

CLAIMS

What is claimed is:

1. A decorative, multi-layer surfacing material comprising: a first resin-impregnated paper layer and a second resin-impregnated paper layer, and a first conductive material having a first terminus and a second terminus and capable of carrying an electric current from the first terminus to the second terminus; wherein the first conductive material is disposed on a first surface of the first resin-impregnated paper layer; wherein the first resin-impregnated paper layer and the second resin-impregnated paper layer are disposed in a stacked and compressed relationship such that the first conductive material is encapsulated between the first resin-impregnated paper layer and the second resin-impregnated paper layer; and wherein at least one of the first resin-impregnated paper layer, the second resin-impregnated paper layer or an optional additional resin-impregnated paper layer is a decorative layer.
2. The decorative, multi-layer surfacing material according to claim 1, further comprising at least one outer protective layer.
3. The decorative, multi-layer surfacing material according to claim 2, wherein the at least one outer protective layer comprises a polymer selected from the group consisting of acrylics, polyesters, melamine resins, vinyl resins, and urethanes.
4. The decorative, multi-layer surfacing material according to claim 2, wherein the at least one outer protective layer comprises a melamine resin.
5. The decorative, multi-layer surfacing material according to claim 1, wherein the decorative layer comprises a visual attribute selected from the group consisting of colorings, patterns, indicia, pictures, embedded objects, and combinations thereof.
6. The decorative, multi-layer surfacing material according to claim 1, wherein the first conductive material disposed on the first surface of the first resin-impregnated paper layer is patterned.

7. The decorative, multi-layer surfacing material according to claim 6, wherein the patterned first conductive material comprises a continuous meandering line selected from the group consisting of spirals, spirangles, sawtooth waves and combinations thereof.

8. The decorative, multi-layer surfacing material according to claim 1, further comprising an enhancement layer comprising a soft magnetic material dispersed in a thermoset resin, the enhancement layer disposed and cured between the first conductive material and one of the first and second resin impregnated layers.

9. The decorative, multi-layer surfacing material according to claim 1, further comprising a third resin-impregnated paper layer and a second conductive material having a first terminus and a second terminus and capable of carrying an electric current from the first terminus to the second terminus, wherein the second conductive material is disposed on a second surface of the first resin-impregnated paper layer, wherein the second surface is on a side of the first resin-impregnated paper layer opposite of the first surface, and wherein the first resin-impregnated paper layer and the third resin-impregnated paper layer are disposed in a stacked and compressed relationship such that the second conductive material is encapsulated between the first resin-impregnated paper layer and the third resin-impregnated paper layer.

10. The decorative, multi-layer surfacing material according to claim 9, wherein the first conductive material and the second conductive material are conductively connected through the first resin-impregnated paper layer.

11. The decorative, multi-layer surfacing material according to claim 9, further comprising an enhancement layer comprising a soft magnetic material dispersed in a thermoset resin, the enhancement layer disposed and cured between one of the first and second conductive materials and an adjacent resin impregnated layer.

12. The decorative, multi-layer surfacing material according to claim 10, further comprising a third conductive material having a first terminus and a second terminus and capable of carrying an electric current, wherein the third conductive material is disposed on a first surface of the second resin-impregnated paper layer, wherein the third conductive material is in a facing relationship with the first conductive material, wherein the resin impregnating the first and second paper layers comprises a thermoset resin, and wherein an additional layer selected from the group consisting of an interposed resin-impregnated paper layer, an enhancement layer comprising a soft magnetic material dispersed in a thermoset resin, and combinations thereof, is disposed and cured between the first conductive material and the third conductive material.

13. The decorative, multi-layer surfacing material according to claim 12, wherein the first conductive material and the third conductive material are conductively connected through the additional layer.

14. The decorative, multi-layer surfacing material according to claim 1, further comprising a first conductive protrusion and a second conductive protrusion extending from the first terminus and second terminus of the first conductive material, respectively, to two positions along a periphery of the surfacing material and configured such that an external electrical current can be supplied to one of the first and second conductive protrusion.

15. The decorative, multi-layer surfacing material according to claim 1, further comprising a circuit component disposed on the first surface of the first resin-impregnated paper layer and in conductive contact with the first conductive material.

16. The decorative, multi-layer surfacing material according to claim 1, wherein the material is a high pressure laminate.

17. A solid surface comprising the decorative, multi-layer surfacing material according to claim 1 disposed on a supporting substrate.

18. A method comprising:
(a) providing at least two sheets of resin-impregnated paper;
(b) disposing a patterned conductive material on a surface of one of the at least two sheets of resin-impregnated paper; and
(c) compressing the at least two sheets of resin-impregnated paper together with heat and pressure in a facing relationship wherein the conductive material is disposed between the at least two sheets of resin-impregnated paper.

19. The method according to claim 18, wherein at least one of the at least two sheets of resin-impregnated paper or an additional sheet of resin-impregnated paper comprises a decorative layer.

20. The method according to claim 18, wherein a second patterned conductive material is disposed on a second surface of the one of the at least two sheets of resin-impregnated paper and the first and second conductive material are conductively connected through the sheet.

21. The method according to claim 18, wherein compressing the at least two sheets of resin-impregnated paper together with heat and pressure comprises arranging the at least two sheets of resin-impregnated paper in a stacked relationship between two pressing plates, increasing the pressure on the stacked sheets between the at least two pressing plates to at least 1000 psi, raising the temperature to $\leq 140^{\circ}\text{C}$, reducing the temperature to $\leq 40^{\circ}\text{C}$ while maintaining pressure, and subsequently lowering pressure to zero gauge pressure.

22. A method of wirelessly transmitting energy, the method comprising: (i) providing a decorative, multi-layer surfacing material according to claim 1; (ii) providing electrical current to the first conductive material such that an electromagnetic field is generated in a region adjacent to the surfacing material; and (iii) placing a device configured to receive wireless energy transmission proximate to the upper surface of the surfacing material and within the electromagnetic field.