Dec. 14, 1965 W. N. WILBURN 3,223,056

TABLE CONSTRUCTION

Filed Nov. 25, 1964

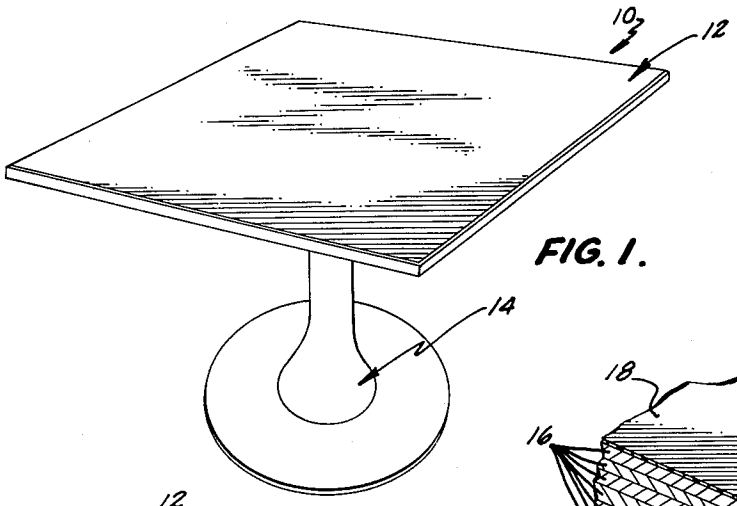


FIG. 1.

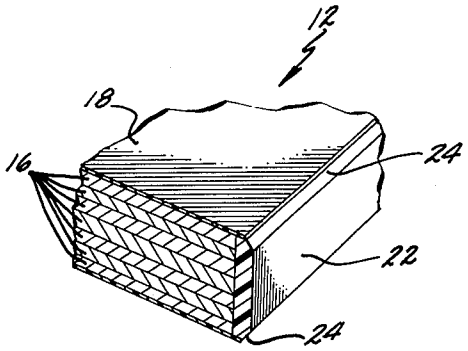


FIG. 2.

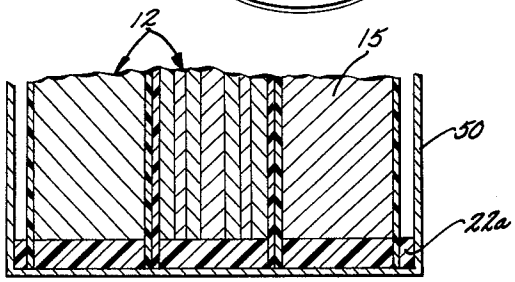


FIG. 5.

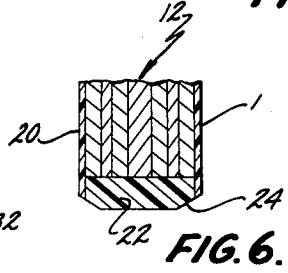


FIG. 6.

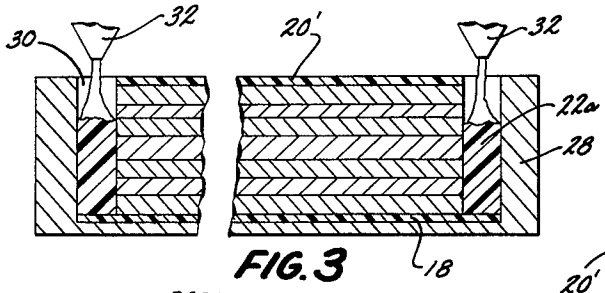


FIG. 3

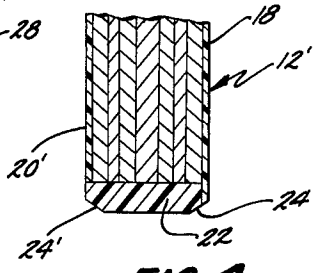


FIG. 4.

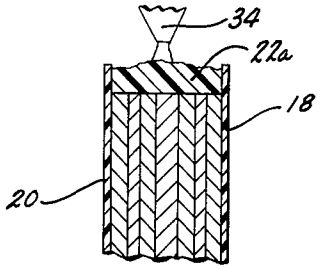


FIG. 7.

INVENTOR.
WILLIAM N. WILBURN
BY Price & Heneveld
ATTORNEYS

United States Patent Office 3,223,056 Patented Dec. 14, 1965

3,223,056

TABLE CONSTRUCTION

William N. Wilburn, Grand Rapids, Mich., assignor to Wilburn Company, Grand Rapids, Mich., a corporation of Michigan

Filed Nov. 25, 1964, Ser. No. 416,191
1 Claim. (Cl. 108—150)

This is a continuation-in-part application of my copending application entitled Construction for Supporting Surface, filed March 13, 1963, Serial No. 264,882, now abandoned.

This invention relates to tables, and more particularly to panel edge construction for table top panels.

Table tops having a decorative veneer top sheet conventionally have a peripheral veneer edge strip covering the panel core. These edge strips often become damaged and dislodged after a relatively short period of time. This is especially true in institutions such as colleges, hospitals, schools and dormitories where the tables are treated roughly, both by banging their edges together or against the walls, or by sliding them along the floor on one edge when students are clearing the room. Consequently, the edge strip becomes chipped, loosened and/or peeled to create an unsightly appearance. Ordinarily, the remainder of the table is still in excellent condition, but loses its attraction due to the edge damage. Often however, the upper veneer also tends to peel along its edge with damage of the edge strip. Therefore, a constant expense and nuisance exists today to periodically recondition these damaged edges. To achieve this, the panels must either be returned to the factory, or a special expensive crew of workmen must travel to the place where the panels are utilized.

Consequently, although a veneer covered furniture panel provides an attractive and generally durable unit today for various purposes, their edges constitute a definite Achilles heel that shortens the useful decorative life of the entire panel, unless periodically refinished at a substantial expense.

It is therefore an object of this invention to provide a panel edge construction that eliminates the readily damageable characteristics of the conventional panel edge, and extends the life of the edge to a value at least equal to, and normally greater than the remainder of the panel itself.

It is another object of this invention to provide a panel edge construction having excellent aesthetic appeal, as well as providing a unique bumper along the edge capable of withstanding abuse.

It is a further object of this invention to provide a table top that can be bumped against other table tops or against the wall, etc. with tremendous impact without the slightest damage to the panel edge or veneer, either structurally or aesthetically. It can even be skidded along the floor on one edge without any noticeable damage to the edge.

Another object of this invention is to provide a door having an edge construction that absorbs bumping or abuse by carelessly wheeled hospital beds or such other equipment without any noticeable damage.

A still further object of this invention is to provide a method of forming a protective decorative bumper strip on furniture panels such as table tops, doors, countertops and the like without the formation of any air pockets in the strip, providing permanent bonding, enabling manufacture using relatively inexpensive techniques, and extending the useful life of the panel, yet without any periodic reconditioning of the edges.

These and other objects of this invention will be apparent upon studying the following specification in conjunction with the drawings in which:

FIG. 1 is a perspective view of a table employing the panel as a table top;

FIG. 2 is an enlarged, sectional, perspective view of a portion of the panel;

FIG. 3 is a side elevational, sectional fragmentary view illustrating one method of formation of the panel;

FIG. 4 is a fragmentary, sectional, elevational view of a second form of the panel;

FIG. 5 is a fragmentary, sectional, elevational view of a second method of forming the panel;

FIG. 6 is an enlarged, side, sectional, elevational view of the panel illustrated in FIG. 2; and

FIG. 7 is an enlarged, sectional, elevational fragmentary view illustrating a third method of forming the panel.

The novel panel **12** illustrated in FIG. 1 serves as a table top supported by a base **14** to form the completed table **10**. The base is recessed laterally beneath the top so that the top extends beyond it around its periphery.

The panel **12** has a core which may be formed of laminated construction with a series of layers **16**, or alternatively of a solid core **15** (FIG. 5) of hollow core. The rigid core is the main portion of the table top. It includes a thin flexible veneer sheet **18** on the top for decorative effects, and preferably a lower thin veneer sheet **20** on the bottom to cover the rough bottom core surface. Since "top" and "bottom" are relative terms, the veneer cover layers are more accurately on "opposite sides" of the panel.

The layers **16** may, and usually do, comprise sheets of wood bonded together with a suitable adhesive in conventional manner to form a rigid core. The core may alternatively comprise a chipped core of flaked core, a veneer core, a hardboard core, a lumber core, or others such as plastic and metal.

The thin veneer cover sheets **18** and **20** may comprise a resin-impregnated sheet of wood, paper, cloth or synthetic material in solid or woven form. It is thin, flexible, and of itself has little strength. The veneer is adhesively bonded to the surface of the core, preferably with an unsaturated polyester resin adhesive having up to about 100% solids. The polyester may be formed from conventional components of dihydric alcohol and a dibasic acid. The alcohol may be a glycol of ethylene, propylene, 1,3- or 2,3-butylene, diethylene or dipropylene. The acid may be a saturated dibasic acid such as terephthalic, isophthalic, adipic, azalaic, phthalic anhydride, or in some instances, an unsaturated dibasic acid such as maleic anhydric or fumaric acid. These materials are conventionally used for such purposes and may be substituted by any of several other suitable adhesives such as an epoxy resin formed conventionally from epichlorohydrin and bisphenol A, or epoxy-polyamide copolymers. Other suitable thermo setting resins may also be used instead of the ones described above.

The veneer sheets themselves will flex and curve with little stress. However, the porous material that is saturated with resin to form the veneer sheets **18** and **20** acquires a relatively stiff characteristic sufficient so that, even though the free sheet will flex before assembly, once they are bonded to the core they are self-supporting when positioned to protrude a small amount past the edges of the core, and the overlapping edges, though friable, will hold their position. This is used to form a cavity "mold" for the protective resin when still fluid. That is, the veneer layers, when adhered to the core and protruding approximately ½ inch more or less beyond the peripheral edge of the core, define a gap therebetween. According to this invention, this gap or recess is filled with a curable resinous composition which will form a

sturdy, wear-resistant, acid-resistant, water-resistant, non-corroding, rigid bumper strip having only slight resilience. The edge also has excellent aesthetic qualities, especially when provided with one of any selected colors to match the room decor. This novel bumper **22** is provided around the periphery of the panel.

The edge is formed by casting or molding the resin in place on the panel. This casting in place has been found, after extended experimental use, to be very important to prevent the formation of any air bubbles beneath the plastic adjacent the core, and to achieve good bonding. The uncured fluid resin is held in place and thereby confined between the protruding edges of the veneer sheets, enabling it to bond securely to both the veneer sheets and to the core, while simultaneously assuming the proper dimension and shape. The bond is especially secure if the material has an epoxy resin base due to the excellent bonding characteristics of epoxy resins. Several different epoxy resins are satisfactory for this use, with the preferred one being formed from conventional components of epichlorohydrin and bisphenol A. Suitable catalysts may be used such as the Lewis acid type, including boron trifluoride and its complexes. Straight epoxy resins may also be utilized, but since these normally require elevated temperatures for curing, they are not preferred.

Also, a copolymer of epoxy-polyamides may be employed. Both have a hard, durable characteristic.

Instead of the preferred poly epoxy, with its excellent adhering qualities as well as its wear resistance and aesthetic appeal, a suitable polyester may be employed. This polyester may be from conventional components of a dihydric alcohol and a dibasic acid as described above with respect to the adhesive to be employed for the veneer sheets. Typical catalysts may be used with the polyester resins such as an organic peroxide or a hydroperoxide. A 2% addition of methyl ethyl ketone peroxide is preferred. Accelerators such as cobalt naphthenate, alkyl mercaptans and dialkyl aromatic amines in amounts of approximately ½% in a 6% solution may be added to the catalysts. Obviously these percentages and particular components will vary with the desired curing time and curing temperature, in accordance with presently known technology.

Instead of the poly epoxy, poly epoxy-polyamine, or polyester materials described above, certain other thermosetting materials may be used for this purpose. An example of these are the polyurethane resins conventionally formed from ethylene glycol or other di or poly hydroxy organic materials, and a diisocyanate such as tolylene diisocyanate or castor oil diethanolimine diisocyanate. Equivalent materials useful for this purpose will of course require good bonding characteristics, excellent wear qualities, and aesthetic appeal. These resins may be reinforced by a suitable fibrous agent such as fibrous glass, nylon or the like in random form embodied in the resin. Such reinforcement is not normally necessary however.

In order to form the novel edge strip, one of three of the modifications of the novel method illustrated in FIGS. 3, 5 and 7 may be employed.

Referring to FIG. 3, in this form of the invention only the upper veneer sheet **18** protrudes beyond the edge of the core, while the lower veneer sheet **20'** has its edges coincident with the edges of the core. This assembly is surrounded by a mold **28** which abuts the edges of the extending veneer sheet **18** to form closed cavities **30** between the core and the mold **28** having an open upper end. Subsequently, the uncured resin **22***a* is cast, injected or poured from injector **32** into this peripheral space **30** around the core to fill this space. It bonds securely to the veneer sheet **18** and the core as it cures. After the resin is at least partially cured to a self-supporting state, the mold is removed to allow complete curing of the edging either at elevated or room temperatures, depending upon the catalyst used, the polymer or copolymer employed and other operational factors. The cured polymeric edge projects beyond the veneer sheets.

The corners of the panel edge may be purposely beveled as illustrated at **24** and **24'** in FIG. 4, so that each bevel **24** recesses the protruding edge of the adjacent veneer strip **18** to prevent it from being bumped and thereby peeled from the remainder of the panel or chipped. Consequently, the most protruding portion constitutes the rigid resin material which can absorb bumps or be slid along the floor without damage to the decorative veneer sheet. Preferably the lower corner **24'** is also beveled as illustrated for protection of the lower veneer sheet against peeling and chipping, for symmetry of design, and for maximum wearing capacity.

Instead of forming a flat edge and beveling it to cause the bumper edge protrusion beyond the decorative veneer, this same result can be achieved by initially providing a protruding plastic portion with a generally convex cross sectional configuration. This can be achieved by employing a flexible mold having a peripheral concavity to form the resin.

In the form of the invention where both of the veneer strips **18** and **20** protrude beyond the edge of the core, one of the methods illustrated in FIGS. 5 and 7 is employed.

Referring to FIG. 5, a series of the panels are abutted together side to side, and lowered end wise into a tank **50** containing uncured liquid resin **22***a* in the bottom thereof to a depth at least as great as the depth of the cavity or gap between the veneer sheets. The resin material is allowed to cure or otherwise solidify sufficiently to cause it to bond and adhere to the core and inside of the veneer sheets sufficiently to retain this position. In order to prevent any permanent bonding from occurring between the resin and the outside of the decorative veneer sheets, a suitable releasing agent may be coated thereon.

The panels are then removed from the vat **50**, and the resin is completely cured at room or elevated temperatures. Then the corners of the edging are beveled at **24** (FIGS. 2 and 6) to recess the veneer sheets **18** and **20**, and cause all bumping and wear to occur on the resin rather than upsetting the decorative cover sheet.

In the method illustrated in FIG. 7 the panel is set upright with the veneer sheets **18** and **20** forming an open-topped cavity into which the uncured resin **22***a* is injected from a suitable injecting means **34**. When this is filled to the level of the protruding edges of the veneer sheets, it is cured completely, and the edges are subsequently beveled as at **24** in FIGS. 2 and 6.

The cured resin does not extend above the upper plane surface of the panel, nor below the lower panel surface. It in effect is an integral part of the panel with its base embedded within the confines of the panel, and its edge face protruding laterally beyond the outermost portions of the panel veneeer. It will be realized that the specific configuration of the overall panel may vary greatly to include square, rectangular, circular, ovular or others without departing from the method or structure taught. With curved edges, the method of FIG. 3 with only one overlapping veneer sheet, and a peripheral mold is preferred.

Certain other obvious modifications may be made in this inventive construction and to this method within the skill of the ordinary designer without departing from the principles taught, once this invention is understood. These principles enable, for the first time as far as is known, a table panel edge construction having excellent wear qualities as well as optimum attractiveness. The panels are presently being received with great enthusiasm by larger institutions such as colleges and universities. The inventive structures, methods, and their obvious modifications within the principles taught, are deemed to be part of this invention, which is to be limited only by the scope of the appended claim and the reasonably equivalent structures and methods to those defined therein.

I claim:

A table construction comprising: a base; a table top supported on said base; said top including a rigid core

forming the main portion of said top, a thin bottom surface sheet under and bonded to the bottom surface of said core, and a decorative flat veneer sheet overlying, covering, and bonded to the upper surface of said core; said sheets both having portions extending beyond the entire peripheral edge of said core around the periphery of said table top, forming a peripheral cavity; said portions being in the same planes as their respective sheets; a cast-in-place, cured, peripherally extending, rigid resin edge filling said cavity, and bonded to the peripheral edge of said core, to the under surface only of the overlapping portions of said veneer sheet, and to the upper surface only of the overlapping portion of said bottom sheet to rigidify the overlapping sheet portions and prevent flexure thereof, while the sheet portions contain the resin only between them, with said resin having a vertical thickness equal to that of said core; said cast resin and sheet overlapping portions having generally beveled finished surfaces at their end junctures; said resin edge protruding laterally outwardly beyond both of said sheet portions around the entire table top periphery, forming a decorative visible rigid peripheral bumper preventing contact again and peeling and chipping damage to said sheets with bumping of said table by another like table, and preventing flexure of said edge portions transverse to their respective planes.

References Cited by the Examiner

UNITED STATES PATENTS

753,641	3/1904	Shepherd	156—293 XR
1,444,405	2/1923	Wagemaker	161—44
1,936,113	11/1933	Jelliffe	20—74
2,278,331	3/1942	Meyercord	161—44
2,717,187	9/1955	Morgan et al.	20—15
2,734,789	2/1956	Wilson	20—15
2,813,766	11/1957	Shumaker et al.	20—15

FOREIGN PATENTS

229,750	8/1960	Australia.

ALEXANDER WYMAN, *Primary Examiner.*

W. A. POWELL, JACOB STEINBERG, *Examiners.*