Aug. 23, 1949. G. B. HOGABOOM 2,480,022

ROTARY BARREL

Filed Oct. 7, 1944

FIG. 1.

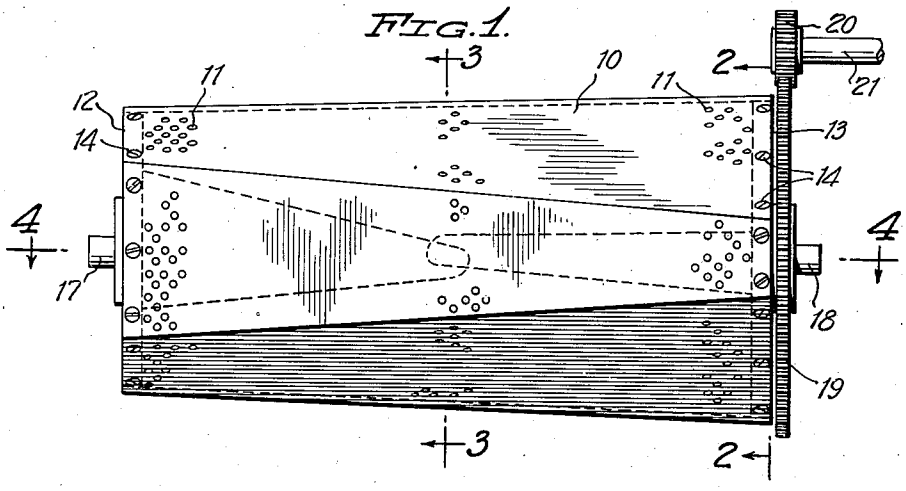


FIG. 2.

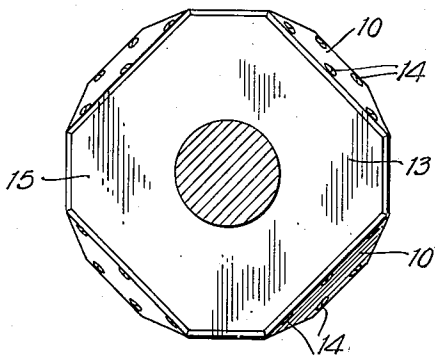


FIG. 3.

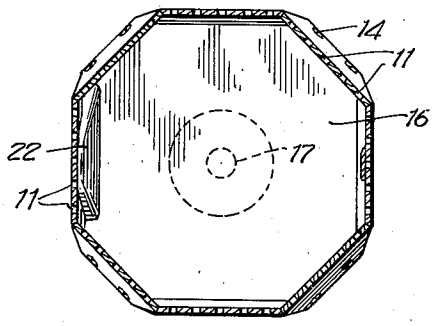
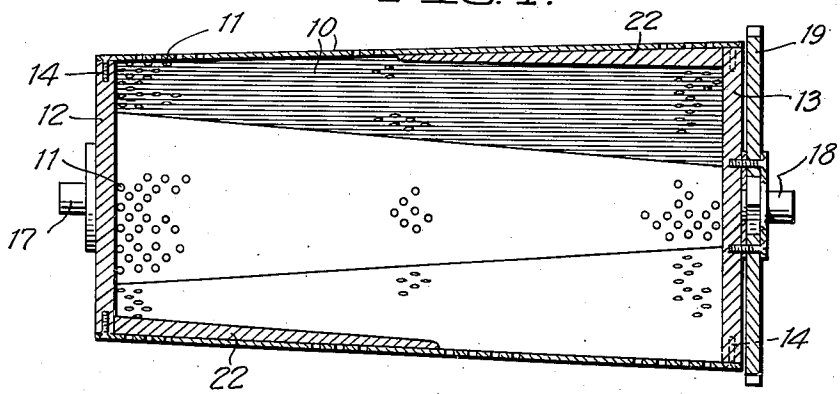


FIG. 4.



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ROTARY BARREL

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4 Claims. (Cl. 259—81)

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This invention relates to rotary barrels for treating small articles in bulk, such as, for example, plating barrels rotating in tanks of electroplating solution.

In the operation of such barrels, the pieces of work are continually being carried up as one side of the barrel rises until a point is reached at which they fall by gravity to a point at lower level, from where they are again raised to repeat the cycle of motion.

An important object of my invention is to provide a construction of such plating barrels which will cause the work pieces to move in an axial or longitudinal direction in addition to the usual rising and tumbling motion, this axial or longitudinal motion alternating first toward one end of the barrel and then toward the other, back and forth, so that a very thorough exposure and presentation of all surfaces are secured with consequent very uniform action upon the articles.

In principle, the construction which I employ to accomplish the above and other objects comprises the forming of the circumferential wall of the plating barrel by juxtaposing a succession of longitudinal panels of trapezoidal form with their longer and shorter parallel sides and their directions of taper alternating from one panel to the next so as to provide an enclosed treating space of varying polygonal section having longitudinal surfaces alternately inclined to the barrel axis and successively serving as floor sections as the barrel rotates. In this way the rotation of the barrel brings into play first a floor or wall surface inclined toward the axis in one direction and then a floor or wall surface inclined toward the axis in the other direction so that the work pieces gravitate first toward one end of the barrel and then toward the other end of the barrel as the rotation raises them and releases them to the influence of gravity. The shape and dimensions of the space occupied by the articles being treated constantly vary from one end of the barrel to the other, and the successive joints between adjacent panels incline first one way and then the other as the barrel rotates. In consequence of these conditions, the work pieces are subjected to a continual redisposition and variation of the surfaces exposed to the electrolytic or other surface action with the result that a very uniform effect is achieved.

The results described are functions of the tapered form of the panels by reason of which their non-parallel edges incline toward each other first from one end of the barrel and then

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from the other. This condition obtains whether the panels are trapezoidal or triangular in form. In this respect, the trapezoidal and triangular forms are in principle equivalent for the purposes of this invention, although I prefer the trapezoidal form, and more particularly the symmetrical trapezoidal form in which the two non-parallel sides of the panel are inclined at equal angles to the panel axis. For simplicity, I shall refer to the panels as of trapezoidal form, intending thereby to embrace the triangular form as an extreme or limit of the true trapezoidal form where one of the two parallel sides has been reduced to zero.

An embodiment of the invention is illustrated by way of example in the accompanying drawing, in which—

Figure 1 is a top plan view of a rotary plating barrel with its driving gears.

Figure 2 is a sectional elevation thereof taken on the line 2—2 of Figure 1.

Figure 3 is a similar view taken on the line 3—3 of Figure 1, and

Figure 4 is a longitudinal section thereof taken on the line 4—4 of Figure 1.

Referring to the several figures of the drawing, it will be observed that the circumferential wall of the barrel is formed of symmetrical trapezoidal panels 10 extending longitudinally of the barrel and juxtaposed along their edges with the direction of their taper alternating first toward one end of the barrel and then toward the other end of the barrel. These panels may, in accordance with conventional plating barrel practice, be provided with perforations, as indicated at 11, to permit the circulation of liquid, such as the electroplating solution, through the same. The parallel ends 12 and 13 of the trapezoidal panels are secured, as by screws 14, upon the periphery of the end walls 15 and 16 respectively, which are in the form of polygons having sides alternating in length, corresponding with the dimensions of the successive ends 12 and 13 of the panels 10. These end walls 15 and 16 are provided with trunnions 17 and 18, to journal the barrel for rotation about its main axis in the usual end bearings of the plating tank or the like in which the barrel is used. A gear 19 is secured on the end wall 13 to mesh with a pinion 20 on the drive shaft 21, intended to indicate diagrammatically in the drawing any conventional form of drive for rotating the barrel.

In use, the barrel may be opened to introduce work by unscrewing the fastening screws 14 of one of the panels 10. The panel is then replaced

and the barrel lowered into the tank for rotation in well-known manner. As the barrel rotates, the work pieces are lifted at one side of the barrel to a point from which they descend by gravity and distribute themselves upon the floor surfaces constituted by the panels 10. These floor surfaces slope alternately first toward one end of the barrel and then toward the other end of the barrel during the continued rotation, so that there is added to the tumbling motion of the work pieces a back-and-forth movement in an axial direction. Since the polygonal section of the interior space of the barrel varies from one end to the other, this composite motion or distribution of the work pieces results in a very thorough and uniform distribution of the electrolytic action or other treatment over the entire surface of the work.

It will be understood that electrodes of any suitable well-known type may be embodied in the construction or associated therewith to furnish electric current for electro-deposition or other treatment to which the articles are to be subjected. Deflectors or guide riffles 32 may, if desired, be provided on some or all of the panels to modify the distribution of the articles being treated.

I claim:

1. A rotary barrel to be driven for tumbling and electrolytically treating small articles in bulk, said barrel having end walls provided with means to journal the barrel for rotation about its main axis and having its circumferential wall formed of longitudinal panels of trapezoidal form circumferentially juxtaposed with their direction of taper alternating circumferentially from one panel to the next to provide an enclosed space having longitudinal surfaces alternately inclined to the main barrel axis and successively serving as floor sections to expose to electrolytic action varying surfaces of the small articles being tumbled and treated as the barrel rotates.

2. A rotary barrel to be driven for tumbling and electrolytically treating small articles in bulk, said barrel having end walls provided with means to journal the barrel for rotation about its main axis and having its circumferential wall formed of longitudinal panels of trapezoidal form circumferentially juxtaposed with their direction of taper alternating circumferentially from one panel to the next to provide an enclosed space of polygonal section having longitudinal surfaces alternately inclined to the main barrel axis and successively serving as floor sections to expose to electrolytic action varying surfaces of the small articles being tumbled and treated as the barrel rotates.

3. A rotary barrel to be driven for tumbling and electrolytically treating small articles in bulk, said barrel having end walls provided with means to journal the barrel for rotation about its main axis and having its circumferential wall formed of longitudinal panels of symmetrical trapezoidal form circumferentially juxtaposed with their direction of taper alternating circumferentially from one panel to the next to provide an enclosed space having longitudinal surfaces alternately inclined to the main barrel axis and successively serving as floor sections to expose to electrolytic action varying surfaces of the small articles being tumbled and treated as the barrel rotates.

4. A rotary barrel to be driven for tumbling and electrolytically treating small articles in bulk, said barrel having end walls provided with means to journal the barrel for rotation about its main axis and having its circumferential wall formed of longitudinal panels of trapezoidal form circumferentially juxtaposed with their direction of taper alternating circumferentially from one panel to the next to provide an enclosed space of polygonal section varying from one end of the barrel to the other having longitudinal surfaces alternately inclined to the main barrel axis and successively serving as floor sections to expose to electrolytic action varying surfaces of the small articles being tumbled and treated as the barrel rotates.

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