(No Model.)

T. GUILFORD.

METHOD OF AND APPARATUS FOR MAKING BUTTONS, &c.

No. 251,218. Patented Dec. 20, 1881.

Fig. 1.

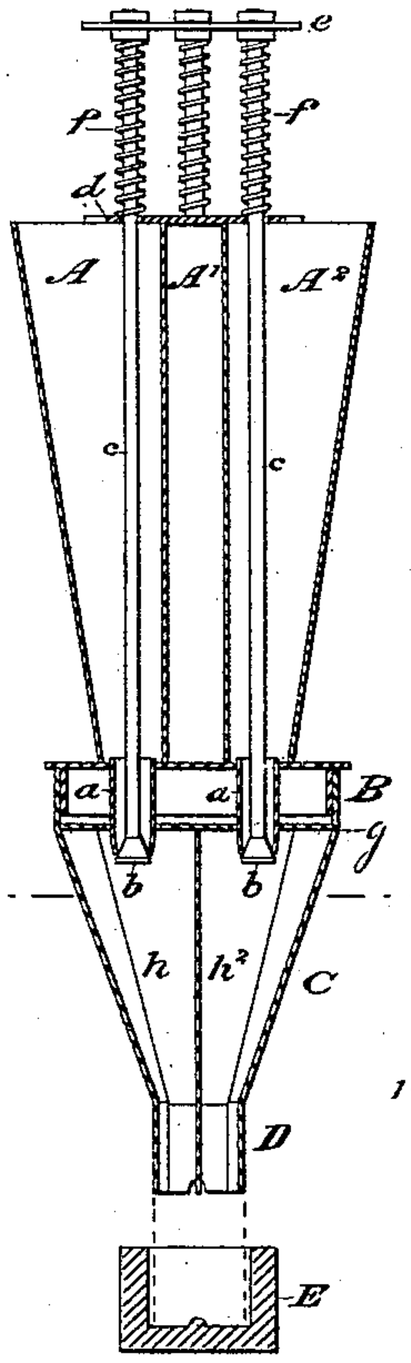

Fig. 2.

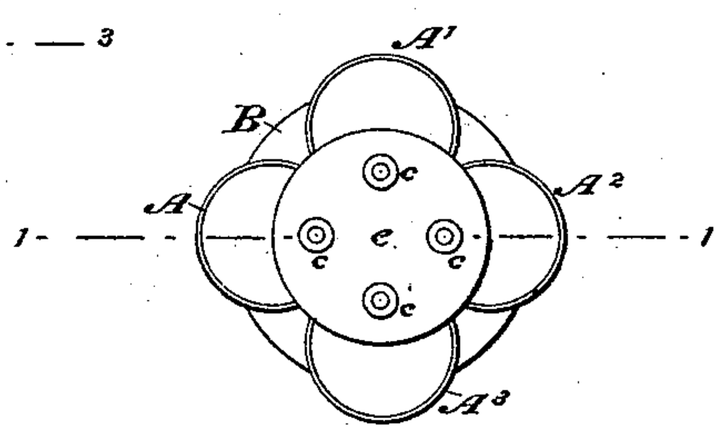

Fig. 3.

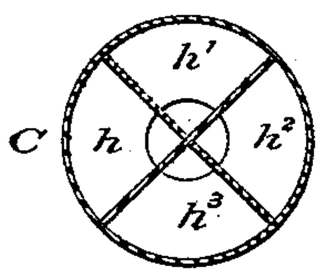

Fig. 4. Fig. 5. Fig. 6. Fig. 7.

Fig. 8.

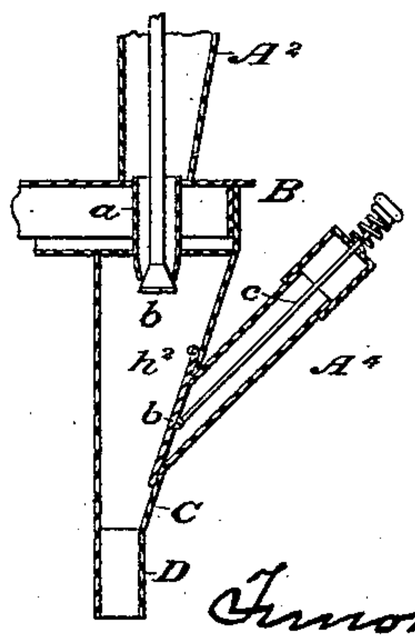

Fig. 9.

WITNESSES:

E. B. Bolton

Isaac Bainbridge

INVENTOR:

Timothy Guilford

By his Attorneys,

Burke, Fraser & Bennett

UNITED STATES PATENT OFFICE.

TIMOTHY GUILFORD, OF NEW YORK, N. Y.

METHOD OF AND APPARATUS FOR MAKING BUTTONS, &c.

SPECIFICATION forming part of Letters Patent No. 251,218, dated December 20, 1881.

Application filed November 14, 1881. (No model.)

To all whom it may concern:

Be it known that I, TIMOTHY GUILFORD, a citizen of the United States, residing in the city, county, and State of New York, have invented certain Improvements in Methods and Apparatus Employed in Making Buttons, &c., of which the following is a specification.

My invention relates to the manufacture of buttons and other small articles from pulverized horn and hoof and other substances which are molded and consolidated by heat and pressure, the object being to ornament the faces of the articles.

The nature of the invention will be best understood by reference to the annexed drawings, wherein the apparatus I have invented and which I employ is fully illustrated.

Figure 1 is a vertical mid-section of the apparatus or instrument, taken in the plane of the lines 1 1 in Figs. 2 and 3. Fig. 2 is a plan of the instrument. Fig. 3 is a transverse section on the line 3 3 in Fig. 1. Fig. 4 is an end view of the nozzle or discharging end of the instrument; and Figs. 5, 6, and 7 are illustrations of different forms of nozzles adapted for different styles of ornamentation. Fig. 8 is a sectional view, illustrating a modification which will be hereinafter described. Fig. 9 is a view of a button ornamented by my method.

In making buttons or other articles from pulverized horn or hoof the powdered material is placed in a metal female die and the male die forced down upon it to solidify it. While under pressure the die, with its filling, is exposed to heat to consolidate the filling and render it homogeneous. In some cases a finer facing material is first placed in the die and a cheaper or coarser backing afterward placed on top of it. An ornament is also sometimes embedded in the button or other article. Other similar materials are treated in the same manner.

The above was, in substance, the condition of the art up to the date of my present invention.

The object of my invention is to produce upon the face of the article an organized design in color, formed generally of the same material of which the article is composed, but of different colors, and making a part of the article. Indeed, the design may extend through the article from face to back; but, as the material for ornamenting is generally of a more costly character, I prefer only to form the ornament in the face and make the mass of the article of a cheaper quality of material.

My process consists in temporarily dividing up the bottom of the die which forms the face of the article with thin partitions so placed as to part off the several colors to be used in producing the design, and then to place within the spaces thus parted off a sufficient quantity of the facing material of the proper color. The partitions are then carefully removed, so as not to disturb the design thus formed, and the die filled up with the commoner material, to form the body of the article. The whole is now compressed in the usual way for making plain-faced articles, and when the article is removed from the die and finished it will be found that the face will present the intended design formed in and from the material of the article.

To enable me to carry out my process, I have invented the instrument which I will now describe with reference to the accompanying drawings.

Let A A′ A^2 A^3 represent four hoppers or holders for the ornamental facing material, which are united at their lower ends by a base, B.

In the bottom of each hopper is secured an outlet-tube, *a*, which is controlled by a conical valve, *b*, on the lower end of a valve-rod, *c*. The upper ends of these rods pass through a plate, *d*, which connects the four hoppers at their upper ends, and are themselves connected together at their tops by a plate or tie, *e*. Springs *f* encircle the rods between the plates *d* and *e*, and serve to draw the valves *b* up into and against the ends of the tubes *a*, so as to keep them normally closed.

Attached to the base B, by preference so as to be readily removed, is a reducer, C, having a cover, *g*, and provided with partitions, which divide it into four chambers, *h* *h′* h^2 h^3, as best seen in Fig. 3. This reducer terminates in a nozzle, D, which is divided also into quarters by the partitions of the reducer, which extend down through it. Fig. 4 is a view of the end of the nozzle D. The tubes *a* pass down through the cover *g* and lead the contents of A into *h*, A′ into *h′*, and so on.

My apparatus, as herein shown, is adapted

for making a button the face of which is divided into four equal sectors, (see Fig. 9,) the two opposite sectors being, for example, of one and the same color, but adjacent sectors of different colors. In Fig. 1 I have shown in section an ordinary female die, E, employed in making such buttons.

The operation is as follows: The hoppers A and A^2 are filled with ground horn or hoof of the same color—as white, for example—and the hoppers A′ and A^3 filled with ground horn or hoof of a contrasting color—as blue, for example. Any colors may be employed, however. The operator inserts the nozzle D of the instrument to the bottom of the die E, and then, while holding the instrument firmly in place, presses down the plate *e* for an instant. This acts to open the valves *b* long enough to permit enough of the material to escape from the hopper A A′, &c., and into the die to form the face of the button. The partitions in the nozzle D, however, keep the colors separate until the instrument is removed, which is done carefully, so as not to disturb the design they form in the die. After the instrument is removed the remainder of the material for completing the button, which may be of a commoner kind, and which is generally black or dark in color, is placed in the die on the top of the facing, and the button consolidated by heat and pressure in the usual way.

Enough material may, of course, be deposited by the instrument to form the entire button or other article; but this is neither desirable or economical generally.

In Figs. 1 to 4 I have shown the instrument constructed for making a simple design consisting of four quarters or sections of contrasted colors; but it is obvious that almost any design may be formed on this principle in almost any number of colors. Fig. 5 shows a design consisting of five parallel bars; Fig. 6, a design consisting of a center and two concentric circles, and Fig. 7 a design consisting of a uniform ground with four circular dots.

The number of hoppers A A′, &c., employed will depend upon the character of the design and the number of colors therein. Any number of hoppers may be employed. The partitions in the reducer C will, of course, be arranged so as to lead the material from the several hoppers to the compartments in the nozzle D; but that will only require the exercise of ordinary judgment and skill on the part of the maker of the instrument.

It is not necessary that the valves *b* should be all connected together so as to be operated simultaneously. Indeed, in some cases it may be desirable that they should, in whole or in part, be arranged to operate independently—as, for example, it may be desirable to deposit a greater quantity of the material from one hopper than from another, in which case the valve controlling that hopper must be held open longer than the other or others. It is not generally desirable, however, that the quantities in the various compartments of the nozzle D should be of different depths, as when the instrument is removed the deeper may overrun the shallower next adjacent, and if the latter be transparent the former will show through when the article is finished. To obviate this I employ, by preference, where one compartment is large or extended, (as a circular band, for example,) two or more hoppers for this compartment, arranged to discharge into it at different points, whereby, when the valves are all opened simultaneously and for the same length of time, this larger compartment will be supplied with material to the same depth as the smaller ones.

Where tinsel or brocade is employed to form one feature of the design it is desirable to employ very little of it, because of its cost, and to back it up with some of the horn or hoof. To accomplish this I prefer to employ the modified device illustrated in Fig. 8, or its substantial equivalent. In this construction we will assume that the hopper A^2 is to supply the compartment of the design destined to receive the brocade. I tap the chamber h^2 in the reducer C with a supplementary hopper or holder, A^4, provided with a valve, valve-rod, and retracting-spring similar to those shown for the other hoppers. In the hopper A^4, I place the brocade, and in the hopper A^2 the horn or hoof to serve as a backing therefor. Then, in using the instrument, after it is inserted into the die, the valve of hopper A^4 is first opened for an instant, to discharge a little of the brocade into its proper compartment, and afterward the other valves are opened, as before described, when the material in A^2 will fall upon the brocade and complete the facing required in that compartment.

I do not wish to limit myself to the form of valve herein shown for controlling the discharge from the hoppers. Any good form of valve may be employed—as, for instance, a horizontally-moving register-valve.

Having thus described my invention, I claim—

1. The herein-described process of producing an organized design on the face of an article made from pulverized horn, hoof, or other similar material, which consists in dividing up the face of the die by means of partitions into compartments, which form the elements of the design, then placing in said compartments the material of different colors to form the design, and then removing the partitions, so as not to disturb the design, substantially as set forth.

2. An instrument for depositing a facing material in a die for making articles from pulverized horn, hoof, or similar materials, comprising a hopper to hold the facing materials, provided with a valved outlet and a nozzle to insert into the die, said nozzle being connected with the valved outlet of the hopper, whereby when the hopper-valve is opened the material will be deposited in the bottom of the die, substantially as set forth.

3. An instrument for depositing an ornamental facing material in a die, comprising a

nozzle divided by partitions into several compartments corresponding in contour to the elements of a design, hoppers with valved outlets for holding the materials for forming the face of the article, and a reducer arranged to connect the compartments formed in the nozzle with the valved outlets of the several hoppers, all combined and arranged substantially as set forth.

4. The combination of the hoppers A A′, &c., having valved outlets, the reducer C, having chambers *h h′*, &c., and the partitioned nozzle D, all constructed and arranged substantially as set forth.

5. The combination of the hoppers A A′, &c., having outlets *a a*, the valves *b b*, stems *c c*, plates *d* and *e*, springs *f f*, the chambered reducer C, and the partitioned nozzle D, all constructed and arranged substantially as set forth.

6. The combination, with two or more hoppers, A A′, having valved outlets, of the removable reducer having chambers into which the outlets of the hoppers discharge, and the nozzle having compartments into which the chambers of the reducer discharge, all substantially as and for the purposes set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

TIMOTHY GUILFORD.

Witnesses:
HENRY CONNETT,
ARTHUR C. FRASER.