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METHOD OF TREATING WAXED PAPER FOR REPEATED RE-USE IN LINOLEUM MANUFACTURE

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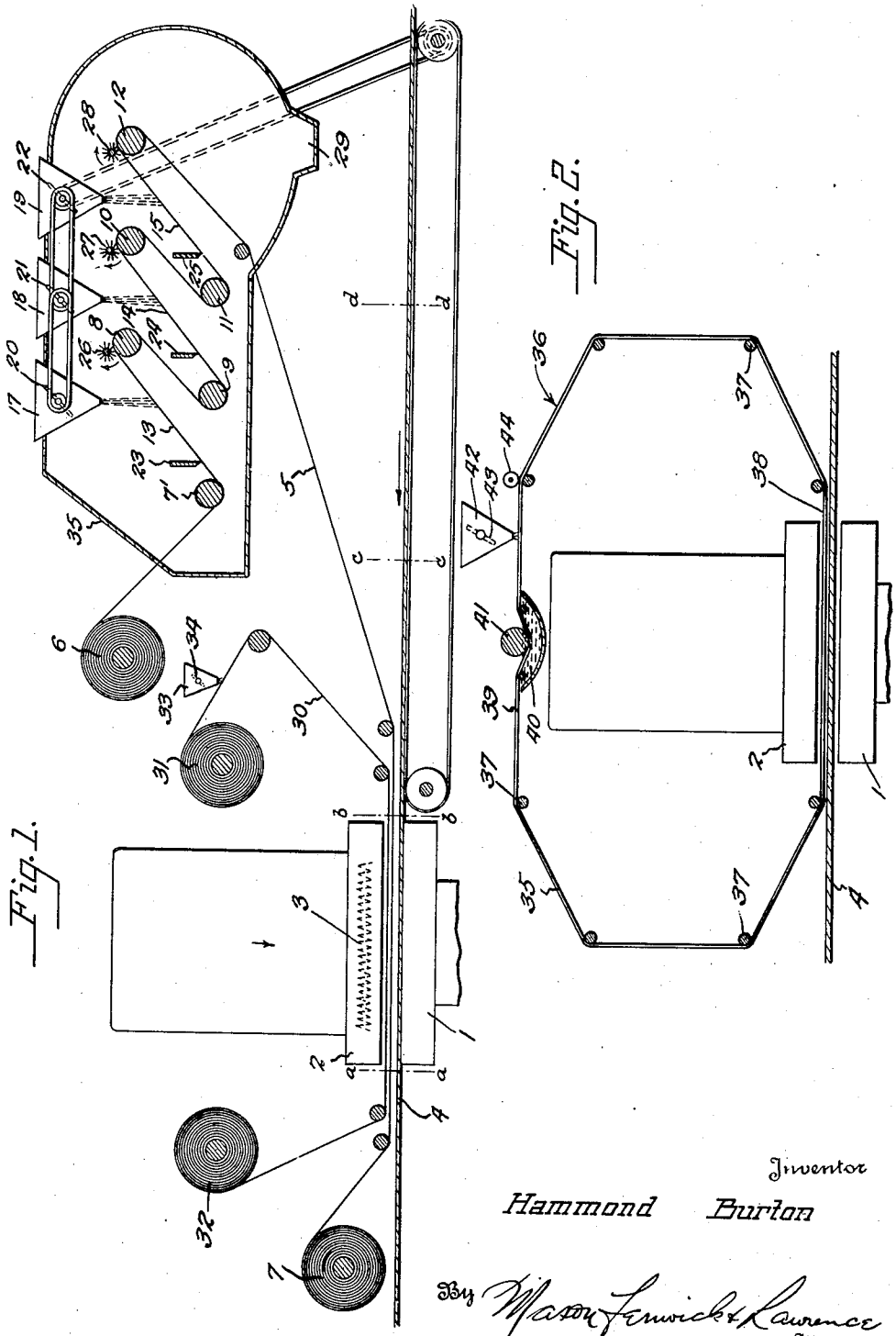


Fig. 1.

Fig. 2.

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METHOD OF TREATING WAXED PAPER FOR REPEATED RE-USE IN LINOLEUM MANUFACTURE

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10 Claims. (Cl. 154—25)

This invention relates to the manufacture of linoleum by the flat press process, in which process a number of linoleum pieces of different color in slightly plastic state are laid in pattern formation upon a unit area of a continuous strip of backing material, the strip being then moved to a position in which the thus prepared unit area is between the bed and heated platen of a press, the platen being brought to bear upon the assembled pieces to fuse them together and to the backing strip. While the pressure is being applied to one unit area, another is being covered with the pattern pieces, and the units so prepared are run successively through the press.

The platen of the press picks up a certain amount of colors from the pattern pieces, and in the absence of measures to prevent it, would print these colors on the next printed unit. This would not be a drawback if the pattern of the succeeding unit could be brought into exact registry with the print on the platen, but this cannot be done, for the laying of the pattern pieces is a manual operation, permitting some tolerance in the relative spacing of the pieces, which may be laid in contact or as much as one-eighth inch apart. Thus, there is no relation of precise conguency between the print on the platen from one unit, and the pattern of the next unit, so that the print on the platen would lap the bounds of the colors on the unit area next subjected to pressure.

To prevent this it is customary to run a continuous sheet of waxed paper through the press above the linoleum, synchronized with the travel of the backing strip, this sheet being unwound from a roll on one side of the press and rewound on a roll on the other side. By this means the color from the linoleum unit under pressure is imparted not to the platen, but to the under side of the waxed paper, a fresh section of the waxed paper being presented above each successive unit area beneath the platen. In time, the entire under surface of the waxed paper becomes contaminated with color and cannot be reused. Then the rolls at the ends of the waxed paper are inter changed as to position, with the reverse side of the waxed paper confronting the linoleum, and the waxed paper may be used again until the entire reverse side has become stained with color. When both sides of the waxed paper have thus been once employed, the waxed paper is no longer useful, and is discarded.

This is an expensive expedient, in view of which attempts have been made to remove the color from the waxed paper, permitting its reuse, as by treating it with a solution which dissolves or washes out the color. The waxed paper ordinarily employed is, however, of such light gauge as to shrivel and weaken, so as to disintegrate under tension, making it unfit for further use, and the liquid solvent for the color depletes the paper of wax so that even if otherwise usable, it loses its property of nonadhesion to the linoleum.

The object of the present invention is to treat the waxed paper concurrently with its use in connection with the linoleum press, so as to permit it to be used in countless subsequent runs, thus providing a great saving in this operation.

Other objects of the invention will appear as the following description of a preferred and practical embodiment thereof proceeds.

In the drawing which accompanies and form a part of the following specification:

Figure 1 is a diagrammatical vertical section through apparatus illustrating the process of the present invention; and

Figure 2 is a similar view, also diagrammatic, illustrating a modified form of the invention.

Referring now in detail to Figure 1, the press which is of the flat type, comprises the fixed bed 1, and the vertically reciprocable platen 2. The platen is designed to be heated, as is indicated by the rheostat 3. The backing strip of the linoleum which may be either of felt paper or burlap, is designated by the reference character 4 and travels in the direction of the arrow. The vertical lines of division *a*, *b*, *c*, and *d* represent unit areas on this backing strip, upon which small differently colored pieces of linoleum are placed by hand in pattern formation. These pieces are positioned manually by skilled workers, and a certain tolerance is permissible in the placing of these pieces so that they may be in contact with one another, or may be separated from one another by a space as wide as one-eighth of an inch. As has been stated in the prefatory portion of this specification, it would be impossible on account of this latitude in the positioning of the strips, for one unit area to be placed upon another with the boundaries of the pattern pieces in precise congruency. Consequently, the waxed paper strip 5 which is of sufficient width to cover the linoleum backing is run between the members of the press and above the linoleum, for the purpose of taking the color impression which is inevitably absorbed from the pattern pieces by the heat and pressure of the press.

The waxed paper strip 5 is unwound from a roll of waxed paper 6 and rewound upon the roll

7. At a region between the roll 6 and the press it is subjected to the treatment contemplated by the present invention, which consists in the application of a fine film of powder to the surface of the waxed paper, which powder film comes in direct contact with the surface of the pattern pieces, absorbs the color therefrom, the color contaminated powder coming off on the linoleum during the press operation.

In carrying out the invention, I have provided a device including a series of staggered rolls 7, 8, 9, 10, 11 and 12, about which the waxed paper passes in a serpentine route, providing the inclined planes 13, 14 and 15 upon which suitable powdered material such as rice flour is evenly sprinkled from the battery of hoppers, 17, 18, and 19, each having a slot in the bottom extending transversely of the waxed paper and throughout the full width thereof, the distribution of powder from said hoppers being accomplished by suitable agitators 20, 21, and 22, extending longitudinally within the hoppers. Said agitators are driven by any suitable means and at least some of the rolls may be driven in order to take tractive strain from the waxed paper. The number of rolls, and consequently the number of inclined planes into which the waxed paper is differentiated, as well as the number of hoppers, is a matter of choice and not critical to the invention. The surplus powder deposited on the waxed paper gravitates down the inclined planes, being detained by the baffles or scrapers 23, 24, and 25, so that it does not lodge beneath the rolls. It is eventually carried upward through frictional contact with the waxed paper, meeting the brushes 26, 27, and 28, adjacent the tops of the inclined planes, by which it is retained on the respective inclined planes and prevented from being carried over in the forward movement of the waxed paper strip. Thus, the waxed paper may be said to travel beneath successive uniform layers of color absorbent powder, becoming uniformly coated with as much powder as will stick to its waxed surface. When the strip of waxed paper passes the final roll 12, such of the powder as is too loosely adherent thereto falls off and may be collected in the trough 29 and conserved for further use. As the waxed paper with the adherent powder film passes between the press members and is subjected to pressure, the powdered side is brought into compressive contact with the plastic colored pattern pieces, the color being absorbed by the powder which leaves the surface of the waxed paper and adheres to the surface of the linoleum. Thus, as the waxed paper leaves the press and winds upon the roll 7, it is substantially free from the powder.

The linoleum backing strip 4 and the waxed paper are fed practically synchronously so that a fresh section of waxed paper is presented to a fresh unit of linoleum at each operation of the press, and when the entire length of the waxed paper has become wound upon the roll 7, the working surface of the same, that is to say, the surface which has been subjected to contact with the linoleum is substantially without powder. At the end of the run the positions of the rolls are interchanged, so that the opposite side of the waxed paper will now be subjected to the coating of powder and will become the working surface with reference to the linoleum beneath the press.

It has been found by experience that each time the waxed paper is subjected to the heat and pressure of the press a certain amount of wax is absorbed by the powder and is taken away from the waxed paper when the powder is transferred to the linoleum, so that it becomes necessary to replace the wax content of the paper, otherwise, it will soon begin to stick to the linoleum. Replenishment of the wax content is accomplished in the following manner. A second strip 30 of waxed paper is employed which unwinds from the roll 31, passes beneath the platen above the strip 5, and is rewound upon the roll 32, the latter roll being preferably driven so that the waxed paper 30 moves synchronously with the waxed paper 5. Each time the platen 2 presses the sheets of waxed paper together and against the linoleum, a small amount of wax is transferred from the strip 30 to the contacting surface of the strip 5, which surface it will be understood was the previous working surface, wax-depleted by contact with the linoleum in the press.

It is contemplated that the rolls 31 and 32 shall be interchangeable as to position in the same manner as the rolls 6 and 7, so that the opposite surfaces of the waxed paper will be alternately employed. After each side of the waxed paper strip 30 has been run through the press once, it will have become depleted of a certain part of its wax content, which is re-supplied by powdered wax sifted upon it through the slotted bottom of a hopper 33 which may, if desired, be equipped with an agitator 34.

Figure 1 shows that the mechanism which applies the rice powder to the strip 5 of waxed paper may be enclosed within a suitable housing 35.

The process as above described contemplates the treatment of waxed paper of the type customarily employed in connection with flat linoleum presses, and which is too delicate in texture to be liquid-treated for the removal of the color.

There are certain types of waxed paper available for other uses which are of sufficiently heavy texture to withstand liquid treatment without impairing their strength or smoothness of surface. Such materials of this class as are now available are in short sheets and not in long rolls. Figure 2 illustrates a modified form of the invention in which such sheets 35 of heavy grade waxed paper are united into a continuous belt 36 passing around a series of rolls 37. It may, of course, be possible that as the demand for longer units of waxed paper of this heavy grade increases, manufacturers will produce it in the form of long strips, a single one of which may be employed to form the endless belt. In the form of the invention shown in Figure 2, the backing strip 4 passes between the press members 1 and 2 in the same manner as illustrated in Figure 1, with the varicolored pattern pieces assembled on successive unit areas. The endless belt is so arranged that the lower flight 38 of the same passes between the press members above the pattern pieces and preferably synchronously with the backing strip 4. The function of the waxed paper is to receive the absorbed color imprint from the pattern, and to provide a fresh portion of waxed paper for each unit area as it comes beneath the platen of the press.

At a certain point in its orbit, for instance, in the top flight 39, a color removing device is provided in the form of a trough 40 at least equal in width to the width of the belt, containing a color solvent, which usually is found to be a good solvent for wax. A roll 41 is arranged to depress the belt below the liquid level in said trough. As the belt passes through the liquid solvent the

color imprint is removed. Incidentally, some of the wax also is dissolved away. The wax, the function of which is that of a lubricant, is replenished from time to time from a hopper **42** arranged on the exit side of the trough **40** having a slotted bottom through which powdered wax or lacquer having an oleaginous content, or the like, is evenly distributed across the width of the belt by means such as the agitator **43**. Excess powder may be brushed back toward the hopper by means of the revolving brush **44**. The belt comes to the region of pressure with a fine film of lubricant adherent to its under surface, a portion of which is absorbed into the belt through the heat and pressure of the platen **2**. In this form of the invention one side of the waxed paper strip is continuously used, but if desired, the belt can be removed, inverted, and a fresh working surface thus provided. It is found that if the powdered lubricant in the hopper **42** is diluted with a suitable filler such as rice fluor, there would be less absorption of lubricant by the linoleum, resulting in retention of a greater proportion of lubricant by the material of the belt. Any suitable material besides waxed paper may be used for the belt material, provided it is surface treated in the manner set forth to form a lubricative color receptive surface, to provide for removing surface color contamination, and to afford means for replenishment of the lubricant in the surface of the belt.

While I have in the above description disclosed only two exemplifications of apparatus by means of which the process of the present invention may be carried out, it will be understood to those skilled in the art that the method is not limited by the apparatus by which it is performed, but has a breadth of scope commensurate with the terms of the appended claims.

What I claim as my invention is:

1. In the manufacture of linoleum or the like, wherein adjacent areas of colored substance are successively pressed by a platen and in which a strip of light gage paper material is passed with the linoleum between the platen and the colored substance to receive a color imprint from color transferred to said strip from said substance as an incident of the pressing, and presenting a fresh surface to each successively pressed area, the method of treating said strip to prevent color contamination thereof whereby it may be used repeatedly, comprising applying to said strip, at a point in advance of the platen, a coating of color-receptive powder frictionally adhesive to the strip but more adhesive to the linoleum, and a lubricant, whereby in the pressing the powder receives the color and sticks to the linoleum, leaving the strip free for repetitive application of the powder coating and the lubricant is absorbed by the strip.

2. In the manufacture of linoleum or the like, wherein adjacent areas of colored substance are successively pressed by a platen and in which a strip of waxed paper is passed with the linoleum between the platen and the colored substance to receive a color imprint from color transferred to said strip from said substance as an incident of the pressing, and presenting a fresh surface to each successively pressed area, the method of treating said strip to prevent color contamination thereof whereby it may be used repeatedly, comprising applying to said strip while moving, at a point in advance of the platen, a coating of color-receptive powder frictionally adhesive to the strip but more adhesive to the linoleum, whereby in the pressing the powder receives the color and sticks to the linoleum, leaving the strip free for repetitive application of the powder coating and contacting the paper with additional wax while the platen is exerting pressure thereon.

3. In the manufacture of linoleum or the like, wherein adjacent areas of colored substance are successively pressed by a heated platen and in which a strip of waxed paper is passed with the linoleum between the platen and colored substance, to receive a color imprint from color transferred to said strip from said substance as an incident of the pressing, and losing part of its wax content by absorption into the linoleum and presenting a fresh surface to each successively pressed area, the method of treating said strip to prevent color contamination thereof and for restoring its wax content, whereby it may be used repeatedly, comprising applying to said strip while moving, at a point in advance of the platen, a coating of color-receptive powder frictionally adhesive to the strip but more adhesive to the linoleum and applying a waxed feed sheet to the un-powder-coated side of said strip beneath said platen, whereby under conditions of heat and pressure the powder receives the color and sticks to the linoleum, leaving the strip free for repetitive application of the powder coat, while the wax content is replenished through absorption of wax from said feed sheet.

4. In the manufacture of linoleum or the like, wherein adjacent areas of colored substance are successively pressed by a heated platen and in which a strip of waxed paper is passed with the linoleum between the platen and colored substance, to receive a color imprint from color transferred to said strip from said substance as an incident of the pressing, and losing part of its wax content by absorption into the linoleum and presenting a fresh surface to each successively pressed area, the method of treating said strip to prevent color contamination thereof and for restoring its wax content, whereby it may be used repeatedly, comprising applying to said strip while moving, at a point in advance of the platen, a coating of color-receptive powder frictionally adhesive to the strip but more adhesive to the linoleum, and running a continuous feed sheet of waxed paper beneath the platen with said strip, adjacent the un-powder-coated side thereof for contacting said strip in the pressing operation and presenting a fresh portion to each successive pressed area whereby under conditions of heat and pressure the powder receives the color and sticks to the linoleum, leaving the strip free for repetitive application of the powder coat, while the wax content is replenished through absorption of wax from said feed sheet.

5. In the manufacture of linoleum or the like, wherein adjacent areas of colored substances are successively pressed by a heated platen and in which a strip of waxed paper is passed with the linoleum between the platen and colored substance, to receive a color imprint from color transferred to said strip from said substance as an incident of the pressing, and losing part of its wax content by absorption into the linoleum and presenting a fresh surface to each successively pressed area, the method of treating said strip to prevent color contamination thereof and for restoring its wax content, whereby it may be used repeatedly, comprising applying to said strip while moving, at a point in advance of the platen, a coating of color-receptive powder fric-

tionally adhesive to the strip but more adhesive to the linoleum, running a continuous feed sheet of waxed paper beneath the platen with said strip, adjacent the un-powder-coated side thereof for contacting said strip in the pressing operation and presenting a fresh portion to each successively pressed area whereby under conditions of heat and pressure the powder receives the color and sticks to the linoleum, leaving the strip free for repetitive application of the powder coat, while the wax content is replenished through absorption of wax from said feed sheet, and applying to said feed sheet while moving, at a point in advance of the platen, a coating of powdered wax frictionally adherent to said feed sheet to compensate the loss of wax content from said feed sheet, permitting indefinite reuse thereof.

6. In the manufacture of linoleum or the like, wherein adjacent areas of colored substance are successively pressed by a platen and in which a continuous belt of waxed paper is passed with the linoleum between the platen and the colored substance to receive a color imprint from color transferred to said belt from said substance as an incident to the pressing, and presenting a fresh surface to each successively pressed area, the method of treating said belt to remove the color imprint therefrom whereby it may be used repeatedly, comprising causing said belt with the color imprint to pass through a color removing liquid, and applying to said belt while moving, at a region between the point of color removal and said platen, a coating of powdered wax frictionally adhesive to said belt for restoring the wax depleted by said color removing liquid and by absorption from said belt by the linoleum.

7. In the manufacture of linoleum or the like, wherein adjacent areas of colored substance are successively pressed by a platen and in which a continuous belt is pressed with the linoleum between the platen and colored substance having a lubricative surface to receive a color imprint from color transferred to said belt from said substance as an incident to the pressing, and presenting a fresh surface to each successively pressed area, the method of treating said belt to remove the color imprint therefrom whereby it may be used repeatedly comprising causing said belt with the color imprint to pass through a color removing liquid, and renewing the surface of said belt by applying lubricant thereto while the belt is moving, at a region between the point of color removal and said platen.

8. In the manufacture of linoleum or the like, wherein adjacent areas of colored substance are successively pressed by a platen with the incidental transfer of a color imprint to the immediately contiguous pressing surface, the method of preventing transfer to the platen of a color imprint from the linoleum comprising interposing a film of lubricant consisting of absorbent powder and wax between the platen and linoleum for receiving the incidental color imprint and being absorbed into the linoleum.

9. In the manufacture of linoleum or the like, wherein adjacent areas of colored substance are successively pressed by a platen, and in which portions of a continuous lubricant impregnated web is interposed between the platen and the colored substance to prevent adherence of the color to the platen, the method of preventing adherence of color to and preserving the web comprising coating that face of the web which is to contact the colored substance with wax and an absorbent powder.

10. In the manufacture of linoleum or the like, wherein adjacent areas of colored substance are successively pressed by a platen and in which portions of a continuous lubricant impregnated web is interposed between the platen and the colored substance to prevent adherence of the color to the platen, the method of preserving the web comprising removing from the web any coloring matter and applying to the web a lubricant to replace that absorbed by the coloring matter.

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