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ROD MOUNTING

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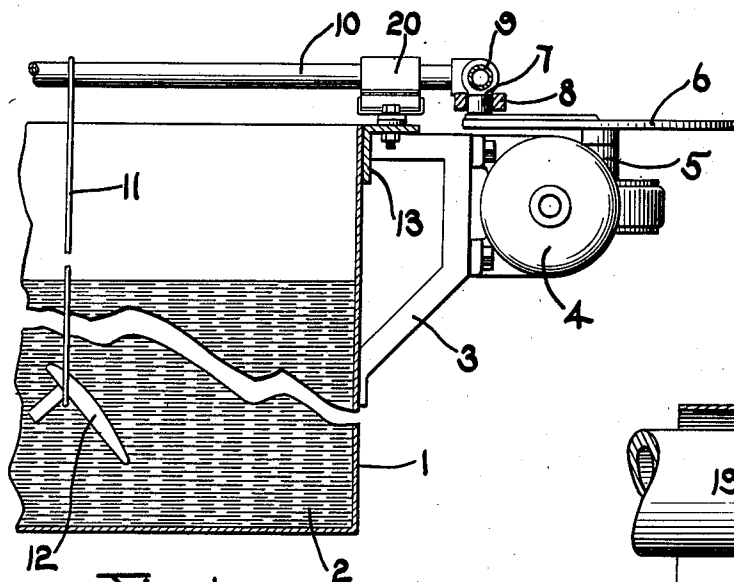


Fig. 1.

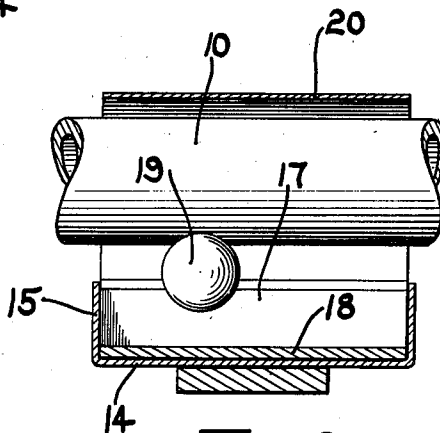


Fig. 2.

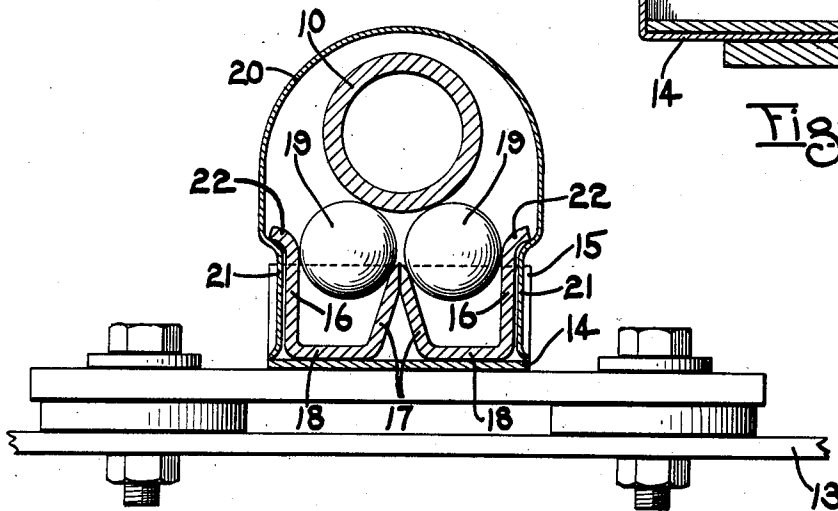


Fig. 3.

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ROD MOUNTING

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2 Claims. (Cl. 308-6)

This invention relates in general to rod mountings and more particularly to a support for a rod which has a longitudinal reciprocating movement.

As illustrative of one of the fields wherein the rod mounting of my invention is adapted to be used, I have chosen the field of electroplating wherein the work rod, from which articles to be plated are suspended into a tank of electroplating fluid, is reciprocated longitudinally. It is to be understood that the particular uses to which this invention may be put are many and varied and I do not wish to be limited to the particular one disclosed.

In this field a tank is usually provided containing an electroplating bath into which articles to be plated are suspended from a work rod. The work rod is reciprocated longitudinally in order to keep the articles in motion and to agitate the bath, and a mounting is provided at an edge of the tank on which the rod or rods may be supported. The practice at the present time is to support these rods adjacent each end thereof by a rotatably mounted V-shaped roller or pulley. These rollers are mounted to rotate about a horizontal axis and when the articles are removed from the bath by elevating the work racks, it is inevitable that a certain amount of solution is dropped on and about these rollers. A comparatively small amount of this is sufficient to impair the free rotatability of these rollers or mountings and soon they cease to rotate at all, and if the mechanism is continued to operate for any length of time the rods are worn flat at their points of contact with these rollers. This, then, increases the friction between the roller and the rod to a maximum and both rollers and rods must be replaced.

My present invention obviates all of these difficulties in general by the provision of two adjacent channel members each having therein a ball adapted to roll longitudinally thereof and on top of which the rod is located which rests on both balls. It is therefore a principal object of the present invention to provide a structure which will overcome all of the attendant difficulties above mentioned.

It is a further object of the invention to provide adjacent channel members wherein adjacent balls are adapted to roll side by side and on top of which the work rod is mounted.

A further object of the invention is to mount these balls in such a manner that their axis of rotation will be such with respect to the rod that a maximum longitudinal movement of the rod

may be had with a minimum rolling distance of the balls.

A still further object of the invention is to provide means on these channel members to support a cover over and around the balls to prevent any splashing of the acid thereon.

Other objects and purposes of the invention will appear more fully as the description proceeds.

To the accomplishment of the foregoing and related ends said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawing and following description set forth in detail certain means for carrying out my invention, said means constituting, however, but one of various ways in which the principle of the invention may be employed.

In said annexed drawing wherein like reference numerals refer to like parts throughout the various views:

Fig. 1 is a fragmentary section through an electroplating tank showing the manner in which my invention is to be used.

Fig. 2 is an enlarged fragmentary vertical section taken longitudinally through the mounting structure or support, and

Fig. 3 is a vertical section through the mounting.

In the use of my invention as illustrated, there is provided a tank 1 which has an electroplating bath 2 therein. A bracket or brace 3 is mounted at an end of the tank to which a motor 4 is secured. At one end of the motor there is a housing 5 which has a shaft rotatably mounted therein to the upper end of which a disk 6 is secured. Near the periphery of the disk a roller 7 is located which is adapted to lie between two bars 8 which are secured to the connecting rod 9 which extends between the outer ends of two of the work rods 10. At spaced apart points throughout the length of these rods hangers 11 are located at the lower end of which they may support an article 12 which is to be plated immersed in the bath 2. An angle member 13 is mounted across each end of the tank adjacent the top thereof which has mounted thereon the support for the rods in which my invention is embodied. There are two of these supports for each rod, the number of which may be varied depending upon the size of the tank, one adjacent each end thereof. A reciprocating motion is imparted to the work rods by the rotation of the disk 6 by means of the motor 4 through the roller 7 mounted thereon between the bars

8. It will be obvious that a rotation of the disk 6, the roller 7 being permitted to move lengthwise between the bars 8, will cause a reciprocating movement of the rods 10.

In the invention itself there is provided a base or supporting member 14 having sides 15 and within which longitudinally thereof the channel members are located within which the balls are adapted to roll. While the particular shape and size of the channel members may be varied, for purposes of illustration I have shown these members as having outer legs 16, inner legs 17 and connecting webs 18. In the form shown each of the outer legs is substantially vertical and the inner legs converge upwardly and meet at their upper ends thereby forming two substantially V-shaped channel members in which a ball is adapted to roll.

A ball 19 is located in each channel and is of such size with respect thereto, and the sides of the channels are located in such a way, that perpendiculars through the axis of the rotation of each ball will converge toward the work rod 10 which is resting thereon.

It is to be noted particularly that the contact of each ball with an outer leg 16 is at a point above the contact thereof with the inner leg 17. This is important because it enables the bearing point between the rod and the balls to be located more closely to the perpendicular through the axis of rotation of the ball. This, in turn, is necessary to get the greatest possible ratio between the distance through which the balls move and the distance through which the rod is to travel.

Explaining further, it will be obvious that if the bearing contact of each ball with inner and outer legs of a channel member were in a horizontal plane, and the contact between the rod and the balls were to be as shown in Fig. 3, while the rod would still move a greater distance than the balls, it would not be as great a distance compared to the distance through which the balls move as is the actual case shown.

In actual use of this mounting structure where the axis of rotation of the balls is substantially as shown, and a 1¼-inch diameter rod is used, the ratio is approximately 4 to 1. In other words, the rod will move through a distance of almost twelve inches while the balls move the length of a three-inch channel. This ratio may be varied or changed by changing the axis of rotation of the balls, or by spacing the balls farther apart, or by using a rod of larger or smaller diameter. If the axis of rotation of the balls is to remain the same but they are to be moved farther apart, the same size rod as shown would not move through as great a distance as it does now. The discovery and reduction to practice of this type of mounting and the manner in which the ratio between the rod and the balls may be changed is the essence of the present invention. The location of the bearing contacts between the balls and the legs of the channels are the most important feature of the construction when combined with a rod resting on both balls. The shape or configuration of the channel members themselves below the points of bearing contact with the balls is of little or no importance. In other words, as illustrated, providing the bearing

contacts between the balls and the channels remain the same, the inner legs could be vertical as well as the outer legs or they could be made integral or have any other configuration. These changes would obviously not alter the ratio between the moving parts as shown.

A further and important advantage arising out of this construction is the fact that, when acid is splashed or spilled on the channels or the balls a thin scale is formed and when this scale is crushed between one of the balls and its channel member it peels or scales off and drops to the bottom of the channel in no way impairing the efficiency of the structure. It has been determined in actual practice that in the former V-shaped roller they would have to be inspected daily to insure that they would be still freely rotatable, but this construction with the ball bearings need only be inspected in a period of months. Furthermore, the former rollers had to be replaced about every six months whereas it is estimated conservatively that the present construction need be replaced only every two or three years.

This construction is also adapted to have a cover 20 located thereover to prevent any inadvertent splashing of the acid reaching the ball bearings. The cover now in use is substantially of the configuration shown having an upper arcuate section and a lower portion 21 which extends inwardly and downwardly for a short distance along the outer legs. Each outer leg is flared outwardly as at 22 for the purpose of releasably holding the cover in place.

From the foregoing it will be apparent that the present structure has numerous advantages over those now in use and will necessarily lower the cost of operation and maintenance. As a matter of fact, even the initial cost of this structure as compared to those now in use is less and the economic as well as structural advantages arising out of this construction will be apparent to those skilled in the art.

Other modes of applying the principle of my invention may be used instead of the one here described, change being made as regards the structure herein disclosed provided, however, that the means stated by any of the following claims or the equivalent of such stated means be employed.

I, therefore, particularly point out and distinctly claim, as my invention:

1. A rod mounting comprising, two channel members mounted side by side, a ball in each channel spaced upwardly from the bottom thereof mounted for rolling movement lengthwise thereof, the bearing contact of each ball against the outer leg of each channel member being at a point above the bearing contact thereof against the inner leg, and a rod mounted for longitudinal reciprocating movement on both of said balls.

2. A rod mounting comprising, a double channel member having two inner and two outer legs, said outer legs being higher than said inner legs, a ball in each channel having bearing contact with said outer leg thereof at a point above the bearing contact with the inner leg, and a rod mounted for longitudinal movement on both of said balls.

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