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(54) **BREAK-AWAY MULTI-PURPOSE FLOORING TRANSITION**

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Related U.S. Application Data

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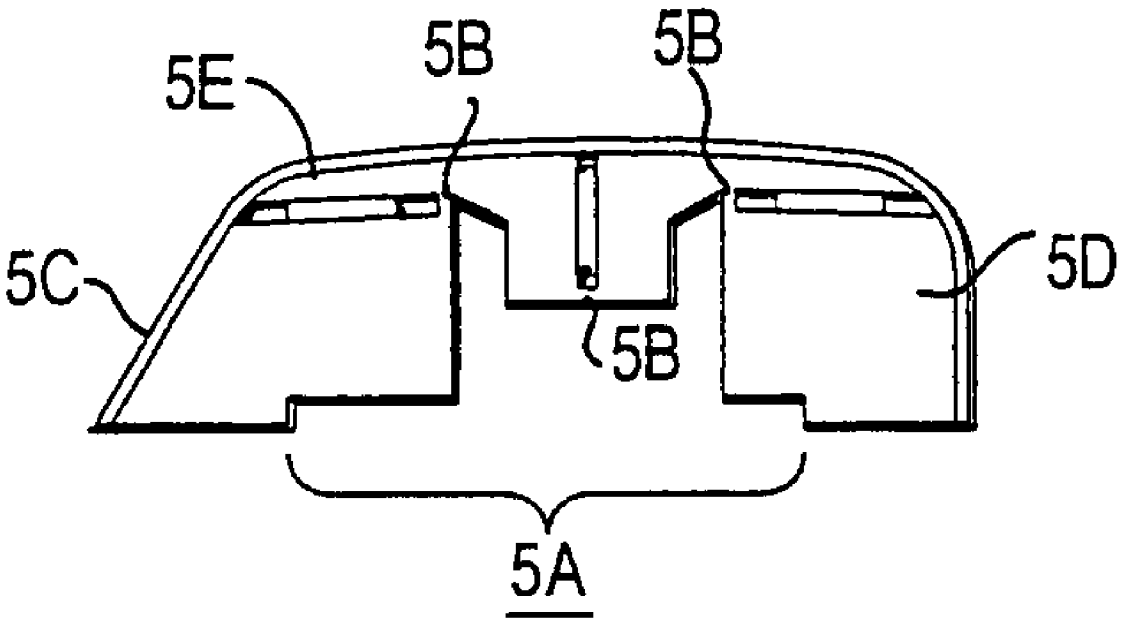
Publication Classification

(51) **Int. Cl.**
E04F 19/02 (2006.01)

(52) **U.S. Cl.** **52/465**; 29/592; 52/749.1

(57) **ABSTRACT**

The invention is a joint cover assembly for covering a gap adjacent an edge of a panel that covers a sub-surface, and a method of covering such a gap. The assembly can be manipulated to form an end molding, a T-molding, a hard surface reducer, a carpet reducer, and/or a stair nose molding. A kit can include the joint cover assembly an a tool for forming a flooring transition from a generic element having break-away sections.



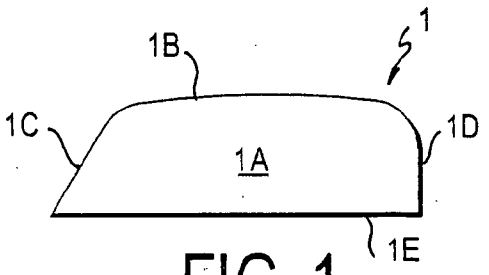


FIG. 1

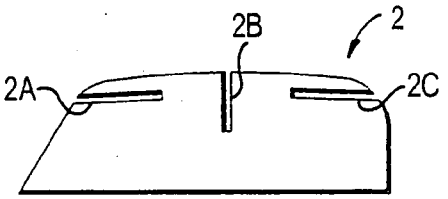


FIG. 2

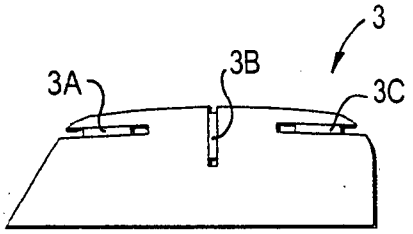


FIG. 3

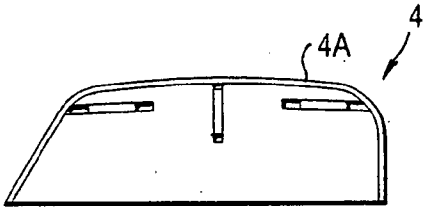


FIG. 4

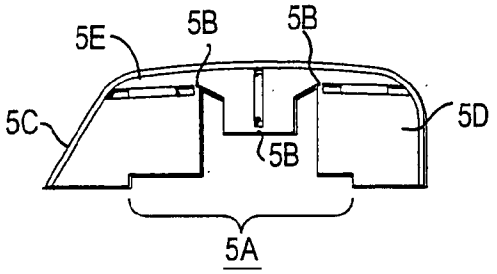
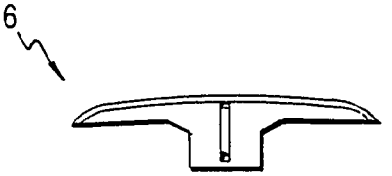


FIG. 5



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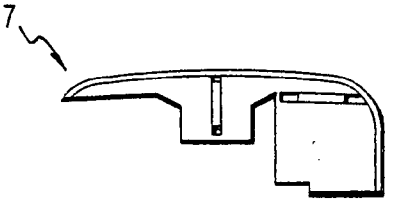

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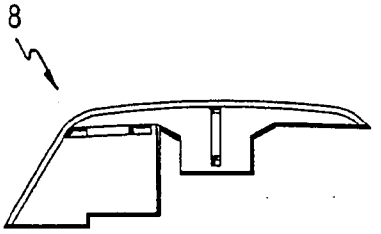

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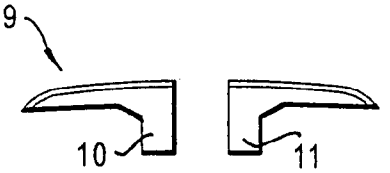

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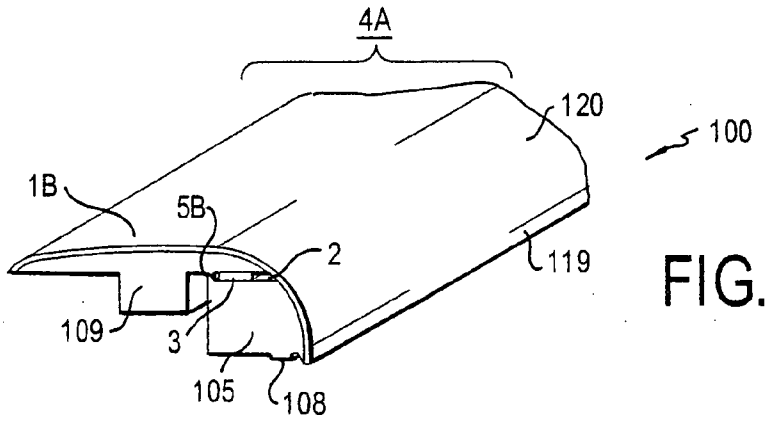

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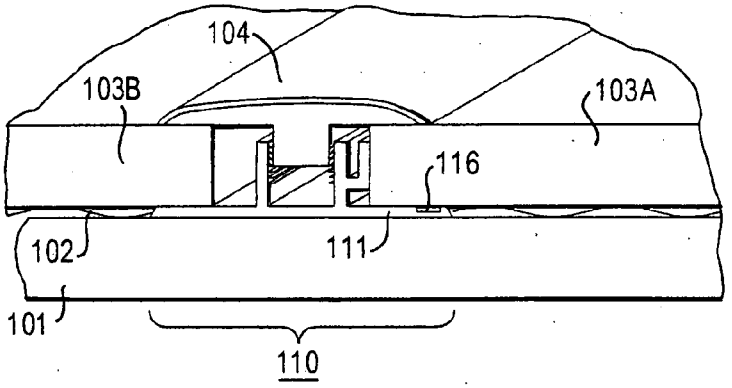

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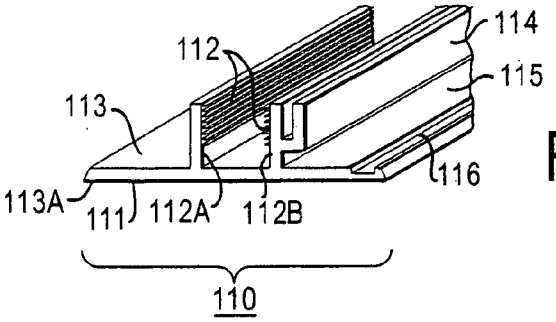

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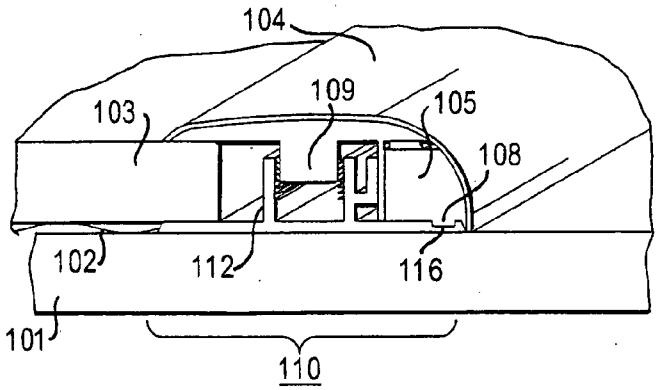

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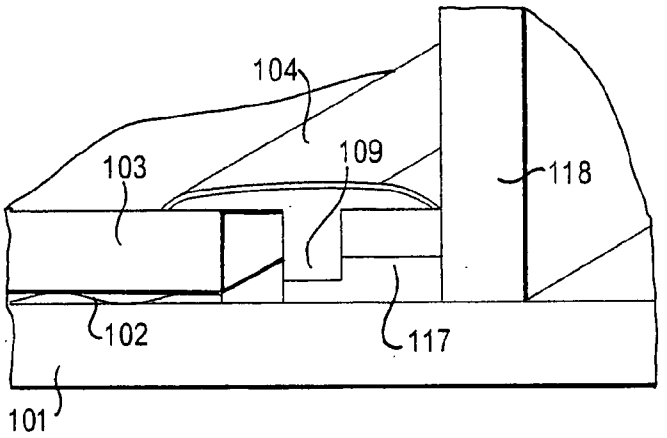


FIG. 14

FIG. 15

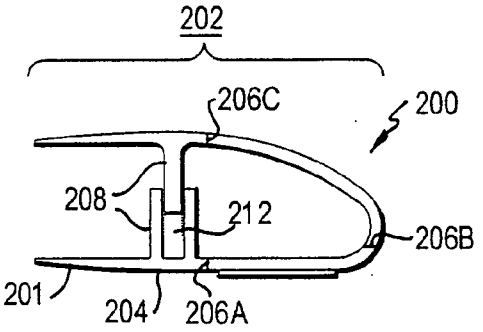


FIG. 16

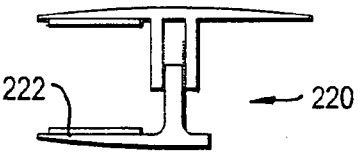
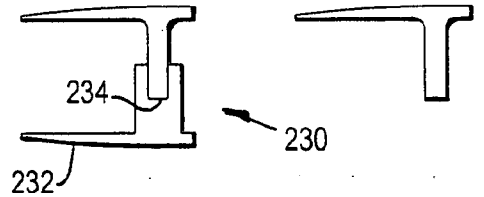


FIG. 17



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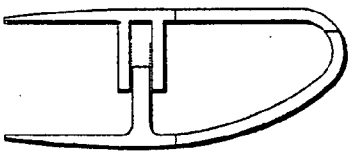

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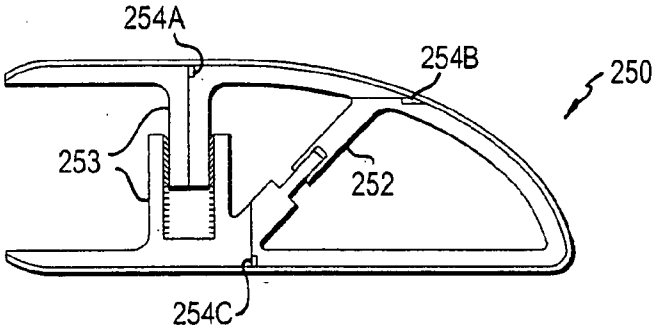
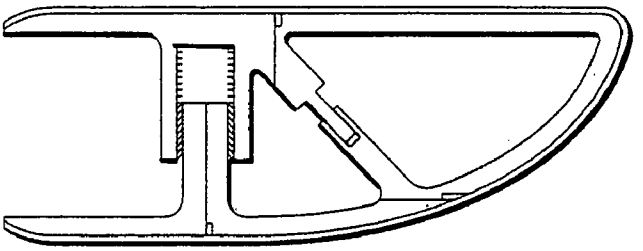


FIG. 20



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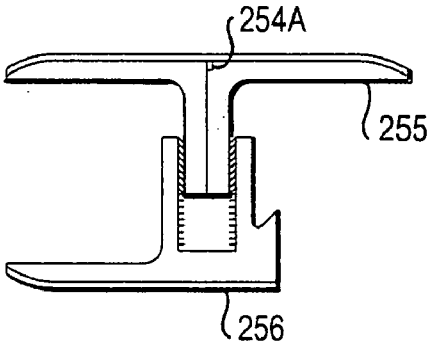
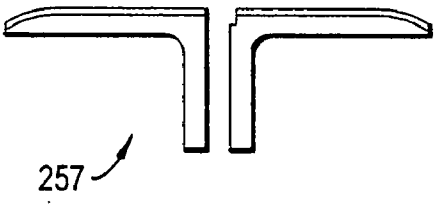


FIG. 22



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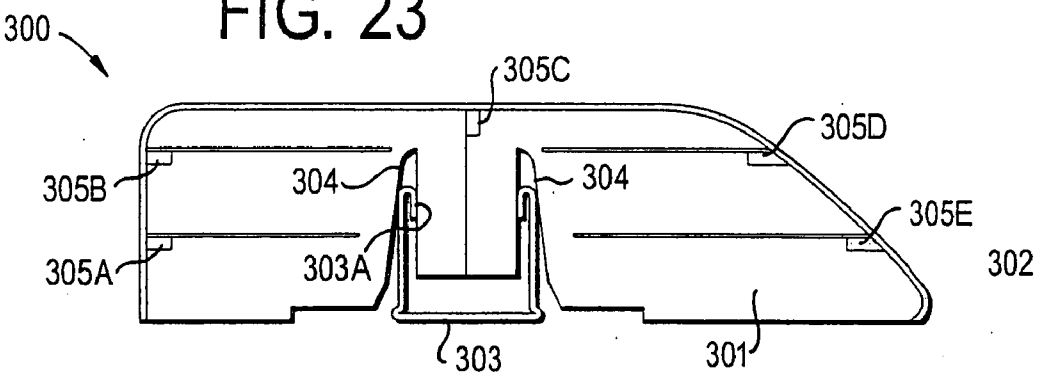

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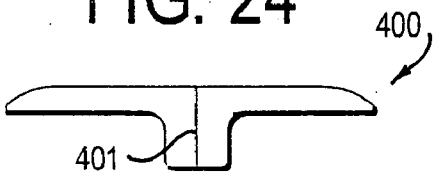

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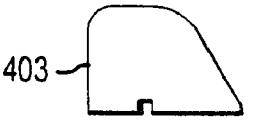

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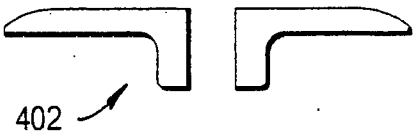

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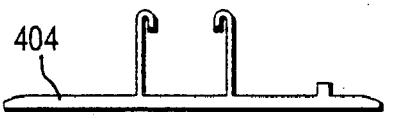

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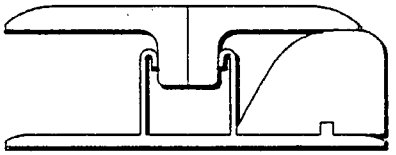


FIG. 29

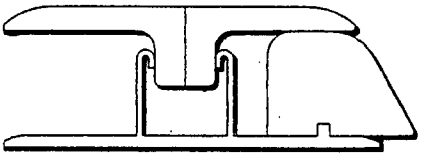


FIG. 30

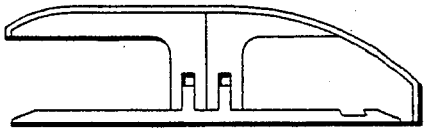


FIG. 31

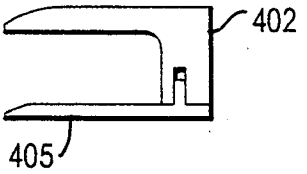
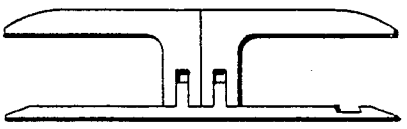


FIG. 32



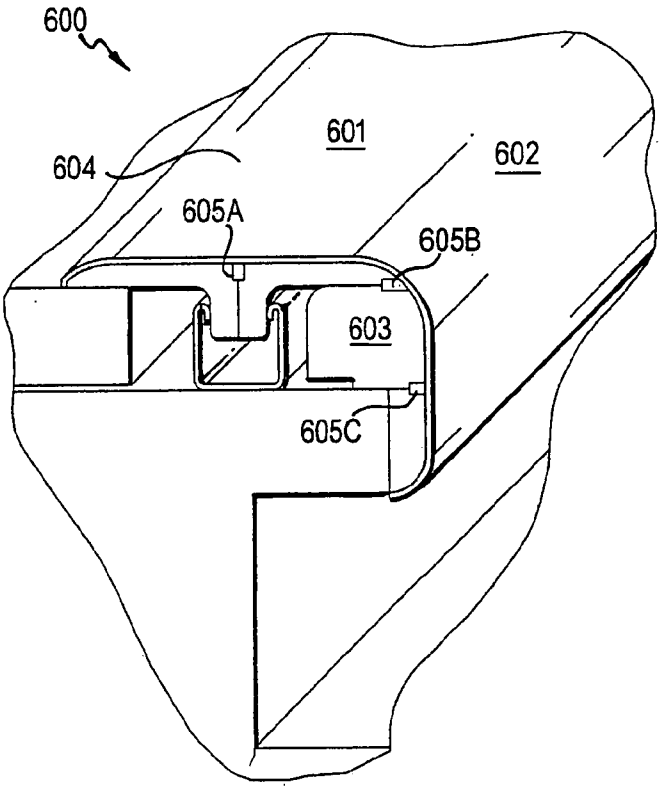


FIG. 33A

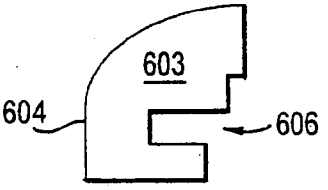


FIG. 33B

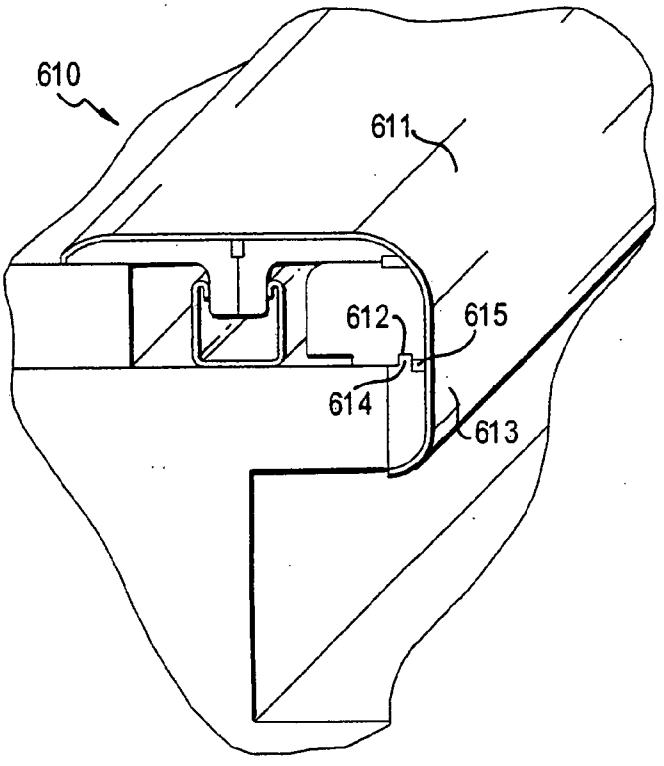


FIG. 34

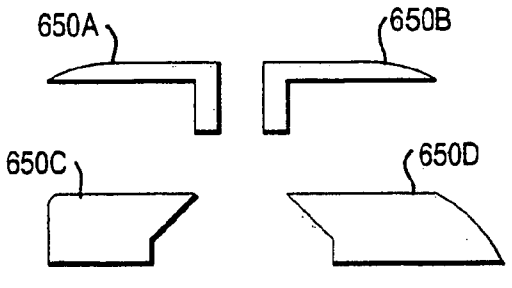


FIG. 35

FIG. 36

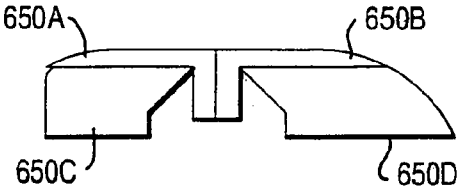
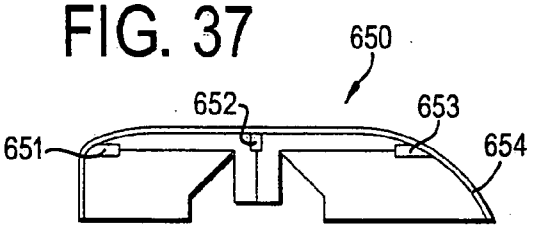


FIG. 37



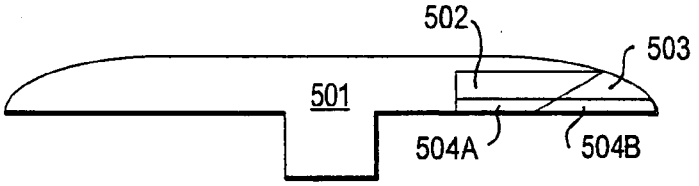


FIG. 38

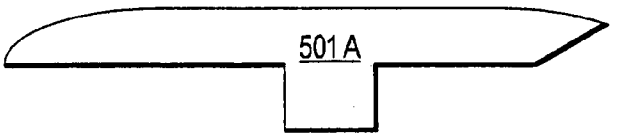


FIG. 39

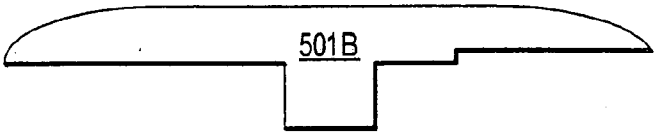


FIG. 40

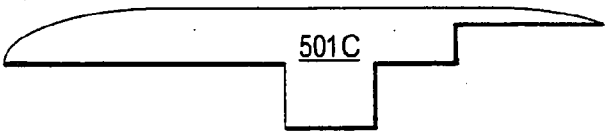


FIG. 41

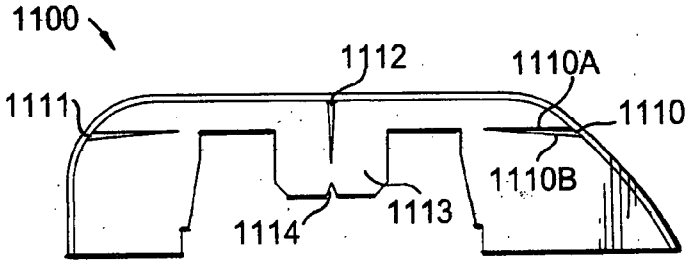


FIG. 42

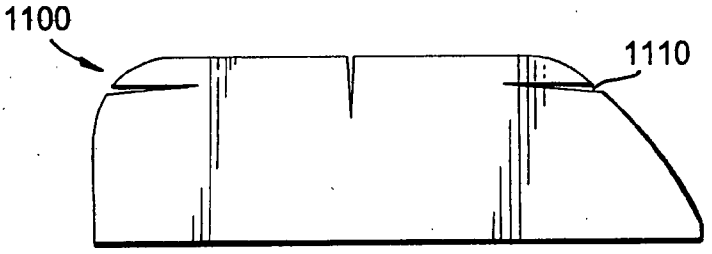


FIG. 43

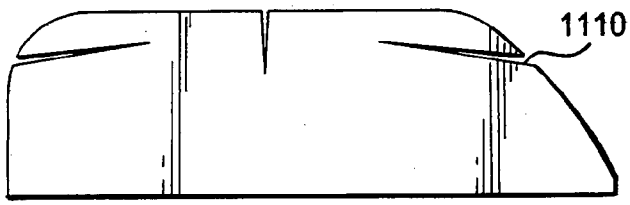
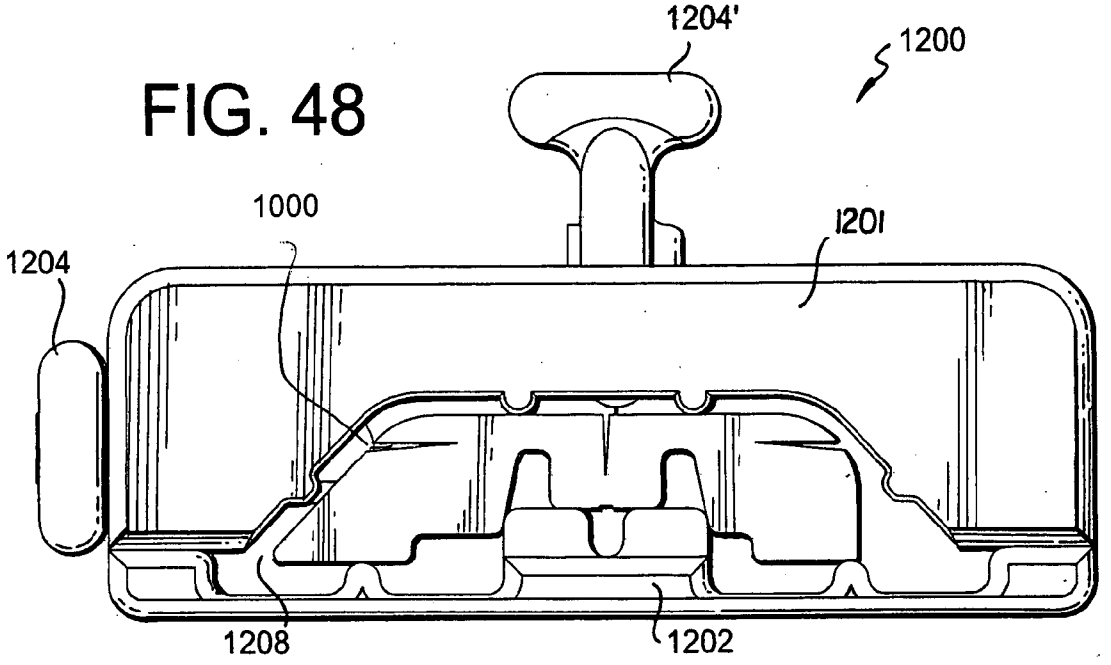


FIG. 44

FIG. 48



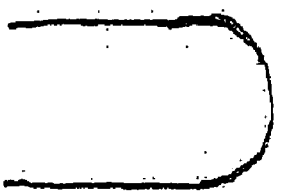


FIG. 45D

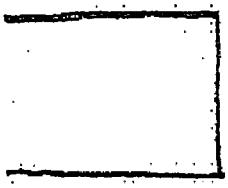


FIG. 45C

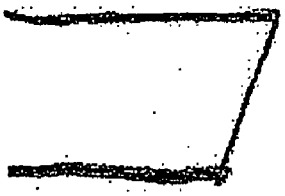


FIG. 45B

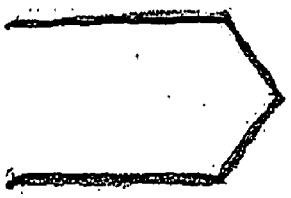


FIG. 45A

FIG. 45E

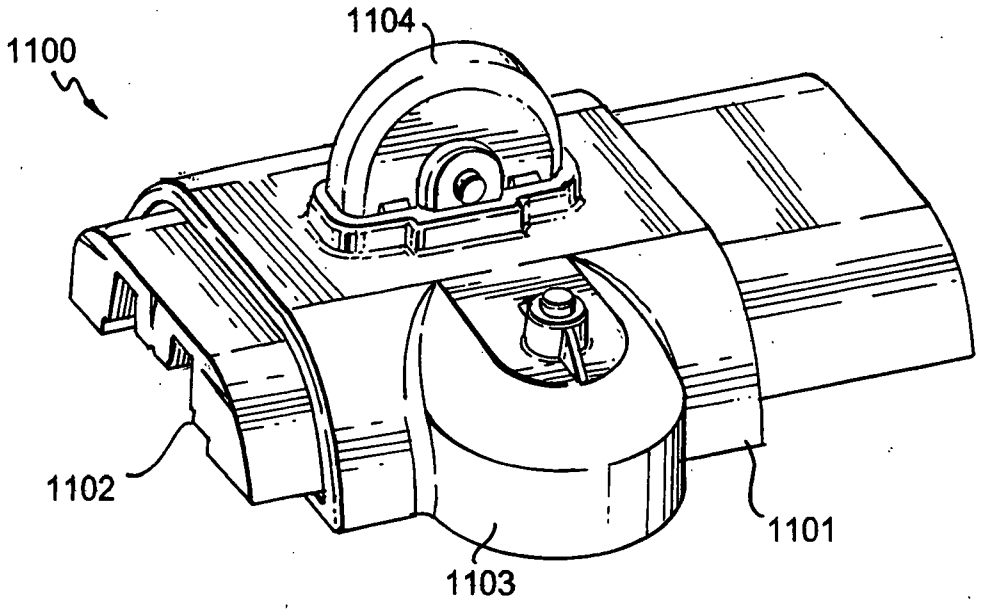


FIG. 46

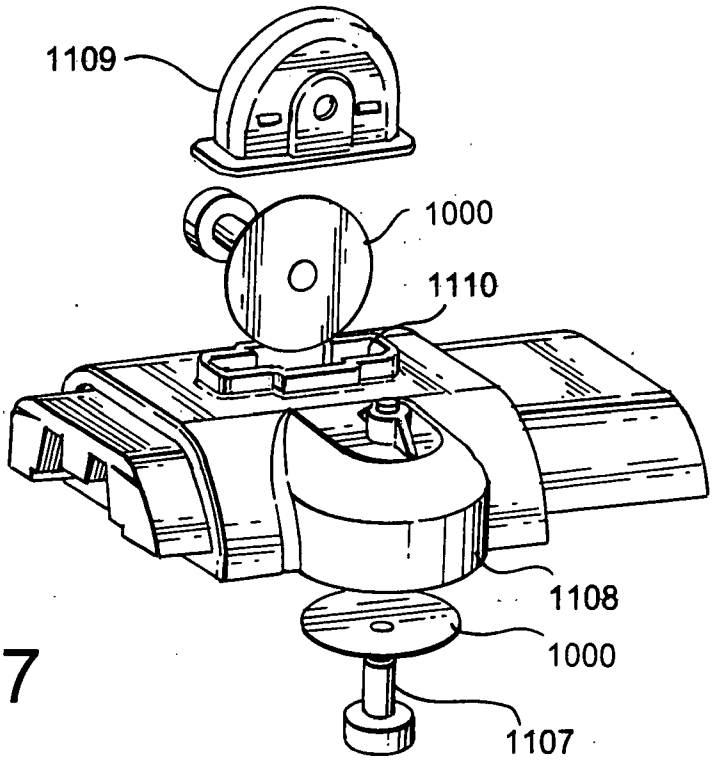


FIG. 47

BREAK-AWAY MULTI-PURPOSE FLOORING TRANSITION

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority from U.S. Provisional Appl. No. 60/808,121, having been filed May 25, 2006, incorporated by reference in its entirety.

BACKGROUND

[0002] 1. Field of the Invention

[0003] The invention is an integral multi-purpose structure which can be separated into various flooring transitions such as T-moldings, hard surface reducers and end moldings.

[0004] 2. Background of the Invention

[0005] Hard surface floors, such as wood or laminate flooring, have become increasingly popular. As such, many different types of this flooring have been developed. Generally, this type of flooring is assembled by providing a plurality of similar panels. The differing types of panels that have developed, of course, may have differing widths and thicknesses. The same is true when a laminate floor (often referred to as a "floating floor") abuts another hard surface, such as a resilient surface (such as vinyl), tile or another laminate surface, a ceramic surface, or other surface, e.g., natural or engineered wood flooring. Thus, when laminate panels having different thicknesses or different floor covering materials are placed adjacent to a similar or dissimilar, transition moldings are often used to create a transition between the same.

[0006] Additionally, one may desire to install floor panels adjacent to an area with different types of material. For example, one may desire to have one type of flooring in a kitchen (e.g., resilient flooring, laminate flooring or ceramic tile), and a different appearance in an adjacent dining room (e.g., solid wood or carpeting), and an entirely different look in an adjacent bath. Therefore, it has become necessary to develop a type of molding or floorstrip that could be used as a transition from one type of flooring to another, either between rooms, or different portions of the same room.

[0007] A problem is encountered, however, when flooring materials that are dissimilar in shape or texture are used. For example, when a hard floor is placed adjacent a carpet, problems are encountered with conventional edge moldings placed therebetween. Such problems include difficulty in covering the gap that may be formed between the floorings having different height, thickness or texture.

[0008] Moreover, for purposes of reducing cost, it is desirable to be able to have a molding that is versatile, having the ability to cover gaps between relatively coplanar surfaces, as well as surfaces of differing thicknesses.

[0009] It would also be of benefit to reduce the number of molding profiles that need to be kept in inventory by a seller or installer of laminate flooring. Thus, the invention also provides a method by which the number of moldings can be reduced while still providing all the functions necessary of different styles of transition moldings.

SUMMARY OF THE INVENTION

[0010] The invention is a joint cover assembly for covering a gap between edges of adjacent floor elements, such as floor panels of laminate or wood, although it may also be used as a transition between a laminate panel and another type of flooring, e.g., carpet, vinyl, ceramic, and wood. The assembly typically includes a body having a foot positioned along a longitudinal axis, and a first arm or member extending generally perpendicularly from the foot. The assembly may include a second arm also extending generally perpendicular from the foot.

[0011] The outward-facing surface of the assembly may be formed as a single, unitary, monolithic surface that covers both the first and second arms. This outward-facing surface may be decorated, for example, with a laminate or a paper, such as a monochromatic or patterned décor, impregnated with a resin, in order to increase its aesthetic value, to match, blend or contrast with the floor panels. Preferably, the outward facing surface has incorporated therein at least one material to increase its abrasion resistance, such as at least one type of hard particles of silica, alumina, diamond, silicon nitride, aluminum oxide, silicon carbide, cerium oxide and similar hard particles, preferably having a Moh's hardness of at least approximately 6. This outward-facing surface may also be covered with other types of coverings, such as cork, foils (such as paper or thermoplastic foils), paints, papers (optionally stainable), polyurethane (optionally cured), printable surfaces (which may be the surface itself), fiber glass, glass fiber reinforced plastics, or a variety of other decorative elements, including, but not limited to, wood veneer, ceramic (such as tiles), metal, vinyl or other decorative materials.

[0012] The assembly is preferably provided with a securing means, such as a clamp or track, to prevent the assembly from moving out of position once assembled. In one embodiment, the securing means is a clamp, designed to grab the foot. Preferably, the clamp includes a groove into which the foot is inserted. In a preferred embodiment, the clamp or track may be joined directly to a subsurface below the floor element, such as a subfloor, by any conventional means, such as a nail, screw or adhesive.

[0013] A shim may also be placed between the foot and the subfloor to provide for height adjustments to allow the assembly to be used in various situations. In one embodiment, the shim may be positioned on the underside of the clamp; however, if a clamp is not used, the shim may be positioned between the foot and the subfloor. The shim may be adhered to either the foot or subfloor using an adhesive or a conventional fastener, e.g., nail or screw.

[0014] The assembly is typically formed from one of a variety of materials, such as a core covered with carpet, laminate, ceramic or wood tile, linoleum, turf, metal, paper, natural wood or wood veneer, vinyl, ceramic or composite finish, or any type of surface covering, while the core is generally formed from wood, engineered wood, fiberboard, such as high density fiberboard (HDF) or medium density fiberboard (MDF), flaxboard, plastics, or other structural material, such as metals (e.g., aluminum, copper, brass, alloys thereof and stainless steel) or composites, and at least over a portion of the surface thereof may be covered with a foil (metal, plastic, etc.), cork, a plastic, a paper, a décor or a laminate to match or contrast with the first and second arms, or other materials, such as those discussed by U.S. Pat. Nos. 6,860,074 and 6,898,911, each of which is herein incorporated by reference in its entirety. Preferred plastics

include extrudable and/or moldable thermosetting and thermoplastic resins, the latter including high density olefins and PVC.

[0015] The assembly may additionally be used to cover gaps between tongue-and-groove type panels, such as glued or glueless laminate floor panels, or even other types of flooring which are secured to a subsurface.

[0016] An adhesive, such as a glue, a microballoon adhesive, contact adhesive, or chemically activated adhesive, including a water-activated adhesive, may be also positioned on any of the pieces of the assembly to either hold the assembly together or in place. Of course, such an adhesive is not necessary, but may enhance or supplement the fit and positioning of the assembly over the gap between the floor elements. Additionally, the adhesive may assist in creating a more air-tight or moisture-tight joint.

[0017] The assembly may be used in other non-coplanar areas, such as the edge between a wall and a floor, or even between the run and rise of stairs. For example, the assembly may include the first and second arms, and foot as described above, but instead of transitioning between two floor elements placed in the same plane, may form the joint between the horizontal and vertical surfaces of a single stair element.

[0018] The inventive assembly may be used for positioning between adjacent tongue-and-groove panels; in this regard, the assembly functions as a transition molding, which provides a cover for edges of similar or dissimilar surfaces. For example, when installing floors in a home, the assembly could be used to provide an edge between a hallway and a bedroom, between a kitchen and living or bathroom, or any areas where distinct flooring is desired. Additionally, the assembly may be incorporated into differing types of flooring, such as wood, tile, linoleum, cork, carpet, or turf.

[0019] The invention also is drawn to an inventive method for covering a gap between adjacent panels of a generally planar surface. The method includes multiple steps, including, inter alia, manipulating a generic element by removing a part of the generic element to produce one or more moldings, and thereafter, installing the moldings where needed.

[0020] The invention additionally includes a new and innovative securing means used to install both the inventive moldings as described herein, as well as other moldings, such as those described by U.S. Pat. Nos. 6,517,935, and 6,898,911, and WO0240809 (each of which is herein incorporated by reference in its entirety). This securing means is, most often, a track or clamp which can be glued, or otherwise secured to a subfloor and/or one or more flooring elements.

[0021] Other objects, features and advantages of the present invention will become apparent from the following detailed description. It should be understood, however, that the detailed description and the specific examples, while indicating preferred embodiments of the invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022] FIG. **1** is a side-view of a structure from which the moldings of the invention can be made.

[0023] FIGS. **2**, **3** and **4** are side-views of intermediate elements which can be used in the construction of the molding of the invention;

[0024] FIG. **5** is a side-view of a completed generic element in accordance with the invention;

[0025] FIG. **6** is a side-view of a T-molding formed from the generic element of FIG. **5**.

[0026] FIG. **7** is a side-view of one carpet reducer embodiment formed from the generic element of FIG. **5**;

[0027] FIG. **8** is a side-view of a hard surface reducer formed from the generic element of FIG. **5**.

[0028] FIG. **9** depicts two end-moldings in accordance with the invention.

[0029] FIG. **10** shows a different carpet reducer/hard surface reducer in accordance with the invention.

[0030] FIG. **11** represents a T-molding installed with the track of the invention.

[0031] FIG. **12** is a view of the track used in FIG. **11**.

[0032] FIG. **13** represents an installation of the reducer of FIG. **10** using the track of FIG. **11**.

[0033] FIG. **14** shows an installed end molding in accordance with the invention.

[0034] FIG. **15** depicts a breakaway combination hard surface reducer/carpet reducer in accordance with the invention.

[0035] FIG. **16** shows another T-molding embodiment formed from the combination of FIG. **15**.

[0036] FIG. **17** is an end molding formed from the combination of FIG. **15**.

[0037] FIG. **18** represents a carpet transition formed from the combination of FIG. **15**.

[0038] FIG. **19** represents an embodiment similar to the combination of FIG. **15**.

[0039] FIG. **20** shows a carpet transition formed from the combination of FIG. **19**.

[0040] FIG. **21** shows a T-molding formed from the combination of FIG. **19**.

[0041] FIG. **22** shows end moldings formed from the combination of FIG. **19**.

[0042] FIG. **23** represents an additional break away molding of the invention.

[0043] FIG. **24** is another T-molding with a break away feature.

[0044] FIG. **25** is a reversible CR/HSR.

[0045] FIG. **26** shows two end moldings.

[0046] FIG. **27** shows a track which can be used with embodiments of the invention.

[0047] FIG. **28** represents an assembled and installed carpet reducer.

[0048] FIG. **29** represents an assembled and installed hard surface reducer.

[0049] FIG. **30** shows a combination HSR/CR with two break away sections.

[0050] FIG. **31** is an end molding with a track after the track has been separated.

[0051] FIG. **32** shows another T-molding of the invention installed in its track.

[0052] FIGS. **33** and **34** depict a stair nose attachment of the invention.

[0053] FIGS. **35-37** show elements of the generic molding of the invention, indicating a construction method.

[0054] FIGS. **38-41** show additional embodiments of the generic molding of the invention, and products produced therefrom.

[0055] FIG. **42** schematically represents a generic element, having been provided with cuts by a laser.

[0056] FIGS. **43** and **44** schematically show shaped core materials before a surface material is applied and the core material modified to its final shape.

[0057] FIGS. **45**A-E schematically show alternative edges of a cutting blade which can be used in a tool in accordance with the invention.

[0058] FIG. **46** is a perspective view of a cutting tool which can be used in accordance with the invention.

[0059] FIG. **47** is an exploded perspective view of the cutting tool of FIG. **46**.

[0060] FIG. **48** is a schematic representation of an alternate cutting tool to be used in accordance with the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0061] FIG. **1** shows a structure **1**, from which the present invention can be formed. Structure **1** typically has a core **1**A, an upper face **1**B, a first lateral face **1**C, a second lateral face **1**D and a lower face **1**E.

[0062] Preferably, core **1**A is formed from a fiberboard, such as high-density fiberboard (HDF) or medium-density fiberboard (MDF), plastic, wood, engineered wood, metal, composites, gypsum, high-density fiber reinforced plaster, or other natural or synthetic material such as cork, or any additional material, such as described in U.S. Pat. No. 6,860,074, herein incorporated by reference in its entirety. Preferred plastics include extrudable thermoset and thermoplastic resins, the latter including high density olefins and polyvinylchloride. In preferred embodiments of the invention, the core **1**A is unitary, i.e., it is a single piece/unit, not a multi-piece element, held together by glues, adhesives, joints, etc.

[0063] The decorative outer face can have a variety of finishes, such as varnishes, lacquers, paints, polyurethane, hard surfaces (optionally containing hard particles, to increase the durability, e.g., abrasion and scratch resistance, of the surface materials), such as laminates (such as taught by U.S. application Ser. No. 10/902,062, herein incorporated by reference in its entirety), or hardwood flooring finishes, veneers, foils, stainable papers, or digital printing or other flooring materials, such as vinyl, metal, composites or plastics or natural materials such as cork. It is additionally within the scope of the invention to provide the decorative outer face of quarter round **6** with ceramic or wood tiles, as taught by U.S. Pat. No. 6,860,074. Typical laminates which can be used are those taught by U.S. Pat. No. 6,517,935 (herein incorporated by reference in its entirety), including monochromatic or patterned (including random) décor sheets which may or may not be impregnated with a thermosetting resin, and a cellulosic overlay paper, such as one made from alpha-cellulose, which also may or may not be impregnated with a resin. Other laminates include ones in which the overlay is eliminated, and may be substituted by a polymer containing cellulosic particles, evenly or randomly distributed throughout a (typically otherwise clear) resin. The outer surface may be a conventional laminate, such as a high pressure laminate (HPL), direct laminate (DL), compact laminate (CPL) or a post-formable laminate (as described in U.S. application Ser. No. 08/817,391, herein incorporated by reference in its entirety); a foil; a print, such as a photograph or a digitally generated image; or a liquid coating including, for example, aluminum oxide. Thus, in the event natural wood or wood veneer is not selected as the material, the appearance of wood may be simulated by coating the decorative outer surface with a laminate having a decor that simulates wood. Alternatively, the decor can simulate marble, ceramic, terrazzo, stone, brick, inlays, or even fantasy patterns.

[0064] In a preferred embodiment, the decorative face or surface includes a laminate formed from a thermosetting resin, having a décor sheet, optionally an overlay layer (with or without cellulosic fibers atop or therein) or sheet and hard particles therein in order to impart an abrasion resistance thereto, which is affixed or joined to the remainder of the quarter round **6** in a high-pressure laminate process step. Such laminate may be affixed as described by U.S. Pat. No. 6,805,951, herein incorporated by reference in its entirety. The outer face can be other finishing materials such as thermoplastic containing laminates, wood veneers, thermosetting polymers, such as melamine or phenolic resins, thermoplastic polymers such as olefins, foils (such as thermosetting, thermoplastic, paper or metal foils), optionally impregnated with or without hard particles, polyesters, vinyls, metals (such as sheets or strips), or combinations thereof. For example, the outer face can include multiple elements, as described herein. It is additionally considered within the scope of the invention to affix a material to the outer face during a direct lamination step, as is known in the art.

[0065] Often, the outer face is provided with a patterned paper sheet therein, wherein the pattern resembles a natural or synthetic object, such as wood, ceramic, stone (including marble and granite), or fantasy patterns (i.e., those not found in nature), including a monochromatic or random field. The specific décor can be selected to enhance the appearance of the surfaces which will be adjacent to quarter round **6** when installed. Such enhancement can be accomplished by matching exactly the visual pattern to that of the adjacent surface, or by contrasting the patterns, for example, such that when installed, a visual pattern extends from a flooring element (wall base or wall), onto and possibly completely across, the molding, as described by U.S. Patent Application Publication No. 2002/0038924, filed Sep. 28, 2001, herein incorporated by reference in its entirety.

[0066] The moldings of the invention typically have a durability rating. As defined by the European Producers of Laminate Flooring, such products can have an abrasion resistance rating of anywhere from AC1 to AC5. Typical abrasion resistances are >300 cycles, >400 cycles, >500 cycles, at least 900 cycles (AC1), at least 1800 cycles (AC2), at least 2500 cycles (AC3), at least 4000 cycles (AC4) and at least 6500 cycles (AC5), as measured by European Standard EN 13329 (Annex E). Typical products according to the invention can also have impact resistance ratings of IC1, IC2 or IC3, as measured by European Standard EN 13329.

[0067] Moreover, it is possible to provide a texture which enhances the pattern of the underlying paper sheet or printed image. Such texturing can be created to be "in register" with, offset from, or to contrast with the image of, e.g., the paper sheet. Such texturing may be created by physical pressing, e.g., embossing (as taught by U.S. application Ser. No. 10/440,317, U.S. Pat. No. 7,003,364, and WO9731775 and WO9731776, each of which is herein incorporated by reference in its entirety) or chemically created (as taught by U.S. Pat. No. 6,991,830, herein incorporated by reference in its entirety). The texture can be selected to enhance (e.g., match or contrast with) any texture of adjacent surfaces. The texture may also be provided such that features of the texture extend from a flooring element (or wall base or wall) onto, and possibly completely across, the molding, which texture may, or may not coincide with the underlying décor.

[0068] Although core **1**A is shown as being a single unitary structure without any joints or connections therein, it is considered within the scope of the invention to form core **1**A by joining two or more separate elements. Such separate structures need not be of the same material(s), and may be joined by, for example, by friction joints, tongue-and-groove joints, compression joints, glue, adhesive strip, double-sided tape, or any combination thereof. Although FIG. **1** shows core **1**A as being solid, it is additionally considered within the scope of the invention to utilize a hollow structure, optionally with one or more supports or reinforcements provided in the interior thereof, or a composite core, incorporating an interlayer of a softer and/or resilient material, e.g., balsa or other relatively soft wood, plastic, rubber, paper, or foamed materials, in combination with a wood-fiber layer. Such an interlayer is optionally positioned in locations to facilitate removal, such as by peeling, to form the desired shapes of the invention.

[0069] In order to achieve the generic molding of the invention, preferably, structure **1** is provided with one or more cuts **2**. Such cuts **2** can be created by milling or cutting with, for example, a blade or even a laser, on or into core **1**A of structure **1**. Alternatively, however, it is possible to create structure **1** with cuts **2** already therein, by, for example, an extrusion or other molding process. The particular location and number of cuts **2** are selected based upon the final shapes to be created, as will be described below. Preferably, however, structure **1** is provided with a first cut **2**A in face **1**C, a second cut **2**B in upper face **1**B, and a third cut **2**C in face **1**D, with no cuts in lower face **1**E, as is shown in FIG. **2**. Lower face **1**E may be provided with a groove, which groove can be sized and shaped to accommodate for heads of screws used to affix the securing elements to the subfloor.

[0070] Known lasers include gas lasers (e.g., CO_2, CO, HeNe, argon), having a power output of between 5 and 100 W, up to 100 kW, preferably 20-60 W, and more preferably approximately 30 W, having a wavelength in the range of 5 μm-550 nm, typically 7-15 μm or 450-550 nm. Other known lasers include metal ion lasers (e.g., HeAg and NeCu), having wavelengths between 220 and 250 nm, chemical lasers (e.g., HF and Deuterium flouride), having wavelengths between 2700 and 4000 nm, excimer, solid state, semiconductor (e.g., Nd:YAG) and dye lasers. However, the parameters of any laser used to produce a cut should be selected depending upon, in part, on issues such as the material to be cut, the depth and/or length of the cut. The cutting laser can be part of a flying optic machine—where the cutting laser moves over the structure to be cut, although it is considered within the scope of the invention to process the workpiece by moving the workpiece with respect to the cutting laser.

[0071] According to a preferred embodiment, laser scoring can penetrate at any desired depth depending upon the material that is being used and depending upon the speed and strength of the laser used when scoring the material. Laser strength can vary from 5 W to 100 kW, preferably within a range of 4 kW to 8 kW when scoring HDF or MDF material and other strengths used depending upon the materials and speed of scoring. As the laser cuts are substantially narrow, the laser cut or scoring does not need to be filled with shims or other materials for support (although shims are not prohibited).

[0072] In one generic element **1110** according to the invention (FIG. **42**), the preferred opening of each laser score or cut **1110** is approximately 0.05-1 mm, most preferably approximately 0.3 mm, however it can be less or greater than this measurement. The opening typically corresponds to the type and thickness of the blade used to cut the surface material above the cut, by example a 0.3 mm opening using a blade slightly less than 0.3 mm or even less than 0.3 mm to 0.2 mm or slightly less can produce a cleaner cut edge with as little unsupported surface material **1111**, surface material at the edge of the cut that does not have core material supporting it, as possible. The ideal opening and type blade and blade thickness will leave a smooth cut of the surface material with as much supporting core material as possible. When a larger opening is used with a smaller blade thickness, by example, 0.6 mm opening with a 0.3 mm blade, a larger portion around the cut edge of the surface material is left unsupported by core material. This configuration is less preferred because unsupported surface material can partially crack, tear and/or separate. In such a configuration, the cut edge can be sanded or otherwise smoothed to cure the cracks, tears, etc.

[0073] The horizontal laser cuts **1110** can be parallel to the top surface of the molding. Specifically, one or both of an upper cut definition **1010**A and a lower cut definition **1010**B can be parallel to the surface of the molding. However, either or both of the upper cut definition **1010**A and lower cut definition **1010**B can be at an angle, i.e., not parallel, to the surface of the molding (the upper surface and/or the bottom surface, which are preferably, but need not be, parallel). A vertical laser cut **1112** can be used as well. FIG. **43** shows an example the generic element **1100**, having been provided with the parallel cuts **1110**, but prior to affixing of the surface material **1111**, while FIG. **44** shows the generic element **1100** with angled cuts **1110**. Such cuts **1110** are typically approximately 0.8 mm at the opening, and taper to be linear

at the innermost portion, and are typically cleaned (e.g., brushing and/or blowing) to remove any remaining char and soot. A leg **1113** of this molding part which is also the material that is held by a track (not shown), can be penetrated by the vertical laser cut with a corresponding V groove **1114** formed, e.g., by milling, on the underside of the "leg" such that when the surface material **1111** is cut and pressure is applied to separate the generic element **1110** (to form, e.g., the end molding **22** or **402**), the material between the laser cut and the milled groove will break in a desired location. When milling the underside of the generic element **1110**, a variety of milling techniques can be used. Since the leg **1113** is almost divided in half by laser scoring or cutting and milling, additional strength can be given each half by increasing the radius of the cuts where the underside surface of the T and the junction where the leg joins the underside of the T. By increasing the radius at this point additional strength can be given to each half of the leg **1113**. Thus, although shown as being right angles. such angles may also be rounded.

[**0074**] Also this same practice can be accomplished where the HSR and CR parts of the molding are attached to the underside of the "T", increasing the strength of these parts as desired as well as the amount of core material that remains between the end of the cut or laser score and where the underside milling begins on each piece.

[**0075**] The preferred use is for cutting laminate, foil, wood veneer, covered flooring transitions or wall trim.

[**0076**] Typically, cuts **2** penetrate the respective face **1**B-D, but do not make a separate piece from parts of structure **1**. Depending on the material used for core **1**A as well as the desired force necessary, as will be described below, the depth of cuts **2** can vary greatly. If, however, covering **4**A (as described below) is strong enough, it is possible for one or more cuts **2** to separate a part of structure **1**, because the covering **4**A can maintain the structural integrity. It is also within the scope of the invention to form cuts **2** such that a frangible connection is made between various sections of structure **1**.

[**0077**] In a preferred embodiment, filler material, such as shims **3**A-C are inserted into cuts **2**A-C, respectively. Shims **3** preferably have a width slightly smaller than the width of the respective cut **3**A-C. As a result, shims **3** typically fit snugly in the cut **3**. Although no particular length for shims **3** is required, it is preferable that shims **3** are substantially shorter than the length of the respective cut **2**, which cut can have differing dimensions across its length and/or width. Such may be accomplished by using tools, e.g., blades and lasers, of different dimensions. Although cuts **2** and shims **3** are shown as all being of the same shape/dimensions, it is within the scope of the present invention to vary the size, shape and dimensions of the respective cut/shim combination. Although it is preferred that shims **3** are manually or mechanically inserted into the respective cut **2**, and pushed inside cut **2**, it is possible to provide shims **3** having a length greater than the depth of the respective cut **2**, and after insertion, remove any portion outside cut **2**, and optionally a small section to provide an opening for a cutting blade, as described below. It is additionally possible to use shims **3** which have a smaller width, in combination with an adhesive or sealant to maintain shim **3** in position. If, however, cut **2** is sufficiently small, it is possible to eliminate the need for shim **3**.

[**0078**] The material for shims **3** is preferably an olefin, polyester, or other moldable and/or extrudable thermoplastic or thermosetting material such as vinyl; solid or engineered wood or other cellulosic material, or metal. It is additionally within the scope of the invention to provide the material for shims **3** in a flowable form, which sets, hardens or dries into a solid form. The material may also be expandable, such as by foaming or by heating or chemical reaction, such that after expansion, the material substantially fills the respective cut **2**. In preferred embodiments, the material for shims **3** is substantially incompressible, once set/hardened/dried.

[**0079**] In an alternate embodiment, the interlayer (as previously described) is positioned in alignment with the cuts **2**, such that removal of the various sections is easily accomplished once the covering **4**A is cut, sliced, scored, etc. In one embodiment, the interlayer allows for the sections to be peeled away. In another embodiment, the interlayer is provided with a notch therein, to facilitate easy separation from the remainder of the generic element **5**; however, it is considered within the scope of the invention to provide an interlayer without any notch, which notch can be formed during the slicing, cutting, scoring, etc. of the covering **4**A.

[**0080**] FIG. **4** shows structure **1** having a covering **4**A thereon. In a preferred embodiment, covering **4**A is a laminate formed from a thermosetting resin, having a décor sheet, optionally an overlay layer (with or without loose cellulosic fibers atop or therein) or sheet and hard particles in proximity thereto (e.g., in, on, above, or below, with or without a separate structure therebetween) in order to impart an abrasion resistance thereto, which is affixed to structure **1** in a high-pressure laminate process step. Such laminate may be affixed to structure **1** as described by U.S. Pat. No. 6,805,951, herein incorporated by reference in its entirety. Covering **4**A can also be other finishing materials such as thermoplastic containing laminates, wood veneers, thermosetting polymers, such as vinyl or polyesters, thermoplastic polymers such as olefins, foils (such as thermosetting, thermoplastic, paper or metal foils), impregnated with or without hard particles, polyester, metals (such as sheets or single or strips), or combinations thereof. For example, covering **4**A can include multiple elements, as described herein. It is additionally considered within the scope of the invention to affix covering **4**A during a direct lamination step, as is known in the art.

[**0081**] Once covering **4**A is applied, structure **1** can be shaped to form the generic molding **5** as to be sold. As shown in FIG. **5**, generic molding **5** may have one more notches **5**A disposed in under face **1**E. Such notches may additionally include elements or structures as described by U.S. application Ser. No. 11/343,199, herein incorporated by reference in its entirety. Such shaping may be performed by manual or automated cutting, such as by severing, broaching, machining, routing, sawing, chipping, planning, sanding, or by any other method for removing material from the structure of structure **1**. Of course, the method used to shape structure **1** is usually selected depending upon the material used for structure **1** and the desired shape for generic element **5**. For example, if structure **1** were extruded or molded, it is possible to form structure **1** with the notches **5**A therein, such that a separate shaping step is not necessary.

[**0082**] Typically, generic element **5** can be manipulated by a further shaping step to form more than one flooring

molding. Thus, the configuration of generic element **5** depends upon the desired traditional flooring moldings potentially formed by manipulating generic element **5**. Accordingly, FIG. **5** shows a typical generic element **5** in accordance with the invention.

[**0083**] As shown in FIG. **5**, generic element **5** has a first removable section **5**C and a second removable section **5**D connected to a central section **5**E at connections **5**B. Connections **5**B are typically ledges or other elements, which hold removable sections **5**C and **5**D to central section **5**E. Although FIG. **5** shows connections **5**B as being merely extensions of the material of core **1**A, it is additionally within the scope of the invention to form connections **5**B as frangible joints, friction joints, tongue-and-groove joints, compression joints, glue (or other adhesive), or any combination thereof, in order to maintain such connections **5**B made without any physical connections because the cut goes all the way, relying, at least in part, on covering **4**A to maintain structural integrity. The various separable sections of the invention are preferably break-away sections, i.e., can be separated from other sections in a single unitary piece by breaking a connection between the break-away section and at least one other section. In contrast, when a milled-away section is removed from another section, such milling does not form a unitary piece, but rather smaller particles, such as dust.

[**0084**] Due to the construction of generic element **5**, including covering **4**A and connections **5**B, various flooring profiles or moldings can be formed. Removing removable sections **5**C and **5**D from generic element **5** can produce a T-molding **6**, while removing only section **5**C from generic element **5** can produce a carpet reducer **7**, and removal of only section **5**D from generic element **5** can produce a hard surface reducer **8**. If core **1**A is provided with a cut **2**B in upper surface **1**B, it is further possible to divide T-molding **6** to form two end moldings **10**.

[**0085**] Similarly, a generic molding can be manufactured having only two removable sections, such that in its original configuration, the generic molding is a T-molding **400** (FIG. **24**), and when separated along breakaway **401**, two end moldings **402** are produced (FIG. **26**). This T-molding **400** can be used in combination with a reversible element **402** (FIG. **25**) to form a HSR or CR (depending upon the orientation of reversible element **402**), as described by U.S. application Ser. No. 11/066,099 and U.S. application Ser. No. 11/343,199, each of which is herein incorporated by reference in its entirety. The T-molding **400** and reversible element **402** can be used with a different track **404** to hold the resulting assembly in place (FIGS. **27**-**32**). When the end molding **402** is to be used with a securing element, preferably an alternate track **405** is used (FIG. **31**). The track **405** can be formed by cutting or breaking track **404** to match the latitudinal length of the end molding **402**.

[**0086**] Another generic molding which can be used without manipulation is T-molding **501** (FIG. **38**). This T-molding **501** has a number of removable sections **502**, **503**, and **504** (A and B), which can produce different shapes. For example, removal of sections **503** and **504**B can produce a CR **501**A (FIG. **39**). Removal of section **504**B only could produce a first modified T-molding **501**B (FIG. **40**), which can be used for shallow tile, vinyl or low carpet (e.g., Berber). Removal of sections **502**, **503**, **504**A and **504**B can produce a second modified T-molding **501**C (FIG. **41**) for higher floorings, such as tile and hardwoods and deeper carpets.

[**0087**] In other embodiments, it is possible to create other flooring profiles or transitions from generic molding **5**. For example, removable section **5**C or **5**D can be shaped to form a traditional quarter-round molding when removed from section **5**E. Additionally, generic element **5** may be shaped to form a traditional stair nose molding when one or both of removable sections **5**C and **5**D are separated. Thus, it is considered within the scope of the invention to shape generic molding **5** such that when separated, removable section **5**C can be used as a quarter-round molding, while the remaining structure, i.e., section **5**D joined to section **5**E, can be used as a stair nose molding, as discussed below.

[**0088**] In one embodiment, covering **4**A must be cut or severed in order to separate the removable sections. Such a process typically requires the use of a specialized tool, which divides covering **4**A, e.g., with a blade or other cutting tool, along the respective cut **2**. Once covering **4**A has been subdivided, it becomes possible to separate any necessary removable sections. Typically, a great deal of force is required to break connection **5**B, such that if the generic molding **5** were used with the removable section in place, the generic molding **5** would maintain its structural integrity, although in other embodiments, little or no force is required. The cutting tool or a second tool can be used to provide that force, for example, a standard flat-head screwdriver or other narrow width tool can be inserted into cut **2**, either through the slot in severed covering **4**A or from a longitudinal end of generic molding **5**, and the removable section pried from the remainder of generic molding **5**. Thereafter, the remaining part of generic molding **5** can be sanded to remove any burrs or other rough surfaces created during the prying. In one embodiment, the cutting, prying and sanding can all be performed by the same tool. Thus, it is possible to package one generic molding **5** along with the three-function tool.

[**0089**] A cutting blade **1000** can also be used as part of a tool to separate the elements of the generic molding **5**, with different embodiments shown in FIGS. **45**A-E. In one embodiment, the cutting blade is substantially circular, and can be made of any conventional cutting material, e.g., ferrous or non-ferrous metals (such as stainless-steel) or ceramics. While the blade **1000** typically has a thickness of between 0.2 mm and 0.3 mm, the thickness of the blade **1000** should be selected depending upon the desired thickness of the resulting cut **2**. In a preferred embodiment, the blade **1000** rotates, as it can be circular or non-circular. Additionally, the blade **1000** can be stationary or reciprocate as it cuts. For example, the blade **1000** can have a substantially rounded shape (e.g., elliptical), such that as it rotates, the cutting surface reciprocates against the surface to be cut.

[**0090**] The cutting blade can have a smooth bevel FIG. **45**A, where one bevel from each side of the blade meets equidistant to the center thickness of the blade, such that the two bevels are of equal length. However, one bevel may be longer than the other. The cutting blade may also have a single non-beveled cutting edge (FIG. **45**B), where cutting edges are on each side, running from one side through the entire thickness of the blade to the opposite side, resembling a wedge shape around the perimeter of the circular blade.

[0091] A non-beveled (e.g., square-edge) blade FIG. **45**C can be used, where the cutting edges are on each side of the perimeter of the circular blade created by a vertical or near vertical or perpendicular surface rather than the one edge created by a beveled surface around a circular blade. An advantage of this "vertical edge" blade, depending upon the material cut, is sanding of the cut edge of the material may not be necessary, saving an additional operation that maybe required when using a beveled edge blade.

[0092] In one embodiment a rounded edge blade FIG. **45**D is used, without any cutting edge. This type of blade presses through the covering material into the void beneath the material creating, depending upon the material, a rolled edge that in many cases will not require sanding or smoothing. The perimeter of the blade typically has a semicircular surface running smoothly from one side of the blade side surface to its opposite side.

[0093] A reverse double or chevron-shaped blade (FIG. **45**E) can also be used. This blade has the advantage of cutting along both angled surfaces simultaneously.

[0094] Such cutters or blades can be stationary or moveable, e.g., by reciprocating, but are preferably rotating and can be used to cut surface materials that are placed over a shaped, extruded or molded core material that is scored, has cuts or extruded or molded grooves. Typically the core is made of wood based material, e.g., fiberboard, such as HDF, MDF, particle board or solid wood, composites, plastics or metals that can be covered by a variety of surface materials such as wood veneer, foils, laminate, paper, metal, plastic, cork, leather, linoleum, vinyl, rubber, bamboo, ceramic or glass tiles, textiles and the tool may be designed to score the surface of hard materials such as ceramic, making it possible to break the ceramic after the scoring. Although it is preferred that breaking or separating connection **5**B require the use of a tool, it is within the scope of the invention to have a weaker attachment. For example, connection **5**B may be broken by human hand and arm pressure alone, i.e., without the use of any type of tool.

[0095] A specialized cutting tool **1100** is preferably used to cut the structure **1** into the separate parts. The tool **1100** has a body **1101**, defining a workspace **1102**, into which the structure **1** is passed. In a preferred embodiment, the tool **1100** has a length no greater than the width of the structure **1**, to allow for simple packaging of a tool **1100** with a structure **1**. The tool **1100** typically includes a horizontal cutter **1103** and a vertical cutter **1104**, in which separate cutting blades **1000** are located. Preferably, each of the cutting blades **1000** in the tool **1100** are of the same structure, but it is within the scope of the invention to have different blades **1000**. Each of the blades **1000** are connected to an axis **1107**, which axis is mounted in a horizontal cutter housing **1108** or a vertical cutter housing **1109**, respectively. The vertical cutter **1104** preferably penetrates the body **1101** through vertical cutter aperture **1110**.

[0096] During use of the tool **1100**, the structure **1** is relatively moveable through the workspace **1102** to come in contact with either the horizontal cutter **1104** and/or vertical cutter **1104**, depending upon the desired shape of the structure **1** after cutting. Specifically, the structure **1** can be moved with respect to the tool **1100**, the tool **1100** may be moved with respect to the structure **1**, or both the **1100** and the structure may be moved with respect to each other. For example, if the structure has an initial shape as shown in FIG. **5**, and only section **5**D is desired to be removed, the structure can be inserted into the workspace with cut **2**C positioned toward the horizontal cutter **1103**. As the structure **1** passes the blade **1100**, the edge of the blade **1100** will penetrate sever the covering **4**A, thereby exposing the cut **2**C. Depending upon the particular configuration of the structure **1**, section **5**D can then be removed by, for example, simply allowing it to fall away, separating a glue, prying and/or snapping section **5**D from the remainder of the structure **1**. Additionally, an additional tool, such as the operative end of a flat-head screwdriver can be inserted into the cut **2**C and twisted to assist in the separation. Finally, the structure **1**, having been cut, can be sanded if needed to remove any jagged or rough ends formed by the removal step. In a preferred embodiment, once the covering is severed, the individual pieces can be separated by hand and arm pressure alone or with the use of a tool.

[0097] In order to prevent the vertical cutter **1104** from severing cut **2**B when such severing is not desired, the blade **1000** inside the vertical cutter **1104** is typically moved away. This can be accomplished by simply pulling up on the vertical cutter **1104** to move the blade **1000** therein upwards to move the blade to an inoperative, yet preferably retained in the tool **1100**, position, or the vertical cutter housing **1109** be physically disconnected from the tool **1104**, allowing removal of the blade **1000** therein, depending upon the particular configuration of the tool **1100**.

[0098] If, after section **5**D is removed, the user wants to form a T-molding by removing section **5**C, the structure **1** can be relatively moved through the workspace **1102** a second time, whereby the blade **1000** in the horizontal cutter **1103** severs the covering **4**A over cut **2**A. Thereafter, section **5**C is removed.

[0099] Finally, if the user desires to form an end molding, e.g., as shown in FIG. **9**, the structure **1** can be passed through the tool **1100**, with the blade **1000** inside the vertical cutter **1104** in the operative or engaged position. Accordingly, the vertical cutter **1104** will sever the covering over cut **2**B. As the tool **1100** can be operated with one or both of the vertical cutter **1104** and the horizontal cutter **1103** in an operative position, it is possible to use both cutters simultaneously or in any sequence to achieve the desired configuration of the structure **1** (e.g., the cut **2**B can be formed before cut **2**A or **2**C). In a less preferred embodiment, the tool **1100** is provided with a removable and/or detachable second horizontal vertical cutter **1103'** (not shown) positioned opposite the first horizontal cutter **1103** to permit all three severing steps to be performed at the same time or in any desired sequence without having to install the cutters.

[0100] In a much preferred embodiment, when making the end moldings using the vertical cut in the center leg, all three cuts are made before any pieces are separated from the one piece structure. Thus, the full structure is intact to help the tool **1000** to operate correctly.

[0101] Once all three cuts are made the "T" can be separated in half and then the HSR and CT parts can be separated from the "½ T" (End Molding Part) and/or the HSR and CT parts can be removed along the horizontal cuts and then the "T-Molding can be divided in half along the vertical cut into two end moldings. Ideally we can break these parts off with hand pressure alone.

[0102] It is also within the scope of the invention to provide each of the cutters **1103**, **1104**, **1103'** with multiple blades **1000**. For example, the cutters can have 2, 3, 4, or 5 individual blades, each of which can be of any of the shapes and types described herein. One or more blades can independently rotate or be stationary, and/or one or more blades may independently reciprocate. There may also be a single blade **1000** which is interchangeable between the different cutters. In a preferred embodiment, the vertical cutter **1104** and horizontal cutter **1103** are designed such that the entire cutter can be removed from the horizontal position and placed in the vertical position, or vice versa. In such an embodiment, only one cutter need be provided to perform all of the cutting functions.

[0103] A second cutting tool **1200** is schematically shown in FIG. **48**, and operates in a substantially similar manner to the first cutting tool **1100**. The cutting tool **1200** includes a body **1201** and a lower section **1202** defining a workspace **1203** therein, with the blade(s) **1000** being mounted similarly to as described in connection with the first cutting tool **1100**. Typically, the lower section **1202** is fixedly joined to the body **1201**, either by being integrally formed with or affixed thereto by, e.g., screws, glue, or straps. Again, in a preferred embodiment, the tool **1200** has a length no greater than the width of the structure **1**, to allow for simple packaging of a tool **1200** with a structure **1**. The tool **1200** typically includes a cutter **1204** which can be placed in its horizontal position, or in the alternative, in its vertical position. Depending upon the particular cutting of the structure **1** to be made, the cutter **1204** can be shifted from the first position to the section position. This is typically accomplished by pulling the cutter **1204** distally outward to disengage the blade **1000** disposed therein from its location where it can engage the structure **1**, and sliding the cutter **1204** along the body **1201** until the cutter reaches the second operative position. Preferably, when in the disengaged position, the blade **1000** is retained inside the tool **1200**. Thereafter, the cutter **1204** can be pushed to move the blade **1000** such that it can engage the structure **1** in the second operative position.

[0104] In another embodiment, the cutter **1200** is provided with a second cutter **1204'**, such that a vertical cut and a horizontal cut can be made simultaneously. Accordingly, in order to prevent unwanted severing of the structure **1**, either or both of the cutters **1204**, **1204'** can be removed entirely or simply disengaged from the operative location.

[0105] Because shim **3** is inserted into cut **2**, separation of a removable section from generic molding **5** often will cause shim **3** to fall out. However, instead of simply discarding shim **3** as trash, shim **3** may be used as a shim to be utilized when installing any resulting molding, above or below any means for attaching the resulting molding, such as a track or clamp.

[0106] As covering **4**A is preferably applied to core **1**A in one piece, as is described by U.S. Pat. Nos. 6,517,935 and 6,898,911 (each of which is herein incorporated by reference in its entirety), covering **4**A should not have any dividing lines or other demarcations marring the decorative surface.

[0107] Often, covering **4**A is provided with a patterned paper sheet therein, wherein the pattern resembles a natural or synthetic object, such as wood, ceramic, stone (including marble and granite), or fantasy patterns (i.e., those not found in nature), including a monochromatic or random field. The specific generic molding **5** can be selected to enhance the appearance of the surfaces which will be adjacent to the generic molding **5** (or parts thereof) when installed. Such enhancement can be accomplished by matching exactly the visual pattern of generic molding **5** to that of the adjacent surface, or by contrasting the patterns, for example, such that when installed, a visual pattern extends from a flooring element onto and possible completely across the molding.

[0108] Moreover, it is possible to provide covering **4**A with a textured upper surface which enhances the pattern of the underlying paper sheet. Such texturing can be created to be "in register" with, offset from, or to contrast with the image of the paper sheet. Such texturing may be created by physical pressing, e.g., embossing (as taught by U.S. application Ser. No. 10/440,317 (filed May 19, 2003), U.S. Pat. No. 7,003,364, WO9731775 and WO9731776, each of which is herein incorporated by reference in its entirety) or chemically created (as taught by U.S. Pat. No. 6,991,830, herein incorporated by reference in its entirety). The texture of the covering **4**A can be selected by the installer to enhance (e.g., match or contrast with) any texture of adjacent surfaces.

[0109] It is additionally possible to provide removable sections **5**C and **5**D with opposite decorative surfaces (as disclosed by U.S. application Ser. No. 10/748,852, Ser. No. 11/066,099, and Ser. No. 11/343,199, each of which is herein incorporated by reference in its entirety), such that after being removed from generic molding **5**, removable sections **5**C and/or **5**D can be re-attached in a reverse configuration to section **5**E by, for example, tongue-and-groove joints, friction joints, or adhesive. By providing generic molding **5** with reversible structures, the number of functions of the single product can be greatly increased.

[0110] FIG. **10** shows a different embodiment for a CR/HSR **100**. When installed as a carpet reducer ("CR"), the end of the carpet adjacent CR/HSR **100** can be tucked or turn against a vertical face **119** of removable section **105**. When used as a hard surface reducer ("HSR"), inclined surface **120** provides an angular surface that graduates the height differences between two flooring surfaces. A foot **109** is provided on CR/HSR **100** to allow for connection to track **110**, as described below. Foot **109** is preferably formed from the same material as the remainder of CSR/HSR **100**, but alternatively, may be formed from a different material through a different process and thereafter, joined to the remainder of CR/HSR **100**. Similarly, foot **109** can be joined to the remainder of CR/HSR **100** by, for example, an additional connection **5**B, such that, if desired, foot **109** can be removed. As with generic element **5** (FIG. **5**), removable section **105** is preferably attached by a connection **5**B, formed by the creation of a cut **2** (with or without a shim **3** placed therein), and can be removed from CR/HSR **100** to form a T-molding, such as shown in FIGS. **6** and **11**. In a preferred embodiment, removable section **105** is provided with a tab **108** that can fit and rotate with a corresponding groove **116** in a securing element (described below).

[0111] In FIG. **11**, removable section **105** has been removed to create a T/End molding **104**. T/End molding **104** can be connected to a securing element **110**, which securing element **110** is preferably not affixed to a sub-floor. Securing element **110** is, however, preferably affixed to one or both

adjacent flooring elements **103**A, **103**B. This can be accomplished with a fresh adhesive, pre-glue, magnetically, or by any conventional mechanical device, such as a screw, nail, etc. Arms or extensions of T/End molding **104**, as well as T molding **6**, can overlap finished flooring approximately 0.25"-0.75" (approximately 6.5-20 mm), preferably approximately 0.5" (13 mm).

[**0112**] An underlayment **102** can be placed between flooring elements **103** and subfloor **101**. Underlayment **102** can be any conventionally known underlayment, such as those used as moisture barriers and/or sound/shock/electric charge dampening, and can be affixed to flooring elements **103**, or simply laid down before flooring elements are installed. It is additionally considered within the scope of the invention to utilize an underlayment which creates moisture channels below flooring elements **103**, such as PLATON STOP and/or PLATON FLOOR, by Isola as of Norway, such as described by U.S. patent application Ser. No. 11/522,535, herein incorporated by reference in its entirety.

[**0113**] As shown, T/End molding **104** overlaps the flooring elements **103**A, **103**B. This allows the T/End molding **104** to function, with sufficient space for expansion or contraction of flooring elements **103**A and/or **103**B without the need to anchor securing element **110** to the subfloor. Additionally, if the flooring elements **103**A, **103**B are not secured to the securing element **110**, each of the flooring elements **103**A could move independently of each other. It is also considered within the scope of the invention to affix securing element **110** to one of the flooring elements **103**A, which would cause T/End molding **104** to move with flooring element **103**A, while the other flooring element **103**B would not be so constrained.

[**0114**] A preferred securing element, or track **110** to be used with the moldings of the invention is shown in FIG. **12**. Track **110** is preferably made of a plastic, metal or composite material, and can be used to secure any of the parts described herein to flooring elements **103**A, **103**B and/or a subfloor. Vertical portions **112** are shown as upstanding from base **111**. Although shown as being perpendicular to base **111**, vertical portions **112** can be at any angle therefrom. For example, while a first vertical portion **112**A can be perpendicular to base **111**, a second vertical portion can be disposed at any angle. In one preferred embodiment, vertical portions **112** are upstanding from base **111**, but angle towards each other. As a result, vertical portions **112** are biased inwards, and the biasing assists in holding the molding in place.

[**0115**] First wing **113** is a portion of base **111** which is designed to be placed below a flooring element **103** (as shown in FIG. **11**). A distal portion **113**A of wing **113** can be folded back **1800** to form a shim, in order to raise track **110** or other parts to accommodate thicker flooring elements **103**.

[**0116**] Disposed adjacent to, but preferably not in contact with, a vertical portion **112** is a second vertical portion **114**. This second vertical portion helps to support, for example, removable section **105**, by preventing back and forth movement. When removable section **105** is stepped on, rolled over, or otherwise subjected to forces tending to push it inwards, second vertical portion **114** acts to maintain removable section **105** in the correct location.

[**0117**] Track **110** can also have a second wing **115**, which second wing **115** can include a pre-applied adhesive (e.g., an encapsulated glue as described by U.S. Pat. No. 7,029,741 and application Ser. No. 10/270,163, each of which is herein incorporated by reference in its entirety), adhesive tape, fresh adhesive or can have a mechanical or magnetic attachment (as described by U.S. application Ser. No. 10/747,261, herein incorporated by reference in its entirety) to affix track **110** to the underside of flooring elements **103** and/or the subfloor. Second wing **115** may also be provided with a groove **116**, sized and shaped to receive tab **108**, which helps to hold removable section **105** in place and, simultaneously, allows removable section **105** to rotate in adjustment as the height of flooring elements **103** increases. It is considered within the scope of the invention to swap the relative locations of the tab **108** and grove **116**.

[**0118**] It is additionally possible to utilize a track having a single upstanding section, positioned between lower lateral ends (such as shown in FIG. **1**A of both U.S. Published Patent Appl. No. 2003/0084634 and No. 2003/0154678—each of which is herein incorporated by reference in its entirety). Such a track can be inserted into a groove positioned in an underside of generic structure **5**. In one embodiment, the foot, or middle lower depending portion of generic structure **5** can be reduced in size or eliminated, as the interaction between this track and groove can be sufficient to hold the structure in its installed condition. Additionally, an uppermost end of the track can be provided with barbs, spikes, projections, joint elements (such as tongue/groove) or other elements which can enable the track to lock or more securely hold the structure in its installed condition.

[**0119**] In FIGS. **13** and **14**, T/End molding **104** is shown, in an installed condition, as a carpet/hard surface reducer (with removable section **105**) and an end molding (without removable section **105**), respectively. As can be seen, foot **109** of T/End molding **104** is secured in track **110** by vertical sections **112**. Track **110** is secured to a subfloor **101** with an adhesive, magnetic forces or mechanical attachments. In FIG. **14**, T/End molding **104** is installed adjacent a wall **118**. A sealant or adhesive **117** may be placed in any gaps between T/End molding **104** and another structure, such as a wall **118**. As shown in FIG. **14**, T/End molding **104** can be used without any securing element, as the presence of adhesive **117**, may be sufficient to maintain T/End molding **104** in place. Such sealant or adhesive can be a fresh glue or a pre-applied glue (e.g., a "preglue" applied at the factory). In a preferred embodiment, adhesive **117** is a foaming adhesive, e.g., a silicone sealant or alternate foaming adhesive, such that after adhesive **117** and T/End molding **104** are installed, adhesive **117** foams or expands to fills voids between wall **118** and T/End molding **104**.

[**0120**] FIGS. **15-22** depict an additional molding assembly of the invention. This extrudable assembly **202** is preferably formed from an extrudable polymeric, composite or metal material, but may also include or be substituted by milled composite materials, wood, fiberboard, or any other material discussed herein suitable for core **1**A.

[**0121**] Typically, assembly has a decorative outer surface **201**, which surface **201** is preferably selected from the same materials for the outer faces of structure **1**.

[**0122**] As shown, assembly **200** can be constructed with a combination HSR/CR **202** and a T-molding **204** (which need not be of the same material), joined at breakaways **204**. Breakaways **204** can be narrowed or scored or other sections

of assembly **202**, allowing for separation of the parts of assembly **200**. Breakaways **204** can also be joints between two separate elements, formed by, for example, friction joints, tongue-and-groove joints, compression joints, glue, or any combination thereof.

[**0123**] Assembly **200** can be fixed to a subfloor using any material described herein, such as adhesive (e.g., pre-applied or fresh glue), tape or magnetic strip (optionally with tape or adhesive). Installing assembly **200** in a first configuration produces a HSR, while inverting assembly **200** produces a CR (FIG. **18**).

[**0124**] By providing one set of legs **208** on assembly **200**, assembly **200** can be used in a variety of configurations. As can be seen in FIG. **15**, applying force to push or pull the sections of assembly **200**, different shapes, to accommodate different flooring heights. Desired positions for legs **208** can be selected and locked in place by utilizing a glue, sealant, epoxy, or other chemical element, or in the alternative (or in combination with), barbs or teeth **212**.

[**0125**] By splitting or breaking assembly **200** at breakaways **206**, different moldings can be realized. Another T-molding **220** is created by separating assembly **200** at each of breakaways **206**B and **206**C. This T-molding **220** is preferably joined to one flooring element with an adhesive **222**, which can take the form of any glue or adhesive described herein, but preferably is a peel-and-stick adhesive, and is positioned to join to both an upper surface and a lower surface of the flooring element. Such a construction, similar to other embodiments, allows T-molding **220** to "float" with the joined flooring element, independent of other flooring elements. In another embodiment, T-molding **220** can be affixed to the subfloor with any glue, adhesive or magnetic means (discussed herein), alone or in combination with affixing to the flooring element.

[**0126**] If assembly **200** is split or separated at breakaways **206**A and **206**C, an end molding **230** can be produced (FIG. **17**). The end molding **230** can be affixed to the upper surface of an adjacent flooring element, or if used in combination with a track **232**, both the track **232** can be joined to either the subfloor or the underside of the adjacent flooring element, alone, or in combination with the end molding **230** being affixed to the flooring element. If the end molding **230** is used without the track **232**, a lower end of end molding **230** can also be affixed to the subfloor.

[**0127**] An alternate embodiment of the assembly **200** shown in FIG. **15** is an additional assembly **250** (FIGS. **19** and **20**), which can also function as a HSR or CR, depending upon its installed orientation. This assembly **250** has a supporting strut **252** that is adjustable and can move when adjustable legs **253** are raised/lowered for different finished flooring thicknesses. The adjustable strut **252** provides additional strength to the structure of the assembly **250**. In order to prevent strut from moving once installed, it is considered within the scope of the invention to provide a locking mechanism, such as barbs, glues/adhesives, or other means for maintaining the strut **252** in its desired configuration. Just as the assembly **200** can be separated at various breakaways, the assembly **250** can be broken at breakaways **254**A-C for form various products. A T-molding **256**, and its optional associated track **256** (FIG. **21**), can be formed by separating assembly **250** at breakaways **254**B and C. Two end moldings **257** (FIG. **22**) can be produced by separating assembly **250** at breakaways **254**A, B and C.

[**0128**] Another embodiment of the generic molding of the invention is shown as generic molding **300** (FIG. **23**). The generic molding **300** is a breakaway version with multiple horizontal sections for forming a versatile molding capable of being used for a large range of finished flooring thicknesses. This version can be an extrusion or other milled or shaped material such as HDF, MDF, composites, metal, wood or plastic. A core **301** of the generic molding **300** can also be manufactured from any structural material discussed herein in connection with other embodiments of the invention. Similarly, a finished surface material **302** covers at least a portion of the core **301** and preferably provides the generic molding **300** with a decorative outer surface, and may be any type of decorative surface discussed elsewhere herein. When in a desired configuration, the generic molding **300** is preferably installed with a track **303**, which track can include one or more gripping flanges **303**A which can interact with one or more gripping grooves **303**B (not shown) to help to maintain the generic molding in place. In a preferred embodiment, the generic molding **300** is provided with rounded shoulders **304**, formed as part of the core **301** or as an additional structure, which bears against legs of the track **303** to add support to each of the sections holding the generic molding **300** in place.

[**0129**] In order to use the generic molding **300** in various configurations, the generic molding **300** is typically provided with breakaways **305**A-D, to independently reduce the height of the core **301** of the generic molding **300** to form a T molding, end molding, CR or HSR as discussed herein, for a number of heights. Although shown with a particular number of removable sections on each side of the generic molding **300**, it is considered within the scope of the invention to increase or decrease the number, size and shape of the sections, such that, for example, the number of sections on one side is unequal to the number of sections on the other side.

[**0130**] The invention additionally includes a stair nose assembly **600** (FIGS. **33**A and **34**). In a first embodiment, the stair nose assembly **600** can be formed by joining a T molding (such as T-molding **6**, **220**, **255**, **400**, or T/End molding **104**) with a structure (such as end moldings **10** and **230**). The joint formed at the junction between the T-molding and the additional structure can be maintained by any means discussed herein, such as adhesive/glue or other chemical or mechanical element. By forming the elements of stair nose assembly **600** with matching décor, a uniform appearance can be achieved.

[**0131**] Preferably, however, stair nose assembly **600** is a unitary structure, sold as a single unit, consisting of a first section **601**, and a second section **602**, manufactured as a single structure. Typically, the stair nose assembly **600** includes a core **603** and a covering **604**, which are selected from the cores and covering materials discussed elsewhere herein. In one embodiment, the stair nose assembly **600** is provided with cuts **605**A-C which permit the stair nose assembly **600** to be used for other purposes after being separated at cuts **605**A-C. For example, dividing at cut **605**A produces an end molding **10**, while dividing at cut **605**B produces both an end molding **10** and a T-molding **6**. Dividing at cut **605**A and **605**C can produce an element which can be used as a quarter round or shoe molding **606** (FIG. **33**B).

[0132] An alternate stair nose assembly **610** can be formed by forming a carpet reducer **611**, substantially similar to the carpet reducer **7**, having a groove **612** in a lower surface thereof. By joining a stair nose attachment **613**, by inserting a tongue **614** thereof into the groove **612**, the stair nose assembly **610** can be formed. Similarly, stair nose assembly can be manufactured as a single piece by joining the carpet reducer **611** to stair nose attachment prior to adding the decorative surface thereof, or by forming the stair nose assembly **610** as a unitary structure, allowing for removal of stair nose attachment **613** at installation, at, for example, cut **615**. When removed, stair nose attachment **613** can be used as a shoe molding or quarter round molding.

[0133] Each of the stair nose assemblies **600** and **610** can be affixed directly to the subfloor with a mechanical, chemical or other attachment means as discussed herein. Alternatively, a track may be used to secure the stair nose assemblies **600** and **610**.

[0134] One preferred method for forming a generic molding element **650** is shown in FIGS. **35-37**. By this method, individual pieces are separately manufactured and held together in place by the covering material. In a first step, two end moldings **650**A and **650**B, a carpet reducer part **605**C and a hard surface reducer part **605**D are milled or otherwise shaped from a core material (as disclosed herein) and held together (FIG. **36**). This can be accomplished by, for example, using a clamp, other mechanical elements or a glue (sufficient to hold the pieces together until the covering is applied). Once the pieces are held together cuts **611-613** can be made, and thereafter, a covering **654** (as discussed herein) is applied. Through this method, the covering **654** (and optionally the glue) holds the generic molding element **650** together.

[0135] The molding of the invention can be produced by forming the generic structure, and providing cuts therein, before affixing the covering thereto. In one embodiment, the separable parts are completely removed from each other and can be held in place by a clamp or a mold, until the covering is affixed thereto.

[0136] In another embodiment, the covering can be affixed to the generic structure prior to the separable elements being formed. Typically, the cuts are formed in the underside of the structure, as the upper surface of the generic structure has the covering thereon.

[0137] In one embodiment, the invention uses a paper (with or without hard particles—e.g., having a Moh's hardness of at least about 4 or 6, preferably at least about 7, therein, which can be alpha-aluminum (alumina), silicon carbide, diamond, cerium oxide, zirconium oxide, and/or glass beads), and once printed, is impregnated with a thermosetting resin. The impregnated paper is then further combined with other layers and elements to form a laminate which can be bonded to a core material.

[0138] Suitable core materials include one or more of wood, fiberboard, such as high density fiberboard (HDF) or medium density fiberboard (MDF), polymer (thermosetting and thermoplastic), flaxboard, stone (e.g., ceramic, marble, slate), cardboard, concrete, gypsum, high density fiber reinforced plaster, veneers such as plywood, oriented strand board, cores made from particles (including discrete pieces of polymer or wood, which can be in the form of chips, curls, flakes, sawdust, shavings, slivers, stands, wavers, wood flour, wood wool and/or fibers), and other structural materials, such as metals (e.g., brass, aluminum, steel, copper, composites, composites or alloys). In some embodiments, the core material can be foamed (either open cell or closed cell), such as polyurethane. In still further embodiments, the core is made as a composite from multiple materials (such as those listed above), either as a heterogeneous mass, multiple layers or defined sections, e.g., upper and lower veneers covering a core of particles. Any of the above materials may also be provided with antistatic or antibacterial properties, e.g., by the inclusion of silver flakes, powders or particles, carbon black, ceramics, or other metals or alloys. Preferred plastics include extrudable and/or moldable thermosetting and thermoplastic resins, the latter including high density olefins and polyvinylchloride.

[0139] This laminate may also be covered with other types of coverings, such as foils (such as metal, paper or thermoplastic foils), paints or a variety of other decorative elements, including, but not limited to wood veneer, ceramic, metal, vinyl or other decorative materials.

[0140] In anther embodiment, the décor is provided on the core material itself, i.e., without the paper layer, e.g., as described by, e.g., U.S. Pat. No. 6,465,046 (herein incorporated by reference in its entirety). In one embodiment, the core is optionally provided with a primer and/or a base color, on which the decorative pattern or display is printed or otherwise generated. While the term "pattern" is used herein, it is to be understood that "pattern" need not be or include any repeating units, thus "pattern" is simply a visual and/or textual display. Once the décor is complete, the printed décor can be covered with a wear layer, thereby giving the décor abrasion and/or scratch resistance. The wear layer can be provided in the form of a sheet of alpha-cellulose which is bonded to the core, or it can be applied in a liquid form, and is typically provided with hard particles as described herein. The wear layer can include melamine-formaldehyde, urea-formaldehyde, maleamid, lacquers, acrylic resins, and/or urethanes.

[0141] Often, the result of the printing process of the invention resembles a natural or synthetic object, such as wood or wood tiles or boards, ceramic (e.g., tiles), stone (including marble and granite, such as tiles), or fantasy patterns (i.e., those not found in nature), including a monochromatic or random field.

[0142] Moreover, the invention can have a texture which enhances the pattern of an underlying printed image. Such texturing can be created to be "in register" with, offset from, or to contrast with the image of the paper sheet. Such texturing may be created by physical pressing, e.g., embossing (as taught by U.S. application Ser. No. 10/440,317 (filed May 19, 2003), U.S. Pat. No. 7,003,364, and WO9731775 and WO9731776) or chemically created (as taught by U.S. Pat. No. 6,991,830). The texture can be selected by the installer to enhance (e.g., match or contrast with) any texture of adjacent or included surfaces. The texture may also be provided on the decor such that features of the texture extend from a flooring element onto and possible completely across the adjacent flooring elements, which texture may, or may not coincide with the underlying décor. Each of the documents discussed in this paragraph are incorporated herein in its entirety.

[0143] The invention is typically used in the construction of a surface, such as a top for a counter or table, floor, ceiling, or wall. Such surfaces are often found in residential structures (e.g., single and multi-family houses, condominiums, townhomes, co-operatives, apartments, and lobbies of such buildings), commercial structures (e.g., retail stores, strip malls, shopping malls, office buildings, hotels, restaurants, supermarkets, banks, churches, airports and other transit stations), public structures (e.g., stadiums and arenas, schools, museums, theaters, post offices, hospitals, courthouses and other government buildings), as well as industrial structures (e.g., manufacturing plants, mills, and warehouses) and surfaces of vehicles (e.g., ships. trains, aircraft, public and private busses, cars and other motor vehicles).

[0144] It should be apparent that embodiments other than those specifically described above may come within the spirit and scope of the present invention. Hence, the present invention is not limited by the above description.

We claim:

1. A method for forming an integral multi-purpose structure for forming flooring transitions comprising:

providing a unitary core having an outer surface;

imparting to the outer surface of the core at least one cuts thereby defining a plurality of break-away sections in the core, wherein the cuts are sized, shaped and positioned such that removal of a break-away section of the core transforms the structure into a flooring transition; and

covering at least a portion of outer surface of the core having the at least one cut therein with a decorative material.

2. The method of claim 1, wherein the providing comprises placing the cuts such that removal of a break-away section transform the core into a flooring transition selected from the group consisting of a hard surface reducer, carpet reducer, T-molding, end molding, quarter-round, shoe molding, wall base and stair nose.

3. The method of claim 1, wherein the decorative material at least partially covers a cut in the core.

4. The method of claim 1, wherein the imparting step comprises at least one selected from the group consisting of milling and cutting.

5. The method of claim 4, wherein the cutting comprises using a blade or a laser.

6. The method of claim 1, comprising inserting a supporting material into a cut before the covering step.

7. The method of claim 1, wherein the core comprises an interlayer positioned between the plurality of break-away sections.

8. The method of claim 1, wherein the core comprises a material selected from the group consisting of fiber board, particle board, oriented strandboard, plywood, plastic, wood, engineered wood, metal, composites, gypsum, high-density reinforced plaster, and cork.

9. The method of claim 1, wherein the decorative material is printed at least partially directly on the core to provide a decorative pattern.

10. The method of claim 1, wherein the decorative material comprises a patterned paper sheet.

11. The method of claim 1, wherein the decorative material comprises a wear layer comprising hard particles having a Moh's hardness of at least approximately 6.

12. The method of claim 1, wherein the decorative material comprises a wear layer comprising particles selected from the group consisting of silica, alumina, diamond, silicon nitride, aluminum oxide, silicon carbide, cerium oxide and glass beads.

13. A method of forming a flooring transition comprising:

providing an integral multi-purpose structure, the structure comprising:

a unitary core;

cuts in the core, defining a plurality of break-away sections in the core; and

a decorative material covering at least a portion of the core and the cuts; and

severing the decorative material over the cuts in the core; and

removing at least one break-away section.

14. The method of claim 13, wherein the flooring transition is selected from the group consisting of hard surface reducer, carpet reducer, T-molding, end molding, quarter-round, shoe molding, wall base and stair nose.

15. A tool for severing a multi-purpose structure into a flooring transition comprising:

a housing defining an interior space for receiving the structure;

a first blade position along a first side of the tool for severing the structure along a first axis;

a second blade position along a surface of the tool different from the first side for severing the structure along a second axis; and

a blade located in the first blade position.

16. The tool of claim 15, further comprising a second blade located in the second blade position.

17. The tool of claim 17, further comprising a third blade located in a third blade position for cutting the structure along a third axis, wherein the third blade position is substantially perpendicular to the first blade position and substantially parallel to the second blade position.

18. The tool of claim 15, wherein the first blade position is substantially perpendicular to the second blade position.

19. The tool of claim 15, further comprising means for moving the blade from the first blade position to the second blade position.

20. The tool of claim 15, further comprising means for moving the blade from an operative position to an inoperative position,

21. A kit comprising:

the tool of claim 15 and

an integral multi-purpose structure, the structure comprising:

a unitary core;

cuts in the core, defining a plurality of break-away sections in the core; and

a decorative material coving at least a portion of the core and the cuts;

wherein at least one of the blade positions corresponds to the locations of a cut when the structure is moved through the interior space.

22. The kit of claim 21, further comprising a clamp or track.

23. A flooring transition formed according to the method of claim 1.

24. A unitary structure for forming a flooring transition comprising:

a unitary core having an outer surface and cuts penetrating the outer surface, and

a decorative material covering a portion of the outer surface and the cuts,

wherein the cuts are sized, shaped and positioned to define a plurality of break-away sections in the core, such that removal of a break-away section of the core transforms the structure into a flooring transition.

25. The structure of claim 24, wherein the core comprises a top face and two opposite lateral faces, and wherein each of lateral faces and the top face comprise a cut.

26. The structure of claim 25, wherein at least one of the lateral faces comprises a plurality of cuts.

27. The structure of claim 24, wherein the core comprises a material selected from the group consisting of fiber board, plastic, wood, engineered wood, metal, composites, gypsum, high-density reinforced plaster, and cork

28. The structure of claim 27, wherein the core comprises fiber board.

29. The structure of claim 24, wherein the decorative material comprises one selected from the group consisting of a foil, laminate, wood, wood veneer, ceramic, tiles, metal, vinyl, stone, paper, composite, and plastic.

30. The structure of claim 24, wherein the decorative material comprises:

a patterned paper sheet impregnated with a thermosetting resin; and

a wear layer, the wear layer comprising hard particles having a Moh's hardness of at least approximately 6.

31. The structure of claim 24, wherein the decorative material comprises a wear layer comprising particles selected from the group consisting of silica, alumina, diamond, silicon nitride, aluminum oxide, silicon carbide, cerium oxide and glass beads.

32. The structure of claim 24, wherein:

the core comprises fiber board and

the decorative material comprises:

a patterned paper sheet impregnated with a thermosetting resin; and

a wear layer, the wear layer comprising hard particles selected from the group consisting of silica, alumina, diamond, silicon nitride, aluminum oxide, silicon carbide, cerium oxide and glass beads.

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