HANDLING WORKING PIECES IN LIQUIDS IN DENTAL TECHNOLOGY

Inventor: Hans Lea, Frankfurt, Germany
Assignee: Deutsche Gold-und Silber-Scheidewalt Vormals Roessler, Frankfurt/Main, Germany

Filed: Oct. 29, 1973
Appl. No.: 410,550

Related U.S. Application Data

Foreign Application Priority Data
Nov. 26, 1971 Germany................................. 2158637

U.S. Cl. .................. 134/135, 21/100, 99/355, 134/92, 134/143, 134/154
Int. Cl. .................. B08B 3/04
Field of Search .......... 134/84, 85, 92, 105, 107, 134/135, 143, 154, 183, 201; 99/355; 21/95, 100

References Cited
UNITED STATES PATENTS
1,479,236 1/1924 Heidbrink.................................. 21/100
1,884,181 10/1932 Pauly................................... 134/183 X
2,572,983 10/1951 Burtwells................................ 134/183 X
2,806,123 9/1957 Steinbock, Jr........................... 134/201 X
3,444,868 5/1969 Hungerford et al. ....................... 134/143

Primary Examiner—Robert L. Bleutge
Attorney, Agent, or Firm—Cushman, Darby & Cushman

ABSTRACT

Work pieces are treated in pickling liquids especially in dental technology and gold and silver forging for deoxidation purposes. The workpieces are arranged in a removable container swingingly mounted on the cover of the bath apparatus. This avoids the necessity of using material handling equipment such as forceps and tongs.

4 Claims, 1 Drawing Figure
HANDLING WORKING PIECES IN LIQUIDS IN DENTAL TECHNOLOGY

This is a division of application Ser. No. 291,166, filed Sept. 22, 1972, now U.S. Pat. No. 3,793,076.

In dental technology and in gold and silver forging technology it is necessary to deoxidize oxidized workpieces of base metal containing noble metal alloys by casting, brazing or annealing. Generally, for this purpose there are used simple ceramic containers, for example porcelain casseroles, which are filled with a suitable pickling liquid. The required heating of the pickling liquid takes place over the flame of a bunsen burner or on an electric hotplate. After the pickling the workpiece must be taken out of the hot pickling liquid with tongs or forceps. In this procedure there is the danger of the formation of a galvanic cell which leads to a copper deposit on the workpiece. Remnants of such copper deposit can, for example, in noble metal working in dental technology bring about disagreeable discolorations in the mouth of the patient. A further disadvantage of this process is the escape of acid vapors injurious to health and corrosive to the iron tools.

It has now been found that the disadvantages of the known processes can be avoided by having the deoxidation take place in a closed apparatus containing the pickling liquid in which the workpieces to be pickled are arranged in a removable container which is fastened in swinging fashion to the cover of the apparatus. This construction permits the user to completely eliminate the additional material handling equipment such as forceps, tongs and the like whose disadvantages are described above.

The workpieces for the pickling are placed by hand in the container mounted in swingable manner on the cover of the apparatus and together with the container are lowered into the pickling liquid. Thereupon the cover of the apparatus joined to the swingable container returns in guided manner to its closed position and closes the apparatus so tightly with its sealing ring during the pickling process that no vapor of the pickling liquid can escape outside.

After the end of the pickling process, the user raises the cover of the apparatus high whereby in guided manner, the workpieces arranged in the swingable container are removed from the pickling liquid. During these processes the pickling liquid which is found in the container in the pickling process flows back through openings on the bottom side of the container in the apparatus. By a hand motion the user turns the cover of the apparatus 180° so that the bottom side of the cover is arranged below the container with the workpieces. In this situation the bottom side of the cover serves as a collecting vessel for residues of the pickling fluid still dropping from the container. In this position the user goes with the workpieces to a water tap with a discharge basin. He swings the cover about 90° over the discharge basin with a hand motion and can now cleanse the pickled workpieces in the flowing water jet from remaining residues of pickling liquid.

A further possibility in rinsing the workpieces is that the user of the apparatus instead of employing the flowing water jet employs a prepared vessel containing water. In this case he swings the cover of the apparatus about 180° by a hand motion after which he can likewise bring about an appropriate rinsing by alternating immersion in and raising of the container above the water bath.

In both cases after the rinsing process for the return of the workpieces to the working place the cover of the apparatus is so turned by a hand motion that its bottom side comes to rest under the container with the workpieces. Thus, the water dropping from the container or from the workpieces is caught on the bottom side of the cover.

At the working place the now pickled and cleansed workpieces can be withdrawn from the container with the fingers, again without utilization of assisting apparatus such as tongs or forceps and the further working can be carried out. The flat top side of the cover makes possible assembly at the working place so that both hands are free.

A further characteristic of the invention is that the pickling fluid condensing on the relatively cool bottom side of the cover is returned again into the deoxidation vessel.

The single FIGURE of the drawing is a cross-sectional view of an apparatus for carrying out the invention.

Referring more specifically to the drawing there is provided a container 1 for a bath, e.g., a pickling bath consisting of sulfuric acid or another pickling agent.

The container is heated by a heater 7. Inside the bath container 1 there is situated another container 2 which contains workpieces, e.g., dental tools. The container 2 is swingingly connected with the cover 3 by support 4. The container 2 in its bottom has openings 5 through which it is guaranteed that the pickling fluid can flow around the workpieces to be treated.

After the pickling the cover is raised up whereupon simultaneously the container 2 is removed from the pickling fluid. Since the container 2 is swingably mounted on the supports 4 the person undertaking the working process can bring the treated workpieces in the range of his sight by swinging the container 2 and thereby control whether the surface properties of the treated pieces are unobjectionable.

In the pickling process in the heated pickling bath there takes place an evaporation of the liquid. It is undesired that this vapor reach the working space. For this reason it is suitable to condense this vapor on the relatively cool surface of the bottom of the cover and return it again into the bath container 1. Therefore, there is provided an additional conical inner cover 6 on whose surface a substantial part of the evaporated liquid condenses and then flows back again into the bath container 1. A supplementation of the pickling liquid is practically not necessary because the vapor developed condenses again in the apparatus and is returned into the bath container 1.

What is claimed is:

1. Apparatus suitable for treating workpieces with a liquid, such as the de-oxidizing of dental workpieces with a liquid pickling bath, said apparatus comprising a first container for containing the liquid, a second smaller container for supporting the workpieces, cover means operable to be disposed in closing relation to said first container and to be removed therefrom, said cover means including an interior wall having a central conical portion disposed with its apex extending toward said second container for condensing vapors from the pickling liquid, and
means for connecting said second container to said cover means for movement of said second container with said cover means in supported relation therewith and for swinging movement of said cover means with respect to said second container between an operative position wherein said cover means is disposed in closing relation with said first container and said second container is supported therebelow within the liquid contained in said first container and a drop receiving position wherein said cover means is removed from closing relation with said first container and inverted with respect to its position therein and said second container is supported thereabove.

2. Apparatus as defined in claim 1 wherein said cover means includes an outer cover member having a generally flat top side and an annular wall within which said interior wall is disposed.

3. Apparatus as defined in claim 1 wherein said first container includes an upwardly and inwardly facing frustoconical surface at the upper portion thereof and said cover means includes an annular seal for engaging said surface when said cover means is disposed in closing relation with said first container.

4. Apparatus suitable for treating workpieces with a liquid, such as the de-oxidizing of dental workpieces with a liquid pickling bath, said apparatus comprising a first container for containing the liquid, cover means operable to be removed therefrom, a second smaller container for supporting the workpieces, and means for connecting said second container to said cover means for movement of said second container with said cover means in supported relation therewith and for swinging movement of said cover means with respect to said second container between an operative position wherein said cover means is disposed in closing relation with said first container and said second container is supported therebelow within the liquid contained in said first container and a drop receiving position wherein said cover means is removed from closing relation with said first container and inverted with respect to its position therein and said second container is supported thereabove, said connecting means comprising a support having an annular portion connected adjacent the juncture between said annular wall and said interior wall and extending toward said second container and a pair of arm portions extending from said annular portion at diametrically opposed positions thereon and axially aligned pivot pin means between the free ends of said arm portions and said second container.