April 18, 1967 H. J. HILL 3,314,119

SEAMING STRIP

Filed Feb. 15, 1965 2 Sheets-Sheet 1

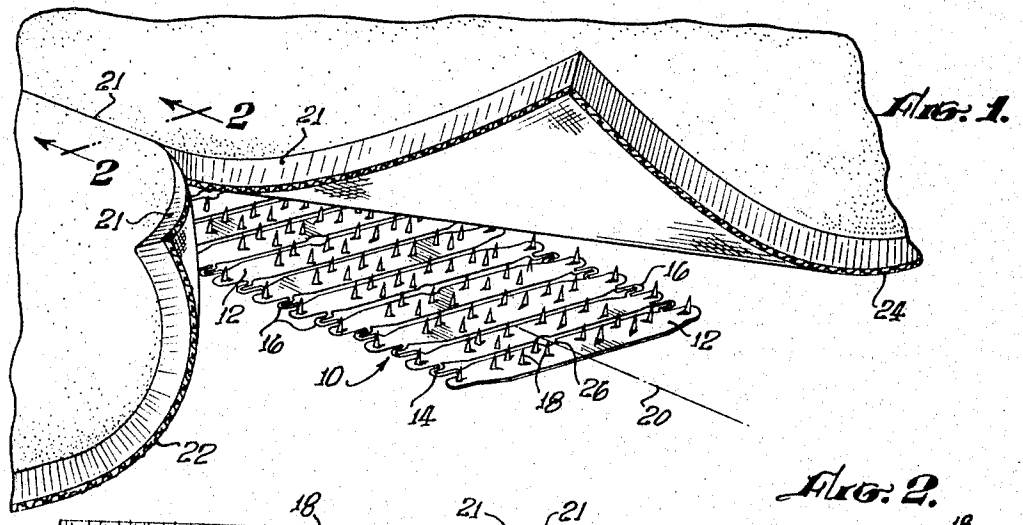

Fig. 1.

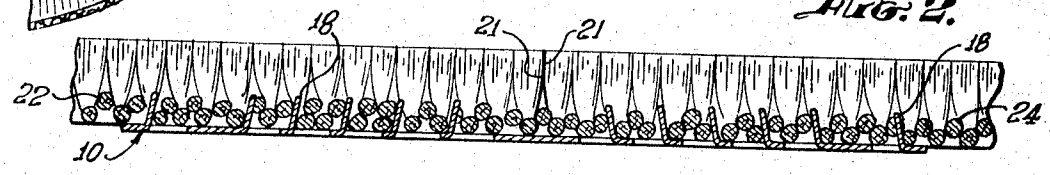

Fig. 2.

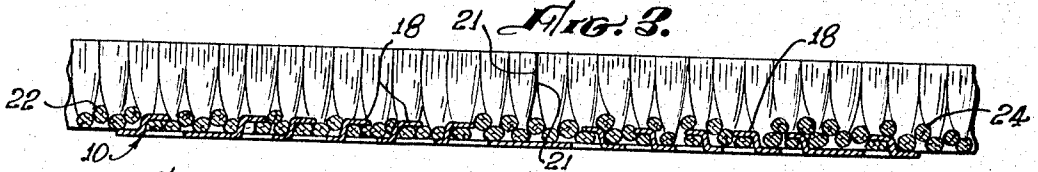

Fig. 3.

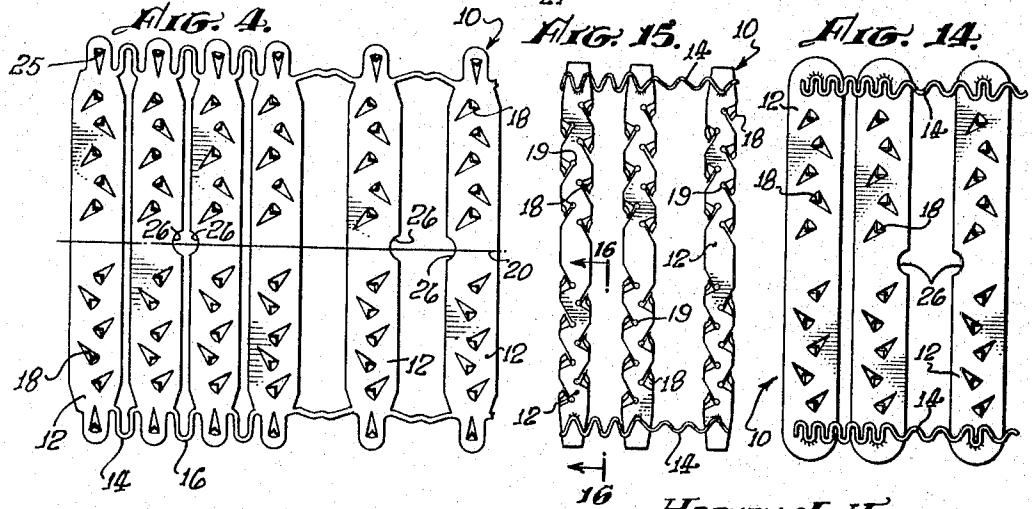

Fig. 4.

Fig. 15.

Fig. 14.

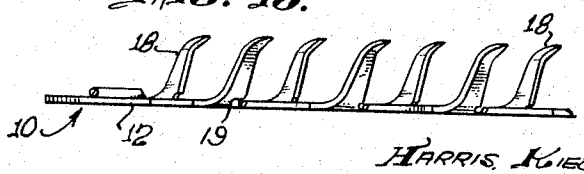

Fig. 16.

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April 18, 1967 H. J. HILL 3,314,119

SEAMING STRIP

Filed Feb. 15, 1965 2 Sheets-Sheet 2

FIG. 5.

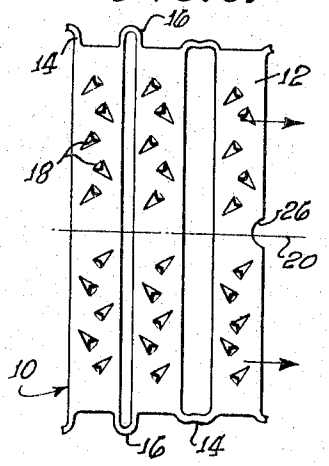


FIG. 6.

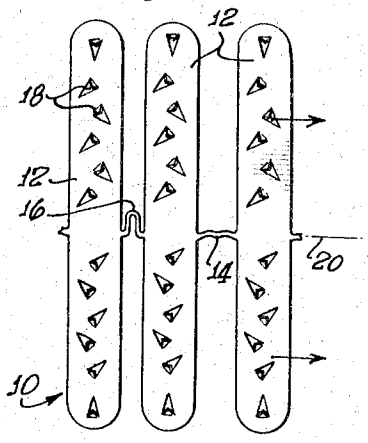


FIG. 7.

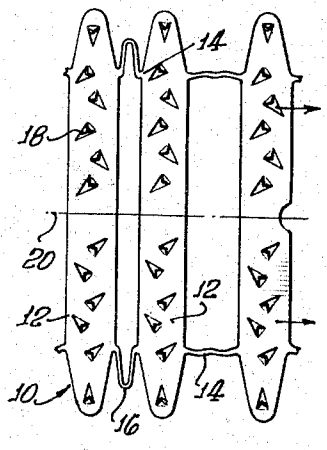


FIG. 8.

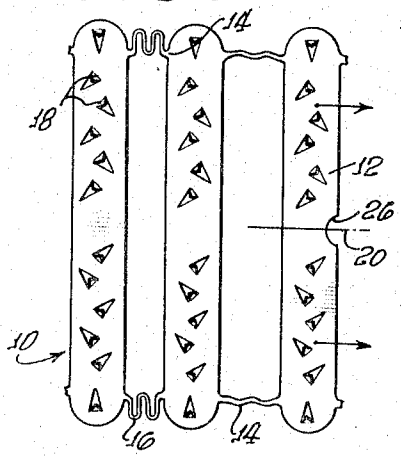


FIG. 9.

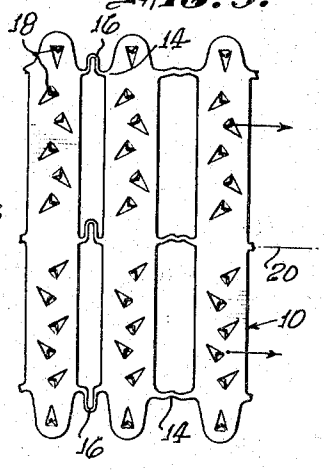


FIG. 10.

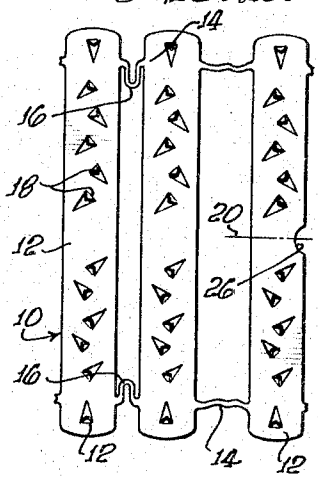


FIG. 11.

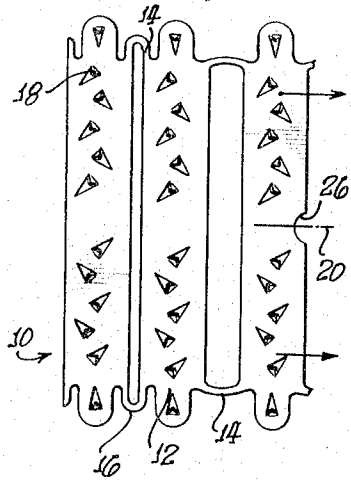


FIG. 12.

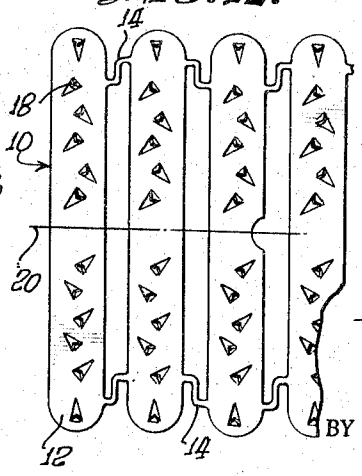
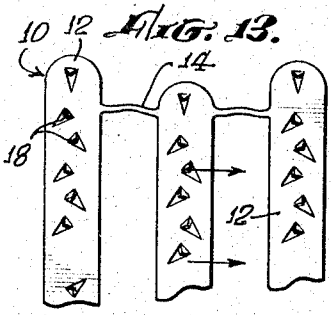


FIG. 13.



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3,314,119

SEAMING STRIP

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7 Claims. (Cl. 24—87)

This invention is concerned with a device for joining together two pieces of material such as the adjoining ends of two pieces of carpeting and the like.

Conventionally, pieces of carpeting are bound together by sewing and/or gluing the adjoining pieces to a cloth webbing or tape. Sewing of adjoining carpeting pieces together may result in a high ridge at the seam which is subject to excessive wear with passage of time. Additionally, sewing being principally a manual operation involves high labor costs. Bonding of adjacent carpet pieces together with use of a suitable adhesive is not wholly acceptable because of the required drying time, poor strength, and the inability to readily separate the two carpeting pieces should it becomes necessary after the adhesive has set. It will be appreciated that a somewhat high degree of skill is required on the part of the laborer in both sewing and bonding by adhesive. A desirable carpet seam will resist forces tending to pull the two joined pieces apart and yet permit a limited amount of stretch parallel to the seam, this stretching being necessary to the conventional installation procedures for floor carpeting.

It is a principal object of the invention to provide a seaming device which permits joined pieces of carpet to be used immediately after installation.

It is a still further object of the invention to provide a seaming device which when installed strongly resists forces tending to pull the two joined pieces apart and yet permits the necessary and normal stretching of the seam and joined material in a direction paralleling the length of the seam.

It is a further object of the invention to provide a seaming device for the installation of carpeting which device may be installed with a minimum of time and by less skilled labor than required for sewing or gluing.

It is another object of the invention to provide a seaming device which may be readily removed after installation to permit the separation of the joined pieces of material.

It is another object of the invention to provide a seaming device which provides a large number of locking prongs which securely join together the abutting pieces of material.

It is a further object of the invention to provide a device which provides smooth seams devoid of ridges and which are not subject to excessive wear with passage of time.

It is an object to further provide a device that holds material being seamed further back from the edge than is practical with generally used sewing techniques, this being particularly desirable on material which is loosely woven and subject to edge fraying.

It is still an additional object to provide a seaming device which permits the user to readily locate and relocate the mating materials so that matching patterns and colors are at all times visible and under full control.

It is a further object of the invention to provide a seaming device particularly adaptable for use in seaming of adjoining carpeting pieces and a device which when installed locks even more tightly as the carpet is walked upon.

It is a still further object of the invention to provide an improved seaming device which may be substituted for seaming by adhesives and thus reduce the possibility of costly accidents by careless or inexperienced installers.

It is another object of the invention to provide a seaming device which may be altered by hand stretching prior to installation to reduce the number of locking prongs to a number meeting the needs of a particular job.

It is a still further object of the invention to provide a seaming device having locking prongs tilted from the vertical generally toward the longitudinal axis of the device, thus providing a seaming device which forces the abutting ends of the adjoining pieces of carpet and the like tightly together when hit with a hammer or equivalent and more strongly opposes perpendicular forces that may be applied to the seam.

The seaming device of the invention in one embodiment comprises a plurality of juxtaposed sections which are joined together by flexible connecting means. The respective sections of the device are provided with a plurality of prongs. The connecting means hold the adjoining sections in a closely spaced, first position and permit movement of the sections into an extended, spaced apart, second position. The connecting means take the form of narrow flexible straps which in a first position have portions of their lengths at an angle, preferably perpendicular, to the longitudinal axis of the metal strip. A preferred embodiment utilizes flexible, extendable wires for the connecting straps. The flexible connecting straps may be stretched to assume an extended second position wherein the adjoining sections are spaced somewhat further apart. In a preferred embodiment of the invention the flexible connecting straps take the form of loops which upon opening or partial opening permit movement of adjoining sections a further distance apart. The juxtaposed sections of the seaming device are desirably parallel both in their initial positions and in their spaced apart positions. The flexible connecting straps are generally located adjacent the opposite longitudinal margins of the metal strip and are preferably located within the confines of the strip.

Other objects and advantages that may be had with the use of the seaming device of the invention will become more apparent in the following specification and drawings in which:

FIG. 1 is a fragmentary, isometric view of the installation of a carpet employing an embodiment of the seaming device of the invention;

FIG. 2 is a sectional view taken along line 2—2 of FIG. 1 illustrating adjoining pieces of carpet positioned upon the prongs of the seaming device;

FIG. 3 is a sectional view taken from the same site as that of FIG. 2 but illustrating the prongs in their clinched positions;

FIG. 4 is a plan view showing the seaming device of FIGS. 1–3 with four of the sections of the device having been moved into extended, spaced apart positions;

FIGS. 5–11 are fragmentary plan views of several other embodiments of the seaming device of the invention with in each instance one of the sections having been moved into an extended, spaced apart position;

FIG. 12 is a fragmentary plan view of an embodiment wherein the connecting strap between adjoining sections is connected at different heights to the adjoining sections;

FIG. 13 is a fragmentary plan view illustrating the seaming device of FIG. 12 in its extended position;

FIG. 14 is a plan view of an embodiment of the seaming device of the invention employing wire as the connecting straps;

FIG. 15 is a plan view of a preferred embodiment of the seaming device of the invention which utilizes wire for the connecting straps between adjoining sections of the device; and

FIG. 16 is a fragmentary sectional view taken along lines 16—16 of FIG. 15.

The embodiment of the seaming device of the invention illustrated in FIGS. 1–4 comprises a metal strip 10 which is formed or cut to have a plurality of juxtaposed, in this instance parallel, elongated sections 12, held together by narrow, flexible connecting means or straps 14 which take the form of loops 16 in the strip's initial unstretched form. The metal strip from which the seaming device is formed is very thin, flexible material, preferably steel having a thickness in the range of .005 to .030 inch and preferably within the more limited range of .010–.020 inch. The narrow connecting straps 14 are formed, in the particular embodiment illustrated, to permit approximately 50% extension of the strip length by hand stretching with very little spring back.

The elongated sections 12 of the seaming device are provided with a plurality of prongs 18 which are formed or stamped out of the metal of the strip 10. The prongs 18 on the opposite sides of the longitudinal axis 20 of the seaming device (FIGS. 2 and 4) are formed with their axes tilted preferably approximately 10° from the vertical generally toward the longitudinal axis. With this arrangement, upon vertical hammering of the prongs 18 they will bend generally toward the longitudinal axis or seam as illustrated in FIG. 3 and thus force the two carpet pieces 22 and 24 more tightly together and oppose forces that may later be applied in a direction perpendicular to the seam. Each of the sections 12 is provided on opposite sides of the longitudinal axis 20 of the seaming device with multiple prongs 18 (six in the particular embodiment illustrated). The outermost prongs 25 although tilted as the others slightly toward the longitudinal axis, squarely face that axis. The other prongs 18 in the embodiment illustrated are alternately disposed in opposite directions and at an angle up to about 45° to the longitudinal axis 20 of the seaming device. All of the prongs 18 may squarely face the longitudinal axis 20 as prongs 25. Every second and third ones of the sections 18 has a notch 26 located on the longitudinal axis 20 of the seaming device which aids in the location of the device in the laying of a carpet or its use in other applications.

Various techniques may be evolved in the use of the seaming device of the invention in the laying of the carpet or in other applications. A suitable method for carpet laying involves first truing the carpet edges to be joined to make them substantially straight. On carpets which are loosely woven and the exposed tufts on the edges are loose, the respective edges should be sealed with a fast-drying latex-type material to prevent fraying, a technique practiced by skilled installers even when sewing. The seaming strip 10 is then located on top of the floor or underlying padding and the opposing edges 21 of the two carpet pieces 22 and 24 are abutted above the seaming strip in such a fashion that they force each other slightly upward. This is done to compensate for the slight movement of each carpet edge away from the other due to the slight angle at the edges of the prongs 18 and to insure suitable contact between the carpet backing and prongs before the prong penetration actually occurs. The carpet pieces 22 and 24 are pressed manually down upon the prongs 18 to prevent separation of the carpet edges and then pounded with a hammer or other suitable device. One convenient way of impaling the carpet upon the prongs 18 is to employ a block of solid material which is struck as an anvil with a hammer. It will be recalled that the prongs 18 are formed with their axes tilted approximately 10° from the vertical toward the seam, and hence, when hammered the prongs bend toward the seam and force the two carpet pieces more tightly together as illustrated in FIG. 3. The carpet as first impaled on the prongs 18 prior to the bending over of the prongs toward the seam is illustrated in FIG. 2. The hammering of the prongs 18 to assume the clenched position of FIG. 3 secures the seaming device to the carpet pieces 22 and 24 and prevents accidental removal. One of the pieces of carpet 22 or 24 may be fastened first, followed by locating and fastening of the other carpeting piece. A piece of plywood may be used over the padding and immediately beneath the seaming device to facilitate clinching, this being especially useful where the padding is unusually soft.

The seaming device is not limited to use as described in the preceding paragraph but it may be pushed onto a carpet which is inverted on the floor. A rigid block covering several aligned seaming devices would be desirable in this instance with a metal plate or other hard surface located under the carpet to bend the prongs 18.

The strip or individual sections may be used as reinforcement for a sewn seam, this being especially helpful to prevent visible parting on seams where individual stitches would not withstand tensions created by stretching tools.

Where it is desired, it is possible to nearly double the strength per foot by stacking one seaming device on top of another with segments of one strip being positioned in the spaces between segments of the other strip. The seaming device may be removed from the carpet backing, if desired, by prying it off. This is a feature not feasible with a glued-to-tape seam, or a sewn seam which is also commonly reinforced with latex adhesive. The seaming device of the invention provides a seam which is normally or usually less visible than that obtainable by sewing in the conventional manner. The improvement is particularly noticeable where the carpet concerned is relatively thin, smooth, and of a single color. The seaming device of the invention will stretch longitudinally in two basic stages because of the flexibility of the connecting straps 14. The connecting straps 14 in the device of FIGS. 1–4 take the form of extendible loops 16. Because of the extendible loops 16, the seaming device may be extended to increase the length of the device by approximately 50%. The stretching of the device to this first stage is done by hand and there is little spring back. It will be appreciated that the seaming device may be used without stretching where the maximum number of sections 12 per foot of seam and the maximum strength are desired. Referring to the right-hand portion of FIG. 4 it will be seen that the loops 16 in the extended first stage of the device of the invention, are substantially or nearly straight, but even here the connecting straps are still slightly curved following the hand stretching. The remaining curvature of the connecting straps 14 provides for additional movement of the carpet as it is stretched parallel to the length of the seam with the powerful stretching tools that are conventionally used in the trade. During and after each stage of extension, the seaming device, including the connecting straps 14, remains substantially flat.

The extendible feature of the seaming device of the invention provides several distinct advantages. It permits lessening the cost of the seaming device per linear foot and reduces the hammering required for the installation of the device. The stretching feature permits the reduction of strength in those areas where the requirement is low. By stretching the seaming device to its full first stage extension or portion thereof, it is possible to reduce the amount of metal underlying the carpet seam and thus provide more resilient action between the carpet and underlying padding. The stretchable feature of the seaming device also facilitates quick fitting of the device to a dimension without meticulous measuring, this being a distinct advantage in an area such as across a doorway.

The connecting straps 14 between the adjoining longitudinal sections 12 of the seaming device are rigid enough to support the weight of a sizable length of the device without permitting appreciable extension. The connecting straps 14 are small enough in cross section to permit vertical bending, thus assuring conformation of the seaming device to uneven floors or padding surfaces. This

vertical bendability feature permits adjacent longitudinal sections **12** to move substantially independently of each other, with their planes offsetting to conform to irregular foot pressures on the overlying carpet. The connector straps **14** further serve as handy breakoff points which permit the installer to flex the device several times in order to fatigue and break the metal rather than cutting it with shears or tin snips. The connecting straps **14** are preferably recessed inwardly as illustrated in the device of FIG. 4, away from the longitudinal margins of the seaming device and within the confines thereof. The placing of the connecting straps **14** within the confines of the seaming device protects the straps against damage in packaging, shipping, and general handling. The flexibility of the seaming device provides a seamed carpet which may be rolled perpendicular to the axis of the seam, this being a distinct advantage where the carpet is removed for cleaning or other reasons. The relatively short lengths of the individual sections **12** and the flexibility of the thin metal material permit the carpet to be rolled parallel to the seam as well. The flexibility of the seaming device permits some twisting of the seam without damage, as will often happen when a carpet is moved through a narrow doorway or other confined area in the process of installation.

If in time, due to flexing of the carpet at the seam, the connecting straps **14** fracture, this causes no harm to the seam since it is the sections **12** which are responsible for holding the seam. This feature also permits small leftover scraps of the seaming device to be installed.

The connecting straps **14** may take various forms and may be used in different numbers between adjoining sections **12** of the seaming device of the invention. It will be seen that in all of the connecting straps of the various configurations there is a portion of the length of the strap disposed at an angle to the longitudinal axis of the seaming device. Preferably, the connecting straps **14** take the form of a loop as illustrated in most of the configurations with a portion of the loop being substantially perpendicular to the longitudinal axis **20** of the metal strip or seaming device. In all of the embodiments illustrated except that of FIG. 6, the connecting straps **14** are located adjacent the opposite longitudinal margins of the metal strip **10**. Preferably, the connecting straps **12** are within the confines of the device proper but, alternatively, they may be placed exteriorly as are the loops **16** of the device of FIG. 5. In the device of FIG. 6, there is provided a single connecting loop **16** between the adjoining sections **12** and this connecting loop is adjacent the longitudinal axis **20** of the device, this arrangement permitting maximum twisting of material seamed without harm to the seam. The connecting loops **16** may extend outwardly as in the preferred embodiment of FIG. 4 and as illustrated in the devices of FIGS. 8, 9, and 11. Alternatively, the loops **16** may extend inwardly as shown in the device of FIG. 10. In the seaming device of FIG. 12, the connecting strap **14** is provided with a non-loop configuration but a configuration in which a portion of the length of the strap is substantially perpendicular to the longitudinal axis **20** of the metal strip **10**. In this arrangement the opposite ends of the connecting straps **14** are connected at different heights to the adjoining sections **12**. Thus, upon extension of the seaming device to its extended form, the alternate sections **12**, while remaining parallel with the adjoining sections, are moved perpendicularly to the longitudinal axis **20** of the device as best seen in FIG. 13. It is thus apparent that the connecting straps **14** may take many forms and may be used in various numbers as long as the major axis of the strap deviates from the longitudinal axis of the strip.

The seaming device illustrated in FIG. 14 comprises a plurality of elongated, parallel, juxtaposed steel sections **12** connected by straps **14** taking the form of crimped wires which are spot welded at spaced intervals along their lengths to the respective sections **12**. The wire connecting straps **14** provide approximately 50% extension of the seaming device's length by hand stretching. The connecting straps **14** instead of being formed of crimped wires may be stamped members which are susceptible to hand stretching. The wire connecting strap version has the advantage of being easily fabricated with no waste. In some applications untempered thin steel sections **12** will be bent upon application of localized pressure. This may be remedied by forming the sections **12** from a mild tempered, thin spring steel which is hard enough to provide the desired resiliency but still soft enough to permit punching of the prongs **18** without cracking due to brittleness of the material. The connecting wire straps **14** of the embodiment of FIG. 14 have no appreciable resiliency and are soft enough to permit ready bending.

The prongs **18** of FIGS. 2–14 have a generally triangular shape which imparts rigidity and facilitates penetration into tough carpet backings. The prongs are tilted from the vertical generally toward the longitudinal axis **20** of the device preferably in the range of approximately 5 to 20 degrees from the vertical, in order that they may be bent toward the seam with the application of vertical pressure. For heavy grade carpeting, the length of the prong is desirably about $\frac{3}{16}$ of an inch. The prongs are constructed so that they extend through the average carpet backing in order that the hammering or rolling subsequently applied will bend over the tips, thus locking the carpet backing between the hooked tips of the prongs and the base surface of the strip. It will be seen that the prongs are not facing in the same directions nor tilted directly toward the axis of the seam except for the outermost prongs **25** of most of the embodiments.

The seaming device of FIGS. 15 and 16 has proven to be a particularly desirable embodiment and is made up of a plurality of elongated, parallel, relatively narrow juxtaposed sections **12** formed of spring steel and connected by crimped wires **14** which are spot welded to the respective sections **12**. The wire connecting straps **14** permit approximately a 50% extension of the seaming device when the straps are in their expanded position. The sections **12** of the particular embodiment of FIGS. 15 and 16 are formed of spring steel and are relatively narrow compared to that of FIG. 14. Prongs **18** are formed at the edge of the material after first punching small round holes **19** in the material to eliminate metal tearing at the base of the later-formed prongs **18**. The prongs **18** also have a somewhat different shape and at their outer ends are turned over slightly as best seen in FIG. 16. The prongs **18** being generally made of relatively stiffer material than the embodiment illustrated in FIGS. 2 and 3 do not crimp over when hammered to the same degree as the prongs **18** of FIG. 3. The prongs **18** of the embodiment of FIGS. 15 and 16 bend more at the base and less in the middle area.

Since the device of the invention in its various embodiments is stretchable, the carpet can be stretched after the two pieces of carpet are joined together, thus eliminating any possibility of puckering as frequently occurs in hand sewing when the carpet edges are not properly aligned before and during sewing. The device reduces the need of stretching and temporarily fastening the stretched edges before the seam is made. It is generally advisable when sewing a seam to turn the two pieces of carpet face down in order to facilitate the operation. Due to the fastening method provided by the new device this awkward time consuming operation is eliminated.

Although exemplary embodiments of the invention have been disclosed herein for purposes of illustration, it will be understood that various changes, modifications, and substitutions may be incorporated in such embodiments without departing from the spirit of the invention as defined by the claims which follow.

I claim:

1. A seaming device comprising:

a thin strip of metal formed into a plurality of parallel sections joined together by flexible, connecting straps located adjacent opposite longitudinal margins of said metal strip with the respective sections being provided with a plurality of prongs, said flexible connecting straps having a first position holding adjoining sections closely spaced and an extended, second position holding said sections away from each other and in spaced apart, parallel orientation.

2. A seaming device in accordance with claim 1 wherein the flexible connecting straps take the form of loops.

3. A seaming device comprising:

a thin strip of metal formed into juxtaposed, elongated sections having a plurality of prongs on both sides of the longitudinal axis of said metal strips with said prongs being tilted toward said longitudinal axis and with the juxtaposed sections being joined together by flexible connecting straps, said connecting straps in their first positions each having a portion of its length at an angle to the longitudinal axis of the metal strip and holding adjoining sections closely spaced, and each of said flexible connecting straps having an extended, more nearly straight second position wherein adjoining sections are spaced further apart, said flexible connecting strap being located adjacent opposite longitudinal margins of said strip.

4. A seaming device in accordance with claim 3 wherein the flexible connecting straps comprise loops located within the confines of said strip.

5. A seaming device comprising:

a thin strip of metal formed into parallel, elongated sections having a plurality of prongs and joined together by flexible connecting straps, said connecting straps in their first positions each having a portion of its length substantially perpendicular to the longitudinal axis of the metal strip and holding adjoining sections closely spaced, and each of said flexible connecting straps having an extended substantially straight second position wherein the adjoining sections are spaced apart in parallel relationship, at least some of said flexible connecting straps being located adjacent the opposite longitudinal margins of said strip.

6. A seaming device in accordance with claim 5 wherein at least some of the flexible connecting straps connecting adjoining sections are located along the longitudinal axis of said metal strip.

7. A seaming device in accordance with claim 5 wherein the margin-located flexible connecting straps are located outside the confines of said strip.

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