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3,175,256

WEATHER STRIP

Filed March 21, 1962

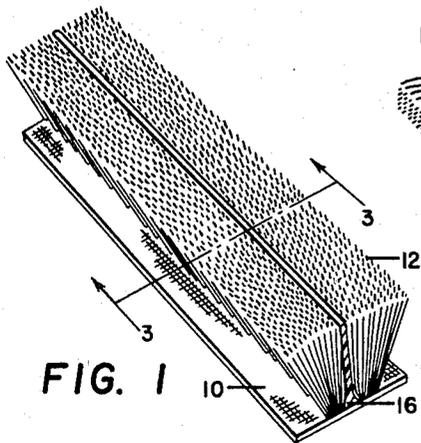


FIG. 1

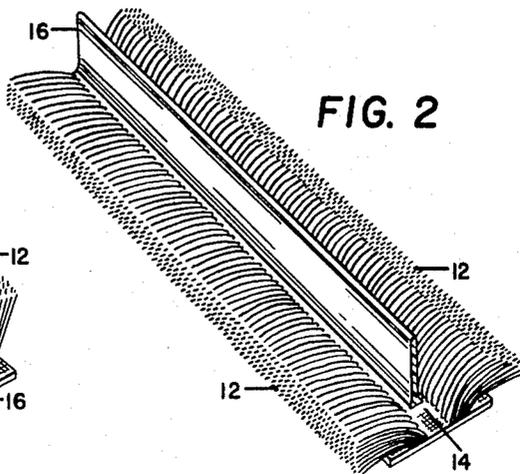


FIG. 2

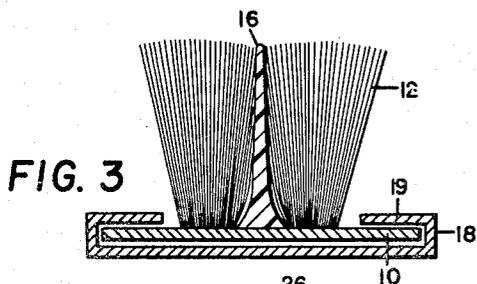


FIG. 3

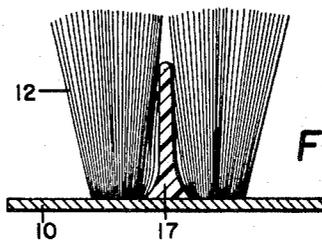


FIG. 4

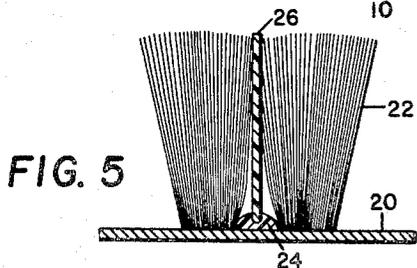


FIG. 5

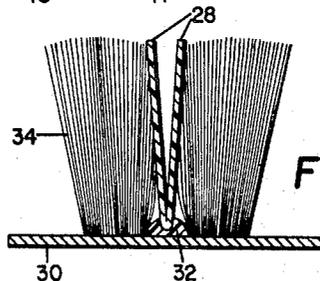


FIG. 6

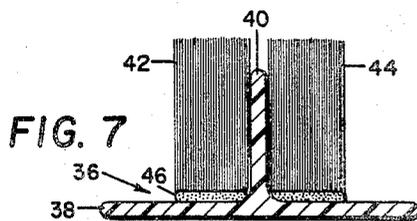


FIG. 7

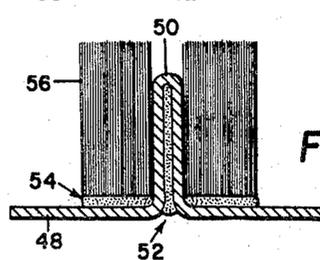


FIG. 8

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1

3,175,256

WEATHER STRIP

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9 Claims. (Cl. 20-69)

The present invention relates to weather stripping for sealing joints, such as those between doors, windows and other closures and the frames or structural supports therefor, one object of the invention being to provide an improved sealing means for such purposes of a more durable, economical and effective character.

Another object is the provision of a weather strip or windlace of the above nature affording a more impervious barrier to weather conditions.

A further object is to supply a weather stripping means having the above advantages in a construction which is more economical to manufacture and install in use.

To these and other ends the invention resides in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

FIG. 1 is a perspective view of a windlace or weather strip embodying the present invention;

FIG. 2 is a view similar to FIG. 1 but showing a manufacturing step;

FIG. 3 is an enlarged, sectional elevation on the line 3-3 in FIG. 1, including, in addition, a typical holding member;

FIG. 4 is a view similar to FIG. 3 but showing a modified embodiment;

FIG. 5 is a view similar to FIG. 3 but showing another modification;

FIG. 6 is a view similar to FIG. 5 but showing another modified form;

FIG. 7 is a view similar to FIG. 5 but showing another modification, and

FIG. 8 is a view similar to FIG. 5 but showing a further modification.

Weather stripping for the purposes herein disclosed has been heretofore constructed of materials such as rubber, felt or the like, subject to the defects that such materials have tended to harden and deteriorate in use and become permanently deformed, so as to deteriorate rather rapidly with age. Such weather strips have also been made with a textile base strip carrying a longitudinal body or band of resilient, long pile fibers to accomplish sealing, and the present invention is an improvement upon weather stripping of that type for the purpose of making it more impervious to penetration by wind and water, to improve its sealing efficiency and also to reinforce, stiffen and support the pile fibers against deformation in use.

The invention comprises a supporting base strip 10 which, in one of its forms, is woven of textile fibers preferably of wool, with or without a minor proportion of fibers of nylon, Orlon or the like. This base strip is preferably woven in a known one-up, one-down pattern, with upstanding resilient long pile fibers 12, which may be either cut or left uncut. Such pile fibers may be made of known plastic materials or of natural mohair, goat hair, worsted, jute or the like, affording relatively long, resilient fibers capable of returning to original upright position after deformation. Base strip 10 is preferably woven with a narrow, longitudinal gap or "skip" 14 in its pile, intermediate its marginal edges, for a purpose which will now be described.

A relatively thin barrier strip 16 of known flexible

2

thermoplastic material, such as vinyl, or nylon or glass fiber fabric coated with vinyl, is secured on edge to the base strip 10 in gap 14, as shown, preferably while the pile fibers 12 are parted for access to the base as shown in FIG. 2. This is preferably accomplished by heating the strip 16 to soften the vinyl strip or its vinyl coating sufficiently to cause it to adhere tenaciously to the base strip 10. Then the pile fibers 12 are allowed to return to upright position and preferably pressed into contact with the barrier strip 16 to cause more or less adherence of the fibers thereto, depending upon the degree of heating of the vinyl. Barrier strip 16 may have the full height of the fibers 12 as shown in FIG. 3, or may terminate somewhat below the top of the fibers, as shown at 17 in FIG. 4.

Base strip 10 is preferably given a coating of a known thermoplastic such as polypropylene, to protect it against abrasion and facilitate the cutting of the strip without fraying from sheet material.

The base strip 10 preferably has its marginal edges extending beyond the pile fibers, as shown, to adapt the strip for sliding reception in a channel-shaped holder or keeper member 18 (FIG. 3) having its flanges 19 overlapping the marginal edges of the base strip. The member 18 may be attached in any known and suitable way or made integral with the frame of a closure to be sealed.

A weather strip constructed as described above provides an impervious barrier to wind and rain. The resilient pile fibers and flexible barrier strip 16 cooperate in mutual support to produce a sealing body which is resilient as a whole, so as to permanently return to and maintain its original shape and integrity in use. Furthermore, the construction is durable and readily and economically manufactured and installed.

A weather strip having the above advantages may be manufactured also in the modified form shown in FIG. 5, in which the base strip 20 and pile bodies or bands 22 are constructed as described above, with an intervening gap between the fiber bodies in which a bead 24 of vinyl is laid longitudinally of the base strip with the fibers parted as shown in FIG. 2. A barrier strip 26 of vinyl, or of nylon or glass fabric coated with vinyl, is inserted with its edge embedded in bead 24 which, on cooling and setting, firmly secures the barrier to the base strip, with the barrier extending at its other edge part way or entirely to the top of the pile fibers.

In another construction embodying the present invention (FIG. 6), the barrier strip comprises a sheet 28 of flexible plastic material such as vinyl or nylon or glass fiber fabric coated with vinyl and folded longitudinally and medially upon itself and secured at its folded edge to the base strip 30 by means of a vinyl bead 32 similar to the bead 24 described above. This construction provides a stronger barrier of double thickness, with increased supporting cooperation between the barrier and the pile fibers 34.

A further embodiment of the invention is shown in FIG. 7 in which a member 36 of inverted T shape supplies in an integral construction both the base strip 38 and the barrier strip 40, made of known and suitable plastic material such as vinyl, nylon, polyethylene or the like. Bodies or bands of flexible, long pile fibers 42 and 44 are assembled by known "flocking" apparatus along both sides of the central barrier 40, with the inner ends of the fibers set in a layer 46 of any known and suitable cement. The barrier 40 may extend either part way or entirely to the top of the fibers and may be made thick enough to provide increased support for the fibers.

A further embodiment of the invention is shown in FIG. 8 in which a base strip 48 is folded medially as at 52 to form an integral upstanding barrier strip 50 of

double thickness, with its sides adhesively secured together. Layers of cement 54 are applied to the base strip on opposite sides of the barrier and resilient long pile fibers 56 are secured to the base strip by the known "flocking" method, as described above in connection with FIG. 7, and with the pile fibers extending to the top or above the top of the barrier strip. Or the pile fibers may be woven from the woven base strip 48, if so desired, as described above and shown in FIGS. 1-6. This and the other modified constructions described above may be secured to a structure to be sealed as described and shown in connection with the construction shown in FIG. 3.

Typical embodiments of the above described weather strips, for example, may have a width at the base strip and also an overall height of one fourth of an inch, more or less, depending upon particular installations and requirements.

The invention thus provides an improved weather strip in several forms, adaptable to various conditions, each supplying a weather stripping of the resilient, long pile type, made impervious to wind and weather and reinforced and supported by an included single or double barrier strip of impervious material firmly anchored at its inner edge to a base strip. The latter may be of either woven or plastic material with edges adapted to be slidably received and supported in a channel-shaped holding member.

This application is a continuation-in-part of my pending application, Serial No. 119,624, filed June 26, 1961, for Weather Strip, and now abandoned.

It will thus be seen that the invention accomplishes its objects and while it has been herein disclosed by reference to the details of preferred embodiments, it is to be understood that such disclosure is intended in an illustrative, rather than a limiting sense, as it is contemplated that various modifications in the construction and arrangement of the parts will readily occur to those skilled in the art, within the spirit of the invention or the scope of the appended claims.

I claim:

1. A flexible weather strip adapted to be fixedly secured to an enclosing structure and to seal an opening therein, comprising a base strip of flexible sheet material, spaced bodies of resilient, long pile fibers extending longitudinally of said base strip with a pile-free gap therebetween, and a barrier strip of impervious, flexible sheet material fixed at one edge to said base strip in said pile gap, to project laterally from and extend longitudinally of said base strip to seal and support said fiber bodies.

2. A flexible weather strip having the construction

specified in claim 1 and further characterized by a base strip of textile material having said pile fibers woven therewith.

3. A flexible weather strip having the construction specified in claim 1 and further characterized by bodies of pile fibers having the fibers thereof adhesively secured at their ends to said base strip.

4. A flexible weather strip having the construction specified in claim 1 and further characterized by a barrier strip of plastic material adhesively secured at one edge to said base strip.

5. A flexible weather strip having the construction specified in claim 1 wherein said base strip is provided with pile-free marginal edges and further characterized by a holding member of substantially channel shape having its flanges enclosing said marginal edges of said base strip for slidably receiving and supporting the same.

6. A flexible weather strip having the construction specified in claim 1 and further characterized by a barrier strip of flexible sheet material folded upon itself and having its folded edge adhesively secured to said base strip.

7. A flexible weather strip having the construction specified in claim 1 and further characterized by a base strip formed of plastic sheet material with said barrier strip formed integrally therewith and projecting therefrom and said pile fibers adhesively secured at their lower ends to said base strip.

8. A flexible weather strip having the construction specified in claim 1 and further characterized by a base strip folded medially upon itself to form a barrier strip of double thickness having its adjacent sides adhesively secured together to project from said base strip with said pile fibers on said base strip adjacent opposite sides of said barrier strip and supporting and supported by said barrier strip.

9. A flexible weather strip having the construction specified in claim 8 and further characterized by pile fibers adhesively secured at their lower ends to said base strip.

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