

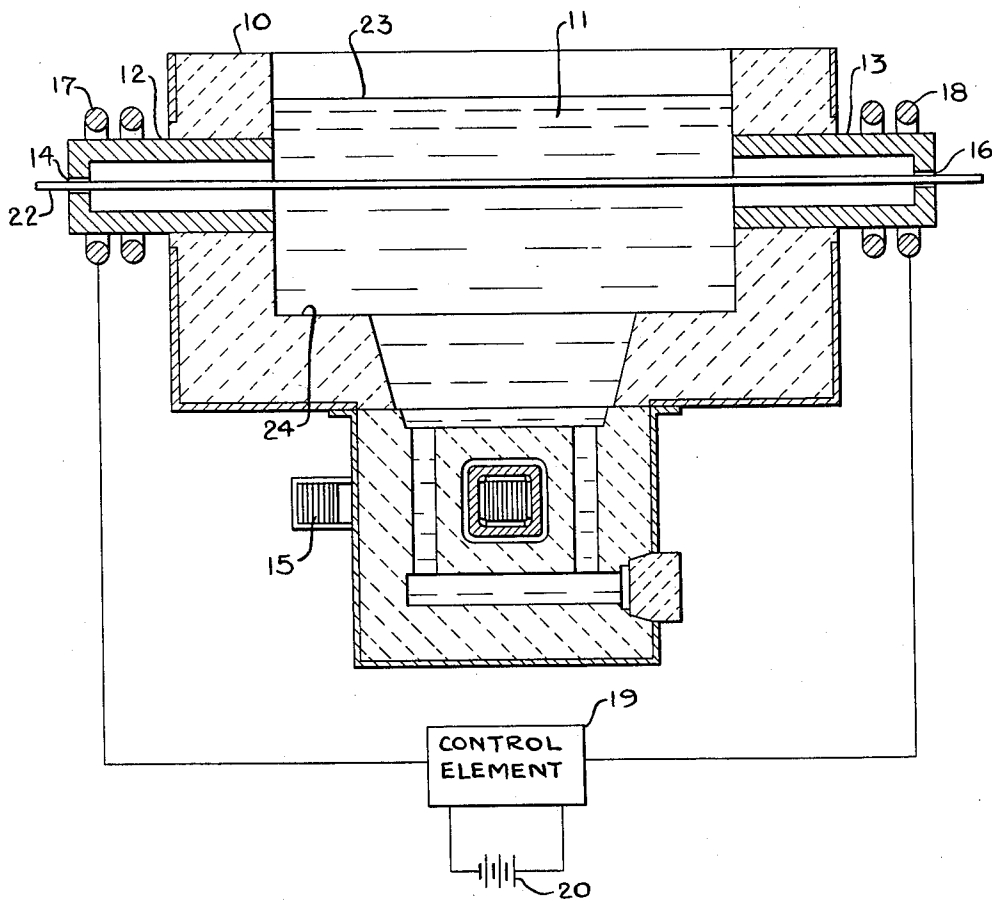
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2,834,692

ARTICLE METAL COATING

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HIS AGENTS.

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2,834,692

## ARTICLE METAL COATING

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Application March 14, 1955, Serial No. 494,205, which is a division of application Serial No. 281,333, April 9, 1952. Divided and this application March 28, 1957, Serial No. 649,259

2 Claims. (Cl. 117—93)

The invention relates to metal coating of articles, and relates more particularly to methods of and means for coating articles with molten metal by drawing them through a bath of the coating metal.

This is a divisional application of my application Serial No. 494,205, filed March 14, 1955, and entitled "Electromagnetic Valve," now abandoned, which in turn is a division of my application Serial No. 281,333, filed April 9, 1952, and which matured into Patent No. 2,707,720.

In my aforesaid copending patent application, there are set forth methods and means to control the discharge of molten metal from a metal container. Broadly speaking, the container there is provided with an opening through which the molten metal may normally flow out by gravity, but an electric field is applied that causes electric induction tensioning promoting a spherical arching effect in the molten metal near the opening, thereby preventing the outflow of metal through the opening whenever the electric field is applied. Conversely, when the electric field is removed, the molten metal will be released to flow through the opening until the electric field is re-applied. This arching effect control has been termed in said application an "electromagnetic valve."

The instant invention has among its objects to utilize the arching effect to restrain the outflow from a molten metal bath, through two apertures which are provided below the metal level to introduce an article to be drawn through the bath for metal coating.

The foregoing and other objects of the invention will be best understood from the following description of exemplification thereof, reference being had to the accompanying drawing.

The single view is a vertical sectional view of an apparatus in accordance with the invention.

A vessel or container 10 for holding molten metal 11 is shown that is made of suitable material such as refractory material for holding molten metal such as aluminum. The vessel 10 may be a furnace of the induction type with an inductor heating unit 15. The vessel 10 is provided with two nozzles or tubes 12 and 13, which define outlets or apertures 14 and 16, respectively. These nozzles 12 and 13 are in axial registry and disposed oppositely to each other relative to the vessel 10. The nozzles 12 and 13 are provided with induction coils 17 and 18, respectively and these coils are interconnected, by means of a control element 19, to an electric source 20. The control element 19 provides for synchronous switching off and on the coils 17 and 18.

This apparatus lends itself for metal coating such as galvanizing, of articles for instance wires or the like.

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The vessel 10 is arranged to maintain a bath of molten metal 11, such as coating material, for an article, for instance a wire 22, to be drawn through the opposite nozzles 12 and 13.

During actual use, the coils 17 and 18 are energized and the resultant tension within the metal disposed in the nozzles will restrain the metal from flowing out of the vessel through the outlets 14 and 16. Each outlet 14, 16 is so dimensioned that the area thereof is only slightly larger than the area of the sectional contour of the article to be drawn through the bath 11.

This permits the coating of articles 22 by drawing them through the bath while maintaining the same straight, without requiring any elastic deflection of the article from the straight position, eliminating thereby the need for any deflecting roller or similar auxiliary device heretofore in use for the coating of wire and other articles.

The invention affords the advantage that articles may be drawn through the coating bath in a horizontal direction. By a proper dimensioning of the height of the metal level 23 above the bottom 24 of the bath, and by proper spacing of the apertures 14, 16 and thereby of the article above the bottom 24 of the bath and below its level 23, the article will be drawn through the optimal region for coating. This region is spaced above the bottom and therefore is free from any dross that may accumulate on the bottom 24. On the other hand, the region is below the level 23 and therefore free from any solid particles, such as may be suspended near the level 23 of the metal.

I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

Having thus described the invention, what I claim as new and desire to be secured by Letters Patent is as follows:

1. In an article coating apparatus, a container for molten electrically inductable metal, heating means for said container to keep said metal molten, said container having in its side wall below the metal level two oppositely disposed horizontal passages adapted to pass articles apt to withstand metal melting temperature drawn through said molten metal to receive a metal coating, each passage having an outlet of a contour slightly larger than the contour of said article, and an induction coil surrounding each passage and being interconnected to an electric source and operable to produce in the metal disposed within said passages a tension sufficient to restrain discharge of the metal through said outlets.

2. In a method of electrically coating elongated articles, apt to withstand metal melting temperature, in a container for molten electrically inductable metal having two opposite apertures disposed below the metal level, the steps comprising, inserting said article in one aperture and drawing it through said bath and through said other aperture, and restraining gravitational outflow of metal through said other apertures by electric induction tensioning applied to the metal bath.

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