

Feb. 18, 1941.

L. SPRARAGEN

2,232,570

BEADING STRIP

Filed April 28, 1939

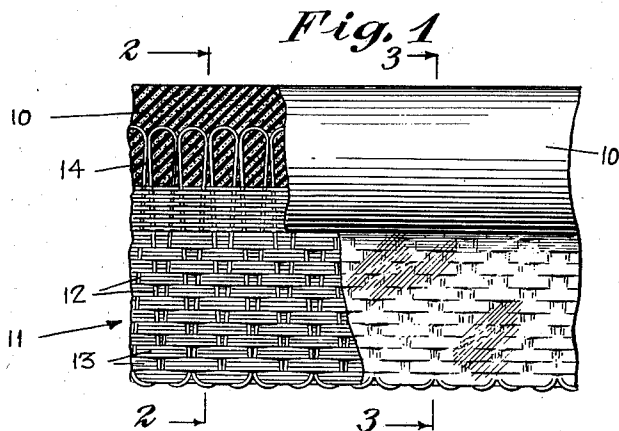


Fig. 2

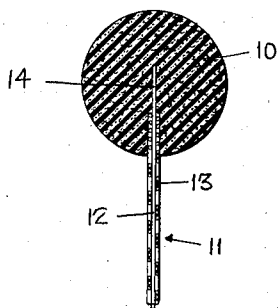


Fig. 3

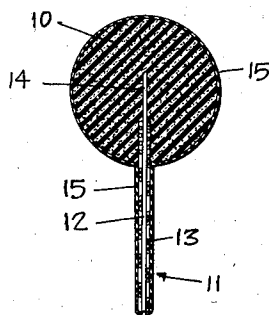


Fig. 4

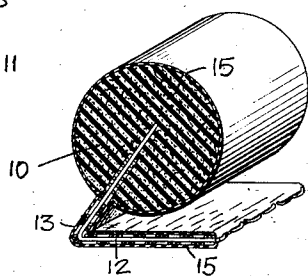


Fig. 5

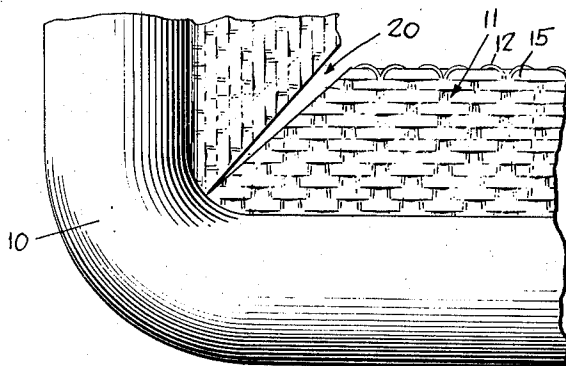
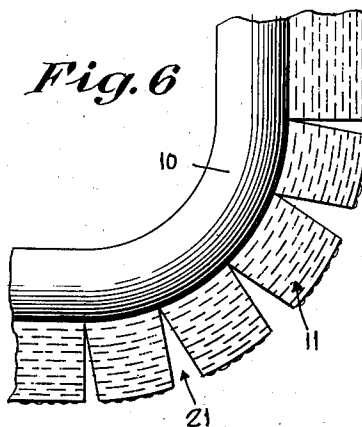


Fig. 6



INVENTOR
Louis Spraragen
BY *Johnson, Klein & Smith*
ATTORNEYS

UNITED STATES PATENT OFFICE

2,232,570

BEADING STRIP

Louis Spraragen, Bridgeport, Conn., assignor to
Bridgeport Fabrics, Inc., Bridgeport, Conn., a
corporation of Connecticut

Application April 28, 1939, Serial No. 270,581

3 Claims. (Cl. 20—69)

This invention relates to a resilient flexible beading strip, and, more particularly, to a strip to be used in forming a seal or weather stripping for openings.

In prior constructions, beading strips have been made with a resilient foundation, and the latter covered with a suitable covering material, such as woven fibrous fabrics, leather or artificial leather or the like, to harmonize with the material with which the beading strip is to be used.

When these strips, having nonfibrous coverings such as leather or artificial leather or the like, were used to seal openings which have curves having a short radius of curvature, it was difficult to properly position the beading strip due to the fact that the covering material was not sufficiently resilient and bunched at the curve so as to present a rough, unsightly appearance.

An object of the present invention is to provide a sealing strip with a nonfibrous cover which is highly resilient and flexible so that it can be bent and curved to fit curves having a very short radius of curvature without bunching. This is accomplished by providing the resilient bead strip with a resilient flexible cover of latex or the like which is secured thereto by bonding so as to be integral therewith. The cover, being of flexible material, will stretch or be compressed so as to conform to the curve and enable the bead strip to be shaped around a curve having a short radius of curvature without bunching or otherwise presenting an objectionable appearance.

The present invention is a specific form of the broad invention disclosed in my copending application Serial No. 270,582.

In the preferred form of the invention, the sealing strip comprises a bead portion of resilient material having a stiff attaching strip embedded or otherwise secured therein and projecting therefrom. The beading strip is then dipped or otherwise coated with a relatively thin layer of covering material which is resilient and flexible and which adheres to the bead and attaching strip.

When it is desired to fit the sealing or beading strip around a curved opening, such as is found around doors in automobiles, the attaching strip is cut or folded at spaced intervals and the bead, with its resilient covering adhering thereto, is then bent around either inside or outside curves and with any desired radius of curvature and secured in place by means of the attaching strips.

The covering material may be of any suitable

elastic coating material, but, in the preferred form of the invention, it comprises a latex, synthetic latex, or synthetic rubber or the like which is firmly adhered to the surface of the bead and attaching strip so as to become a part thereof. This covering can be in any desired color or appearance to match the material with which it is to be used and can be blended therewith as to its surface.

The attaching strip is made of a stiff woven fabric having one edge embedded in and secured to the body of the bead so that the strip projects therefrom. Preferably, the fabric strip includes wire reinforcement in the form of loops, the ends of which project from the edge of the strip which is embedded in the bead and interlocks with the bead to hold the strip therein. The strip serves to hold the bead in proper position when the bead is put in place and can be bent in any suitable manner so that the bead can be properly located in the position in which it seals or weatherproofs the opening.

When the attaching strip is transversely slit in order to permit bending of the beading strip around the curves in a plane in which the attaching strip lies, unravelling of the woven fabric of the attaching strip at the severed edges thereof is prevented by the resilient covering, preferably of rubber deposited from a latex dispersion, adhering to said strip, which bonds the fibers of said fabric together in a coherent layer.

In its broader aspects, the present invention contemplates the providing of a beading strip with a resilient nonfibrous covering intimately adhering thereto so as to form a part thereof so as to assume any shape to which the bead may be bent or twisted.

Other features and advantages of the invention will be apparent from the specification and claims when taken in connection with the drawing, in which:

Figure 1 is a side elevation, partly in section, of the strip.

Fig. 2 is a longitudinal sectional view, taken along line 2—2 of Fig. 1.

Fig. 3 is a longitudinal sectional view, taken along line 3—3 of Fig. 1.

Fig. 4 is a view of the beading, with the attaching strip bent so that the strip can be secured in place.

Fig. 5 shows an elevation of the strip bent around an outside curve.

Fig. 6 shows an elevation of the strip bent around an inside curve.

In an automobile or like construction, the

openings around the doors, for example, are usually sealed with a beading strip or weather stripping fitted in place so as to engage the door. The strip is made to correspond and blend with the upholstery of the automobile so as to become a part thereof.

Difficulty was encountered in properly fitting the strips to the openings due to the fact that the covering material used thereon to blend in with the upholstery of the car prevented the strip from being bent around corners having a relatively short radius of curvature, as the material on the strips would bunch up and also become unsightly.

This difficulty has been overcome by the strip of the present invention which comprises a bead of resilient material, preferably sponge rubber or the like. While the bead may have any cross-section, in the illustrated form of the invention it is circular.

In order to attach the bead in sealing position, an attaching strip 11 is employed. The strip, which is secured to the bead as shown in the drawing, comprises a relatively stiff woven fabric having the warps thereof comprising a plurality of wire loops 12 interwoven with fabric strands 13.

As shown in the drawing, the ends of the wire loops project, as at 14, from the edge of the strip which is embedded in the bead, and are interlocked with the bead by having the material secured to and through the loops.

The fabric of the strip can be suitably treated with a compound or binder so that it adheres to the rubber bead when the bead is either formed thereon or placed thereon and cemented thereto.

After the bead and the attaching strip have been secured together, the strip is then provided with a resilient nonfibrous cover 15. In the preferred form of the invention, the material of the cover comprises a deposit from a dispersion of latex, synthetic latex, natural or synthetic rubber, or other flexible and resilient material. The material is applied to the strip by either dipping, spraying or otherwise applying it so as to produce a relatively thin layer or film of the covering material, such as shown in Fig. 3, completely covering the bead and attaching strip. In order to secure complete adherence of the cover, the sponge rubber bead portion and attaching strip can be impregnated with a bonding cement prior to the application of the cover so that it adheres thereto and becomes integral therewith.

Suitable pigments, coloring agents or fillers can be added to the covering material so that the bead or sealing strip can be made to harmonize with the upholstery with which it is to be used.

The attaching strip with the wire incorporated therein forms a satisfactory base by which the bead can be attached or mounted about the door opening of an automobile, for example, and, being very stiff and resilient, will hold the bead in proper position to engage the door and seal the same. The attaching strip, after being attached, can be concealed by the upholstery material around the door.

In some instances, it may be desired to mount the strip on the top of the door to bear against the frame. In such cases, the attaching strip may be bent as shown in Fig. 4 so as to properly position and resiliently urge the strip into sealing relation with the frame. The resilient nonfibrous cover will permit relatively sharp ends in the attaching strip without undue bunching as is clearly shown in the drawing.

When it is desired to apply the strip to an

opening having curves having relatively short radius of curvature, the attaching strip is clipped, as shown in Figs. 5 and 6, so that the bead can be readily bent to fit the curve. The covering material, which is very resilient and flexible, intimately adheres to the bead, and will be stretched on the outside of the curve and compressed on the inside of the curve with the resilient bead to form a smooth surface. When the latex-coated attaching strip is clipped for the aforesaid purpose, the woven fabric of said strip is prevented from unravelling at the severed edges, as shown in Fig. 5, by the latex covering which bonds the fibers of said fabric together in a coherent layer.

As shown in Fig. 5, the bead is prepared for an outside curve by making a V-shaped cut 20 in the attaching strip at the point of the bend. Any number of these cuts can be made as required. The bead is then curved and the attaching strip secured in place. Also, the attaching strip can be folded over into V-shaped folds instead of being cut out to enable this bend to be made. In this instance, the attaching strip itself will hold the bead in proper curvature.

When it is desired to apply the strip to an inside curve, as shown in Fig. 6, it is merely necessary to clip the attaching strip as at 21 at a plurality of spaced points along the portion to be curved and the attaching strip thus cut will enable the bead to be curved and fitted smoothly to the curve.

The attaching strips are secured in place about the opening either by means of clips fastened into the body of the automobile, or the strips may be provided with a dry adhesive or a thermoplastic adhesive and attached to the body by rendering the dry adhesive sticky and tacky or by applying heat and pressure to the thermoplastic adhesive.

In the broader aspects, the present invention provides a beading strip or a weatherproofing strip having a resilient cover intimately secured thereto and adapted to give with the material of the beading when bending around curves so that the beading strip or weatherproofing can be carried around curves having a relatively short radius of curvature. The beading strip of the present invention can, of course, be used wherever it is desired to seal an opening, for, due to its resilient nature, it can be pressed into intimate contact with the cooperating portion to form a seal. The beading strip can also be used as trimming for the upholstery, where such trim is necessary to give a desired finished appearance, for example, to the interior of an automobile.

Variations and modifications may be made within the scope of this invention and portions of the improvements may be used without others.

I claim:

1. A beading strip comprising a bead of sponge rubber having an attaching strip projecting therefrom, said attaching strip having loops projecting from the margin thereof and interlocked with the bead material, said bead and attaching strip being impregnated with a binder; and an outwardly nonadhesive coating deposited from a dispersion of latex covering the impregnated bead and attaching strip and adhering securely thereto and forming a flexible cover for the bead which will bend with the bead without bunching.

2. A flexible sealing strip comprising a bead core of a soft, flexible, resilient, cellular rubber substance, of substantial cross-sectional area; a long and relatively narrow attaching strip of

coarsely woven strands including transversely extending strands of resilient metal wire, said strip being stiff and bend-resisting except for transverse bends, said attaching strip having one longitudinal margin embedded in and firmly anchored to said cellular rubber core, the remainder of the attaching strip extending outwardly from the core and constituting a band for mounting the sealing strip in place; a bonding composition coating the core and projecting band of the attaching strip and filling the interstices of the woven attaching strip; and an outwardly non-adhesive layer of rubber deposited from a latex dispersion and forming a continuous non-absorbent covering over the surfaces of said bead and attaching strip and sealing the joint between them, said layer of rubber being securely and integrally bonded to said surfaces by said bonding compound and being in the form of a

thin film yielding to permit the bead to be bent into a curve of short radius without buckling and without more crumpling than that produced by such bending of the cellular core, said rubber coating coherently bonding the strands of the projecting portion of the attaching strip together against unravelling when said portion is slit transversely to permit bending of the sealing strip around inside or outside curves in the plane in which the attaching strip lies.

3. A beading strip comprising a bead portion of sponge rubber having an attaching strip anchored thereto along one edge and projecting therefrom, said bead portion being impregnated with a bonding compound, and a relatively thin, outwardly nonadhesive film deposited from a dispersion of latex covering the impregnated bead and attaching strip.

LOUIS SPRARAGEN.