A method of packaging manufactured stones comprises placing two layers of manufactured stones in a vented container and separating the two manufactured stone layers with a separator sheet made from a spun-bond, non-woven fabric having a desired moisture vapor transmission rate.
METHOD OF PACKAGING MANUFACTURED STONE

TECHNICAL FIELD AND INDUSTRIAL APPLICABILITY OF THE INVENTION

[0001] The present invention relates generally to the field of manufactured stone veneer and more particularly to an improved method of packaging manufactured stone veneer.

BACKGROUND OF THE INVENTION

[0002] Manufactured stone veneer such as sold by Owens Coming under the Cultured Stone® trademark is a popular choice for architects, builders and homeowners seeking to add style and presence to a structure. A significant amount of water is present in manufactured stone veneer during the manufacturing process. After packaging, water is slowly evolved from the stone.

[0003] The face of the manufactured stone veneer is protected from scratching and scuffing by providing a separator sheet. Significantly, the inventor has discovered that this sheet must not trap water evolved from the stone. This is because that water contains salts which produce water spotting, mottling and efflorescence. These lead to color inconsistency and customer dissatisfaction.

[0004] The present invention relates to a method of packaging manufactured stone veneer so as to more efficiently and effectively reduce water spotting, efflorescence and mottling while also protecting the stone from scratching and scuffing.

SUMMARY OF THE INVENTION

[0005] In accordance with the purposes of the present invention as described herein, a method of packaging manufactured or synthetic stones is provided. That method comprises the steps of placing two layers of manufactured stones in a vented container and separating the two layers of manufactured stones with a separator sheet preferably made from a spun-bond, non-woven fabric having a moisture transmission rate of at least 100 grams/100 sq in/24 hours as measured by ASTM E-96. A preferred method further includes using polypropylene material for the fabric with a weight per unit area of between about 2.1 and about 0.5 ounces/yd² and more typically about 0.75 ounces/yd². In an alternative embodiment the method includes using a polyester material for the fabric.

[0006] Further the method includes using a fabric with a tensile MD of at least 58 N as per Edana ERT 20.2-89. Still further, the method may include providing a series of apertures in the separator sheet. Those apertures may have a diameter of about 0.25 inches. Additionally, the method may include providing a double layer separator sheet. The double layer separator sheet may be provided with at least one side seam so as to form a pouch for carrying the manufactured stones.

[0007] In the following description there is shown and described several different embodiments of the invention, simply by way of illustration of some of the modes best suited to carry out the invention. As it will be realized, the invention is capable of other different embodiments and its several details are capable of modification in various, obvious aspects all without departing from the invention. Accordingly, the drawings and descriptions will be regarded as illustrative in nature and not as restrictive.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The accompanying drawings incorporated in and forming a part of this specification, illustrate several aspects of the present invention, and together with the description serve to explain certain principles of the invention. In the drawings:

[0009] FIG. 1 is a perspective view of a separator sheet as used in the method of the present invention;

[0010] FIG. 2 is a partially schematical side elevational view illustrating the stacking of the manufactured stone and the use of separator sheets to protect the faces of those stones;

[0011] FIG. 3 is a perspective view of an alternative embodiment of the separator sheet; and

[0012] FIG. 4 is a side elevational view showing how the separator sheet embodiment of FIG. 3 is utilized to carry manufactured stones.

[0013] Reference will now be made in detail to the present preferred embodiments of the invention, examples of which are illustrated in the accompanying drawings.

DETAILED DESCRIPTION AND PREFERRED EMBODIMENTS OF THE INVENTION

[0014] Reference is now made to FIG. 1 illustrating a first possible embodiment of the separator sheet 10 utilized in the method of the present invention for the packaging of manufactured stones. A preferred separator sheet 10 is made from a spun-bond, non-woven fabric 12 having a moisture vapor transmission rate (MVTR) of at least 100 grams/100 sq in/24 hours as measured by the “cup method” set out in ASTM E-96. The fabric 12 may be made from an appropriate material providing the desired moisture vapor transmission rate including but not limited to polypropylene, polyester and mixtures or combinations thereof. A particularly useful fabric 12 comprises polypropylene material with a weight per unit area of between 2.1 and about 0.5 ounces/yd² and more typically about 0.75 ounces/yd². The fabric typically has a thickness of between about 5 and about 40 mils. The fibers utilized in the fabric have a denier of about 2.0. Further, the fabric 12 typically provides tensile MD of at least 58 N as per Edana ERT 20.2-89. Typically the fabric used is patternless: that is, has only random surface features. This prevents any possibility of imprinting or transferring a pattern to the face of the stone.

[0015] As illustrated in FIG. 1 the separator sheet 10 may optionally include a series of apertures 14 having a diameter of about 0.25 inches. The apertures 14 may be randomly spaced as illustrated in FIG. 1 or alternatively, spaced in any desired pattern.

[0016] In an alternative embodiment, the separator sheet 10 may comprise a construction other than the nonwoven sheet described above, provided such a sheet has the strength, non-scruffing and vapor transmission characteristics described herein. Such as sheet may optionally include apertures 14, and may comprise a film, a woven sheet, a nonwoven sheet, such as a fiberglass sheet made from a wet laid, dry laid or continuous filament process. Likewise, such a sheet may comprise natural or man-made fibers formed using physical entanglement, nonwoven needling, thermoset binders or thermoplastic fiber melt matrix technologies.
Such mats may be carded, air-laid, needlepunched, thermobonded, or formed by other processes known to one skilled in the art.

A further alternative embodiment for the separator sheet 10 is illustrated in FIGS. 3 and 4. In this alternative embodiment the separator sheet 10 comprises two separate fabric layers 16, 18. The fabric layers 16, 18 are made from a spun-bond, non-woven fabric having a moisture vapor transmission rate of at least 100 grams/100 sq in/24 hours as measured by ASTM E-96 just like the fabric layer 12 of the first embodiment. The fabric layers 16, 18 may be made from substantially any appropriate material including but not limited to polypropylene, polyester and mixtures thereof. The weight per unit area of the sheet 10 illustrated in FIG. 3 is typically between about 2.1 and about 0.5 ounces/yd² and most typically about 0.75 ounces/yd². As illustrated in FIGS. 3 and 4, the sheet 10 is doubled over to form a seamless bottom wall 20. Side seams 22, 24 are provided by means of appropriate adhesive or heat welding. Together the bottom wall 20 and side seams 22, 24 form a pouch 26 that may be used to hold and carry manufactured stones S as illustrated in FIG. 4. The open top 28 allows one to add or remove stones S from the pouch 26 as desired.

A package 30 of manufactured stones S is illustrated in FIG. 2. As illustrated the package 30 includes a pallet 32 made of wood or other appropriate material. Side walls 34 of corrugated cardboard or other appropriate material are secured to the top of the pallet 32 by staples 36 or other appropriate means. Air vent apertures 38 are provided in the side walls 34 at spaced locations to allow for the escape of moisture. Corner posts 40 of wood or other appropriate material may be provided to reinforce the side walls 34. Alternatively, the package may compromise a pallet with shrink wrap or other film, reusable plastic containers, or any other known construction, provided the overall package has adequate ventilation to expel the water.

In a preferred embodiment, a first layer of manufactured stones S₁ is stacked face up on a cardboard floor insert 42 overlying the pallet 32. A separator sheet 10 as illustrated in FIGS. 1 or 3 is then provided overlying the face of the first layer of stones S₁. A second layer of stones S₂ is then positioned face down on the separator sheet 10.

Next, a third layer of stones S₃ is positioned face up directly on the second layer of stones S₂. This is followed by placing a second separator sheet 10 over the exposed face of the third layer of stones S₃. Then a fourth layer of stones S₄ is positioned face down on the second separator sheet 10 overlying the third layer of stones S₃. This stacking procedure is followed until the package 30 is full of stones. A vented, corrugated cardboard top (not shown) may then be provided on the package 30. Alternatively, the package 30 may be shipped without a top if desired.

The separator sheets 10 of the present invention provide a number of benefits. By placing the separator sheets 10 between the faces of the stone layers S₁, S₂ and S₃, the faces are protected from scratches, scuffing and marring. Specifically, the fabric has sufficient tensile strength to resist tearing and abrasion so as to substantially prevent direct face-to-face contact between the stones of the layers S₁, S₂ and S₃.

In addition, the relatively high moisture vapor transmission rate of the sheets 10 ensures that any moisture evolved from the stones in the layers S₁-S₄ after packaging is quickly transmitted away from the stones so that it may exit from the package 30 through the vents 38 and/or the open top. Advantageously, this reduces or substantially eliminates water spotting, efflorescence and differential wetting which would otherwise contribute to a mottled appearance. As a result the stones have a more consistent color and customer appeal is enhanced.

It should be appreciated that the optional apertures 14 are beneficial in that they allow any rain or liquid water entering the package 30 to drain rapidly from the separator sheets 10 and the stones thereby protecting the appearance of the stones.

The foregoing description of the preferred embodiments of the present invention have been presented for purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to the precise form disclosed. Obvious modifications or variations are possible in light of the above teachings. The embodiments were chosen and described to provide the best illustration of the principles of the invention and its practical application to thereby enable one of ordinary skill in the art to utilize the invention in various embodiments and with various modifications as are suited to the particular use contemplated. All such modifications and variations are within the scope of the invention as determined by the appended claims when interpreted in accordance with the breadth to which they are fairly, legally and equitably entitled. The drawings and preferred embodiments do not and are not intended to limit the ordinary meaning of the claims and their fair and broad interpretation in any way.

What is claimed:
1. A method of packaging manufactured stones, comprising:
   - placing two layers of manufactured stones in a vented container, and
   - separating said two layers of manufactured stones with a separator sheet made from a spun-bond, non-woven fabric having a moisture vapor transmission rate of at least 100 grams/100 sq in/24 hours as measured by ASTM E-96.

2. The method of claim 1 including using a polypropylene material for said fabric.

3. The method of claim 1, including using a polypropylene material with a weight per unit area of between about 2.1 and about 0.5 ounces/yard² for said fabric.

4. The method of claim 1, including using a polypropylene material with a weight per unit area of about 0.75 ounces/yard² for said fabric.

5. The method of claim 1, including using a polyester material for said fabric.

6. The method of claim 1, including using a combination of polypropylene material and polyester material for said fabric.

7. The method of claim 1, including using a fabric with a tensile MD of at least 58 N as per Edana ERT 20.2-89.

8. The method of claim 1, further including providing a series of apertures in said separator sheet.

9. The method of claim 8, including using apertures having a diameter of about 0.25 inch.

10. The method of claim 1, including providing a double layer separator sheet.

11. The method of claim 10, including providing said double layer separator sheet with at least one side seam so as to form a pouch.
12. The method of claim 1, including using a patternless fabric with only random surface features.

13. A package of manufactured stones, comprising:
two layers of manufactured stones positioned in a vented container; and
a separator sheet positioned between the two layers of stones, the sheet comprising a material having a moisture vapor transmission rate of at least 100 grams/100 sq in/24 hours as measured by ASTM E-96.

14. The package of claim 13, wherein the separator sheet comprises a spun-bond, non-woven fabric.

15. The package of claim 14, wherein the separator sheet is made from a material selected from a polypropylene material, polyester material or a combination thereof.

16. The package of claim 15, wherein the sheet is made primarily from a polypropylene material having a weight per unit area of between about 2.1 and about 0.5 ounces/yd².

17. The package of claim 16, wherein the polypropylene material has a weight per unit area of about 0.75 ounces/yd².

18. The package of claim 13, wherein the separator sheet comprises a fabric with a tensile MD of at least 58 N as per Edana ERT 20.2-89.

19. The package of claim 13, further including providing a plurality of apertures in said separator sheet.

20. The package of claim 13, wherein the separator sheet comprises a double layer separator sheet with at least one side seam so as to form a pouch.

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