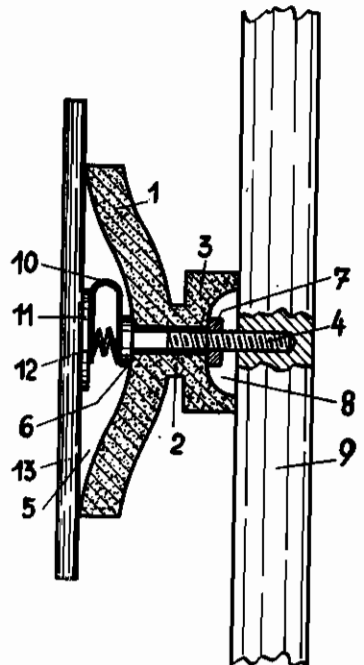


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DEVICE FOR SUPPORTING ARTICLES IN
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DEVICE FOR SUPPORTING ARTICLES IN GALVANIC BATHS AND THE LIKE

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The present invention relates to the suspension in galvanic baths and the like by means of suction of objects which have no hooks, eyes or similar attachments.

The known devices of this kind have various disadvantages of which one, for example, consists in that to support objects to be suspended in addition to the suction additional mechanical means must be provided. This renders the apparatus complicated and expensive. A further disadvantage is that vibration, such as impacts against the container of the bath, generally react very unfavourably on the objects to be galvanized which are often very sensitive. Finally, it has been found to be a defect of the known apparatus that it is not possible rapidly to mount in position the objects to be galvanized.

Now I have found that the above mentioned defects and disadvantages can very simply be avoided by providing, for the direct attachment of the objects to the carrier, suction cups of elastic materials which conveniently are also provided with conducting parts for the supply and withdrawal of the electric current.

The apparatus according to my invention has also the advantage that, in particular, objects which have no hooks, eyes or the like can be suspended in the bath very rapidly without trouble and with certainty. Thus, for example, shields, medals or the like can very rapidly and with certainty be applied to their carrier. The use of the previous widely customary frame for holding the objects to be galvanized can be completely eliminated by using the apparatus according to my invention. Holding frames have, apart from their complications in use, the further disadvantage that the frame, together with the object, cannot be moved through the liquid of the bath because then the contacts for the electrical current supply are affected. This disadvantage has a particularly unfavourable effect when, for example, in processes for chromium plating, it is absolutely necessary to have very powerful and good contacts.

The suction cups to be used according to my invention can consist of india-rubber or the like. In certain cases a suction conduit can be connected to the suction member so that it is possible to alter at will the pressure prevailing in the suction space.

The suction members can consist wholly or partly of metallized india-rubber so that in some cases the provision of special electrical connections is unnecessary.

It is convenient so to connect the members

carrying the electric current with the supporting parts of the apparatus that in practical operation they are completely protected from undesired influences, for example the liquid of the galvanic bath. Preferably a screw is used as the member for fastening the suction cup to a member of the container for the bath, which screw projects into or traverses the wall of the suction cup in the latter case has, for example, a shoulder or the like by means of which the screw abuts against the inner surface of the suction cup. Preferably, in order to secure the screw bolt and in some cases to adjust it there is provided a nut which is conveniently so disposed outside the suction cup that it can be adjusted by hand.

A particularly simple and convenient constructional form of the subject of my invention is obtained when the above mentioned attachment screw is constructed as a conductor for the electrical current which is to be supplied to the object to be galvanized.

For transferring the electric current to the object to be galvanized there is conveniently provided a contact spring which is preferably disposed in the cavity of the suction cup. This arrangement has, for example, the advantage that the contact spring is fully protected from the influence of the galvanic bath when the suction cup is pressed on, i. e. when in practical operation.

In addition to the contact spring, there is conveniently also provided an expansion spring which seeks to bring the contact spring into abutment with the object to be galvanized or its rear side. When an expansion spring is so used, the contact spring is bowed and so arranged that it encircles the expansion spring in U-form. The one end of the contact spring is then connected in a conducting manner with the head portion of the attachment screw which passes centrally through the wall of the cup, whilst the other end of the contact spring carries the contact plate which is to abut against the object to be galvanized. At the rear side of the suction cup is preferably provided a projection which is conveniently of dish form, the cavities in the dish and the suction cup facing away from one another. The projection of dish form has, for instance, the advantage that it permits a secure positioning of the whole suspension device on an object, ledge or the like, in particular when the projection is likewise constructed as a suction cup.

An arrangement is also to be recommended in

which the projection and the suction cup are formed as a unit, for example of india-rubber or the like. In some cases there can be provided between the projection and the suction cup a thin portion of such form that the suction cup has a certain freedom of movement relatively to the projection.

When providing a projection on the suction cup, the member for attaching the whole suspension device is conveniently located in the central axis of the device. In some cases the supporting bolt, for example a screw bolt, is of hollow construction and provided at its end remote from the suction cup with a connecting piece by means of which it can be connected to a pressure conduit or the like. The other end of the screw bolt then conveniently opens immediately into the cavity of the suction cup so that the pressure or suction produced in the cup cavity on pressing the cup on to the object to be galvanized can be varied if necessary. It is also then possible by increasing the pressure in the connected conduit to facilitate detachment of the object from the cup. The suspension device and, in particular, the parts of it which come in contact with the liquid of the galvanic bath are preferably constructed of a material practically insensitive to the influence of the bath, for example acid-resisting india-rubber; in some cases the particularly endangered parts may be provided with a protective coating, for example of varnish or the like.

As has also been found, the utility of the suspension device can be increased by using several suspension devices, for example in a row adjoining one another on one ledge. An example of construction of the subject of my invention is shown diagrammatically and in section in the accompanying drawing.

1 denotes the suction cup consisting, for example, of ordinary soft rubber or other elastic natural or synthetic material which is provided on the side remote from its cavity with a rearwardly projecting portion 2, which adjoins a further portion 3 having the form of a bell or dish, the diameter of which is greater than the diameter of the throat 2 but smaller than the

diameter of the suction cup 1. The suction cup 1, throat 2 and dish shaped portion 3, which can likewise have the form of a suction cup, consist of a single piece, all the parts of which are conveniently in the form of bodies of revolution. Coaxially with the central axis of these bodies of revolution is provided a screw spindle 4 having, at the end terminating in the cavity 5 of the suction cup 1, a collar or shoulder 6, the rear annular surface of which abuts against the inner face of the suction cup. On the screw spindle 4 is also arranged an adjustable nut 7, which is located within the cavity 8 of the dish shaped portion 3.

The screw spindle 4 engages in a frame 9, for example of ledge form, and thereby gives the suspension device the necessary support and the correct position.

In the cavity 5 of the suction cup 1 is provided a contact spring 10 connected at one end with the shoulder 6 and at the other end to a contact plate 11. Between the front face of the shoulder 6 and the opposing surface of the contact plate 11 is arranged a helical spring 12, consisting for example of steel, which seeks to distance the contact plate 11 from the shoulder 6 and thereby brings the plate into firm abutment with the object 13 to be galvanized, for example an ornamental shield.

The screw 4 may be made of brass, the contact spring 10 of copper plate, and the suction cup, together with the parts formed in one piece with it, of rubber or the like.

To the screw 4 is attached in a manner not further described the connecting lead for the supply of electrical current to the object to be galvanized.

The suspension of the object to be galvanized and the attachment of the electrical contact is effected in a simple manner by pressing the suction cup on to the rear face of the shield or the like to be galvanized. In place of the contact device shown in the drawings, there can obviously also be employed a device constructed as a bell push contact.

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