April 18, 1939. F. R. CONKLIN 2,154,438

MANUFACTURE OF DECORATIVE PLASTICS

Filed May 18, 1934

Fig.1.

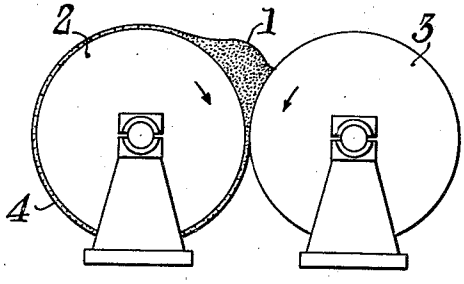


Fig.2.

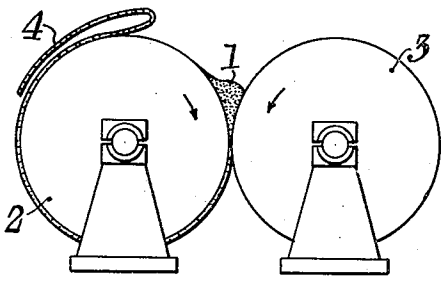


Fig.6.

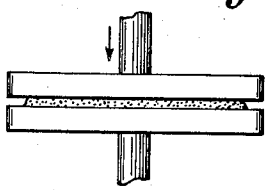
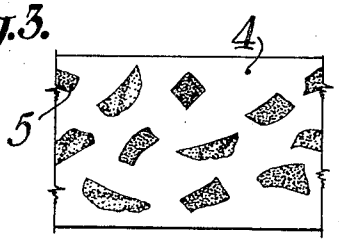


Fig.3.



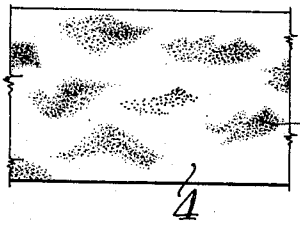


Fig.4.

Fig.5.

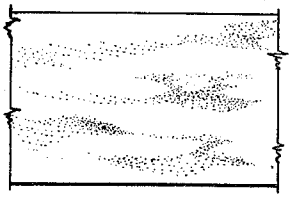
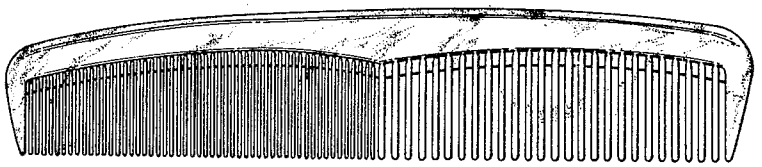


Fig.7



Inventor:
Frederick R. Conklin,
Newton M. Perrin
Daniel J. Mayne
By
Attorneys.

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MANUFACTURE OF DECORATIVE PLASTICS

Frederick R. Conklin, Kingsport, Tenn., assignor, by mesne assignments, to Eastman Kodak Company, Jersey City N. J., a corporation of New Jersey

Application May 18, 1934, Serial No. 726,311

14 Claims. (Cl. 18—61)

This invention relates to decorative plastic products, especially to the production of material and products made therefrom which have a variegated appearance. This invention relates more particularly to the production of cellulose derivative products having an iridescent, delicate, wavy, cloud-like appearance.

The production of plastic materials of variegated appearance from cellulose derivative material has long been known. One method of producing these products is to lay differently colored sheets of pyroxylin or similar material one upon upon another and press them together until a solid block is formed and then cut the block "across the grain" so as to form a sheet or slab having therein a variegated design corresponding in color or effect to the colors or effects of the individual sheets originally employed. Square, round, hexagonal, or other shaped blocks are sometimes employed instead of sheets and these are stacked or merely piled indiscriminately together and pressed. In some cases these blocks are given a coating of dye or other coloring matter to give a mosaic effect to the sheet subsequently cut therefrom. If the sheets or blocks are stacked diagonally and pressed while in this relation, or are pressed and then cut diagonally, the shape of the design may be altered so as to produce a variety of different effects.

Another type of product, possessing a sheen, luster, or iridescence simulating that of mother of pearl, is made by incorporating pearl essence, metal powder, or certain metallic salts into a fluid-like plastic material and subjecting the material to one or more mechanical operations. In one method of making such products the pearl essence or its equivalent is incorporated by forming a suspension of the pigment in a liquid and this suspension is added to a cellulose derivative material, either during the customary kneading operation in the presence of solvents, or by spraying or painting it upon sheets or blocks which are subsequently pressed together. In another method the pearl essence is incorporated into a cellulose derivative solution which is formed into films. These films, still containing a considerable amount of solvent, are placed alternately between other sheets of transparent or pigmented or colored cellulosic material and the assembly pressed together into a block which is then cut into sheets or slabs in the manner above described. In still another method metal foils in the form of sheets or pieces are employed to produce the desired iridescent or light-reflecting surfaces.

It will be noted that in all of the methods referred to above, a relatively complicated procedure is necessary in order to dispose the light-reflecting pigmented or colored portions so that they will produce the desired mother of pearl effect. This is due to the fact that workers in this field have long believed that it was possible to obtain an iridescent effect only when the pigment particles or effect materials were homogeneously distributed throughout the plastic material and disposed in such manner that the light-reflecting surfaces or portions throughout the product lie in different planes. In most of these prior art processes it was necessary to employ a series of more or less complicated operations in order to insure this varied disposition of the light-reflecting particles. In some processes it has even been considered necessary to first cause the pigment particles to assume a unidirectional trend in a sheet and then to stack up a series of such sheets or pile broken pieces of the sheets together indiscriminately in order to provide for this varied disposition of the particles. Numerous other more or less complicated operations have been relied upon to obtain the same or similar results.

Possibly the process and product of greatest commercial prominence prior to my invention is that defined by the Higgins U. S. Patents Numbers 1,539,084, 1,606,030, 1,607,622, 1,607,623, 1,607,624, in which a true mother of pearl simulation is stated to be obtained; these patents may be taken as representative of the type of product sought by the prior art. My invention differs distinctly therefrom in that the light-reflecting pigment or effect particles are heterogeneously and indiscriminately disposed in the mass without any predetermination of, or control whatever over, their directional trend.

I have now discovered a unique and extremely simple method whereby the necessary degree of variegation and iridescence may be produced in cellulose organic derivative plastic products by the employment of a suitable pigment, such as pearl essence, crystalline guanine, or its equivalent, without the use of the complicated and tedious mechanical operations heretofore considered indispensable. My invention accordingly has for its principal object to eliminate most of the mechanical or chemical operations of the prior art and to provide a simple but effective process for producing variegated decorative cellulose organic derivative plastic materials. A further object is to provide a process whereby one may easily and quite exactly control the degree of variegation or iridescence of the plastic product. A

still further object is to produce a variegated cellulose organic ester plastic material having unique physical characteristics and susceptible of being formed or molded into a variety of useful articles of commerce. Another object is to provide a plastic material of this nature in the form of sheets or slabs and having a beautiful wavy, cloud-like iridescence. Other objects will appear hereinafter.

The invention to be described herein is the outgrowth of previous original work which I have done in the field of molding cellulose derivative compositions, particularly the process of dry molding described and claimed in my copending applications Serial No. 665,258, filed April 10, 1933, now Patent 2,048,686 and Serial No. 91,370 filed July 18, 1936.

I have discovered that one may produce a decorative plastic product having a beautiful variegated appearance by first making up a batch or mass of plastic cellulose organic derivative base material substantially devoid of volatile solvent, kneading the mass upon heated rolls, heterogeneously and indiscriminately disposing in the mass, various blocks, cubes, pieces or portions of pigmented plastic, preferably of the same general type as the original base material, but including effect materials or pigments which the base material does not contain or at least in a widely different proportion or concentration from the base material, and continuing the kneading or rolling on heated rolls of the resulting mass or mixture further to distribute the differently pigmented portions in the mass, after which it is subjected to heat and pressure, either in a platen press or a mold, to occasion a certain amount of spreading or extension of the differently pigmented portions within the base material. When pearl essence is employed as the effect material, the flowing or spreading out of these added portions provides the necessary irregularity of disposition of the effect particles to produce beautiful iridescent "cascaded" or wavy, cloud-like effects in the products obtained, as will be more fully set forth hereinafter.

In the following examples and description I have set forth several of the preferred embodiments of my invention, but it is to be understood that they are included merely for purposes of illustration and not as a limitation thereof.

I will now describe my invention by reference to a cellulose acetate plastic, but it will, of course, be understood that I am not limited to the use of this particular material as my invention is equally applicable to the production of decorative plastic materials from other cellulose organic derivatives, such as cellulose propionate, cellulose butyrate, cellulose acetate propionate, cellulose acetate butyrate, and, in fact, to almost any type of thermo-plastic cellulose organic derivative moldable material.

My invention is, however, to be sharply distinguished from processes involving the use of cellulose nitrate, since that material, due to its high degree of inflammability, instability, and other properties, requires a special technique and is not thermo-plastically safe at the temperatures which I employ in connection with cellulose organic derivatives. Cellulose nitrate cannot with safety be subjected to the relatively high temperatures and pressures employed in my process and even if certain cellulose nitrate compositions could be safely handled according to my technique, it would not be suitable on account of its instability and tendency to decompose and discolor.

In the accompanying drawing which illustrates several of the more important steps of the process and product herein described—

Fig. 1 is an elevational view of a pair of milling rolls in operation and illustrating in general the manner in which the plastic material is acted upon during the kneading operation.

Fig. 2 is intended to show the same pair of rolls and illustrates that step in the processing in which the plastic mass is cut and laid back upon itself in order further to facilitate mixing of the ingredients.

Fig. 3 is a fragmentary plan view illustrating the manner in which the pigmented cubes or portions are disposed in the plastic mass before it is removed from the rolls.

Fig. 4 is a fragmentary plan view illustrating the partial flowing of the pigmented portions shown in Fig. 3 after the rolls have completed two or three revolutions following addition of the effect material.

Fig. 5 is a fragmentary plan view illustrating the cloud-like, variegated, wavy, or iridescent appearance of the product after it has been subjected to the pressing operation in the platen press of Fig. 6.

Fig. 6 is a schematic showing of a conventional platen press and illustrating the manner in which the plastic material is subjected to the pressing operation.

Fig. 7 illustrates a comb produced in accordance with my invention.

In accordance with one form of my invention, I first prepare a plastic mass of cellulose acetate. The cellulose acetate may be any of the conventional varieties of this material, such as the hydrolyzed acetone-soluble variety, which are of course familiar to persons skilled in the art to which my invention relates. The material is first ground in a suitable type of apparatus, such as a ball mill or other grinding device, until it will pass a 40 to 300 mesh screen. This material of course includes particles of varying degrees of fineness, the coarsest particles not being over a size which will pass a screen of about 40 mesh while the finest will pass a 300 mesh screen or even finer. This will of course include groups of particles, such as those having a particle size ranging from 40, 60, 80, etc. to 200 or 300 mesh, and so on. It may be said, however, that the finer the material and the more uniform the particle size, the more readily can the desired plasticizing materials be incorporated therewith and the more easily can the material be worked up according to the technique herein described, i. e., it is not best to employ 40 mesh material alone with 300 mesh material but one should employ the entire gradient by particle size between the meshes selected as the limits of particle size.

100 lbs. of the ground acetate is then placed in a suitable mixing machine and 40–60 lbs. of appropriate plasticizer, such as triacetin or tripropionin, is then added and the batch is mixed until a fair degree of homogeneity is attained. The amount of plasticizer will, of course, vary widely with the particular type of plasticizer employed as well as with the degree of plasticity required in the finished product. In addition to triacetin and triproprionin, many different plasticizers may be used in my process so long as they form a solution with the cellulose organic derivative under heat and pressure. In some cases a mixture of plasticizers may be employed, typical examples of which

are a mixture consisting of 50% dimethyl phthalate and 50% diethyl phthalate, a mixture of 50% diethyl phthalate and 50% dipropyl phthalate, or a mixture of 60% diethyl phthalate and 40% dipropyl phthalate. The resulting plastic mixture forms the base or body of the finished product and if it is desired to produce a colored base, a suspension or solution of the desired coloring material may be incorporated into the batch at this point and thoroughly mixed with the cellulose acetate and plasticizer during the mixing operation. The dye or other effect material may be added to the bath in a relatively concentrated condition, that is, the dye may be dissolved in the plasticizer and then added to the acetate as described, for example, in the copending application of R. O. Wood, Serial No. 582,886, Dec. 23, 1931, now Patent 1,966,327. It is particularly to be noted at this point that no solvent for the cellulose derivative is employed to attain plasticity of the mass, the mixture consisting only of cellulose derivative material, plasticizer and dissolved or suspended color or effect material.

After mild mixing of the cellulose acetate, plasticizer and (optionally) coloring material, say for a period of one-half to one hour, more or less, the batch is transferred to steam-heated kneading rolls, such as those illustrated in Fig. 1, which are heated to a temperature of about 280–300° F. The plastic mass forms a cylinder upon one roll, the other merely acting as a platen or idle roll. During this preliminary kneading or rolling operation, which is continued for say 5 to 10 minutes, the plastic mass is from time to time stripped from the roll as illustrated in Fig. 2, and folded upon itself from either edge so as to thoroughly mix the materials.

After the kneading or mixing operation has been carried to the desired extent, which will vary with the plasticity and other characteristics of the different materials employed and also somewhat with the plasticity of the mass, cubes, blocks, or portions of differently pigmented, plastic material (in which the pigment may be present in varying concentrations) are thrown into the mass as the rolls rotate. It should be noted in this connection that the pigmented plastic material added to the mass may have a different degree of plasticity than that of the base and this may be either higher or lower, depending on the results desired in the finished product. In some cases, for example, it may be desirable that the base be much more flowable under the heat and pressure subsequently to be applied than the added materials, while in other cases a higher degree of flow in the added materials than in the base may be required. Preferably the pigmented material is in the form of small cubes, say a half or three-quarters of an inch along their edges, although the particular shape or size of the added portions is not of vital importance to my invention, since blocks, spheres, discs, or even irregular fragments of the material may be employed with practically the same ultimate result. These pigmented cubes or pieces may be prepared in a manner somewhat similar to the preparation of the plastic mass itself, except that these cubes or pieces contain a high proportion of pigment such as pearl essence, light-reflecting salts, or metallic flakes, whereas the base material in its preferred embodiment contains no pigment whatsoever or at least no appreciable amount compared to that contained in the cubes. In this specification, where a pigment is referred to, it is limited to effect materials which have the ability to substantially reflect light from faces or facets thereon and whose light transmitting and reflecting properties are different from the light transmitting and reflecting properties of the material of the base or mass in which the above-mentioned pieces or portions are heterogeneously disposed.

A convenient source of such material may in some cases be the scrap or fragments produced as an incident to the molding operation to be more fully described hereinafter. In the preferred embodiment of my invention the cubes or pieces to be added are of a considerably lighter hue or cast than the base material so as to accentuate the variegated effect contributed thereby; this is normally accomplished by using less dye or a lighter dye therein than in the base material.

I find that I can obtain unusually beautiful results when using pearl essence, metal powders, or flakes or their equivalents as the effect material. I can for example, produce products having a beautiful delicate, wavy, cloud-like iridescence by causing the pearl essence-containing material to flow slightly under the influence of heat and pressure, as for example, by subjecting to platen pressing under heat or merely to the usual molding operation in a heated mold. As indicated in the above discussion of the prior art, prior workers in the plastic art have recognized that only by causing the light reflecting surfaces of the pearl material to become disposed in different planes, it is possible to obtain iridescence in the product; and considered it necessary to employ the above mentioned elaborate methods in order to obtain this effect. I have discovered, however, in direct contrast to this teaching of the prior art, that these elaborate methods are unnecessary and that products having a hitherto unattainable degree of iridescence, delicacy and beauty can be produced by employing the far more simple and direct methods outlined herein.

As an example of preparing an iridescent product, in accordance with one form of my invention I proceed as follows: One-tenth compound of pearl essence suspended in acetone is thoroughly mixed with 50 lbs. of a cellulose acetate plasticizer, such as tripropionin, and the mixture added to 100 lbs. of the finely ground cellulose acetate mentioned above and thoroughly mixed. The mass may then be worked up on rolls similar to those above referred to until it acquires the desired degree of homogeneity. It is then cooled down and reduced to cubes, pieces or fragments of the desired size and these fragments are used in the manner to be more fully described below. It should be again noted that the amount of plasticizer employed for this pigmented material may vary within wide limits. In some cases it may be desirable to use a greater proportion of plasticizer than is used in the base material with which the pieces or fragments are used, or a less proportion may be used, this depending entirely on the amount of flow of the fragments desired in the finished product.

The previously milled base material is at this point preferably still on the milling rolls and it is into this plastic mass that the highly or at least differently pigmented pieces or fragments are imbedded while the mass is still on the rolls. Under the influence of heat and pressure, the imbedded cubes, pieces or fragments are spread out, extended, or flowed to a slight extent within the base. In some cases it will be desirable to preheat the pigmented fragments prior to adding

them to the base material on the rolls in order to soften them slightly before rolling, although in most cases the fragments are added cold, that is, at room temperature.

Following addition of the effect materials, the rolls are stopped after one or two minutes of rolling, which, at the speed usually employed, will be sufficient for two or three revolutions or more of the rolls, after which the plastic mass, which is then in the form of a cylinder on one roll, is slit from end to end of the roll, removed therefrom, and laid out on a table. It will be noted by reference to Fig. 3 that, neither the rolling, nor the subsequent pressing of the plastic material is sufficient to cause anything even approaching homogeneous distribution of the effect materials therein, as it is one of the features of my process that the pigmented or colored portions are never completely dispersed, but remain more or less unmixed with, or at least merely disposed in the base with no controlled or predetermined degree of uniformity notwithstanding that these portions undergo a certain amount of flow within the plastic mass of base material and are amalgamated therewith and spread out or extended irregularly therein.

The material is at this point in the form of a rough slab having the general appearance of the product illustrated in Fig. 4 and, if desired, may be used directly for the molding of various articles of commerce in which irridescence or variegation is desired. However, in more conveniently and economically carrying forward the idea of the invention into the molding of the finished article, this slab of plastic, which may be approximately one-quarter to one-half on inch in thickness, is then placed in a platen press provided with suitable heating means and therein subjected to a pressure of about 1500 lbs. per square inch and a temperature of about 280–300° F. to produce the finished article. In some cases it may be desirable to employ differential heating of the platen press, that is, heating one of the platens to a higher temperature than the other. For example, one platen may be heated to 300° F. while the other is heated to 250° F., etc. The heat of the press, in conjunction with the pressure, causes the slab to again become plastic and produces an increased flowing of the pigmented portions contained therein. This additional flowing action brings about such a disposition of the light reflecting surfaces of the individual pigment particles that the product, as above mentioned, acquires a beautiful wavy, cloud-like iridescence as illustrated by Fig. 5.

In making the finished article, I may either take the rough slab as it comes from the rolls after incorporation of the cubes or portions of effect materials therein and mold it directly without any further treatment such as platen pressing, or I may first press the material into the form of a smooth sheet in a platen press and employ this pressed sheet in the molding operation. In the case of molding of the rough slab material directly I am enabled to obtain the same type of beautiful wavy iridescence in the finished product as in the case of molding the platen-pressed material. The only difference in the two products is that that produced from the platen-pressed sheet may have a slightly greater degree of flowing, spreading out or extension of the entrained pearl-containing material. It may be said in general that where a molding operation which gives sufficient amalgamation, spreading out, or extension of the pearl essence or other effect material is to follow, the rough slab may be molded directly without any intermediate pressing step, but in operations in which there would be insufficient amalgamation, flowing, spreading, or extension to give the desired effect, the prepressed sheet may be used to better advantage.

An additional feature of my invention is that I may granulate the rough slab from the milling rolls after rolling in of the pigmented pieces or fragments, mold the granulated material and obtain the wavy, cloud-like effects above described. A similar result may be obtained by granulating and molding the platen pressed material. For many purposes, however, I prefer to employ the slab or sheet material for the molding operation due to somewhat greater convenience in handling. By molding the granulated material I obtain somewhat finer, less prominent or more delicate variegations than when molding the slab or sheet material because in the case of the granulations the pigmented portions are broken up and distributed throughout the mass more intimately, but nonetheless heterogeneously and indiscriminately.

By controlling the action of the press in various ways, a variety of different effects may be produced in the plastic mass. Under some circumstances the added pigmented portions of the mass will tend to be pushed outwardly from the center thereof, while under other conditions the pigmented portions will simply be extended more or less longitudinally so as to produce an effect somewhat akin to striations therein. I do not, of course, limit mystelf to any particular method of pressing the slab taken from the rolls, nor do I limit myself to the use of a platen press, although I find it convenient to employ this type of apparatus, especially for the production of sheet material. Irrespective of the particular method of pressing employed, I obtain, especially when using pearl essence of its equivalent as the pigment, a product having a beautiful delicate, wavy appearance somewhat simulating some types of cloud formations, such as the so-called "mackerel sky".

As before stated, my invention is not limited to the use of cellulose acetate as I may use almost any type of cellulose organic derivative for the base and for making up the pigmented materials to be added thereto. Likewise, my invention is not limited to the use of pearl essence, as it will be readily understood by those skilled in the art that I may obtain a product of the variegated appearance described above by employing other equivalent types of pigments, such as metal powders, metal flakes, mica dust, and the like.

The present process is wholly distinguished from processes for making decorative plastics, by forming loosely bound cakes of cellulose derivative material of different colors, mixing together pieces of fragments thereof and molding under heat and pressure to produce a somewhat mottled or variegated appearance. The present process, as above indicated, involves a certain amount of flow or at least spreading out or extension of the added pigmented materials and an intermingling thereof with the plastic base which, however, as pointed out above, does not reach or even approach homogeneity, whereas in the prosess just referred to, the vari-colored pieces are merely colloidized under the influence of heat and pressure (and the solvent action of any plasticizer which may be present) and are thereby merely joined together with substantially no intermingling of the individual pieces.

In making up the original cellulose acetate mass, any suitable plasticizer may be employed. In general, when using cellulose acetate, for example, I prefer to employ a liquid plasticizer, such as triacetin, tripropionin, diacetin, diethyl, dipropyl, or dibutyl phthalates, or mixtures thereof.

The particular details of my process are susceptible of many changes within the scope of the invention. The time of mixing of the original ingredients, of the kneading or rolling and pressing operations may vary within wide limits as also may the temperature employed as taught herein.

It will be seen from the above description that my process is characterized by extreme simplicity and a complete avoidance of any of the complicated steps of the prior art which have heretofore been considered necessary in order to obtain iridescent or variegated products. All that is necessary is to form the plastic mass, distribute the pigmented portions therein, and then subject the mass to the pressing operation. No formation of films or blocks, no stacking or slicing of sheets or fragments, and no directed or controlled orientation of the pigment particles is necessary or even desired. It will be seen that the present process involves as its principal steps a combination of kneading and pressing to accomplish the above mentioned flowing or amalgamation and intermingling of the materials and proper disposition of differently pigmented portions.

In view of the vast amount of work which has been done in an effort to obtain decorative effects of the general character of those described herein in plastic materials, and the fact that only by elaborate and complicated procedures were such results attainable, it is in the nature of a surprising discovery that I am enabled to obtain highly decorative effects of the type described by simple rolling and pressing operations. In this connection it is desirable again to allude to the peculiar action taking place in the above described process. It should be especially noted that my process is one whereby pearl essence or other effect material is incorporated into a relatively transparent or translucent base to give a product having a delicate, wavy iridescence. It is a fact well known to the prior art that in order to obtain iridescence the light reflecting surfaces of the effect materials must be disposed so that these surfaces lie in different planes.

In marked contrast to this I obtain what may be considered quite the opposite of control, that is, an indiscriminate uncontrolled amalgamation and spreading out or extension of the cellulose derivative material containing the pigment. It will be evident that when the pigmented portions are added to a relatively soft plasticized mass of cellulose derivative according to my process, these pigmented portions, under the influence of rolling and more particularly under the influence of the subsequent pressing of the rolled material, is forced into intimate contact with and in fact, amalgamated with, the base material. In addition to this amalgamating action, however, the pigmented portions are turned, twisted, spread out, and extended lengthwise and it is this movement which carries the pigment particle surfaces into an almost infinite variety of different alignments and gives the desired iridescence. But the effects produced are not confined merely to the production of iridescence. I obtain a distinctly novel effect in that the pigmented portions are spread out and extended within the plastic mass of the base material in the form of wavy lines or aggregations which give a delicate cloudlike effect very closely simulating mackerel sky. In some cases this cloudlike effect is somewhat comparable to the attenuated portions of steam, carried away from a steam exhaust. The effects obtained may, in fact, be rather well compared to the more delicate portions of the cloud formations illustrated on page 423 of American Photography for July 1933, page 112 of The Amateur Photographer of August 2, 1933, and on page 279 of the same publication of September 27, 1933, and page 484 of the issue of Nov. 29, 1933.

Another way of describing the appearance of the product is by comparison to a cascade, especially the type in which wavy or irregular lines or waves are produced as the water descends.

It is also especially to be noted that this wavy, delicate, cloud-like effect is produced in and carried by a mass of base material which is transparent or translucent. In other words, the light can, in the case of a transparent base, for example, pass completely through the base between the wavy or extended portions of pigmented material, that is, the pigmented portions are segregated within the mass as sharply distinguished from being uniformly distributed throughout the mass. To put it another way there is a very considerable amount (in some cases even a predominating amount) of the transparent or translucent base in which there is no pigment whatever, the wavy, cloud-like effect being due to the pigment contained in the segregated portions.

I have already alluded to my prior application Serial No. 665,258 on the dry molding of cellulose derivatives. It may be said that the present process is analogous to dry molding processes in that in making both the rough slab material and the pressed sheet or finished article I employ no solvents to obtain the desired degree of plasticity, but depend exclusively on the amount of plasticizer added, the degree of heat and pressure employed, and control of the operating conditions to obtain the desired result. This is another marked departure from prior art practice in the manufacture of variegated poducts, in which it has practically always been considered that the use of considerable quantities of solvent was indispensable for attaining a workable or practical degree of plasticity.

The present invention makes possible the production of an almost infinite variety of decorative effects in plastic products. For example, the base material may be dyed or tinted one color and the added "effect" portions another. Again the added portions may be colored a variety of different colors to add to the variegated effect. In the case of iridescent products, these may likewise be given delicate tints which enhance the inherent decorative effect.

The products of my invention, either in the form of the rough slab from the milling rolls after addition of the effect materials, or in the form of the sheet from the platen press, may be employed for a wide variety of molding operations, including the manufacture of toilet articles, toothbrush handles, combs, mirror backs, receptacles, knobs, and, in fact, an almost unlimited number of articles. Neither the sheet material, nor the molded products resulting from its use require any curing whatever since, as indicated above, the plastic material contains no volatile solvents. In addition to being molded, the material may be cut, stamped, drilled or machined,

and in fact is susceptible of almost any type of mechanical treatment.

What I claim is:

1. The process of making a variegated decorative plastic material which comprises kneading a plastic mass of cellulose organic derivative material free from volatile solvents between heated rolls, heterogeneously disposing in the mass during the kneading step a number of pieces of previously prepared cellulose derivative plastic material containing effect materials of different light-transmitting and reflecting properties than the mass and thereafter subjecting the resulting mixture to a hot pressing operation to occasion merging and flowing of the added portions in attenuated, cloudlike, but substantially unstratified form, within the mass.

2. The process of making a variegated decorative plastic material which comprises kneading a plastic mass of cellulose acetate free from volatile solvents between heated rolls, heterogeneously disposing in the mass during the kneading step a number of substantially solid pieces of previously prepared cellulose acetate plastic material containing particles of effect material having the general characteristics of pearl essence and having different light-transmitting and reflecting properties than the mass, and thereafter subjecting the resulting mixture to a hot pressing operation to occasion merging and flowing of said portions in attenuated, cloudlike but substantially unstratified form within the mass.

3. The process of making a variegated decorative plastic material which comprises kneading a plastic mass of cellulose organic derivative material free from volatile solvents between heated rolls, heterogeneously disposing in the mass during the kneading step, a number of pieces of previously prepared cellulose organic derivative plastic material containing effect materials of different light reflecting and transmitting properties than the mass, subjecting the resulting mixture to only sufficient kneading to occasion embedding and a slight degree of flowing or deformation of the added portions and thereafter subjecting the resulting material to a hot pressing operation to occasion merging and flowing of the added portions to produce wavy, attenuated, cloudlike but substantially unstratified formations within the mass.

4. The process of making a variegated decorative plastic material which comprises kneading a plastic mass of cellulose organic derivative material free from volatile solvents between heated rolls, heterogeneously disposing in the mass during the kneading step, a number of pieces of cellulose organic derivative plastic material containing effect materials of different light transmitting and reflecting properties than the mass, subjecting the resulting mixture to a hot pressing operation simultaneously to occasion substantial flowing of the added portions and to form a sheet in which the added portions are in wavy, attenuated, cloudlike but unstratified form within the mass and thereafter subjecting the pressed sheet to a molding operation.

5. The process of making a variegated decorative plastic material which comprises kneading a plastic mass of cellulose organic derivative material free from volatile solvents between heated rolls, heterogeneously disposing in the mass during the kneading step, a number of pieces of previously prepared cellulose derivative plastic material containing effect materials of different light-transmitting and reflecting properties than the mass, granulating the kneaded material, and molding it in a suitable mold.

6. The process of making a variegated decorative plastic material which comprises kneading a plastic mass of cellulose organic derivative material free from volatile solvents between heated rolls, heterogeneously disposing in the mass during the kneading step, a number of pieces of previously prepared cellulose derivative plastic material containing effect materials of different light-transmitting and reflecting properties than the mass, subjecting the resulting mixture to a hot pressing operation to occasion merging and flowing of the added pieces in attenuated, cloudlike but substantially unstratified form within the mass, granulating the pressed material, and molding it in a suitable mold.

7. The process of making a variegated decorative plastic material which comprises kneading a plastic mass of cellulose organic derivative material free from volatile solvents between heated rolls, heterogenously disposing in the mass during the kneading step, a number of pieces of previously prepared cellulose derivative plastic material containing effect materials of different light transmitting and reflecting properties than the mass and thereafter subjecting slabs of the resulting material to heat and pressure in an open mold of suitable shape, thereby causing merging and flowing of the added portions in attenuated, cloudlike but substantially unstratified form within the mass.

8. The process of making a variegated decorative plastic material which comprises kneading a plastic mass of cellulose organic derivative material free from volatile solvents between heated rolls, heterogeneously disposing in the mass during the kneading step, a number of pieces of previously prepared cellulose derivative plastic material containing effect materials of different light-transmitting and reflecting properties than the mass which have been preheated to a temperature slightly below their flowing point, and thereafter subjecting the resulting mixture to a hot pressing operation to occasion merging and flowing of the added portions in attenuated, cloudlike but substantially unstratified form within the mass.

9. The method of forming unusual effects in plastic sheets which comprises hot pressing in a platen press, a slab of cellulose organic derivative plastic composition containing pigment particles, each of said platens being uniformly heated but at a different temperature from the other, thereby causing at the pressure employed differential flowing of the pigment in the composition.

10. The method of forming unusual effects in plastic sheets which comprises kneading a plastic mass of cellulose organic derivative material free from volatile solvents between heated rolls, heterogeneously disposing in the mass during the kneading step a number of pieces of previously prepared cellulose derivative plastic material containing effect materials of different light-transmitting and reflecting properties than the mass and thereafter subjecting the resulting mixture to a hot pressing operation in a platen press having one of the platens at a higher temperature than the other thereby causing differential merging and flowing of the added portions in attenuated, cloudlike, but substantially unstratified form, within the mass.

11. In the process of preparing plastic molding powders, and the like, wherein a plastic is kneaded to form a compacted, coherent mass,

the steps comprising adding coloring matter to said plastic subsequent to the start of the kneading, continuing said kneading, and terminating said kneading before said coloring matter has been uniformly distributed throughout the compacted mass.

12. In the process of preparing plastic molding powders wherein a plastic is kneaded to form a compacted, coherent mass, the steps comprising adding coloring matter to said plastic subsequent to the start of the kneading, continuing said kneading, terminating said kneading before said coloring matter has been uniformly distributed throughout the compacted mass, and breaking said mass down into granular form.

13. In the process of preparing plastic molding powders, and the like, wherein a plastic is kneaded to form a compacted, coherent mass, the steps comprising adding to said plastic subsequent to the start of the kneading an additional quantity of a plastic compatible therewith, containing coloring matter dispersed therein, continuing said kneading, and terminating said kneading before said additional quantity of plastic has been uniformly mixed with the initial plastic.

14. The process of making a variegated decorative plastic material which comprises kneading a plastic mass of cellulose organic derivative material free from volatile solvents, heterogeneously disposing in the mass during the kneading step, a number of pieces of previously prepared cellulose derivative plastic material containing effect materials of different light transmitting and reflecting properties than the mass and granulating the composition to form a granular molding material.

FRED R. CONKLIN.