R. H. ISBELL.

Manufacture of Buttons.

No. 165,448. Patented July 13, 1875.

Fig. 1.

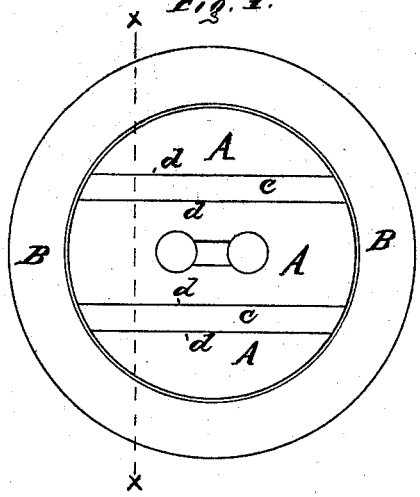


Fig. 2.

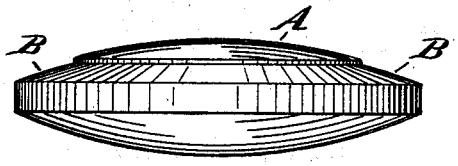
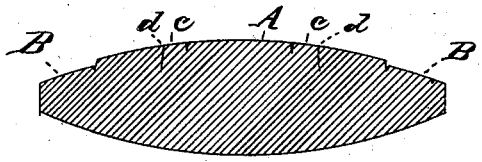


Fig. 3.



Witnesses

Phillips Abbott.

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UNITED STATES PATENT OFFICE.

ROBERT H. ISBELL, OF NEW MILFORD, CONNECTICUT.

IMPROVEMENT IN THE MANUFACTURE OF BUTTONS.

Specification forming part of Letters Patent No. **165,448**, dated July 13, 1875; application filed February 9, 1875.

To all whom it may concern:

Be it known that I, ROBERT H. ISBELL, of the town of New Milford, State of Connecticut, have invented a new and useful Button as an article of manufacture, and the process by which the same is made, reference being had to the accompanying drawings making part of this specification, in which—

Figure 1 is a top view enlarged; Fig. 2, a side view or edge view; Fig. 3, a sectional view on the line *x x* of Fig. 1.

Like letters indicate like parts in all the figures.

My invention consists in a new article of manufacture, being a button upon which any desired figures may be formed, in the manner to be hereafter described, which figures may have the same color as the remaining portion of the button, or, preferably, they may be of a lighter color; for instance, they may be made to match the cloth to which the buttons are to be attached.

A button is made of the ordinary shape, and in the ordinary manner of vegetable ivory, or of any other substance possessing the requisite compressibility.

If softened by moisture, the moisture is allowed to permeate the substance of the button, and its introduction is aided by applying a certain degree of heat to the liquid in which the button may be immersed. The upper surface, which is the surface on which the figures are to be produced, is turned smooth by placing the button in a chuck, or other device attached to a lathe, or some equivalent mechanism, in the ordinary manner. The rim or portion, as shown in Figs. 1, 2, and 3, at B, may be turned below the surface of the central portion, as shown; or the rim may be an elevation, instead of a depression, and may or may not be ornamented by milling or cutting with some appropriate tool. The central portion, as shown in Figs. 1, 2, and 3, at A, is left smooth, with the exception of the necessary holes for attaching the button to the cloth or other substance.

In some cases, however, it may be preferred to leave the entire upper surface of the buttons smooth—as, for instance, when the figures are to be produced upon the entire upper surface, and not upon the central portion only—though it is preferred to have the same manner of rim or edge, either an elevation or a depression, as shown in the drawings.

The button is now placed in a vat or other receptacle, along with a substance used to give it color. This process of dyeing is common to many articles, and need not be described. Suffice it to say that any color may be used, or such component parts of colors may be used as will, when the dyed button is brought subsequently in contact (in another vat) with some other colored dye, produce the shade which may be desired. After the button is dry, and the dyeing process complete, it is placed in a die which supports its lower side, or the side upon which no figures are to be impressed. The button, if of a rigid material, is previously softened by being subjected to the action of moisture, aided by a certain degree of heat, the particles of water or other liquid entering the substance of which the button is composed, and thereby producing the desired degree of softness. A gentle heat, of, say, 160° is found to materially aid the perfect penetration of the button by the moisture. While in this partially pliable condition, produced by the moisture, (aided by the heat,) an upper die or stamp is brought down with considerable force upon the face of the button, or rather upon that portion which was, in the forming of the article, left smooth for the reception of the figures. The face of this die or stamp is not smooth, portions being cut away, and the remaining portions left projecting. Thus a letter, a device, or two bands, as shown at C, Figs. 1 and 3, can be left in the face of the die or stamp, as the projecting portions; or, if preferred, the figure to be produced (the letter or device) may be the portions of the face which are cut away in the stamp. This stamp or die is now pressed upon the button with a force sufficient to depress the surface of the button wherever it comes in contact with the projecting parts of the face of the die or stamp, such depressions extending for about one-sixty-fourth of an inch into the face of the button, or below the previous surface of the smoothed portion A, which was formed to receive the desired figure or device, and the portion being thus depressed is in no way cut out, or the substance of

the button removed; but the material of the button is simply compressed or made more dense in such compressed portions. Thus, whatever figure or device is engraved upon the face of the die, its form will be left in perfect relief upon the hitherto smooth portion of the button.

After this operation, the button, having retained the color imparted to it in its previous dyeing, is again placed in the chuck upon a lathe, or some similar mechanism, and the portions which have been left in relief by the depression of the parts which come in contact with the projecting portions of the face of the stamp or die are turned away sufficiently only to remove that very thin surface penetrated by the dye, care being taken in all cases not to permit the tool to touch or injure the depressed portions of the figure, which portion is left intact, with the color first given to it untouched. The turning away of the portions in relief will, however, have completely removed all color from such parts of the surface as were under the face of the die or stamp, but not subjected to compression, the rim or edge (if there be one) and the depressed portions being the only parts of the upper surface which retain the color imparted in the first dyeing. The button in this condition, with a portion of its surface prepared to receive color, is subjected to a second dyeing, the operation being precisely the same as in the first instance, except the color may be different. The effect of this will be to impart to that portion of the button from which the color was removed when the surface of the elevated portions were turned away an entirely different and distinct color to that possessed by other portions, this color depending entirely upon the dye used in the latter coloring process, which dye may or may not affect the previously-dyed portions, depending upon what shade was used in the first dyeing. If black, it will always remain so, regardless of the color used in the second dyeing; but if blue is used in the first dyeing and yellow in the second dyeing, the edges and compressed portions will be green, while the parts affected only by the second dyeing will be yellow. Thus any two colors or different shades of one color may be given to the button, thus producing a contrasting effect.

I use the word contrasting, meaning by it the contrast always produced between any two colors, or between any two shades of one color, and not limiting myself to such colors as are distinguished by artists as contrasting colors.

The second dyeing may not consist in an immersion in a vat; but a diversity in the application of the color may be produced by applying the dye with "spatter-brushes," or with a "string-board," such mechanism having been invented and a patent applied for by me. The effect of a button thus treated will be almost precisely similar to that obtained by the costly and partially imperfect system of inlaying, or using a number of small pieces of different colors, with which to form the button.

The cost of buttons made in the manner described by me will be less than one-half that of the imported or inlaid article, while at the same time I produce an article more lasting, it being all in one piece.

The inlaid buttons are apt to come to pieces when subjected to moisture, as in washing the fabric to which they are attached.

My buttons may, after the two dyeing processes, be polished by being placed between two smooth and polished dies, one of which revolves, while the dies are forced together by great pressure—an invention of my own, and for which I hold Letters Patent, dated December 24, 1872, No. 134,286, reissued December 23, 1873, No. 5,694.

I would also mention that more than two colors can be given to the surface of the button by repeating the already-described process of pressing between two dies, one of which has the desired figure engraved thereon, and then removing by turning, or in some similar manner, the portions which are left above the compressed parts, and which have not been subjected to the indenting or depressing effect of the elevated figures or portions of the dies.

It will be noticed that the figures upon the buttons are defined by lines or divisions *d d*, which are apparently cut into the surface of the button, separating the differently-colored portions.

I find, when a portion of the surface is depressed by pressure, as described, that, though the actual passage of the die into and below the surface of the material of the button may be only one-sixty-fourth of an inch, the material is divided to a slight depth in the general line of the die's downward motion, as shown at *d d*, Fig. 3, caused by the packing upon itself or the compression of the material at such portions having an effect upon the substance of the button below the point of the die's actual passage.

After the button is finished, I find that, though I have been unable, for fear of removing the color from the depressed surfaces *c c*, Figs. 1 and 3, in which it is to remain, to turn those parts of the figure which were left in relief or uncompressed (excepting the edge, if there be one) perfectly even with the surface of the compressed portions, the natural elasticity of the material used will eventually cause those portions which were depressed by the projecting surface of the die or stamp to slightly expand, bringing the variously-colored portions of the figure to about the same level. This tendency of the compressed portions to swell or expand is increased when the buttons are polished by great compression between the surfaces of two smooth and polished dies, one of which revolves, and thus polishes the surface with which it is in contact, as described in my patent and reissue before mentioned. This polishing is the last process to which they are submitted.

What I claim, and desire to secure by Letters Patent, is—

1. As a new article of manufacture, a button made of one piece, on the surface of which is produced variously-formed and variously-colored figures, the figures being separated from the surrounding surface by divisions extending into the substance of the material, substantially as described.

2. The process for making colored and figured buttons, as described, consisting in dyeing the solid uncolored buttons, subjecting them to a softening operation, if the button be of a rigid material, depressing certain portions of the surface of the button by the instrumentality of engraved dies or stamps, removing the color from that portion of the surface of the previously-dyed button to which it is desired to give a different color or shade, and again dyeing, so as to affect directly the surfaces from which the color has been removed by the previous operation, which second dyeing may or may not affect the previously-dyed portions, which still contain a contrasting color.

ROBERT H. ISBELL.

Witnesses:
PHILLIPS ABBOTT,
HENRY L. BREVOORT.