

- [54] MEANS FOR ELECTROPOLISHING DENTURE FRAMES
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- [58] Field of Search ..... 204/297 W, 129.1, 297 R

[56] **References Cited**

UNITED STATES PATENTS

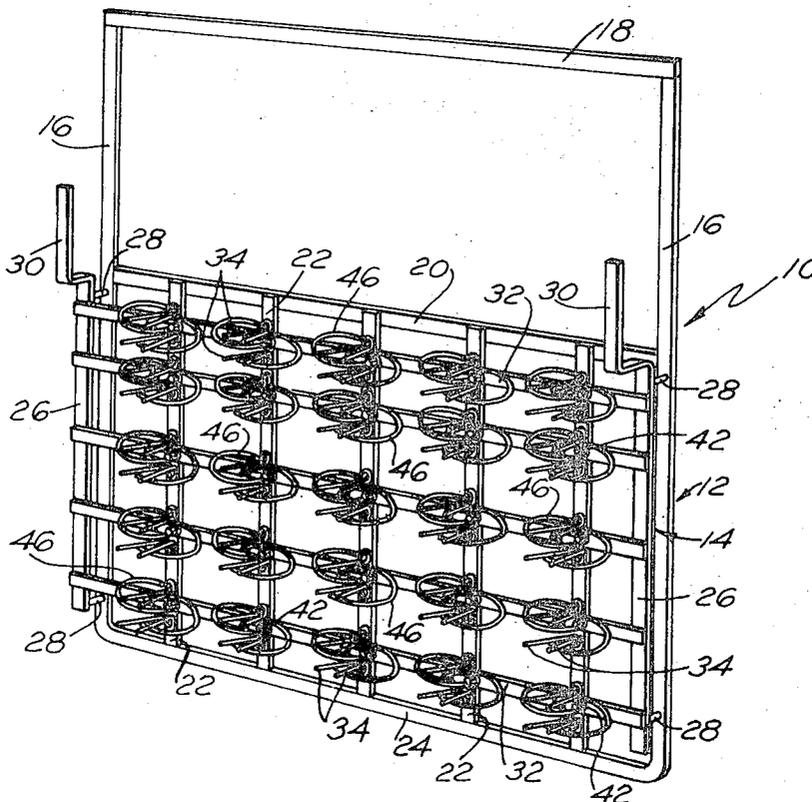
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[57] **ABSTRACT**  
 A rack comprising a pair of frames mounted one in front of the other. The rear frame is provided with spaced vertical strips of metal and the front frame is provided with spaced horizontal strips of metal. The

construction is of copper and the assembly bolts are titanium. At the intersections the vertical strips are provided with clamps, one above and one below the adjacent horizontal strip. Each clamp comprises a pair of stiff titanium arms extending outwardly from a point in a V-shape. The arms are notched adjacent their outer ends. The horizontal strips are provided on each side of the vertical strips with lengths of lead wire, one servicing the upper clamp and one the lower clamp. The rack, bolts and clamps are covered with an acid resistant plastic, only the notched ends of the clamps and the lead wires being exposed. The denture frames, the cast stainless steel frames without the teeth, are mounted on the rack, one between each pair of notched clamping arms. The lead wires are positioned about one-half inch from the denture frames. A short length of lead wire is extended under each frame and a longer length extends over each denture frame. The method of polishing is as follows: a standard electropolishing solution such as "ELECTRO-GLO," made by Electro-Glo Chemicals, Inc., of Chicago, Ill., or the equivalent, is used. The solution is placed in a suitable tank and preheated at 125° F. for 3 hours while constantly agitating. The filled rack is now placed in the solution and locked in place with the conventional electrical connections. A 5 v. DC current is applied for 45 minutes. The rack is removed and thoroughly rinsed. The dentures are now clean and polished.

4 Claims, 5 Drawing Figures



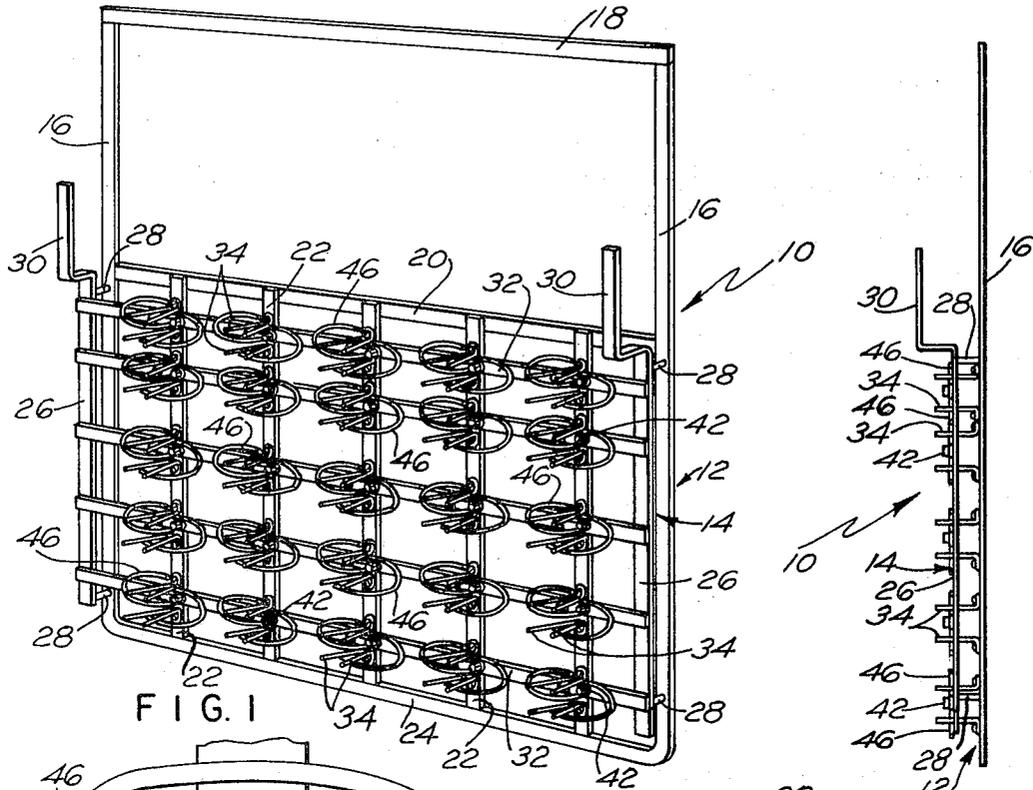


FIG. 1

FIG. 2

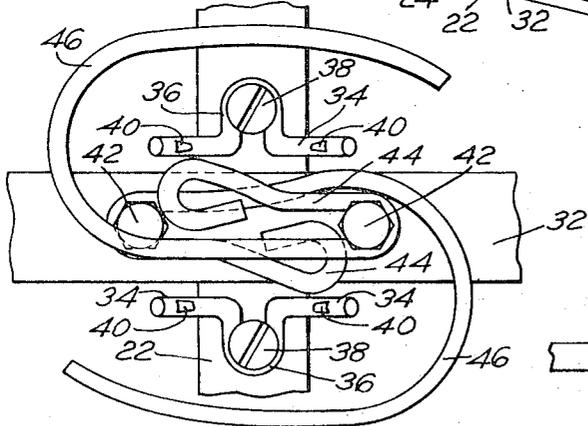


FIG. 3

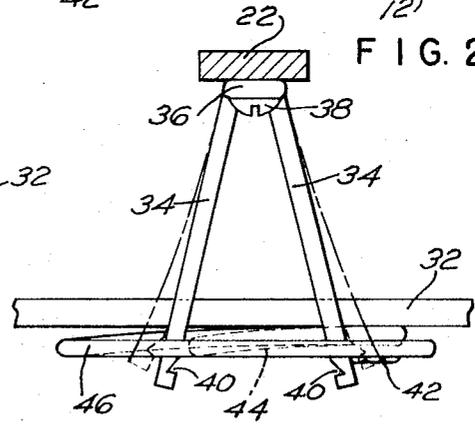


FIG. 4

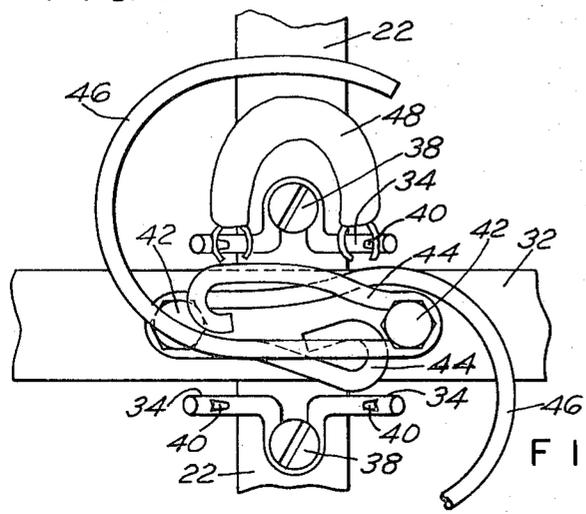


FIG. 5

## MEANS FOR ELECTROPOLISHING DENTURE FRAMES

### BACKGROUND OF THE INVENTION

In making partial dentures, the base metal, usually stainless steel, is first cast to the proper shape before inserting the teeth. The casting is dirty, greasy, scratched and dull. When the denture is being made by a dentist or a dental technician making one at a time, it can be hand cleaned and polished and individually dipped in a cleaning solution. However, commercial dental laboratories handle large quantities of dentures. To avoid undue delays, many devices have been used for simultaneously cleaning and polishing several dentures. Now the volume has increased to an extent that such methods have been found unsatisfactory.

### SUMMARY OF THE INVENTION.

The present invention provides a method and means of polishing large quantities of dentures simultaneously, a rack of the present invention handling 45 or more dentures at one time. The rack of the present invention comprises a double rectangular copper frame, one mounted slightly in front of the other. The rear frame is provided with spaced vertical strips of copper and the front frame is provided with spaced horizontal strips of copper. At each intersection provision is made to hold two dentures, one above and one below the horizontal strip. The holding means comprises a pair of stiff, resilient titanium arms extending out from a point in a V-shape, the outer ends being notched to hold a denture therebetween. On the horizontal strips, spaced bolts hold lead wires, one servicing the upper clamp and one the lower clamp at each intersection. The frames, bolts and clamps are covered with an acid resisting plastic, leaving the lead wires and the notched ends of the clamps uncovered. The dentures are placed between the notched ends of the clamps and the associated lead wire is bent with a short end under the denture and the longer end over the denture about one-half inch from the surface.

After the frame has been loaded with dentures it is ready for polishing. A standard electropolishing solution such as "Electro-Glo", sold by Electro-Glo Chemicals, Inc., of Chicago, Ill., is placed in a suitable tank and preheated for 3 hours at 125° F. under constant agitation. The loaded rack is locked into the solution with the conventional electrical wires attached. A current of 5v D.C. is applied for 45 minutes. The rack is then removed and rinsed.

### DESCRIPTION OF THE DRAWING.

In the drawing:-

FIG. 1 is a perspective view of a rack embodying our present invention;

FIG. 2 is a side elevation thereof;

FIG. 3 is an enlarged fragmentary plan view of one of the clamping areas;

FIG. 4 is a top plan view of one of the clamps; and

FIG. 5 is a view similar to FIG. 3 showing the mounting of a denture in one of the clamps.

### DESCRIPTION OF THE INVENTION.

Referring more in detail to the drawings, the rack 10 comprises a rear frame portion 12 and a front frame portion 14. The rear frame portion 12 is a large rectangular frame made of copper strips, the sides 16 being

elongated so that the top horizontal strip 18 may be used as a handle. Slightly above the center, a horizontal strip 20 is provided which acts as the top of the main frame 12. Spaced vertical strips 22 extend between the horizontal strip 20 and the bottom strip 24. The front frame portion 14 comprises vertical strips 26 mounted in front of the vertical sides 16 of the rear frame portion 12 on dielectric bars 28. The upper ends of the strips 26 are bent out and then upwardly at 30 for the mounting in a tank and the electrical connections (not shown). The vertical strips 26 are connected by spaced horizontal strips 32, which cross in front of the vertical strips 22. Note that the bottom strip 32 is vertically spaced from the bottom 24 of the rear frame portion, that the top strip 32 is below the strip 20 of the rear frame, and that the two top strips 32 are closer to each other than the rest of the strips.

As can be seen in FIG. 1, the arrangement is such that a denture clamp is located on the vertical strips 22 just above the top strip 32, and thereafter, one above and one below each of the other horizontal strips 32. Referring to FIGS. 3, 4 and 5, a titanium bar 34 is bent to form a pair of resilient arms extending in a V-shape outwardly from an integral central portion 36 which is mounted on the vertical strip 22 by a titanium bolt 38. Adjacent their outer ends, the arms 34 are notched at 40. To the right of the intersection, FIG. 3, a length of lead wire is bolted by a titanium bolt 42 to the horizontal strip 32 forming a short length of wire 44 and a longer length 46. The lead wire to the right services the clamp arms 34 above the strip 32 and the same arrangement to the left services the clamp arms 34 below the strip 32.

As can be seen in the dotted lines in FIG. 4, the clamp arms 34 are stiff and resilient. To load the dentures on the rack, each denture 48, FIG. 5, is placed between the notches 40 at the ends of the arms 34 by spreading the arms slightly. Now the short end of the lead wire 44 is bent under the denture 48 so that it is approximately one-half inch from the surface. The longer length 46 is bent over the denture, also approximately one-half inch from the outer surface. The rack can be made in any desired size, the rack illustrated in FIG. 1 holding 45 dentures. Note that the strips, frames, bolts, and arms are covered with an acid resistant plastic material, leaving the lead wires and the notched ends of the arms 34 exposed. It should also be noted that while copper, titanium and lead have been recited, the rack can be made of stainless steel or aluminum and the wires can be made of stainless steel or copper, and the clamps must be made of titanium. However, because of the acid bath, the copper rack, titanium wire and bolts, and lead wires have been found the best.

The dentures are dirty, greasy and scratched. An electrochemical bath will remove the scratches, clean the dentures and polish them to a smooth finish. The method is as follows:- A standard electropolishing solution such as "Electro-Glo" made by Electro-Glo Chemicals, Inc., of Chicago, Ill., is placed in a suitable tank and preheated at 125° F. for 3 hours while constantly being agitated. The rack, loaded with the dentures, is placed and locked in the tank and the electrical connections are made. A current of 5 v. DC is applied for 45 minutes. The rack is then removed and rinsed. Using this method and the rack hereinafter described, 45 dentures will be nicely cleaned and polished simulta-

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neously. The rack of the present invention is thus designed to hold a plurality of dentures in a polishing and stripping tank. The rack is designed for long wear under caustic conditions and will hold a plurality of dentures in a minimum of space. Thus, a large quantity of dentures can be polished in a minimum of time and with a minimum of labor. Other advantages of the present invention will be readily apparent to a person skilled in the art.

We claim:

1. A rack for electrochemically polishing dentures comprising a rear frame portion, a front frame portion dielectrically mounted in spaced relation in front of said rear frame portion, said rear frame portion having spaced vertical strips, said front frame portion having spaced horizontal strips, means on said vertical strips at the intersection of said strips for holding a denture in position for electropolishing, said means comprising a pair of stiff, resilient, titanium arms extending outwardly in a V-shape, said arms having an integral apex

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held to said vertical strip by a titanium bolt, said arms having holding notches adjacent their free ends, and a soft lead wire mounted on said horizontal strip and bendable around a denture in said holding means in spaced relation to the denture.

2. A rack as in claim 1 wherein said fram portions and said strips are of copper coated with an acid resisting plastic.

3. A rack as in claim 1 wherein there are two holding means at each intersection, one above and one below said horizontal strips.

4. A rack as in claim 3 wherein said length of lead wire is bolted to said horizontal strips to form a short and a long portion of wire, said short portion being bendable around a denture held in said upper holding means and said long portion being bendable around a denture in said lower holding means at each intersection.

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