

[54] **PLATING BOXES FOR HOLDING A STACK OF SEMI-CYLINDRICAL BEARING LINERS DURING PLATING**

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[22] Filed: **Apr. 17, 1972**

[21] Appl. No.: **244,483**

[30] **Foreign Application Priority Data**

Apr. 20, 1971	Great Britain	10,252/71
Apr. 29, 1971	Great Britain	12,094/71
Aug. 9, 1971	Great Britain	37,314/71

[52] **U.S. Cl.**..... **204/297 R**

[51] **Int. Cl.**..... **C23b 5/70**

[58] **Field of Search**..... **204/297 R**

[56]

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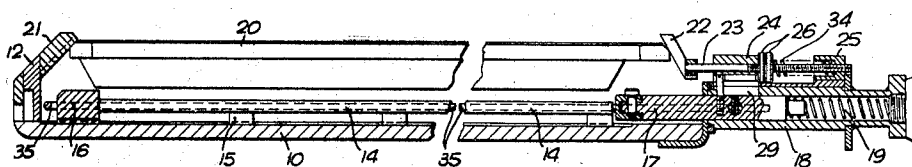
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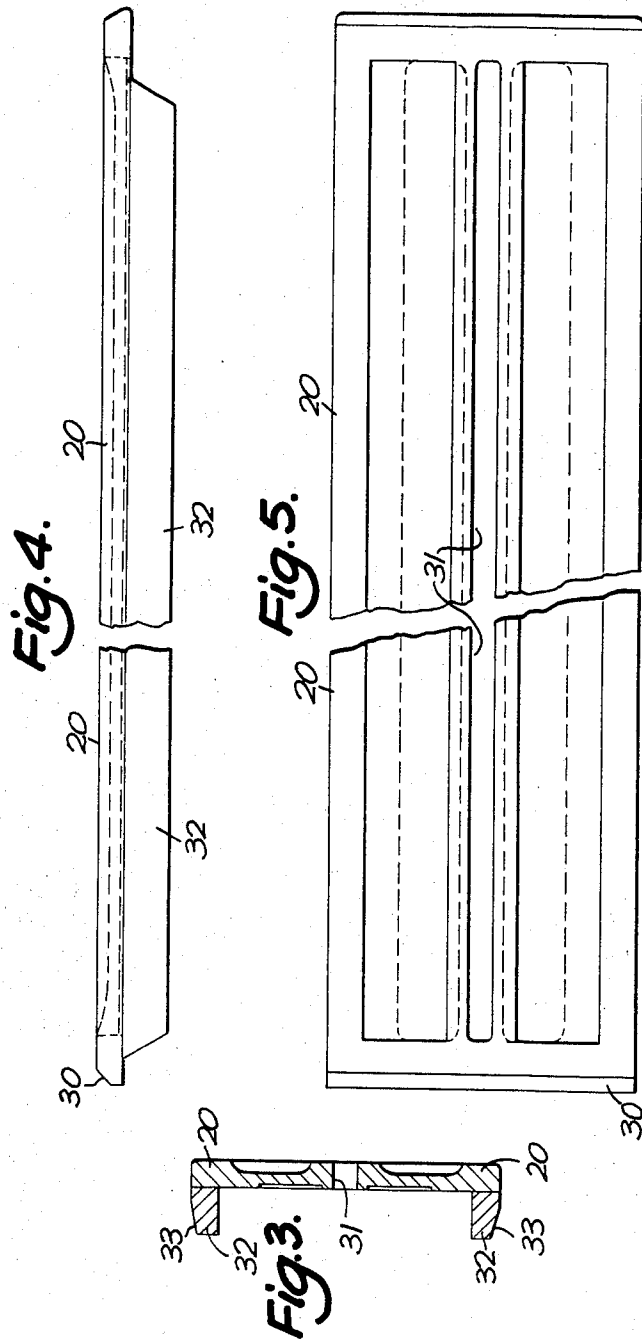
**ABSTRACT**

The disclosure relates to a plating box for holding a stack of bearing liners during plating. The box has a removable front wall with an elongate slot through which ions can pass. The box contains supports for a stack of liners to hold the stack with the parting faces of the liners against the front wall symmetrically on either side of the slot. A spring loaded presser holds the front wall against the parting faces of the liners.

**9 Claims, 5 Drawing Figures**







# PLATING BOXES FOR HOLDING A STACK OF SEMI-CYLINDRICAL BEARING LINERS DURING PLATING

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

This invention relates to plating boxes for holding stacks of semi-cylindrical bearing liners during plating.

### 2. Description of the Prior Art

British Patent Specifications No. 627,294 and 645,183 described plating presently in use which are provided with a slot in the base and are loaded by aligning the bearings horizontally in a V-shaped jig, inverting the box over the column in the jig and clamping the column by pressure applied at the edge of the bearing nearest the handle of the box. The base of the jig incorporates four alignment pins so that the box is positioned with the bearings symmetrically placed with respect to the slot. The boxes are suspended vertically in the bath.

There is no support for the bearings once loaded in the box other than the clamping pressure applied at the top of the column and it is a disadvantage of this type of box that any irregularity in the semi-circumferential edges of each bearing affects the whole column, causing it to form an arc and allowing metal deposition on the parting lines. These irregularities frequently cause collapse of the column in the plating tank when the internal surfaces of the bearings are subjected to a higher pressure than that acting on the external surfaces.

One object of the invention is to provide a plating box in which the stack of liners is supported against collapse. A further object is to avoid the necessity of assembling the stack in a jig prior to insertion in the base.

## SUMMARY OF THE INVENTION

The invention provides a plating box for holding a stack of semi-cylindrical bearing liners during plating in a bath, which box is formed from an insulating material and has a removable wall formed with an elongate slot to admit ions from an electrolyte to the box, there being means in the box to support a stack of bearing liners extending in the direction of the length of the slot and engaging the removable wall at their parting line faces to either side of the slot, means to press the removable wall inwardly of the box to engage the ends of the bearing liners and means to connect an electric supply to the stack of liners.

## BRIEF DESCRIPTION OF THE DRAWINGS

- FIG. 1 is a plan view of a plating box;  
 FIG. 2 is a sectional view along the box;  
 FIG. 3 is a sectional view of the removable wall;  
 FIG. 4 is a side view of the removable wall;  
 and  
 FIG. 5 is a plan view of the removable wall.

## DESCRIPTION OF THE PREFERRED EMBODIMENTS.

Referring firstly to FIGS. 1 and 2 of the drawings there is shown a plating box for a stack of semi-cylindrical bearing liners comprising a back wall 10, side walls 11 and a bottom wall 12. Two parallel rods 14 extend along the length of the bottom wall 10 and are mounted on chocks 15 secured to the bottom wall. The lower ends of the rods 14 are connected together by a cross-member 16.

A stack of half-bearing liners to be plated around their inner peripheries is laid on the rods 14 with the outer circumferential surfaces of the liners engaging the rods. The lowest liner of the stack rests on the cross-member 16. At the upper end of the stack there is a dummy liner which is engaged by a sliding plunger 17 mounted in a housing 18 secured to the upper end of the box and the plunger 17 is spring loaded downwardly towards the bottom wall of the box by a powerful coil spring 19. A front wall 20 for the box, as illustrated in FIGS. 3 to 5, has a close sliding fit between the side walls 11 of the box and engages the circumferential ends of the liners of the stack. Secured to the bottom wall 12 of the box there is an inwardly facing inclined ramp 21 which the lower edge of the front wall engages and the upper edge of the front wall is engaged by an inwardly facing inclined member 22 mounted on a rod 23 slidably supported in two blocks 24, 25 secured at spaced locations to the housing 18. The rod 23 is encircled between the blocks 24 and 25, by two screw-threaded rings spring loaded by a spring 34. The rod 23 and plunger 17 are interconnected by a pin 28 projecting laterally from the plunger 17 and slidable along a slot 29 in the housing and a pin 27 engaged between pin 28 and one of the rings 26. Adjustment of the rings 26 along the rod 23 varies the relative positions of the rod 23 and plunger 17. Thus when the stacks of liners of different sizes are to be placed in the box, the rod 23 can be set with respect to plunger 17 to give the front wall 20 of the box the required penetration into the box to firmly engage the ends of the liners in the box. The plunger 17 may also be adjustable in length to suit stacks of liners of different lengths.

The front wall 20 of the box is formed with an elongate slot 31 located centrally of the front wall and extending along the length of the stack of liners symmetrically between the ends of the liners to permit ions from the electrolyte to flow into the space within the stack of bearings and deposit on the inner surfaces of the liners as described later. The width of the slot is determined by the diameter of the liners making up the stack.

The side edges of the front wall 20 have flanges 32 which project into the box. The outer faces of the flanges are bevelled as indicated at 33 to facilitate insertion of the front wall between the side walls.

In use, the box is suspended in an electrolytic bath up to a level half way up the dummy liner, this being below the top of the front wall 20. Electrolyte enters the box through slots cut out at spaced locations on the inwardly facing surface of the ramp 21 secured to the bottom 12 of the box. The electrolyte also drains through the slots when the box is removed from the bath. An electric supply is connected to the stack of bearings located within the box through the housing 18 and plunger 17. When the current is switched on ions pass through the slot 31 and deposit evenly over the inner circumferential surfaces of the bearings of the stack. Because the ends of the liners stack engage the front wall of the box no charge ions can deposit on the ends of the liners. A conducting rod 35 is mounted within the box behind the stack. The rod receives a supply of electric current either from the plunger 17 or from a separate source. The electric potential of the rod ions in the space behind the stack of liners preferentially migrate towards the rods thereby preventing

deposition of metal ions onto the back of the stack of bearings.

It will be appreciated that many modifications may be made to the above described embodiment without departing from the scope of the invention. For example the box may contain two parallel sets of rods 14 for mounting two parallel stacks of bearings side by side and the lid is then provided with two parallel slots, one for each stack. Lids having different slot widths are used with the same box for bearings of different diameters, larger slot widths being used for larger bearings and smaller slot widths for smaller bearings.

It has been found that the plating box can be used to form coatings of bearing material up to 0.0015 inches in thickness around the inner surface or base of the liners. The uniformity of the coating is such that no subsequent finishing machining is required. It is also found that there is minimal deposition of bearing material on the parting lines of the bearings.

We claim:

1. A plating box for holding a stack of semi-cylindrical bearing liners during plating in a bath with said box being adapted to be vertically positioned on end in the bath, said box having opposing ends, a back wall, spaced parallel side walls, and a removable front wall slidably located between said ends and said side walls for movement towards and away from the back wall, said removable front wall having opposing ends and having an elongated slot extending parallel to said side walls, between said ends for the admission of ions from the plating bath in which the box is immersed into the interior of the box, means in the box to support the bearing liners in a stack with the liners extending parallel to said slot and engaging the removable front wall at their parting line faces on either side of said slot so as to be positioned symmetrically on either side of the slot, means including spring means engaging the removable front wall so as to press the removable front wall towards the parting line faces of the liners to hold the stack of liners against said supporting means and means to clamp the liners in the stack together so as to minimize the passage of ions around the parting faces of the liners to the spaces behind the liners whereby the ions are prevented from depositing on the backs of the liners and means to connect electric supply to one end of said stack.

2. A plating box as claimed in claim 1 wherein the means to press the removable wall inwardly of the box comprises a presser member slidably mounted on the

box and means to urge the presser member in a direction to urge the removable wall inwardly of the box.

3. A plating box as claimed in claim 2 wherein the presser member is slidable in a direction extending parallel to the plane of the wall and the member has a face engaging an end of the removable wall which face is inclined with respect to said wall into the box and the other end of the removable wall engages a face on the box inclined with respect to the wall into the box and means are provided for urging the presser member towards said inclined face on the box whereby the removable wall is urged inwardly of the box.

4. A plating box as claimed in claim 3 wherein the means to clamp the bearing liners together in a stack within the box includes a fixed abutment at one end of the box for receiving one end of the stack and a movable clamping member at the other end for engaging the other end of the stack and spring means to urge the clamping member towards the abutment.

5. A plating box as claimed in claim 4 wherein the abutment member and said inclined face are located at one end of the box and the presser member and clamping member are located at the opposite end of the box, the two members being interconnected and means being provided for urging the clamping member in a direction to clamp a stack of liners in the box and the presser member in a direction to force the removable wall inwardly of the box.

6. A plating box as claimed in claim 5 wherein the interconnection between the presser and clamping members includes means for relative adjustment between said members to allow for bearings of different sizes to be stacked in the box.

7. A plating box as claimed in claim 4 wherein the means to clamp the stack of liners in the box is formed from an electrically conductive material and comprises said means to connect an electric supply to the stack of liners.

8. A plating box as claimed in claim 1 wherein the box contains at least one conducting rod located in the box so that in use the rod is behind a stack of liners, so that when the rod is connected to an electric supply there is preferential migration of ions towards the rod instead of the backs of the stack of liners.

9. A plating box as claimed in claim 1 wherein means are provided in the box for supporting two side by side stacks of bearing liners and the removable wall has two elongate slots one for each stack of liners.

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