Oct. 28, 1958 W. E. BUNKER 2,857,633

WEATHERSTRIP MEANS FOR A SLIDING DOOR

Filed Oct. 1, 1954

FIG. 1.

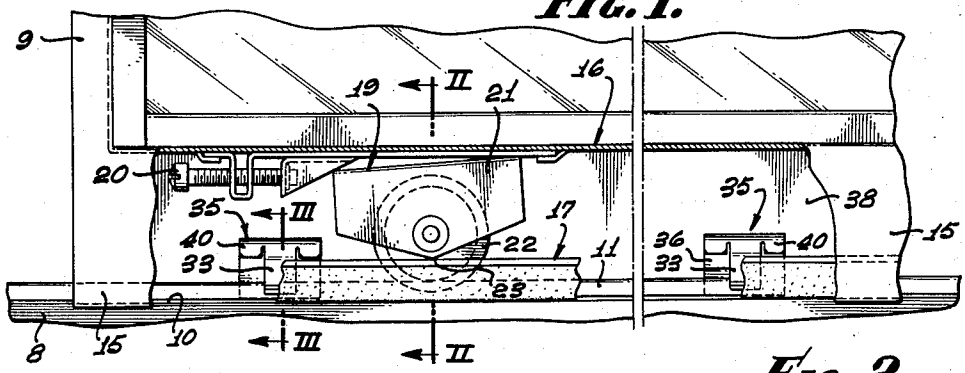


FIG. 2.

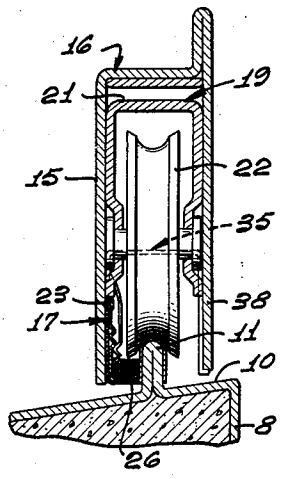


FIG. 3.

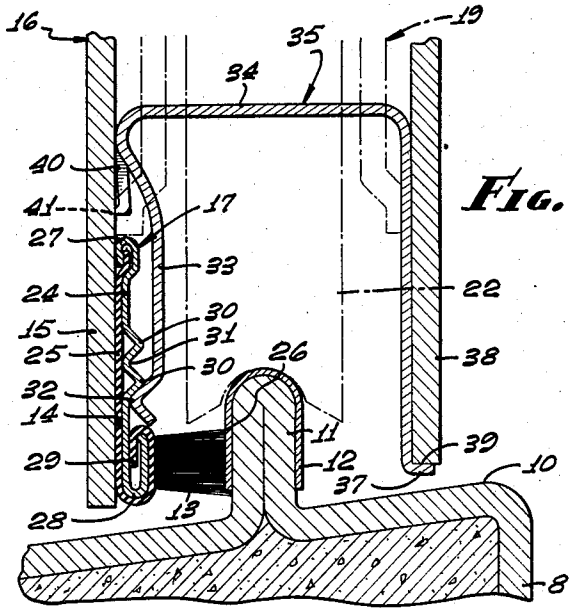


FIG. 4.

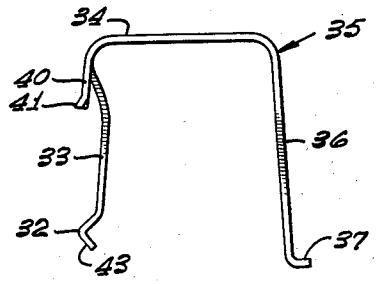
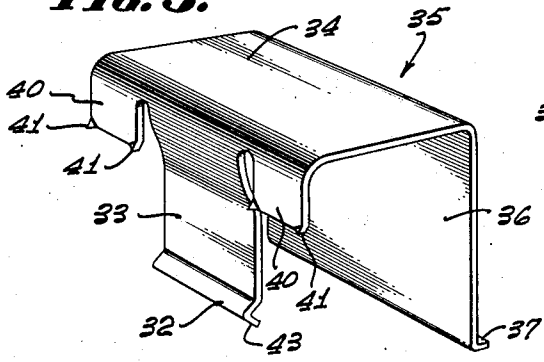


FIG. 5.



INVENTOR.
WILLIAM E. BUNKER
BY
ATTORNEY.

United States Patent Office

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WEATHERSTRIP MEANS FOR A SLIDING DOOR

William E. Bunker, West Covina, Calif., assignor to Arcadia Metal Products, Inc., Arcadia, Calif., a corporation of California

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10 Claims. (Cl. 20—19)

This invention relates to weatherstrip means and more particularly to weatherstrip means for sliding panels or doors.

Weatherstripping of exterior sliding doors presents a difficult problem. Such a sliding door must be mounted for relatively easy sliding movement and is usually provided with wheels enclosed within a bottom rail member of the door and engaging an upstanding track provided on a door frame member or sill. Adequate space or clearance is necessarily provided between the track and the interior walls of the rail member to permit easy movement of the door. This space, which extends the length of the door, also provides a passageway for air, dust, dirt and the like.

Sliding doors may be adjustable so that vertical rail members of the door may be accurately plumbed or arranged to properly meet with cooperable jamb members of a door frame or with a vertical rail member of an adjacent panel. In adjustment of the door to the door frame, the top and bottom horizontal rail members of the door may not be parallel to the adjacent door frame members. Heretofore, weatherstrip means have been fixed in various manner and form to a horizontal rail of a sliding door by permanent screws, bolts and the like. When such a sliding door is mounted in a door frame in the field, such weatherstripping on a rail member for the door may not properly engage a track or other opposed face on a door frame member. Thus the weatherstrip means is rendered virtually ineffective for a substantial portion of its length and does not effectively serve its purpose.

The primary purpose of this invention is to provide a novel weatherstrip means for sliding doors mounted in such a manner that upon adjustment of the door to a door frame, the weatherstrip means is simultaneously and automatically adjusted so as to remain in effective weathersealing relationship with a cooperable portion of the door frame.

An object of this invention is to disclose and provide a weatherstrip means for a sliding door quickly and readily adjusted into proper position with respect to the cooperative door frame member when the door is adjusted to the door frame.

Another object of this invention is to disclose and provide a novel manner of floatingly, adjustably mounting an elongated weatherstrip means in a door rail member.

A further object of this invention is to disclose and provide a weatherstrip means for use in a bottom rail member of a sliding door and which will automatically be adjusted into proper relationship with a track on the sill of the door frame upon adjustment of the door to the door frame.

A further object of this invention is to disclose and provide a mounting means for such a weatherstrip means which releasably interengages therewith for automatic or facile adjustment of the weatherstrip means.

A still further object of this invention is to disclose and provide a weatherstrip means wherein means normally carried by a rail member of the door cooperably engages and then released so that the side wall and securing elements **41** are snapped against the walls of the rail member. The clips are inserted at selected spaced intervals.

A still further object of this invention is to disclose and provide a weatherstrip means wherein means normally carried by a rail member of the door cooperably engages the weatherstrip means for properly positioning the weatherstrip means with respect to the associated door frame member.

Still another object of this invention is to disclose and provide a weatherstrip means which is readily replaceable when worn.

Generally speaking, this invention contemplates a weatherstrip means for a sliding door wherein a door bottom rail member and a door frame member or sill in relatively movable relation are provided with opposed longitudinally extending faces defining a longitudinally extending space to be sealed. The weatherstrip means of this invention is floatingly mounted on an inner face of the door rail member and is provided with a sealing pile portion extending to an opposed face on the door frame member for weather-sealing contact therewith. The weatherstrip means includes longitudinally extending spaced parallel ridges which cooperably and releasably interlock and interengage with a projection on an outwardly biased tongue provided on each of a plurality of longitudinally spaced spring clips. The spring clips provide mounting means for the weatherstrip means and are sprung within the bottom rail member of the door. The top edge of the weatherstrip means is contacted by the lower extremity of a sheave housing carried within the bottom rail and thus relative displacement of the bottom rail with respect to the door frame member does not disturb the sealing relation of the weatherstrip means with the opposed face on the track of the door frame member when the door is adjusted within the door frame.

Other objects and advantages of this invention will be readily apparent from the following description of the drawings in which an exemplary embodiment of this invention is shown.

In the drawings:

Fig. 1 is a fragmentary side view, partly in section, of a bottom corner of a sliding door provided with weatherstrip means of this invention.

Fig. 2 is a transverse vertical section taken in the plane indicated by line II—II of Fig. 1.

Fig. 3 is an enlarged fragmentary view of the lower portion of Fig. 2, the sheave and wheel assembly being shown in phantom lines.

Fig. 4 is an end view of a spring clip for mounting the weatherstrip means.

Fig. 5 is a perspective view of the spring clip shown in Fig. 4.

In the drawings, a door frame **8** and a sliding door **9** mounted in the door frame are only fragmentarily shown. It is understood that the door frame comprises usual construction including vertical jamb members interconnected at the top by a header member. A sill **10** of the door frame may be of any suitable form and is illustrated as being provided with an upstanding longitudinally extending rolled track **11** provided with a cap **12**. The cap **12** provides an outer vertical face **13** which is spaced from and opposed to an inner face **14** provided on an outer leg **15** of a downwardly opening U-section horizontal bottom rail member **16**. The opposed faces **13** and **14** define a longitudinally extending space which is sealed by a weatherstrip means **17** embodying this invention.

The bottom rail member **16** of the sliding door **9**, may be connected in usual manner at opposite ends to vertical

rails which are interconnected by a top rail. Means for adjusting vertical rail members of the door with respect to the vertical jamb members of the door frame for proper meeting engagement may comprise an adjustable pivotally mounted sheave means **19** which may be actuated by a screw bolt **20** for field adjustment of the door to a door frame. The sheave means **19** is described and claimed in Patent No. 2,668,318. The sheave means **19** includes a sheave housing **21** enclosed and mounted within the bottom rail member **16**. Within the sheave housing is carried a wheel **22** for rolling engagement with the track **11**. It should be noted that at least the outer side wall of the sheave housing extends downwardly below the axis of the wheel to a lowermost extremity indicated at **23**.

The weatherstrip means **17** comprises an elongated rigid metal member **24** and a corresponding elongated fabric means **25** secured to said rigid member **24** and provided with a sealing portion **26** extending to and contacting the outer face **13** of the track cap **12**. The rigid member **24** may be made of any suitable material and includes an outwardly overfolded to margin **27** which receives the top margin of the fabric means **25** and which may be crimped thereagainst for tightly securing the top margin of the fabric means. The rigid member **24** is somewhat similarly provided with an inwardly directed overfolded bottom margin **28** which receives and secures the bottom margin **29** of the fabric means **25**. The fabric means **25** extends along the outer surface of the rigid member **24**, around the overfolded bottom margin **28** and then downwardly between the margin **29** and the main portion of the member **24**. The overfolded margin **28** has sufficient width to provide proper backing or support for the sealing portion **26** of the fabric means.

The sealing portion **26** may be made in any suitable manner and may comprise a longitudinally extending strip of resilient relatively stiff pile elements, such as mohair or the like. The sealing portion **26** together with the bottom overfolded margin of the weatherstrip means **17** completely closes the space between the opposed faces **13** and **14** of the track cap and the door rail member respectively. The ends of the sealing portion **26** slidably contact face **13** of the track cap. To provide effective weathertight engagement, the sealing portion **26** is maintained and held in contact with face **13** as shown in Figures 2 and 3 for the entire length of the rail member.

Means for mounting the weatherstrip means **17**, so that the sealing portion **26** maintains the desired contact with the track cap, includes a plurality of parallel longitudinally extending spaced inwardly directed ridges **30** provided on rigid member **24** above the bottom overfolded margin **28**. The ridges **30** define therebetween longitudinally extending valleys or grooves **31**. Cooperably engageable with at least one of said ridges **30** is an outwardly directed projection **32** provided at the bottom end of an outwardly biased tongue **33** depending from one side edge of a top wall **34** of each of a plurality of spring clips generally indicated at **35**. The spring clips **35** provide means for floatingly mounting the weatherstrip means **17** against the inner face **14** of the bottom rail member.

The spring clip **35** includes a side wall **36** outwardly biased and provided with an outwardly directed lip **37** adapted to seat as at **39** against the bottom edge of an inner leg **38** of the bottom rail member **16**. On opposite sides of tongue **33** and integral with top wall **34** are provided depending outwardly biased secured elements **40**, each securing element **40** being provided at bottom corners thereof with outwardly directed sharp points **41**. The points **41** engage the inner face **14** of the rail member and precent slippage of the spring clip with respect thereto.

It assembly with the bottom rail member, spring clips **35** are compressed as by squeezing, inserted into the rail member until lip **37** contacts the bottom edge of the rail, and then released so that the side wall and securing elements **41** are snapped against the walls of the rail member. The clips are inserted at selected spaced intervals.

The weatherstrip means **17** may then be readily inserted within the bottom rail **16** and securely held against the inner face **14** of the outer leg **15** thereof by the tongues **33** of the spring clips. It will be noted that each projection **32** is formed with an outwardly flaring face **43** which facilitates springing back of the tongue **33** when the top edge of the weatherstrip means **17** is inserted into the bottom rail member. The weatherstrip means is selectively positioned so that the sealing portion **26** will properly engage the track cap and extend in parallel relation therewith, such selective positioning being afforded by the releasable interlocking slipping engagement of projections **32** with the ridges **30** on the weatherstrip means. In normal assembled position, the top edge of the weatherstrip means **17** contacts the lowermost extremity **23** of the sheave housing. This contact serves to properly position the weatherstrip means with respect to the track because of the fixed relationship between the track and the axis of rotation of the wheel.

When the door is adjusted to a door frame in the field and the sheave housing is pivoted by actuation of the screw bolt **20**, the bottom rail member is displaced vertically with respect to the track. Since the top edge of the weatherstrip means **17** has contact with the sheave housing at **23**, the weatherstrip means will be prevented by the sheave housing from moving therewith. Thus as the sheave is adjusted, the weatherstrip means is simultaneously and automatically adjusted or held in effective sealing relation with the track. It will be noted that the clips **35** move with the bottom rail and biased tongues **33** of clips adjacent to the sheave housing will disengage from one ridge **30** and engage an adjacent ridge **30**. Relative movement or slippage between the clips and the rail is prevented during this adjustment by the sharp points **41** on each spring clip which tend to dig into the metal of the bottom rail member. Relative movement is afforded between the weatherstrip means **17** and the face **14** on the bottom rail member during such adjustment particularly immediately adjacent the sheave. Relative movement of the opposite end of the weatherstrip means is insufficient to cause change in engagement of the projections **32** with ridges **30**. Thus the weatherstrip means **17** is held and maintained in proper relation with the track cap.

It will thus be understood by those skilled in the art that an adjustable weatherstrip means has been provided for a sliding door wherein the weatherstrip means may be readily, properly positioned and maintained with respect to the door frame member with which it cooperates for providing effective sealing contact. Since the weatherstrip means is held and maintained in position by a plurality of spring clip means, it may be readily removed and replaced when worn by merely pulling the weatherstrip means downwardly and out of the bottom rail member. The floating suspension of the weatherstrip means by the spring clips also provides easy application of the means of this invention to old door constructions.

It is understood that various modifications of this invention may be made which come within the spirit of this invention. Although the exemplary embodiment has been described with respect to weatherstripping of a bottom rail member and the sill of a door frame, it is understood that the weatherstrip means may be mounted and may be employed between any two members arranged in relatively movable relation with respect to each other.

All changes and modifications coming within the scope of the appended claims are embraced thereby.

I claim:

1. Means for weather sealing a longitudinally extending space between opposed faces of a pair of members, one member being movable relative to the other, comprising: a weatherstrip means seated against a face of one member and provided with a sealing portion extending from one side for contact with the opposed face of the other member; a plurality of parallel longitudinally extending ridges provided on the said one side of the weatherstrip means; and mounting means for the weatherstrip means carried

by said one member and including a plurality of longitudinally spaced projections, each projection being spring biased into releasable interengagement with a ridge on said weatherstrip means for adjustably holding and maintaining said weatherstrip means in weather sealing relation to said opposed faces on said members.

2. A means for weather sealing as stated in claim 1, wherein said mounting means includes a plurality of longitudinally spaced spring clips, each spring biased and sprung into holding engagement with the said one member.

3. Means for weather sealing as stated in claim 1, wherein said weather sealing means includes an elongated rigid member and a fabric means carried thereby, said fabric means being seated against the said one face of said one member and movable relative to the said one member.

4. A weather sealing means for use between a door rail member and a door frame member arranged in relatively movable relation and having opposed faces defining a longitudinally extending space to be sealed comprising in combination: an elongated weatherstrip means having one side seated against the face of the door rail member and provided with a sealing portion extending from the other side thereof to engage the face on said door frame member, said weatherstrip means including longitudinally extending spaced parallel ridges above said sealing portion; means adjustably mounting the weatherstrip means in a direction transverse to said ridges comprising a plurality of spaced spring clips spring mounted in said door rail member and each provided with an outwardly biased tongue having a projection releasably engageable with said ridges; and means carried by the rail member to automatically and simultaneously maintain the sealing portion in sealing relation with the face of said frame member when the rail and frame members are displaced relative to each other during adjustment of the door to the frame.

5. A means as stated in claim 4, wherein said means carried by the door rail member includes a sheave housing in contact with the top edge of said weatherstrip means.

6. A means as stated in claim 4, wherein said weatherstrip means includes an elongated rigid member and a fabric means carried and secured by said rigid member.

7. An automatically and simultaneously adjustable weather sealing means for use between a door rail member and a door frame member arranged in relatively movable relation and having opposed faces defining a space to be sealed comprising in combination: a plurality of retaining clips on said rail member, each having an outwardly biased weatherstrip engaging member and having means for engaging the rail member in non-slip relation; weatherstrip means carried by said retaining clips and provided with a sealing portion extending across the space to be sealed for engagement with the door frame member and having means cooperable with the outwardly biased member on the retaining clips and adjustable with respect thereto; and means carried by the rail member to maintain the sealing portion in sealing relation when the rail member is adjusted to the door frame and during relative movement between the rail member and the weatherstrip means.

8. In combination with a door rail member and a door frame member arranged in relatively movable relation, a weather sealing means comprising: retaining means carried by the rail member to move therewith and provided with a biased member; weatherstrip means carried by said retaining means and having means adjustably cooperable with said biased member on said retaining means, said weatherstrip means being provided with a sealing portion extending across a space to be sealed between said door members; and means carried by the rail member in predetermined fixed relation to the door frame member and having a portion in contact with said weatherstrip means whereby movement of the rail member with respect to the frame member causes automatic displacement of said weatherstrip means with respect to said retaining means for maintaining sealing relation between the rail and frame members.

9. A weather sealing means for use between a door rail member and a door frame member arranged in relatively movable relation and having opposed faces defining a longitudinally extending space to be sealed comprising, in combination: an elongated weatherstrip means including a rigid strip member and a fabric means carried by said strip member, said fabric means being seated against the face of the door rail member and having a portion extending around one edge of said strip member to lie between said strip member and the face on said door frame member; a sealing means extending from said portion of said fabric means for sealing engagement on the face on said door frame member; a plurality of longitudinally extending, spaced, parallel, engagement means on said rigid strip member above said portion of said fabric means; means adjustably mounting the weatherstrip means comprising a plurality of spaced clips being carried by said door rail member and each clip being provided with a resilient biased member having an engagement projection releasably engageable with said engagement means on said strip member; and means carried by the rail member to maintain the sealing means in sealing relation with the face of said frame member when the rail and frame members are moved relative to each other upon adjustment of the door to the frame.

10. A weatherstrip means including an elongated rigid strip member lying in a planar zone having a width substantially greater than the depth of said zone, said weatherstrip member being provided with laterally spaced parallel, longitudinal weatherstrip mounting ridges extending away from one face thereof and located between and spaced from longitudinal edges of the strip member, said strip member having an over-folded bottom longitudinal strip portion lying in spaced relation to said one face; a fabric means having a back portion seated against the opposite face of said strip member, said fabric means including a bottom portion extending around said strip portion on said strip member and into the space between said one face and said longitudinal strip portion, said bottom portion of said fabric means including a sealing means projecting in a direction away from said one face and out of said planar zone.

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