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PROCESS AND APPARATUS FOR DECORATING BUTTONS AND LIKE ARTICLES

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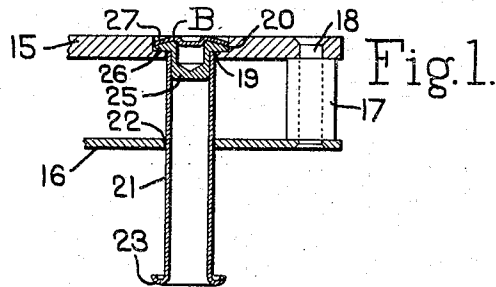


Fig. 1.

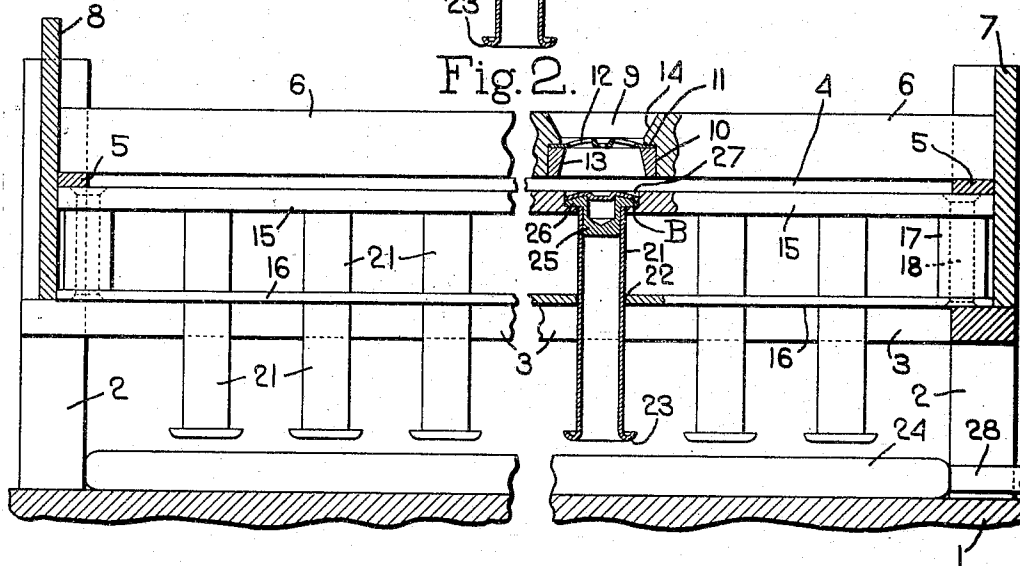


Fig. 2.

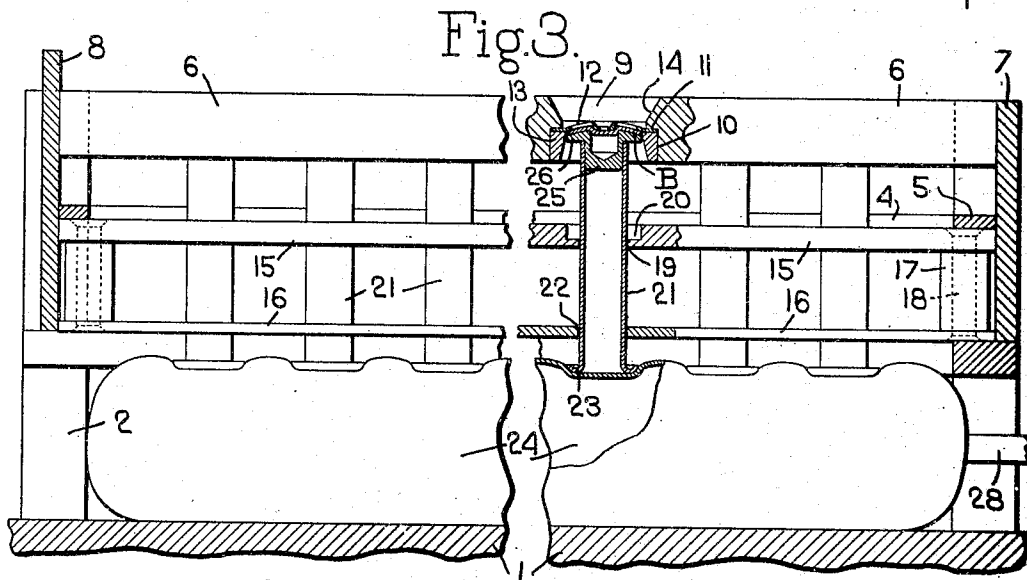


Fig. 3.

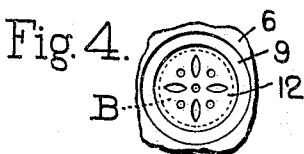


Fig. 4.

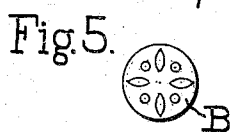


Fig. 5.

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UNITED STATES PATENT OFFICE

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PROCESS AND APPARATUS FOR DECORATING BUTTONS AND LIKE ARTICLES

Application filed November 20, 1930. Serial No. 496,957.

This invention relates to improvements in process and apparatus for producing ornamental designs upon a multiplicity of small articles, such as buttons.

5 The process in its broad sense comprises assembling a multiplicity of said articles in separated, but preferably narrowly juxtaposed relation upon a carrier, transferring the assembled articles from the carrier into
10 contact with stencils arranged in juxtaposition complimentary to the assembly of the articles, forcing the respective articles against their respective stencils with substantially uniform pressure and applying to the
15 stencils a coloring material containing a highly volatile solvent, removing the articles from engagement with the stencils, and permitting or causing the articles to dry.

Desirably the articles, or at least the face
20 of the article which is to be ornamented is first coated with a soluble enamel, such as nitro-cellulose which is soluble in the solvent which is employed in the coloring or painting mixture, so that the color may be caused
25 to penetrate into the body of the enamel, thereby producing a permanent coloring effect without destroying the smooth enamel surface of the article or causing the design to appear in relief upon the surface of the
30 article. However, the process is not necessarily limited to the use of enamel for the article, nor to the use of an enamel and a paint mixture soluble in a common solvent, as in some instances it may be desirable to
35 produce the pattern in relief on the article.

An illustrative form of apparatus for producing the process is shown in the accompanying drawing, in which,

40 Fig. 1 is a detail view of a portion of an assembling carrier;

Fig. 2 is a view, partly in longitudinal vertical section, and partly in elevation, and broken away centrally, of the apparatus illustrating the relative position of the stencil
45 plate and the carrier for the assembled articles, with means for forcing the respective articles into contact with the stencils with substantially uniform pressure;

50 Fig. 3 is a similar view, illustrating the articles held in engagement with the stencils

and in position to be coated by an air brush, or other suitable coating means;

Fig. 4 is a detail plan view of one of the stencils mounted in the stencil plate; and,

Fig. 5 is a detail view of an article, such as
55 a button, ornamented with a stenciled ornamentation shown in Fig. 4.

The apparatus illustrated in the accompanying drawing comprises a bed 1, and end frames 2 connected by longitudinally extending
60 girders 3 and 4, the girders 3 providing slides for supporting the assembling means, while the girders 4, together preferably with cross girders 5 upon the end frames 2, form supports for the stencil plate 6. One of the
65 end frames 2 desirably is provided with an abutment 7 adapted to be engaged by the ends of the carrier, and the stencil plate 6, while the other end frame 2 may be provided with a
70 gate 8 slidably mounted in the posts of the end frame adapted to be removed for the purpose of introducing and removing the assembling plate. The gate 8 when replaced will also serve to lock the assembling plate and the stencil plate in proper relation to each
75 other.

The stencil plate 6 may be of metal, or of other suitable material, and provided with apertures 9 therethrough, the walls of the lower portions of said apertures being counter-
80 bored to provide countersinks 10 presenting shoulders 11 adapted to be engaged by stencils 12. The stencils 12 may be of sheet metal, or other material, suitably apertured to provide the desired design, and curved to
85 conform to the contour of the face of the article, such as a button, which is to be ornamented. The stencil plates 12 may be secured against the shoulders 11 of the countersinks by suitable collars 13 removably secured
90 within the countersinks in any desired manner.

The inner faces of the collars desirably are tapered convergingly to guide the articles into proper engagement with the stencils.
95 Desirably the upper walls 14 of the apertures 9 converge downwardly to insure access of the coating material to all portions of the stencils.

The stencil plate is provided with a multi-
100

plicity of apertures desirably arranged in close juxtaposition and in such a manner that a maximum number of stencils may be supported in the stencil plate.

5 The assembling means as illustrated comprises an upper plate 15 and a lower plate 16 held apart by spacing sleeves 17 surrounding rivets 18, or other suitable means for securing the plates together in spaced relation. 10 The upper plate 15 desirably is formed of or constructed to present a smooth upper surface of a material, such as Bakelite, which is not affected by the solvent contained in the coloring or painting material which is used 15 for decorating the articles.

The upper plate is provided with a plurality of apertures 19 provided with counter-sinks 20 complementary to and registering axially with the apertures 9 of the stencil plate 6. Tubular plungers 21 are reciprocally mounted in the apertures 19 and extend downwardly therefrom through suitable guiding apertures 22 in the lower plate 16 of the assembling device. The lower ends of the 25 sleeves 22 desirably are beaded outwardly to form curved surfaces 23 adapted to be engaged by the flexible wall of a fluid-containing bag 24 which rests upon the base 1 of the machine.

30 The upper ends of the tubes 21 may be flared outwardly to provide heads to engage the articles, but preferably are provided with heads 25 which are removably secured in the upper ends of the plungers 21 and provided 35 with outwardly extending flanges 26, the upper surfaces of which, in whole or in part, conform to the under face of the articles, such as buttons B, to be decorated.

40 The articles to be decorated are placed in the recesses 27 above the heads of the plungers 21 and when thus assembled desirably lie substantially in the plane of the upper face of the assembling plate 15.

45 As before stated, the assembling means, comprising the upper plate 15, the lower plate 16, and the plungers 21 carried thereby, are removably mounted in the frame and upon withdrawal of the gate 8 may be slid lengthwise out of the machine to enable the articles 50 to be assembled in the recesses of the upper plate 15. Such assembling of the articles in the plate may be performed by placing the plate in an assembling machine, such as disclosed in my prior Patent No. 1,711,250, in 55 which the plate or tray is supported upon a reciprocating device in such a manner that a mass of articles placed upon the plate or tray is caused by the reciprocation of the same to pass over the tray, only such articles 60 remaining in the plate or tray as are deposited within the recesses, with like faces presented upwardly, or a mass of the articles may be brushed over the surface of the plate 15 so that the articles will only be deposited 65 in the recesses when the faces of such articles

conform to the contour of the heads of the plungers, while articles presenting the reverse side, being unable to enter the recesses, will be swept across the plate and discharged therefrom.

70 When the recesses of the plate are filled with articles in assembled relation, the assembling plate is slid into the machine in the manner above described and locked in position in the machine by the gate 8, or 75 other suitable means, in such position that the plungers are in axial alinement with the apertures in the stencil plate.

Fluid under pressure, such as air, may then be introduced through a suitable stem 28 80 leading to the flexible bag 24, thereby inflating the bag and causing the upper wall thereof to engage and raise the plungers 21, thereby forcing the articles into engagement with the stencils 12. 85

Desirably the stencil plate 6 is so mounted that it may be raised by the pressure applied to the lower ends of the plungers 21, so that upon further inflation of the bag 24 all of the articles will be forced against their stencils with a uniform pressure and maintained 90 in close contact therewith. When the articles have been thus forced into intimate contact with the stencils, the coloring material or paint may be applied in any usual manner, preferably by an air brush. 95

Desirably a slight clearance is provided between the plungers 21 and the walls of the apertures in the plates 15 and 16 through 100 which they pass, so that when the articles are pressed firmly against the stencils, centralization of the articles relatively to the stencils will be insured. Such firm pressure also insures a sharp outline of the design obtained upon the face of the button when 105 the coloring material is applied thereto.

Desirably the face of the articles to be ornamented, or if desired the entire articles may be coated with an enamel or lacquer of material such as nitro-cellulose which is soluble 110 in the carrying vehicle of the paint mixture. By reducing the non-volatile portion of the painting mixture, practically to the pigment, using only enough gums to act as a binder, a composition is produced which 115 may be very finely atomized and applied slowly. The nitro-cellulose enamel coating of the article will then absorb the liquid practically as fast as it is applied. Inasmuch as the painting or decorating mixture 120 is almost entirely pigment and solvent, it is very easily atomized and applied. Furthermore, the use of a mixture having very little non-volatile matter is advantageous in that the apertures in the stencils will not become 125 loaded up and the stencil plate may, therefore, be used a considerable time before it is necessary to clean the same.

By providing an assembling plate 15 made of or having a surface coating of Bakelite,

or other material, which presents a smooth polished surface, and is not soluble in the solvent contained in the painting or coloring mixture, it can be readily wiped off each time the assembling means is removed from the machine and will not, therefore, be coated with paint, dust, or any other material, nor gummed up in such a manner as to prevent proper and rapid assemblage of articles thereupon.

While in the construction illustrated in the drawing a stencil plate containing a multiplicity of stencils, and an assembling tray containing a multiplicity of recesses complementary to the stencils, is provided with plungers for forcing the articles carried by the assembling tray into engagement with the respective stencils, other mechanism may be provided for accomplishing this purpose, such as complementary travelling members provided respectively with stencils and assembling means with means for yieldably forcing the articles into engagement with the stencils to provide an automatic continuously operating painting machine of the type disclosed in my prior application Serial Number 153,512, filed December 9, 1926, for machines for assembling and coating a multiplicity of articles. It will, therefore, be understood that the particular embodiment of the invention disclosed herein is of an illustrative character and is not restrictive of the meaning and scope of the following claims.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is:

1. Apparatus for producing ornamental designs upon a multiplicity of small articles comprising a stencil carrier having a multiplicity of apertures therethrough, stencils secured in said apertures, means for supporting said stencil carrier, assembling means having a multiplicity of article-receiving recesses complementary to said stencil-containing apertures, means for so supporting said assembling means as to cause the articles supported thereby to register with the respective stencils, and simultaneously operable means for independently forcing each of said articles into firm engagement with the stencil therefor, whereby decorating material may be applied to the article through the design of the stencil.

2. Apparatus for producing ornamental designs upon a multiplicity of small articles comprising a stencil carrier having a multiplicity of apertures therethrough, stencils secured in said apertures, means for supporting said stencil carrier, assembling means having a multiplicity of article-receiving recesses complementary to said stencil-containing apertures, means for so supporting said assembling means as to cause the articles supported thereby to register with the respective

stencils, and simultaneously operable means for yieldably forcing all of said articles into firm engagement with their respective stencils with a substantially uniform pressure, whereby decorating material may be applied to the article through the designs of the stencils.

3. Apparatus for producing ornamental designs upon a multiplicity of small articles which comprises a stencil carrier having a multiplicity of apertures therethrough, stencils secured in said apertures, means for supporting said stencil carrier to permit a bodily movement thereof, assembling means having a plurality of article-receiving recesses complementary to said stencil-containing apertures, means for so supporting said assembling means as to cause the articles supported thereby to register with said stencils, and means for yieldably forcing said articles into engagement with their respective stencils, and thereupon conjointly moving said stencil carrier and said articles while maintaining the same in firm engagement.

4. Apparatus for producing ornamental designs upon a multiplicity of small articles which comprises a stencil carrier having a multiplicity of apertures therethrough, stencils secured in said apertures, means for supporting said stencil carrier to permit a bodily movement thereof, assembling means having a plurality of article-receiving recesses complementary to said stencil-containing apertures, means for so supporting said assembling means as to cause the articles supported thereby to register with said stencils, and means for yieldably forcing said articles into engagement with their respective stencils with sufficient force conjointly to support said stencils upon said articles, whereby intimate engagement of all of said articles with the respective stencils will be insured.

5. Apparatus for producing ornamental designs upon a multiplicity of small articles which comprises a stencil carrier having a multiplicity of apertures therethrough, stencils secured in said apertures, means for supporting said stencil carrier, assembling means having a multiplicity of article-receiving recesses complementary to said stencil-containing apertures, plungers reciprocably mounted in said recesses, means for so supporting said assembling means as to cause the article-receiving recesses to register with the respective stencil apertures, and means for simultaneously actuating the respective plungers to force the respective articles yieldably into firm engagement with the stencils therefor.

6. Apparatus for producing ornamental designs upon a multiplicity of small articles which comprises a stencil carrier having a multiplicity of apertures therethrough, stencils secured in said apertures, means for supporting said stencil carrier, assembling means having a multiplicity of article-re-

ceiving recesses complementary to said stencil-containing apertures, plungers reciprocally mounted in said recesses, means for so supporting said assembling means as to cause the article-receiving recesses to register with the respective stencil apertures, and fluid-operated means for actuating the respective plungers to force said articles into firm engagement with the stencils therefor with substantially uniform pressure.

7. Apparatus for producing ornamental designs upon a multiplicity of small articles which comprises a stencil carrier having a multiplicity of apertures therethrough, stencils secured in said apertures, means for supporting said stencil carrier, assembling means having a multiplicity of article-receiving recesses complementary to said stencil-containing apertures, plungers reciprocally mounted in and depending from said recesses having heads complementary to one of the faces of said articles and enabling the articles supported in said recesses, with the complementary faces of the articles and plunger in contact, to lie below the upper plane of the article-receiving means, means for so supporting said assembling means as to cause the articles supported thereby to register with the respective stencil apertures, and means for actuating said plungers to force the respective articles yieldably into firm engagement with the stencils therefor.

8. Apparatus for producing ornamental designs upon a multiplicity of small articles which comprises a base, a frame mounted thereupon, a stencil plate yieldably mounted on said frame having a multiplicity of apertures therethrough, stencils secured in said apertures, an assembling tray having a plurality of article-receiving recesses complementary to said stencil-containing apertures, means for removably supporting said assembling tray upon said machine with the article-receiving recesses in registry with the stencil apertures, and means for simultaneously forcing said articles into firm but yielding engagement with the respective stencils with substantially uniform pressure.

9. Apparatus for producing ornamental designs upon a multiplicity of small articles which comprises a base, a frame mounted thereupon, a stencil plate yieldably mounted on said frame having a multiplicity of apertures therethrough, stencils secured in said apertures, an assembling tray having a plurality of article-receiving recesses complementary to said stencil-containing apertures, means for supporting said assembling tray upon said machine with the article-receiving recesses in registry with the stencil apertures, and fluid-operated means for simultaneously forcing said articles into firm but yielding engagement with the respective stencils with substantially uniform pressure.

10. Apparatus for producing ornamental designs upon a multiplicity of small articles which comprises a base, a frame mounted thereupon, a stencil plate yieldably mounted on said frame having a multiplicity of apertures therethrough, stencils secured in said apertures, an assembling tray having a plurality of article-receiving recesses complementary to said stencil-containing apertures, plungers reciprocally mounted in said recesses having heads to support said articles, means for guiding said plungers, means for supporting said assembling tray with the article-receiving recesses in registry with the stencil apertures, and fluid-operated means for actuating said plungers to force the respective articles into firm but yielding engagement with the respective stencils with substantially uniform pressure.

11. Apparatus for producing ornamental designs upon a multiplicity of small articles comprising a stencil plate having a plurality of apertures therethrough, with the lower portion of the wall of each aperture countersunk, stencils mounted in the countersinks of the respective apertures and detachable means for securing each stencil in its countersink.

12. Apparatus for producing ornamental designs upon a multiplicity of small articles which comprises a stencil carrier having a multiplicity of apertures therethrough, stencils secured in said apertures, means for supporting said stencil carrier, assembling means having a multiplicity of article-receiving recesses complementary to said stencil-containing apertures, tubular plungers reciprocally mounted in said recesses having enlarged heads supported in said recesses presenting article-engaging faces, means for supporting said assembling means to cause the article-receiving recesses to register with the stencil apertures, and fluid-operated means for actuating the respective plungers to force said articles into firm but yieldable engagement with the respective stencils with a substantially uniform pressure.

13. Apparatus for producing ornamental designs upon a multiplicity of small articles which comprises a stencil carrier having a multiplicity of apertures therethrough, stencils secured in said apertures, means for supporting said stencil carrier, assembling means having a multiplicity of article-receiving recesses complementary to said stencil-containing apertures, tubular plungers reciprocally mounted in said recesses and having removable heads presenting article-engaging faces adapted to support the articles within said recesses only when like faces of said articles are engaged by said plunger heads, means for supporting said assembling means with the article-receiving means in registry with the stencil apertures, and fluid-operated means engaging the lower

end of said plungers operable to force the respective articles into firm but yieldable engagement with the respective stencils with a substantially uniform pressure.

form pressure, spraying upon the stencil carrier and stencils an atomized mixture comprising a pigment and a relatively small proportion of a solvent for the enamel and removing the articles from the stencils.

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

FORREST G. PURINTON.

5 14. Apparatus for painting ornamental designs upon a multiplicity of small articles which comprises a stencil carrier having a plurality of apertures therethrough, stencils secured in said apertures, means for
10 supporting said stencil carrier, an assembling plate presenting a smooth polished surface insoluble in the solvent of the paint and provided with recesses complementary to said stencil-containing apertures, means
15 for supporting the assembling plate with the article-supporting recesses in registry with the stencil-containing apertures, and means for independently forcing each of said articles into firm engagement with the stencil
20 therefor.

15. The process of producing ornamental designs upon a multiplicity of small articles which comprises assembling the articles in separate but juxtaposed relation upon a
25 carrier, simultaneously transferring the assembled articles from the carrier into contact with stencils arranged in juxtaposition complementary to the assembly of said articles, forcing the respective articles against
30 the stencils therefor with substantially uniform pressure, spraying upon the stencils atomized coloring material containing a highly volatile solvent and removing the articles from engagement with the stencils.

35 16. The process of producing ornamental designs upon a multiplicity of small articles which comprises coating the face of the article which is to be ornamented with a soluble enamel, assembling the articles in separate
40 but juxtaposed relation upon a carrier, transferring the assembled articles from the carrier into contact with stencils arranged in juxtaposition complementary to the assembly of said articles, forcing the articles
45 against the stencils therefor with substantially uniform pressure, and applying to the stencils a coloring material mixed with a highly volatile solvent for said enamel, removing the articles from engagement with
50 the solvent in assembled arrangement, and removing the articles from engagement with the stencils.

17. The process of producing ornamental
55 designs upon a multiplicity of small articles which comprises coating the face of the articles which is to be ornamented with a soluble nitro-cellulose enamel, assembling the articles in separate but juxtaposed relation upon a carrier, transferring the assembled articles from the carrier into contact with stencils arranged in juxtaposition complementary to the assembly of said articles, forcing the respective articles against
60 the stencils therefor with substantially uni-

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