

Sept. 3, 1946.

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2,407,145

METHOD OF HANDLING SMALL ARTICLES IN ELECTROLYTIC TREATMENT

Filed Nov. 8, 1941

Fig. 1.

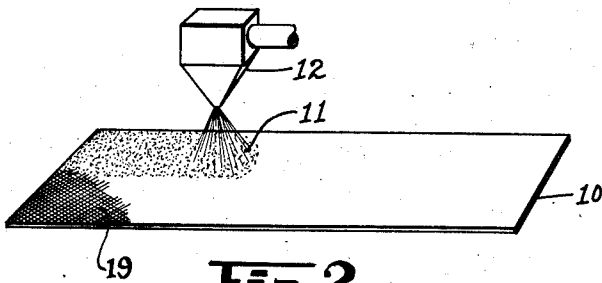


Fig. 2.

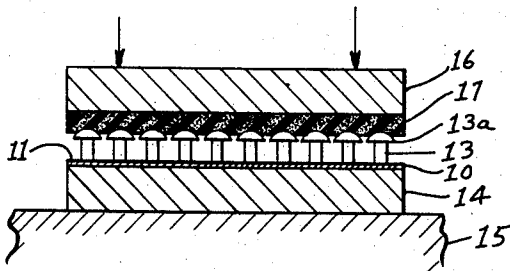


Fig. 4.

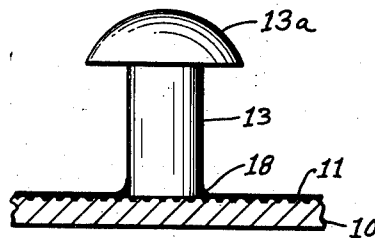
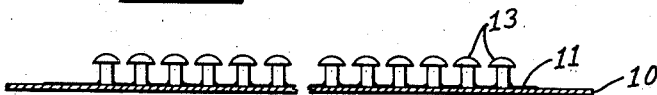


Fig. 3.



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2,407,145

METHOD OF HANDLING SMALL ARTICLES
IN ELECTROLYTIC TREATMENTCharles Tennant Elwin, Waterbury, Conn., as-
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Application November 8, 1941, Serial No. 418,370

4 Claims. (Cl. 204—23)

1

This invention relates to the art of handling small articles and particularly in connection with articles having to be disposed in a prearranged manner suitable to be acted upon by subsequent operations, such as plating, dyeing, painting, buffing and like operations.

It is one of the objects of this invention to provide a method in which small articles may be mounted on a support or rack in a prearranged manner and so held for any subsequent treatment to which the articles may be submitted. The method contemplated is for the treatment of small articles wherein there will be no objection to having a relatively small portion or surface of the article not subjected to the treatment to which the major part or surfaces of said articles are to be subjected.

Accordingly it is a general object of this invention to affix the articles to a support by a suitable adhesive that will be immune to any of the processes to which the articles are to be treated while on the support, and which adhesive is of a frangible nature that will permit the articles to be readily broken away and removed from the support as individual units after all treatments are completed. In a more specific aspect a support is used suitable to serve as an electrical conductor to which is applied a coating of adhesive. While the adhesive is still in a soft or wet state, articles are applied to the plate in a prearranged manner with sufficient force to squeeze the adhesive out from between contiguous surfaces of the articles and support to assure an electrical contact therebetween, whereupon the adhesive displaced from between the article and support will accumulate in a relatively greater quantity around the edge of the article adjacent the support, then holding the articles in such a prearranged state to the plate until the adhesive is dried and thus securing a good bond between the articles and the support. With the articles thus applied to the support, the articles may then be conveyed to any apparatus to subject the articles to various treatments desired. Where the articles are to be subjected to an electrolytic solution, the support will then serve as an anode or a cathode depending on the treatment resorted to.

With these and other objects in view a better understanding will be had by referring to the accompanying drawing wherein:

Fig. 1 is a perspective view of the supporting plate showing one conventional manner in which an adhesive may be applied to one side of said plate.

2

Fig. 2 shows the manner in which the articles in a prearranged manner are affixed to the supporting plate.

Fig. 3 shows the articles as they appear attached to a sectional portion of the supporting plate after the adhesive is in a set state, and

Fig. 4 is an enlarged sectional view through the supporting plate and full view of one of the articles adhered thereto showing in detail the contiguous surface connection between the article and plate.

Referring now to the drawing wherein like numerals refer to like parts throughout the several views, the numeral 10 refers generally to a supporting plate which, in the case where the articles are to be subjected to an electrolytic operation, should be of a material suitable to act as an electrical conductor in the electrolyte.

The first operation is to coat one side of the supporting plate 10 with a suitable adhesive indicated by the numeral 11. Preference is given to lacquer because of its ease of handling, flexibility and its immunity to attack from the various treatments to which the articles may be subjected, and specifically I recommend the use of a nitrocellulose lacquer. The lacquer, for use as an adhesive, may be sprayed upon the plate 10 through a nozzle 12 or it could equally as well be applied with a paint brush or by dipping. While the adhesive is still in a wet state, articles that are prearranged, which in this case are shown as small rivets 13, may be disposed upon the plate such that the ends of the rivet shanks are disposed against the treated surface of the plate, and preferably in a uniform manner with a slight space between each rivet. The rivets can be applied individually by hand or they can be prearranged in a quantity by any conventional frame suitable for such purposes and then conveyed to the supporting plate in a uniform manner.

To assure a good electrical contact between the rivets and the plate and also a firm bond through the adhesive, while the adhesive is still in a wet state, axial pressure is applied upon the rivets to force the shanks into the adhesive material. The manner in which this is accomplished is best shown in Fig. 2, wherein a lower block 14 is disposed upon a support 15 and the plate 10 with a coating of adhesive exposed upwardly is rested upon said block 14. The rivets 13 are then conveyed to the plate in a prearranged manner and dropped upon the treated side of the supporting plate 10, after which the rivets 13 are subjected to an axial pressure through the medium of a

force applied to an upper block 16 as indicated by arrows in Fig. 2. To make sure that the axial pressure upon all the rivets will be uniform a sponge rubber mat 14 or similar material is disposed between the rivet heads 13a and the adjacent surface of the upper block 16. The need of the sponge rubber mat 17 is to take care of any variation that may occur in rivet lengths due to manufacturing tolerances or imperfections and assure that all the rivets will be pressed into the adherent surface of the supporting plate 10 with a uniform pressure, and which pressure must be of a force sufficient to squeeze all or at least enough of the adherent material 11 from between the contiguous surfaces of the end of the rivets 13 and the plate 10 to assure a metal-to-metal and a good electrical contact therebetween. As best shown in the enlarged view of Fig. 4, the adhesive that is squeezed out from between the rivets and the supporting plate will accumulate in a greater quantity in the manner of a fillet, as indicated by numeral 18 in Fig. 4, around the edges of the rivets adjacent the plate 10 due to the natural forces of adhesion and proportionally increase the bonding effect of the adherent in retaining the articles to the plate.

With the articles so disposed into the adherent surface of the plate the blocks 14 and 16 may be clamped together by means of suitable clamps not shown and so held until the adherent material 11 is sufficiently dried after which the clamps may be loosened and the blocks 14 and 16 and rubber mat 17 removed from the set-up, leaving the rivets set in a firm manner and all projecting from one side of the plate 10 in like manner and in properly spaced relationship such as shown in Fig. 3. The plate 10 with attached articles may then be conveyed to any apparatus where the articles may be subjected to any desired treatment such as plating operations (electrically or dip), dying or anodizing operations, painting or enameling and if desired the head surface of the rivets or like articles could be subjected to a buffing or scratch brushing operation, etc. The essence of the invention being that here is disclosed a very economical and easy way of mounting small articles in quantity on supports for various treatments where it is necessary to have all the articles treated in a like manner without interfering with each other.

While the lacquer of the nitrocellulose class has been recommended as the best adherent for most purposes, it is within the purview of the invention to use other substances such as shellac, wax, asphalt, commercial glue, etc., depending upon the nature of the article and the treatment to which the articles are to be subjected.

In case where the articles are specifically to be subjected to an electrolytic operation, I further recommend the use of a support plate that has a patterned or more or less roughened surface presenting numerous closely related projections divided by corresponding recesses on the side to which the articles are to be adhered, which effect is arbitrarily shown as an area of cross-hatching indicated by the numeral 19 in Fig. 1, and in cross section in an enlarged manner in Fig. 4. By the use of plate 10 so surfaced it will be easier to squeeze out the adhesive material from between the articles and plate and in case some of the adhesive from between the articles and plate is not entirely squeezed out from therebetween there will be assurance that at least some of the high points of the roughened surface will make a metal-to-metal engagement with the adjacent end of the rivet to assure a good electrical

contact necessary to an electrolytic operation.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. The method of racking small metallic articles of like uniform character upon a portable support member for electrolytic treatment of the character of electroplating or anodizing which comprises the use of a portable imperforated flat electrical conductor plate of relatively thin material to one side of which is applied an adhesive material immune to the electrolyte and of a frangible character when in a dry state, applying the articles in a prearranged manner and a separated state to the adhesive side of said plate and setting a relatively small portion of each article into said adhesive material while in a tacky state, applying sufficient axial pressure upon each of said prearranged articles to squeeze the adhesive material from between the adjacent surfaces of said articles and plate and establish electrical contact therebetween, said displaced adhesive material forming an anchor fillet about each of the articles adjacent the point of contact, maintaining the articles in a fixed manner relative to the plate until said adhesive material has set, subjecting said articles to an electrolytic treatment of the character mentioned above and thereafter breaking them away from said support as individual units.

2. The method of racking headed rivets for subsequent surface finishing treatment of an electrolytic character which comprises the use of an imperforated flat electrical conductor plate to one side of which is applied an adhesive material of a frangible character when in a dry state, prearranging a quantity of the rivets in a uniform manner, spaced relative to each other and setting the shank ends of the prearranged rivets simultaneously into the adhesive material coating upon said plate while the adhesive material is in a tacky state, applying sufficient axial pressure upon said rivet heads to squeeze the adhesive material from between the adjacent surfaces of the ends of the rivet shanks and the plate to establish an electrical contact therebetween, said displaced adhesive material forming an anchor fillet about the ends of the rivet shanks, maintaining the rivets in a rigid manner with their axis perpendicular to the plate until said adhesive material has set, subjecting said rivets attached to said plate as a unit to an electrolytic treatment and thereafter breaking them away from said support as individual units.

3. The method of affixing small metallic articles of like uniform character for electrolytic treatment which comprises applying an adhesive material of a frangible character when in a dry state to one side of a portable electrical conductor member the surface of which comprises numerous closely spaced projections subdivided by corresponding recesses, applying the articles to the adherent side of said member in a prearranged uniform manner and spaced relative to each other while the material is in a tacky state, applying sufficient pressure to the articles to squeeze out the adhesive from between said articles and the member and assure a metal-to-metal contact between a portion of said articles and the apexes of the interposed projections, retaining said articles in a set position until the adhesive material has dried, then subjecting the combined member and articles to an electrolytic

5

treatment and finally breaking the treated articles away from said member as individual units.

4. A method of racking relatively small metallic articles of like uniform character having a generally enlarged body portion and shank portion on a portable electrical conductor support member which comprises applying an adhesive of a frangible character when in a dry state to said support member, prearranging the articles in a uniform manner in spaced relationship, setting the ends of the shanks of the prearranged articles

6

simultaneously as a unit into the adhesive material while in a tacky state and applying pressure sufficient to establish metal-to-metal contact between the shank ends and said support member, maintaining the articles rigidly relative to said support plate until the adhesive material has set, subjecting the articles so attached to said support to an electrolytic treatment and finally breaking the treated articles away from said member as individual units.

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