The present invention is a hardwood flooring board including a middle layer formed from a non-hardwood flooring material and a hardwood material upper layer which is secured to an upper surface of the middle layer. The middle layer forms between 45% and 75% of the overall material of the board and enables the board to be manufactured to be more dimensionally stable, i.e., wider and longer, than conventional hardwood flooring boards. Also the use of the non-hardwood material in the middle layer greatly increases the dimensional stability and long term performance of the flooring boards, while providing a genuine hardwood appearance to the floor. The board also includes a lower layer that can be formed from either a hardwood material or a non-hardwood material to function as a base for the board.
HARDWOOD FLOORING BOARD
CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority from U.S. Provisional patent application Ser. No. (to be assigned), for an Improved Hardwood Flooring Board filed on Apr. 20, 2004.

FIELD OF THE INVENTION

[0002] The present invention relates to flooring surfaces, more specifically to a flooring surface made of individual flooring boards secured to one another to form the flooring surface.

BACKGROUND OF THE INVENTION

[0003] In a large number of commercial and residential buildings, hardwood flooring surfaces are utilized to provide an aesthetically pleasing appearance to the interior of the building. In most instances, the flooring surface is formed from a number of flooring boards or planks engaged with one another to form the flooring surface. These boards are usually formed entirely of the desired hardwood, with each board being formed into the desired shape to facilitate the use of the boards to form the flooring surface.

[0004] However, while these hardwood flooring surfaces provide the desired appearance to the interior of the building, the natural characteristics of traditional solid wood flooring often create challenges during installation and can develop lower effecting the long term performance of the floor.

[0005] To reduce these problems, a number of different types of flooring boards has been developed that are formed from non-hardwood materials that give the appearance of a hardwood. While these boards are faster to install and can be less expensive, the quality of the hardwood appearance is often unsatisfactory, and long term performance is poor, as normal wear and tear can often damage the hardwood-appearing surface of the boards, exposing the non-hardwood material forming the board.

[0006] Therefore, it is desirable to develop a flooring board that is made of wood, yet is easy to install with a special profile and construction that insures long term performance. Further, the board should be able to be maintained in a manner similar to that of a hardwood surface and offer all the aesthetic features of a traditional solid wood floor.

SUMMARY OF THE INVENTION

[0007] According to a primary aspect of the present invention, an improved hardwood flooring is constructed with upper and lower layers formed of a conventional flooring material and a central or middle layer formed of an alternative non-hardwood flooring material. The board includes a hardwood layer forming the upper layer of the board to give the board the appearance of a conventional hardwood flooring surface when the boards are assembled to form the flooring surface. This enables the boards to be sanded when damaged similarly to a hardwood only board in order to maintain the hardwood appearance of the board.

[0008] However, the use of the alternative flooring material as the middle layer or core of the board greatly increases the dimensional stability of the board. In addition, the raw material cost for the non-hardwood material forming the middle layer costs less than that of the hardwood forming the upper layer. Further, the types of non-hardwood materials that can be used to form the middle layer can be chosen to enhance various properties of the board, such as the dimensional stability, longer average board length and a specially milled connection between each board that significantly minimizes any future visible contraction of each board.

[0009] Other aspects, features and advantages of the present invention will be made apparent from the following detailed description taken together with the drawing and figure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The drawings illustrate the best most currently contemplated of practicing the present invention.

[0011] In the drawings:

[0012] FIG. 1 is an isometric view of a flooring surface constructed using boards formed according to the present invention;

[0013] FIG. 2 is an isometric view of a flooring board constructed according to the present invention;

[0014] FIG. 3 is a cross-sectional view along line 3-3 of FIG. 2;

[0015] FIGS. 4A-4B are partially broken away cross-sectional views of the boards of FIG. 3 in connected and disconnected configurations; and

[0016] FIGS. 5A-5D are partially broken away cross-sectional views illustrating the connection of the boards of FIGS. 4A-4B.

DETAILED DESCRIPTION OF THE INVENTION

[0017] With reference now to the drawing figures in which like reference numerals designate like parts throughout the disclosure, a flooring surface is shown generally at 8 in FIG. 1. The surface is formed over a support surface 9, such as a concrete slab, from a number of flooring boards 10 constructed according the present invention.

[0018] Looking now at FIGS. 2-3, each board 10 is between 0.10 inches and 1.00 inches, and preferably about 0.75 inches in thickness, and includes an upper layer 12, a core or middle layer 14 and a lower layer 16. The upper layer 12 and the lower layer 16 can be attached to opposite sides of the middle layer 14 in any conventional manner, such as by using an adhesive or mechanical fasteners, in conjunction with heat and/or pressure, so as long as the upper layer 12 and bottom layer 16 are prevented from delaminating or otherwise becoming detached from the middle layer 14 during the installation and use of the boards 10.

[0019] The upper layer 12 is formed of a conventional hardwood material in order to provide the desired aesthetic appearance to the flooring surface 8 constructed using the boards 10. Any particular hardwood material can be used for upper layer 12, depending upon the desired appearance for the flooring surface 8. The upper layer 12 has a thickness of between about three (3) mm and about five (5) mm. This allows the upper layer 12 to be sanded approximately 3-5 times before the layer 12 is worn completely through. Thus,
any gouging, scratching or refinishing of the upper layer 12 can be done similarly to a conventional hardwood flooring board without exposing the middle layer 14, as occurs with the prior art engineered non-hardwood flooring. Also, due to the use of a hardwood material to form the upper layer 12, the board 10 can have a face grade from the National Oak Flooring Manufacturers Association similar to the boards formed entirely of the hardwood.

[0020] The lower layer 16 can also be formed from a hardwood material similar to the upper layer 12, or can be formed from a non-hardwood material that has certain selected properties, e.g., water resistance or rigidity, as a base for the board 10. The material forming the lower layer 16 is capable of being secured to the support surface 9 by any suitable means, such as an adhesive, when the boards 10 are attached "in flex," or a mechanical fastener, e.g., a nail or screw, to hold the boards 10 thereon to form the flooring surface 8. The lower layer 16 also has a thickness comparable to the upper layer 12, preferably between about three (3) mm and about five (5) mm.

[0021] The central layer 14 is formed of an alternative, non-hardwood flooring material that provides a stable core for the board 10. The non-hardwood material used in the middle layer 14 can be any suitable generally rigid and non-compressible material, but is preferably a material such as High Density Fiber Board, Medium Density Fiber Board, plywood, chipboard, Oriented Strand Board, a cheaper wood or wood composite material, or the like, in comparison to the materials utilized to form the upper layer 12 and the bottom layer 16. This non-hardwood material can be selected and used to form the middle layer 14 to create boards 10 that are more dimensionally stable such as by orienting the non-hardwood material in a direction perpendicular to the length of the board 10 and the grain of the hardwood forming the upper layer 12. This enables the boards 10 to be made longer and wider than conventional flooring boards which results in fewer boards 10 being required to form the flooring surface 8. Also, the non-hardwood material forming the middle layer 14 can be formed or milled very precisely prior to assembly into the board 10, which results in boards 10 with tight tolerances than can easily be engaged with one another to form the flooring surface 8.

[0022] To accomplish this, the middle layer 14 is preferably formed to have a thickness of between six (6) mm and fifteen (15) mm. Thus, the middle layer 14 forms between about 40% and about 75% of the total material of the board 10, more preferably between 45% and 65% of the total board material, and most preferably about 55% of the total board material.

[0023] In order to enable the boards 10 to be secured to one another to form the flooring surface 8, the central layer 14 also includes a tongue 18 and a groove 20 positioned on and extending along opposite sides of the board 10. The tongue 18 is preferably formed integrally with the middle layer 14, but may be formed of a separate, more rigid or more flexible material that is secured to the board 10, if desired. The tongue 18 can have any suitable shape but preferably has a base portion 21 extending outwardly from the middle layer 14 that has a rounded end 22 disposed opposite the middle layer 14. A notch or recess 24 is formed on one side of the base portion 21 adjacent the upper layer 12 to facilitate the engagement of the tongue 18 within the groove 20 and to allow a certain amount of expansion of the tongue 18 due to the changing moisture content of the board 10.

[0024] The groove 20 is shaped to be complimentary to the tongue 18 and preferably defines an interior space 28 slightly greater than the size of the tongue 18 to accommodate the normal expansion and contraction of the tongue 18 based on the changing moisture content of the board 10. The tongue 18 can be secured within the groove 20 simply by using a friction fit between them, or an adhesive (not shown) or other suitable means to permanently hold the tongue 18 in engagement with the groove 20. The groove 20 can be milled out of the middle layer 14 during the formation of the middle layer 14, similarly to the tongue 18.

[0025] The side of the board 10 including either the tongue 18 or the groove 20 can be formed such that the upper layer 12 extends outwardly further than the lower layer 14 to enable the boards 10 to be joined to form a surface 8 with a minimum of space between the upper layers 12 on adjacent boards 10.

[0026] In one particularly preferred embodiment shown best in FIGS. 3, 4A-4B and 5A-5D, the groove 20 includes one of a connecting rib 26 or connecting notch 28 integrally formed therein. The rib 26 or notch 28 is engageable with an opposed rib 26 or notch 28 formed on the tongue 18. The engagement of the rib 26 with the notch 28 secures the tongue 18 in engagement with the groove 20 without using any materials other than the boards 10 themselves, thus reducing the complexity of forming the surface 8 using the boards 10. To properly engage the notch 28 with the rib 26, the tongue 18 is formed with a recessed portion 30 that enables the tongue 18 and notch 28 to be inserted beneath the rib 26 and then engaged with one another to secure the boards 10 to each other as illustrated in FIGS. 5A-5D. The engagement of the rib 26 with the notch 28 maintains the positioning of the adjacent boards 10 with one another, such that the boards 10 present a continuous flooring surface 8 as the individual boards 10 take on and lose moisture due to the changing environmental conditions.

[0027] Also, in order to enable the boards 10 to be more easily attached to the support surface, the lower layer 16 may include one or more recesses 32 within which an adhesive or other fastening means to be utilized can be positioned to enable the board 10 to be positioned flush on the support surface 9 when secured to the support surface 9. In situations where mechanical fasteners (not shown) such as nails or screws are used, the fastener on occasion creates splinters when breaking through the bottom layer 16, the recesses 32 is designated to facilitate these splinters. More particularly, the recesses 32 enable the board 10, and specifically the lower layer 16, to flex under the force of the fastener being engaged with the board 10 and the support surface 9.

[0028] Various alternatives are contemplated as being within the scope of the following claims, particularly pointing out and distinctly claiming a subject matter regarded as a the invention.
1. A flooring board comprising:
   a) an upper layer formed of a first material;
   b) a middle layer formed of a non-hardwood material and
c) a lower layer formed of a third material and joined to
the middle layer opposite the upper layer.
2. The board of claim 1 wherein the first material and the
second material are each formed from a hardwood material.
3. The board of claim 2 where the first material and the
second material are formed from the same hardwood mate-
rial.
4. The board of claim 1 wherein the non-hardwood
material is selected from the group consisting of: HDF,
MDF, plywood, chipboard, OSB board and non-flooring
hardwoods.
5. The board of claim 1 wherein the middle layer further
comprises;
   a) a tongue disposed along one side of the middle layer;
   and
   b) a groove disposed opposite the tongue along the other
side of the middle layer.
6. The board of claim 5 wherein the tongue is formed with
a cross-sectional area less than that of the groove, such that
the tongue can expand within the groove.
7. The board of claim 5 further comprising a securing
means engaging the tongue within the groove.
8. The board of claim 7 wherein the securing means
comprises one of a connecting notch or a connecting rib
disposed on the tongue that is engageable with the other of
the connecting rib or connecting notch disposed within the
groove.
9. The board of claim 1 wherein the bottom layer includes
at least one recess disposed opposite the middle layer.
10. The board of claim 1 wherein the middle layer has a
thickness approximately 2-4 times the thickness of the upper
layer.
11. The board of claim 1 wherein the middle layer has a
thickness approximately 2-4 times the thickness of the bot-
tom layer.
12. The board of claim 1 wherein the upper layer and the
lower layer are joined to the middle layer by an adhesive.
13. A method of forming a hardwood floor, the method
comprising the steps of:
   a) providing a number of flooring boards each including
an upper layer formed of a hardwood material, a middle
layer formed of a non-hardwood material and affixed to
the upper layer, and a lower layer affixed to the middle
layer opposite the upper layer;
   b) placing a first flooring board on a support surface with
the lower layer positioned in contact with the support
surface;
   c) placing a second flooring board on the support surface
with the lower layer of the second board positioned in
contact with the support surface;
   e) engaging the second board with the first board; and
e) repeating steps c) and d) until the support surface is
entirely covered by the flooring boards.
14. The method of claim 13 wherein each of the number
of flooring boards includes a tongue disposed along one side
of each board and a groove disposed along the other side of
each board, and wherein the step of engaging the second
board with the first board comprises engaging one of the
tongue or groove on the second board with the other of
the tongue or groove on the first board.
15. The method of claim 14 wherein the groove in each
board includes one of a connecting rib or a connecting notch,
and the tongue on each board includes the other of the
connecting rib or the connecting notch, and the step of
engaging one of the tongue or groove on the second board
with the other of the tongue or groove on the first board
comprises engaging one of the connecting notch or the
connecting rib on the second board with the other of the
connecting notch or the connecting rib on the first board.
16. A hardwood flooring board comprising:
   a) an upper layer formed of a hardwood material;
   b) a middle layer affixed to one side of the upper layer, the
middle layer formed of a non-hardwood material; and
   c) a lower layer affixed to the middle layer opposite the
upper layer, wherein the middle layer forms between
about 45% to about 75% of the total material of the
flooring board.
17. The board of claim 16 wherein the middle layer forms
between about 50% and about 65% of the total material of the
flooring board.
18. The board of claim 17 wherein the middle layer forms
approximately 55% of the total material of the flooring
board.
19. The board of claim 16 wherein the flooring board is
between 0.10 and 1.00 inches in thickness.
20. The board of claim 16 wherein the flooring board is
approximate 0.75 inches in thickness.
21. The board of claim 16, wherein the board is adapted
to be fixed directly to a support surface.
22. The board of claim 21, wherein the lower layer
includes at least one notch extending into the lower layer
towards the middle layer.
23. The board of claim 22, wherein the at least one notch
extends longitudinally across the board.
24. The board of claim 22, wherein the lower layer
includes three notches spaced from one another.
25. The board of claim 21, wherein the board is adapted
to be fixed to the support surface by a fastener.
26. The board of claim 25 wherein the fastener is selected
from the group consisting of a nail and a screw.

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