

Nov. 8, 1955

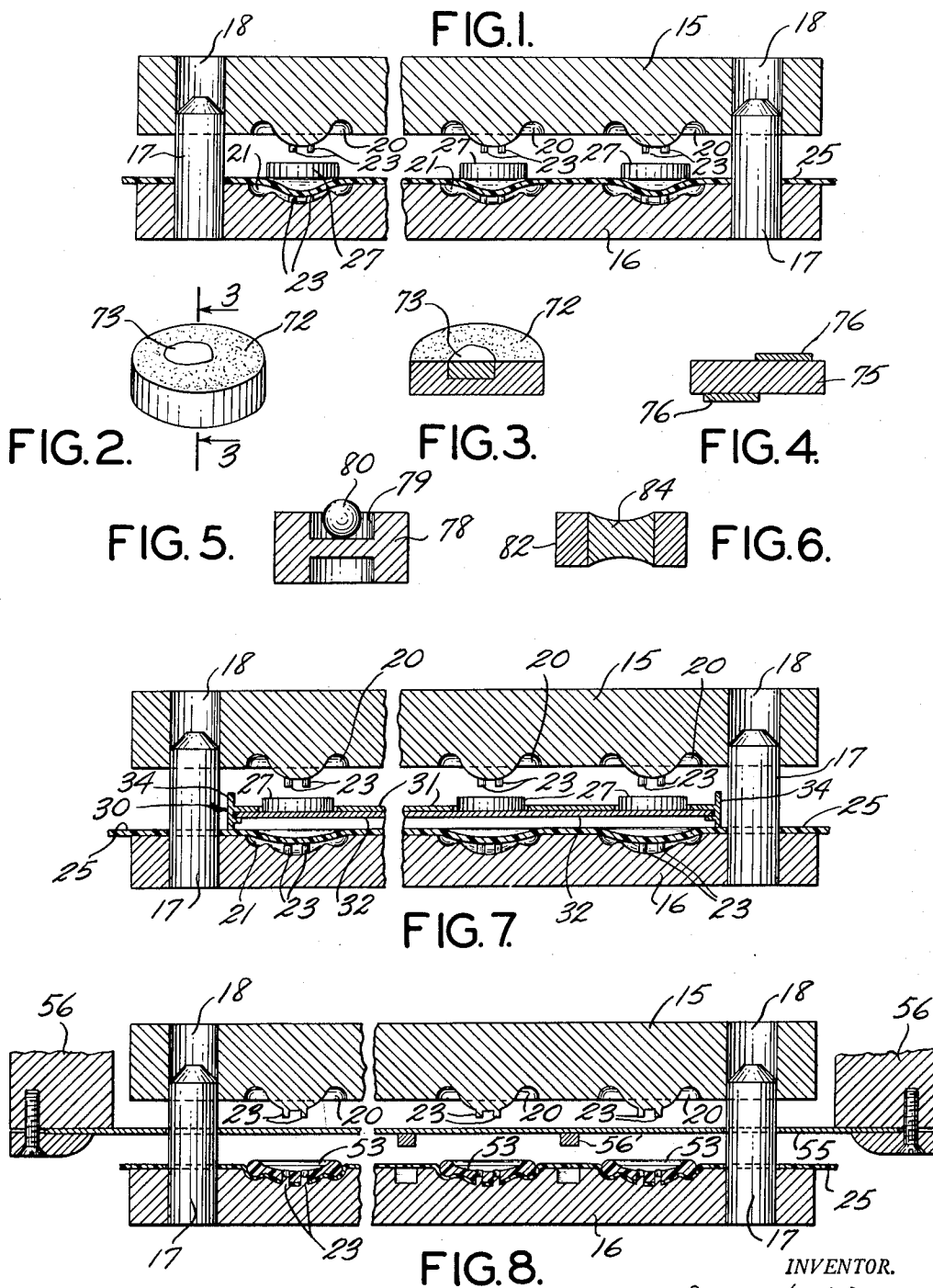
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2,722,720

METHOD OF MAKING BUTTONS WITH VARIEGATED EFFECT

Filed Jan. 2, 1951

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

FIG. 9.

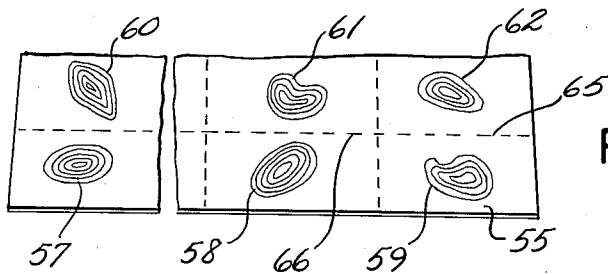
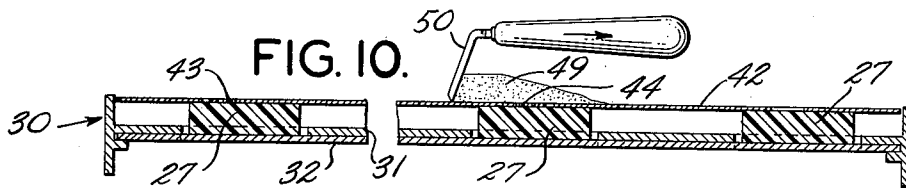
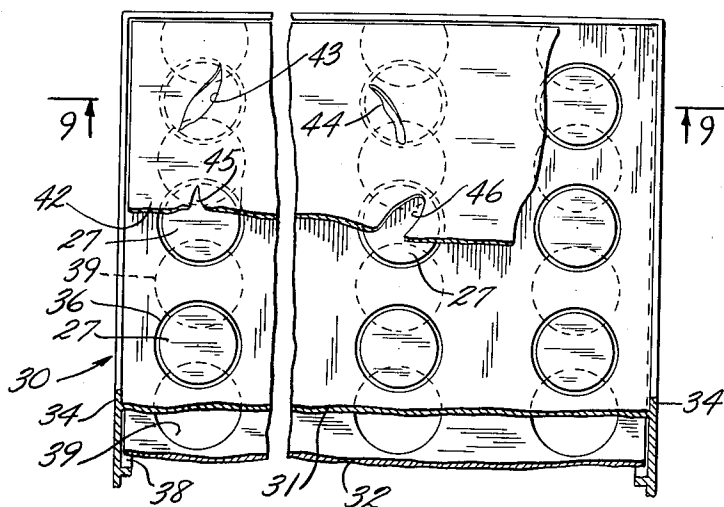


FIG. 11.

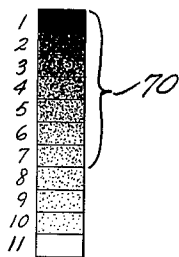


FIG. 12.

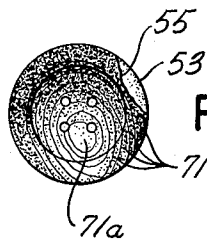


FIG. 13.

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2,722,720

METHOD OF MAKING BUTTONS WITH VARIEGATED EFFECT

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13 Claims. (Cl. 18—59)

This invention relates to buttons and other molded articles, and to methods of making them, with variegated effects ranging up to a white or off-white highlight effect as observed in genuine horn, especially buffalo horn.

Various methods of the past, such as those disclosed in U. S. Patents Nos. 2,101,540 and 2,208,494 have not produced good simulations of the fine-grained designs of natural horn. A recently suggested method reproduces buffalo horn designs photographically and prints the design on paper which is laminated to the button or other article on which the design is to appear. The principal difficulty in obtaining variegated effects, with white or off-white highlights, by this method, is the showing of an objectionable highlight edge resulting from the white or light colored paper or other carrier sheet upon which the design is printed.

Such highlight edges are unavoidable with this photographic process of the prior art because the molded articles, especially buttons, have to be freed from the adhering flash material after the molding operation. This is accomplished either by tumbling, or in a lathe-type device by means of a file, an abrasive or a cutting tool.

It is an object of this invention to provide an improved construction that gives buttons and other molded articles variegated effects ranging up to a white or off-white highlight without highlight edges except at local regions where a highlight of the front surface extends to a side edge of the button or other article.

Another object is to provide an improved button or other molded structure in which the material of the highlights is light transmitting so that a portion of the light is reflected from the surface and some from inside the material giving the highlights a "depth" such as is found in horn, but not found in a photographic reproduction of a horn section.

Some features of the invention relate to the way in which the highlight material is added, as an insert in a pellet that is to be molded or a lamination on the pellet, or as a coating on the underside of the facing of the button or other article.

Other objects are to provide methods for making the improved buttons or other articles, and to provide improved methods for making a plurality of buttons in a multicavity die with provision for maintaining in proper register with the buttons the extended surface designs which are located on a single sheet. Other features of the invention relate to the simultaneous making of the group of buttons in a multicavity die.

The invention will be described for the manufacture of buttons, but it will be understood that some of the features and steps are equally applicable to other molded articles.

Other objects, features and advantages of the invention will appear or be pointed out as the description proceeds.

In the drawing, forming a part hereof, in which like reference characters indicate corresponding parts in all the views,

Figure 1 is a vertical sectional view through a multi-

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ple cavity die containing a backing sheet and pellets for molding buttons in accordance with this invention,

Figure 2 is a greatly enlarged perspective view of a pellet for use in the die shown in Figure 1,

Figure 3 is a sectional view on the line 3—3 of Figure 2,

Figure 4 is a sectional view showing a modified construction from that shown in Figure 3,

Figures 5 and 6 are sectional views similar to Figure 4, but showing other modified constructions for the pellet,

Figure 7 is a sectional view similar to Figure 1 but showing a filling tray inserted between the upper and lower portions of the die for positioning the pellet in the die,

Figure 8 shows the die after the first step of the molding operation,

Figure 9 is a top plan view of the filling tray shown in Figure 7,

Figure 10 is a diagrammatic view showing one way in which highlight material is applied to the pellets in the filling tray,

Figure 11 is a fragmentary, detail, perspective view showing a portion of the design bearing sheet that is used in the die as illustrated in Figure 8,

Figure 12 is a gray scale illustrating one feature of the invention,

Figure 13 is an enlarged view of one of the buttons made in accordance with this invention.

Figure 1 shows a multiple cavity die having an upper portion 15 and a lower portion 16 which move toward and from one another to open and close the die. Dowels 17 projecting from the lower portion of the die slide in bores 18 in the upper portion of the die in accordance with conventional practice. The die illustrated has cavities for making molded buttons of the type commonly used on overcoats. There are cavities 20 in the bottom face of the upper portion 15 shaped to conform to the front of the button; and there are complementary cavities 21 in the lower portion of the die conforming to the desired shape for the back of the button. Studs 23 displace the moldable material to leave the necessary thread openings in the buttons.

The method of this invention can be carried out in either one step or two steps, depending upon the type of button being manufactured. Relatively flat buttons can be made in one step, as for instance, men's ware buttons. However, the invention will be described as carried out in two steps in order to provide a more complete disclosure, and the one step process will then be explained after the two step method is fully understood. Buttons having deep fore-and-aft curvature require two steps.

A backing sheet 25 is placed between the upper and lower portions of the die. This sheet may sag into the die cavities 21, or it may bridge these cavities depending upon the stiffness of the sheet. Pellets 27 of moldable material are then placed on the backing sheet 25, one pellet being located over each of the cavities 21. In order to locate the pellets 27 in register with the cavities 21, and to position all of these pellets and with a minimum of labor, a filling tray is used.

Figure 7 shows the way in which the pellets are placed in the die. A filling tray 30 comprises a panel 31 with holes through it corresponding to the locations of the cavities 21 of the die. When the filling tray 30 is properly oriented between the upper and lower portions 15 and 16, one of the holes in the panel 31 is located over each of the die cavities 21. Before putting the filling tray into the die, the pellets 27 are placed in the holes in the panel 31 and they rest upon a slide 32 which runs in grooves in the side walls 34 of the tray. The construction of the filling tray is best illustrated in Figure 9.

Figure 9 shows the panel 31 of the filling tray 30 with

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holes 36 in which the pellets 27 are placed. These holes 36 are slightly larger than the pellets so that the pellets can be lodged in the holes quickly by merely moving a mass of pellets back and forth across the top of the panel 31 until all of the holes 36 are filled. Excess pellets are then removed from the tray.

The slide 32 moves in grooves 38 in the side walls and these grooves comprise a guideway for the slide which has holes 39 of the same size or slightly larger than the holes 36 in the panel 31. When the slide 32 is in the position shown in Figure 9, however, the holes 36 are out of register with the holes 39 so that the pellets are supported by the material of the slide between the holes 39. When the slide 32 is moved to bring the holes 39 into register with the holes 36 of the panel, the pellets 27 drop out of the filling tray and into the die cavities beneath them. The filling tray is then removed, leaving the pellets in place in the die.

One way in which highlight material is applied to the pellets is illustrated in Figures 9 and 10. A masking sheet 42 is placed in the filling tray 30 while the pellets 27 are in the tray and before the filling tray is put in the die. The mask 42 has openings 43, 44, 45 and 46 over different pellets in the filling tray. It will be understood that the mask 42, which is broken away in Figure 9 to illustrate underlying structure, extends across all of the pellets in the filling tray, and that it is held in position by the sides of the filling tray so that the openings 43—46, and other openings over the other pellets, are located in their intended positions with respect to the pellets beneath them. If desired, each of the openings 43—46 may be of a different shape and/or differently located so as to give variety to the positions of highlight material on the pellets.

Referring again to Figure 10, a mass of highlight material 49, which may be either pulverulent or liquid, is placed on top of the mask 42 and moved across the mask by a spreader 50. Some of this highlight material 49 is deposited in each of the openings 43, 44, etc., of the mask 42. When the highlight material 44 has been moved across all of the mask openings, the excess material on the mask is removed leaving each of the pellets 27 with a quantity of highlight material upon it having the general shape of the mask opening through which the highlight material was deposited on the pellet. There is usually some spreading of the highlight material on the surface of the pellet, particularly if the material is liquid, but this spreading is not objectionable and is sometimes advantageous in that it produces a gradation of the highlight material at the edges of the areas that the highlight material covers.

After the pellets, with the highlight material upon them, have been deposited in the die, as shown in Figure 1, they are in position for the first step of the molding operation. The upper portion 15 of the die is brought down and the pellets 27 are forced into the cavities 20 and 21 of the die under heat and pressure. No apparatus for heating or closing the die is illustrated, since such apparatus is well understood in the art and an illustration of it is not necessary for a complete understanding of this invention.

Figure 8 shows the pellets molded into button bodies 53 in the die cavities and held in the lower cavities by the backing sheet 25. The purpose of the backing sheet 25 is to hold all of the button bodies on the same portion of the die. If some were on the upper portion and others were on the lower portion when the die opened, this would interfere with the next step of the process. The backing sheet need not be used if some other expedient is employed for keeping all of the bodies in the same portion of the die; for example, the use of more heat on one portion of the die than on the other, or the use of undercuts, or the inherent shape of the button.

A design bearing, facing sheet 55 is placed between the upper and lower portions of the die and is accurately posi-

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tioned by inserting it in a holder 56 which has intermediate bars 56' for supporting the sheet 55. This sheet 55 is best illustrated in Figure 11.

Figure 11 shows the facing sheet 55 with etched designs 57—62 in position to register with the different button bodies in the die. Each of these designs is preferably different so as to obtain variety in the buttons manufactured with each operation of the die. The designs represent grain and simulate that found in horn buttons; and these designs may be worked out to correspond to the shape of the highlight areas on the respective buttons to which the designs are to be applied.

The facing sheet 55 is preferably made of light paper impregnated with moldable plastic material, and it is a feature of the invention that the sheet 55, which provides the facing for the buttons, be made of material that is transparent, or at least translucent or light transmitting after processing of the sheet in applying facing to the buttons.

If the buttons are of designs that require a substantial distortion of the sheet 55 as it is pressed into contact with the faces of the button bodies, the desired registrations of the designs 57—62 with the faces of the button bodies can be maintained by having tear lines 65 and 66. This prevents the pull at one cavity from distorting the portion of the sheet that is over the button body at another cavity and prevents resulting shifting of the design out of register with the face of the button body.

When the die is closed with the design bearing, facing sheet 55 in position, as shown in Figure 8, the sheet 55 is pressed into contact with the faces of the button bodies and molded to them under heat and pressure.

The designs etched on the facing sheet 55 have their colors darker than the desired colors in the button. Figure 12 represents a "gray scale" showing the variations from black to white through the different grades of the scale. Similar scales are used for any color and the expression "gray scale" is used in a broad sense to represent the gradation of color to white regardless of the color.

In carrying out this invention, the gray scale is preferably compressed into seven grades and all shades are exaggerated by making them darker. That is, the invention utilized only the portion of the gray scale included by the brace 70 in Figure 12. The reason for this exaggeration is that the reflection of light from the highlight material below the facing sheet 55 tends to exaggerate the color so that light areas three or four grades from white appear white by the sub-surface reflection of the light. Other grades similarly appear lighter than the grade of color actually used on the design or facing sheet. The number of grades is sometimes difficult to predetermine. It depends upon the desired effects desired for the finished product, furthermore upon the finishing methods. For most effects a change of the order of three grades darker is sufficient.

Figure 13 shows a finished button made in accordance with this invention. The face of the button contains grain lines 71 and at least a part of the top surface of the body of the button is visible through the facing layer on which the grain lines are etched. There is a highlight 71a on the body portion of the button a little below its center. This highlight material reflects light from beneath the facing sheet and the design on the facing covers at least the edges of the highlight area. The covering of the edges of the highlight area is sometimes dispensed with and a pleasing gradation is obtained when the facing sheet is made of translucent or light-transmitting plastic which reflects light from the highlight material without making the edge portions of the highlight area sharply visible.

It will be understood that the back of the button may be of similar construction to the front shown in Figure 13, but ordinarily this is not necessary, because the back of the button does not show as much as the front; and

the manufacture of buttons with both sides faced adds something to the cost of the buttons.

The highlight material may extend all the way to the edge of the button so that there is a highlight visible from the edge at one or more regions, but these regions always blend with a portion of the face that comprises a highlight. This is in contrast with certain earlier constructions in which the white edge of a paper facing layer was exposed around the edge of the button even at places where the adjacent portions of the button and button face were dark or black.

The invention has been described thus far with a quantity of highlight material, either pulverulent or liquid, placed on the top surface of the pellets while they are in the filling box. Highlight material can be applied to the pellets in other ways as shown in Figures 2 to 6.

Figures 2 and 3 show a pellet 72 with a mass of highlight material 73 embedded in the pellet. This construction has certain advantages in that it eliminates the step of applying material to the pellets in the filling box, it avoids danger of the material being spread or smeared during the filling of the die cavities, and it provides greater mass of material for displacement during the molding step.

Figure 4 shows a pellet 75 with highlight material 76 on both the upper and lower surfaces of the pellet. The highlight material in such a construction is preferably applied with light paint and allowed to harden before the pellets are used. In Figure 4 the thickness of the highlight material 76 is greatly exaggerated for clearer illustration. It will be understood that in the case of any of the highlight materials shown in Figures 2 to 4, the exposed face of highlight material may have any desired shape as in the case of the cutout openings 43-46 (Fig. 9) in the mask 42 so as to give the buttons a variety of design.

Although the pretreated pellets of Figs. 2 to 4 eliminate the necessity of the process step in which highlight material is applied to the pellets in the filling frame, they have an offsetting disadvantage in that they do not provide the same coordination of the facing sheet designs with the locations of the highlight material on the pellets as can be obtained with masks.

Figure 5 shows another modified form of pellet in which the pellet is made with a body 78 having a recess 79 in its upper surface and preferably also in its lower surface. A pill or ball 80 of highlight material is dropped into the recess 79 while the pellet is in the filling tray, and when heat or pressure is applied to the pellet, the pill or ball 80 is compressed into the recess 79 and forms as a highlight insert in the face of the body of the button.

Figure 6 shows a pellet 82 comprising an outer annular sleeve of dark material and a center insert 84 of highlight material. The pellets shown in Figures 5 to 6 do not provide for variation in the location of the highlight material on the button, but variety can be obtained by having different designs on the facing sheets that are used over the button bodies made from the pellets 78 and 82.

When the highlight material is translucent or light transmitting, more pleasing effects can be obtained by having depth to the highlight material as in the case of the pellets of Figures 2, 3, 5 and 6. Figure 6, in particular, obtains unusual depth effects because the highlight material 84 is one into which an observer can look for some depth, and there is no dark material behind it.

Another modification for applying the highlight material to the buttons is by putting the material on the underside of the design bearing sheet so that it comes into contact with the pellets or body portion of the buttons at the same time that the design bearing or facing sheet is brought against the pellet, in the case of a one step process; or when the design bearing sheet is brought into contact with the molded bodies of the buttons, when using the two step process. The highlight material can

be put on another sheet that is laid under the design bearing sheet if desired.

In the manufacture of buttons which are so shaped that only a limited distortion of the pellets is required, it is practical to put the design bearing or facing sheet 55 (Fig. 8) into the die and across the top of the unmolded pellets 27 of Fig. 1. In such a case the buttons are made in one operation instead of requiring two operations of the die as in the procedure already explained.

When the design bearing sheet 55 is placed in the die above the pellets 27 for making the buttons in a one-step operation, the sheet 55 is held out of contact with the top surface of the pellets by the holder 56 until the sheet is in its final position if there is highlight material on the pellets in the form of powder, liquid or flakes which might be smeared by dragging the sheet across this material. Otherwise, the sheet 55 can be moved into position while in contact with the pellets.

The facing sheet 55 may be made of cellulose, hemp, silk or a filler-free paper. The expression "filler-free paper" is used herein to designate paper containing no fillers that opacify the paper, as, for example, china clay. It may also be made of plastic, cloth, cellophane and other materials. Paper has the advantage of low cost and it can be impregnated with the plastics. It is a feature of the invention that at least a portion, and preferably all, of the area of the facing sheet over each die cavity is transparent, or at least light transmitting in the finished button. It is sufficient that plastic impregnated paper become light transmitting after being subjected to heat and pressure in the molding process.

In addition to the light-transmitting facing of the buttons, the bodies of the buttons can be made of light-transmitting materials in order to obtain a still greater depth effect and a more pleasing appearance of the button. When a fully opaque body portion is used with a light transmitting facing, then the depth from which light is reflected on the button cannot be any more than the thickness of the facing.

Various materials can be used for the highlights, it being understood that the highlight is merely the lightest part of the button and that it may be off-white by a great many grades of the gray scale. Suitable materials for the highlight are urea formaldehyde resin, and melamine formaldehyde. Fillers can be used as necessary to obtain color shades that match the button when desired. Other highlight materials are titanium dioxide, preferably powdered, white paper, white lead, and any highlight pigment that does not react with the molding compound. Any molding materials commonly used for molding buttons can be used for the body portion of the buttons of this invention, for example, condensation products such as phenol, urea, thiourea, melamine, natural or artificial resins with formaldehyde or similar substances, plastics of casein, cellulose, or cellulose derivatives. The enumeration of these substances is not intended to limit the invention, other organic plastic substances being subject to use so far as suitable with the various aspects of the invention.

The preferred embodiments of the invention have been illustrated and described, but changes and modifications can be made, and some features can be used alone or in different combinations without departing from the invention as defined in the claims.

I claim as my invention:

1. The method of making articles having variegated effects ranging up to at least an off-white highlight and with said articles free of substantially continuous high-lighted edges, which method comprises adding a moldable white or off-white highlight producing substance to a moldable plastic material darker than the highlight producing substance, placing the highlight producing substance in position to be exposed on at least one surface of the mass of darker moldable plastic material, limiting the highlight producing substance to a part, and only a

part, of the surface on which it is exposed, placing over the plastic material and highlight-producing substance a facing of moldable material, that covers the entire area of said surface at least some portion of the facing being a material that is at least translucent over at least an area of its total surface after the final processing, said facing having a surface design marked thereon which is large enough to cover at least part of the edge regions of the highlight-producing substance underneath the facing, and then molding the plastic material, highlight-producing substance and facing together under heat and pressure without rupturing the facing.

2. The method of making molded articles having variegated effects, which method comprises making a pellet of moldable material, imbedding in the pellet a mass of highlight-producing substance with said substance exposed over a portion, and only a portion, of an upper face of the pellet, covering said upper face over its entire surface with a facing that has a design marked thereon and that has at least a portion of its area over the exposed high light-producing substance made of material that is at least translucent, holding the facing material in position with said area over the highlight-producing substance, and while the facing material is so held subjecting the pellet and facing material to heat and pressure in a mold cavity to form them into the desired article without rupturing the facing material.

3. The method of making molded articles having variegated effects, which method comprises applying to a surface of a preformed pellet a coating of highlight-producing substance which covers a portion and only a portion of the front surface of the pellet, placing the pellet in a cavity of a die, placing over the partially-covered surface of the pellet a facing sheet that has grain lines marked thereon, and that is at least partially light-transmitting over at least that portion of the sheet which has the grain lines marked thereon and which is disposed above the highlight-producing substance, and applying heat and pressure to the pellet and facing sheet while thus assembled to mold the sheet to the material of the pellet and to shape the pellet to the configuration of the die cavity without rupturing the facing sheet.

4. The method of making articles having variegated effects ranging up to an off-white highlight and with said articles free of substantially continuous highlighted edges, which method comprises locating a plurality of moldable pellets in pre-determined, spaced relationship with one another, applying to the upper faces of said pellets, while in such relation, a quantity of highlight-producing substance to cover a portion, and only a portion, of the top surfaces of said pellets, placing all of the pellets, while still in said pre-determined relationship with one another, in mold cavities of a multi-cavity die, covering the pellets with a facing sheet that has light-transmitting areas and that has designs marked thereon in pre-determined positions with the light-transmitting areas over highlight-producing areas and with the designs covering edge regions of the areas of said highlight-producing substance, and while the facing sheet is in such position, bringing another die element into contact with the facing sheet and forcing the facing sheet against the pellets under heat and with sufficient pressure to mold the sheet and pellets into an integral mass and to shape the mass to the configuration of the die cavities.

5. The method of making molded buttons, in a multi-cavity die, with a mask having openings therein of pre-determined shapes and located in various positions over the respective cavities of the die, which method comprises disposing in a pre-determined relation with one another, corresponding to the cavities of the die, a plurality of pellets made of moldable material, covering the pellets with the mask with the openings therein located in various positions over the respective pellets, applying a highlight-producing substance to the pellets by moving a quantity of said substance across the top of the mask in such a manner as to leave some of the substance on

the portions of the pellets that are exposed through the openings in the mask, removing the mask and while the pellets remain in said pre-determined relation inserting all of them in the cavities of the multi-cavity die, placing a facing sheet over the pellets in the die with markings on the sheet representing desired designs for the faces of the molded buttons, said facing sheet having light-transmitting areas over at least a part of the highlight portions of each pellet, and applying heat and pressure to the facing sheet and pellets in the die to mold the facing sheet to the pellets and shape the pellets to the contours of the die cavities.

6. The method of making buttons in a multi-cavity die, from a plurality of pellets to which highlight-producing substance is applied from a dispensing device that applies the substance differently to different pellets which are subsequently covered by facing material having grain designs thereon and that is light-transmitting, at least after being subjected to heat and pressure used in the method which method comprises disposing the pellets, which are made of moldable material, in a pre-determined, spaced relationship corresponding to the cavities of the multi-cavity die, applying the highlight-producing substance to the top surfaces of the pellets from the dispensing device located above the pellets while in said spaced relationship, moving all of the pellets simultaneously into the cavities of the multicavity die while maintaining the spaced relationship of the pellets, applying the facing material to all of the pellets over the top surfaces of the pellets and over the highlight-producing substance with the grain designs on said facing material over at least a portion of the highlight-producing substance on each underlying pellet, and subjecting the facing material and pellets to heat and pressure in the die to mold the facing material to the pellets and shape the pellets to the die cavities.

7. The method of making articles having variegated effects ranging up to an off-white highlight with said articles free of substantially continuous highlighted edges, which method comprises adding a moldable white or off-white highlight-producing substance to a part, and only a part, of a front face of each of a plurality of moldable masses of dark plastic material, placing the respective masses in the cavities of a multi-cavity die, making a facing sheet of moldable material with areas that are light transmitting, at least after being subjected to heat and pressure in the making of the molded article, putting on the facing sheet designs located in various positions over the respective cavities of said die, providing the facing sheet with weakened tear lines extending between all of the design areas and away from the pellets so that with subsequent distortion of the parts of the sheet above the pellets the sheet will tear along said tear lines, placing the sheet in the die and with the sheet disposed above said masses and with the design areas in register with the cavities, applying heat and pressure that molds the sheet and the masses together and to the shape of the die cavities.

8. The method of manufacturing buttons having at least partially light-transmitting faces and variegated effects ranging up to an off-white highlight and with said buttons free of substantially continuous highlight edges, which method comprises disposing a plurality of pellets of moldable material in the cavities of a multi-cavity die, which cavities are shaped to the desired configuration of the buttons, placing a backing sheet under the plurality of pellets, molding the pellets under heat and pressure to the shape of the cavities with the backing sheet in contact with all of the pellets so as to produce button blanks which are connected together by said backing sheet, providing highlight-producing material on a part, and only a part, of the top surface of each of the button blanks, thereafter placing a facing sheet over the surfaces of the button blanks with design markings on the facing sheet in register with the respective button blanks, at

least part of the areas within the design markings for each button blank being light-transmitting over that portion of the design which overlies the highlight material area of the moldable material beneath the facing sheet, and applying heat and pressure to the moldable sheet and button blanks to mold the sheet to the buttons.

9. The method of manufacturing buttons having at least partially light-transmitting faces and variegated effects ranging up to an off-white highlight and with said buttons free of substantially continuous highlight edges, which method comprises disposing a plurality of pellets of moldable material in the cavities of a multi-cavity die, which cavities are shaped to the desired configuration of the buttons, providing highlight-producing material on a part, and only a part, of the top surface of each of the pellets, molding the pellets under heat and pressure to the shape of the cavities to produce button blanks, thereafter placing a moldable facing sheet over the surfaces of the button blanks with design markings on the facing sheet in register with the respective button blanks, at least part of the areas within the design markings for each button blank being light-transmitting over that portion of the design which overlies a part of the surface of the blank having the highlight material thereon beneath the facing sheet, and applying heat and pressure to the moldable sheet and button blanks to mold the sheet to the buttons.

10. In the manufacture of molded buttons having variegated effects with highlights ranging up to an off-white and with design bearing facing material over the highlight area of the button, the improvement that comprises placing a plurality of pellets of moldable material in the cavities of a multi-cavity die, locating a facing sheet above the pellets with designs marked on the facing sheet and in various positions over the die cavities in which the pellets are located, said facing sheet having a highlight-producing substance carried by it on the under surface of the sheet and in a pre-determined relation to the designs on the sheet so that the highlight-producing substance under each design is located under at least a portion of the sheet that is light-transmitting on the molded button, and with the edge portions of the highlight-producing substance located under markings of the design, and while maintaining the sheet with its designs in various positions over the die cavities, subjecting the sheet and pellets to heat and pressure that mold the facing sheet to the pellets and that shape the pellets to the contours of the die cavities without rupturing the sheet over the surfaces of the pellets.

11. In the manufacture of molded buttons having variegated effects with highlights ranging up to a slightly off-white shade, the improvement that comprises molding a body portion of a button with a front face that is dark over portions of its area, providing lighter material over other portions of the area to produce highlights in the finished button, making a design on a facing material that is at least partially light-transmitting after processing, applying the facing to the body portion of the button and bonding it thereto with the design covering

at least the edges of the highlight material so that part of the light falling on the button is reflected from the front surface of the button and part of the light is reflected from the body portion through the light transmitting facing, and making the shade of color of the design darker than the shades desired for the corresponding areas of the finished button by an amount of the order of three grades on the gray scale.

12. In the manufacture of molded buttons having variegated effects with highlights ranging up to an off-white and with design bearing facing material over the highlight area of the button, the improvement that comprises placing a plurality of pellets of moldable material in the cavities of a multi-cavity die, placing highlight material at selected locations on the respective pellets, locating a facing sheet above the pellets with designs marked on the facing sheet and in register with the die cavities in which the pellets are located, holding the facing sheet out of contact with the highlight material on the pellets while locating the facing sheet to bring the designs in register with the mold cavities, and with the edge portions of the highlight-producing substance located under markings of the design, and while maintaining the sheet with its designs in register with the die cavities, bringing the sheet into contact with the pellets and highlight material and subjecting the sheet, pellets and highlight material to heat and pressure that mold the facing sheet to the pellets and that shape the pellets to the contour of the die cavities without rupturing the portions of the sheet overlying the pellets.

13. In the manufacture of molded buttons having variegated effects with highlights ranging up to an off-white and with design bearing facing material over the highlight area of the button, the improvement that comprises placing a plurality of pellets of moldable material in the cavities of a multi-cavity die, locating a facing sheet above the pellets with designs marked on the facing sheet and in register with the die cavities in which the pellets are located, locating a second sheet under the design-bearing facing sheet and over the pellets with highlight material on said second sheet above predetermined portions of the pellets and under portions of the design bearing sheet that are light-transmitting in the molded buttons, and while maintaining the sheets with their designs and highlight-producing substances in register with the die cavities, subjecting the sheets and pellets to heat and pressure that mold the sheets to the pellets and that shape the pellets to the contours of the die cavities.

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2,208,494	Broderson	July 16, 1940
2,434,477	Winter	Jan. 13, 1948
2,571,193	Broderson	Oct. 16, 1951