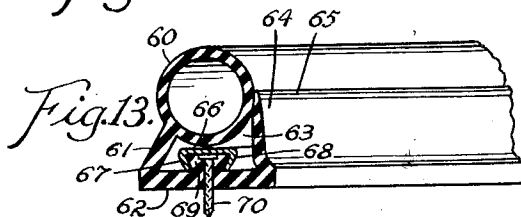
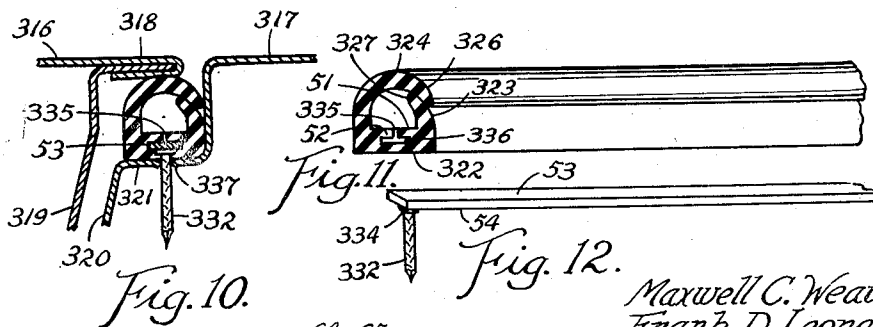
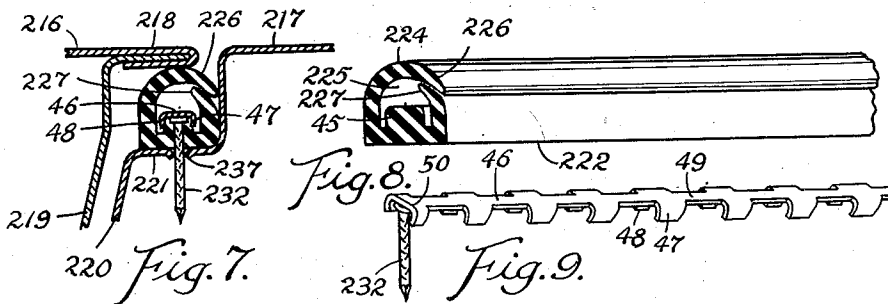
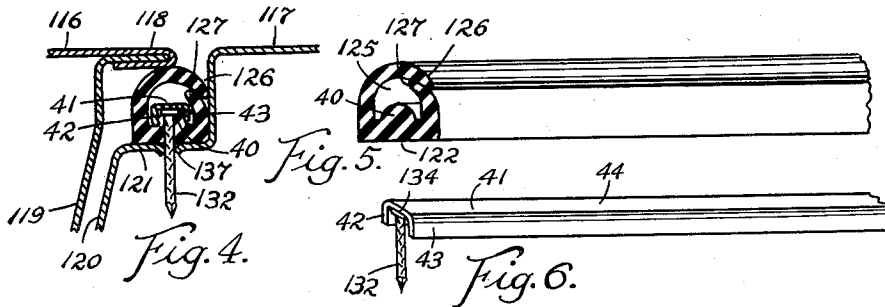
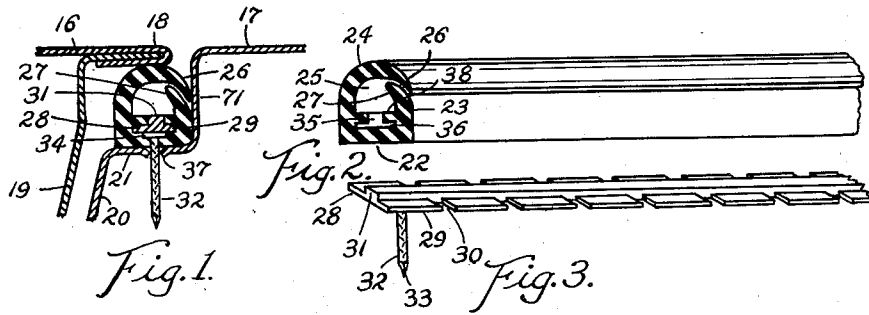


March 20, 1951

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WIND STOP OR SEALING STRIP

2,546,049

Filed Jan. 9, 1946



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UNITED STATES PATENT OFFICE

2,546,049

WIND STOP OR SEALING STRIP

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Application January 9, 1946, Serial No. 640,052

3 Claims. (Cl. 20-69)

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The present invention relates to improvements in windstops or sealing strips used quite generally in the finishing of vehicle bodies and the like.

An object of the invention is to provide an article of the character stated, which is highly simplified in the interests of rapid and economical fabrication.

Another object is to provide a strip incorporating improvements which enhance the durability and effectiveness thereof as a sealing medium, and which facilitate application thereof to a support such as a door jamb or the like.

Another object is to provide a sealing strip with a clinch core designed to facilitate assembly and prolong the useful life of the article as a whole.

The foregoing and other objects are attained by the means described herein and illustrated in the accompanying drawing, in which:

Fig. 1 is a cross-sectional view of a door and a frame jamb with the sealing strip of the invention applied thereto.

Fig. 2 is a perspective view of the resilient body of the strip shown in Fig. 1.

Fig. 3 is a perspective view showing a core piece constituting part of the Fig. 1 sealing strip.

Fig. 4 is a view similar to Fig. 1, showing a first modification.

Fig. 5 is a perspective view showing the resilient body of the first modification.

Fig. 6 is a perspective view showing the core piece of the first modification.

Fig. 7 is a view similar to Fig. 1, showing a second modification.

Fig. 8 is a perspective view showing the resilient body of the second modification.

Fig. 9 is a perspective view showing the core piece of the second modification.

Fig. 10 is a view similar to Fig. 1, showing a third modification.

Fig. 11 is a perspective view showing the resilient body of the third modification.

Fig. 12 is a perspective view showing the core piece of the third modification.

Fig. 13 is a view showing a fourth modification.

With reference to the accompanying drawing, 16 indicates a hinged door to be closed against a supporting structure 17. The supporting structure may be, for example, the body of a vehicle to which access may be had by opening the door 16. The door preferably will include a flange 18 and a jamb 19. The body or supporting structure 17 likewise may include a

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jamb 20 which is offset from the portion 17, resulting in the provision of a long and narrow seat 21 adapted to the mounting of a windstop or other sealing strip furnishing a tight closure in the vicinity of the jambs. In vehicle body construction, the jambs do not ordinarily cooperate to provide a good seal or joint, but instead, will be somewhat separated as indicated upon the drawing. Notwithstanding this fact, however, the jamb surfaces in structures other than vehicle bodies might cooperate to provide a substantial closure, which might be supplemented by application of the windstop or sealing strip of the invention. As will readily be understood, the present invention is not necessarily limited in its application to vehicle bodies, but may be used wherever a substantially tight joint or seal is required.

The windstop or sealing strip as illustrated by Figs. 1, 2, and 3, comprises an elongated body member of resilient material, which may be any kind of rubber or rubber-like substance. The body comprises a mounting base portion 22 which preferably is substantially flat, and an upstanding sidewall 23 along one edge of the base, the other edge of the base being furnished with an arched hood member 24 which spans substantially the full length of the body. The parts 23 and 24 cooperate to establish a contractible inner chamber 25 extending throughout the length of the body member. Hood member 24 preferably is formed with a tapered or feathered lip 26 which overlies and is adapted to slide upon a similarly tapered lip 27 at the upper edge of the sidewall 23. From the foregoing, it will be understood that pressure applied along the length of the windstop or sealing strip in the vicinity of hood 24, as by means of the door flange 18, causes the lip 26 to slide downwardly over the complementary lip 27 to effect a sliding closure, the amount of sliding movement between the lips being governed by the amount of pressure applied to the top of the hood member. An increase of pressure results in contracting to a greater degree, the sides of the chamber 25 beneath the hood member. Because of the resiliency of the material from which the windstop or sealing strip is formed, a perfectly tight seal will be effected in the vicinity of the jambs 19 and 20, irrespective of the extent to which the strip or windstop is depressed by the door flange 18.

It will be noted that the arched hood member 24, in substantially spanning the base of the windstop or sealing strip, is of much greater

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extent than the upstanding sidewall 23, and accordingly, the distortion effected by the door flange occurs principally in the material of the hood member. The sidewall 23, from the base 22 to the tapered or feathered end 27, curves inwardly over the base so as to facilitate sliding movement of the tapered or feathered edges or lips 26 thereover.

In order to stiffen the article and to provide for fixation thereof to a support, the resilient body preferably is furnished with a core piece as illustrated by Fig. 3. The core piece comprises a series of separate wings 28 and 29 resting in a common plane, and spaced apart by means of the notches 30, said wings being extended laterally in opposite directions from a central upstanding spine 31. The core piece preferably is made of metal or other substantially rigid material, and carries a depending fastener 32 which may be in the form of a barbed nail having a pointed end 33 and a head end 34, the latter being welded or otherwise fixedly secured to the core piece directly beneath the spine. In order that the resilient body may accommodate the core piece, the body is provided with a longitudinal central slot 35 and communicating undercut recesses or ways 36 extending laterally in opposite directions beneath the slot. Recesses 36 embrace the wings of the core piece, while slot 35 embraces the spine 31. In the process of manufacture, the core piece is laid within the slot and recesses as illustrated by Fig. 1, this being accomplished by elevating and turning back the hood member 24 progressively as the core piece is inserted. In mounting the finished windstop or sealing strip upon the seat or flange 21 of the support, the barbed fasteners are driven through it by force or hammer blows applied to the spine directly above the fasteners. In the preferred construction, the seat portion 21 of the support is provided in advance with a series of elongated narrow slots 37 arranged in longitudinal alignment along the seat portion, and as the fastener is driven through the slots, the slots distort in the direction of the pointed end of each fastener as illustrated upon Fig. 1. The slots initially are of a width less than the diameter of the fasteners, to provide for the necessary frictional engagement overcoming any tendency of the fasteners to withdraw from the slots. The foregoing arrangement will be seen to permit rapid and effortless application of the windstop or sealing strip to the seat 21 of the body or support 17. The windstop or sealing strip when applied as above explained will furnish a substantial seal against the door flange 18, even though the door flange might not be uniformly spaced from the seat 21 at all points along its length. The sliding lip arrangement at 26 and 27 is responsible for this advantage, and will compensate for substantial variations in the fitting of the door flange. The ledges 38 at opposite sides of slot 35 serve to resiliently but firmly maintain the core piece in place relative to the base 22 of the resilient body.

In the modified construction illustrated by Figs. 4, 5 and 6, parts corresponding to those in the previous drawing figures are given the same reference characters preceded by the digit 1. Thus, the door flange is indicated at 118 and the body or support at 117. This modified construction is distinguished from the structure illustrated by Figs. 1, 2 and 3, in that the resilient body, instead of being interiorly slotted and

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undercut as previously explained, is furnished with a continuous longitudinal stool 40 upstanding within the chamber 125. The core piece 41 in this instance consists of an inverted U-shaped metallic strip having depending legs or clinch flanges 42 and 43 integral with a connecting portion 44, the legs or flanges being spaced apart a distance approximating the width of the stool. In the process of assembly, the clinch flanges or legs 42 and 43 are turned slightly inwardly upon the sides of the stool so as to clinch and firmly embrace the stool at its sides. Barbed nails or other fasteners 132 are fixed to the core piece at intervals along its length, preferably by welding the heads thereof to the core piece at locations such as 134, the shanks of the fasteners projecting in the general direction of extension of the legs or flanges 42 and 43. The fasteners penetrate the stool and the base of the resilient body as the core piece is applied thereto in the process of assembling. The completed windstop or sealing strip is applied to the seat or flange 121 with the aid of hammer blows or other suitable force applied to the core piece, as was explained in connection with Figs. 1, 2 and 3. It will be understood, of course, that the seat or flange 121, like the seat or flange 21, is initially furnished with longitudinally aligned slots or slits to guide the fasteners toward a seated or home position during application of the windstop or sealing strip.

In the modified construction of Figs. 7, 8 and 9, parts corresponding to those illustrated by Figs. 1, 2 and 3 carry the same reference characters, preceded by the digit 2. Figs. 7, 8 and 9 illustrate the preferred construction, which will be seen to include a continuous integral stool 45 upstanding within the chamber 225. A clinch core 46, constructed to firmly clinch and embrace the stool, consists of a longitudinal strip of metal or similar substantially rigid but deformable material, and is furnished with a series of opposed clinch flanges 47 and 48 which depend from a connecting portion 49 of the core piece. The pairs of clinch flanges are spaced apart longitudinally of the core piece, and are adapted to be bent inwardly to clinch opposite sides of the stool as clearly illustrated by Fig. 7. The clinching operation may be effected concurrently with insertion of the core piece into the chamber 225 while the hood member 224 is temporarily elevated and turned back to render the stool accessible during the assembling procedure. At intervals along the length of the core piece, barbed nails or other suitable fasteners 232 are fixed to the intermediate portion 49 of the core piece, as by means of welds applied at the locations 50. Due to the fact that the spacings between pairs of clinch flanges on the core piece are substantial in extent, the windstop or sealing strip constructed in accordance with this illustration possesses a degree of flexibility such as will permit application thereof to seats or surfaces 221 which are curved or possibly serpentine in character. Application of the modified windstop or sealing strip just described, is effected in substantially the manner previously explained in describing the preceding forms of the article.

In the modified construction of Figs. 10, 11 and 12, parts corresponding to those illustrated by Fig. 1 bear the same reference characters, preceded by the digit 3. For example, the door flange is marked 318, and the vehicle body or support carries the reference character 317.

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This modification is quite similar to the structure illustrated by Figs. 1, 2 and 3, in that the resilient body is longitudinally grooved at 335, and furnished with undercut recesses extending laterally at opposite sides of the groove, as indicated at 336. The groove 335 in this instance may be very narrow, or substantially in the form of a mere slit providing ledges 51 and 52 which overlie and retain the core piece 53. The core piece 53 may consist of a length of bendable metal or other material capable of limited distortion, having an underface 54 to which is welded or otherwise suitably fixed the head 334 of a barbed nail or other fastener 332. Fasteners such as 332 or its equivalent, are fixedly applied to the core piece preferably at regular intervals along the length of the latter, and are to be driven through slots or slits 337 in the seat 321 as previously explained, so that the windstop or sealing strip may be firmly mounted upon the support or its seat 321 with facility and despatch. As in all the previous forms of the article, the resilient body includes the arched hood member 324 and the sidewall 323 having tapered or feathered edges cooperating to furnish the desired sliding closure that performs with maximum effectiveness to seal the space between the jambs 319 and 320. The core piece 53 will preferably be of such character as to permit conformation of the windstop or sealing strip to simple or complex curved seats or supporting surfaces 321. As in the previously described constructions, the seat or surface 321 will be slitted or slotted as suggested at 337, to accommodate the nails or other fasteners 332 with the desired frictional engagement to preclude withdrawal or accidental displacement of the fasteners and the resilient body attached thereto.

Fig. 13 illustrates a preferred form of windstop or sealing strip to be applied to a support in precisely the manner heretofore explained. It is considered unnecessary, therefore, to show the support and the flanged door in this view. Here, the arched hood has been superseded by a substantially tubular head portion 60 of resilient soft rubber-like material which stands upon a longitudinal rib or leg 61, said rib or leg being integral with the head 60 and the base 62 of the body. The head is deformable or collapsible and thereby compensates for pressure applied to the top thereof by the door flange, resulting in an effectual seal for the jamb of the door.

The rib or leg 61 preferably is obliquely inclined over the base, so that it may flex and thereby afford but little resistance to closing of the door. To preclude entry of water or dirt into the chamber 63, one edge of the base is provided with an upstanding sidewall 64 having its longitudinal free edge tapered or feathered as at 65 to rest lightly but yieldingly against the outer wall of the tubular head, as shown, all along the length of the head. In the preferred construction, the body of the article, including the base 62, leg 61, head 60, and sidewall 64, is an integral molded or extruded structure. The tubular head may have its wall made thinner than other parts of the body, to enhance the resiliency and the sealing function thereof upon the door flange.

The means for mounting the Fig. 13 strip or windstop upon a support such as 21, for example, may be the same as illustrated by any of the preceding drawing views. As shown, however, the core piece 66 is like that of Fig. 6 or 9, and includes depending legs or clinch flanges 67 and 68 which securely embrace the opposite sides of

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a longitudinal rib or stool 69 formed integrally with the base 62, within chamber 63. A barbed nail or other fastener 70 has its head end welded or otherwise suitably fixed to the under face of the core piece 66.

The core piece is applied, in assembly, by simply laying back the tubular head 60, in a direction away from sidewall 64, and then inserting the core piece while clinching its legs onto the stool in a progressive manner. After the core piece is inserted and clinched in place, the head will spring back to the normal covering position of Fig. 13. When applying the article to a seat such as 21 of Fig. 1, the sidewall 64 will preferably rest in proximity to the wall 71 of the support 17, by which it will be protected against injury or maltreatment.

From the foregoing, it should readily be evident that the improved windstops or sealing strips possess many qualities of merit not found in known articles of a generally similar nature. They are capable of fabrication and assembly by continuous rapid production methods, with a minimum of hand work and other expensive labor factors. The materials used in the manufacture may be of a common type procurable in a readily available form, and accordingly may be handled or manipulated with the use of simple rapid production machinery. Of interest to the user of such articles, is the fact that they permit speed and facility of application or mounting upon a support or body to be sealed. Various other advantages will be recognized by persons skilled in the art to which the invention appertains.

What is claimed is:

1. A sealing strip of the character described, comprising in combination, an elongated resilient body including a longitudinal tubular head deformable to a partially flattened condition, a base beneath the head, and a longitudinal resilient rib obliquely inclined over the base to support the tubular head, an integral stool on the base projecting upwardly therefrom toward the head, an elongated comparatively rigid core piece coextensive with the base and comprising a strip having opposed side edges, clinch fingers depending from said edges and clamped about the stool to fix the core piece relative to the base, said core piece extending substantially the length of the strip, and a fastener having a shank penetrating the stool and the base, one end of said fastener being fixed to the core piece strip intermediate the clinch fingers.

2. A sealing strip of the character described, comprising in combination, an elongated resilient body including a longitudinal tubular head deformable to a partially flattened condition, a base beneath the head, and a longitudinal resilient rib obliquely inclined over the base to support the tubular head, an integral stool on the base projecting upwardly therefrom toward the head, an elongated comparatively rigid core piece coextensive with the base and comprising a strip having opposed side edges, said core piece extending substantially the length of the strip, clinch fingers depending from said edges and clamped about the stool to fix the core piece relative to the base, and a fastener having a shank penetrating the stool and the base, one end of said fastener being fixed to the core piece strip intermediate the clinch fingers, and a resilient sidewall on the base opposite the obliquely inclined rib, said sidewall having a continuous free edge yieldingly abutting the tubular head at

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one side thereof to provide a closure for confining the stool and the core piece.

3. A sealing strip which comprises an elongated resilient tubular sealing portion and an elongated backing portion integral with the sealing portion, the backing portion being of channel shape, the tubular sealing portion being attached to and supported by one flange of the backing portion and extending across the backing portion normally into abutting relation with the other flange of the backing portion; an elongated substantially rigid core piece extending substantially the length of the backing portion between the flanges of the backing portion, and fasteners attached to the core piece and extending through the web of the backing member for attaching the sealing strip to a support, the core piece being adapted to hold the web of the backing member against the support, the tubular member covering the core piece

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and being adapted to be resiliently deformed to form a seal.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,161,648	Widman	June 6, 1939
2,215,515	Matheny	Sept. 24, 1940
2,263,063	Allen	Nov. 18, 1941

FOREIGN PATENTS

Number	Country	Date
794,152	France	Dec. 2, 1935
826,082	France	Dec. 27, 1937