

PATENT SPECIFICATION

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DRAWINGS ATTACHED

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(54) DOOR SEALING STRIP ARRANGEMENT

(71) I, KUNIO ISAMATSU, a subject of Japan, of 111-4, 5-Chome, Sekimae, Musashino-Shi, Tokyo-To, Japan, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates generally to openable and closable doors and the like and more particularly to a new and improved door sealing arrangement for sealing the gaps between doors and their doorway frames.

Doorways and their doors are necessary and important structures in exterior and interior walls of building structures, the principal purpose of a door being to provide a freely openable and closable part of a wall and, when closed, to preserve the barrier function of the wall. Ordinary doors, particularly side-hinged doors, however, do not afford a tight seal against the passage of matter, such as dust, draughts, and rainwater, and energy, such as sounds and heat.

The reason for this is that clearances must be left for the practical operation of the doors, and gaps are inevitably present between adjacent parts of doors and their doorway frames even in prefabricated assemblies, which are made with relatively high precision.

It is an object of the present invention to provide a sealing arrangement for doors whereby, when the door is closed, the doorway is effectively sealed to prevent passage there-through of energy and matter such as heat, noise, draughts, dust and rainwater.

Another object of the invention is to provide a sealing arrangement of the above-stated character which is of simple and inexpensive construction and has high durability.

A further object of the invention is to provide a sealing arrangement of the above-stated character which can be easily installed.

According to the present invention there is provided a door sealing arrangement for seal-

ing a door with respect to the jambs, lintel, and sill of a doorway frame, which jambs and lintel are rebated to provide a surface against which the door when closed abuts and is stopped, said sealing arrangement comprising, in combination, a first resilient sealing strip secured to and along said rebate surfaces and a second resilient sealing strip secured to and along the lower marginal edge portion of said door, said first sealing strip having a cross-section consisting integrally of a flat part for securing the first strip to said rebate surfaces and a folded-back free part connected to and diverging from said flat part and terminating in a bulbous bead for resilient contact with the door; said second sealing strip having a cross-section consisting integrally of a flat part for securing the second strip to the lower marginal edge portion of the door and a resilient free part extending downward from said flat part and terminating in a bulbous bead for resilient and rubbing contact with said sill, exposed surfaces of said first and second sealing strips being covered with a pile.

A door sealing arrangement according to the present invention will now be described, by way of example only, with reference to the accompanying drawing, in which:—

Figure 1 is an elevational view showing a doorway frame and door provided with an example of the sealing arrangement according to the invention;

Figure 2 is a relatively enlarged side elevational view, in vertical section and with the middle part cut away, showing the door of Figure 1 in closed state in the doorway frame;

Figure 3 is a fragmentary sectional view showing the manner in which a first sealing strip is secured to the door jamb or lintel of the doorway frame; and

Figure 4 is a fragmentary sectional view showing the manner in which a second sealing strip is secured to the lower edge of the door.

Referring to the drawing, a doorway frame 1 of conventional construction comprises two

side jambs and an overhead lintel. Each of the jambs and lintel in cross-section is stepped to form a rebate, into which a door 5 loosely fits when closed, and a rebate surface 12, against which the door 5, at its inside surface along the side and upper edges thereof, normally abuts or seats and is stopped in closed position.

Even with this rebated construction of the jambs and lintel, considerable gaps inevitably exist between these parts and the door in ordinary practice, through which gaps matter, such as dust, draughts, and rainwater, and energy, such as noise and heat, can pass. Furthermore, the lower sill part 9 of the doorway presents a problem in that, while slightly stepped sills exist, sills in ordinary doorways are generally made as smooth as possible to prevent tripping of persons and bumping of wheeled vehicles passing thereover.

A resilient sealing strip 15 is secured to and along the entire lengths of the rebated surfaces 12 of the jambs and lintel of the doorway frame 1 for sealing the gap between the inside surface of the door 5 and the rebate surface 12. A resilient sealing strip 16 is secured to and along the lower edge of the inside surface of the door 5 for sealing the gap between the lower edge of the door and the sill 9.

The resilient sealing strip 15 has a flat part 2 of rectangular cross-section, for securing by means of an adhesive to the rebate surface 12, and a folded-back free part 4 contiguously connected to the flat part 2 at its inner edge (lower edge as viewed in Figure 3) and curving outward (upward as viewed in Figure 3) and toward the door 5. At the extremity of the folded-back free part 4 there is formed a bulbous bead 3. The entire exposed surface of the sealing strip 15 is covered with a pile 14.

The resilient sealing strip 16 has a flat part 6 of rectangular cross-section for securing to the lower edge of the door 5 on the inner side thereof by means of a flat strip 10 and fastening members 11 such as screws or nails. A zig-zag free part 6a extends downward from the flat part 6, and a bulbous bead 7 is formed at the extreme lower edge of the zig-zag part 6a. The sealing strip 16 is thus secured to the door 5 in such a vertical position that the bead 7 is caused to be in rubbing contact with the surface of the sill 9, with anode resilient force provided principally by the deformation of the zig-zag part 6a from its free state. The entire exposed surface of the sealing strip 16 is also covered with a pile 8.

The sealing strips 15 and 16 are made of a resilient material such as a rubber or a resilient synthetic resin.

In the case of a double door, that is two doors respectively hinged on opposite jambs and having free vertical edges meeting and engaging each other at the centre of the doorway, the sealing strip 15 is secured to the free vertical edge of one of the doors.

The door sealing arrangement functions in the following manner when the door 5 is closed. The closure of the door 5 causes its inside surface along its sides and top to press against the bulbous bead 3 of the sealing strip 15, whereby the free part 4 thereof is resiliently deflected toward the rebate surface 12 and, at the same time, exerts a resilient reaction force by way of bead 3 against the inside surface of the door 5. The sealing strip 16 also exerts a resilient force by way of bead 7 against the surface of the sill 9.

Accordingly, all four edges of the door 5, when in its closed position, are in a tightly sealed state relative to the doorway frame 1 and the sill 9, which sealed state is rendered even more effective by the sealing action of the piles 14 and 8.

WHAT I CLAIM IS:—

1. A door sealing arrangement for sealing a door with respect to the jambs, lintel, and sill of a doorway frame, which jambs and lintel are rebated to provide a surface against which the door when closed abuts and is stopped, said sealing arrangement comprising, in combination, a first resilient sealing strip secured to and along said rebate surfaces and a second resilient sealing strip secured to and along the lower marginal edge portion of said door, said first sealing strip having a cross-section consisting integrally of a flat part for securing the first strip to said rebate surfaces and a folded-back free part connected to and diverging from said flat part and terminating in a bulbous bead for resilient contact with the door, said second sealing strip having a cross-section consisting integrally of a flat part for securing the second strip to the lower marginal edge portion of the door and a resilient free part extending downward from said flat part and terminating in a bulbous bead for resilient and rubbing contact with said sill, exposed surfaces of said first and second sealing strips being covered with a pile.

2. A door sealing arrangement substantially as hereinbefore described with reference to the accompanying drawing.

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side jambs and an overhead lintel. Each of the jambs and lintel in cross-section is stepped to form a rebate, into which a door 5 loosely fits when closed, and a rebate surface 12, against which the door 5, at its inside surface along the side and upper edges thereof, normally abuts or seats and is stopped in closed position.

Even with this rebated construction of the jambs and lintel, considerable gaps inevitably exist between these parts and the door in ordinary practice, through which gaps matter, such as dust, draughts, and rainwater, and energy, such as noise and heat, can pass. Furthermore, the lower sill part 9 of the doorway presents a problem in that, while slightly stepped sills exist, sills in ordinary doorways are generally made as smooth as possible to prevent tripping of persons and bumping of wheeled vehicles passing thereover.

A resilient sealing strip 15 is secured to and along the entire lengths of the rebated surfaces 12 of the jambs and lintel of the doorway frame 1 for sealing the gap between the inside surface of the door 5 and the rebate surface 12. A resilient sealing strip 16 is secured to and along the lower edge of the inside surface of the door 5 for sealing the gap between the lower edge of the door and the sill 9.

The resilient sealing strip 15 has a flat part 2 of rectangular cross-section, for securing by means of an adhesive to the rebate surface 12, and a folded-back free part 4 contiguously connected to the flat part 2 at its inner edge (lower edge as viewed in Figure 3) and curving outward (upward as viewed in Figure 3) and toward the door 5. At the extremity of the folded-back free part 4 there is formed a bulbous bead 3. The entire exposed surface of the sealing strip 15 is covered with a pile 14.

The resilient sealing strip 16 has a flat part 6 of rectangular cross-section for securing to the lower edge of the door 5 on the inner side thereof by means of a flat strip 10 and fastening members 11 such as screws or nails. A zig-zag free part 6a extends downward from the flat part 6, and a bulbous bead 7 is formed at the extreme lower edge of the zig-zag part 6a. The sealing strip 16 is thus secured to the door 5 in such a vertical position that the bead 7 is caused to be in rubbing contact with the surface of the sill 9, with ample resilient force provided principally by the deformation of the zig-zag part 6a from its free state. The entire exposed surface of the sealing strip 16 is also covered with a pile 8.

The sealing strips 15 and 16 are made of a resilient material such as a rubber or a resilient synthetic resin.

In the case of a double door, that is two doors respectively hinged on opposite jambs and having free vertical edges meeting and engaging each other at the centre of the doorway, the sealing strip 15 is secured to the free vertical edge of one of the doors.

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Accordingly, all four edges of the door 5, when in its closed position, are in a tightly sealed state relative to the doorway frame 1 and the sill 9, which sealed state is rendered even more effective by the sealing action of the piles 14 and 8.

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