May 10, 1966 P. J. CONNOLLY 3,249,974

ORNAMENTAL BUTTON

Filed Jan. 2, 1964

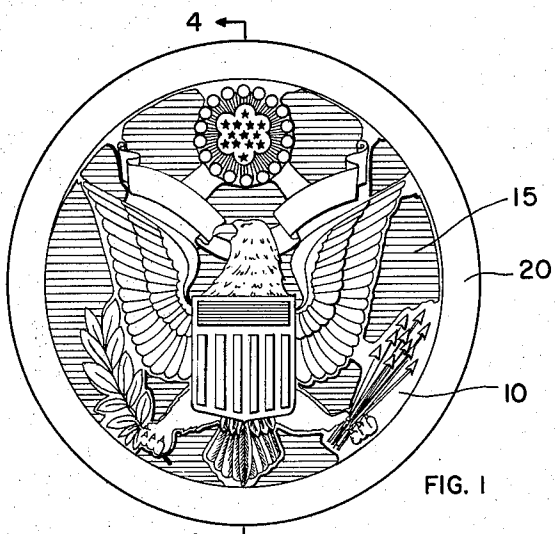


FIG. 1

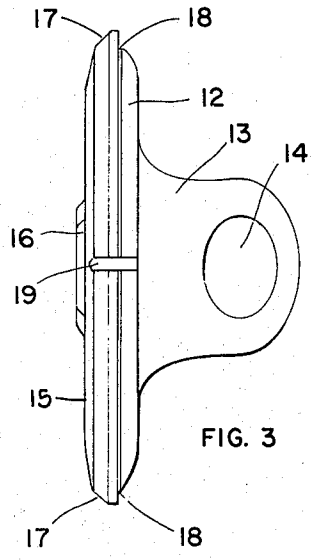


FIG. 3

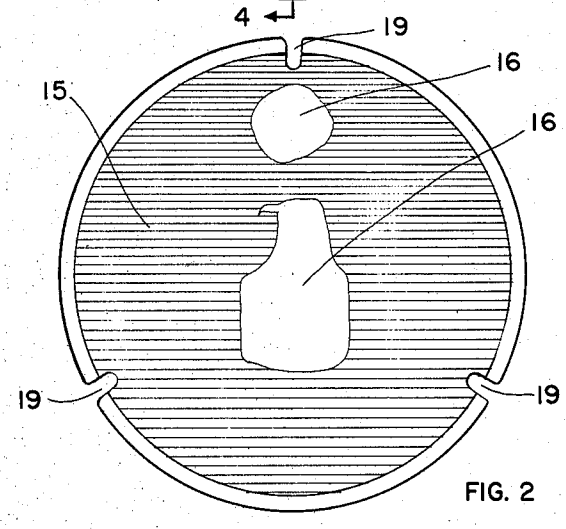


FIG. 2

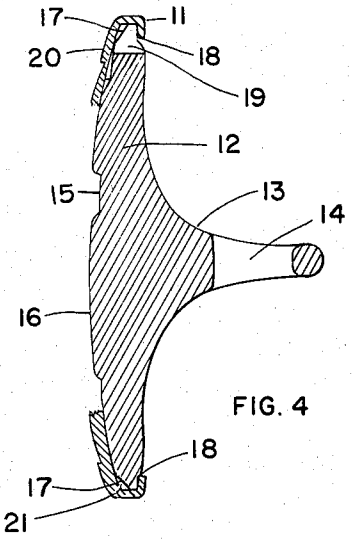


FIG. 4

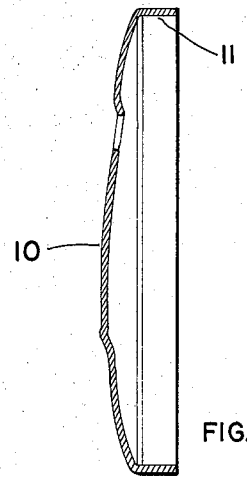


FIG. 5

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ORNAMENTAL BUTTON

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The invention described herein, if patented, may be manufactured and used by or for the Government for governmental purposes without the payment to me of any royalty thereon.

This invention relates to a button and more particularly to an ornamental button of the type frequently used with uniforms.

Traditionally military and military type uniforms, especially dress uniforms, have included ornamental buttons made of a base metal such as brass and usually plated with a precious metal such as gold or silver. In addition to the cost of the precious metal used in plating these buttons, the finish obtained is very difficult to maintain in good appearance, especially where the uniforms are used in proximity to salt water or other corrosion-inducing atmospheres.

In recent years methods have been devised for treating aluminum with an anodizing process which, with the assistance of special dyes, provides a finished article closely approximating the appearance of a precious metal-plated article. Such an anodizing process, when applied to ornamental buttons, results in aluminum buttons which a casual observer cannot distinguish from precious metal-plated buttons. However, in the process of anodizing aluminum buttons it is necessary to expose the buttons to acidic solutions which may cause non-uniform acceptance of dyes by the anodically oxidized surface on the aluminum if the acid is not thoroughly rinsed from all parts of the buttons. Thorough rinsing also prevents subsequent corrosion and formation of salts in the crevices and consequent dulling of the appearance of the buttons.

In the manufacture of a currently preferred style of ornamental button called a pierced button, problems have been encountered in attempts to take advantage of the great economy and more lasting finish of anodized aluminum. The so-called pierced button is made of two pieces, a backplate which carries a shank used for attaching the button to the uniform and an embossed and pierced shell or front piece which bears the desired ornamental indicia and which is mounted on the backplate by rolling the peripheral portion thereof over the edge of the backplate. In the application of the anodized technique to buttons made in this manner it has been found that some of the acid required in the anodizing process becomes entrapped in the space formed between the rolled portion of the front piece and the edge of the backplate. This acid seeps out during the subsequent dyeing step and causes non-uniform dyeing of the button, which is thus unsuitable for use. Because of this problem buttons of this type are manufactured in aluminum by anodizing the two pieces prior to assembly and then, through the use of great care to preserve the finish, assembled as described above. Buttons made in this manner have an acceptable initial appearance but the rolling of the front piece over the backplate causes numerous minute cracks in the anodized finish such that the button becomes very susceptible to deterioration of the finish through corrosion. In addition to this disadvantage, the separate anodizing of each of the pieces requires, in effect, twice the effort and twice the cost of the single anodizing step after assembly of the two pieces.

It is, therefore, an object of this invention to provide an ornamental button which can be anodized after assembly without danger of producing a non-uniform product due to acid seepage. Another object is to provide a simple means for effecting the drainage and removal of acid and rinse water during the anodizing of an assembled button of the type described without affecting the normal appearance of the button.

These and other objects are accomplished by providing means for the passage of fluids into, through and out of the space formed between the rolled portion of the front piece and the backplate such that this space may be rinsed free of acid or other material during the processing of the button.

The invention may be more clearly understood by reference to the drawings in which like numerals are used to designate like parts in all views and in which:

FIGURE 1 is a view showing the front face of a two-piece ornamental anodized aluminum button, such as those applied to uniforms of U.S. Army personnel.

FIGURE 2 is a front view of the backplate of the button of FIGURE 1 prior to its assembly with the front piece.

FIGURE 3 is a side elevation of the backplate of FIGURE 2.

FIGURE 4 is a sectional view of the button of FIGURE 1 along the line 4—4, with a portion of the front piece broken away.

FIGURE 5 is a sectional view of the front piece prior to assembly with the backplate.

In the illustrated embodiment of the invention, the front piece **10** is stamped from a thin sheet of aluminum, for example, 0.02" thick. The front piece is formed, the desired indicia embossed thereon and then pierced to remove those portions of the face which do not form part of the indicia. As best seen in FIGURE 5, the front piece is formed to provide a rearwardly extending peripheral flange **11** for a purpose to be described.

A backplate **12** including a shank **13** is then stamped as a single piece from aluminum. Backplate **12** has a hole **14** in its shank which serves as a means of attaching the assembled button to a uniform. The front face **15** of the backplate is line-grooved and provided with support platforms or pads **16** which are conformed to support the embossed portions of the front piece after assembly, all as best seen in FIGURE 2. These pads **16** also serve as a means of locating the front piece relative to the backplate prior to assembly. Additional locating means in the form of very small projections or pins (not shown) may be provided on the face of the backplate to register with corresponding depressions provided in the rear of the front piece.

The front edge **17** of the backplate is bevelled, while the rear surface thereof is provided with a groove or step **18**, as best seen in FIGURES 3 and 4. Slots **19** passing completely through the backplate are cut in the periphery thereof and extend inwardly slightly beyond the step **18** in the rear surface thereof. The slots **19** are located in relation to the unpierced portions of the front piece so that they will be concealed from view from the front during normal use of the assembled button.

The assembly of the button is accomplished by placing the backplate **12** into the front piece **10**, aligning the two pieces by means of the support pads **16** and/or other alignment means, and then rolling the flange **11** of the front piece over the edge of the backplate in a suitable die so that the edge of the flange **11** fits into the step **18** in the rear surface of the backplate to produce a substantially flat surface at the joint therebetween. The front surface of the rim **20** of the front piece may be further worked after assembly to give the desired appearance. It is important, however, both in the rolling of

the flange 11 over the edge of the backplate 12 during assembly and in any subsequent working of the rim 20 or edge of the assembled button to provide for and maintain a passage 21 (FIGURE 4) between the bevelled front edge 17 of the backplate and the inside surface of the rolled flange 11 of the front piece. This passage will be formed during the step of rolling the flange 11 over the edge of the backplate through the use of a suitable die. It provides a path for the free circulation of acid solution and rinse water in the space between flange 11 and rim 20 of front piece 10 and the bevelled front edge 17 of backplate 12 during the anodizing process to follow.

Following assembly of the button, the outside surfaces of the flanged portion of the front piece are polished by means of a polishing wheel as needed to produce the desired finish. A group of the polished buttons is then placed on titanium metal racks and subjected to a degreasing and etching operation in 5% caustic soda solution at 150° F. for 5–10 seconds. Following rinsing, the buttons are then electropolished for approximately 60 seconds, the time depending on the solution employed and the degree of electropolishing desired. The buttons are then subjected to an anodizing operation in a bath of 20% aqueous sulfuric acid solution at 68–75° F. for 30 minutes, applying a current density of about 0.1 ampere per square inch. The buttons are then thoroughly rinsed in clear water agitated by air. The thoroughly rinsed buttons are then dyed in an appropriate solution to attain the desired color. For example, the appearance of gold plating can be produced by using a mixture of Yellow G3 LW and Red B3 LW in aqueous solution, in proportions selected to match the shade desired, at pH 5–6, for approximately 30–45 seconds dyeing time. The excess dye bath is rinsed off and the dyed buttons are then sealed by immersion in an appropriate solution such as a nickel cobalt acetate solution at 195–200° F. for 30–60 minutes, the time depending on the temperature employed. The sealed buttons are then rinsed and dried and are ready for use.

The bevelled front edge 17 of the backplate 12 insures enough clearance between the backplate and the rolled portion of the front piece to permit acid and rinse water to flow around the peripheral front edge of the backplate. The slots 19 in the periphery of the backplate permit the acid or rinse water to freely circulate into, through and out of the passage 21 so formed. The line-grooved surface 15 of the face of the backplate and the slight spacing of the embossed portions of the front piece from the face of the backplate afforded by the support pads 16 assure adequate flushing and drainage of the space between the embossed portions of the front piece and the backplate. In this manner, the acid used in anodizing the aluminum button is readily and completely removed during the rinsing step and the button is left in condition to accept the dye or dye mixture uniformly over all surfaces that will be seen when the button is applied to a garment.

The slots 19 may be varied as to both number and location on the periphery of the backplate, depending on the arrangement of the ornamental front piece. It will normally be preferable to provide at least two or three slots in order to provide good fluid circulation to assure rapid and complete flushing of the passage 21. It is desirable to have the slots located behind portions of the ornamental parts of the front piece which are physically joined to the flanged periphery thereof for purposes of concealment. It, therefore, will not always be possible, nor is it necessary, that the slots be spaced equidistantly on the periphery of the backplate or that three or any other particular number of slots be used.

While the invention has been described in terms of two-piece anodized aluminum pierced buttons, it is to be understood that it may be applied to other types of buttons. For example, where an unpierced or solid front piece is used, the slots 19 can provide for passage of fluid to and from the space between the rear face of the front piece and the front face of the backplate in addition to peripheral passage 21. The invention will be particularly advantageous in connection with buttons which require thorough rinsing of a chemical agent from the spaces between surfaces which may be close-fitting and may become wetted by such a chemical agent at some stage in the manufacture of the buttons. It is also to be understood that the invention may be applicable to buttons made of metals other than aluminum. However, it will be especially advantageous in the manufacture of anodized aluminum buttons or in the manufacture of electroplated metallic buttons.

As a result of this invention, it is now possible to produce ornamental aluminum buttons of the type desired, anodized after assembly, which will be uniformly dyed and free of cracked edges or corroded spots or deposits of salts at the edges of crevices in said buttons. Ornamental buttons, particularly gold-simulating buttons for uniforms, will have a greatly improved appearance because of this invention. The cost of uniforms will also be reduced since the invention removes the remaining practical obstacle to the substitution of anodized aluminum buttons for gold-plated buttons in uniforms, namely the unevenness of the application of the dye or dye mixture due to bleeding of acid or other chemical agents from the close spaces between the parts of the anodized aluminum buttons which occurred prior to the present invention.

In addition to the embodiment described herein, various modifications or alterations may be made therein without departing from the spirit and scope of the invention as set forth in the appended claims.

I claim:

1. An ornamental button comprising an indicia-bearing front piece and a backplate, said front piece having a continuous peripheral flange extending over and around the edge of said backplate fixedly joining said front piece to said backplate and defining a fluid passage between said flange and the periphery of said backplate, said backplate being provided with a plurality of fluid passage means connecting said fluid passage with the exterior of said button, said fluid passage means in said backplate being concealed from view from the front of said button by said front piece, whereby processing and rinsing fluids may be readily circulated through said passage and passage means.

2. An ornamental button comprising an indicia-bearing front piece and a backplate, said front piece having a continuous peripheral flange extending over and around the edge of said backplate fixedly joining said front piece to said backplate and defining a fluid passage between said flange and the periphery of said backplate, said backplate being provided with a plurality of slots formed in its edge and connecting said fluid passage with the exterior of said button, said slots in said backplate being concealed from view from the front of said button by said front piece, whereby processing and rinsing fluids may be readily circulated through said passage and passage means.

3. An ornamental button comprising an indicia-bearing front piece and a backplate, said backplate having a bevelled front edge, said front piece having a continuous peripheral flange extending over and around the edge of said backplate fixedly joining said front piece to said backplate and defining a fluid passage between said flange and said bevelled front edge of said backplate, and said backplate being provided with a plurality of fluid passage means connecting said fluid passage with the exterior of said button, said fluid passage means in said backplate being concealed from view from the front of said button by said front piece, whereby processing and rinsing fluids may be readily circulated through said passage and passage means.

4. An ornamental button comprising an indica-bearing front piece and a backplate, said backplate having a bevelled front edge, said front piece having a continuous peripheral flange extending over and around the edge of said backplate fixedly joining said front piece to said backplate and defining a fluid passage between said flange and said bevelled front edge of said backplate, said backplate being provided with a plurality of slots formed in its edge and connecting said fluid passage with the rear surface of said button, said slots in said backplate being positioned to be concealed from view from the front of said button by said front piece, whereby processing and rinsing fluids may be readily circulated through said passage and passage means.

5. The method of making an ornamental button of the type having an indicia-bearing aluminum front piece and an aluminum backplate, said front piece having a continuous rearwardly extending peripheral flange, comprising:

(a) forming a plurality of fluid passage means in said backplate extending from the peripheral edge thereof to one of the other surfaces thereof, said fluid passage means being positioned to permit the passage of fluids between the exterior of the button and said peripheral edge of the backplate and to be concealed from view from the front of the button after assembly of the button,

(b) assemblying said button by rolling the peripheral flange of said front piece over the peripheral edge of said backplate to join said front piece and said backplate and to define a peripheral fluid passage between said fiange and said backplate,

(c) anodizing the assembled button,

(d) rinsing the assembled button by immersing said assembled button in rinsing fluid and agitating said fluid, and

(e) dyeing said assembled button.

6. The method of making an ornamental button of the type having an indicia-bearing aluminum front piece and an aluminum backplate, said front piece having a continuous rearwardly extending peripheral flange, comprising:

(a) bevelling the peripheral front edge of said backplate,

(b) forming a plurality of slots in said backplate extending from said bevelled edge of the backplate to the rear surface thereof in positions to permit the passage of fluids between the exterior of the button and said bevelled edge of the button and be concealed from view from the front of the button after assembly,

(c) placing the front face of said backplate against the rear face of said front piece,

(d) assemblying said button by rolling said peripheral flange of said front piece over the peripheral edge of said backplate to join said front piece and said backplate and define a peripheral fluid passage between said flange and said backplate,

(e) anodizing the assembled button,

(f) rinsing the assembled button by immersing said assembled button in rinsing fluid and agitating said fluid, and

(g) dyeing said assembled and rinsed button.

7. The method of making an ornamental button of the type having a metal front piece abutting and secured to the front face of a back piece which comprises:

(a) bevelling the peripheral front edge of said back piece,

(b) notching the periphery of said back piece leading from said bevelled peripheral front edge to the rear face thereof,

(c) placing the front face of said back piece against the rear face of said front piece in a position to conceal said notching from view from the front of the button,

(d) deforming a peripheral portion of said front piece over and around the periphery of said back piece to join said pieces and to provide a closed marginal passage along said bevelled edge, opening for drainage by the notching through the back face of said back piece,

(e) anodizing the assembled front piece and back piece,

(f) rinsing the anodized front piece and back piece, and

(g) dyeing said rinsed front piece and back piece,

8. The method of making an ornamental button having a front piece and a backplate, said front piece having a continuous rearwardly extending peripheral flange, comprising:

(a) forming a plurality of fluid passage means in said backplate extending from the peripheral edge thereof to one of the other surfaces thereof, said fluid passage means being positioned to permit the passage of fluids between the exterior of the button and said peripheral edge of the backplate and to be concealed from view from the front of the button after assembly of the button,

(b) assembling said button by rolling the peripheral flange of said front piece over the peripheral edge of said backplate to join said front piece and said backplate and to define a peripheral fluid passage between said flange and said backplate,

(c) treating said assembled button by immersion in a processing fluid to form a predetermined condition on the surface thereof, and

(d) rinsing said processing fluid from said button by immersion of said button in a rinsing fluid.

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