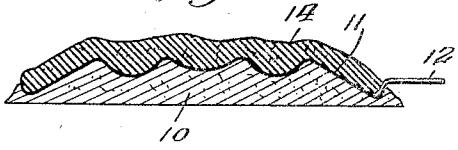
B. BART.

PROCESS OF GALVANOPLASTY.

APPLICATION FILED MAR 31, 1916. RENEWED JUNE 3, 1918.

1,296,453. Patented Mar. 4, 1919.

Fig. 1.



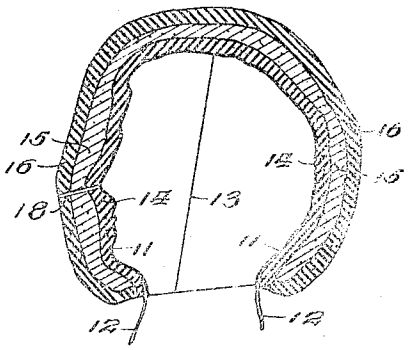


Fig. 2.

Fig. 3.

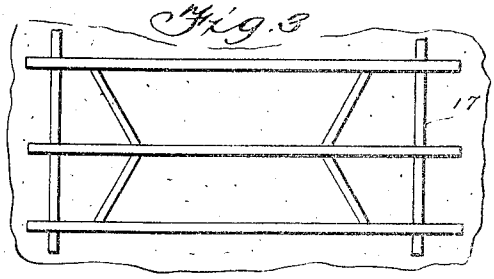


Fig. 4.

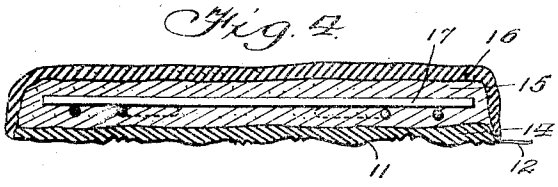


Fig. 5.

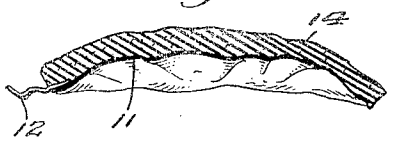


Fig. 6.

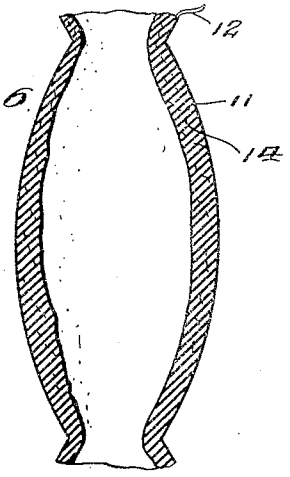
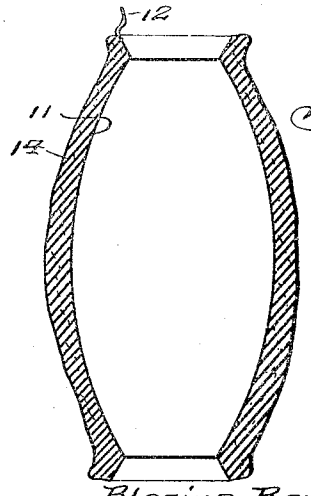


Fig. 7.



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UNITED STATES PATENT OFFICE.

BLASIUS BART, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR, BY MESNE ASSIGNMENTS, TO DYMALKON METALS CORPORATION, OF CROTON-ON-HUDSON, NEW YORK, A CORPORATION OF NEW YORK.

PROCESS OF GALVANOPLASTY.

1,296,453. Specification of Letters Patent. Patented Mar. 4, 1919.

Application filed March 31, 1916, Serial No. 88,166. Renewed June 3, 1918. Serial No. 238,035.

To all whom it may concern:

Be it known that I, BLASIUS BART, a citizen of the Republic of Switzerland, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Processes of Galvanoplasty; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a new process of galvanoplasty which makes it possible to obtain by means of electro-chemical steps copies in all sizes, reproducing every feature and detail of the model. The copies can be made entirely in one piece having a uniform thickness, and they can be made with the same facility, whether they are in relief or hollow pieces.

The advantages of this process over the processes generally used are: It eliminates completely all inconveniences of the old process, like the long and minute preparation of the shape, the drying up of the same, the preparing to make it conductive for the electrical current by means of graphite or other material, soldering and all reparation, etc., and assures at the same time the obtaining of all conditions necessary for the reproduction of good copies, like a deposit uniform and homogeneous on the whole surface, also in the deepest places, the reproduction of the finest details at minimum labor, as well as an expenditure of a much shorter time in the electrolytical bath, and eliminates all customary preparations of the shape, like drying up, impregnation, graphiting, soldering, etc.

Besides, this process makes it possible to make copies with the same facility from positive or negative shapes in one piece, whether the shapes are made in one piece or in several parts, and all the materials used for the preparation of the shape can be used repeatedly.

The accompanying drawings give examples and illustrations for the execution of the process and in these drawings,

Figure 1 is a vertical sectional view through a model having a shape formed thereon and a non-conductive backing applied to said shape,

Fig. 2 is a similar view showing the reassembled parts of a shape of a more complicated model showing supplemental layers of non-conductive material including a reinforcing material therebetween,

Fig. 3 is a plan view of one form of reinforcing frame,

Fig. 4 is a sectional view showing the supporting structure for a plate including the reinforcing frame and insulating material,

Fig. 5 is a sectional view through a section of a relief, and

Figs. 6 and 7 are sectional views through a shape with the non-conductive backing applied thereto, showing the positive and negative applications of this process.

The essential features of this process are, the formation of a matrix on a model to reproduce each detail, and of any size, to form this matrix entirely of a metallic substance of high electrical conductivity to receive the electrolytical deposits and to apply a non-conductive covering for parts of the matrix on which no electrolytical deposits are to be had.

Referring to the drawing in which the several steps used in this process are shown, 10 indicates a pattern which may be made of metal, wood, plaster, wax or gelatin or the like and on this pattern a matrix 11 is made by means of vaporizing or impinging a metallic vapor on the whole surface of said metal. This is accomplished by means of a sprayer or atomizer, taking care that the metallic matrix obtained shall have sufficient thickness.

Whether the metallic matrix shall be made in only one or in several pieces depends upon the formation and substance of the model, in order that the metallic matrix when finished can be taken from the model. Electrical terminal wires 12 are included in and become parts of the matrix in its formation, by spraying the metal over the ends of these wires.

When the shape is made in more than one piece, it is possible to fit the sections together as shown along lines 13 so that the

joining lines may be so fine that they can hardly be noticed.

The metallic composition which is used to cover the surface of the model must possess the following qualities: It must not be fragile, it must have a certain solidity, it must have a low melting point and must have a high conductivity for the electrical current and such an alloy can be obtained by combining tin, lead, mercury, bismuth or cadmium.

The metallic matrix thusly prepared is then covered on all parts where the electrolytical deposit is not needed, with an insulating material 14 which is not conductive for the electrical current. Such materials, for my purposes, are asphalt, ceresin, etc., which material can be mixed, according to its nature and purity with turpentine, or some other material, in order that the same may be sufficiently plastic and adhere well to the metallic matrix.

When the shape exceeds certain dimension, it becomes necessary to reinforce the matrix with its insulating covering and for such proportions as may be slightly reinforced, the insulating material is further covered with a stiffening substance 15, such as plaster, sulfur, or a combination of the two. As further support is necessary, braces, rods, or strips 17 may be embedded in the plastic covering 15. When the reinforcing elements are used, they are covered with an insulating material 16 to prevent direct contact between the solid material and the liquid of the bath to thereby avoid harmful chemical decomposition of these materials.

The electrolytical deposit can be had on the inner face as shown in Fig. 7, in which case the shape presents generally a negative form, or on the outside as shown in Fig. 6, when the shape presents generally a positive form.

In each case, the insulating material 14 is applied on the metallic matrix, be it by vaporization, by application of brushes, by pouring or pasting, and has two effects, to insulate the necessary surface and to hold together the various parts at the joining lines to give to the whole a certain solidity.

The metallic surface of the shape thus prepared is now washed, cleaned and the shape is then suspended in the bath by means of the attached wires 12.

As the metallic surface is a good conductor of electrical current, the electrolytical deposit is obtained on all parts of the surface rapidly and uniformly and forms a very homogeneous coat.

After having obtained sufficient electrolytical deposits on the surface of the shape, it is taken out of the bath. The insulating coat is now removed either by breaking it off by hand, or by melting. Next, the braces and supports are taken off, as well as the envelop made of the solid material so that only the metallic matrix remains with the electrolytical deposit which is upon it.

In regard to the metallic coat, this can remain under the electrolytical deposit, or it can be removed by melting the same. This is not difficult to do, as this metallic substance has a very low melting point.

After the shape is removed and one coat after another has been taken off, there remains the electrolytical deposit in one entire piece, which forms a very exact copy of the model presenting all fineness, and this deposit has a uniform thickness throughout.

Having fully described my invention, what I claim to be new and desire secured by Letters Patent is:—

1. A method of preparing a metallic matrix for electro-deposition by spraying the pattern with a metal.

2. A method of preparing a metallic matrix for electro-deposition by spraying the pattern with a metal of low fusibility.

3. A method of preparing a metallic matrix for electro-deposition by spraying the pattern with metal and coating the portions of the surfaces of the matrix so sprayed and which are not to be subjected to the metallic deposit with a non-conducting material.

4. A method of preparing a metallic matrix for electro-deposition by spraying the pattern with metal and coating the portions of the surfaces of the matrix so sprayed and which are not to be subjected to the metallic deposit with a non-conducting and reinforcing material.

5. A method of preparing a metallic matrix for electro-deposition by spraying a pattern with metal, placing conducting wires upon the metallic surface so sprayed and uniting said conducting wires and surfaces by further spraying metal thereon.

6. A method of preparing a metallic matrix for electro-deposition by spraying the pattern in sections with a metal, removing the matrix so made in sections and reassembling said sections.

In testimony whereof I affix my signature.

BLASIUS BART.