Oct. 27, 1942. F. W. HUMPHNER 2,300,224

TAPE

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Fig. 1.

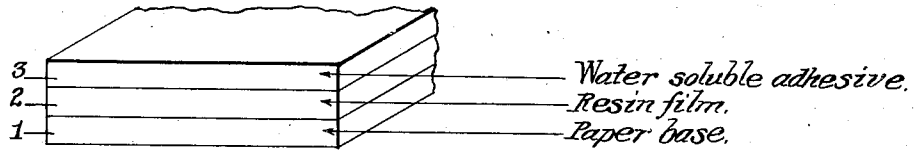


Fig. 2.

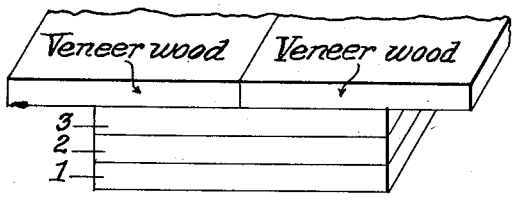


Fig. 3.

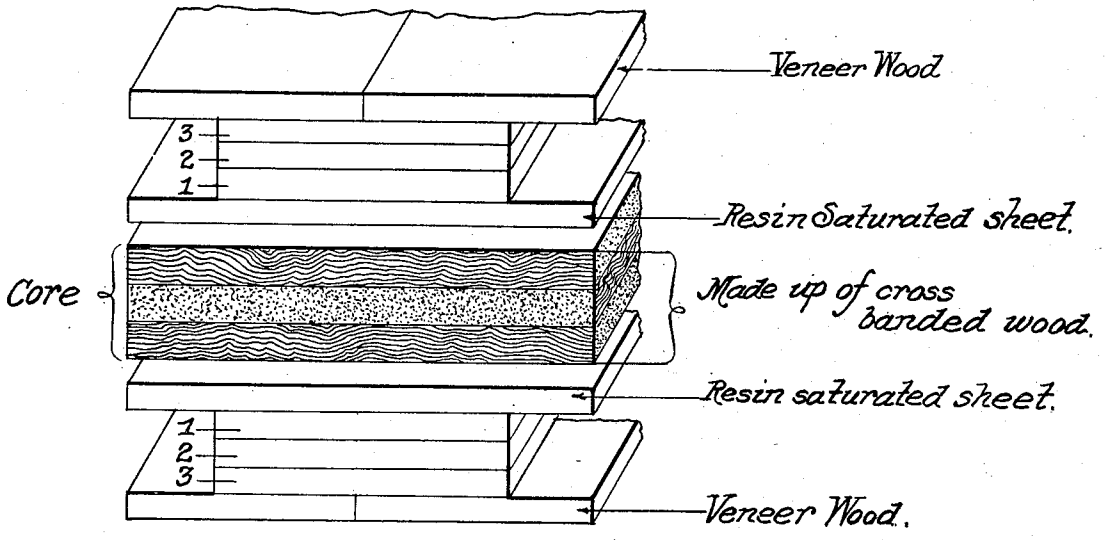


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Fig. 4.

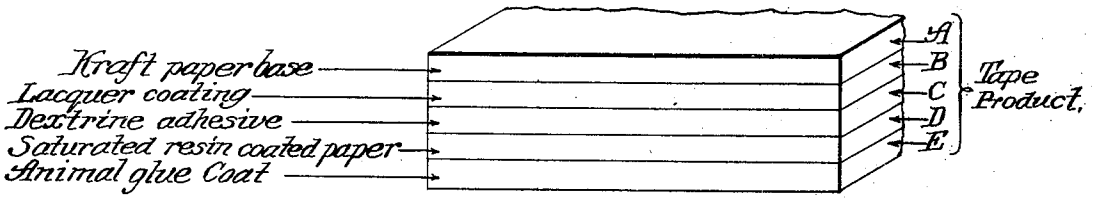


Fig. 5.

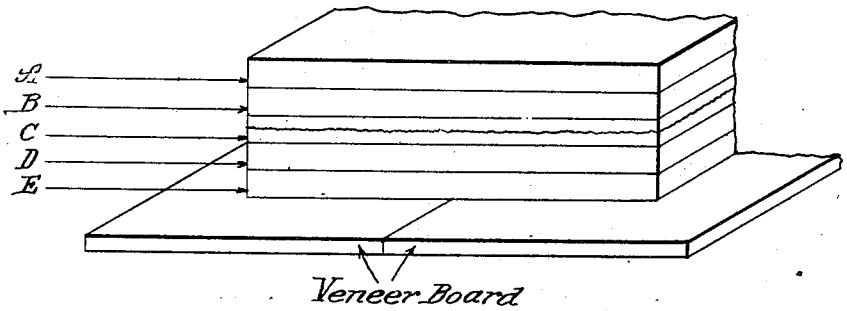


Fig. 6.

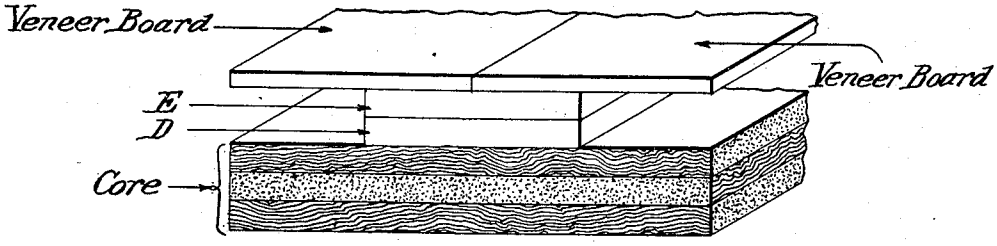


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Fig. 7.

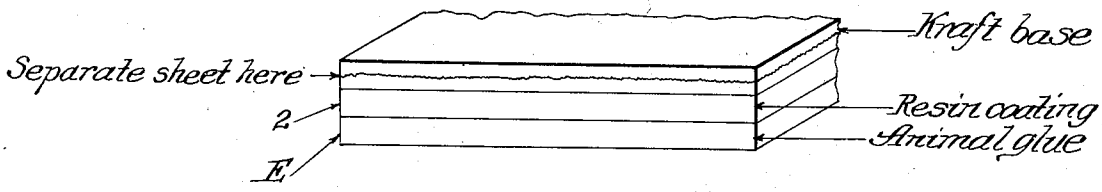



Fig. 8.

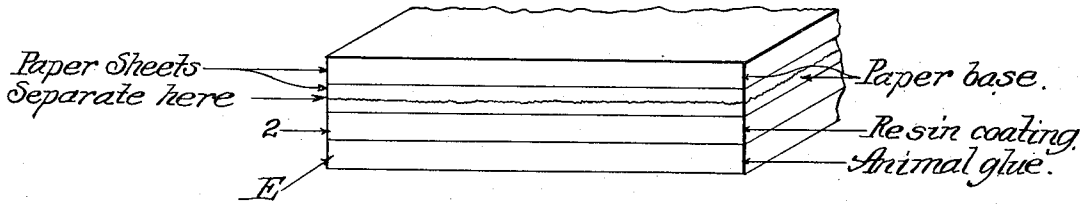
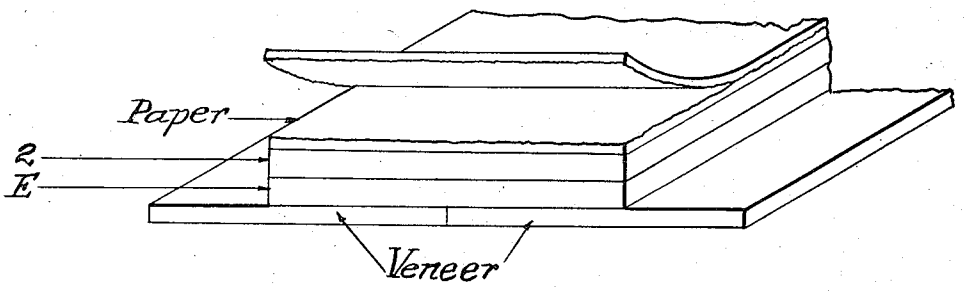



Fig. 9.

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Patented Oct. 27, 1942

2,300,224

# UNITED STATES PATENT OFFICE

2,300,224

## TAPE

Ferdinand W. Humphner, Oak Park, Ill., assignor to Mid-States Gummed Paper Co., Chicago, Ill., a corporation of Delaware

Application February 25, 1939, Serial No. 258,564

3 Claims. (Cl. 154—43)

This invention relates to tape. It is particularly useful in connection with a veneer tape for forming veneered joints, veneered panels, etc., that will not be affected by moisture, water, or many of the common solvents used in finishing wood for furniture and other wood products.

An object of the invention is to provide a tape which after application becomes a permanent part of the panel and does not require sanding off. Another object is to provide a tape which overcomes objections found in the old style tapes, including weakness of joint due to cellulose fiber and also due to crystallization of the glue under heat when the panel is formed. A still further object is to provide a veneer tape equipped with a heat-responsive condensation resin which becomes plastic under pressure and heat and molds into the wood so as to provide a perfect bond, the tape itself being not visible from the outer surface of the panel. Other objects and advantages will appear as the specification proceeds.

The invention is illustrated, in preferred embodiments, by the accompanying drawings, in which—

Figure 1 is a broken perspective view of a tape product embodying my invention; Fig. 2, a view similar to Fig. 1 but showing the tape applied to two veneer panels which are being joined; Fig. 3, a view similar to Fig. 2 but showing veneered panels being secured to a central core; Fig. 4, a perspective view of a modified form of tape; Fig. 5, a perspective broken view of the tape shown in Fig. 4 applied to a veneered board; Fig. 6, a view of the tape shown in Fig. 4, a portion thereof having been removed and the remaining portion being employed for securing veneered boards to a central core; Fig. 7, a perspective broken view of a tape equipped with a splittable sheet; Fig. 8, a view similar to Fig. 7 but showing a paper sheet attached to the lower splittable sheet; and Fig. 9, a view similar to Fig. 7 but showing the tape applied to veneer and the upper splittable portion of the paper sheet being removed.

As shown more clearly in Figs. 1 and 2, I provide a paper base of any suitable weight or type. For example, I find that a thin sheet of kraft paper, approximately 21–25 pounds basis weight, 24 x 36/480, may be used, and to this I apply a suitable condensation product which condenses under heat and pressure to form a resin. A large number of such condensation products formed of phenol-formaldehyde, urea-formaldehyde, etc., are well known in the art. In the specific illustration given, I apply to the graft paper a coating of phenol-formaldehyde condensation resin in the proportion of about 5 pounds per ream, 24 x 36/480, so that the layer lies on one side only. In the particular illustrations given, the various layers are shown in exaggerated thicknesses for the purpose of clarity of illustration. The viscosity of the resin solution is adjusted so that partial penetration only in obtained. The penetration should not be complete at the time the coating is applied. In this way, there is enough of the original strip not impregnated so as to make the strip a safe carrier during machine application.

In order to make present machine equipment for applying veneer tape usable, I apply to the resin a thin coat of animal glue. When the tape is to be applied, the glue is moistened and applied over the veneered joint. The veneer is then laid over the core in the usual manner and placed under a hot plate with pressure varying from 200–300 pounds per square inch at a temperature ranging from 250–325° F. varied to meet the thickness of the panel for a period of 5 to 25 minutes, depending upon the length of time it takes the heat to go through the panel. The heat crystallizes the glue and causes the plastic resin to penetrate through and take hold of the wood fibers and at the same time to penetrate back through the fibers of the paper forming a bond.

If desired, a sheet of paper saturated with the resin and dried may be placed between the tape and core, as illustrated in Fig. 3. The migration of the resin in both directions produces an inseparable bond.

I find that the saturated resin sheet, together with adhesive coating, will in itself form a satisfactory bond. However, to facilitate the handling of the product and the application to a panel, I prefer to coat a paper base with a lacquer coating and then attach the lacquer coating by weak adhesive to the saturated resin paper, the front portion of the saturated resin paper being provided with an animal glue coat, as illustrated in Fig. 4. The application of the tape is illustrated in Figs. 5 and 6. In this arrangement, the paper base is coated on one side with a thin film of lacquer. The paper may be of any suitable basis weight to fit mechanical needs for handling, as for example, 50 pounds basis 24 x 36/480 good grade kraft paper. To this paper on one side is applied a suitable waterproof lacquer which is dried. To the lacquer is applied an intermediate soluble adhesive with relatively little strength, such as, for example, dextrine or starch. This adhesive bonds the saturated resin coated paper to the lacquer coated paper base. The outer sur-

face of the saturated resin coated paper is covered with an animal glue coat. The tape strip is thus moistened as usual in the machine used for veneering and applied to the veneered board. When dry, the paper base with its lacquer coating and most of the adhesive can be readily peeled off, thus leaving the saturated resin coated paper and animal glue coat only for bonding the veneered board to the core. Application of heat and pressure produces the consolidation of the veneered board with the core as heretofore described.

The purpose of the lacquer coating is to prevent the combining coat from striking through after remoistening for application to the veneered panel. It also increases the tension on the surface of the kraft paper, throwing the strain on to the weaker adhesive and causing it to separate.

In order to produce a thin paper base and one which is essentially useful as backing for veneer panel, I employ a kraft base which is splittable. To one side of the kraft base is applied the usual resin coating and an animal glue over the resin. A second paper strip is attached to the splittable sheet so as to enable the sheet to be readily split. The split sheet is illustrated in Fig. 9.

In the operation of each of the tape modifications, it will be noted that the resin or resin-saturated sheet flows readily under the application of heat and pressure and molds into the wood so as to provide a perfect bond, the flowing of the resin in both directions serving to completely combine the tape strip with the wood panel. The resulting joint will not be affected by water or any of the common solvents used in finishing wood for furniture, etc.

Instead of using a water soluble adhesive, it will be understood that other adhesives suitable for temporarily combining the tape with the surface may be employed, the adhesive crystallizing under heat and pressure and being thereby substantially eliminated while the resin itself flows through the surfaces to be united and then sets, forming an insoluble resin body uniting the two layers.

I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

I claim:

1. A veneer tape of the character set forth, comprising an unimpregnated paper base, a lacquer coating thereon, a paper strip impregnated with a heat-responsive condensation resin, a frangible adhesive over said lacquer coating for temporarily bonding said paper base to said paper strip, and a water-soluble adhesive over the exposed surface of said strip, said first-mentioned adhesive providing a frangible bond whereby said paper base may be stripped away from said resin-impregnated paper strip.

2. A veneer tape of the character set forth, comprising an unimpregnated paper base, a water-impervious coating over said base, a paper sheet saturated with a heat-responsive condensation resin, and a frangible dextrine adhesive over said water-impervious coating for temporarily bonding said paper base to said paper sheet, said dextrine adhesive providing a frangible bond whereby said paper base may be stripped away from said resin-saturated sheet.

3. A veener tape of the character set forth, comprising an unimpregnated paper base, a lacquer coating thereon, a paper sheet saturated with a heat-responsive condensation resin, and a frangible dextrine adhesive over said lacquer coating for temporarily bonding said paper base to said paper sheet, said dextrine adhesive providing a frangible bond whereby said paper base may be stripped away from said resin-saturated sheet.

FERDINAND W. HUMPHNER.