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Newell

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[54] **ENTRANCE DOOR AND METHOD OF CONSTRUCTION**

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[51] **Int. Cl.** **B32b 21/14**

[58] **Field of Search** ..... 161/38, 36, 145; 52/313, 52/455, 615; 156/182; D13/1 M

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[57] **ABSTRACT**

A door with decorative paneling thereon is constructed by forming a composite sheet of paneling on a flat working surface from pieces of hardboard which form the stile and rail portions as well as the decorative panel portions of the paneling. Strips of adhesive tape applied along the division lines of the pieces of hardboard enable the composite sheet to be handled as a unit. After the composite sheet of paneling has been placed over and glued to the surface of an understructure provided for the door, the strips of adhesive tape are removed. Grooves are then formed along the edges of the pieces of hardboard forming the decorative panel portions of the paneling.

6 Claims, 10 Drawing Figures

FIG. 1

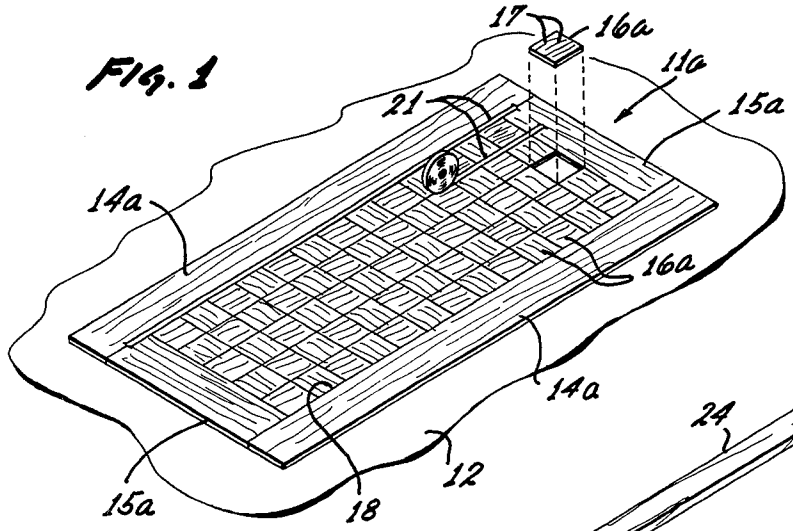
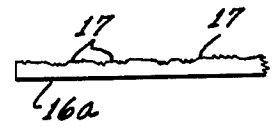


FIG. 1a



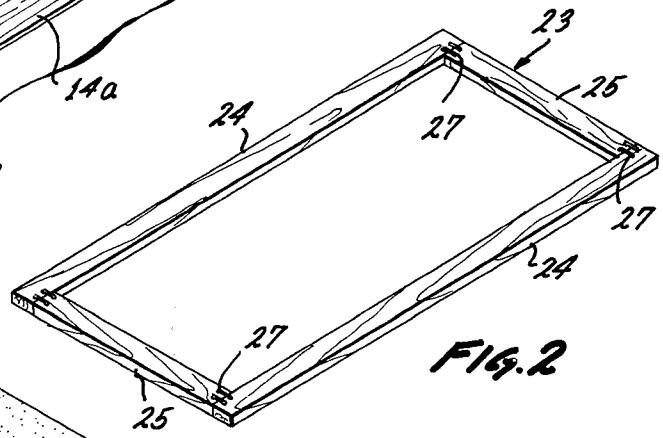


FIG. 2

FIG. 3

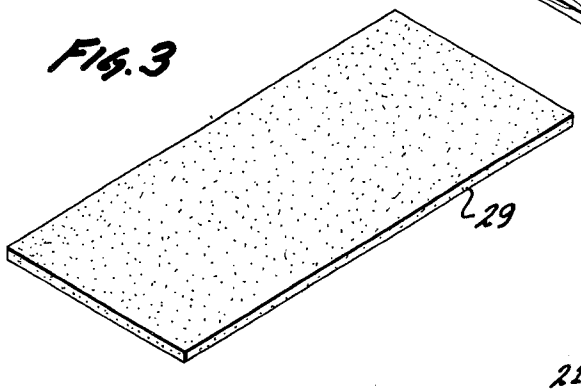


FIG. 4

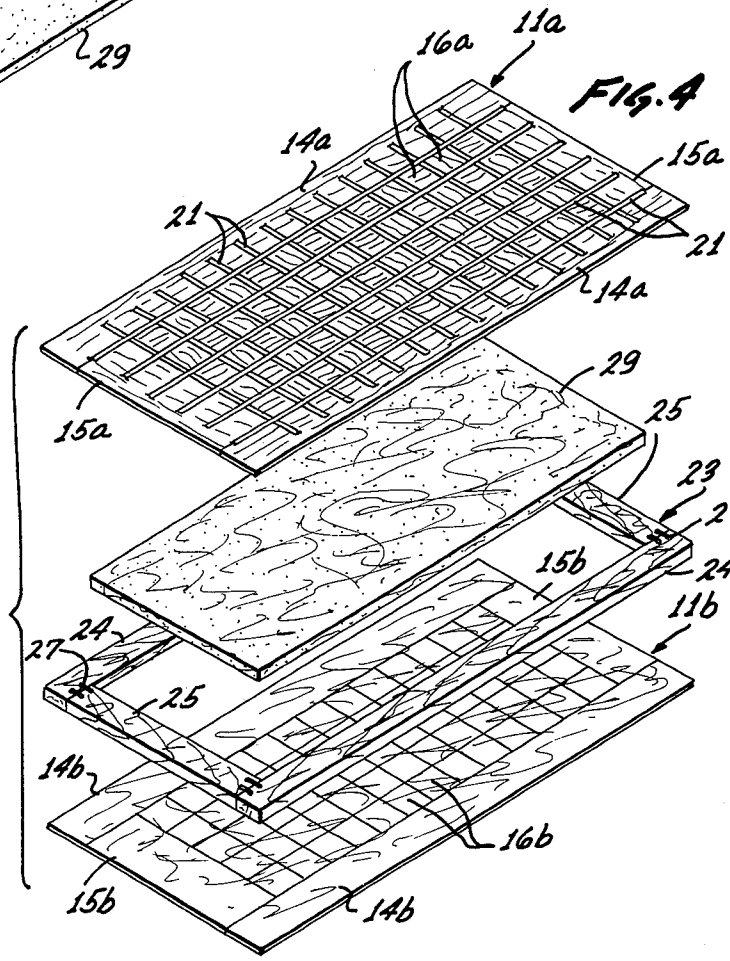


FIG. 5

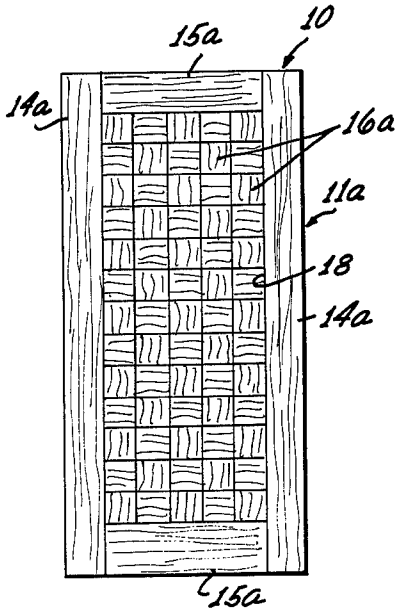


FIG. 6

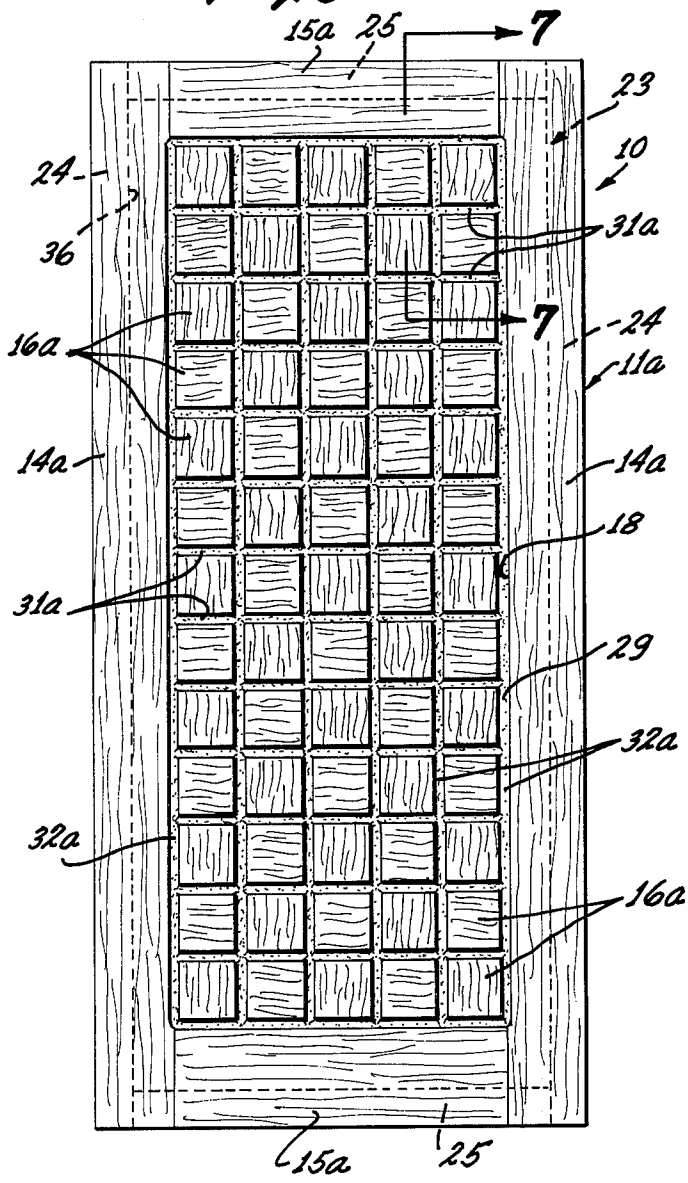


FIG. 7

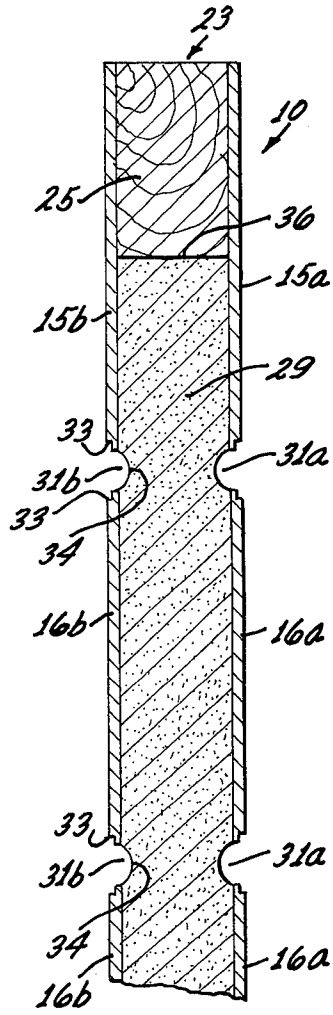


FIG. 8

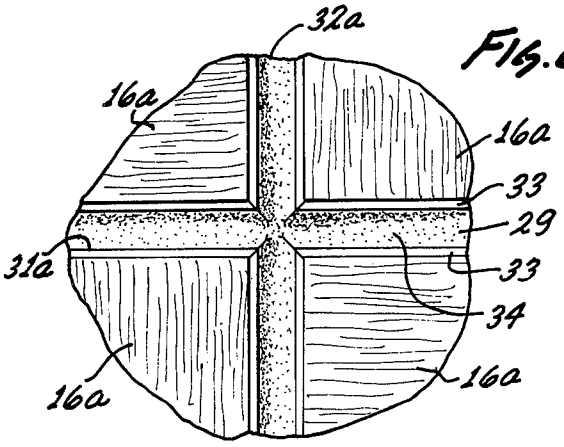
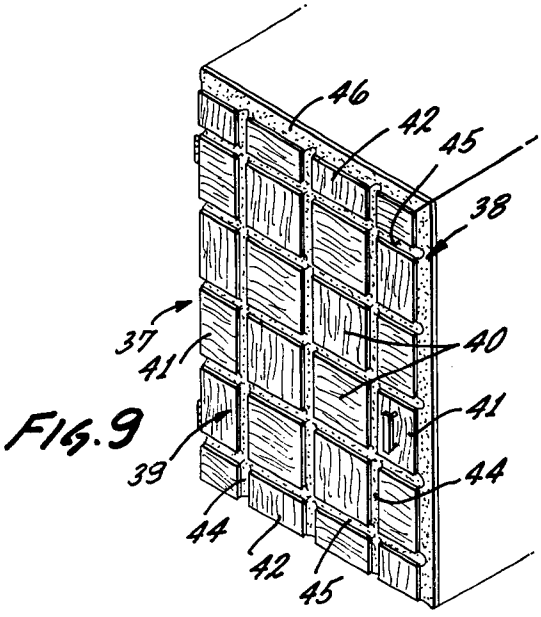


FIG. 9



ENTRANCE DOOR AND METHOD OF CONSTRUCTION

This invention relates to improvements in the construction of entrance doors, and, more particularly, to a novel structural arrangement and method of providing decorative paneling on such doors.

It is highly desirable to provide an entrance door with panels on the surface thereof for the purpose of decorating the door. Such decorative panels may be formed by carving them out of the surface of solid wood boards from which the door is made. However, because of the labor involved, such a manner of forming the panels is quite costly and can only be used for constructing the more expensive doors. As an alternative, these decorative panels can be in the form of individual pieces of wood that may be held on the surface of the door by glue. This manner of forming the panels is less expensive, but when a large number of such individual panels are provided on the surface of the door, the setting of them one at a time relative to each other in a spaced relation is time consuming and costly.

Accordingly, an object of the present invention is to provide an entrance door with decorative paneling that can be economically manufactured.

Another object of the present invention is to provide an improved process which simplifies and facilitates the setting of decorative paneling on the surface of the understructure of an entrance door.

A further object of this invention is the provision of an improved process for paneling the surface of an entrance door with a plurality of small panel members grouped and arranged in patterns of diverse grain directions.

A still further object of the invention is to provide an improved entrance door structure which includes on the surface thereof paneling comprised of a plurality of grain embossed hardboard panel members grouped and arranged in patterns of diverse grain directions.

Briefly, in accordance with the present invention, a rectangular composite sheet of paneling for an entrance door is assembled on a flat working surface by laying down a pair of stile panel members and a pair of rail panel members to form the four marginal sides of the sheet of paneling and thereby define a rectangular, open, central section. The grain of the stile panel members runs longitudinally of the sheet and the grain of the rail panel members runs laterally thereof. A plurality of decorative panel members are then laid down in abutting relation in the open, central section of the sheet with adjacent ones of the panel members having a diverse grain direction. Strips of adhesive tape are applied along the division lines of the panel members to enable the composite sheet of paneling to be handled as a unit. The entire sheet of paneling is then placed on and glued to the surface of the understructure for the door. The assembly is held together until the glue dries, after which the strips of tape are removed. Grooves are then formed along the lines of division which include the decorative panel members to give them the desired effect of having been set on the surface of the door with a spaced relation.

These and other object, advantages and features of the present invention will become apparent from consideration of the following description and claims when taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective view of a plurality of panel members laid down in abutting relation on a flat working surface;

FIG. 1*a* is an edge view of one of the panel members;

FIG. 2 is a perspective view of the wood frame for the door;

FIG. 3 is a perspective view of the particle wood core supporting structure for fitting in the frame of FIG. 2;

FIG. 4 is an exploded view showing the component parts of the door;

FIG. 5 is a front elevation view of the door assembly of FIG. 4;

FIG. 6 is a front elevation view of the door assembly showing the grooves formed on the paneling thereof;

FIG. 7 is an enlarged cross sectional view of a portion of the door assembly as taken along line 7—7 of FIG. 6;

FIG. 8 is an enlarged, fragmentary view of the intersection of the grooves formed on the paneling; and

FIG. 9 is an alternative embodiment of a door for a cupboard;

Referring to FIG. 1 of the drawings, a rectangular composite sheet of paneling **11***a* for the entrance door **10** of the present invention is shown lying on a flat working surface **12**. The pieces of the paneling **11***a* include two long, rectangular stile members **14***a*, two shorter, rectangular rail panel members **15***a*, and a plurality of small square panel members **16***a*. These panel members are cut from large, thin, sheets of hardboard. The hardboard is a commercially available product of the type that is manufactured by tearing pieces of wood into its basic fibers and then compressing the fibers into sheet form with a grain structure embossed on the surface thereof. The grain structure generally extends in a direction parallel to one side of the sheet. Thus, each of the two rectangular stile panel members **14***a* and the two rectangular rail members **15***a* are cut such that its grain structure runs generally along the length thereof. Likewise, each of the plurality of square panel members **16***a* is cut such that its grain structure runs generally parallel to a side thereof. FIG. **1***a* is an edge view of one of the panel members **16***a* showing the embossed grain **17** standing out of the surface thereof.

As seen in FIG. **1**, the two stile panel members **14***a* and the two rail members **15***a* are laid down on the working surface **12** to form the four marginal sides of the composite sheet of paneling **11***a* and thereby define a rectangular, open, central section **18** in the paneling. The square panel members **16***a* are laid down within the central section **18** in a side-by-side relation with adjacent ones of the panel members **16***a* oriented with their grain embossed surface at **90°** to the next, as shown.

Strips **21** of flexible tape consisting of a narrow web having an adhesive on one side thereof, such as conventional masking tape, are then applied along the division lines formed by the adjacent sides of the aligned juxtaposed panel members **14***a*, **15***a* and **16***a*. It should be noted that the strips **21** of the adhesive tape lay, in the manner previously described, over the grained surfaces of the panel members and serve to hold them together such that the composite sheet of paneling **11***a* can be handled for processing as a unit.

Although only one composite sheet of paneling **11***a* is shown in FIG. **1**, in the preferred embodiment of the paneled door **10** disclosed herein, an additional composite sheet of paneling **11***b* (FIG. **4**) is provided which

is formed of identically shaped panel members **14***b*, 15*b* and **16***b* that are similar held together by strips **21** of adhesive tape.

A rectangular frame **23**, as shown in FIG. **2**, is formed of longitudinal and lateral wood sidings **24** and **25**. The wood sidings are held together at their corners by metal staples **27**. A rectangular core **29** made of compressed sawdust, is positioned within frame **17**, to form the understructure of the door **10**.

FIG. **4** shows an exploded view of the component parts from which the entrance door **10** is fabricated. These parts include the taped front composite sheet of hardboard paneling **11***a*, the wood frame **23**, the particle core **29**, and the taped back composite sheet of hardboard paneling **11***b*. It should be noted that the paneling **11***b* is shown in its inverted position with its flat, untaped, surface facing upwardly.

To assemble the component parts of the door **10**, the composite sheet of paneling **11***b* is placed with its taped embossed grain surface lying against a flat working surface. The core **29** is then placed within the central opening of the frame **23**, and a layer of glue is spread over the bottom surface of the understructure so formed. The understructure is then placed with its glued surface on top of the composite sheet of paneling **11***b*. A layer of glue is then spread over the opposite surface of the understructure and the composite sheet of paneling **11***a* is then placed with its under surface over this opposite surface of the understructure.

It should be noted that the composite sheets of paneling **11***a* and **11***b* have an outside dimension that is approximately the same as the outside dimension of the frame **23**. Such a construction facilitates the aligning of the sides of the paneling and frame and thereby the positioning of one on the other.

The assembled component parts of the door **10** are then placed in a press wherein they are tightly held together under pressure until the glue has dried. The strips **21** of tape are then removed from along the abutting edges of the panel members **14***a*, 15*a* and **16***a* of the composite sheet of paneling **11***a* that is secured on one surface of the door **10**, and also from along the abutting edges of the panel members **14***b*, 15*b* and **16***b* of the composite sheet of paneling **11***b* that is secured on the other surface of the door.

As indicated in FIG. **5**, the four sides of the assembled door **10** are trimmed off a slight distance inwardly of the edges thereof for the purpose of squaring these sides with a smooth finish. As shown in FIG. **6**, a router (not shown) is then used to form lateral and longitudinal grooves **31***a* and **32***a*, respectively, which coincide with the lateral and longitudinal lines of division of the several panel members **16***a* forming the paneling **11***a*. The paneling **11***b* on the opposite surface of the door understructure is similarly provided with lateral and longitudinal grooves **31***b* and **32***b* which extend along the lines of division of the several panel members **16***b*. As illustrated in FIGS. **7** and **8**, the grooves **31***a*, 32*a* and **31***b* and **32***b* are each shaped to provide square side shoulders **33** on the edges of adjacent panel members, and have a curved bottom **34** which extends slightly into the particle core **29**.

It should be noted that making the core **29** wider and longer in dimension than the central section **18** defined by the stile and rail panel members **14***a* and **15***a* of the paneling **11***a*, for example, assures that the grooves **31***a* and **32***a* outlining the central section **18**, are not near the division line **36** defined by the abutting sides of the frame **23** and the core **29**, since, if these grooves were so located, the structure of the door would be weakened.

As noted in FIG. **6**, as a result of this form of constructing paneling on door **10**, the front and back surfaces of the understructure of the door **10** are effectively sheathed over the entire surface thereof by the coextensive composite skins or sheets of paneling **11***a* and **11***b*, respectively. This construction gives the appearance, because of the diverse directions of the grain of the stile and rail panel members, such as **14***a* and **15***a*, respectively, that these portions of the assembled door **10** are constructed from individual solid pieces of wood boards, in the manner of conventional stile and rail doors. Moreover, the plurality of decorative, panel members, such as **16***a*, on the front surface of the door appear, because of the grooves **31***a* and **32***a*, to be made of thick pieces of individual wood panels that have been set on the surface of the understructure in a separated relation. Furthermore, as a result of this groove construction, the diverse grained panel members **16***a*, 16*b* are effectively raised above the apparent plane of the particle core **29** to provide adequate modeling by light which greatly enhances their appearance.

It should be noted that the process of the present invention enables the open, central sections **18** of the respective door panelings **11***a* and **11***b* to contain any desired number of the same of differently sized panel members having diverse grain structure and thus giving a pleasing appearance to the door. It should be evident that the door **10** may, if desired, be constructed with a single large sheet of hardboard glued on the back surface thereof.

FIG. **9** shows an alternate embodiment of a door **37** constructed by the method of the present invention. The door **37** may be provided for a cupboard. It is formed from a particle core understructure **38**. In this embodiment, a composite sheet of paneling **39** is forming of a plurality of square panel members **40** on the central portion thereof, with narrower rectangular panel members **41** along the sides thereof, and with half-sized rectangular panel members, such as panel members **42**, along the top and bottom thereof. This design array of panel members is initially laid down on a flat working surface as previously described in connection with FIG. **1**, with the grain structure of the adjacent panel members oriented at **90°** with respect to each other for the purpose of bringing their surfaces in relief to provide a pleasing effect. Strips of tape (not shown) are then placed along the edges of the aligned panel members to hold them together. A layer of glue is then spread over the surface of the core understructure **38** and the composite sheet of paneling **39** is laid thereover. The door assembly is held together in a press until the glue is dried and the strips of tape are removed. Longitudinal and lateral grooves **44** and **45** are then cut along the lines of division of the panel members to give the appearance that the panel members **40**, 41 and **42** have been individually set on the core understructure with a spaced relation. The side edges **46** of the cupboard door **37**, including the edges of the understructure and the paneling **39**, may then be beveled, as shown.

While the procedure and the resulting product of the invention has been disclosed in detail, it is evident from the disclosure that some latitude in specific details is

permissable, and, accordingly, it is desired that the scope of the invention be restricted only in accordance with the definition of the invention as portrayed in the appended claims.

What is claimed is:

1. A method of constructing a door with paneling on the surface thereof, including the steps of

cutting a thin sheet of hardboard having a grain structure embossed on the upper surface thereof to provide a plurality of panel members,

laying said panel members down side-by-side on a flat working surface to form a rectangular composite sheet of paneling with the adjacent panel members in at least the central section of the composite sheet grouped and arranged in patterns of diverse grain direction,

laying strips of adhesive tape along the cracks of adjacent panel members to hold them together,

applying glue to a surface of an understructure for the door,

placing said composite sheet of paneling on said surface of the understructure,

pressing said composite sheet of paneling and understructure together until the glue dries, and

forming grooves along the horizontal and vertical side edges of said plurality of panel members in at least the central section of the composite sheet.

2. A method of constructing an entrance door with decorative paneling on the surface thereof, including the steps of

cutting two stile panel members, two rail panel members and a plurality of decorative panel members out of thin sheets of hardboard,

forming a composite sheet of paneling by laying the stile and rail panel members down on a flat working surface to form the four marginal sides of the sheet and thereby define a central opening section, and laying down the plurality of decorative panel members on said flat working surface in side-by-side relation within said central opening section with the grain of adjacent ones of these latter panel members oriented at 90° to each other,

placing strip of adhesive tape along the separating lines defined by the sides of the decorative panel members to hold the members together,

forming an understructure for the door from a rectangular wood frame having a particle wood core,

applying a glue on a surface of said understructure,

placing said composite sheet of paneling on said surface of the understructure,

pressing said composite sheet of paneling and understructure together until the glue dries, and

forming grooves along the horizontal and vertical side edges of said plurality of decorative panel members.

3. The method of claim 2 including the steps of

providing a similarly formed composite sheet of paneling on the opposite surface of the understructure of the door.

4. The method of claim 2 wherein said panel members are cut from sheets of compressed wood fiber having grain structures embossed on their surfaces.

5. The method of claim 2 wherein said plurality of decorative panel members are square shaped and identical in size.

6. An entry door comprising

an understructure for said door including

a wood frame, and

a wood particle core positioned within said frame,

a sheet of paneling secured to at least one surface of said understructure,

said sheet of paneling comprised of pieces of hardboard having an embossed grain structure on their surface running along a direction generally parallel to the side edges thereof, said pieces of hardboard including a pair of stile panel members and a pair of rail panel members arranged to form the four marginal sides of the sheet of paneling and thereby define a central opening section, the grain of the rail panel members running longitudinally and the grain of the stile members running laterally of the sheet, and

said sheet of paneling further comprised of a plurality of decorative panel members positioned in abutting relation within the central opening section thereof, each decorative panel member having its grain structure oriented at 90° to the grain structure of the adjacent decorative panel member, and

grooves formed along the edges of the plurality of decorative panel members.

* * * * *