Sept. 6, 1938. A. L. KRONQUEST 2,129,220

APPARATUS FOR APPLYING ENAMEL TO CAN BODIES

Filed July 6, 1936 2 Sheets-Sheet 1

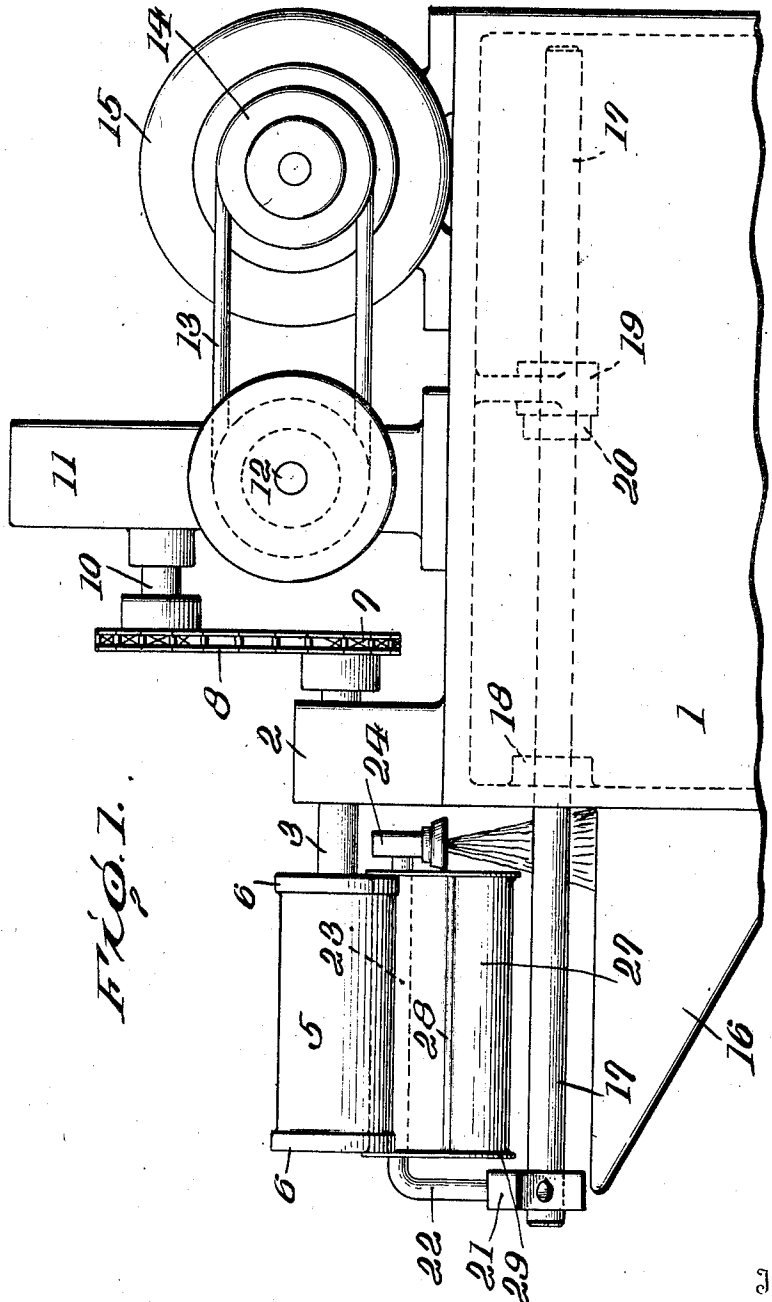


FIG. 1.

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Fig. 2.

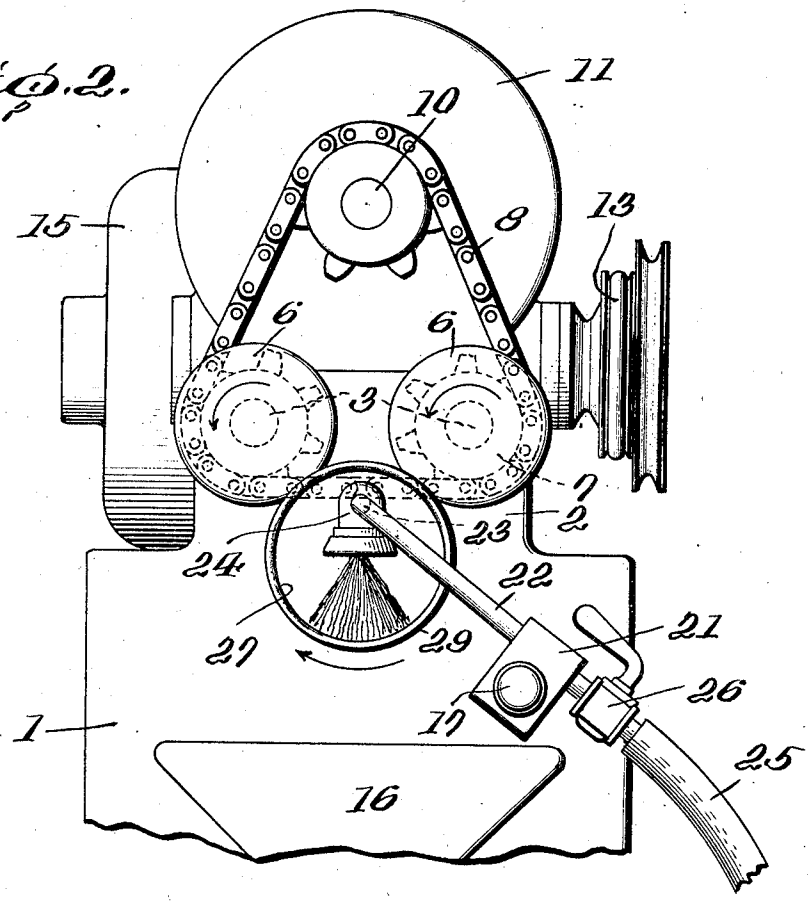
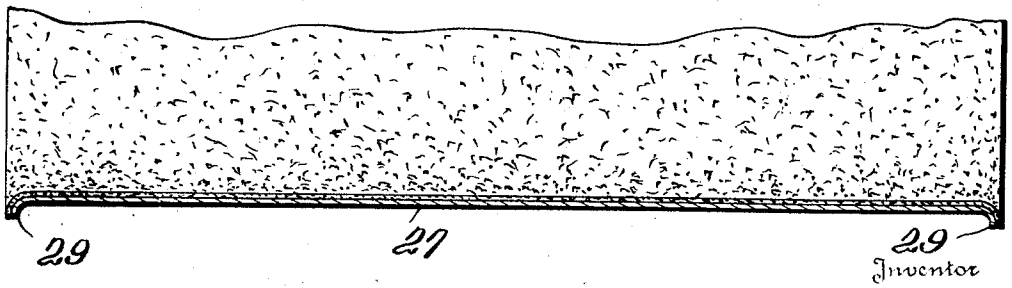


Fig. 3.



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UNITED STATES PATENT OFFICE

2,129,220

APPARATUS FOR APPLYING ENAMEL TO CAN BODIES

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Application July 6, 1936, Serial No. 89,255
In Great Britain October 3, 1935

1 Claim. (Cl. 91—44)

The invention relates to new and useful improvements in an apparatus for enameling the inner surface of a body.

An object of the invention is to provide an apparatus for applying a thin coating of enamel to the inner surface of a can body after it is side seamed and flanged so that a coating of uniform thickness is provided which covers the entire inner surface of the can body extending to the outer edges of the flanges.

In the drawings—

Figure 1 is a side view of an apparatus embodying the invention;

Fig. 2 is an end view of the same; and

Fig. 3 is a view in section showing a portion of a can body flanged and coated by the improved method and apparatus.

It is well known that when certain substances are stored in metal cans so as to contact with the metal surface thereof, a reaction takes place, which although slow, has a deleterious effect on the substance contained therein. Particularly is this true where beer is stored in metal cans, since the reaction between the beer and the metal effects cloudiness of the beer. To prevent this it is essential that the entire inner surface of the can shall be covered with a substance which has no clouding effect upon the beer. The present invention has to do with an apparatus for applying a coating of enamel to the can body after it has been side seamed so as to insure the covering of the meeting edges at the side seam and the solder bond joining the same. The invention also contemplates the coating of the can body with enamel after it is flanged so that the covering for the inner surface of the can body extends all the way out to the edge of the flanges. When the can body is coated in the manner stated, then by the use of properly coated can ends wherein the coating extends all the way across the channel of the can ends, a can is constructed so that the entire inner surface is covered with a non-metallic material which extends out into the double seam so that the contents of the can cannot pass into the double seam to an extent sufficient to contact with the exposed metal. In my co-pending application Serial No. 725,184, filed May 11, 1934, there is shown and described a can such as described above wherein the can body is coated throughout the entire inner surface thereof and the coating extends to the edges of the flanges.

In the drawings, there has been illustrated more or less diagrammatically an apparatus embodying the invention. The apparatus includes a supporting frame structure 1 having a bearing bracket 2 fixed thereto. Mounted in the bearing bracket 2 are two shafts indicated at 3, 3 in the drawings. Each shaft is provided with a magnet 5 having annular projected pole pieces 6, 6. Each shaft is also provided with a sprocket wheel 7 on the inner end thereof. A sprocket chain 8 runs over these sprocket wheels and also over a sprocket wheel 9 on the shaft 10. The shaft 10 is mounted in a bracket 11 which is carried by the frame 1. This shaft 10 carries a spiral gear meshing with a worm on the shaft 12 and said spiral gear is so dimensioned relative to the worm on the shaft 12 that the speed of the shaft 10 is much less than the speed of the shaft 12. The shaft 12 is driven by a belt 13 running over a belt wheel carried by the shaft, and also running over a belt wheel 14 on the actuating shaft of a motor 15. This motor 15 is likewise mounted on the frame 1. The frame 1 contains a tank in which is placed an enamel which is to be coated upon the can body. Extending from the frame 1 is a receptacle 16 having a connection with the tank in the frame 1.

Mounted in the frame 1 is a rod 17. This rod 17 is adapted to move endwise in bearings 18 and 19 carried by the frame 1. The rod is provided with a collar 20 which contacts with the bearing 19 to limit the movement of the rod to the right, as viewed in Fig. 1, and contacts with the bearing 18 to limit the movement of the rod to the left, as viewed in said figure. Mounted on this rod is a head 21. Carried by the head 21 is a pipe 22 which extends at right angles to the rod and is thence bent so as to provide a portion 23 which extends parallel with the rod. Mounted on the end of this horizontal portion 23 is a spray head 24. The pipe 22 extends through the head 21 and is connected to a supply pipe 25. A valve 26 is provided for regulating the flow of coating to the spray head 24. This pipe 25 is connected to any suitable means for supplying the coating material under pressure so that it is forced from the spray head in the form of a fine spray.

The can body to be coated is illustrated at 27. Said can body is provided with the usual side seam 28. In other words, the can body is made from a blank which is rolled into cylindrical form, and then the edges are joined, preferably by a lock and lap seam, which is referred to as the side seam of the can body. After the edges have been interlocked, then a solder bond is applied for securing the same. Upon the completion of the side seam, the can

body is subjected to flanging dies and the ends thereof are formed with flanges indicated at 29, 29 in the drawings. This is the well-known way of making a cylindrical can body. The can body is supported by the magnets 5, 5 during the coating of the same. Let us assume that the rod 17 is moved all the way to the left, as viewed in Fig. 1. The can body is then placed in contact with the magnets and the magnets are each so dimensioned that the poles of the magnets engage the can body adjacent the flanges. The magnets are rotated and as the magnets rotate, they will rotate the can body. The flanges will prevent the can body from moving endwise on the magnets during the rotation thereof. It is the magnetic attraction of the poles that holds the can body suspended, and the rotation of the magnets that causes the can body to rotate. The valve 26 is opened, and then the rod 17 is moved to the right from the position just described for the placing of the can body in the magnets. This movement of the rod will cause the spray head to pass into the can body and move lengthwise thereof, and thence out of the other end of the can body. The receptacle 16 will catch any coacting issuing from the spray head which does not contact with the can body and direct it back into the storage tank. The amount of coating issuing from the spray head is regulated and the rotation of the can timed so that as the head moves into and through the can body, every portion of the can body will be brought beneath the spray head so that the entire inner surface of the can body will be covered with the enamel coating. Inasmuch as the head moves from a position outside of the can body into the can body, it will coat the flange all the way to the edge thereof at the receiving end of the can body. Likewise, as the head moves out of the can body at the other end, it will coat the flange all the way to the edge thereof. After the can body has been coated, the rod is moved to the left and the spray head again passed through the can body and retracted therefrom. The coating material may be supplied to the inner surface of the can while the spray head is moving in both directions, if desired, or the supply may be cut off and the spray head then withdrawn from the can body. It is essential that the spray head shall be withdrawn from the can body to facilitate the removal of the can body from the supporting magnets.

It will be understood that the apparatus may be greatly modified as to the manner of supporting the can body and rotating the same, also as to the manner of supporting and moving the spray head, but it is essential that the can body shall be rotated and the spray head given a relative movement into the can body, through the can body and out of the other end thereof during the coating operation. While the spray head in the apparatus as illustrated is moved manually, it will be understood that other ways may be provided for the mounting of the head and the moving of the same. While the enamel has been referred to as of a character wherein a solvent is used as a vehicle for flowing the enamel over the surface of the can body, it will be understood that from certain aspects of the invention, a thermoplastic enamel may be used which is reduced to liquid form for flowing over the can body by the application of heat and which is set by cooling.

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

An apparatus for coating can bodies comprising a supporting frame, a pair of spaced rotating shafts mounted on said frame, a magnet carried by each shaft, means for rotating said magnets, each magnet including pole pieces spaced so as to engage a flanged can body inside of and adjacent the flanges for supporting and rotating the can body, a spray head, means for supporting said spray head whereby the same may be moved in a direction parallel with the axis of rotation of the can body, from a position outside of the can body, into one end thereof and through the can body and out of the other end thereof.

ALFRED L. KRONQUEST.