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Seery

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[54] **HAND RAIL CONSTRUCTION**

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[52] **U.S. Cl.** ..... **428/44;** 144/315 R; 256/59

[51] **Int. Cl.²** **B32B 3/10**

[58] **Field of Search** ..... 161/36, 38, 69; 256/19, 256/59; 144/315 R, 318

[56] **References Cited**

UNITED STATES PATENTS

2,878,844	3/1959	Andersson	144/315
3,144,892	8/1964	Webster	144/318
3,525,620	6/1970	McPherson	161/38
3,730,820	5/1973	Fields et al.	161/38
3,813,842	6/1974	Troutner	144/317

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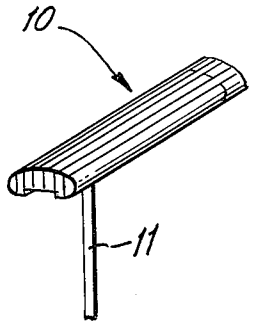
Attorney, Agent, or Firm—Arthur B. Colvin

[57] **ABSTRACT**

A construction is disclosed which is especially adapted for the production of elongated hardwood molding sections. The handrail is characterized by being composed of a plurality of elongated wood modules, rectangular in transverse section, aligned modules being formed into further elongated laminae by end to end butt joint connections therebetween formed during or before the laminating procedure. The handrail is constructed by bonding the sides of adjacent laminae to each other, the construction being characterized by the butt end connections in adjacent laminae, the composite being offset one from the other lengthwise of the handrail, whereby the staggered butt joint connections do not compromise the strength of the handrail. The modules from which the handrail is formed are preferably impregnated with a polymeric composition before lamination, whereby the same may be passed through a molding machine in conventional manner and thereafter polished or otherwise finished to provide a structure highly resistant to dents, scratches, etc.

1 Claim, 5 Drawing Figures

FIG. 1



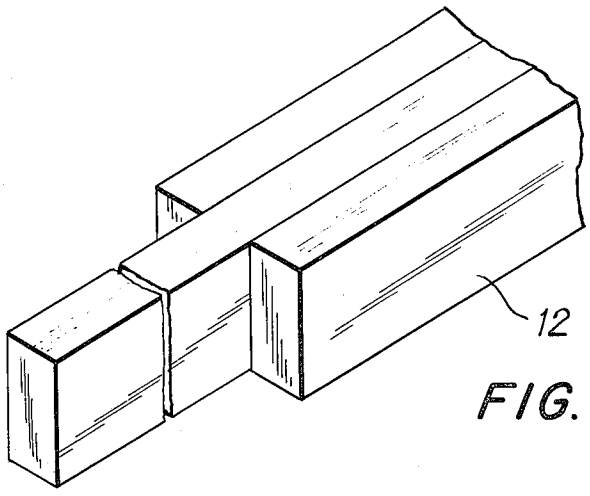


FIG. 5

FIG. 2

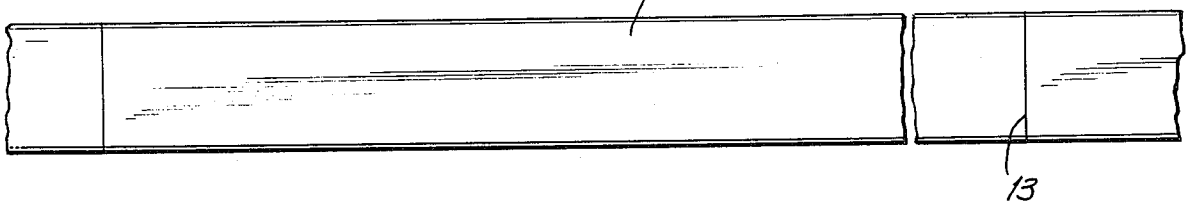


FIG. 3

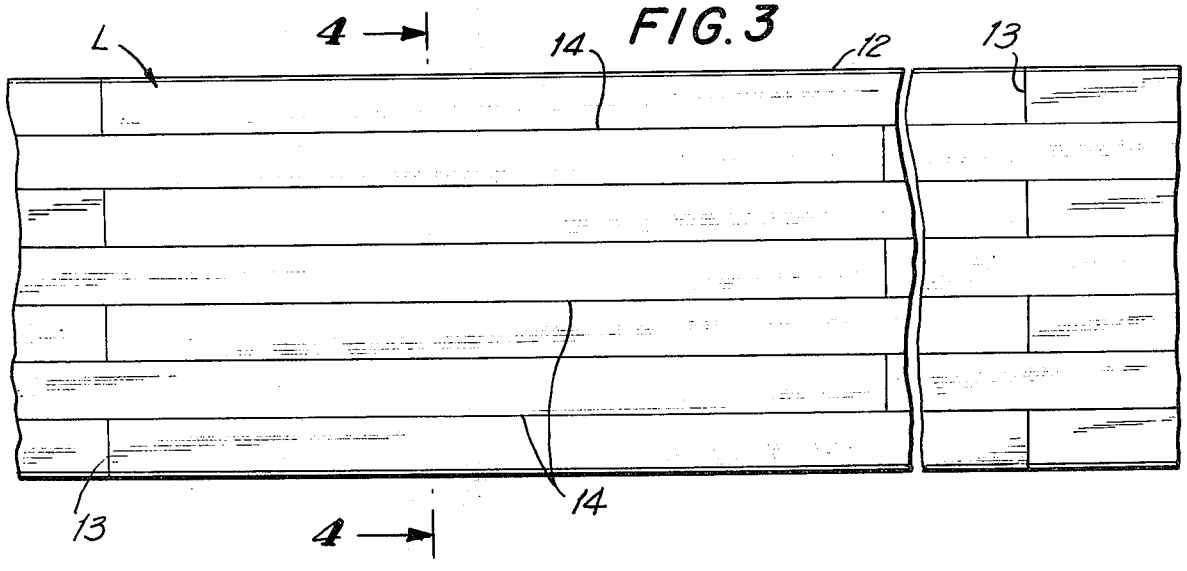
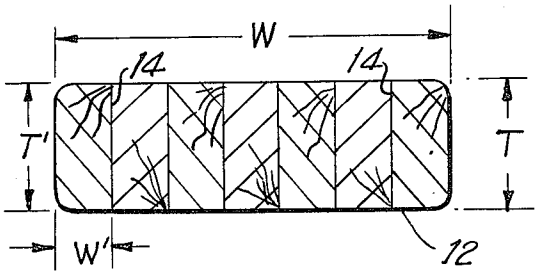


FIG. 4



HAND RAIL CONSTRUCTION

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention is in the field of decorative moldings, and particularly elongated hardwood handrail moldings.

2. The Prior Art

It is known to provide elongated handrails consisting of hardwood moldings fixed to spaced brackets mounted either on posts or affixed to bulkheads, etc.

Handrail moldings are in widespread use along stairways and in like environments wherein substantial structural rigidity is mandated. Often the rails must be of substantial length. Since the rail is typically gripped by the user as a means of support, it is evident that the cross sectional dimension must be such as to be comfortably accommodated within the hand, or else the protective value thereof is lost.

For comfortable gripping and to supply the requisite rigidity, the cross sectional dimension of the rail must be substantial, normally in the area of at least about three inches in its largest dimension.

While it is known to provide hardwood handrails, for instance of walnut, oak or ash, it is becoming increasingly difficult to obtain sound pieces of such woods in substantial lengths and of sufficiently large cross section to function as a handrail molding.

SUMMARY

The present invention may be summarized as directed to an elongated handrail comprised of a series of modules, which modules, when assembled in side to side relation, provide the necessary cross sectional dimensions, the modules individually being of lesser length than the total length of the handrail desired, the modules being butt-end connected to each other, the butt end connections of individual modules, when assembled into the composite handrail, being longitudinally offset one from the other in adjacent layers. By thus offsetting the butt end connections, there is provided a handrail composite having resistance to longitudinal bending stresses approaching that of a unitary handrail section.

It is substantially easier and less expensive to obtain individual components of small cross section and short regular or random length than a sound integral wood component whose overall cross sectional matches that of the assembled composite modules.

It is accordingly an object of the invention to provide an improved laminated handrail molding.

A further object of the invention is the provision of a molding of the type described whose resistance to longitudinal stress exceeds that of a handrail molding fabricated of two or more integral end to end connected wood sections.

A further object of the invention is the provision of an elongated handrail of the type described, fabricated of hard wood laminae bonded together in side by side relation to define a desired cross section, the individual lamina being formed of two or more modules in butt joint connection with each other, the butt joint connections of adjacent layers of the assembled handrail being offset in a direction longitudinally of the rail. By such staggering of the butt joint connections, solid pieces of the modules adjacent butt joint connections of other modules reinforce the composite.

To attain these objects and such further objects as may appear herein or be hereinafter pointed out, reference is made to the accompanying drawings in which;

FIG. **1** is a fragmentary perspective view of a finished handrail and supporting post;

FIG. **2** is a plan view of an individual lamina composed of three module segments;

FIG. **3** is a top plan view of a finished section of handrail;

FIG. **4** is a section taken on the line **4—4** of FIG. **3,** and

FIG. **5** is a perspective view of a series of partially assembled laminae.

Referring now to FIG. **1,** a handrail section **10** of hardwood is provided, it being understood that the particular cross sectional shape of the illustrated handrail is illustrative only and a multiplicity of differently shaped configurations may be advantageously employed.

At fixed intervals along the length of the handrail, posts **11** are secured by brackets (not shown), the lower ends of the posts being fixed to a structural component of a building, such as a stairwell, etc.

As best seen from an inspection of FIGS. **2** to **5,** the handrail molding **10** is comprised of a plurality of modules **12** of hardwood, such as ash, oak, walnut, etc., the modules being of a length less than the length of a given handrail section, and of a width less than the width of the total section.

It will be appreciated that sound wood components of a width W and thickness T are a scarce commodity and that it is even more difficult to obtain extended lengths of the latter. Additionaly, if extended sections of integral hardwood of width W and thickness T were connected together, sharp color distinctions between adjacent sections would exist since it is virtually impossible to provide accurate color matching.

In accordance with the present invention, a series of modules **12,** having a common width W′ and thickness T′, are bonded together such that the cross sectional dimension of the composite equals the desired handrail dimension.

It will be understood that individual modules **12** may be much more readily obtained, especially considering the fact that the module lengths need not equal that of the total handrail expanse.

In the illustrated embodiment, the handrail **10** is composed of several laminae L, each lamina being comprised of two or more modules **12.** The laminae L are formed by effecting a butt joint connection between adjacent modules at the sections **13.** The butt joint connections may be made in any conventional manner, preferably by gluing, doweling at the connections being possible but unnecessary in view of the strengthening of the connections by the manner of their assembly into the composite. The butt joints are preferably formed at the same time as the laminae L are interconnected.

Individual laminae L of a desired length are brought into side to side contact, glued connections between adjacent laminae being effected along the side lines of connection **14.**

It is an important feature of the present invention that, in assembling the laminae prior to gluing along the lines **14,** the butt joint connections **13** be staggered in

such manner that the connections at least in adjacent laminae are longitudinally offset one from the other.

It will be evident, as a result of the manner of connection of the laminae, that solid components of the laminae will reinforce the butt joint connections of adjacent laminae, whereby a mutual reinforcing influence is achieved, providing a composite which is extremely rigid and resistant to transverse stresses.

Preferably, the individual laminae are impregnated, as with an acrylic or other polymer before assembly into a composite. The concept of impregnation, per se, is well known and forms no part of the present invention.

Generally speaking, impregnation is effected in such manner that the polymer penetrates completely or substantially completely into the body of the wood. The polymeric impregnant is polymerized, preferably by irradiation, whereupon, by reason of the uniform penetration of the resinous material, the appearance of the components exposed by finishing procedures such as milling, routing, etc. will match that of the remainder of the molding.

A substantial benefit derived from the use of a handrail in accordance with the invention lies in the fact that a natural and consistent appearance may be achieved in elongated handrail sections. In hardwoods, due to grain conditions within the wood proper, light and dark contrasting areas are presented. By a judicious selection of modules, it is possible to simulate in the laminated rail the graining effects of natural wood. In contrast, if the handrail were comprised of individual integral wood sections of lesser length than the entirety of the handrail, the sections would be likely to differ in color value longitudinally to either side of the butt joint connection, presenting an artificial or unnatural appearance. Moreover, in the last mentioned instance, since the butt joint connection extends across the entire width of the handrail, the handrail is structurally weak at such connection, a deficiency which is not encountered in the handrail of the instant invention.

In a typical practical embodiment of the invention, a 16 foot length of the composite may be built up by placing two eight foot lengths of impregnated modules

in end to end relation on the lower platen of a press, a glue being inserted between the ends. Next, two four foot end sections of stock material are aligned with the outer ends of the lower layer, and a central eight foot section set in between the end sections in spanning relation of the butt joint of the lower section. A third layer identical to the lower layer is laid over the second layer, and the process repeated until the desired thickness is achieved, it being preferred that the uppermost layer, like the lower layer, includes only one butt joint connection. Appropriate glues or cements have been placed between the layers and the butt joints, and the composite is subjected to inward pressure to set the butt joints and downward pressure as by an upper platen, to unite the laminae, heat being present if desired to accellerate setting. The composite is passed through a shaper to provide the desired cross sectional configuration.

Having thus described the invention and illustrated its use, what is claimed as new and sought to be protected by United States Letters Patent is:

1. As a new article of manufacture, an elongated, laminated hand rail structure comprising a plurality of elongated, side-by-side disposed laminae, each of said laminae being comprised of separate, elongated, resin impregnated wood module sections butt-joint connected in end-to-end relation, adjacent laminae being adhesively connected at their interface, said hand rail being characterized by said wood module sections being resin impregnated prior to the formation of said adhesive connection between laminae, and by the butt joint connections between the modules forming adjacent said laminae when assembled into said hand rail being offset in a longitudinal direction one from the other, thereby to define a molding structure having a high degree of resistance to transverse stress as a result of solid portions of adjacent modules reinforcing the said butt joint connections, said molding, in addition, having an improved appearance as a result of the regular thickness of adhesive lines of connection defined between adjacent said laminae.

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