Feb. 15, 1966 J. P. GOULD 3,235,440

MAT AND METHOD FOR FINISHING A ROUGH BASE

Filed Aug. 13, 1962 5 Sheets-Sheet 1

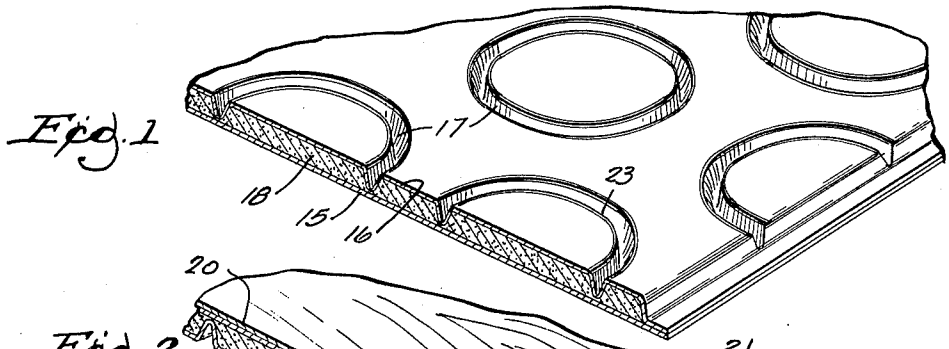



Fig. 1

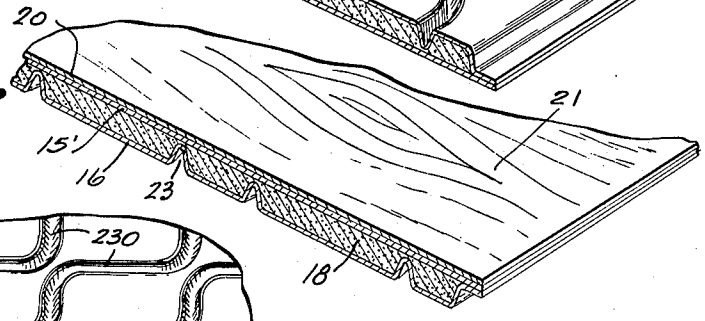



Fig. 2

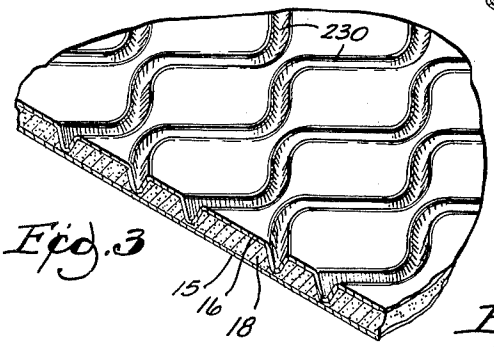



Fig. 3

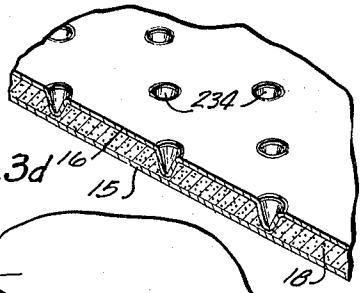



Fig. 3d

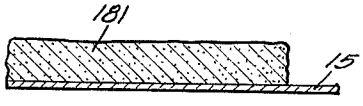



Fig. 3a

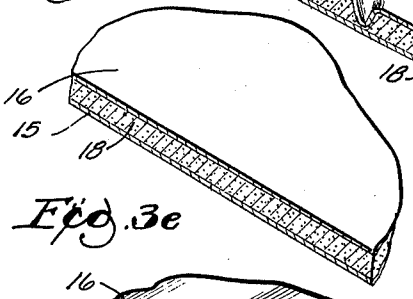



Fig. 3e

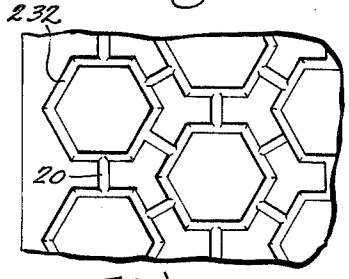



Fig. 3b

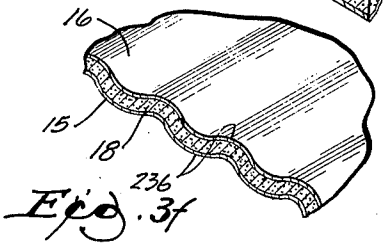



Fig. 3f

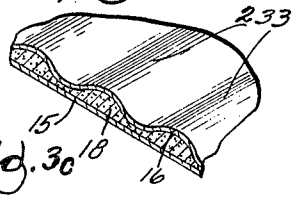



Fig. 3c

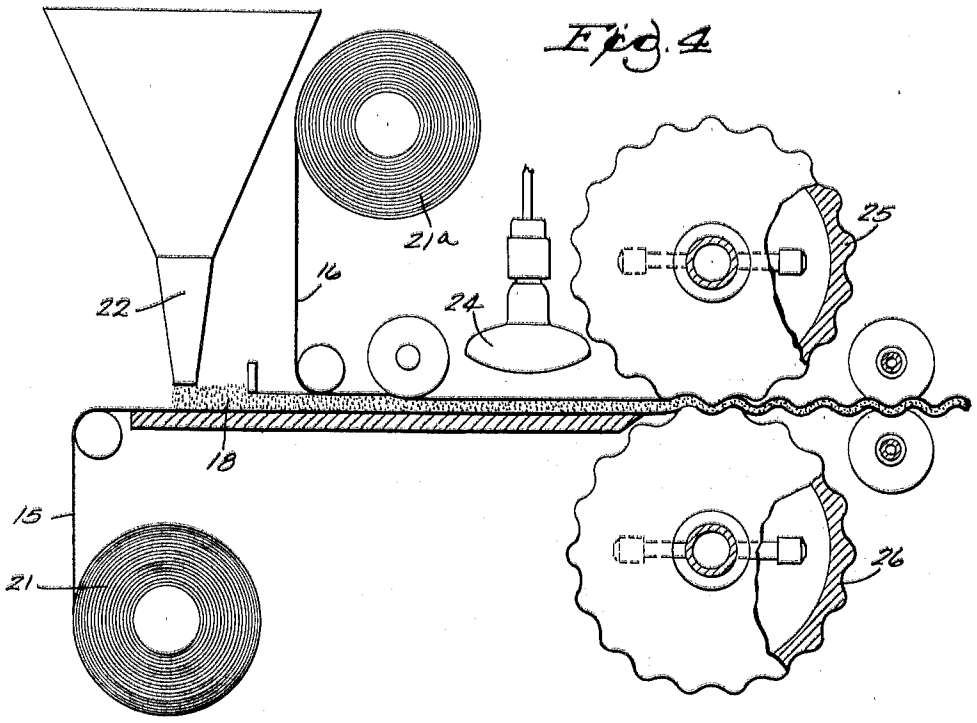
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Feb. 15, 1966 J. P. GOULD 3,235,440

MAT AND METHOD FOR FINISHING A ROUGH BASE

Filed Aug. 13, 1962 5 Sheets-Sheet 2

Fig. 4



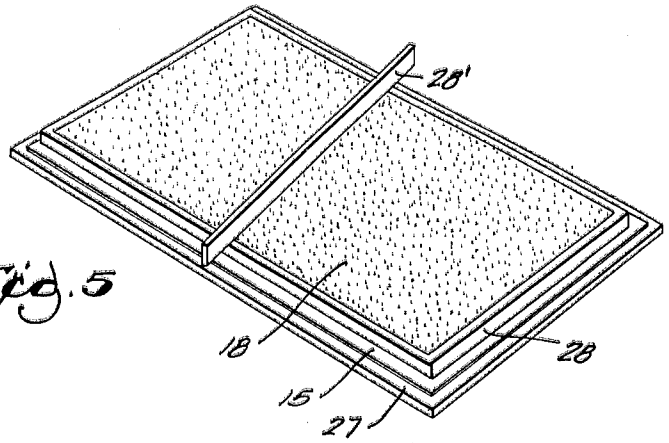




Fig. 5

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Feb. 15, 1966 J. P. GOULD 3,235,440

MAT AND METHOD FOR FINISHING A ROUGH BASE

Filed Aug. 13, 1962 5 Sheets-Sheet 3

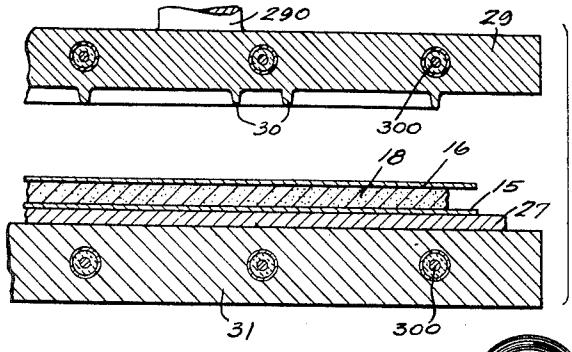



Fig. 6

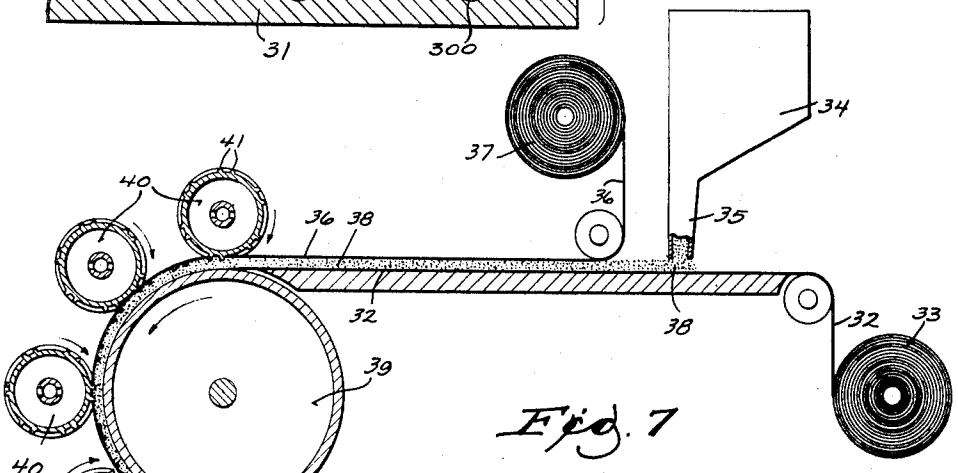



Fig. 7

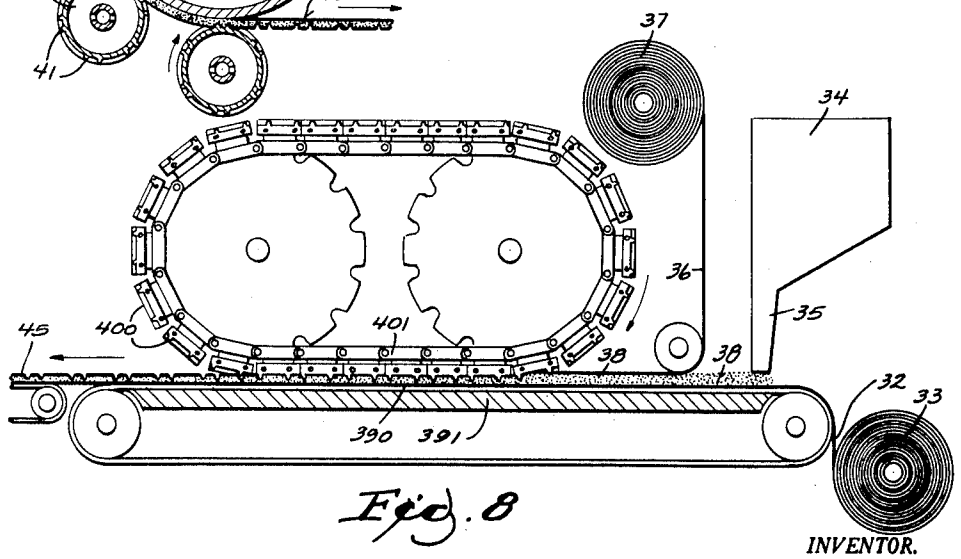



Fig. 8

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Feb. 15, 1966 J. P. GOULD 3,235,440

MAT AND METHOD FOR FINISHING A ROUGH BASE

Filed Aug. 13, 1962 5 Sheets-Sheet 4

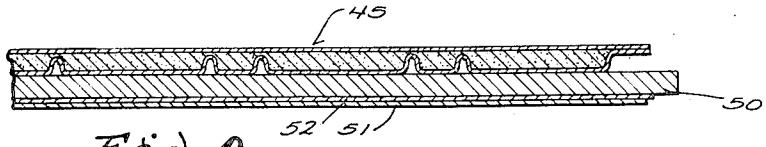



Fig. 9

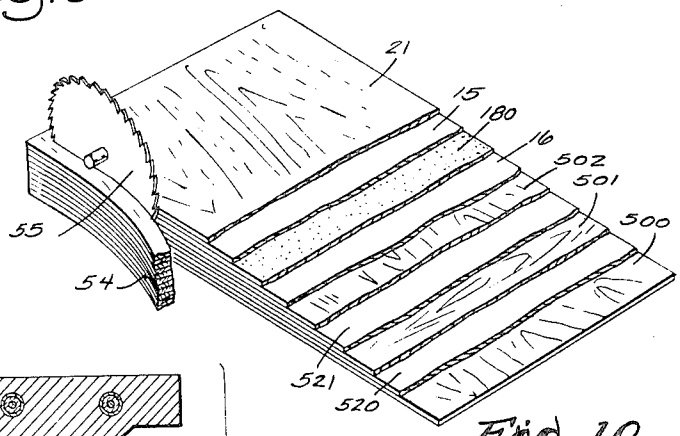



Fig. 10

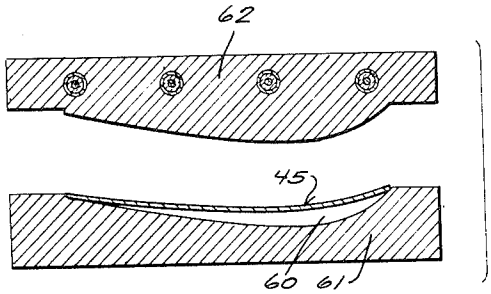



Fig. 11

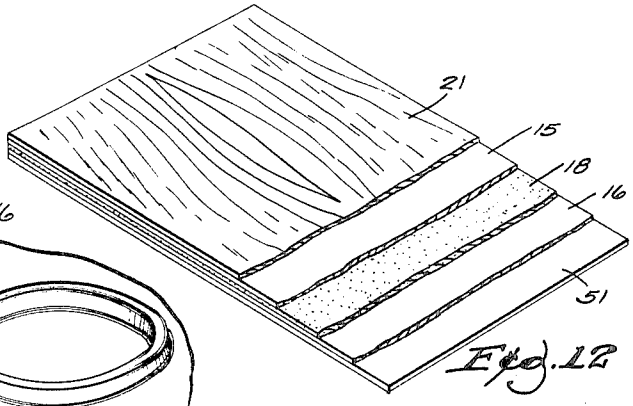



Fig. 12

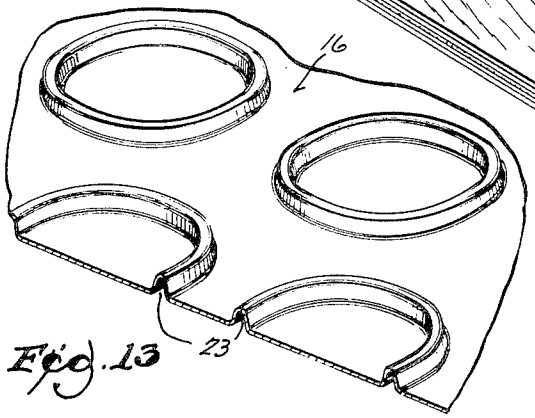



Fig. 13

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Feb. 15, 1966 J. P. GOULD 3,235,440

MAT AND METHOD FOR FINISHING A ROUGH BASE

Filed Aug. 13, 1962 5 Sheets-Sheet 5

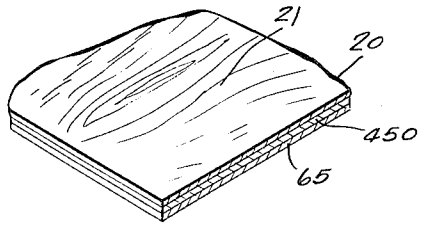



Fig. 14

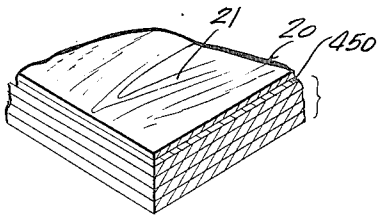



Fig. 15

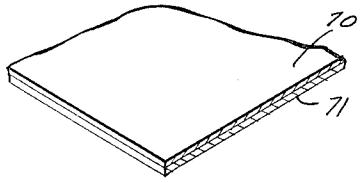



Fig. 16

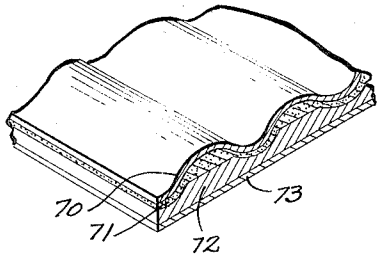



Fig. 17

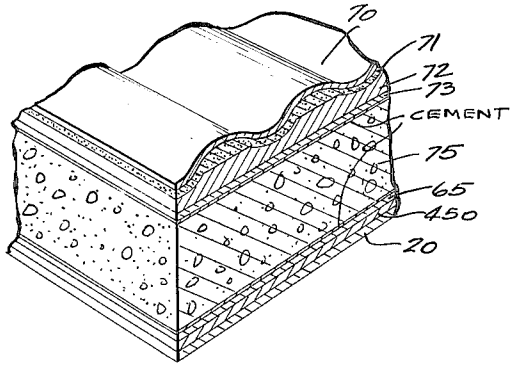



Fig. 18

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United States Patent Office 3,235,440 Patented Feb. 15, 1966



3,235,440

# MAT AND METHOD FOR FINISHING A ROUGH BASE

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Filed Aug. 13, 1962, Ser. No. 216,355
8 Claims. (Cl. 161—119)

This invention relates to a method of applying a decorative treatment to a rough base, sometimes concurrently with base production, and to a mat including a layer of a mix of resin and filler for use in molding and laminating. The present application is a continuation-in-part of my application 114,967, filed June 5, 1961, now abandoned, which is a continuation-in-part of my application 48,920, filed August 11, 1960, and now abandoned.

My improved mat is flexible not only to facilitate its handling or laminating usage but to facilitate its use for shapes and contours which are other than flat, pipe being an example of one ultimate product in which the use of a flexible mat is important.

The mat comprises filler material in prefabricated assembly on a carrier web of paper, resin film or foil. In one embodiment, the mat comprises two webs between which is confined a mixture of filler such as wood flour and dry adhesive powdered resin comprising ten percent to twenty percent or even more of the total by weight and the filler comprising ninety percent to eighty percent (or less) of the total. Normally, the resin would be thermosetting resin but for some purposes I may use thermoplastic resin or a mixture of thermoplastic and thermosetting resin.

Ordinarily, the mat will include some localized means for confining the filler, the objective being to keep the filler approximately uniformly distributed in the mat until the mat is used, the filler-confining means being of such a character as to allow the filler to migrate under the heat and pressure used in the laminating operation. Localized filler-confining partial pre-cure is one way of satisfying this objective. Others will be described hereafter.

The webs which confine the filler should be compatible in the sense that they either contribute to the desired characteristics of the finished product or lose their identity in the finished laminate (as would be the case if the web is a resinous film or a sheet of paper impregnated with a resin, which sheet may lose its separate identity when subjected to heat and pressure in the polymerization of the resin content of the filler). For certain purposes, a web of the mat may constitute a finishing ply which provides a finished or decorated surface for the resulting product. For example, the mat and a decorative ply may be laid up with veneer in a plywood press to manufacture the plywood and to decorate its surface in a single operation.

For other purposes, both of the webs may comprise a material which will merge with the mix upon polymerization.

In another embodiment, the mat may comprise a single web which may be paper or film with or without decoration or may be some thin metal such as copper foil or steel or aluminum. In this instance, the resin comprises an adhesive which not only holds the filler mix in the mat by uniting the particles with each other but also holds the filler mix to the carrier ply of film or paper or foil pending the molding operation hereinafter described.

Under the heat and pressure used either in molding or laminating to form the filler mix and polymerize its resin content, the filler flows readily, this being an important factor which makes it possible to use very inferior veneer or plywood core stock and still produce a highly finished surface on the resulting laminate. It



also makes possible the use of my mat where the problem is one of molding rather than laminating. For example, a flat mat may be introduced into a concave mold, into which it cannot fit without wrinkling. Yet, under pressure of a male die, the material of the filler will migrate to fill the mold without leaving the slightest evidence of wrinkling.

To preserve this free mobility of the filler, while at the same time precluding undue migration of the mixture during handling, it is preferred that if the particles comprising the mat are not inherently adhesively joined to each other either by their own adhesive quality or by the use of an adhesive component, some localized filler-confining procedure should be followed. For example, one or both of the confining webs constituting the envelope of the mat may be molded to form corrugations or quilting, or the filler itself may be rendered adhesive or may be temporarily molded by precure, by pressing at least one of the mixture-confining webs toward the other under preliminary heat and pressure which are sufficient to maintain the pattern of deformity of the web without polymerizing either the web or the resin content of the confined mixture sufficiently to preclude free flow during subsequent molding or laminating. An important advantage of having the mat include a confining envelope for the filler is to minimize heat and pressure required for this filler-confining function. Without the envelope, excessive pre-cure might be necessary.

Herein disclosed are various means of making up mats for the purposes of the present invention and various types of products exemplifying the uses of the mat. While a variety of resins are usable for various specific products, one of the features of the present invention consists in the fact that the resin content of the mat can be polymerized or cured with the temperatures and pressures used in an ordinary plywood press, whereby the problem of obscuring any defects in the veneers is dealt with in the same operation in which the plywood is conventionally assembled, a metallic or beautifully grained or otherwise finished surface being provided at the same time, if desired.

In the drawings:

FIG. 1 is a view in perspective fragmentarily showing a quilted mat in the inverted position of manufacture and combining a mixture of thermosetting resin and filler between confining webs to facilitate manipulation.

FIG. 2 is a view in perspective fragmentarily showing the quilted mat of FIG. 1 as it appears right side up and laminated to a pattern ply.

FIG. 3 is a fragmentary detail view similar to FIG. 1 but showing a modified quilted arrangement.

FIG. 3*a* is a view in side elevation fragmentarily illustrating a mat in which the filler has means other than quilting for holding it in position on the mounting sheet.

FIG. 3*b* is a fragmentary detail view in plan showing a quilting arrangement different from those illustrated in FIGS. 1 and 3.

FIG. 3*c* is a fragmentary detail view showing a further modified mat arrangement in which the confinement of the filler is accomplished by providing convolutions in one of the confining mats and not in the other.

FIG. 3*d* is a fragmentary detail view in perspective which shows a filler-confining quilted arrangement accomplished by spot-embossing one of the confining plies toward the other.

FIG. 3*e* shows a further modified embodiment fragmentarily illustrated in perspective and illustrating a mat in which there is no localized connection to confine the filler against migration between the spaced upper and lower webs.

FIG. 3*f* is a fragmentary detail view in perspective

showing an embodiment in which both webs and the intervening filler are corrugated to form convolutions as a means of fixing the position of the filler between the webs.

FIG. 4 is a fragmentary detail view partially in section and partially in side elevation diagrammatically showing apparatus for manufacturing a mat of the type shown in FIG. 3*f*.

FIG. 5 is a detail view in perspective showing apparatus for a batch method of mat manufacture.

FIG. 6 is a fragmentary detail view through a quilting die and platen and component parts of my mat as assembled thereon preliminary to a quilting operation to produce a mat of the type shown in FIG. 1.

FIG. 7 is a view diagrammatically illustrating in transverse section a modified quilting apparatus and method.

FIG. 8 is a diagrammatic view in transverse section illustrating a further modified quilting apparatus and method.

FIG. 9 is a fragmentary detail view in transverse section through a laminar assembly as it appears prior to treatment with heat and pressure to produce a laminated product using the mat of my invention.

FIG. 10 is a fragmentary detail view in perspective showing a laminated product made in accordance with the present invention as it appears in process of being trimmed, portions of the various laminations being broken away.

FIG. 11 is a view in perspective through a forming die in which a mat is disposed according to the present invention to be molded into a shaped thermoset resinous product.

FIG. 12 is a view in perspective showing a laminar product which involves nothing other than the compression and curing of the mat itself, assuming that the mat is made with a decorative sheet as shown in FIG. 2 and, optionally, a backing sheet, portions of the several plies being broken away.

FIG. 13 is a view in perspective fragmentarily illustrating a pre-embossed sheet which can be used in assembling a mat embodying the invention.

FIG. 14 is a fragmentary detail view in perspective of a product made according to the present invention by laminating a pattern sheet to one face of a mat and laminating a backing sheet to the other face of the mat.

FIG. 15 is a view similar to FIG. 14 showing the pattern sheet laminated to a number of plies of veneer to make up a decorative plywood panel in one operation.

FIG. 16 is similar to FIG. 14 showing the product made by laminating a mat to a very thin foil.

FIG. 17 is a fragmentary detail view in perspective showing a product made by using my improved mat to laminate very thin foil to wood veneer and a backing sheet.

FIG. 18 shows a fragmentary detail view in perspective of a product made by laminating an article such as that of FIG. 17 to an inverted article like that of FIG. 14 with an intervening thin layer of foam plastic or the like to produce a panel suitable for use in trailer and buildings and having an external waterproof surface and an interior decorative surface with intervening thermal insulation.

The present invention facilitates molding and laminating operations of such a nature that heretofore there has been no economical way of maintaining a mixture of resin and filler in a condition to flow under heat and pressure to achieve uniform depth after filling imperfections in an individual ply or plies of a product to be laminated. If the resin is a thermosetting resin, it will be polymerized by the heat and pressure used in lamination. The present invention assures the desired uniformity of distribution by maintaining the resin and filler mixed therewith in flowable condition. Disclosed herein is one arrangement in which the filler is bonded by the resin to the carrier sheet and another arrangement in which the filler is held to the carrier sheet by a confining sheet preferably impregnated with thermosetting resin. One sheet may be decorated or may be metal or resin film. In either case, the finishing web is sometimes called a pattern sheet because it is exposed to provide a decorative finished surface. Fluting or quilting or partial pre-cure are suggested as a means of attaching the sheets to each other and confining the filler.

In any event, the assembly is readily manipulated for placement in the mold or the laminating press. It is flexible enough so that it does not break when handled. The resin impregnated paper is compatible with whatever resin is used in the filler mix so that the impregnated paper sheet or sheets lose their identity in the press or mold despite the localized filler confining operation by heat and pressure short of that required for thermosetting.

FIG. 1 shows a completed mat as it appears following a quilting operation. It includes sheets **15** and **16**, between which is confined by the embossed pattern **17** a mixture **18** of powdered thermosetting resin and powdered filler. The powdered ingredients are preferably no larger than 70 mesh on the average and thoroughly mixed. By way of example and not by way of limitation, it is noted that I have successfully used a filler combining particles of varying sizes ranging from 40 to 145 mesh. The various particle sizes are, of course, distributed as homogeneously as possible. Wide variation in proportions is possible, the preferred proportions being ten to twenty percent of resin and ninety to eighty percent of filler by weight. Any appropriate filler may be used, wood flour or walnut shell flour being most common examples. A variety of thermosetting resins may be used, the preferred resin being a B stage phenolic with which it is preferred to include any desired proportions of so-called "hexa" (hexamethylenetetramine). I have successfully used a B stage Novolak type phenolic resin extensively used in varnishes. It is understood to be a wax-free reaction product of one phenol mol with less than one formaldehyde mol and an acid catalyst.

If the sheets **15** and **16** are to lose their identity upon polymerization of the thermosetting resin of the mix **18**, they should be compatible. Successfully used in the practice of the present invention are paper sheets of well-known type impregnated with thermosetting phenolic resin and sold as Tego dry film glue and also as Reichhold P.G.L. A preferred web is known as "Kimpreg" and is a sheet of paper which is supplied already impregnated with phenolic resin. Instead of paper, I may use as an envelope web, a resin film such as "Phenoxy 8" film made by Union Carbide Company. Whatever the envelope web used, the invention contemplates that the flat sheet **15** may comprise a decorated finish ply having "grain" for display in the ultimate laminate product. In that event, it may be either a decorated P.G.L. or may be a paper without resin impregnation, or may comprise a sheet of metal such as aluminum. It may also comprise an undecorated sheet of kraft paper or the like adapted to receive paint.

In the embodiment shown in FIG. 2, the sheet **15'** is not a finishing sheet but is a sheet which is simliar to the sheet **16**, comprising resin impregnated paper which bonds the mat to a separate pattern sheet **20** and having a decorative, artificially grained finished surface at **21**.

A specific example of the material used is as follows: The sheet **15** and/or **16** comprises phenolic impregnated paper, an example being well-known "Kimpreg" or "P.G.L." The filler comprises 100 pounds of Novolak resin mixed with twelve pounds of hexamethylenetetramine. Twenty pounds of the mixture of Novolak and hexa are then mixed with eighty pounds of wood flour, all ingredients of the mix being dry and no larger than 70 mesh on the average. This formulation is given merely by way of example and will, of course, be modified by skilled operators to suit the particular requirements of the work at hand.

The pattern of mix-confining channels should be such as to confine the mix **18** to preclude substantial migration thereof during handling. It has been found that a

pattern 17 made up of circles as shown in FIG. 1 is a desirable arrangement. It will be noted that the circles defined by the embossed channels 23 in FIG. 1 are spaced. In the mat shown in FIG. 3, the channels 230 are disposed on sinuous lines to approach and recede from each other.

In the mat shown in FIG. 3*a*, the filler 181 is bound by thermoplastic resin and does not interfere with the thermosetting properties desired. Thermoplastic binding makes it unnecessary to use any pattern of confining channels. In practice, I have used a commercial adhesive known as "Cycleweld" which is a C stage, phenolic resin fortified with vinyl. Preferably, I thin this with four parts of solvent to one part of adhesive, using a compatible alcohol as the solvent. The thinning is done solely to facilitate the preferred application of the adhesive in the form of an atomized mist with which the particles and the supporting sheet are coated during application.

The mat shown in FIG. 3*b* uses a pattern of channels 232 in which the figures are generally hexagonal having connecting channels 20 which subdivide the spaces between the hexagonal patterns.

In the construction shown in FIG. 3*c*, sheet 16 has been provided with generally parallel convolutions 233 to and from the plane of sheet 15 and within which the filler 18 is confined against migration.

In the mat shown in FIG. 3*d*, the quilting is accomplished by localized deformation of spot-embossing at 234.

The mat shown at 3*e* is similar to that shown in FIG. 3*a* except that it has a top confining ply 16 added to it, neither ply having a channel pattern and adhesive in the filler being relied upon to control migration pending the press treatment.

The mat shown in FIG. 3*f* has both the plies 15 and 16 provided with corresponding convolutions at 236 so that the whole mat has a wavy appearance. Apparatus for the construction of such a mat is shown in FIG. 4.

Referring to FIG. 4, it will be observed that the supporting and pattern plies 15 and 16 are delivered from supply rolls 21, 21*a*. The filler 18 is delivered from hopper 22 onto the web 15 and leveled off before being covered with web 16. The heat lamp 24 softens the material short of polymerization, providing just enough heat to facilitate the operation of the heated corrugated rolls 25, 26 which leave the material in the form shown in FIG. 3*f*. Instead of the rolls, reciprocable upper and lower dies may be used as shown in FIG. 6, the feed being intermittent in such a case.

In the operation diagrammatically shown in FIG. 5, the bottom web 15 may be laid on a caul board 27 (merely to protect the platen of the press) and the filler mix 18 applied thereon is confined by the frame 28, wherein it is leveled off by a strikeoff bar 28'.

However, the mix is positioned on ply 15, the pattern ply 16 is placed on the mix as shown in FIG. 6. Thereupon the caul board may be placed on the lower platen of a press beneath the heated die 29 which is reciprocated by ram 29 and has ribs 30 of the desired pattern, the die being heated by steam cavities 300 to approximately 280° F. to produce no more than partial pre-cure. The lower platen 31' may also be heated and preferably is heated. Exposure is so short that the effect thereof is merely to emboss the sheet 16 and the mix 18 with an appropriate pattern as exemplified by those shown in FIGS. 1, 2 and 3*a* to 3*f* without setting the resin. The dwell at the temperatures and pressures and with the particular resin employed may be about forty-five seconds or less.

Depending on the nature of the product and what material is used and the use to which the product is to be put, I have used temperatures between 250° and 500° F. applied for periods ranging from one to ten seconds, these figures being variable and given by way of example and not by way of limitation. Desirably, the stroke of the ram 290 is relatively slow and carefully restricted so that the spacing between the confining sheets is reduced at the point of pressure of the rib 30 by approximately one-half. Specifically, I have used successfully a mix having a depth of one-quarter inch and displaced without undue compression where embossed by the ribs to a thickness of about one-eighth of an inch. The thickness of the mat and the depth of embossing will be varied as required and the figures given are by way of example only. The embossing displaces the still "fluid" mix without much change in density under the rib.

Whatever the product completed as shown in FIGS. 1 to 6, it is immediately removed from the press and is ready for storage or for use in a molding or laminating operation. When completed, the mat may be stored indefinitely and is a commercial article which may be sold for its ultimate intended use.

For more expeditious manufacture of such mats, it is preferred to use production equipment of any appropriate type, those shown in FIG. 4, as above described, or FIGS. 7 or 8 being for exemplification only.

In FIG. 7, a continuous web 32 of the material used to form the sheet 15 or the sheet 15' of FIGS. 1 and 2 is fed from a supply roll 33 beneath a hopper 34 from which the mix of resin and filler is discharged and spread by the hopper spout 35. The web 36 of the impregnated sheet material 16 of FIGS. 1 and 2 is supplied from roll 37 and guided to overlie the deposit 38 of the mix, resin and filler spread on web 32. As the filler 38 confined between webs 32, 36 passes around the matrix roll 39, it is acted upon by a succession of hollow patterned rolls 40 which have ribs at 41 for making the embossed channels 23 which constitute the desired pattern as shown in FIGS. 1 to 3. The rolls 40 will obviously be driven at the same speed so that their several ribs will engage corresponding embossed areas in the work, the cumulative effect of their heat and pressure being sufficient to accomplish the desired embossing without polymerizing the resin. The resulting mat 45 which moves away from the matrix roll 39 is like that shown in FIG. 1.

FIG. 8 shows a very similar arrangement except that a belt 390 moving over a table 391 is substituted for the matrix roll 39 and the individually heated embossing dies 400 carried by chains 401 are substituted for the succession of rolls 40.

Alternatively, the ribs 23 may be pre-embossed in the sheet 16 prior to the assembly of such sheet with the other component parts of the mat. A pre-embossed sheet for this purpose is shown in FIG. 13. It will be apparent that when this sheet is covered with the dry powdered mix 18 either in the manner suggested in FIG. 4 or otherwise, the ribs will hold the powder against migration when the pre-embossed sheet and powder are assembled to the other lamination or laminations of the mat as herein disclosed.

FIG. 9 shows one way of using a completed mat embodying the invention in the manufacture of a decorated panel using a single ply of rough veneer at 50. The backing paper 51 used to prevent warping, and a laminating sheet of dry film glue at 52 are assembled with a veneer ply 50 and a completed mat 45. When this assembly is subjected to about 325° F. and pressure of about 200 p.s.i. for about seven and one-half minutes in a conventional plywood press, the backing paper is laminated to one side of the veneer and the finishing ply 15 of the mat 45 is laminated to the other side. Obviously, the figures given are related to the resins used and to the particular assembly. They are therefore illustrative only.

Instead of showing the completed product resulting from the operation above described, I have illustrated in FIG. 10 a somewhat more complex product using three veneer plies 500, 501 and 502 bonded by two layers of dry film glue 520 and 521 and having a decorative top sheet such as that shown at 21 in FIG. 2 bonded to the top veneer ply 502 by the polymerization of a mat such as that shown at 45 in FIG. 1. The raw edges 54 can readily

be trimmed from the resulting plywood by a trimming saw **55** as suggested in FIG. **10**.

FIG. 11 shows the use of a mat such as that illustrated at **45** in FIG. 1 or **181** in FIG. 1*a* for molding purposes, rather than for making laminates. Here the mat is placed in the cavity **60** of a female mold or die **61** and subjected to heat and pressure by the heated male die **62**. It would be very difficult, in the absence of a mat which includes both a carrier and resin-filled filler, to distribute the mix of filler and resin with any uniformity whatever in a cavity such as that shown at **60**. With the mat, the distribution becomes very simple. Any slight wrinkling of the mat or irregularities in the cavity are readily accommodated by the flow of the mix under heat and pressure immediately preceding the polymerization which sets the resin.

A mat subjected to heat and pressure without being laminated to any other product is of itself a commercial article of manufacture, having substantial stiffness and tensile strength and useful for many purposes. In FIG. 12, I have shown a mat product made by limitating the mat of FIG. 2 to a backing web or sheet of paper or the like such as that shown at **51** in FIG. 9. This product is applicable to the surfaces of furniture, for example, to provide them with a grained and heat resistant finish.

It is to be noted that the finish or pattern sheet **21** is not an essential part of the original mat. The identical product shown in FIG. 12 may be made by using the mat of FIGS. 1 to 3 and laying any desired decorative pattern sheet on the mat prior to final compressing.

It will, of course be understood that, as is usual in the art, release sheets such as Patapar or Teflon or parting materials such as silicon or the like will be used wherever needed to facilitate removal of the product from the press or mold. Ordinarly, no release sheet or parting material will be necessary if the mat is used to bond one or more plies of veneer to a decorative and non-impregnated sheet such as a sheet of aluminum or the decorated sheet **21** of FIG. 2 or a sheet of ordinary kraft paper (which is useful if the resulting board is to be painted).

Examples of the preferred thermosetting resins and fillers and the proportions thereof have already been given. The temperatures both in quilting and in the final laminating step will vary according to the materials used and the time of exposure. Using films of "Kimpreg" (phenolic-impregnated alpho cellulose), it is practicable to use temperatures approximating 250° F.–300° F. for quilting on a drum type of press with limited pressure applied for approximately four to six seconds. In the preferred operation in which the quilting is done in a flat press, the temperature of the quilting die may be held at approximately 450° F. for a period of about two seconds or less.

In the final thermosetting molding or lamination step using a melamine pattern sheet, the preferred temperature is about 285° F. at a pressure of 400 to 600 pounds per square inch. Using a face sheet of aluminum, I prefer to cure at about 385° F. under approximately 250 pounds pressure. Using a phenolic pattern sheet, I prefer about 300° F. at about 200 pounds pressure. In all cases, the temperature and pressure are maintained for a period sufficient to effect the desired polymerization or cure.

A few examples of products made from the mat and through the use of the process here disclosed are as follows:

The laminate shown in FIG. 14 is very thin, comprising a pattern sheet **20** bonded to the backing **65** by the polymerized ply **450** resulting from the treatment with heat and pressure of the mat shown at **450** in FIG. 2.

FIG. 15 shows a piece of plywood comprising four plies of veneer bonded to each other and faced with a pattern sheet **20** by laminating the pattern sheet and mat assembly of FIG. 2 to the cross grain veneer made in a single operation as suggested in FIG. 12 and above described.

FIG. 16 shows a product similar to that illustrated in FIG. 14 except that the finish ply **70** comprises aluminum foil of 5 mil. thickness laminated to backing **71** which is made from one of the mats above described without any other backing sheet of any character. This sheet is as flexible as aluminum of like total thickness and has the same external appearance but is less easily dented and, of course, is much cheaper.

In FIG. 17, a corrugated die has been used to laminate together the foil ply **70**, the filler mat **71**, a ply **72** of fir veneer and a resin-impregnated backing sheet **73**. This is a very satisfactory wall panel.

The product shown in FIG. 18 is made by cementing the product of FIG. 17 onto a thick layer **75** of plastic foam such as Styrofoam with the product of FIG. 14 cemented to the other side of the Styrofoam layer **75**. The result is a thermally insulated panel suitable for constructing buildings and trailers, and for other purposes. The external foil ply **70** is completely waterproof and vermin-proof. The Styrofoam provides thermal insulation. The veneer-reinforced pattern sheet **20** provides an attractive decorative interior finish that is not easily dented and has considerable mechanical strength.

I claim:

**1**. As a new article of manufacture for use in the molding of another product under heat and pressure, a flexible mat comprising at least one web of material compatible with said product, a homogeneous mixture in dry powdered form of filler and of unpolymerized resin distributed upon at least one said web and adapted to be polymerized when the mat is used as aforesaid, and means for holding the mixture to the web in prefabricated assembly and for releasably confining the mixture in localized zones to preclude displacement during handling and for releasing the mixture for displacement when the mat is subjected to pressure and prior to polymerization of the resin, whereby the powdered mixture can migrate by dry flow to equalize pressures throughout the mat when the mat is used in a molding press in the molding of another product.

**2**. The article of claim **1** including a metallic facing.

**3**. The article of claim **1** in which the mat comprises a second web constituting a sheet of finishing material adapted to maintain its identity as such when the resin content of the mat mixture is polymerized.

**4**. A method of making a decorated laminate which comprises prefabrication of a finishing lamina, laying up such finishing lamina with a mat comprising at least one supporting lamina on which is bound a mix of thermosetting resinous adhesive and filler in the form of dry powder, the said mix being disposed between the finishing lamina and the supporting lamina, the mix being subject to dry flow under pressure prior to polymerization of the resinous adhesive, and subjecting said laminae and intervening powder to pressure sufficient to cause the powder to flow to assume positions in which density is substantially uniform and to heat sufficient to polymerize the adhesive whereby to complete the laminate and provide a finishing surface therefor in one operation.

**5**. A method according to claim **4** in which additional plies are laminated to the mat and the finishing lamina concurrently with the laminating of the finishing lamina to the mat by said heat and pressure.

**6**. A method of making a decorated laminate which comprises laying up a plurality of laminar plies, one of which comprises a core ply having imperfections, introducing between said core ply and an adjacent ply a layer of mix of at least ten percent to twenty percent by weight of dry powdered thermosetting resin with ninety percent to eighty percent by weight of dry powdered extender, said mix being flowable under pressure prior to polymerization thereof, and thereupon subjecting the laid up plies and said mix to pressure sufficient to cause the mix to flow to fill the imperfections and to equalize density as between said imperfections and portions of the plies adjacent thereto, and to temperatures sufficient in value and duration to polymerize the resin.

7. A method of preparing a mat to facilitate the handling of a mix of filler and adhesive preliminary to the use of said mix in a laminating operation, said method comprising preparation of a dry mix of filler flour with dry adhesive powdered resin, the resin in said mix being polymerizable and said mix being flowable under pressure prior to polymerization, distributing the mix to predetermined depth upon a confining web, superimposing another confining web upon the said mix to constitute said webs and mix as a mat, and embossing portions of one of said webs toward the other in a temporary localized mix confining pattern to preclude any substantial migration of the mix between the webs during handling of the mat.

8. A method of finishing rough veneer which comprises prefabricating a mat comprising a carrier sheet, and a homogeneous mix of initially discrete particles of a filler flour, and a polymerizable resin adhesive bonding said particles temporarily to each other and to the carrier sheet, and thereafter assembling the prefabricated mat to the imperfect face of a piece of veneer with the adhesively



bonded particles contacting the veneer, and subjecting the mat and veneer to heat and pressure sufficient to cause the mix to migrate to fill imperfections in said face and to equalize density and thereafter to polymerize the resin and to bond the mat to the veneer.


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