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(54) Title: BUILDING PRODUCT AND METHOD OF MANUFACTURE AND USE

(57) Abstract: A building product and method for manufacturing a building product made from an oriented polymer composition which can be split to provide a surface of the building product with a plurality of visible fibrils to form an aesthetic representative of real split wood.

FIG. 1B
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— with amended claims (Art. 19(1))

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What is claimed is:

1. A building product comprising a body having a length and width both greater than a thickness thereof, the body having a first outer surface bordered by the body length and width, and having a first surface area, and a second outer surface bordered by the body length and width, juxtaposed with the first outer surface thereof, and having a second surface area, the building product comprising:
   - an oriented polymer composition forming the body comprising long chain polymer strands that are aligned with the length of the body; and
   - a plurality of oriented polymer composition fibrils extending from at least one of the first or second outer surfaces on substantially the entire first or second surface area;
   - wherein the fibrils extending from the at least one of the first or second outer surfaces provide an aesthetic representative of a real wood split surface.

2. The building product of claim 1 wherein the second outer surface comprises a de-oriented surface layer.

3. The building product of claim 1 wherein the building product length is 12 inches to 48 inches (30.5 cm to 121.9 cm), the width is 2 to 12 inches (5.1 cm to 30.5 cm), and the thickness is 1/8 inch to 2 inches (0.32 cm to 5.1 cm).

4. The building product of claim 1 wherein the oriented polymer composition comprises an inorganic filler selected from magnesium hydroxide, talc or calcium carbonate.

5. The building product of claim 4 wherein the oriented polymer composition comprises polypropylene.

6. The building product of claim 1 having a density corrected flexural modulus greater than 2.4 GPa and a density of 0.5-1.0 g/cc.

7. The building product of claim 1 wherein the building product is configured to be overlaid with multiple building products to form an exterior surface of at least one of a roof or a wall.

8. The building product of claim 1 wherein the oriented polymer composition is a cavitated oriented polymer composition.
9. The building product of claim 1 wherein the oriented polymer composition further comprises a foaming agent.

10. The building product of claim 1 wherein the oriented polymer composition comprises long chain polymer strands having a predetermined degree of orientation such that when the body is split along its length to form at least one of the first or second outer surfaces, the long chain polymer strands are one of cut by the splitting to form the plurality of oriented polymer composition fibrils or lifted off the at least one of the first or second outer surface.

11. A method for manufacturing a building product comprising the steps of:

   providing a polymer composition having a softening temperature;

   drawing the polymer composition through a drawing die at a drawing temperature less than the softening temperature of the polymer composition, the polymer composition exiting the drawing die in an axial, lengthwise orientation, to form an oriented polymer composition comprising long chain polymer strands that are aligned lengthwise with the drawn oriented polymer composition;

   moving the oriented polymer composition against a splitting assembly to separate the oriented polymer composition lengthwise along a longitudinal axis of the oriented polymer composition into at least two planar portions, each planar portion comprising a split face where the oriented polymer composition is split; and

   splitting a plurality of the long chain polymer strands to form a plurality of oriented polymer composition fibrils extending from the split face of each planar portion on substantially the entire split face of each planar portion;

   wherein the fibrils extending from the split face of each planar portion provide an aesthetic representative of a real wood split surface.

12. The method of claim 11 wherein the moving step occurs one of downstream of the splitter assembly by a pulling device or upstream of the splitter assembly by a pushing device.

13. The method of claim 11 wherein the splitting assembly comprises a wedge.

14. The method of claim 13 and further comprising providing the wedge with a predetermined wedge angle to alter at least one characteristic of the fibrils formed on the surface of the oriented polymer composition during the splitting step.
15. The method of claim 13 wherein a wedge angle of the wedge is 70 degrees or less and greater than 20 degrees.

16. The method of claim 11 and further comprising a locating device adapted to alter at least one of the position of the oriented polymer composition with respect to the splitting assembly, the impingement angle of the oriented polymer composition with respect to the splitting assembly, or both.

17. The method of claim 11 and further comprising the step of one of at least partially compounding or pre-compounding a volume of inorganic filler with the polymer composition.

18. The method of claim 11 and further comprising the step of forming a plurality of concentrated filler volumes within the oriented polymer composition to form crack propagation sites within the oriented polymer composition.

19. The method of claim 11 wherein the step of drawing the oriented polymer composition through the drawing die is at a linear draw ratio greater than 4.

20. The method of claim 11 and further comprising separating the drawn oriented polymer composition into discrete portions prior to the step of splitting.

21. The method of claim 11 wherein the splitting temperature is at least 25 °C below the softening temperature of the oriented polymer composition.

22. The method of claim 11, wherein the splitting further comprises lifting a plurality of the long chain polymer strands from the split face of each planar portion.

23. The method of claim 11, further comprising cooling the drawn oriented polymer composition to a splitting temperature less than a softening temperature of the oriented polymer composition prior to the splitting step.