METHOD OF ORIENTING CHIPS IN THE MANUFACTURE OF FLOOR AND WALL COVERING

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This invention relates to a method of making sheet material and, more particularly, to a method of orienting design pattern elements on a backing prior to consolidation of the material into a finished product.

In the production of vinyl type floor and wall coverings in which the decorative wear surface is comprised of a plurality of small preformed pattern elements positioned on a backing in close proximity to one another with the area between adjacent pattern elements filled with a transparent plastic material, the common practice has been to place a thin layer of design elements on the backing and apply vibatory motion to the backing to orient the pattern elements with respect to one another in an arrangement in which the wear layer has only one thickness of elements touching one another at least one point on their peripheries. Since the preformed pattern elements are the thickness of the final wear layer it is essential that they be oriented so that they are not positioned on one another but are in close proximity. In order to accomplish this pattern orientation it has been common practice to move the backing through a horizontal plane at a relatively slow speed. The pattern elements are fed to the backing from a continuous belt feeder which deposits uniformly front to back. The order in which the pattern elements of the pattern sheet are fed to the backing is important. In order to avoid pattern elements disposed upon one another or relatively large gaps between adjacent pattern elements.

In order to correct this situation vibatory motion is applied to the backing after the pattern elements have been positioned thereon in order to vibrate the elements into a uniform arrangement one element thick and in close proximity to one another.

With the trend toward larger pattern elements in the production of this type of floor and wall covering, increasing difficulty has been experienced in moving the heavier, larger pattern elements with respect to one another by means of the vibrators. This is true both in those instances where the pattern elements are of irregular shape as well as those in which the pattern elements are regular shapes such as squares, etc.

The present invention is directed to a method of feeding a plurality of small symmetrical transparent vinyl particles onto the backing along with the large pattern elements so that when the material is vibrated these small symmetrical particles act as rollers or carrying means to move the larger pattern elements to aid in orienting them in close proximity to one another and also to aid in removing any pattern elements which are positioned on top of other pattern elements.

An object of this invention is to provide a method whereby conventional vibrating equipment can be used to orient larger pattern elements on a backing during the initial stages of laying up the pattern elements.

In utilizing the invention here under consideration the chips or pattern elements which form the major portion of the design are of a size having at least one dimension ranging between 1/4" and 1". The preponderance is such that over half the elements have at least one dimension between 1/2" to 3/4". The thickness of the chips or pattern elements is approximately .070". These chips are made from previously calendered sheets which are broken or cut into chips of the size desired and are mixed so that a uniform mixture of chip sizes is available throughout the entire design.

The backing to which these chips are fed has a rather rough surface. The friction coefficient of this rough surface is increased by the application of an adhesive coating. The adhesive coating, even though dry when the chips are placed thereon, is later rendered tacky by the application of heat. In order to aid in the movement of the chips a quantity of small vinyl resin particles is fed to the backing. These particles are preferably spherical in shape and of a size which will pass through a 50-mesh screen but will remain retained on a 100-mesh screen. The quantity of these small resin particles is in the range of 1% or less of the volume of chips or pattern elements. It is preferable that the small granules be transparent so that they will blend well with the resinous material later placed between the adjacent pattern elements in the final product. The resin particles may be the same as that used in the manufacture of the floor covering and the backing. The resin particles should be ground fine enough to meet the specifications referred to above.

If a filler is incorporated with the fused resin, it is of course difficult to render the particles transparent. However, in those cases where the material between pattern elements is pigmented the colored, filled resin particles could, of course, blend in with this pigmented material without any difficulty.

The pattern elements and the resin particles are fed to the backing separately to avoid segregation. It will be understood that to have uniform pattern element orientation it is necessary that the resin particles be uniformly distributed. In order to accomplish this the design elements are first fed to the backing followed by the resin particles. The order of feeding may be reversed if desired. After the resin particles and the pattern elements are on the backing the vibatory motion is applied to the backing, and the pattern elements slide or move easily on the resin particles. After the elements have been properly oriented they are heated to activate the adhesive, and the pattern elements are then pressed into the adhesive after which the resinous material is placed in the interstices between adjacent pattern elements and the entire sheet is finally consolidated into a wear layer.

While it is preferable that the pattern particles be spherical in shape, it will be understood that any very small spherical particles will aid in orienting the chips because the heavier chips will cause the fine particles to rotate regardless of whether they be spherical or not.

In carrying out the method of this invention the backing with the adhesive applied is moved along a horizontal surface over which is disposed a belt feeder which feeds a uniform layer of pattern elements onto the surface of the backing. Because of the nature of the feed it is impossible to ensure against overlapping of pattern elements or excessive space between adjacent pattern elements. The small spherical particles are then fed to the backing in such manner that they are uniformly distributed over the entire area of prepositioned pattern elements. The volume of fine particles to pattern elements is preferably 1% or less. After the fine particles are placed on the backing, the backing is vibrated and the pattern elements move over the small particles.

It will be clear from the foregoing that I have developed a method of positioning relatively large pattern elements on a backing using the conventional vibrators for this purpose.

I claim:

1. A method of orienting pattern elements on a backing in the production of sheet floor and wall covering having a decorative wear layer comprised of pattern elements which are the thickness of the final decorative layer, the steps comprising moving the backing through
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a horizontal plane, feeding a uniform layer of pattern elements to said moving backing, said pattern elements being of a thickness substantially the same as the desired thickness of the decorative wear layer, feeding a mass of small resinous particles uniformly on said backing with said pattern elements, applying a vibratory motion to said backing to cause said pattern elements to move on said small resinous particles to properly orient the pattern elements with respect to one another to form a layer of pattern elements one element thick and thereafter applying heat and pressure to said pattern elements to affix them to said backing.

2. A method of orienting pattern elements on a backing in the production of sheet floor and wall covering having a decorative wear layer comprised of pattern elements which are the thickness of the final decorative layer, the steps comprising moving the backing through a horizontal plane, feeding a uniform layer of pattern elements to said backing, said pattern elements being of a size ranging between $\frac{3}{4}$" and 1" in at least one dimension and being of a thickness substantially the same as the desired thickness of the decorative wear layer, feeding a mass of small resinous particles uniformly on said backing with said pattern elements, applying vibratory motion to said backing to cause said pattern elements to move on said small resinous particles to properly orient the pattern elements with respect to one another to form a layer of pattern elements one element thick and thereafter applying heat and pressure to said pattern elements to affix them to said backing.

References Cited

UNITED STATES PATENTS

3,012,901 12/1961 Reese 264—70 X

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