April 11, 1944. G. L. NANKERVIS 2,346,386

ANODIZING RACK

Filed May 7, 1943

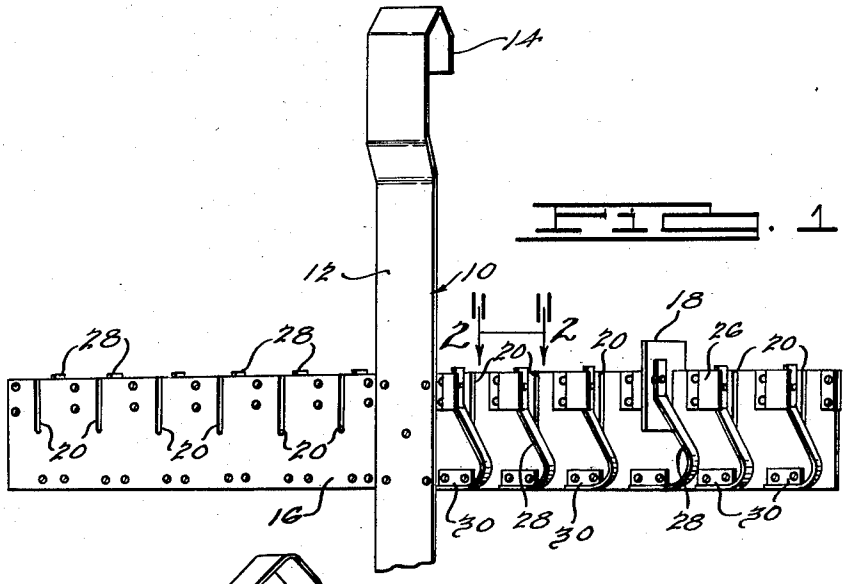


FIG. 1.

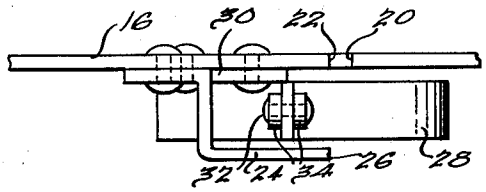


FIG. 2.

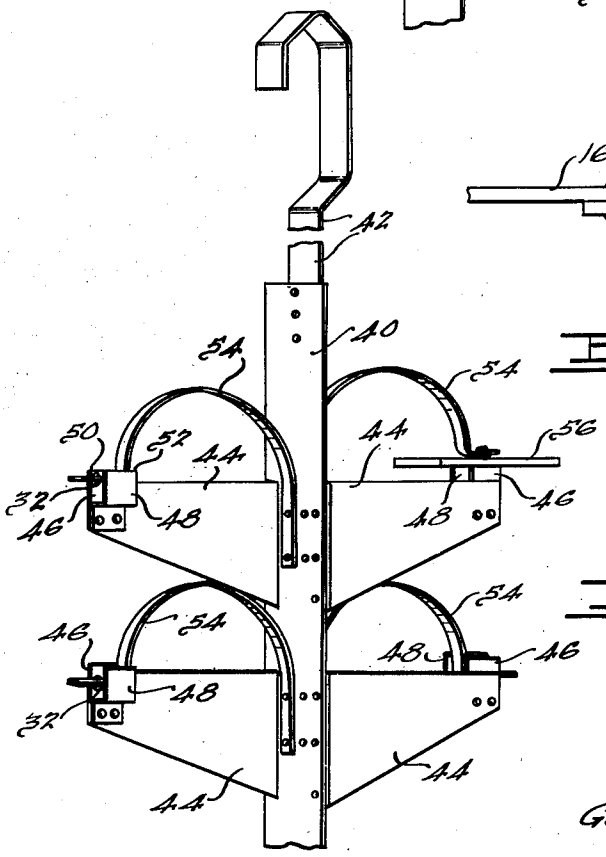


FIG. 3.

INVENTOR.
George L. Nankervis.
BY
Harness, Dickey & Pierce.

Patented Apr. 11, 1944

2,346,386

UNITED STATES PATENT OFFICE

2,346,386

ANODIZING RACK

George L. Nankervis, Detroit, Mich., assignor to George L. Nankervis Co., Detroit, Mich.

Application May 7, 1943, Serial No. 486,108

4 Claims. (Cl. 211—89)

The present invention relates to article supporting racks or hangers and particularly relates to such racks or hangers employed to support articles during anodizing treatments.

One of the primary objects of the present invention is to provide an improvement in racks or hangers of the type mentioned in which articles to be anodized are positively gripped with such force that such articles will not move with respect to the rack during the anodizing treatment.

A further object of the invention is to positively grip an article, as mentioned above, with a minimum of area contact so that substantially all of the surface area of the article will be exposed for treatment.

Other objects of the invention will become apparent from the following specification; the drawing relating thereto and from the claims hereinafter set forth.

In the drawing, in which like numerals are used to designate like parts in the several views throughout:

Figure 1 is a fragmentary perspective view of one form of anodizing rack or hanger embodying features of the present invention;

Fig. 2 is an enlarged, fragmentary plan view taken substantially along the line 2—2 of Fig. 1; and

Fig. 3 is a fragmentary perspective view of a modified form of hanger according to the present invention.

In general, the racks of the present invention provide an article support for a plurality of aluminum articles to be anodized. The racks are formed of aluminum and contact between the supporting portion of the rack and the article is positive and engages a minimum of area on the article. It is essential that the article be positively gripped with such force that it will not move with respect to the article support during the anodizing treatment. This is of particular significance in anodizing racks as compared with plating racks, in that much higher voltages are used in anodizing than in plating; and, if the article moves with respect to the support during the anodizing treatment, burns result which render the articles defective.

The racks of the present invention are particularly employed in anodic treatment of aluminum used in aeroplane construction and particularly in the chromic acid process now most generally used. While the rack is useful in other processes and would also be useful in plating processes, it has particular significance when employed in anodic treatments.

Referring to the drawing and referring particularly to Figs. 1 and 2 thereof, one embodiment of the invention is illustrated. A rack or hanger is generally indicated at 10 and includes a vertical strip or plate 12 terminating at its upper end in hook 14. The hook 14 is adapted to be hooked over a bus bar above the bath contained in the usual treatment tank. Plate 12 extends downwardly and has a plurality of transverse plate members 16 fixed thereto substantially midway between the ends thereof. Only one of such plate members 16 is illustrated, but it will be understood that a plurality of such plates 16 are fixed to the plate 12 at spaced intervals therealong. The plates are so disposed that the articles contained therein are submerged within the treatment bath when the rack is positioned in the treatment tank.

Each plate 16 is formed to support a plurality of workpieces, one of such is indicated at 18. The plates 16 are formed with a plurality of upwardly opening slots 20 therein which are adapted to receive the workpiece 18. Each slot 20 has an edge 22 which is relatively thin and against which the workpiece 18 abuts. A Z-shaped plate member 24 is riveted or otherwise suitably fixed to the plate member 16 so that one of its edges 26 is spaced from the plate member 16 and is aligned with the edge 22. The workpiece 18 also abuts against the relatively thin edge 26 of the member 24. It is thus rigidly supported at two spaced points along relatively thin parallel lines.

The workpiece 18 is positively gripped and forced against the edges 22 and 26 by means of a flat spring 28, one of which springs is provided for each of the gripping portions along the plate 16. The lower end of each spring 28 is secured to a mounting bracket 30 which is secured to the plate 16 along the lower edge thereof. The upper end of the spring 28 is bent so that it is substantially parallel to the slot 20 and the spring is so set that such upper end normally is disposed inwardly of the edges 22 and 26, between such edges, so that it must be pulled outwardly beyond such edges when a workpiece is inserted.

To provide for a minimum area contact, a button 32, which may be a rivet head, is fixed to the upper end of the spring 28. Such button or rivet head may have spacing collars 34 disposed on opposite sides of the plate between the heads thereof. When the button head contact wears out it is a relatively simple matter to drill it out of the spring and insert another one, thereby effecting

a saving in the use of the hanger of the present invention.

As mentioned above, the articles 18 are disposed in the slots 22 with the button end of the spring pulled out beyond the slot. When the spring is released the button resiliently engages one side of the work in point contact and forces the work against edges 22 and 26. With this relatively strong force exerted on the workpiece between supporting edges 22 and 26, the workpiece is positively gripped and will not move relative to the support during the treatment.

In the embodiment described above, the support members and spring are disposed to one side of the plate 16 on one side of the plate 12 and are disposed to the opposite side of the plate 16 on the opposite side of the plate 12.

In Fig. 3 a modified form of the present invention is illustrated in which a depending plate member 40 has a hook 42 fixed to the upper end thereof, which is adapted to be used the same as the embodiment described above. Bracket plates 44 are secured to opposite sides of the plate 40 at spaced intervals therealong, and the outer ends of such brackets 40 each have an upstanding Z-plate 48 fixedly secured thereto. The upper edges 50 and 52 of the plates 46 and 48 respectively are aligned with each other and correspond to the edges 22 and 26 above described.

A flat spring 54 has one end thereof secured to the plate member 40 and the opposite end thereof is turned so that it is substantially parallel to edges 50 and 52. A rivet button 32 is fixed to the outer end of each spring 54 in the same relationship as the button 32 in the embodiment above described and for the same purpose. The spring 54 is set so that the button 32 normally lies inside the edges 50 and 52 and must be pulled outwardly for the insertion of workpiece 56. As shown, the button end of the spring is pulled outwardly beyond edges 50 and 52 for the insertion of the workpiece 56, and the button 32 engages one side of the workpiece 56 in point contact and urges it against the rigidly supporting edges 50 and 52. The button is disposed between such edges so that the workpiece 56 is positively gripped and cannot move during the treatment.

As mentioned above, the parts forming the rack herein described are made of aluminum. The gripping action is such that the workpiece is rigidly supported along two spaced lines and is resiliently engaged in point contact between such lines on the opposite sides of the workpiece.

Formal changes may be made in the specific embodiments of the invention herein described without departing from the spirit and substance of the invention, the scope of which is commensurate with the appended claims.

What is claimed is:

1. An article supporting anodizing rack comprising a main support member, an article support member secured to said main support member, means on said article support member providing a pair of rigid, spaced, article engaging portions of such a shape and size as to engage said article in substantially line contact, and a resilient member on said article support member having an article engaging portion disposed between said spaced portions and positioned to positively grip an article between it and said spaced portions, said last named portion being of such a shape and size as to engage said article in substantially point contact.

2. An article supporting anodizing rack comprising a main support member, an article support member secured to said main support member, rigid means on said article support member forming spaced edges adapted to be engaged by an article, and a resilient member on said article support member having an article engaging portion disposed between said spaced edges and positioned to positively grip an article between it and said edges, said engaging portion being of such a shape and size as to engage said article in substantially point contact.

3. An article supporting anodizing rack comprising a main support member, an article support member secured to said main support member, means on said article support member forming spaced edges adapted to be engaged by an article, and a resilient member on said article support member having a button shaped member fixed thereto, said button shaped member being disposed between said edges and positioned to positively grip an article in substantially point and line contact between it and said edges.

4. An article supporting anodizing rack comprising a main support member, an article support member secured to said main support member, means on said article support member forming spaced edges adapted to be engaged by an article, and a flat spring member on said article support member having a button shaped member fixed thereto, said button shaped member and said spring member being so constructed and arranged that said button shaped member is disposed between said edges and normally positioned inwardly of such edges so that it must be sprung outwardly beyond such edges for the insertion of an article therebetween.

GEORGE L. NANKERVIS.