F. G. NEUBERTH.

METHOD OF MAKING BUTTONS.

APPLICATION FILED JUNE 15, 1915.

1,257,731.

Patented Feb. 26, 1918.

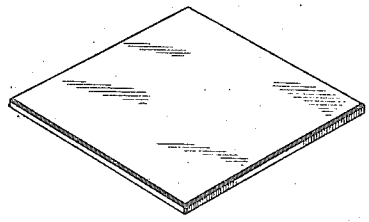


Fig.1.

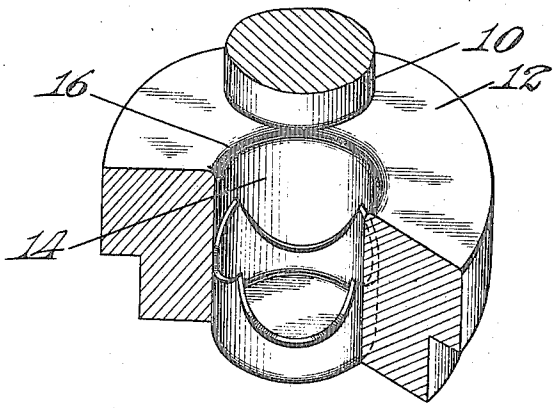


Fig.2.

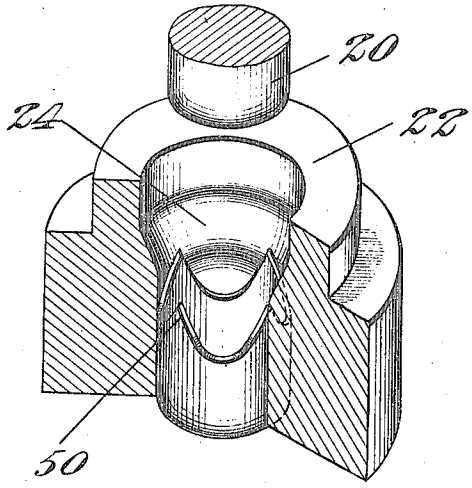


Fig.3.

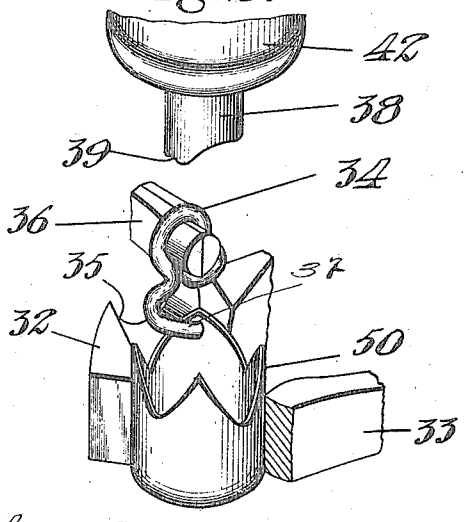


Fig.4.

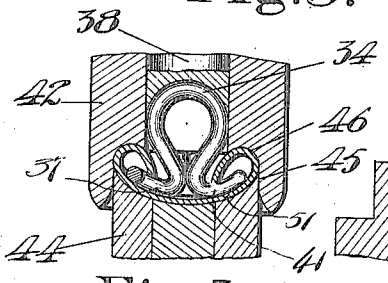


Fig.5.

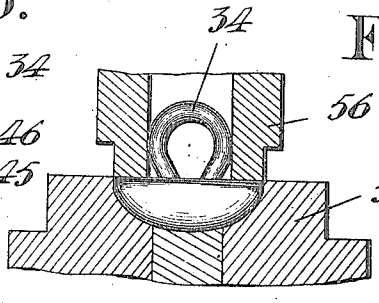


Fig.6.

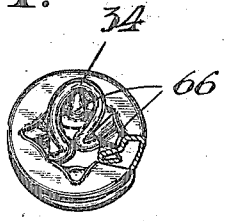


Fig.7.

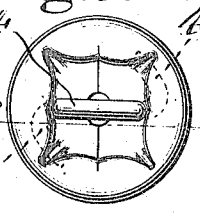


Fig.8.

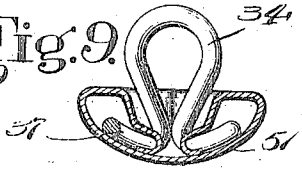


Fig.9.

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By his Attorney

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UNITED STATES PATENT OFFICE.

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METHOD OF MAKING BUTTONS.

1,257,731. Specification of Letters Patent. Patented Feb. 26, 1918.

Application filed June 15, 1915. Serial No. 34,270.

To all whom it may concern:

Be it known that I, FRANKLIN G. NEUBERTH, a citizen of the United States, residing at Ansonia, in the county of New Haven and State of Connecticut, have invented certain Improvements in Methods of Making Buttons, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention consists in an improved method of manufacturing sheet metal buttons such, for example, as those shown in my co-pending application Serial No. 659,523, filed November 10, 1911, on which Letters Patent No. 1,203,245 were granted on Oct. 31, 1916.

An object of the invention is to devise a method whereby buttons may be constructed of sheet metal rapidly and accurately and, if desired, by the operation of automatic machinery.

In one of its important aspects the invention consists in a method of manufacturing a sheet metal button having an inturned portion in which is formed a series of corrugations or creases extending in a general radial direction, which stiffen the turned in portion and firmly hold the eye against being pulled out of place. In the method herein disclosed, which illustrates one manner in which the desired results may be attained, a sheet metal blank with upstanding points is first produced and then the points are bent inwardly and at the same time subjected to a lateral pressure which causes the material of the points to buckle and so form the desired corrugation.

In another of its aspects the invention consists in a method of producing a metal button in which the inturned portion is brought into engagement at certain places with the outer curved portion of the button thus supporting the body portion of the button against being dented in and consequently rendering possible the employment of relatively thin sheet material in the construction of the button. In the method herein disclosed the extremity of each upstanding point is carried beneath the body portion of the point and the point as a whole is bent inwardly until its extremity is brought into engagement with the inner surface of the button back.

The method of the present invention is, however, in no sense limited to the production of buttons having the characteristics above discussed and many of its novel steps may be utilized with good advantage in the production of sheet metal buttons of other types.

The method of this invention may be best understood and appreciated from the following description of one manner in which it can be practised, in connection with apparatus selected for purposes of illustration and shown in the accompanying drawings, in which,—

Figure 1 is a view in perspective of the sheet metal blank;

Figs. 2 and 3 illustrate the first two drawing steps performed upon the blank, together with the apparatus used in carrying out these steps;

Figs. 4 and 5 illustrate the steps of inserting the eye and shaping the blank to hold the eye in place;

Fig. 6 illustrates the steps of flattening the underside of the button and giving it the desired shape;

Fig. 7 is a view in perspective, partly in section, of the completed button;

Fig. 8 is an enlarged plan view of the under side of the button; and

Fig. 9 is a section on the line 9—9 of Fig. 8.

The blank as shown in Fig. 1 comprises a square piece of thin sheet metal such, for example, as annealed sheet steel. Such material may be supplied in strip form and cut without waste into blanks of appropriate size.

In the first step of the method the flat blank has a cylindrical shape imparted to it and, as herein shown, this is effected by the action of a pair of drawing dies 10 and 12 as shown in Fig. 2. The female die member 12 comprises a cylindrical block having a circular opening 14 with a rounded upper edge 16. The male member 10 comprises a cylindrical plunger arranged to enter the opening 14 and being of such diameter as to permit the upstanding rim or edge of the partially formed blank to lie between it and the walls of the opening 14. The flat blank

is placed symmetrically over the opening 14 and then the die 10 is forced downwardly carrying the blank into the opening and imparting to it a cylindrical shape as shown in Fig. 2.

In the second step of the method the cylindrical blank produced by the dies 10 and 12 is elongated and further reduced in diameter. This step is effected by dies such as those shown in Fig. 3 in which the female die member 22 comprises a circular block having an opening 24 which, at its upper end, is of such diameter as to receive the blank shown in Fig. 2 but which tapers inwardly and has a lower portion of a uniform but reduced diameter. The male member 20 comprises a plunger of such diameter as to fit within the reduced portion of the opening 24 having the upstanding rim of the blank between it and the walls of the opening. In the second step of the method the blank shown in Fig. 2 is presented within the enlarged portion of the opening 24 and is then forced downwardly into the reduced portion thereof by the action of the die 20. The lower end of the die 20 is convexly curved, being of such shape as to impart to the body of the button blank substantially the shape desired in the finished button.

It will be seen that by the first two steps of the method a cylindrical blank is formed having an upstanding peripheral rim with upwardly tapering pointed sections, or "points" as they will be termed for convenience. These points it will be observed comprise the material originally included in the corners of the flat blank.

The next step of the method consists in placing in the blank a previously formed eye 34 which is preferably of a form having oppositely extending feet 37 whose outer ends 41 are curved in opposite directions in a plane perpendicular to the plane of the eye. As will be seen from an inspection of Fig. 8, the curvature of these ends 41, in the completed button, conforms approximately to the curvature of the inner periphery of the back of the button. As shown in Fig. 4, the blank is held in place by a pair of gripping jaws 32 and 33 and the eye 34 is presented above the blank, in a predetermined position with respect to the irregularly formed rim thereof, by a carrier 36 which comprises a horizontally extending split pin. Directly above the eye is disposed an inserting tool 38 which is yieldingly received within a die member 42, to be discussed hereinafter. The tool 38 is provided in its lower surface with a slot shaped to receive the upper portion of the eye 34 and the split pin carrier 36 is arranged for a swinging movement downwardly to present the eye within the blank. By reason of the shape of the lower end of the tool 38, the eye 34 is firmly held within the blank against either tilting or rotative turning movement. To permit the movement of the carrier 36 to present the eye in position the jaw 32 is provided with a slot 35, thus allowing the retention of the eye 34 upon the carrier 36 until it is grasped and firmly held in its predetermined position with respect to the points 50 by the tool 38. In presenting the eye the inserting tool 38 is moved downwardly carrying the eye into the blank, the split pin holder 36 being retracted from the eye as soon as the latter reaches the bottom of the blank. The desirability of presenting the eye 34 in a predetermined position with respect to the irregular edge of the blank will be more apparent from an inspection of Fig. 8 which shows that, in the completed button, adjacent points 50 are bent over upon opposite sides of a laterally extending foot 37 so that one of these points overlies a curved end 41, thus avoiding the difficulties which would result if a point 50 were bent over upon the top of the foot 37 and the lateral edges of adjacent points pushed out of alinement.

As already intimated the inserting tool 38 is located within a forming die 42 and in the downward movement of these tools the blank with the contained eye is carried downwardly through the jaws 32 and 33 into a lower die member 44 as shown in Fig. 5. This die is shaped to fit the curve of the outer face of the button blank and retain it while the die 42 bends the upstanding rim and points 50 inwardly into engagement with the feet of the eye or the inside of the button back 51. In the preferred construction, alternate points are brought over the ends 41 of the feet of the eye while the remaining points are brought into engagement with the inside of the button back upon the opposite side of the laterally extending feet 37 thereby to secure the eye in the button against removal or rotation. For this purpose the die 42 is provided with a cylindrical portion 45 and a laterally curved annular portion 46 which first turns over the upstanding points of the blank and then shapes the inturned portion of the blank in a smooth curve as shown in Fig. 5.

In the next step of the method the partially completed button is flattened on its lower surface and to this end the blank is placed in a die member 54 which is shaped to impart the desired final form to the outer portions of the button and which coöperates with a die member 56 having an opening for the reception of the eye and a lower face shaped to give the desired final form and herein to flatten that portion of the button which in the completed article constitutes the under side.

It will be noted that in the operation of the dies 42 and 44, as shown in Fig. 5, the upstanding points 50 of the cylindrical

blanks are rolled inwardly in a general radial direction and in this operation the inclined side edges of the points are forced into contact. As the bending operation continues a lateral pressure is developed by the co-action of the sections and the metal of each point is caused to buckle thus forming a radially disposed crease or corrugation 66 extending from near the tip of the point to its base. These corrugations, as already pointed out, contribute greatly to increased strength of the finished button and prevent the inturned portions thereof from being bent outwardly under a strain upon the eye. In this operation also the extremity of each point 50 is bent outwardly beneath the body of the point and is pressed into engagement with the underside of the button back 51 so that it thereby simultaneously helps to secure the eye in position and acts as a reinforcement for the back.

The apparatus herein disclosed may be embodied to good advantage in a unitary machine, such as that shown in my co-pending application Serial No. 38,203, filed July 6, 1915, in which the material is automatically supplied and transferred from one point of operation to another, but the method of my invention may be practised independently of such machine and by other apparatus than that herein disclosed.

Having now described my invention, I claim as new and desire to secure by Letters Patent of the United States:—

1. The method of making buttons which consists in forming a cylindrical blank with an upstanding rim, placing an eye within the blank, bending inwardly the upstanding rim to hold the eye in place, and simultaneously producing corrugations in the bent-over rim which extend toward the center of the button.

2. The method of making buttons which consists in producing a cylindrical blank with upstanding points, bending the points downwardly and inwardly, and producing lateral pressure on the lateral edges of the points to form corrugations extending longitudinally of the points.

3. The method of making buttons which consists in producing a blank having upstanding tapering points, presenting an eye to said blank, bending said points inwardly and simultaneously therewith subjecting them to lateral pressure to secure said eye in position and at the same time form a corrugation in each point, thereby to give said points added strength against a force exerted upon the eye tending to remove the same from the button.

4. The method of making buttons which consists in producing a blank having tapered points, bending each point inwardly toward a common center, whereby the side edges of the points are brought into contact, and thereafter continuing the bending operation to cause the edges of the points to bear against one another so as to produce in each other a lateral pressure whereby a longitudinally extending corrugation is formed in each.

5. The method of making buttons which consists in producing a cylindrical blank with upstanding points, rolling the points inwardly to carry the extremity of each point beneath the body portion of the point and into engagement with the inner surface of the button back to support the back.

6. The method of making buttons which consists in producing a cylindrical blank with a circular upstanding rim having separate points projecting therefrom, rolling the rim and points inwardly to carry the extremity of each point beneath the body of the point, and simultaneously forming a corrugation in each point which extends toward the center of the button.

7. The method of making buttons which consists in producing a blank having a cylindrical upstanding rim with projecting points and a bottom, reducing the diameter of the blank, imparting a convex shape to the bottom, then, after an eye has been presented to the blank, rolling inwardly the projecting points until the extremity of each point underlies the body of the point and bending the points as a whole until the extremity of certain points engages the concave surface of the bottom of the blank.

8. The method of making buttons which comprises forming a blank to present an upstanding rim of irregular edge contour, presenting an eye within said blank in a predetermined relation to the irregularities presented by the rim, and bending the rim inwardly into holding engagement with the eye while said predetermined relation is maintained.

9. The method of making buttons which comprises producing a blank having a back and upstanding points, presenting an eye to the blank having laterally extending feet, bending alternate points across a portion of said feet and bending the other points into engagement with the back to secure the eye and support the back.

10. The method of making buttons which comprises producing a blank having a back and upstanding points, presenting an eye having laterally extending feet to said blank, and bending adjacent points over against the back upon opposite sides of a foot until the lateral edges of the points contact, whereby the eye is secured in the button against removal or rotation.

11. The method of making buttons which comprises producing a blank having a back and upstanding points, presenting to said blank an eye having laterally extending feet whose outer ends are bent in a plane sub-

stantially at right angles to the plane of the eye, bending certain of said points over the curved ends of said feet thereby to assist in securing the eye against removal, and bending adjacent points against the back upon the other side of said laterally extending feet to assist in the retention of the eye and to prevent its rotation.

12. The method of making buttons which comprises producing a blank having a back and upstanding points, presenting an eye having its ends bent laterally to conform approximately to the inner periphery of the back, and bending certain of said points across said end portions into engagement with said back thereby simultaneously to secure the eye in position and reinforce the back.

13. The method of making buttons which comprises producing a blank having a back and a cylindrical upstanding rim, presenting an eye to said blank, bending said rim inwardly toward said back to secure said eye to the blank, and then shaping said button by pressure exerted upon the back and upon the inturned portion surrounding the eye.

In testimony whereof I have signed my name to this specification.

FRANKLIN G. NEUBERTH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."