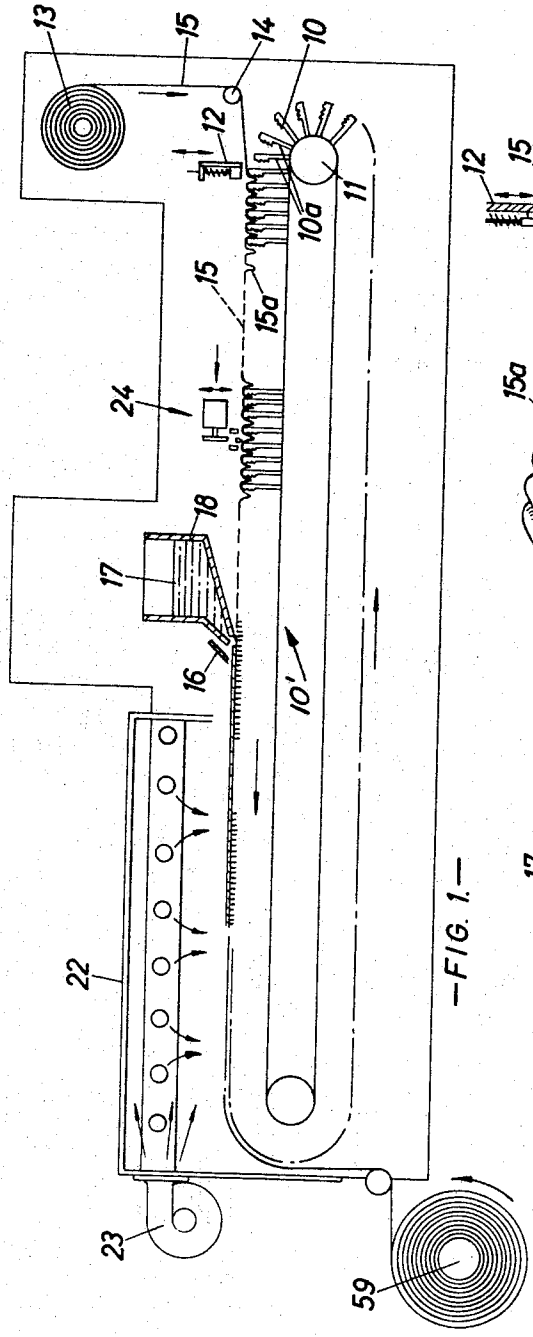
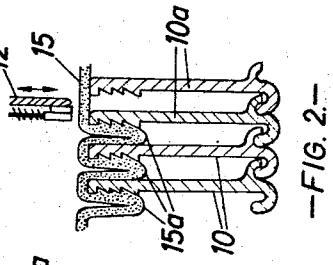
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FLOOR COVERINGS

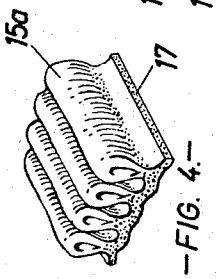
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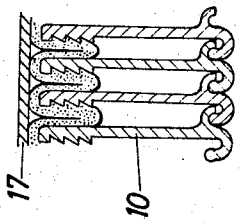
—FIG. 1.—



—FIG. 2.—



—FIG. 4.—



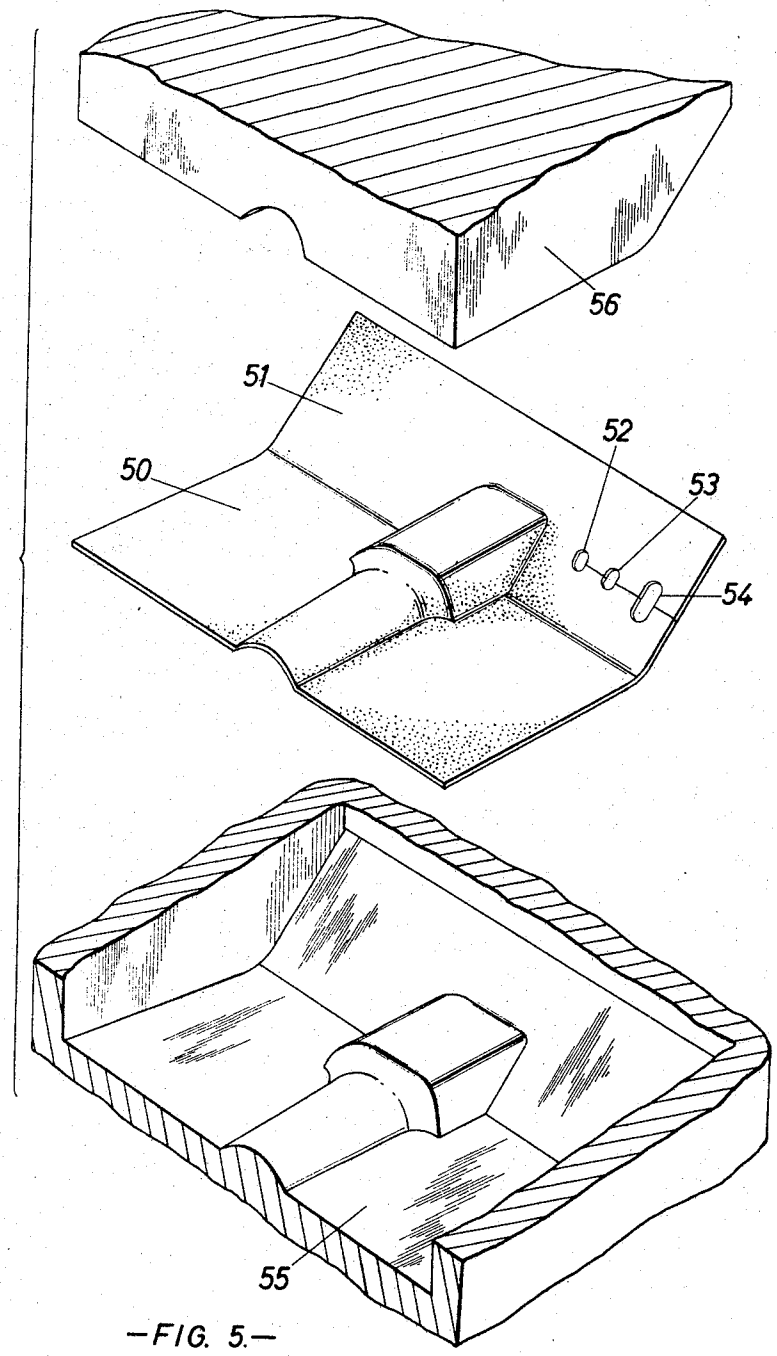
—FIG. 3.—

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FLOOR COVERINGS

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—FIG. 5.—

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FLOOR COVERINGS

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Filed July 3, 1961, Ser. No. 121,591
1 Claim. (Cl. 156—72)

This invention concerns floor coverings and has a particular application to floor covering fabrics.

The fitting of floor coverings to plane surfaces is a relatively simple matter but, in recent years, it has become an increasing practice to provide floor fitting for three dimensionally shaped surfaces and it has been necessary, when providing such coverings, to fabricate the covering by using separate covering elements.

In, for example, the provision of floor coverings for motor vehicles, it is usual to provide separate carpet elements to cover various areas of the floor, so as to provide for covering over contours, wells, transmission tunnels, or other deviations from the main plane floor surface. Alternatively shaped floor covering elements are produced by fabrication, i.e. by cutting and rejoining approximately shaped sheets of carpeting. This, of course, is both expensive and tedious.

One object of the present invention is to provide a one piece floor covering for contoured or other shaped regular or irregular floor shapes.

Another object is to provide a floor covering fabric which can be moulded or otherwise formed to cover a contoured or other shaped regular or irregular floor shape.

According to the present invention, a floor covering for contoured or other shaped regular or irregular floor shapes comprises tufting filaments and a corrugated fibrous web or other pile material provided with a backing material consisting solely of a synthetic plastic, latex or the like, the covering being formed or moulded in one piece to conform substantially with the floor space to be covered.

The tufting filaments are preferably constituted by a fibrous web formed as a lap of loose fibres or like fibrous mass which is bunched or otherwise treated to form it into a plurality of ribs disposed side by side.

The covering is preferably moulded or formed to the desired configuration after the tufting filaments have been backed by the backing material, which preferably comprises a thermoplastic or thermosetting material.

Where the fabric backing is a synthetic thermoplastic material, the forming or moulding is preferably carried out under heat treatment (i.e. by applying heat and pressure in a closed mould or by vacuum forming at an elevated temperature).

One particular form of fabric in accordance with this invention comprises a fibrous web, a carded lap of loose fibres or like fibrous mass, which is bunched or otherwise treated to form it into a plurality of ribs disposed side by side and which is provided on one side with a layer or coating of a plastic, latex or other suitable adhesive which serves to bond the fibres together, the fibre ribs constituting the pile of the fabric and the plastic constituting a backing thereof.

The fabrics aforesaid may be characterised in that the lap is folded or bunched to a regular wave form, the crests of the waves constituting the ribs and the troughs being connected by the backing, and, if desired, the ribs may be cut to produce a cut pile fabric.

The fabrics aforesaid may advantageously be produced using apparatus comprising a plurality of adjacent tufting bars (which may form part of an endless belt or conveyor or may be provided upon the periphery of a large diameter drum) to which a fibrous web, a carded lap of loose fibres or other suitable fibrous mass, is fed, a presser

bar or other suitable means being provided for pressing the fibres into the slots between adjacent tufting bars so as to bunch the fibrous mass into a wave form, means being provided for applying a coating of bonding material to the fibrous mass whilst still on the tufting bars, and curing this material to produce the finished fabric.

Accordingly, the invention further provides a method of making a pile fabric which comprises forming or bunching a fibrous web, a carded lap or other suitable fibrous mass to form it into a plurality of ribs disposed side by side, applying a layer or coating of plastic, latex, or other suitable adhesive or bonding agent to one side of the ribbed fibrous mass, and curing the adhesive or bonding agent.

The fibrous web, carded lap or other fibrous mass may be composed of natural or synthetic fibres, or a mixture thereof.

The invention will be described further by way of example with reference to the accompanying drawings in which:

FIG. 1 is a diagrammatic side elevation of a form of apparatus suitable for producing pile fabric of the type described;

FIGS. 2 and 3 are fragmentary cross-sectional side elevations illustrating two stages in the production of the fabric;

FIG. 4 is a fragmentary view showing pile fabric produced using the aforesaid apparatus; and

FIG. 5 is an exploded perspective view of a mould for producing three dimensional floor coverings in accordance with the invention and illustrating a finished article.

The machine illustrated comprises a plurality of blades **10** swingably connected together laterally (see FIGS. 1, 2 and 3) and mounted in belt-like manner on rollers **11** of small diameter. A vertically reciprocable presser bar **12** is mounted above one roller **11** and is adapted to move downwards to press a fibrous web or carded web of textile fibres **15** passing from a feed-off roll **13** around a feed roller **14** to the blades **10** between a pair of the blades **10***a*, **10***a* (see FIGS. 1 and 4) which is just passing to the upper run of the belt, such blades **10***a*, **10***a* being separated slightly by the curvature of the roller **11**.

Behind the presser bar **12** and above the upper run of the belt is a doctor blade **16** adapted to spread a vulcanizable plastic **17** applied to the upper surface of the fibrous web **15** from a supply tank **18**, and behind such doctor blade **16** is a heating hood **22** which is adapted to supply heated air from a blower **23** so as to heat the plastic **17** and cause the latter to form a bond between the fibres of the web **15** and a backing for the finished fabric.

A mechanism (not shown) is also provided for progressing the belt of blades **10***a* intermittently, a blade pitch at a time, so that the fibrous web **15** is progressed with the band, the presser bar **12** being synchronised with the band in such a manner that it moves downwards and then upwards each time the band becomes stationary to press the part of the web **15** which is just leading onto the band down between the adjacent pair of blades **10***a*. The arrangement, therefore, serves to produce a series of fibrous ribs **15***a* between each adjacent pair of blades **10**.

There may be, between the presser bar **12** and the supply tank **18**, a horizontally disposed cutting device **24** which serves to enter between adjacent pairs of blades **10** and to sever the ribs **15***a*.

In operation, the conveyor, generally indicated by **10'**, is progressed intermittently and the fibrous web is fed thereto beneath the presser bar **12** which reciprocates vertically each time the conveyor becomes stationary to press that part of the web **15** which is disposed immediately below it into the slot between two adjacent tufting blades **10***a*. Thus, as the conveyor progresses, the web is bunched or corrugated by being pushed into the slots of

the conveyor, so as to take up a ribbed or wave form, being held in this condition by the tufting blades.

As the fabric is progressed under the supply device **18** a layer of coating of latex **17** is applied thereto, this being spread by the doctor **16** and subsequently cured by passing through the curing chamber **22**. The fabric emerging from the chamber **22** is stripped from the conveyor and rolled onto a take-up reel **59**. The finished fabric comprises a fibrous pile which is ribbed, and which is anchored to a backing constituted by the cured latex, as is shown in FIG. 4. If the cutting device **24** is operated during production of the fabric, the ribs thereof will, of course, be cut to provide a cut-pile fabric.

The finished floor covering illustrated in FIG. 5 is specially adapted and contoured to cover the front floor of a motor car i.e. that section extending from the front seats forward. This section is formed in two planes, a substantially horizontal plane **50** and an inclined portion **51** which is slotted at **52**, **53** and **54** to allow the foot controls of the vehicle to pass therethrough. The fabric is also contoured along its longitudinal centre line to snugly encase the gear box, and transmission tunnel housing. In the past, as stated, it has been necessary to fabricate such floor coverings by cutting and rejoining appropriately shaped sheets of fabric.

By using the fabric of the present invention, it is possible to manufacture a fabric shaped in three dimensions, as for example, the fabric **50**, **51** in one piece. The backing of the fabric in this example is a thermoplastic material, a suitably dimensioned flat piece being cut directly from the material issuing from the curing chamber **22** and subjected to heat treatment in mould **55** having a press plate **56**. During this process the backing is brought to a plastic state and adopts the contours of the mould **55**, whereby the mould **55** is then cooled, allowing the backing to set and thereby, the fabric takes the contours of the mould **55** as its natural state.

The invention is not confined to the precise details of the foregoing example, and variations may be made thereto. For instance, the fabric can be made using apparatus other than that described.

Any suitable form of fibrous web can be used, this being of natural or synthetic fibres, for instance a carded wool or cotton lap and it will be obvious that adhesives other than latex can be employed.

I claim:

A method of manufacturing a contoured one-piece pile surface floor covering comprising the steps of, corrugating a fibrous web to form a pile material comprised of a plurality of side-by-side ribs, applying a mouldable thermoplastic material to a backing surface of the corrugated web, heating to cause complete curing of the mouldable material for the forming of a coherent laminate, transferring the coherent laminate to a heated vacuum-forming mold and heating the coherent laminate to convert the mouldable thermoplastic material to a plastic condition, vacuum forming the laminate and allowing it to set in the desired moulded shape to form a contoured pile surfaced floor covering.

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