United States Patent [19]

Tesch

[11] **3,895,981**

[45] **July 22, 1975**

[54] **TEXTILE BOTTOM FLOOR COVER HAVING AT LEAST ONE REINFORCING STRIP AND METHOD OF PRODUCTION THEREOF**

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[22] Filed: **Sept. 29, 1972**

[21] Appl. No.: **293,566**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 705,664, Feb. 15, 1968, abandoned.

[30] **Foreign Application Priority Data**

Feb. 20, 1967 Switzerland 2614/67

[52] **U.S. Cl.** **156/71;** 156/322; 156/256; 161/63; 161/67; 161/146; 161/149; 52/179; 52/181; 16/10

[51] **Int. Cl.** **E04f 11/16;** B32b 7/14; D03d 27/00

[58] **Field of Search** 161/63, 67, 145, 147, 149, 161/49, 72, 62, 64, 65, 66, 146, 148, 39, 40; 16/10; 15/215, 217; 52/179, 181; 156/71

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Assistant Examiner—William R. Dixon, Jr.
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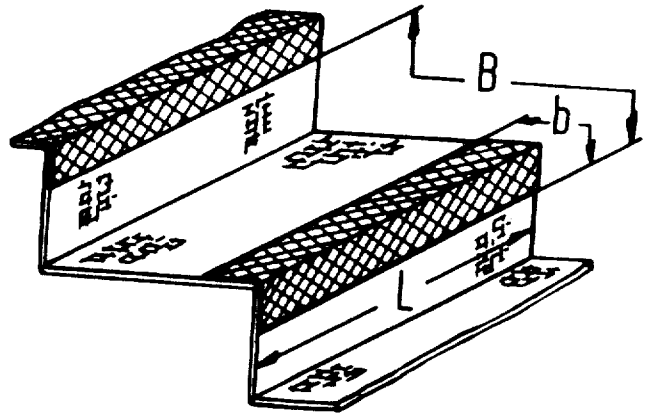
[57] **ABSTRACT**

A ready-made textile stair floor covering material, comprising a covering material having an indefinite length for being subsequently cut into lengths corresponding to the width of a staircase, and having a width between approximately 25 to 50 cm. for covering at least the front edge and the horizontal face of one stair step and a strip of a thermoplastic synthetic reinforcing material applied in the heat-melted state on the visible face of the covering material and being in a solid, nontacky state at room temperature, the strip being arranged adjacent to one lengthwise border edge of the covering material, and a thermoplastic adhesive material applied to the reverse of the covering material in the edge area adjacent the same lengthwise border edge of the covering material to which the reinforcing substance is applied.

5 Claims, 16 Drawing Figures



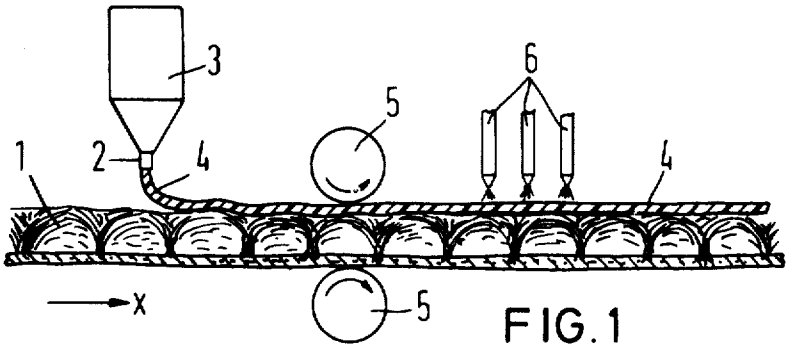


FIG.1

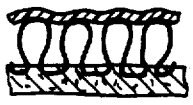


FIG.1a


FIG.1b

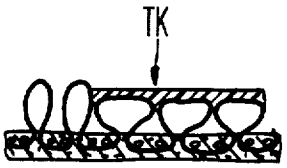


FIG.1c


FIG.1d

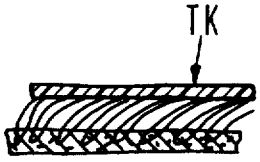


FIG.1e

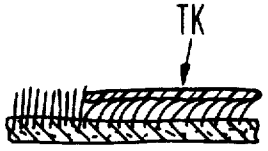


FIG.1f

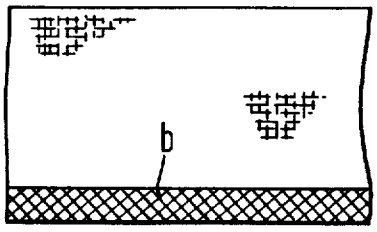


FIG.2

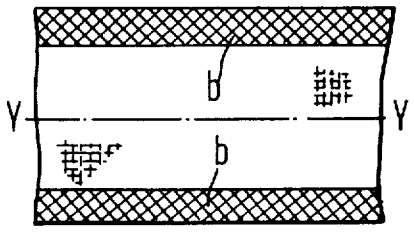


FIG.3

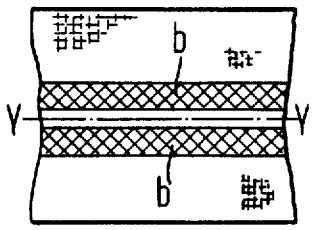


FIG.4

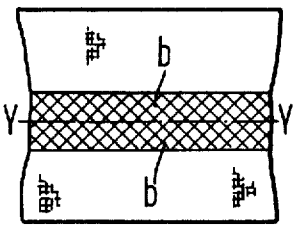


FIG.5

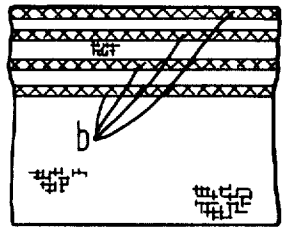


FIG.7

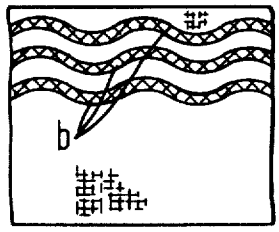


FIG.8

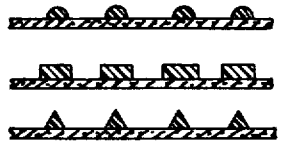


FIG.6

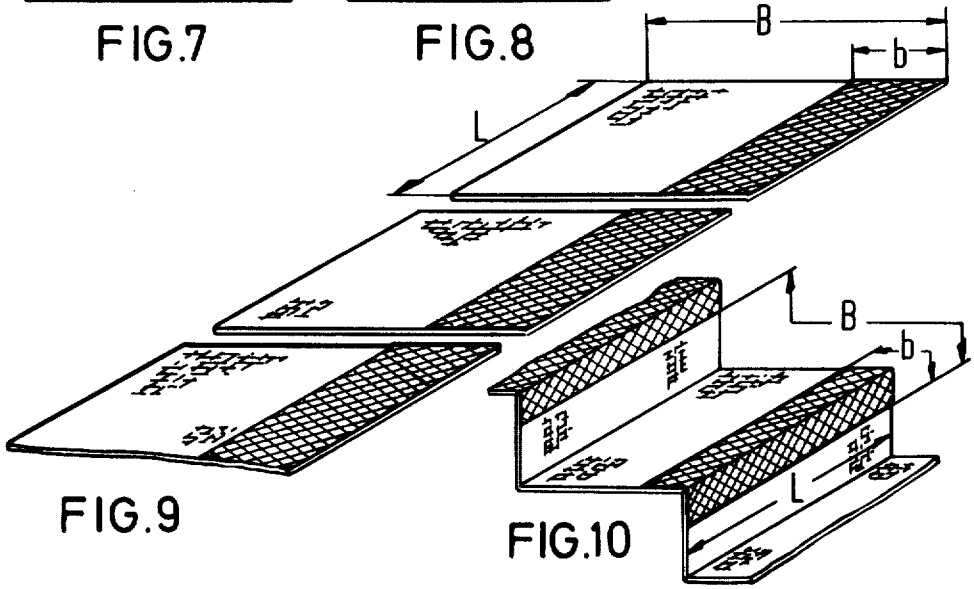


FIG.9

FIG.10

TEXTILE BOTTOM FLOOR COVER HAVING AT LEAST ONE REINFORCING STRIP AND METHOD OF PRODUCTION THEREOF

This is a continuation-in-part application to my co-pending patent application Ser. No. 705,664, filed on Feb. 15, 1968 now abandoned.

The present invention concerns a textile floor covering having one or more reinforcing strips.

It is known to reinforce carpets, particularly car mats, by providing plastic backings at the points of stress; thus a plastic sheet is either sewn on or a thixotropic dispersion in the form of a plastic gel is applied to the surface of the carpet and subsequently gelled out with the application of heat. These processes however are costly and unsuitable for the intended application.

Plastic material strips are also known which are nailed in place.

It is an object of the present invention to provide a web of textile floor covering having one or more reinforcing strips, in which with little expenditure of time and space even with a high production quota adequate cohesion between textile web and reinforcing strip is ensured and therefore the base is protected from deterioration as by overheating.

According to the present invention at least one nozzle is moved relative to the longitudinal direction of a textile web having at least a part of its surface of thermoplastic material and a strip of thermoplastic reinforcing substance which is caused to become flowable by heating is applied to the web surface from the nozzle, the temperature of the strand being at least as high as the softening temperature of the thermoplastic surface and the reinforcing strip so applied to the textile web being hardened or solidified by cooling to room temperature.

In accordance with the present invention the location of the reinforcing strip integrally disposed on the partly thermoplastic surface of a textile fiber covering, is critical and must be at the edge area for covering a step edge.

Heretofore in the state of the art only separate pieces of reinforcing strips were used after a carpet was attached and were placed on the edge of a stair. Such a strip could be a separate piece of metal or the like for reinforcement or wear purposes.

When floor covering for stairs is to be provided, as a rule one can decide only upon laying of the covering, where the reinforcement strip should be attached. Therefore, if a strip was applied at all in the previous conventional laying down methods, it was only put on afterwards — mostly in form of a separate ledge. These systems are used mainly when the same carpet roll is used for covering of the room surface. It is apparent that by such a laying method the exact position of the strips cannot be determined before the laying down of the carpeting of the stairway.

Application of the strip in the production plant for the floor covering is thereby completely impossible.

The present invention has solved this problem and relieves the producer of floor coverings from the worry of the exact location of the reinforcement strips; he needs only to equip them as a edge strip along the floor covering track. The installation man can then put the floor-covering carpet on the stairs, so that the reinforcement strips will be located on the stair edge. Therefore, the installation man does not put the carpet as before from the top of the stairway to the bottom, but horizontally from stair to stair. One can still take advantage that the depth of the stair, as well as the height of the vertical wall between each stair has standard measurements, so that there is an optimum width of the prefabricated covering path "B" by which the slightest waste is obtained. The cutting for the width of the stairs, that is, the length of the staircase, "L", leads to no waste when straight stairs are involved.

The results obtained with the use of such reinforcement strips as prefabricated edge strips on a floor covering track is, therefore, surprising for everyone skilled in the art. The combination with an adhesive strip on the lower side increases the utility of the floor covering material since, if the two strips on top and on the bottom comprise thermoplastic material, these jointly can be softened by a single heating process by means of hot air dryer.

It is a feature of the present invention to provide a ready-made textile stair floor covering material, comprising a covering material having an indefinite length for being subsequently cut into lengths corresponding to the width of a stair case, and having a width between approximately 25 to 50 cm. for covering at least the front edge and the horizontal face of one stair step, and a strip of a thermoplastic synthetic reinforcing material applied in the heat melted state on the visible face of the covering material and being in a solid, nontacky state at room temperature, the strip being arranged adjacent to one lengthwise border edge of the covering material, and a thermoplastic adhesive material applied to the reverse of the covering material in the edge area adjacent the same lengthwise border edge of the covering material to which the reinforcing substance is applied.

It is another object of the present invention to provide a covering material as above mentioned wherein the adhesive material is heat activatable.

It is yet another object of the present invention to provide a covering material as above mentioned wherein the reinforcing material forms a plurality of spaced strips of the plastic reinforcing material having a spacing smaller than ordinary shoe heels.

It is a further object of the present invention to provide a covering material as above mentioned wherein the plurality of spaced strips are applied in undulating shape.

Still another object of the present invention is to provide a covering material as above mentioned wherein the adhesive material is partly adhesive pressure-sensitive at room temperature, whereby a pressing on after heating threrof leads to a stronger binding than a pressing on at room temperature.

It is also another object of the present invention to provide a covering material as mentioned above wherein the adhesive material is partially disposed on the bottom reverse side of said covering material, and the ratio between covered and non-covered part of said reverse side is largest in the range of the reinforcing material.

Another object of the present invention is to provide a covering material as mentioned above wherein the adhesive material is less adhesive at room temperature than in the range of the reinforcing material, and is more adhesive in the range of a step face to be applied thereon.

It is another object of the present invention to provide a method of covering stairs, comprising the steps of providing a roll of covering material with a thermoplastic reinforcing material disposed throughout one side in a longitudinal strip along one edge thereof and having a heat activatable material on a reverse side, cutting the roll of covering material cross-wise to the longitudinal direction thereof into pieces corresponding to the width of each step, respectively, and heating the adhesive material and laying by pressing said pieces on the steps cross-wise thereto such that the reinforcing strip is disposed along the edge of the steps.

It is yet another object of the present invention to provide a method for covering stairs wherein the laying step constitutes laying the pieces only on the horizontal surfaces of the steps.

It is also a further object of the present invention to provide a method for covering stairs wherein the laying step constitutes laying the pieces on both the horizontal and vertical surfaces of the steps.

A step of a staircase is a structural part which measured horizontally has a limited measurement (width); as the height, however, it can have any measure. It is for this reason that one thinks of a cover layer in roll form as a runner, to be rolled off as from the top to the bottom. Actually this is the pre-considered manner for a traditional operation.

To roll up the storage rol crosswise to the steps in horizontal direction and to cut it in so many pieces as the number of steps present constitutes the present inventive concept. The inventive operation is without doubt in the concept of the roll form by ascertaining of the roll width in coincidence with the greatest possible depth of the steps and by the arrangement of the longitudinal reinforcing strips extending therethrough on the upper side in addition to the longitudinal strip with a glue layer on the bottom side.

The passing through of these strips over the entire roll in economical fabrication lengths (for example 25 m.), which have no connection with the measurements of the steps makes possible a series-like prefabrication of step-covering materials with built-in reinforcing strips and glue strips.

The user desires a cover of chemical fibers or of natural sisal fibers or a fiber mixture, and whether the reinforcement mass should consist of polyamide or of bituminal rubber, as well as whether this reinforcement mass is applied in a melt flow from a nozzle, or if sprayed with pressure gas or from a liquid bath with roller transmission method, is of no importance for the performance of the present invention.

The invention extends to textile webs produced according to this method and provided with a covering of one or more reinforcing strips.

With these and other objects in view, which will become apparent in the following detailed description, the present invention will be clearly understood in connection with the accompanying drawings:

FIG. 1 is a longitudinal sectional view of a textile covering web provided with a reinforcing strip illustrating a production process in accordance with the present invention;

FIGS. 1*a* to 1*f* are longitudinal sections through parts of carpets reinforced in accordance with the invention;

FIGS. 2 to 8 show various arrangements of reinforcing strips on textile webs;

FIG. 9 illustrates the separation of a fabric web as shown in FIG. 2 into individual sections for use as stair coverings; and

FIG. 10 shows the arrangement of such stair coverings on stairs.

The method in accordance with the present invention is illustrated in FIG. 1 by way of example in relation to a needled felt. The web-shaped needle felt 1, which contains 30percent thermoplastic fibers, is moved continuously in the direction of the arrow, past a reservoir 3 provided with a wide slot nozzle 2. The reservoir 3, which may be heated electrically, contains a thermoplastic material adapted by heating to be rendered flowable; the thermoplastic material is changed into a low to highly viscous state which is extruded vertically downwardly from the nozzle 2, due to its dead weight or due to an excess pressure prevailing in the reservoir 3, in the form of a strand 4 or a foil or liquid curtain and laid continuously on the travelling surface of the needle felt 1. The thermoplastic material of the strand 4 has a softening temperature of about 60°C to 300° C, preferably 70°C to 120°, and a processing temperature during application at least as high as the softening temperature of the thermoplastic fibers of the needle felt 1 and preferably higher; consequently when the hot strand 4 impacts the surface of the needle felt 1, the thermoplastic fibers of the latter are softened or even melted, so that on the one hand, they form a close cohesive bond with the strand 4 and on the other hand are adhesively joined to non-thermoplastic fibers of the needle felt 1. This bond is so strong that — as shown by experiments — a strand thickness of only 0.5 to 2 mm results in a substantially indivisible bond.

Depending upon the viscosity, the plastic material strand 4 applied to the needle felt 1 may be readily cooled there and allowed to set, or the surface of the needle felt 1 may be embossed to a greater or lesser extent by means of a pair of rollers 5, a bar or other suitable device pressed against it. Cooling of the plastic strand 4 may be affected by the surrounding atmosphere, but it is also possible to accelerate the cooling process in order to increase the production rate. Such accelerated cooling may be obtained by passing the coated needle felt web 1 beneath one or more nozzles 6 from which cold air is blown against the strand of plastic material 4 causing it to set rapidly. Alternatively the web 1 of needle felt may be passed through a cooling chamber; there are, however, also other known cooling methods appliicable in the present case, e.g., a cooling roller which may be formed simultaneously as an embossing roller.

The method refered to above may be used not only in connection with needle felts, but in any kind of textile webs, as far as these are formed wholly or partially of thermoplastic fibers or fibers having a thermoplastic surface, for example, non-thermoplastic fibers the surface of which is covered with a thermoplastic bonding agent; thus the fibers can not only be present as flatwork structures, such as fiber fleeces but also as linear structures, for instance, textile fiber and continuous fiber yarns. Consequently, the method in accordance with the invention may also be used to reinforce fabrics, also carpeting — such as woven, for example, looped, velour and flatowrk fabrics; tufted, for example nap, looped, velour and woven flock and the like carpets — made at least partially of thermoplastic fibers, possibly in the form of threads, or natural fibers which

have received a prior "scalable" coating by means of a dispersion, a powder or the like. In some carpets it may be advantageous to deform the carpet surface first, for example, by pressing the pile down before applying the reinforcing strips, possibly with the application of heat, and possibly with prefixing such as by application of adhesive, with high velour or looping.

FIG. 1*a* shows a longitudinal section through a part of a looped carpet reinforced in accordance with the present invention with reinforcing strip poured thereon, while FIG. 1*b* shows a similar carpet with reinforcing strips pressed thereon; finally, FIG. 1*c* shows a similar carpet the surface of which, however, has been subjected to a pressure and heat treatment during the application of the reinforcing strips, that is, the surface is "thermally compressed" (TK). FIG. 1*d* shows a velour carpet with a liquid compound poured thereon, while the velour carpet as shown in FIG. 1*e* is thermally compressed (TK). FIG. 1*f* shows a thermally compressed flock velour.

Number, width and mutual arrangement of the reinforcing strips may be selected as required and in accordance with the intended purpose, as shown by the plan views of sections of textile webs reinforced in accordance with the method of the present invention as shown by FIGS. 2 to 8. The strip arrangement shown in FIG. 8 is obtained by arranging several nozzles in a row extending transversely of the direction of the web, and causing them to execute an oscillatory movement at right angles to the direction of the web. The reinforcing strips, as shown by FIG. 6, may have a rounded or angular profile in cross-section.

Reinforced webs as shown in FIGS. 2, 7 and 8 are suited in a particularly favorable manner as stair coverings, as will be explained in detail below.

Laying textile stair coverings has hitherto been carried out in accordance with three methods:

a. laying with stair-rods;
b. laying with nailed beading; and
c. adhesion.

Laying with stair-rods is considered where the stair covering is to be frequently removed (for example, for cleaning); this method, due to the large number of rods and their fixing means required, not only involves considerable expenditure of cost and time but in addition, also has the drawback that in the event of the stair covering wearing out only at points subject to particular stress, e.g., the edges of the stairs, and the whole stair covering has to be replaced if it is not desired to put up with unsightly patching stitches.

Laying the nailing beading in the smooth-edge method requires considerable effort. After nailing or cementing each nailing ledge on each stair tread and riser, the individual stairs have a felt pad cemented thereon from the ledge; then the runner under tension is hooked with the bent tensioner on the nailing ledge of the stair tread and driven with the stair tool in a straight line into the joints remaining between two associated nailing ledges. At the lateral ends of the stairs a nail is driven in between two associated nailing ledges in order to cover the latter.

The two methods of laying enumerated above are more readily applied in the case of straight stairs, while the cementing method is also well suited for spiralled stairs.

In all three methods of laying, the protection of the edges produces special problems. The most primitive method of edge protection consists in nailing or cementing a metal protection ledge of brass or aluminum, rubber or plastic material onto the stair covering at the edges of the stairs. This protective ledge, if made of metal, tends to cause accidents due to a foot slipping when ascending stairs, while, if it is made of rubber or plastic material, it is mostly colored black or grey and contrasts unfavorably in color with the stair covering, which has an adverse effect on the appearance.

In this connection the application of textile covering webs produced in accordance with the present invention brings about a fundamental change, namely not only from a safety point of view and better appearance, but especially also from an economics aspect. Proceeding from a textile web as shown in FIG. 2 reinforced only by an edge strip, it is divided in a manner as shown by FIG. 9 by cuts extending at right angles to the direction of web into individual sections of the length L; each piece thus has a width B of the textile web, the width of the reinforcing strip being designated by b. The length L is so chosen that it corresponds to the width of the tread (FIG. 10). Each piece separated from the textile web is now laid in a manner as shown by FIG. 10 on a stair so that the reinforcing stip assumes a position in the region of the edge of the stair where, after bending through 90°, it forms an effective edge protection after the stair covering has been permanently or detachably cemented to the stair. Thus this edge protection, comprising a colorless plastic material or such color exactly like the textile web, not contrast optically unless luminous pigments have been added purposely thereto to make the edge of the stairs visible also in the dark. Moreover in this method of laying, in which contrary to the conventional method work is carried out at right angles to the direction of the stair, waste is at a minimum, because any desired width of stair tread may be chosen from the roller, a certain cutting loss occurring only in the depth of the step of the stairs.

A further considerable advantage is that the covering, which already contains the reinforcement, requires only a single cementing operation — in contrast to the frequently used PVC edge guards which are required to be cemented in position before applying the stair covering and which for cementing require a special and costly contact adhesive which in addition has to be applied not only to the underside of the edge guards but also to the surface of the "bevelled edges" which support the actual stair covering. In the present invention cementing occurs by means of a standard adhesive on the much more porous and more readily cemented reverse side of the carpet. It is, however, also possible to operate with an adhesive cement or contact adhesive. Preferably however, an adhesive is used comprising for example 90 to 40 parts by weight of adhesive cement components causing the adhesive effect to be much increased at room temperature and 10 to 60 parts by weight of thermoplastic components which are less adhesive at room temperatures but which, when heating to a temperature of between 60° C and the softening temperature of the fiber surfaces, with temporary loss of their cohesion, become a highly adhesive cement which at the required area sections causes a permanent bond with the foundation. This adhesive has the advantage that after application of the stair covering it causes a sealing in the region of the edge of the stair when

local heating to about 70° to 110° C is brought about at this point by means of hot air.

Also to be mentioned is that the webs as shown in FIGS. 3 to 5 are divided by longitudinal sections on the lines Y—Y into webs as shown in FIG. 2 and adapted, in the manner referred to, to be further processed into stair coverings.

Finally, webs may be used with undulated reinforcing strips as shown in FIG. 8 — in a conventional manner as stair coverings in the direction of the stairs, if the mutual distances of the reinforcing strips are smaller than the width of ladies' or children's shoes, so that when stepping on such a covering, the shoe is supported only by the reinforcing strip and hence the actual covering is subject to no, or only insignificant wear.

Step measurements are always variable, that is, the length "L" in FIG. 10. This measure is mostly also variable, within a similar building, to a great extent, so that production of a piece in a factory for floor coverings is excluded from the start. Along with this is the fact that the floor covering operator can cut the cover on location in any desired length from the roll and the reinforcing strip for the step edge is already applied constituting an advance of the present invention.

In the present application the development does not lead from the individual production in measured pieces to the continuous production in the form, rather from the continuous production of a material track with non-differentiated surface characteristics to the production of a material track with reinforcing locations in a predetermined arrangement. This development has as a presumption a reversal of the laying method. The traditional laying method from the top towards the bottom does not permit the application of the reinforcing strips, since these must have been applied as cross-strips crosswise over the cover track. This arrangement is very unfavorable as to technical manufacture, and is also not practical for the floor layer, since a variable measure L can only arise by a combination of individual pieces. There results by this step arrangement, the width of which (i.e., the measure L) surpasses the width of the cover track, a seam point, which is visible better in steps than on a room floor, since in case of the stepping up on steps, the eyes are closer to the steps than on a plain floor. In the laying method cross-wise to the steps, however, the seam location can be moved to the edge of the step edge, where it is not visible. The decisive concept of the present application, which makes possible a usable and very accepted solution of this problem consists in the fact, as already mentioned, that the floor cover is to be designed such that it is not as used from the top to the bottom parallel to the center line of the steps, and thereafter cut at the step's edges, depending upon the width, or completed by further strips, rather that the cover track is arranged cross-wise to the steps and parallel to the edge of the step. In such laying method, it is now possible to form the reinforcing strip for the step edge as a marginal strip of the floor covering material track and to include the reinforcing strip in the continuous production process of the material.

In the laying method of the present invention, one starts with production process of the material track in the factory and terminates with the cutting and securing at the place of application of the material on the floor. The method comprises covering of steps with textile floor covering material, worked from prefabricated floor covering materials in track form with applied longitudinal reinforcing strips.

The individual steps of the method consist of two parts, namely, of the steps for production of the covering track in the production operation, and the laying step at the place of application of the covering.

The following steps are arranged in time succession.

1. On the top side of the continuously moving track of the textile floor covering material, a layer mass is applied in a melted liquid state condition in the form of a strip extending in the longitudinal direction of the track and forming a non-adhesive hard surface at room temperature and brought to hardening (by cooling). (As a variation: a double web width with two parallel center strips or a double width individual strip, also multiple track widths).

2. To the bottom side of the material web there is applied equal running strips of thermoplastic glue mass in a melt-liquid condition which is hardened by cooling.

3. This created material web is cut on both sides to the width to be used such that the layer strips of the upper and lower sides coincide with one of the two limit edges of the web (whereby the material web width, suitably suffices for covering of a step surface "B" in FIG. 10).

4. The material web cut to standard width (under circumstances with arrangement of an intermediate movable protection sheet for the underside glue material layer) is wound in a storage roll and brought to the place of application of the floor covering.

5. The material web is cut into pieces by the layers of the floor cover by cuts cross-wise to the web direction corresponding with the length L in FIG. 10 (as well as the measure "B" under circumstances still exactly cut).

6. The pieces are individually laid on the steps such that the upper and the lower sides coincide with the step edge.

7. The edge strip of the piece is heated to the softening of the under-sided applied glue material layer and pressed to the edge of the step until the glue material due to cooling produces a rigid adhesive connection between the covering material and the steps (under circumstances simultaneously, the upper-sided reinforcement strip gets pliant by heating, so that the edge strips can be bent over the step edge — compare FIG. 10 — not however, a softening of the upper-sided reinforcement layer).

The compositions can be considered new in view of their effects during security of the floor coverings on steps.

The relation between the height of the steps and the depth of the steps, the so-called step-rising ratio, is normal. The basis, therefore, is in the observation that this rising ratio is a physiological optimum (depth to height equals 29:17) in which the rising understep is most comfortable and safest.

It is possible to provide a certain track width, and this, by example, (50 cm.), which during laying in accordance with the present invention, leads to the lowest waste which, however, is surprising according to production (normal track width 2.20 m. or more). In the United States it is not always conventional to cover up the vertical step face of steps. For example: 25–40 cm. for covering of the edge and the horizontal face, and

45–60 cm. for covering the edge and the horizontal face plus the vertical face.

Floor covering materials in the form of the given width with a reinforcing strip along a longitudinal edge were hereto fore not known. Step covers with continuous longitudinal reinforcement strips running along the entire roll for the step edges to be cut from a roll is an inventive advantage. Accordingly, the floor covering is usable for any step width.

The following is an example of the present invention for FIG. 1:

On a needle felt 1 of at least 30 percent polypropylene fibers, there is deposited and pressed in a thermoplastic layer of synthetic material 4 in a melting flow, selectively, the following material:

Polyvinylchloride, polyurethane or ethylene/vinylacetate-copolymer. The first ones have a somewhat higher melting range (about 190° to 220° C), the latter is somewhat lower (about 90° to 100° C).

The glue cover on the under side comprises a mixture of two different melting glue materials, of which one is composed such that it has at room temperature a good adhesion (pressure-sensitive hot-melt adhesive). It is applied by a roller transmission process, from a melt of 130° to 150° C, in a striplike manner to the entire underside of the covering. Its composition is as follows:

30.5 percent by weight of ethylene/vinylacetate with a melting index of about 230
30.5 percent by weight of chlorinated triphenyl
15.0 percent by weight of colophoniumester
9.0 percent by weight of filling material
14.0 percent by weight of polyisobutylene with a median molecular weight of about 15,000
1.0 percent by weight of an antiageing agent

The other melt glue material which at room temperature is only slightly glueable (hot seal glue is equal to hot-tack hot-melt adhesive) and serves for glueing of the reinforcement edge strip on the carpet step edge and which likewise as previously mentioned is applied with rolls from a melt of 130° to 150° C, however, only in the range of the carpet step-edge with the following compositions:

59 percent by weight of ethylene/vinylacetate with a melting index of about 230
19 percent by weight of chlorinated triphenyl
6 percent by weight of polyisobutylene with a median molecular weight of about 15,000
5 percent by weight of polyisobutylene with a median molecular weight of about 50,000
10 percent by weight of colophonium ester
1 percent by weight of an antiageing agent

The total distribution of the two glue types is 90 percent – 40 percent adhesive glue material and 10 percent – 60 percent hot seal glue.

The combination with an adhesive strip on the lower side still increases the usability of the floor covering material, even in a double sense, since if the two strips on top and on the bottom comprise thermoplastic material, these jointly can be softened by a single heating process by means of hot air dryer.

In accordance with the present invention any known carpet and fiber content, or known thermoplastic materials are satisfactory and to apply same integrally as a reinforcing material at an edge of the stair covering material fibers adapted to be positioned over the edge of a stair is the novelty of the present invention.

In accordance with the present invention the man of ordinary skill in the art will readily know that any satisfactory material can be used, the contribution of the present invention being in the positioning and arrangement of the reinforcing strip of thermoplastic material at a longitudinal edge of the carpet adapted to be bent over a stair edge.

The commercial form of the floor covering material, as it will go from the manufacturer, is characterized by the fact that it has an indeterminate length of material and limited width, as well as being rollable, that is, it has no angle edge which would not permit a rolling.

In this state, the material is from the fabrication point considered as finished in the sense that during the laying, no further material has to be added (glue material, nails, covering ledges, etc.). Before it however can be laid on the steps it must be cut. Here it is now particularly advantageous that a roll has a handy weight and form, since in the area of steps primarily no place is available in order to operate with the conventional application width (normal 2.3 m. or more). It is also of importance that the length storage is available in this direction, in which the individual steps run, because each step can add any not normalized lengths (the lengths meant here are identical with the widths of the steps). The cut is extremely simplified.

These advantages are only present in the commercial form. The given range for the width of the web of goods (25–50 cm.) for stairs contrasts completely with the conventional widths. A runner with 50 cm. or less, however, for steps is not conventional, rather at least 90 cm. Such widths, however, are particularly uneconomical, since the normal measure for steps (under circumstances including step height) is a clear loss for the extending width.

It is a surprising feature that the reinforcement strips applied during the production of the covering material run only along one side edge. This unsymmetric arrangement has no justification in another material.

In accordance with the present invention:

1. The reinforcement mass on the upperside is thermoplastic so that it can be softened jointly with the same heating process; and

2. The adhesive material is heat activatable, that means a maximum glue force produced by heating and pressing (merely pressure-sensitive glue layers, for example, for adhesive plasters by heating bring about no stronger binding than by cold pressure, since the glue making additions destroy the cohesion of the glue mass, so that the return setting force of the reinforced and thereby also stiffened edge would tear up the glue connection.)

Further, in accordance with the present invention:

a. The glue application on the bottom side is partly gluey (pressure-sensitive) at room temperature, thereby the pressing on after heating of the glue material application to over 60° C, preferably 70° to 110° C leads to a stronger binding than the pressing on at room temperature.

b. The glue material application on the bottom side is on part of the surface and the ratio between the covered and non-covered part of the surface is larger in the range of the reinforcement strip than in the range of the step face.

c. The glue material application is less adhesive at room temperature in the range of the reinforcement

strip than in the range of the step surface, however, is much more cohesive.

The reason for the last two features resides in the fact that on the horizontal step face only slight adhesive force is required and for this reason the pressing on at room temperature suffices, while within the range of the step edge, a strong glueing under heat activation is necessary.

With the present invention, steps have been laid in 3.5 minutes per step. In case of normal width steps 90–120 cm., four steps with lateral cheeks can be laid per hour.

In the method of rlaying steps after the strip is cut, the adhesive can be to 400° C., and pressed to the step.

While I have disclosed several embodiments of the present invention, it is to be understood that these embodiments are given by example only and not in a limiting sense.

I claim:

1. A method of laying a floor covering upon the stairs of a staircase, comprising the steps of:

a. forming a continuous textile web having a base and an exposed face;

b. depositing in a flowable state on said face along a longitudinally edge thereof a thermally softenable strip of synthetic-resin material and permitting same to harden to a non-tacky solid state at room temperature;

c. coating the underside of said base with adhesive having increased bonding strength upon heating;

d. cutting said web into individual lengths equal to the transverse width of the stairs of said staircase;

e. thermally softening said strip and simultaneously thermally activating said adhesive and bending the strip of each of said length around an edge of the respective stair while applying the respective adhesive as activated upon the thermal softening of the respective strip against a stair surface to bond the individual length to the respective stair.

2. A floor-covering material for individual stairs of a staircase consisting of a continuous length of a textile web having a base and an exposed face; a strip of thermally softenable synthetic-resin material deposited along a longitudinal edge of said web and bonded to said face, said strip being in a solid non-tacky state at room temperature; and an adhesive coated onto the underside of said base at least in the region of said strip and thermally activatable concurrently with said thermal softening of said strip to increase the adhesive bond of said covering to surfaces of a stair upon the softening of said strip to conform to a stair edge.

3. The floor covering material defined in claim **2** in an L-shaped profile with said strip bent substantially through a right angle.

4. The floor-covering material defined in claim **2** wherein said strip is provided in transversely spaced substantially parallel zones.

5. The floor-covering material defined in claim **4** wherein said zones are of undulating configuration.

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