

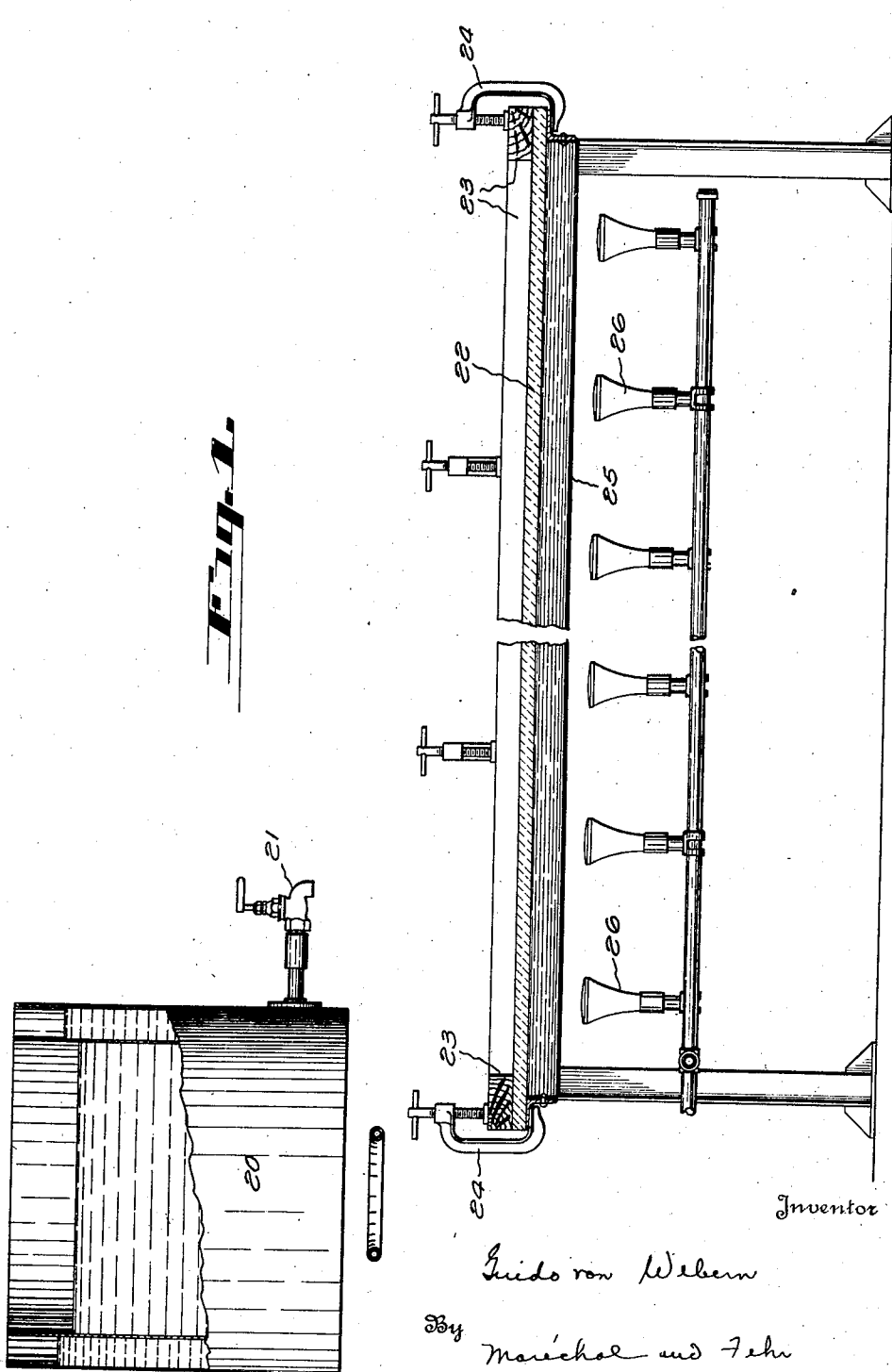
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METHOD OF AND APPARATUS FOR MAKING SHEETS OF IMPRESSION MATERIAL

Original Filed July 30, 1924 2 Sheets-Sheet 1



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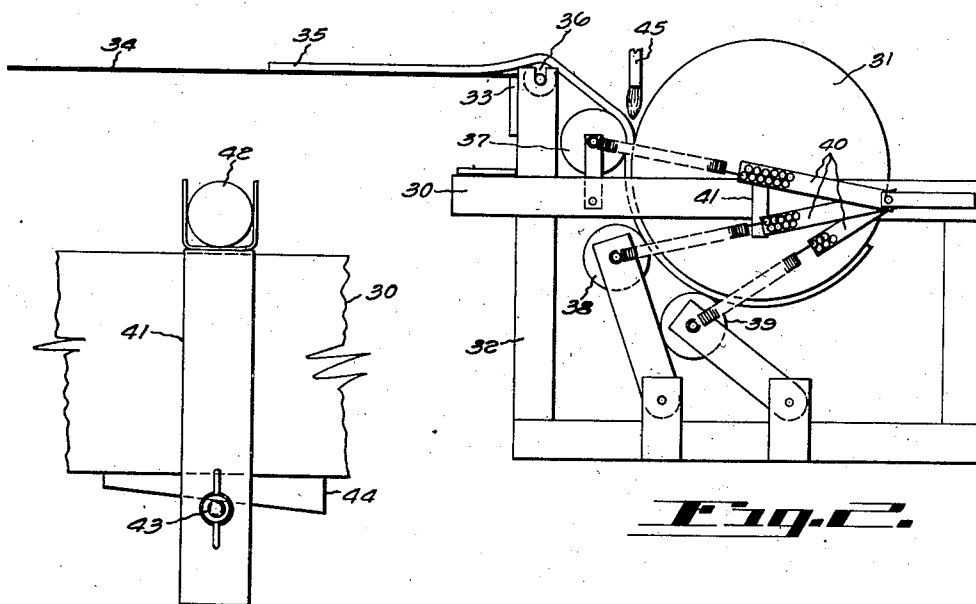
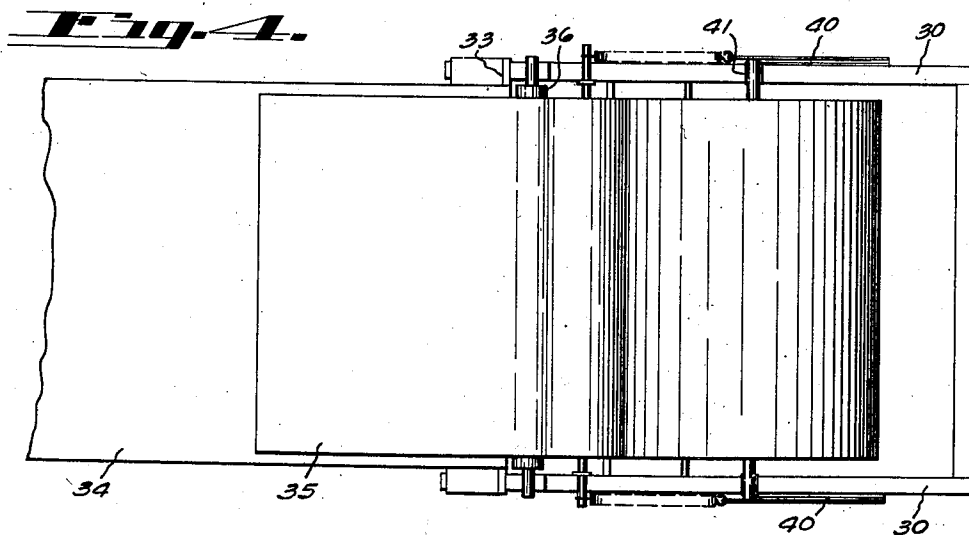


Fig. 2.



E39.3.

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METHOD OF AND APPARATUS FOR MAKING SHEETS OF IMPRESSION MATERIAL.

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The present invention relates to apparatus for use in the commercial reproduction of designs of an artistic nature and more particularly to a process for simulating wood graining, or the like, upon metal or other surfaces.

One of the principal objects of the present invention is to provide a roll having an improved impression material, and an improved method of making the same, for use in the said process of simulating wood graining and the like.

Other objects of the invention will be apparent from the following specification when taken in connection with the accompanying drawings, and in which

Fig. 1 is a longitudinal view, partly in elevation and partly in section, showing the pouring table employed in practicing the present invention;

Figs. 2 and 3 are side elevation and plan views respectively of the applying machine employed in applying the impression material to the surface of a roll in accordance with the present invention; and

Fig. 4 is a fragmentary view of a portion of the apparatus in Fig. 2.

In the process of reproducing designs of an artistic nature, as for example, simulating wood graining upon metal or other surfaces, the design is first formed on a surface of a plate, and this design then transferred to another surface by passing a roll first over the surface of the plate upon which the design is produced and then passing the roll over the surface to which the design is to be transferred. The roll has a surface of a flexible or impression-receiving material so that the ink design adheres to the surface of the roll, and when the roll is passed over the second surface the design adheres thereto, leaving the roll without any design on its surface. The design may be placed upon the first surface or plate in any desired manner as by painting, or by forming the design in relief upon the plate, but preferably the design is produced by means of depressions in the plate, which depressions are filled with a suitable ink and constitute the design to be transferred. For artistic work which portrays the minute cellular construction of wood graining, as well as the shades of color in the surface of the wood, the design is preferably obtained by

photographing a piece of wood and then transferring the design from the photographic negative to a copper, or other type of ink plate by means of etching or any suitable process. After the plate has been formed the entire plate is covered with ink, paint, varnish, or other color bearing medium—for purposes of easier description hereinafter referred to as "ink"—and a doctor is then drawn over the surface of the plate to wipe the ink off the top surface of the plate leaving the depressions or etched portions of the plate filled with ink.

When the roll is passed over the ink plate the design or ink adheres to the surface of the roll and may then be transferred to the prepared surface which is to receive the design. However, great difficulty has been experienced, particularly in fine work, in securing rolls having surfaces suitable for satisfactorily transferring the design from the ink plate to the surface which has been prepared to receive the design, owing to the difficulty of preventing the formation of bubbles or other defects in the surface of the roll, which result in the forming of imperfect designs from perfect plates. This has been particularly true with respect to rolls of large size. Heretofore the surface layers for these rolls have been cast in cylindrical metal, or similar molds. Such surface layers almost invariably contain large numbers of air bubbles which are often so great in number as to render the surface layer useless, or quite inferior.

The present application discloses a method and apparatus for producing a roll of such improved character as to overcome the difficulty mentioned whereby substantially perfect transfers may be made from an ink plate to the surface of any selected object.

Fig. 1 shows a pouring table which is used in forming the flexible or impression material, which material is formed as a slab or sheet and then secured to the circumferential surface of a core or other backing, the backing being preferably of rigid or substantially rigid constructions. The sheet of impression material may be of any suitable thickness but it has been found in practice that good results are obtainable from a sheet having a thickness of one to one and one-half inches. The impression material preferably consists of glue and glycerine in vary-

ing proportions, depending on the physical characteristics desired in the finished product. The proportions of one-half glue and one-half glycerine, which melts at a temperature of about 120 or 130° F. gives very satisfactory results under normal conditions.

The composition may be melted in the water-jacketed vessel 20 and then poured through a suitable faucet 21 upon the horizontally disposed top 22 of the pouring table, this top being preferably a slab of polished marble, suitably supported. A frame composed of rails or strips 23 is secured to the top of the marble slab by means of clamps 24, the strips forming the ends and sides of the frame being preferably separable so that the frame may be made of any size or shape according to the size of sheet that it is desired to pour, and to facilitate removing the sheet from the slab. Beneath the marble slab 22 and cooperating therewith to form a closed chamber is a heating pan 25 which is adapted to contain water or any other suitable liquid which may be heated or boiled by means of the burners 26 located at various positions underneath the heating pan.

When it is desired to pour a sheet of the impression material or composition the water in the pan is heated to bring the marble slab to a temperature of about 160° F. When the slab has attained this temperature the composition is poured on the table to form a sheet of the desired thickness generally about one or one and one-half inches. The composition which melts at a temperature of about 120° in the case of a 50-50 glue-glycerine composition, is thus received upon a table having a higher temperature so that it is not subjected to a chilling effect. The layer of composition and the marble pouring slab, water pan, etc., are then allowed to cool, which cooling takes place at a comparatively slow rate owing to the heat capacity of the composition, the marble slab, the water pan and other heated parts of the pouring table. Due to the slow cooling the layer of composition remains liquid for a considerable period so that substantially all the bubbles of air, water vapor or other matter in the composition rise in the heavy viscous composition and escape so that the surface which is formed on the impression material where it lies in contact with the marble slab is smooth and free from these objectionable bubbles. The marble slab is preferably oiled, with a suitable oil, such as paraffin oil, in order to fill the pores of the marble, any surplus oil being wiped off carefully so that there is no free oil on the surface. This oil treatment of the marble prevents sticking of the composition and also results in a smoother surface. The marble should be given this oil treatment from time to time as needed. It is the surface of the composition which lies in contact with

the marble slab that will become the impression-receiving surface of the roll after the material is secured to the core.

To secure the best results by this process, the sheet of impression material is stripped from the marble slab after it has cooled and preferably allowed to season for four or five weeks in a dry atmosphere to get rid of all moisture in the composition. Such seasoning is not essential but has been, in practice, found to be preferable. The composition is then remelted and the process above described for pouring a sheet of impression material is repeated. This seasoning and repouring process results in a sheet of impression material, having an impression surface of extreme smoothness and uniformity. The finished sheet is preferably spread out on a flexible copper plate, from which all, or portions, of it may be removed, as desired, for forming rolls.

Having formed the sheet of impression material of the proper size and shape, this sheet is now ready to be secured to the surface of the roll or other backing. For this purpose the apparatus illustrated in Figs. 2, 3 and 4 is provided, such apparatus consisting of a framework adapted to support the roll or backing, and the sheet of impression material in such position that they may be readily brought into engagement with one another, it being understood that the sheet of impression material is to lie on the peripheral surface of the roll and to be secured thereto. The frame work of the applying machine is provided with the horizontally disposed supporting bars 30 for supporting the roll or backing 31 in position to receive the impression sheet. At one end of the frame work there are posts 32 which are provided with a ledge or shoulder 33 to support one end of the copper plate 34 which carries the sheet of impression material 35, the smooth or impression surface of which lies in contact with the copper plate. Mounted on the posts 32 adjacent the end of the copper plate when the latter is resting on the ledge 33, is a roller 36 over which the impression sheet may be drawn towards the roll 31. Pivottally mounted in the frame work of the applying machine are three pressure rolls 37, 38 and 39, which are arranged in a series and adapted to bear against the periphery of the roll 31. Adjustable spring tension devices 40 are secured to the ends of the pressure rolls 37, 38 and 39 to provide the desired pressure against the surface of the roll 31. In order that the applying machine may receive rolls of various diameters, each supporting bar 30 is provided with a supporting bracket 41 to receive the shaft 42 of the roll, the supporting bracket being adjustable horizontally along the supporting bar 30 so that the periphery of the roll 31 may be brought into

proper relation with respect to the pressure rolls 37, 38 and 39. After adjustment the supporting brackets 41 are secured in position in any suitable manner as by means of the fastening bolts 43 and wedges 44.

When it is desired to secure the sheet of impression material to the roll, it being assumed that the roll 31 is in position in the frame and the copper sheet carrying the impression material 35 is in position with its edge resting on the ledge 33, the operator draws the end of the sheet 35 over the roll 36 and enters it between pressure roll 37 and the surface of the backing roll 31. Heat is then applied, as by means of a torch 45 to the surface of the impression material adjacent the line of contact between the impression material and the backing 31. In this manner the surface of the glue-glycerine composition of the impression material is softened so that it will adhere to the backing roll 31. The impression material thus furnishes its own adhesive and it may thus be joined directly with the backing roll 31 and without the introduction of an intermediate adhesive material. By turning the backing roll 31 slowly in a counter-clockwise direction the softened or melted surface of the impression sheet is brought into close intimate contact with the periphery of the backing roll under the pressure of the pressure rolls 37, 38 and 39, and other portions of the sheet 35 are brought under the influence of the heating torch 45 and in turn compressed against the backing roll by the pressure rolls. By the time that the sheet 35 emerges from the influence of the pressure roll 39, the surface in contact with the backing roll has set and the impression sheet is firmly secured to the backing roll.

This method of joining the impression material with the backing has the advantage that the impression material is secured throughout its whole area, is applied under uniform pressure, is of even thickness, and generally speaking, is free from such irregularities as would prevent realizing the full advantage of extreme smoothness of the impression surface of the impression sheet 35.

From the foregoing, it will be apparent the the present invention provides a new process for forming an impression material having an impression surface of extreme smoothness, a process for joining such a sheet of impression material to a backing so that the full advantage of its smooth surface may be realized, and an improved roll for transferring impressions from an ink plate to a receiving surface.

While the method herein described, and the forms of apparatus for carrying that method into effect, constitute preferred embodiments of the invention, it is to be understood that the invention is not limited to these precise forms, and that changes may be

made therein without departing from the spirit of the invention.

What is claimed is:—

1. The method of making an impression material having a surface suitable for transferring an impression from one surface to another surface by contact successively with said surfaces, which method consists in melting a composition of glue and glycerine, pouring the mixture to form a sheet, aging the sheet, remelting the composition, pouring the composition upon a smooth surface to form a sheet of the desired thickness, and cooling the sheet slowly.

2. The method of making an impression material having a surface suitable for transferring an impression from one surface to another surface by contact successively with said surfaces, which consists in preparing a substantially homogeneous composition of glue and glycerine, aging the same to remove water and the like, melting the composition, and pouring upon a smooth surface to form a sheet of the desired thickness.

3. The method of making an impression material having a surface suitable for transferring an impression from one surface to another surface by contact successively with said surfaces, which method consists in melting a composition of glue and glycerine, pouring the composition upon a smooth substantially horizontal surface to form a sheet of the desired thickness, and maintaining the sheet liquid for a substantial period.

4. The method of making an impression material having a surface suitable for transferring an impression from one surface to another surface by contact successively with said surfaces, which method consists in pouring the composition with its impression-receiving surface in contact with a smooth heated surface and gradually cooling said surface to cause the material to set.

5. The method of making a sheet of impression material of the character described, adapted for attachment to a suitable backing member, which consists in pouring a portion of a glue-glycerine composition upon a smooth slab heated above the melting temperature of the composition and maintaining the layer of composition on the slab liquid for a substantial period.

6. In apparatus for forming an impression material, a slab having a surface smoothed and adapted to be treated with material to prevent sticking of the impression material thereto, means for pouring the impression material in contact with said surface, removable means bounding to the top of the slab for confining the poured material, and means for heating said slab.

7. The method of making composition impression transfer material for use in offset printing, comprising heating the composition to melt it, pouring the molten composition

tion on a substantially smooth horizontal surface, and then maintaining the temperature of the composition for a substantial period to cause bubbles to rise upwardly away from such surface.

8. The method of treating a congealable substance to form a transfer sheet comprising, melting the substance, pouring the same on a substantially smooth horizontal surface, bounding the surface to maintain the substance on the surface at a constant depth, maintaining the substance in molten state by the application of heat thereto for a substantial period to cause all bubbles to rise away from such surface, and finally dissipating the heat to congeal the substance.

9. The method of making impression transfer material of the character described, comprising, melting the raw material, pouring the molten material upon a plate having a substantially smooth upper surface, uniformly heating the plate through a heat conducting fluid in contact therewith and maintaining the heat for a substantial pe-

riod to cause bubbles in the molten material to rise clear of the surface and finally dissipating the heat to congeal the material.

10. The method of making impression transferring material of the character described comprising melting the raw material, pouring the same on a substantially horizontal surface to form a sheet, aging the sheet, remelting the aged sheet and pouring the material thereof on a smooth preheated surface and gradually cooling the surface to allow all bubbles in the material to rise from the surface.

11. An apparatus for forming impression material comprising a body having a substantially smooth upper surface adapted to be treated to prevent adhesion of the material thereto, means bounding the said upper surface to form a rim for containing the material, and means forming a fluid chamber below the body for conducting heat uniformly to the said surface of the body.

In testimony whereof I hereto affix my signature.

GUIDO VON WEBERN.