 106 rotates between the first and second positions. Although both the first and second extended surfaces 134 and 136 are illustrated in the present embodiment as being curved, it should be understood by those of ordinary skill in the art that the present invention is not limited to
10 having both curved first and second extended surfaces. In alternative embodiments, only one of the first and second extended surfaces may have a curved surface corresponding to a corresponding circumference of rotation.

As can be seen from FIGS. 3A through 3C, a separation D_1 between an inner distal corner 146 of the first protrusion 118 and an axis of rotation 148 of the hinge 110 is greater than a radius of rotation R_1 of an outer distal corner 150
15 of the first extended surface 134 of the leaf 112 of the door or window 106 about the axis of rotation 148 of the hinge 110, and a separation D_2 between an inner distal corner 152 of the second protrusion 120 and the axis of rotation 148 of the hinge 110 is greater than a radius of rotation R_2 of an outer distal corner
20 154 of the second extended surface 136 of the leaf 112 of the door or window 106 about the axis of rotation 148 of the hinge 110. In one embodiment, the separation D_1 between the inner distal corner 146 of the first protrusion 118 and the axis of rotation 148 of the hinge 110 may be less than 10 millimetres (mm) greater than the radius of rotation R_1 of the outer distal corner 150 of the first
25 extended surface 134 of the leaf 112 of the door or window 106 about the axis of rotation 148 of the hinge 110. In the same or a different embodiment, the separation D_2 between the inner distal corner 152 of the second protrusion 120 and the axis of rotation 148 of the hinge 110 may be less than 10 mm greater than the radius of rotation R_2 of the outer distal corner 154 of the second

extended surface 136 of the leaf 112 of the door or window 106 about the axis of rotation 148 of the hinge 110.

Referring now to FIGS. 4A through 4C, another embodiment of the door or window assembly 100 is shown. The door or window assembly 100 is shown in a first position in FIG. 4A, in an intermediate position in FIG. 4B and in a second position in FIG. 4C.

The embodiment shown in FIGS. 4A through 4C differs from the previous embodiment in the positioning of the hinge 110 relative to the second support member 124. More particularly, the first leaf 126 of the hinge 110 is attached to the second support member 124 in a direction parallel to a plane of the second wall 116.

Another difference is that both the first and second extended surfaces 134 and 136 of the leaf 112 of the door or window 106 in the present embodiment are not curved.

In the embodiment shown, a planar separation D_3 between the distal surface 138 of the first protrusion 118 and the inner surface 140 of the second support member 124 is greater than a thickness T_1 of the first extended surface 134 of the leaf 112 of the door or window 106. Additionally, in the embodiment shown, a planar separation D_4 between the distal surface 142 of the second protrusion 120 and the outer surface 144 of the first support member 122 is at least a thickness T_2 of the second extended surface 136 of the leaf 112 of the door or window 106. In one embodiment, the planar separation D_3 between the distal surface 138 of the first protrusion 118 and the inner surface 140 of the second support member 124 may be less than 10 mm greater than the thickness T_1 of the first extended surface 134 of the leaf 112 of the door or window 106. In the same or a different embodiment, the planar separation D_4 between the distal surface 142 of the second protrusion 120 and the outer surface 144 of the first support member 122 may be less than 10 mm greater

than the thickness T_2 of the second extended surface 136 of the leaf 112 of the door or window 106.

Referring now to FIGS. 5A through 5C, yet another embodiment of the door or window assembly 100 is shown. The door or window assembly 100 is shown in a first position in FIG. 5A, in an intermediate position in FIG. 5B and in a second position in FIG. 5C.

The embodiment shown in FIGS. 5A through 5C differs from previous embodiments in the positioning of the first wall 114 relative to the second wall 116.

Another difference is that unlike the earlier embodiments where the second extended surface is detachable, the first extended surface 134 in the present embodiment is removably attached to the leaf 112 of the door or window 106.

Although illustrated in the present embodiments as having one (1) detachable extended surface, it should be understood by those of ordinary skill in the art that the present invention is not limited to having one (1) of the first and second extended surfaces removably attached to the leaf of the door or window. In alternative embodiments, both or none of the first and second extended surfaces may be removably attached to the leaf of the door or window. Provision of at least one extended surface that may be externally removed advantageously allows ease of installation of the door or window assembly 100 and also facilitates the performance of future maintenance work on the door or window assembly 100.

In the embodiments described, the axis of rotation 148 of the hinge 110 lies along or as close as possible to a central plane 156 of the leaf 112 of the door or window 106. Advantageously, when the hinge 110 is secured in a manner where the axis of rotation 148 of the hinge 110 lies along or as close as

possible to the central plane 156 of the leaf 112 of the door or window 106, stress on the hinge 110 is reduced and a swing radius of the door or window 106 is also minimised.

Referring now to FIGS. 6 through 9, apart from a single panel swinging door or window as shown in FIGS. 1A and 1B, the mounting assembly 10 may also be used to mount various other types of door or window and some examples of these are shown in FIGS. 6 through 9. More particularly, FIG. 6 shows a double panel folding door or window 200 attached to the mounting assembly 10, FIG. 7 shows a multi-panel folding door or window 202 attached to the mounting assembly 10, FIG. 8 shows a double panel sliding and swinging door or window 204 attached to the mounting assembly 10, and FIG. 9 shows a three (3) panel sliding and folding door or window 206 attached to the mounting assembly 10.

Referring now to FIGS. 10A and 10B, an application of the mounting assembly 10 will now be described. In the embodiment shown, the mounting assembly 10 is employed in a washroom 250 having a dual frame installation 252. A door 254 is attached to the mounting assembly 10 and is movable between a first position shown in FIG. 10A where the door 254 is used to prevent access to the entire washroom 250 and a second position shown in FIG. 10B where the door 254 is used to prevent access to a section 256 of the washroom 250. When in the first position, the door 254 affords privacy to both the toilet and wash areas of the washroom 250 and when in the second position, the door 254 affords privacy to the toilet area of the washroom 250, allowing others to make use of the wash area of the washroom 250. The flexibility afforded by the mounting assembly 10 in allowing the use of a single door 254 for two (2) door openings without having to install a second separate door also gives rise to space and cost savings.

Further advantageously, in both the first and second positions, the hinge 30 of the mounting assembly 10 is completely concealed from users of the

washroom 254, presenting a neat appearance and enhancing the overall appearance of the washroom 254.

As is evident from the foregoing discussion, the present invention provides a mounting assembly and a door or window assembly that can reduce
5 injury to fingers from rotating doors or windows. Further advantageously, the present invention also provides a door or window assembly with improved aesthetics and a more durable hinging system.

While preferred embodiments of the invention have been illustrated and described, it will be clear that the invention is not limited to these embodiments
10 only. Numerous modifications, changes, variations, substitutions and equivalents will be apparent to those skilled in the art without departing from the scope of the invention as described in the claims.

Further, unless the context clearly requires otherwise, throughout the description and the claims, the words "comprise", "comprising" and the like are
15 to be construed in an inclusive as opposed to an exclusive or exhaustive sense; that is to say, in the sense of "including, but not limited to".