July 14, 1931. H. E. SMITH ET AL 1,814,641

IMITATION PEARL AND METHOD OF MAKING SAME

Filed Oct. 6, 1927

Fig. 1.

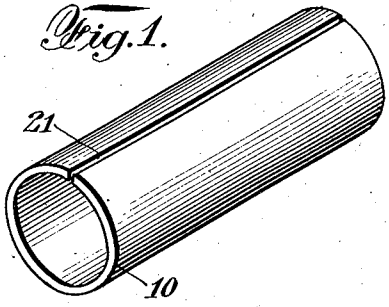


Fig. 2.

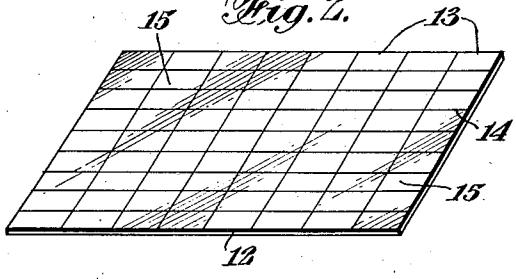


Fig. 3.

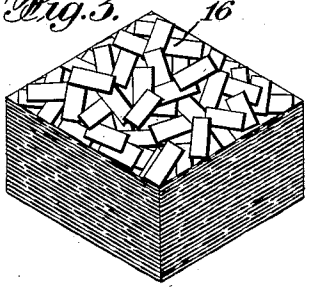
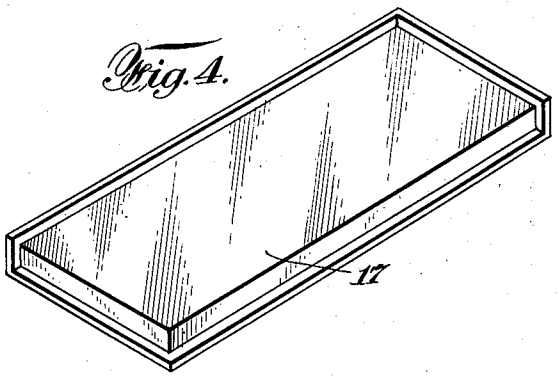


Fig. 4.



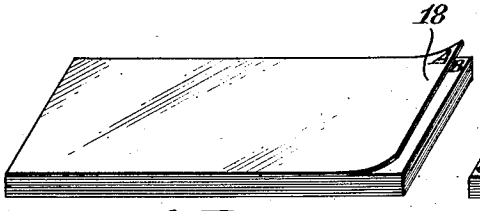


Fig. 5.

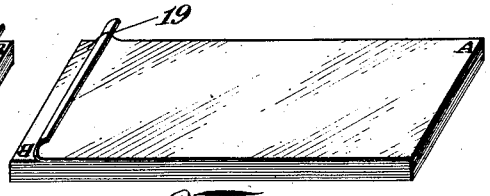


Fig. 6.

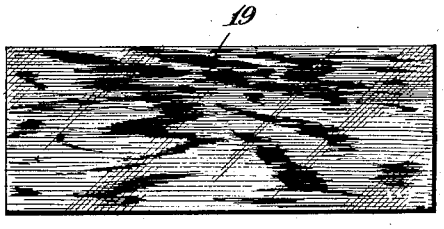


Fig. 7.

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UNITED STATES PATENT OFFICE

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IMITATION PEARL AND METHOD OF MAKING SAME

Application filed October 6, 1927. Serial No. 224,313.

Our invention relates to the production of delicately flowed undulating patterns having a brilliancy like that of the natural mother-of-pearl. We attain such an effect by means which are unique and of moderate cost in that we employ relatively cheap ingredients and simple manipulation.

We find it is possible to impart a pleasing pearly appearance to pyroxylin plastics and other compounds of soluble cellulose or equivalent material and to answer the demand for a refined but low cost configuration by flowing stacked material under pressure to obtain an undulating or drift effect of high lustre and attractive pattern.

In the accompanying drawings illustrating the invention

Figs. 1 to 6 are diagrammatic illustrations of steps in the process of manufacturing a pearly sheeting in accordance with this invention, and

Fig. 7 is a plan view of a finished sheet showing the typical flowed or drift effect.

In the practice of our invention we employ one to three parts (dry weight) of silky mercurous chloride in concentrated aqueous mixture to one hundred parts of pyroxylin dissolved to a flowable consistency in a suitable solvent, for example, methyl alcohol, ethyl acetate, acetone, alcoholized ether or equivalent menstrua. These are preferably employed in effective combinations made according to the skilled operator's choice. Camphor or an equivalent plasticizer is also to be mixed in as desired. Instead of introducing the mercurous chloride in aqueous suspension, we can employ it in combination with a more compatable menstruum in which case there must be a suitable substitute of such menstruum in place of the water during preparation of the mercurous chloride for admixture.

To secure the desired pearly configuration, we spread our flowable combination of dissolved pyroxylin and fish scale substitute on a suitable surface such as a film wheel, and preferably by scraper action according to the practice which prevails in the manufacture of cinematograph sheeting.

The resultant film, in thickness about 5 thousandths of an inch, is stripped from the wheel and wound around a drum, say about 9 inches in diameter and 47 inches long, until a stratified thickness of about 125 thousandths of an inch or less is reached. This cylinder 10 is then sliced lengthwise of the drum as indicated at 11 in Fig. 1 and flattened out to form a soft slab 12 (Fig. 2) about 44 x 27 inches and weighing about 6 to 7 pounds, which operation is repeated until sufficient material has been accumulated to make a batch. These slabs 12, which have a flat silvery appearance, but lacking in wavy or brilliant nacreous effect are cut into strips 13 about 3 to 4 inches in width. These strips 13 are then passed through a machine, such as a fodder cutter, and cut across as indicated at 14 into smaller rectangular pieces 15 about 3 x 1½ inches by 125 thousandths of an inch thick. Then the pieces are mingled promiscuously but in flat or horizontal and more or less overlapping position in a receptacle or storage box about 22 inches square and 8 inches deep forming a mass as indicated at 16 (Fig. 3). A heavy weight, such as a metal slab, is then laid on the surface of the mass to press and hold the pieces together after which the box is sealed and the contents allowed to stand for 10 or more hours. This is done to equalize the distribution of solvent and render the mass with its solvent content of about 20 to 30% more homogeneous for a subsequent flow treatment.

To accomplish this, our plastic mass of mingled pieces is taken from the storage box and so placed in the middle of a large chase that it occupies only one-third or one-half of its area. This is then flowed under heat and pressure until it spreads to the full extent of the chase area, which is about 54 inches long and 22 inches wide. For a larger size block these measurements are increased proportionately. By such an operation the amount of flow or extension may be made to give the desired pattern and in general the spread will be from one-half to three fold to attain the particular drift or pattern of streaky undulation having the most desired effect.

In order to get the right flow, the mass is at first subjected for three hours at 140° F. to a pressure of about 250 pounds per square inch. The pressure is then increased about four-fold or to a point which causes the material to weld itself over the entire chase bottom and form a well shaped block as indicated at 17 in Fig. 4. As before stated, it is this extended flowing which gives the peculiar brilliant and pleasing pearly effect.

When flow has ceased and the block 17 is fully shaped the pressure and heat are continued for three hours, after which it is cooled for about ten hours and is then planed into sheets 18 of about 30 thousandths of an inch thickness as indicated in Fig. 5. To get a still more even or smoother configuration these sheets 18 are again stacked together in a chase by flat stacking and a reversal endwise of each alternate sheet as indicated by A—B in Figs. 5 and 6. Opportunity is here afforded for any necessary correction of solvent content by a greater or less exposure of the sheets. The mass of stacked sheets 18 is now solidified by neat or pressure, after which the block is sliced into sheets 19 of any desired thickness, say 20 thousandths of an inch, in the same general direction as the original sheets as indicated in Fig. 6. These are seasoned and finished according to regular practice and are then suitable for application in the manufacture of commercial articles. These thin sheets 19 as shown in Fig. 7 are especially useful in veneering. While a variety of pyroxylins may be employed in making film which is to carry the pearly mercurous chloride, we select preferably one of much lower or relatively lower viscosity than that employed ordinarily in the manufacture of pyroxylin plastics. One hundred parts of this pyroxylin will produce a flowable solution with from 275 to 550 parts of the solvent or solvent mixture hereinbefore referred to. The camphor or equivalent plasticizer is employed to the extent of 20 to 40 parts. As for the solvent residue necessary for easy flow and complete solidification in the chase it is, as before stated, about 20 to 30%, and is conveniently secured by stripping the film from the wheel before complete drying.

When a film of noninflammability or reduced combustibility is desired acetyl cellulose may be used as a base, in which case the character of solvent and plasticizer must be changed to suit the substitution. We may also employ other forms of soluble cellulose suitable for chase and block press manipulation when made plastic. As to the coloration of our product a great variety is obtainable by the addition of dyes or pigments, and the unique character of luster imparted by our process extends to the enchancement of color effect.

While we prefer to use pearly mercurous chloride as our nacreous ingredient it is obvious that our process is not confined to association with that substance, for it is equally efficacious when employing fish scale luster or any pearl-producing pigment. Nor are we confined to a wheel apparatus in making the film part of our process. We can, as already intimated, use any equivalent operation, such, for example, as a spreading and stripping method in association with a suitable belt or plate-glass surface.

As for the essentially soft condition of the press mass it is not strictly necessary to secure it by underdrying, for an equivalent method would consist of vaporizing a film already dry.

We claim:—

1. The process of making imitation mother of pearl having a base of a thermoplastic substance comprising forming sections of said substance containing a lustrous material, mingling said sections in a stack of predetermined dimensions, heating said stack and subjecting it to pressure in one direction while permitting it to spread as a whole in another direction so as to produce a consolidation of said sections and a drift of the pattern of said lustrous material in the direction of said spreading, and slicing said consolidated material into sheets in the general direction of said drift.

2. The process of making imitation mother of pearl having a base of a thermoplastic substance comprising forming sections of said substance containing a lustrous material, mingling said sections in a stack of predetermined dimensions, heating said stack and subjecting it to pressure in one direction while permitting it to spread as a whole in another direction to a distance such that the sectional area in the direction of said spreading is at least doubled so as to produce a consolidation of said sections and a drift of the pattern of said lustrous material in the direction of said spreading, and slicing said consolidated material into sheets in the general direction of said drift.

3. The process of making imitation mother-of-pearl having a cellulose ester base comprising forming by the flow or scraper method films containing about 20 to 30 parts residual solvent and containing lustrous material, uniting such films to form thicker sheets, slicing such sheets into pieces, massing the pieces promiscuously placed, subjecting them to heat and pressure in a way to spread the area of the original mass in toto from at least one-half to as much as three-fold in a predetermined direction generally parallel to the planes of said pieces, with the effect of producing consolidation and a flow of the pattern of said lustrous material in the direction of said spreading, then cutting the block into suitable sheets or sections.

4. The process of making an imitation

pearl sheet which comprises preparing a solution of cellulose ester suitable for producing film on a wheel or by equivalent film making means, adding to said solution the silky, silvery variety of mercurous chloride as a lustrous material, producing thin semi-dried films therefrom by flowing or scraper action, uniting said films to form thicker sheets, slicing such sheets into pieces, massing the pieces promiscuously placed, subjecting the massed pieces to heat and pressure in one direction in a way to spread the area of the mass practically in toto in another direction with the effect of producing consolidation and a substantial flow of the pattern of said lustrous material in the direction of said spreading, then cutting therefrom sheets or sections of desirable size or thickness.

5. The process of making an imitation pearl sheet which comprises preparing a solution of pyroxylin of viscosity suitable for producing film on a wheel or by equivalent film making means, adding to said solution the silky, silvery variety of mercurous chloride as a lustrous material, producing thin semi-dried films therefrom by flowing or scraper action, uniting said films to form thicker sheets, slicing such sheets into pieces, massing the pieces promiscuously placed, subjecting the massed pieces to heat and pressure in one direction in a way to spread the area of the mass practically in toto in another direction with the effect of producing consolidation and a substantial flow of the pattern of said lustrous material in the direction of said spreading, then cutting therefrom sheets or sections of desirable size or thickness.

6. The process of making an imitation pearl sheet which comprises preparing a solution of pyroxylin of viscosity suitable for producing film on a wheel or by equivalent film making means, adding to said solution the silky, silvery variety of mercurous chloride as a lustrous material, producing thin semi-dried films therefrom by flowing or scraper action, uniting said films to form thicker sheets, slicing such sheets into pieces, massing the pieces promiscuously placed, subjecting the massed pieces to heat and pressure in one direction in a way to spread the area of the mass practically in toto in another direction with the effect of producing consolidation and a substantial flow of the pattern of said lustrous material in the direction of said spreading, slicing therefrom thin sheets, shuffling such thin sheets by alternate reversal or change of position, resolidifying the mass, then cutting therefrom sheets or sections of desirable size or thickness.

7. The process of making an imitation pearl sheet which comprises preparing a solution of cellulose ester suitable for producing film on a wheel or by equivalent film making means, adding to said solution nacreous flakes for imparting a pearly luster, producing thin semi-dried films therefrom by flowing or scraper action, uniting said films to form thicker sheets, slicing such sheets into pieces promiscuously placed, subjecting the massed pieces to heat and pressure in one direction in a way to spread the area of the mass practically in toto in another direction with the effect of producing consolidation and a substantial flow of the pattern of said luster in the direction of said spreading, then cutting therefrom sheets or sections of desirable size or thickness.

8. An imitation pearl sheet comprising a plurality of sections of a luster containing plastic substance consolidated together into a solid mass having all of said sections elongated along generally the same direction so that the resulting pattern of said luster has a directional drift in said direction of said elongation.

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