Sept. 15, 1959 H. A. NALI 2,904,492

WORK HOLDER

Filed June 10, 1957

Fig. 1

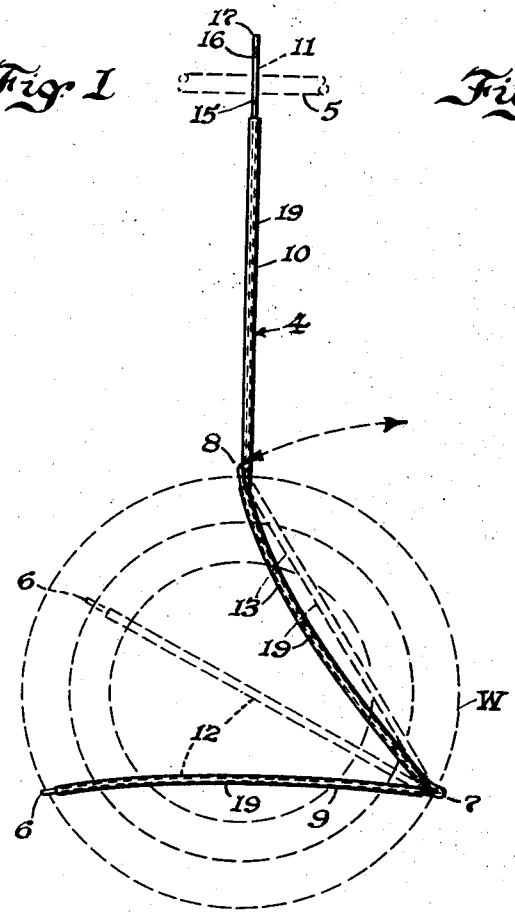


Fig. 2

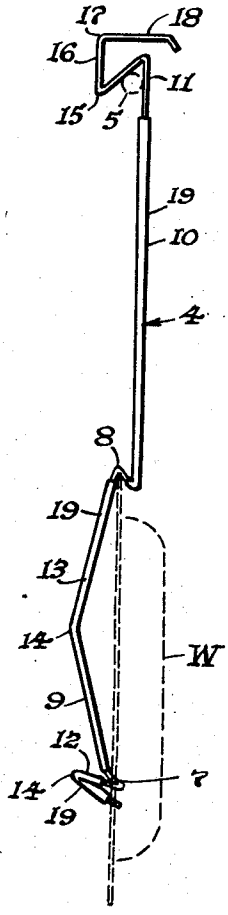
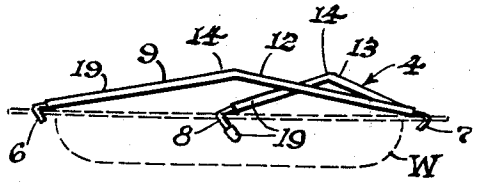


Fig. 3



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WORK HOLDER

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5 Claims. (Cl. 204—297)

This invention relates to work holders for use in electro-plating baths for suspension of articles to be plated, such as trays and the like.

The principal object of my invention is to provide a simple and inexpensive combination work holder and hanger, made almost entirely of wire and designed to enable quicker insertion and removal of work, and also insure more positive holding without danger of scratching the surface or leaving any spots unplated.

A salient feature of the present device is the forming from a single piece of high carbon spring wire of a generally V-shaped work embracing portion having hooks or claws on the three corners thereof to engage the work under the inherent spring tension of the wire, the arms of the V being spread with sufficient force to receive the work and hold it under sufficient tension so that there will be no danger of the V frame spreading and releasing the work when it is suspended from the outer end of one arm of the V, the wire extending from the hook on the one arm upwardly to a hanger hook provided on the upper end of the wire for suspension in the electro-plating bath. There is sufficient give in the V frame to enable applying the same work holder to different sizes and shapes of work pieces, so that if two, three or more different sizes of work holders of this design are provided they should be enough to accommodate whatever work may have to be plated.

Referring to the drawing:

Figs. 1 and 2 are a front view and side view, respectively, of a work holder made in accordance with my invention shown applied to a work piece to be plated and hanging on a supporting bar, as in a plating tank, and

Fig. 3 is an end view of Fig. 1 taken from below.

The same reference numerals are applied to corresponding parts throughout the views.

Referring to the drawing, the work holder is indicated generally by the reference numeral **4** and is shown suspended as a hanger on a metallic cross bar **5** that serves as a conductor for the plating current, the work holder being made from a single piece of high carbon spring wire, such as music wire, whereby it serves also as a conductor, making electrical contact with the work W through the hooks or claws **6**, **7** and **8**, which are provided on the lower end portion **9** of the wire. The latter is bent in the form of a generally V-shaped frame with the hooks or claws **6**, **7** and **8** formed on the three corners thereof by bending the wire. The upper end portion **10** of the wire extends from the end of the hook **8** upwardly and is bent to define a hook **11** on its upper end for suspension on the bar **5**. Thus, the silver or other metal being used for plating and which is provided usually in the form of balls in a basket forming the anode in the plating bath will be transferred to the work W in the flow of current. The hooks **6**, **7** and **8** engage the periphery of the work at three substantially evenly, circumferentially spaced points, the hooks **6** and **7** which are on opposite ends of the arm **12** being first applied and then the other arm **13** being sprung away from arm **12**

sufficiently to engage hook **8** on the periphery of the work. The force required to spread the V frame **9** in this manner is sufficient in relation to the weight of the work to eliminate any danger of the frame **9** spreading when the work is suspended in the plating bath by reason of the upper end portion **10** of the wire extending from the hook **8**. The extent to which the V frame **9** has to be spread in applying it to the work is indicated by the dotted line normal or unsprung position of arms **12** and **13** in Fig. 1. The arms **12** and **13** are both bent outwardly at the middle to V form, as indicated at **14** in Figs. 2 and 3, for better clearance with respect to the work and to facilitate handling of the arms in applying the hooks to or removing the same from the work. In passing, it will be noticed that at the upper extremity of the wire, the wire is bent upwardly from the end of the hook **11**, as at **15**, and the upwardly extending portion **16** is bent at right angles, as at **17**, to provide a forwardly reaching handle grip portion **18** by means of which the operator can easily handle the work holder in placing the work in the bath and later removing it.

To avoid wasting of the precious metal used in plating and also to make the work holders last indefinitely, all portions of the work holder to be immersed in the plating bath, with the exception only of hooks **6**, **7** and **8**, are covered with an insulating rubberlike material, as indicated at **19**.

In operation, the V frame **9** can be spread easily in order to apply the third hook **8** after hooks **6** and **7** have been engaged. There is, therefore, nothing to interfere with the easy placing in this work holder of a tray or the like to be plated, and suspending the same in the plating bath by engagement of the hook **11** on bar **5**. Inasmuch as there is only point contact with the work at each of the three hooks, there is no likelihood of any spots being left unplated. After the work has been plated it can be removed readily from the holder and it is obvious that in neither of these operations is there any danger of the work being scratched, as happened so frequently with other work holders, causing many pieces to be rejected upon inspection after plating. The flexibility of the V frame 9 enables application to a wide variety of shapes and sizes of pieces to be plated, and if these work holders are furnished in several sizes they can take care of most any sizes and shapes of work to be plated.

It is believed the foregoing description conveys a good understanding of the objects and advantages of my invention. The appended claims have been drawn to cover all legitimate modifications and adaptations.

I claim:

1. A work holder for an electro-plating bath comprising a V-shaped work embracing frame formed of spring wire with hooks on the ends of the arms of the V and another hook on the apex of the V, and a suspension portion formed by an integral upward extension on the end of the hook on one of said arms, said suspension portion terminating in a suspension hook.

2. A work holder for an electro-plating bath comprising a V-shaped work embracing frame formed of spring wire with hooks on the ends of the arms of the V and another hook on the apex of the V, and a suspension portion formed by an integral upward extension on the end of the hook on one of said arms, said suspension portion terminating in a suspension hook, the wire at the outer end of the suspension hook being bent upwardly and the upwardly bent portion having an upper end portion bent forwardly defining a handle above and in spaced relation to said suspension hook for convenience in the removal and replacement of the work holder on a supporting bar in the electro-plating bath.

3. A work holder for an electro-plating bath comprising a V-shaped work embracing frame formed of spring

wire with hooks on the ends of the arms of the V and another hook on the apex of the V, and a suspension portion formed by an integral upward extension on the end of the hook on one of said arms, said suspension portion terminating in a suspension hook, all portions of the work holder to be immersed in the plating bath, with the exception of the three hooks on the V-shaped frame, being covered with insulating material.

4. As an article of manufacture, a work holder frame formed of one continuous length of spring wire, one approximately half portion of which is straight and the other half is bent into a V, the apex portion of which is bent to define a hook projecting from the plane of the V and opening toward the arms of the V, the outer end portions of each of the arms of the V also being bent to define a hook opening toward the apex of the V and projecting from the plane of said V on the same side as the first mentioned hook, the straight half portion of said

frame extending from the end of the hook on the outer end of one of said arms in a plane substantially parallel to the plane of the V and adapted to serve as a suspension means for the frame.

5. An article of manufacture as set forth in claim 4, wherein all of said work holder frame, with the exception of the three hooks on the V-shaped portion thereof, is covered with an insulating material.

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