Dec. 21, 1943. L. SPRARAGEN 2,337,303

WEATHER STRIP

Filed Jan. 22, 1940

Fig. 1

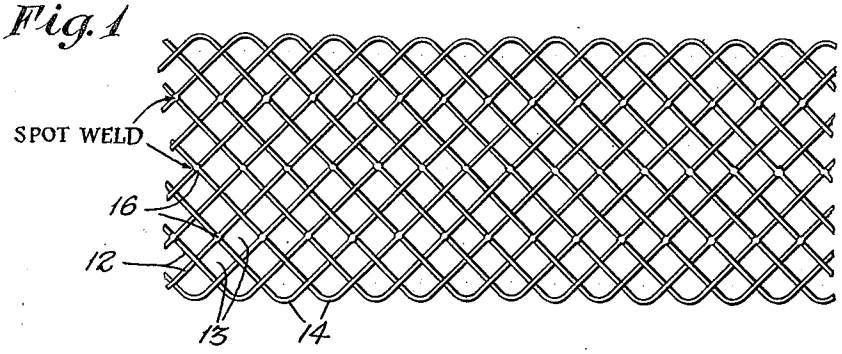


Fig. 2

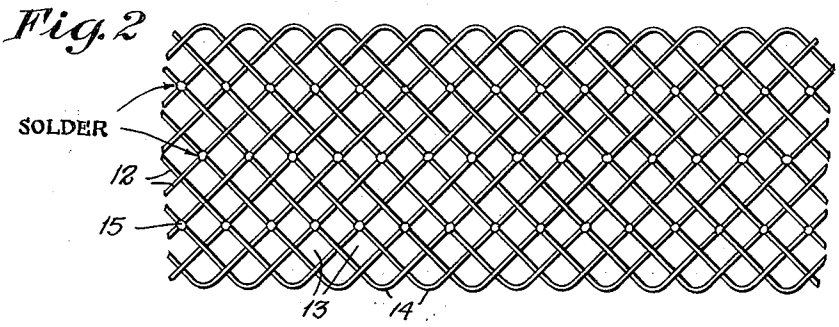


Fig. 3

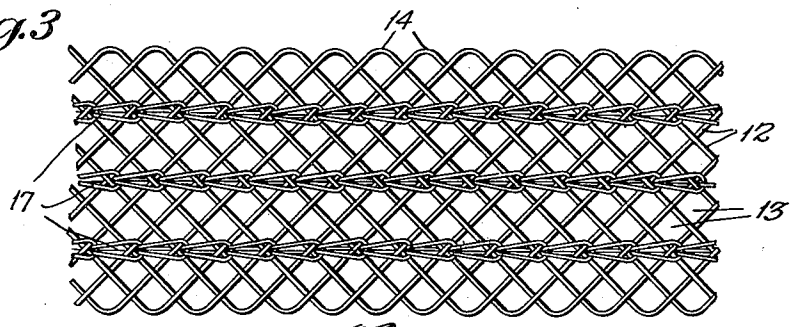


Fig. 4

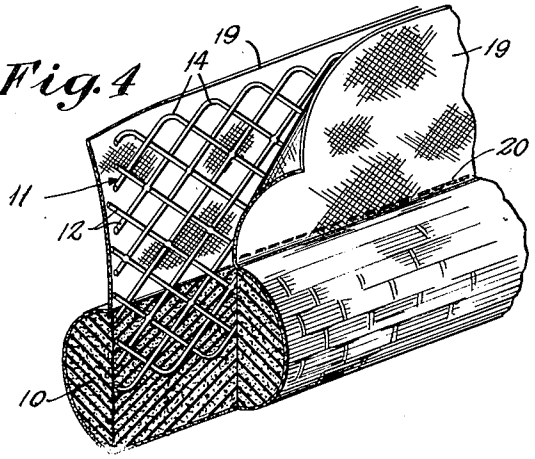
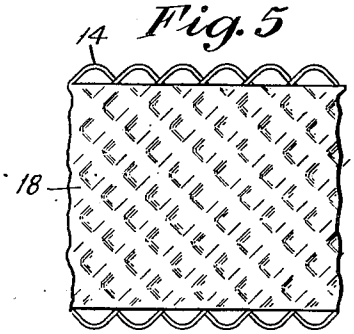


Fig. 5



INVENTOR

Louis Spraragen

BY

Johnson, Kline & Smyth

ATTORNEYS

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WEATHER STRIP

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

Application January 22, 1940, Serial No. 315,059

2 Claims. (Cl. 20—69)

This invention relates to a flexible beading strip, and, more particularly, to an attaching strip therefor of braided resilient wire having means for preventing undue longitudinal stretch therein.

In strips such as are used as finishing molding or weather strips, it is desired to have an attaching strip of resilient wire which will have sufficient resiliency to return the weather strip to a normal position when it has been moved from said position during the sealing operation. Heretofore, it has been proposed to weave a fabric comprising fiber warps and resilient wire wefts for this purpose, or use a braided construction of resilient wire having all of the strands thereof of wire. The attaching strip has secured along one edge thereof a sealing bead of rubber or fibrous material, as by having one edge of the attaching strip embedded therein. The bead and attaching strip are then covered with suitable covering material for use.

When the attaching strip is braided entirely of resilient wire threads, the strip will be elongated under slight pulls, for example, as would occur during associating and assembling the bead thereon. This elongation is caused by the fact that the resilient wires do not bend around one another readily to interlock as would soft wire, but, due to their resiliency, retain a fairly straight course so that they slide easily upon one another, whereby they are readily dsiplaced in an angular sense relative to each other, resulting in attenuation of the braided strip upon application of a stretching force to the strip.

This difficulty has been overcome by the present invention by anchoring the braided wires to one another at spaced points in the strip. This may be accomplished in many ways. For example, as the braided wire emerges from the braiding machine, it is usually desirable to run it through flattening rollers to form the flat attaching strip. These rollers, which do not serve any pulling function, can be utilized to cause the wires to be adhered together. When this is resorted to, the wires may be treated with a suitable flux and the rollers heated to cause the wires to be soldered together at the crossings, or the rollers can be provided with welding wheels which will weld the wires together as they pass thereunder.

If desired, however, the braiding machine need not be altered to secure the wires together in this manner, for a stitching machine can be associated with the braiding machine at the delivery end thereof to provide rows of stitches, either of thread or wire, which will lock the wires of the attaching strip against relative movement.

A still further means for locking the wires against angular shifting movement can be the layer of material extending over a substantial portion of the strip and passing through each of the apertures. This may be a strip of cloth or the like on each side of the attaching strip and pressed through the openings in the braided strip and secured together, or it may be a layer of rubber which will fill the openings in the attaching strip and thus prevent sliding movement. This latter means for holding the strands in the braided strip against movement has an additional feature in that it may permit the attaching strip to stretch slightly, but will always, due to its own resiliency, return the strip to its original position. With the strip thus secured against elongation, it can be readily associated with a bead as by having the bead blown thereon by a continuous process in a well known manner or by having a split bead positioned thereover.

After the bead and attaching strip have been secured together, they may be covered by the usual fabric covering which is stitched along the edge adjacent the joint between the bead and attaching strip, or they may be provided with a coating deposited from a solution of latex.

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

Figure 1 shows a braided attaching strip with the wires thereof secured together at spaced points by welding.

Fig. 2 shows a view similar to Fig. 1, with the wires secured together by solder.

Fig. 3 shows a view similar to Figs. 1 and 2 with the wire secured together by stitching.

Fig. 4 is a perspective view, partly in section, showing the attaching strip assembled with a bead and a covering around the assembled unit.

Fig. 5 shows the attaching strip with the wires anchored by a layer of material extending through the apertures.

As shown in the drawing, the present invention relates to sealing strips and to the formation of the attaching strip to be used with wind laces or weather strips of resilient wire.

In weather strips of this type, a bead 10 of rubber or fibrous material is secured along the edge of the attaching strip 11 with a portion of the attaching strip embedded therein as shown in Fig. 4. The weather strip is adapted to be secured about an opening with the bead pressed

into sealing relation with the door or other closure. In order that this might properly be arranged, the attaching strip is made very resilient so that it will hold the bead in sealing relation and will also return it to its normal position when the closure is moved to break the seal.

Heretofore, the attaching strip has been made of a fabric comprised of fibrous warps and resilient wefts. The present invention, however, simplifies this construction by forming the attaching strip of a plurality of wire strands 12 braided together, as is shown in the drawing, to form a strip having a plurality of openings 13 therealong and a plurality of loops 14 along the edges.

The wire strands used in the attaching strip are preferably of tempered spring steel wire which is rather fine, but with sufficient temper and stiffness that it maintains its original position and also the position of the bead and after being bent or forced to one side, will return to its original position.

When wire of this type is used, it will not bend when woven so as to interlock the strands with one another, as in the case of soft wire. Thus, when a braided attaching strip of resilient spring wire is handled during application of the finished strip or fed during the process of applying the bead therealong, it will stretch and elongate, due to the angular displacement of the wires relative to one another. This causes the attaching strip to be narrowed, and may cause the extent of the attaching strip into the bead to vary.

According to the present invention, however, this danger is eliminated by securing together strands so as to prevent angular shifting thereof and consequent elongation. This may be accomplished in many ways. For example, in manufacturing the attaching strip of the present invention, as it emerges from the braiding machine, it is usually passed through a pair of rollers to insure that the strip will be flattened as desired. These rollers can be utilized to secure the strands together, as by providing the strands with a wash of some suitable flux and heating the rollers to a temperature which will cause the wires to become soldered to one another as at 15 in Fig. 2.

While the strands may be secured at all points of crossing, it is only necessary to secure them at a plurality of points, as is shown in Fig. 2. I have also found that the flattening rollers may be so constructed as to provide rollers capable of spot welding the strands together at spaced points as shown at 16 in Fig. 1. In both of these constructions, a very rigid yet resilient attaching strip is provided.

If it is desired, however, not to modify the structure of the braiding machine, a separate stitching machine can be provided adjacent the delivery end thereof to provide one or more rows of stitches therealong for holding the strands together. These stitches may be of wire or may be a lock stitch or chain stitch of thread, as shown at 17 in Fig. 3.

A still further means for locking the wires against angular shifting movement may be the positioning on each side of the attaching strip, for a substantial portion thereof, as shown in Fig. 5, of a fabric 18 or material which would become adhered to the strands to prevent their shifting. This may take the form of a piece of cloth on each side pressed into and secured together in the openings, or it may take the form of a layer of rubber pressed through so as to adhere to the wires and fill up the openings. The layer of rubber may be pressed therein or formed thereon by passing the strip through a latex bath of proper consistency as it passes from the rollers.

As will be noted in Fig. 5, when the fabric is used, it preferably extends to a point spaced from the edge of the tape to leave loops 14 along the edge thereof. These loops, which will be present in all forms of the attaching strip, are utilized in anchoring the bead thereto. The bead is preferably of sponge rubber and is applied to the attaching strip in a continuous process, wherein the strip is fed along through a machine and the bead of sponge rubber is blown thereon as the attaching strip passes through the machine and is cured prior to its leaving the machine.

As shown in Fig. 4, the bead extends for a substantial distance over the edge of the attaching strip and is interlocked with the attaching strip by being secured together through the loops therein. It is during this assembling operation that stretch will occur in the attaching strip as it is fed through the bead forming and attaching machine if the means of the present invention is not provided.

After the beads and attaching strips have been assembled, the whole may be covered with a fibrous fabric cover 19 which extends around the bead and over the attaching strip, as shown in Fig. 4, and is stitched thereto by a row of stitches 20, or the bead and attaching strip may be provided with a coating formed by the deposit thereon of rubber from a latex solution.

In the broader aspects of the invention, the attaching strip may be used without a bead for various purposes. In each instance, however, it is essential, to a proper operation of the braided strip, that the strands thereof be secured together.

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 weather stripping of the character described, comprising a flat stiffening strip braided from resilient wire and providing loops on the margin thereof, said flat stiffening strip including a plurality of means for reenforcing the said strip against relative angular movement of the wire strands thereof tending to attenuate the strip; a bead secured along one edge of the said stiffening strip, the marginal loops of said strip being embedded in said bead and interlocking therewith to hold the bead thereto; and a cover of fibrous material enclosing the bead and braided stiffening strip and secured thereto by stitching extending along the braided stiffening strip.

2. A weather stripping of the character described, comprising a flat stiffening strip braided from resilient wire and providing loops on the margin thereof, said flat stiffening strip including a plurality of means for reenforcing the said strip against relative angular movement of the wire strands thereof tending to attenuate the strip; a bead secured along one edge of the said stiffening strip, the marginal loops of said strip being embedded in said bead and interlocking therewith to hold the bead thereto; and a cover enclosing the bead and braided stiffening strip and secured thereto by securing means extending along the braided stiffening strip.

LOUIS SPRARAGEN.