

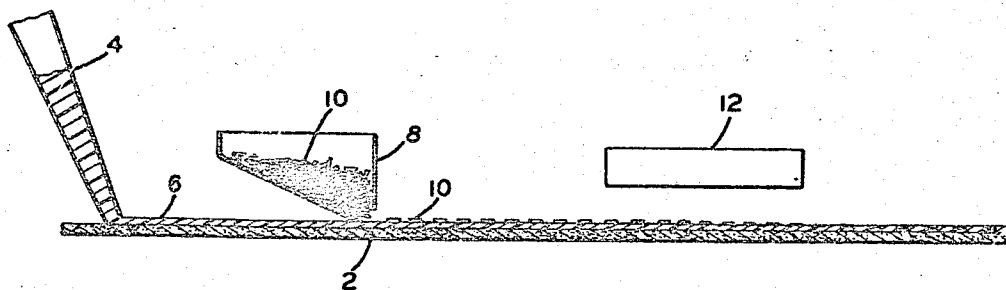
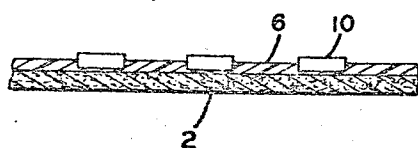
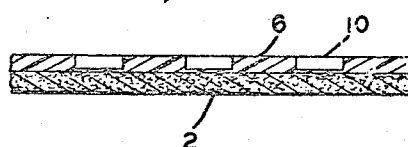
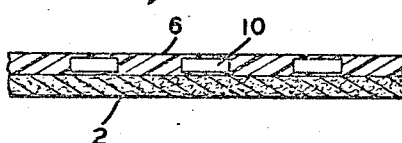
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3,682,741

METHOD OF PREPARING DECORATIVE SURFACE COVERINGS

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Fig. 1*Fig. 2**Fig. 3**Fig. 4*

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1

2

3,682,741

METHOD OF PREPARING DECORATIVE SURFACE COVERINGS

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3 Claims

ABSTRACT OF THE DISCLOSURE

A method of producing a floor covering or the like having different degrees of texture on the floor covering surface. The method consists of placing a plastisol layer on a backing sheet. Various size chips are then deposited on the surface of the plastisol. Upon heating, the chips rapidly sink into the plastisol layer to a point where the top surface of the plastisol is approximately level with the top surface of the chips. Different degrees of surface texture are produced by regulating the thickness of the plastisol layer and the volume of chips placed thereon.

BACKGROUND OF THE INVENTION

Field of the invention

The invention relates to flexible, composite surface coverings and particularly to plastic surface coverings having a wear layer containing decorative chips and particularly to processes for preparing such surface coverings.

Description of the prior art

Many prior art processes exist for the purpose of placing chips in design configuration with a plastisol being used as a grout or background for the chips. The most common method is the adhering of the chips to the backing and utilizing the plastisol as a grouting to fill in the area between chips.

Another technique is shown in Pat. No. 3,265,548, wherein chips are placed upon a plastisol coating, and the weight of the granules or chips will cause them to sink into the coating. The viscosity of the coating is varied to get the chips only partially submerged in the coating. Normally, the chips are forced into the coating by planishing.

The process herein is an improvement over the above technique in that it provides a manner in which there can be controlled submerging of the chips into the plastisol to provide either an embossed effect with the chips only partially submerged, a flat sheet with the chips submerged even with the level of the plastisol or a flat sheet with the chips submerged below the surface of the plastisol.

SUMMARY OF THE INVENTION

The invention comprises the placing of a plastisol layer upon a backing sheet. Chips of various sizes are then deposited in a controlled manner upon the surface of the plastisol. There is maintained a relationship of the volume of chips to the volume of plastisol or a relationship of the weight of chips per square yard to the weight of the plastisol per square yard so that, depending upon the relationship maintained, the chips will partially or completely submerge within the plastisol to provide an embossed sheet or flat sheet. The chips will remain initially on the surface. Upon heating, the chips rapidly sink into the plastisol until such time as their sinking action is terminated by the backing material which will prevent their further downward movement into the plastisol.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a schematic representation which represents the manner of forming the sheet material;

FIG. 2 is a cross-sectional view of one embodiment of the invention;

FIG. 3 is a cross-sectional view of another embodiment of the invention; and

FIG. 4 is a cross-sectional view of another embodiment of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings, a web of backing material 2 is fed past a nozzle structure 4 which deposits a layer of plastisol 6 on the web. The dispensing apparatus 4 can be a simple nozzle dispenser or can be a roll coater or other similar structure.

A hopper 8 distributes uniformly the chips 10 on the upper surface of the plastisol layer. The chip dispensing apparatus can be of the type shown in Pat. No. 3,265,548 or could be a stencil type of dispenser which places the chips on the plastisol in a prearranged pattern. The chip plastisol layer structure then passes under a heating means 12 which causes the chips to rapidly sink in the plastisol. Planishing could also be used to force the chips into the plastisol layer. Further the chips could be allowed to sink in the plastisol by allowing the chip plastisol mass to sit a relatively long time at room temperature. Obviously, in each case the chips would settle down into close proximity with the backing material. When heating is used, the plastisol viscosity lessens and the chips sink into the plastisol layer until their proximity into the plastisol is terminated by the chips coming into close position to the backing. The chips may actually go down into contact with the backing, but usually a small film of plastisol acts as a barrier between the chips and the backing material.

As shown in FIG. 2, the chips may only be partially submerged in the plastisol layer and thus present an embossed appearance wherein the plastisol around the chips appears to be depressed resulting in a three-dimensional appearance for the flooring. As shown in FIG. 3, the upper surface of the chips are even with the upper surface of the plastisol. Again surface tension may affect the plastisol surface configuration. It should be noted that surface tension may affect the surface of the plastisol and cause it to be concave in the FIG. 2 structure. Wetting of the sides of the chips causes the concave effect. As shown in FIG. 4, the chips have been completely submerged in the plastisol, and the upper surface of the chip is below the upper surface of the plastisol. The above three effects are secured by regulating the relationship of the quantity of chips to the quantity of plastisol. To secure the structure of FIG. 4, some techniques such as pressing or pre-wetting may be necessary to submerge the chips within the plastisol.

In the below examples, the chips were manufactured with a .045" thickness thereby permitting the use of a relative weight relationship between the chips and the plastisol to secure the effects shown in FIGS. 2-4. If it is desired to secure an embossed effect, a two-pound quantity of chips per square yard of backing material to be covered is utilized with 1.14 pounds of grouting per square yard of backing material to be covered. This is a 0.57 ratio of pounds of plastisol to a pound of chips per square yard of backing material. This above relative weight relationship will give you a very desirable surface covering which gives the appearance of having a debossed grouting area surrounding a raised chip.

If it is desired to secure a smooth floor covering such as shown in FIG. 3, then two pounds of chips per square

3

yard of backing material are used with 1.7 pounds of plastisol per square yard of backing material. This gives a ratio of 0.85 pound of plastisol to a pound of chips. Again the chips are of a 0.045" thickness. The above quantity of plastisol gives a layer of 0.020" thickness. It will be seen that by maintaining the chip thickness constant, the weight of the chips used has a direct relationship to the total surface area that the chips will cover. Since the base of one square yard of backing material is used, it will be seen that two pounds of constant thickness chips uniformly distributed would cover a certain percentage of a square yard of backing material. Therefore, a certain volume of plastisol is needed to fill in the remaining square yard. The weight of the plastisol being directly related to its volume for the particular plastisol being used, as shown above, 1.7 pounds of plastisol will fill in all of the remaining square yard to provide a flat sheet. Less weight of plastisol will yield an embossed-type sheet. Use of a greater quantity of plastisol will yield the effects shown in FIG. 4. The structure of FIG. 3 was secured by adjusting the plastisol thickness to 0.020". This on a square yard of backing material used 1.7 pounds of plastisol. That used in conjunction with 2 pounds of chips of 0.045" thickness will yield a flat surface sheet. It should be noted that a flat surface sheet as formed above will have a slight texture because of surface tension, irregular settling, etc. A perfectly flat sheet requires a further pressing operation. However, the sheet of FIG. 3 is clearly flat relative to the sheet of FIG. 2.

Suitable backing materials include those formed of flexible resinous composition as well as sheets of woven fabric and impregnated felted fibers. Any of the thermoplastic or elastomeric resinous compositions which can be calendered or pressed to form a flexible sheet can be used to form backing sheets which can be used in the invention. As indicated in Pat. No. 3,265,543, numerous backing sheets are available in the art and could be used.

The chips are formed from a calendered sheet stock which is then broken into small chips or particles by techniques which are well known and conventional in the art. The chips may be filled, or unfilled, or even a combination of filled and unfilled chips. Obviously, other materials could be used as chips. One particular composition which may be used to form the calendered sheet stock has the following formulation, parts by weight:

Resin, polyvinyl chloride, homopolymer	100
Plasticizer, di-2-ethylhexyl phthalate	23.3
Plasticizer, epoxidized soya oil, 100% solids	4.17
Stabilizer, soaps, 2% barium, 1.1% cadmium, trace of zinc	1.25
Stabilizer, soaps, 4.7% calcium, 3% zinc	1.67
Filler, low limestone	183.75
Lubricant, stearic acid	0.42

With the above chip formulation, the following plastisol formulation has been found to be particularly effective, the formulation being given in parts by weight:

4

Resin, polyvinyl chloride, dispersion	50
Resin, polyvinyl chloride, blending	50
Plasticizer 2,2,4 trimethyl-1,3 pentanediol monoisobutyrate ester	25
Plasticizer, isobutyrate	10
Plasticizer, octyl epoxy tallate	5
Stabilizer, barium, cadmium, zinc organic compound	3
Plasticizer, polyethylene glycol monolaurate	3

As indicated above, the plastisol is flowed upon the backing and the calendered sheet stock is reduced to chips which are then deposited upon the top surface of the plastisol layer 6. Heat at about 450° F. is then applied for 1½ minutes to the mass to cause the chips to rapidly sink into the plastisol layer to provide a covering which has a cross-sectional configuration similar to that of FIGS. 2-4, the configuration depending upon the relationship of the quantity of chips to the plastisol. During the heat cycle, the plastisol will undergo a reduction of its viscosity, during which time the chips rapidly settle, a gelation of the plastisol and a fusion of the plastisol.

What is claimed is:

1. A process for producing a decorative surface covering having a continuous solid surface comprising the steps of: applying a predetermined quantity of plastisol per unit area of a backing sheet, maintaining the predetermined quantity of plastisol at a certain thickness, then distributing uniformly a predetermined quantity of chips to the upper surface of the plastisol, maintaining the supply of chips at a certain uniform chip thickness, heating the mass of chips and plastisol to change the viscosity of the plastisol and to permit the rapid settling of the chips into the plastisol, maintaining the condition of the heated mass of chips and plastisol to settle the chips into close proximity to the backing sheet, and maintaining the weight relationship of the quantity of plastisol added per unit area fixed relative to the quantity of chips added per unit area so that the chips and plastisol cover the unit area of backing material to provide a certain configuration to the upper surface of the decorative surface covering.

2. The method of claim 1 further including the step of adjusting the quantity of plastisol related to the quantity of chips to provide a textured effect floor.

3. The method of claim 1 further including the step of adjusting the quantity of plastisol related to the quantity of chips to provide a smooth surface covering with the chips below the level of the surface.

References Cited

UNITED STATES PATENTS

3,265,548	8/1966	Aarkins Jr. et al.	156-79
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