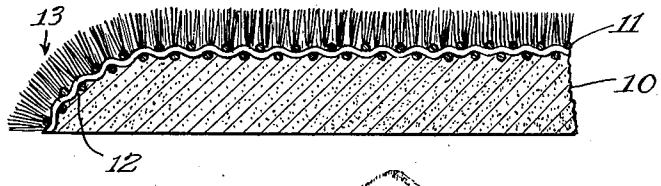
Oct. 8, 1940. T. H. ROTH ET AL 2,217,137

METHOD OF MAKING FLOOR COVERINGS, TABLE COVERINGS, AND THE LIKE

Filed June 3, 1938

Fig. 1.



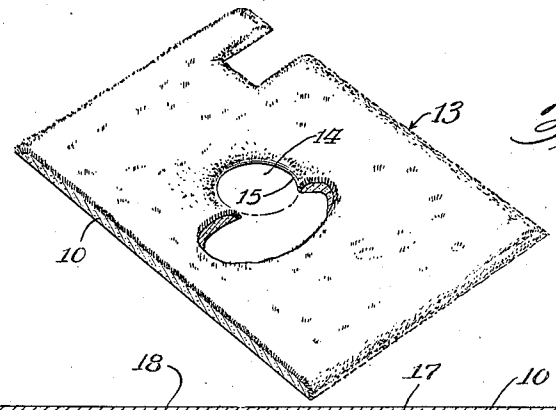
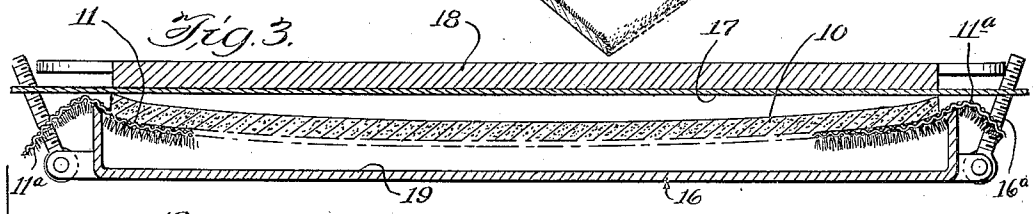


Fig. 2.

Fig. 3.



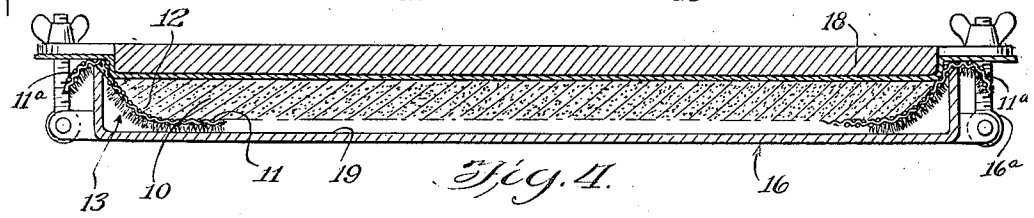


Fig. 4.

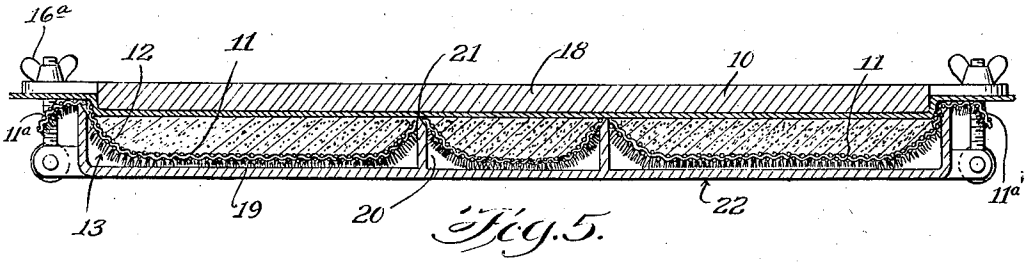


Fig. 5.

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METHOD OF MAKING FLOOR COVERINGS, TABLE COVERINGS, AND THE LIKE

Thomas H. Roth and Theodore D. Hinchcliffe, Chicago, Ill.

Application June 3, 1938, Serial No. 211,624

2 Claims. (Cl. 18—59)

This invention relates to improvements in method of making floor coverings, table coverings and the like.

At present all floor coverings particularly those made of deep pile fabric alone, or in combination with a resilient backing have substantially squared edges which present a hazardous condition to the user due to the danger of tripping over said edges. Generally, the condition is aggravated with use because the edges tend to curl up from continuous contact with the toes of the users. Also the wearing out of the floor covering is more pronounced at the edges and the unsightly picture of frayed or ravelled edges is highly undesirable.

In accordance with the present invention we eliminate the above mentioned objectionable features by providing a floor covering which has bevelled edges and which will not become frayed or ravelled when worn out.

One of the objects of this invention is to provide a mat having a fabric surface and a resilient backing support.

Another object is to provide a mat having preformed bevelled edges.

Another object is to provide a floor covering having bevelled edges and corners designed to eliminate the hazard of tripping thereover.

Still another object is to provide a resilient waterproof covering which has high insulating qualities.

A further object is to provide a floor covering which lies firmly on the floor and which adheres to the surface thereof, thereby eliminating the hazard and inconvenience of its slipping over the floor.

A further object is to provide a method of securing a fabric surface to a sponge rubber backing without the use of any intermediate adhesive material.

Another object is to provide a floor covering which is readily adapted for use as a vehicle floor mat and which will not fray at the edges when cut or worn through.

Other objects and advantages of this invention will become apparent when read in connection with the accompanying drawing.

Fig. 1 is a fragmentary cross sectional view of my improved floor covering provided with a bevelled edge.

Fig. 2 is a perspective view of an automobile floor mat partly in section showing the application of the bevelled edge to cut out portions of the mat.

Fig. 3 is a cross sectional view showing the arrangement of the materials in the mold prior to the formation of the bevelled edge.

Fig. 4 is a similar view of same after the vulcanization process has been completed.

Fig. 5 is a cross sectional view showing manner of forming bevelled edges surrounding cut out portions.

Referring to Fig. 1 our invention comprises a lower layer of sponge rubber 10, of a composition to be hereinafter described, and a surface layer of fabric 11 inseparably secured to said lower layer of sponge rubber. The surface layer can be either pile fabric, mesh fabric, fibre hair material or any such suitable material. The layer of sponge rubber is preformed with bevelled edges 12 as illustrated and the fabric surface is inseparably secured thereto with the edges of the fabric overlying the preformed bevelled edges 12 to form therewith a bevelled edge surface 13.

In the construction shown in Fig. 2 we provide a floor covering having a cut out portion 14 with the edges adjacent the cutout portion preformed with a bevelled edge 15. This covering in all other respects is similar to that shown in Fig. 1. The cutout portion 14 is adapted to fit snugly around protuberances and projections which rise from the floor, as for example the steering column or pedals of an automobile. The design of the bevelled edge as well as the manner in which the fabric surface is secured to the rubber backing eliminate the fraying and ravelling of the fabric at those points, thereby maintaining at all times a very neat appearance.

The sponge rubber layer 10 is made with the following constituents. All of the proportions are given by weight.

Example 1

	Parts by weight
Latex crepe	960
Zinc oxide	27
Asbestos fibre	354
Stearic acid	36
Sodium bicarbonate	162
Petrolatum	36
Sulphur	36
Cork flour	96
"Tuads"	1
"Asbestol"	96

Example 2

	Parts by weight
Latex crepe	960
Zinc oxide	27
Whiting (slaked lime)	450
Stearic acid	36
Sodium bicarbonate	162
Petrolatum	36
Sulphur	36
"Tuads"	1

The term "Tuads" is the trade name of a product which is used as an ultra accelerator. It is an oxidized combination product of dimethylamine and carbon disulphide. "Asbestol" is the trade name of a filler which is composed

of fibrous talc, calcium oxide, magnesium oxide and silica.

In the manufacture of the rubber backing 10, all of the ingredients indicated above in either Example 1 or 2, in the proportions as shown, are mixed for about one-half hour in a mill commonly used in the rubber industry. As a result of this processing the milling causes a substantial rise in temperature of the mix and while still in that condition it is run through a calendar wherein it is rolled in sheet form to a desired thickness and wdth. As it comes from the calender the rubber sheet is non-porous and does not as yet have the characteristics of sponge rubber.

The method of preforming the bevelled edges and vulcanizing the fabric to the rubber will now be described. Referring to Fig. 3, the fabric 11 is placed across the mold 16 face down and extends over the edges of the mold on all sides as at 11*a*. The internal depth of the mold is substantially the same as the desired thickness of the finished product. A layer of the above mentioned rubber sheeting 10 of a size equal to the internal dimensions of the mold 16 is then placed over the fabric 11 contiguous to the underside of said fabric and is covered with a liner 17 which is either duck or canvas material treated with sodium silicate to minimize the adherence of the rubber to the liner. The liner 17 similarly to the fabric 11, extends beyond the edges of the mold 16 and together they are stretched tightly, manually or otherwise, across the top thereof. The rigid mold cover 18 which is adapted to fit within the mold 16 is next placed over the liner 17 and secured in position by suitable locking means 16*a*.

The mold is then placed in a vulcanizer, of a type commonly used in the manufacture of rubber, and is subjected to a temperature of 287° F. for about 12 minutes. During this operation the stearic acid of the rubber composition reacts with the sodium bicarbonate of the rubber compound and a blowing action results which causes the rubber sheet 10 to expand approximately to about three times its original volume, as shown in Fig. 4. Since the mold cover 18 is rigid and is securely fixed, the expansion of the rubber sheet 10 can be only in a direction away from the mold cover or rather towards the fabric 11 which must of a consequence yield, to some extent, to the pressure of the expanding rubber. It will be seen that the internal pressure of the expanding rubber forces the rubber into the pores of the fabric 11 thereby causing an inseparable union of the fabric and the rubber sheet.

The fabric 11 which is stretched across the mold in effect describes a catenary curve. The expansion of the rubber 10 tends to stretch the fabric and also to increase the depth of the curve. This expansion however, is limited by the bottom 19 of the mold which is perfectly flat and thus imparts a perfectly flat surface to the article generally. It will be seen that the squared edge design of the mold permits the fabric at the edge portion to describe a sloping curve of a highly desirable shape. In the expansion process the rubber conforms to the contour of said curve and consequently forms a bevelled edge.

When the article has cooled sufficiently, the liner 17 is stripped from the rubber backing 10 and the excess fabric is trimmed off.

In automobile floor coverings and the like, wherein cut out portions are required, a bevelled edge defining such cut out portions is highly desirable. Fraying of the fabric is thus completely eliminated and a neater appearance is presented. Such bevelled edges are formed by affixing to the base of the mold Fig. 4 a die 20, which conforms to the size and shape of a desired cut out portion and which is of the same height as that of the mold 22. The fabric 11 is placed over the mold in the same manner as that shown in Fig. 3. The upstanding die causes the fabric to describe a catenary curve between the edges of the die and the edges of the mold. The rubber layer is then put in place and the process described with respect to that of Fig. 3 is followed. The top portion of the die is provided with a sharp edge 21 which is sufficiently keen to cut through the fabric and rubber sheeting and in effect stamp out the portion desired to be cut out. In this manner a mat or floor covering having desired cut out portions with bevelled edges adjacent the cut out portions can be produced in one operation without further processing or trimming.

It will be understood that this invention is not limited to floor coverings but finds application as table mats, seat covers and the like and that changes may be made in form and construction without departing from the spirit of the invention or the scope of subjoined claims.

We claim:

1. The method of producing cut-outs in coverings of the class described which comprises providing a die having cutting edges within a mold, placing a layer of imperforate fabric over said cutting die in the mold so that said fabric is in engagement with the edges of said die, placing a layer of processed rubber composition capable of expansion on heating over said fabric layer, covering said composition with a mold cover so as to urge said layers against said mold and die, and heating said mold and contents whereby the expansion of the composition forces the fabric and composition against the cutting die to simultaneously cut out the desired portion, shape and unite the fabric and rubber.

2. The method of producing cut-outs defined by bevelled edges which comprises providing a mold having substantially the same depth as the desired height of the finished article and having a die provided with cutting edges thereon, placing a layer of imperforate fabric over said mold so that said fabric is in engagement with the cutting edges of said die, placing a layer of processed rubber composition capable of expansion upon heating contiguous to said fabric layer, covering said composition with a rigid mold cover so as to urge said layers against said die, and heating said mold and contents to cause said composition to expand to conform to the contour of said fabric layer and simultaneously to unite said layers and cut out the desired portion.

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