May 6, 1969 O. H. KIRKPATRICK ET AL 3,442,783

ELECTROPLATING BARREL

Filed Feb. 10, 1966

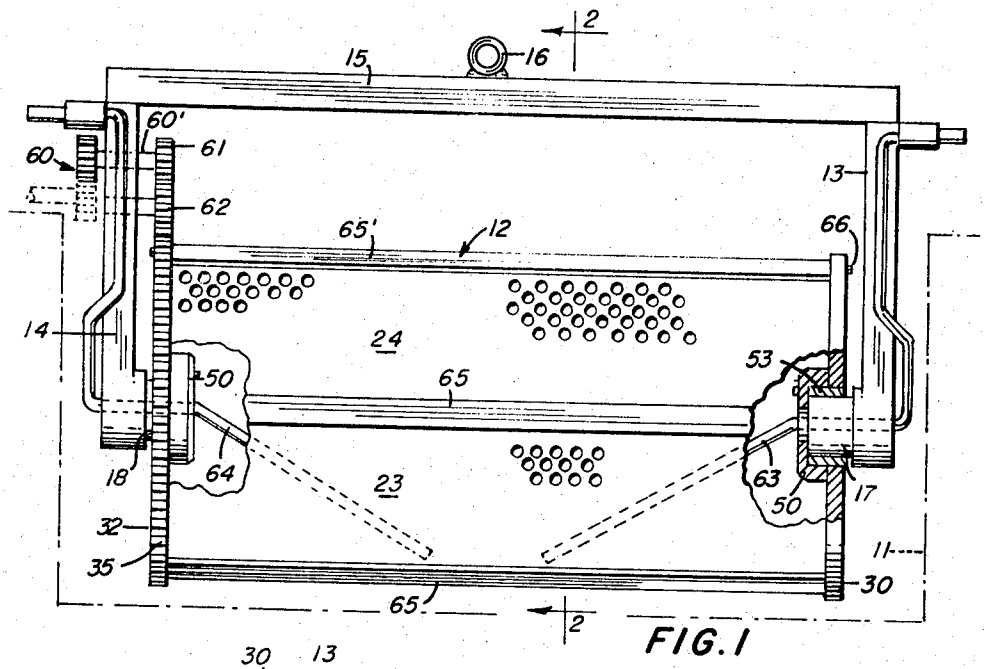


FIG. 1

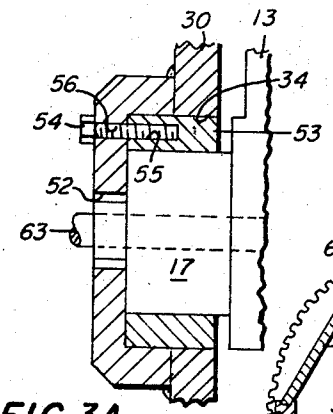


FIG. 3A

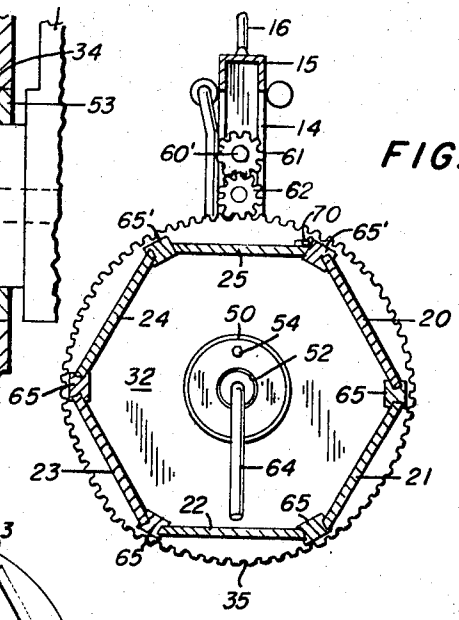


FIG. 2

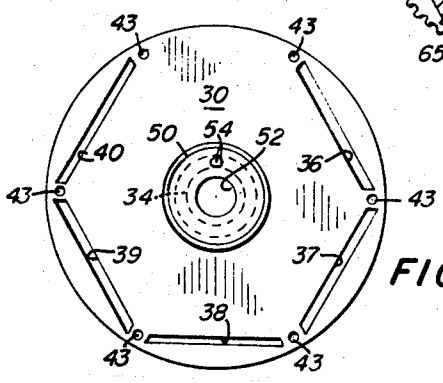


FIG. 3

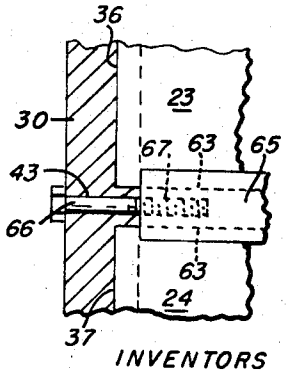


FIG. 4

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ELECTROPLATING BARREL

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U.S. Cl. 204—213 2 Claims

ABSTRACT OF THE DISCLOSURE

This invention involves an electroplating barrel designed to make the best use of space available for the barrel. The barrel comprises two end members, one having gear teeth thereon and having integral individual panels spanning the distance between and attached to the end members thereby forming the circumferential portion of the barrel. The barrel has hub and bearing members entirely disposed in the end members thereof for receiving supporting stubs.

The present invention relates to an improved electroplating barrel and its method of manufacture and is particularly concerned with increasing the working capacity of the barrel.

In the past, there have been many attempts directed to the technique of improving the mode of manufacturing and of assembling electroplating barrels. However, none of these attempts were concerned with increasing the working capacity of the barrels.

It is one object of the present invention to provide a barrel of increased capacity which can be used in combination with any new or existing barrel support structure.

Another object of the present inevntion is the provision of component parts which can be easily assembled, without the use of special tools, into a barrel having an increased length.

Another object of the present invention is the provision of a plastic gear component which is utilized both as one of the barrel end plates and as part of the drive for rotating the barrel.

Another object of the invention is the provision of barrel hub support members which are disposed interiorly of the barrel thereby increasing the overall barrel length and capacity.

Another object of the invention is the provision of bearings in the hub members and end plates which can be easily inserted and removed.

Another object of the invention is the provision of a barrel which is economical, sturdy and durable.

Other objects of the invention will be apparent from the following description and accompanying drawings in which similar characters of reference indicate similar parts throughout the several views.

Referring to the drawings:

FIGURE 1 is a front elevational view of an electroplating unit depicting the invention;

FIGURE 2 is a sectional view taken on lines 2—2 of FIGURE 1;

FIGURE 3 is an elevational view depicting the details of the end plate and the hub member;

FIGURE 3A is an exploded view showing the manner in which the bushing is secured to the hub member;

FIGURE 4 is an exploded view showing a portion of the plastic gear-end member and the manner in which the barrel panel members are secured relative thereto.

With reference to FIGURE 1 of the drawing, the numeral **10** indicates in its entirety an electroplating tank **11**, shown in broken outline, and an electroplating barrel **12** to be used therein. Disposed within the tank is a barrel

hanger support comprised of two depending arms **13** and **14** connected by a transverse bar **15**. The transverse bar **15** is provided with an eye bolt **16** for receiving any suitable means for raising or lowering the barrel into and out of the tank **11**. The lower portion of the brackets **13** and **14** are provided with cylindrical bearings **17** and **18** respectively, which cooperate with barrel hub members in a manner explained hereinafter.

Referring to FIGURE 2, the barrel **12** is preferably hexagonal in shape and is made from three basic components, the end walls **30, 32** and the side walls **20–25**. The side walls which form the circumferential portion of the barrel are individual panels integrally connected to the end plates **30, 32**. Each of the panels is generally perforated, see FIGURE 1, throughout its entire surface area to permit the entry and exit of the electroplating solution into and out of the barrel.

As the end plates **30, 32** are basically the same, reference will be made to only one and, as seen in FIGURES 1 and 3, end plate **30**, which can be made from any suitable material, is circular in shape and is provided with a central opening **34**. One planar surface of the plate is provided with a substantially continuous groove. This groove is comprised of a plurality of milled or otherwise formed slots **36–40**. Each of the slots begins at a point adjacent the peripheral edge of the plate and extends to and terminates at another point adjacent the edge. Positioned between each of the end portions of the slots are openings **43**. The function of these openings will become more apparent hereinafter. Aligned with the openings **34** are circular cup-shaped hub members **50** having their open ends aligned with the openings **34** provided in the end members. Additionally, the hub members are formed with openings **52** in their base portion through which the conductors **63, 64** are inserted to extend within the interior of the barrel.

Bushings **53** are inserted within the openings **34** and seat snugly within the hub members. As will be seen in FIGURE 3A, the bushings **53** are removably secured to the hub members by the use of a pin **54** extending through aligned openings **55, 56** provided in both the bushing and the hub member, respectively.

With continual reference to FIGURES 1 and 2, end plate member **32**, preferably made of plastic, is provided with a series of geared teeth **35** positioned on its peripheral edge. These teeth cooperate with a drive including gear **60** driving a horizontal shaft **60'** and gears **61, 62**, the latter cooperating with the teeth of the member **32**.

The side walls, like the end walls can be made from any suitable material, and as seen in FIGURES 1, 2 and 3, they are each generally rectangular in shape and of the same thickness as one of the slots **36–40**.

The side walls cooperate with retaining members **65**, preferably made of plastic, and which are substantially I-shaped in cross-section and of the same general length as the panels. Upon inspection of FIGURES 2 and 4, it will be apparent that these retaining members serve to close the longitudinal gap between adjacent panel sides by receiving the edges of the panels between the upper and lower flanges thereof. Each of the retaining members has openings **67** in its end portion which are adapted to receive bolts **66** for locking the retaining members and the associated edges of the side panels in place.

It is to be noted from FIGURE 2 that the retaining members **65'** which cooperate with the side panel **25** are not provided with a cutout portion on one of the edges. This is in order to provide a tight fit for panel **25** which, in this instance, forms the cover for the barrel. Panel **25** is connected to the retaining member **65'** by the hinge **70** to provide easy access into the interior of the barrel.

However, it would be well within the purview of this present invention to provide that the retaining members **65'** be I-shaped in cross-section to accommodate the door panel **25**, as well as to provide that the door panel **25** cooperate with slots in the end plates **30, 32.**

The barrel is assembled by disposing the end plates **30, 32** with their grooved slots **36–40** aligned and opposite one another and by inserting opposite ends of one panel into the opposite grooved slots. With the panels circumferentially disposed with respect to the end members, the retaining members are inserted into the gaps between adjacent panels to receive the edges thereof. Additionally, one of the panels is hinged to an adjacent retaining member to permit the same to be opened and closed to gain access to the interior of the barrel for the introduction and removal of articles to be coated. The panels and retaining members are then secured in place by the insertion of the locking means **66** through the aligned openings **43** and **67** provided in the end plates and retaining members respectively. Alternatively, the retaining members could be secured in place with the side panels then being inserted into the slots and retaining members to from the barrel. In either method, one panel is always hinged with respect to an adjacent retaining member to provide an access door for the barrel.

The hub members **50** and the bushings **53** may either be secured to the end members before or after the side panels **20–25** are secured in place.

The electroplating operation may be commenced once the barrel assembly is placed on the hanger support bearings **17, 18** by inserting the same within the bushings **53** and the end plate gear teeth **35** are mated with the teeth of the driving gear **62.**

In view of the foregoing, it can be readily appreciated that an electroplating barrel has been disclosed which is easy to assemble and which additionally provides for an increased work area. The latter is achieved by the utilization of one of the end plates as a means for impacting rotation to the barrel and by disposing the barrel hub support structure interiorly of the barrel.

Having described the invention, what we claim as new and desire to secure by Letters Patent of the United States is:

1. An electroplating barrel comprising two spaced, opposing end members defining a peripheral edge and each having a substantially identical substantially continuous groove on the opposing surface, each of said grooves being formed by a plurality of individual slots each beginning at a point adjacent the peripheral edge of said member and continuing to another point adjacent said peripheral edge whereby a major portion of the slot is spaced from the periperal edge, a plurality of longitudinally extending apertured barrel closure panels, one each of said panels being disposed between said end members and having their respective ends inserted into respective slots to thereby form the circumferential surface of the barrel, one of said end members having its peripheral edge defined by a plurality of teeth, each of said end members further including substantially centrally disposed openings, hub members disposed adjacent each of said openings on said opposing surfaces and extending into the barrel interior, bearing members positioned entirely within said openings and said hub members and means securing said bearing means in fixed relationship with said hubs whereby each of said bearings is adapted to receive a bearing surface disposed on a barrel support hanger.

2. The electroplating barrel of claim **1** wherein the securing means is comprised of a pin extending through aligned openings in the bearing and hub members.

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