Jan. 21, 1930. C. J. LEMONT 1,744,273

APPARATUS FOR HANDLING ARTICLES SUBJECTED TO A GALVANIC ACTION

Filed Jan. 25, 1926 3 Sheets-Sheet 1

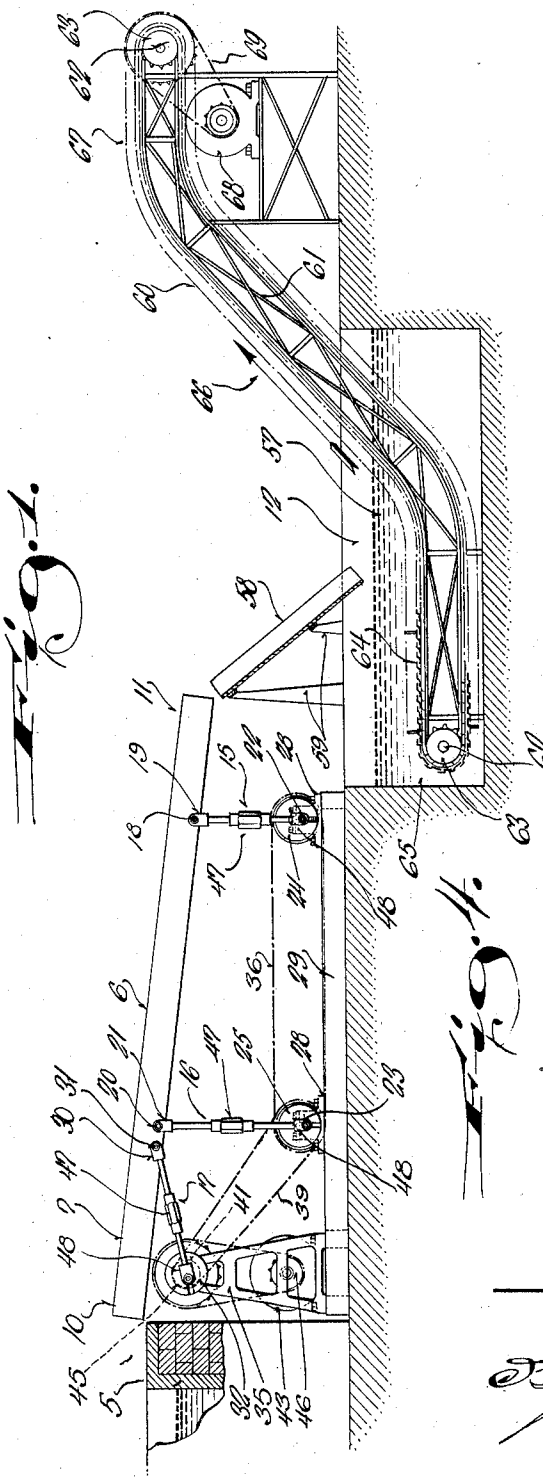


Fig. 1.

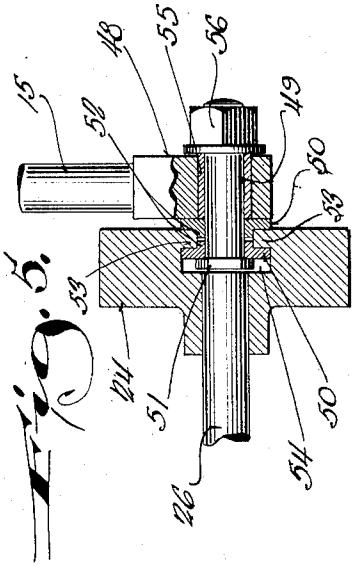


Fig. 5.

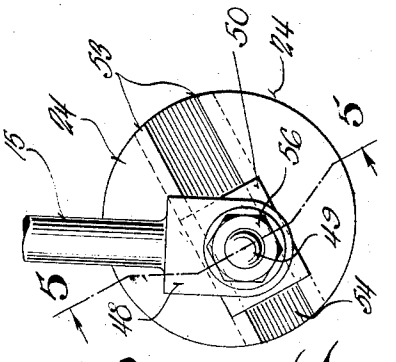


Fig. 4.

Inventor

Clarence J. Lemont

By Ira Milton Jones.

Attorneys

Jan. 21, 1930. C. J. LEMONT 1,744,273

APPARATUS FOR HANDLING ARTICLES SUBJECTED TO A GALVANIC ACTION

Filed Jan. 25, 1926 3 Sheets-Sheet 2

Fig. 2.

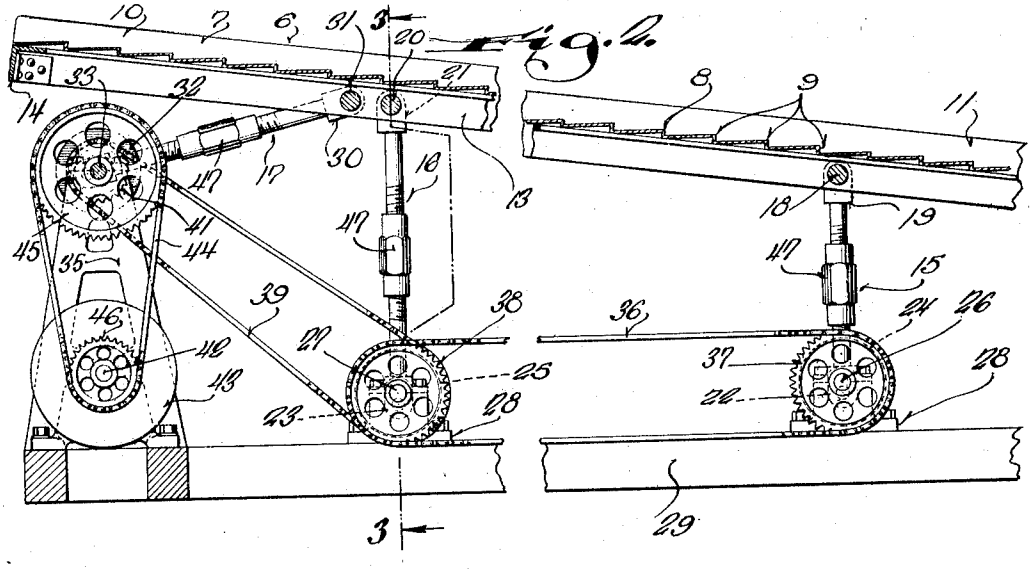
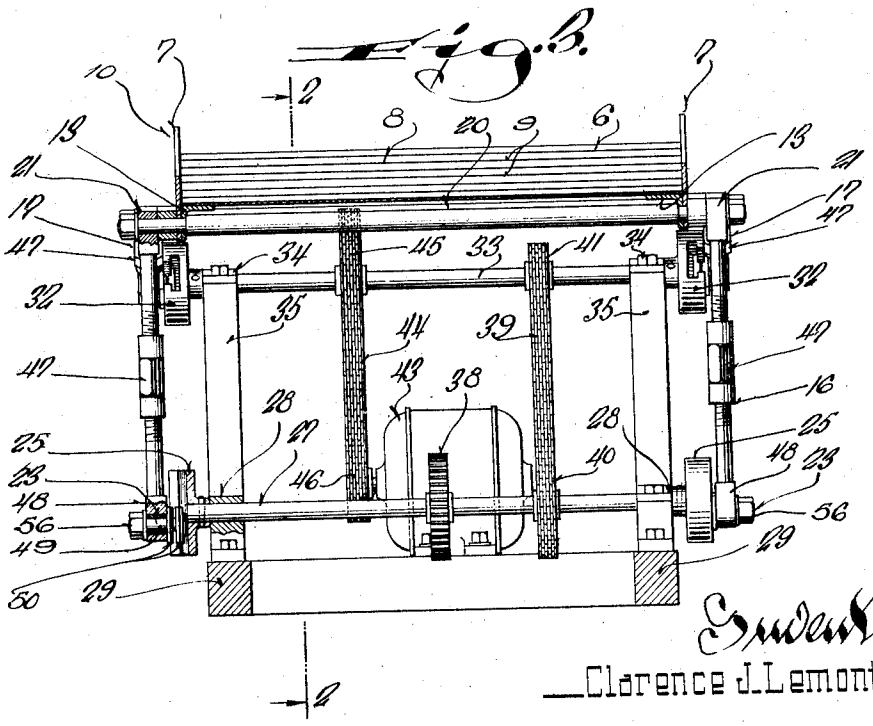


Fig. 3.



Clarence J. Lemont

By Ira Milton Jones

Attorney

Jan. 21, 1930. C. J. LEMONT 1,744,273

APPARATUS FOR HANDLING ARTICLES SUBJECTED TO A GALVANIC ACTION

Filed Jan. 25, 1926 3 Sheets-Sheet 3

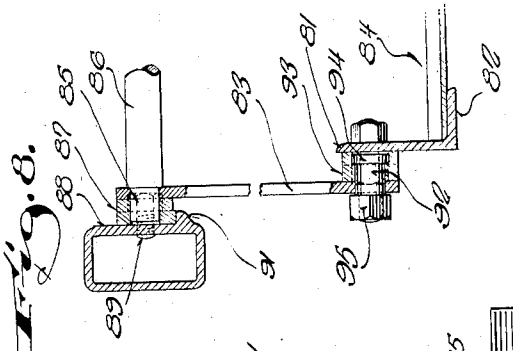


Fig. 8.

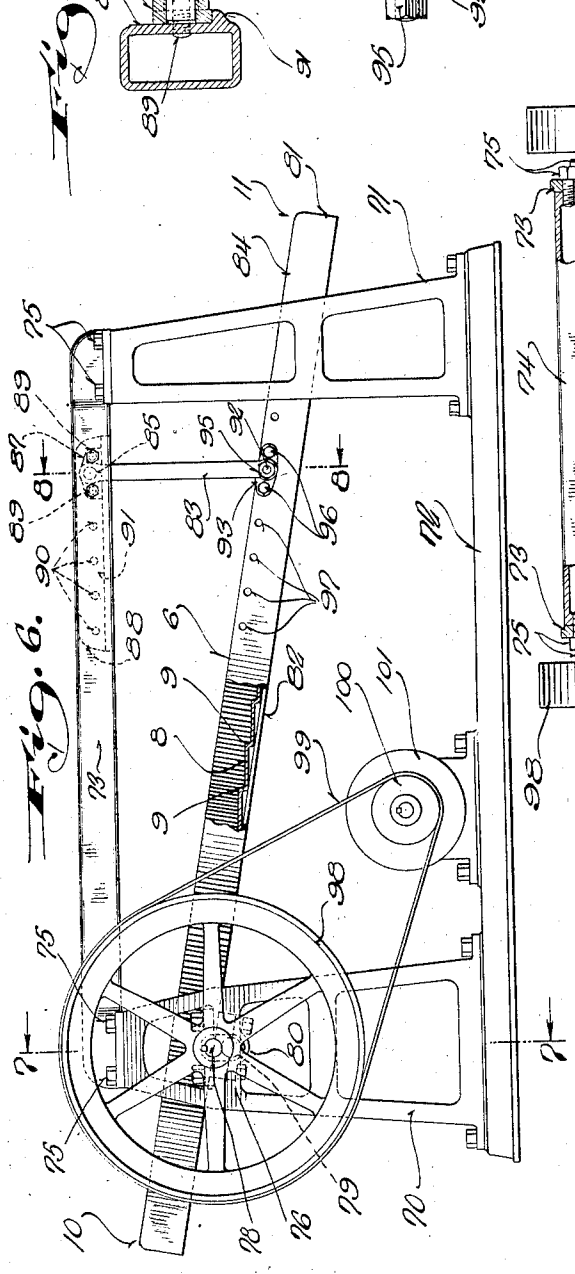


Fig. 6.

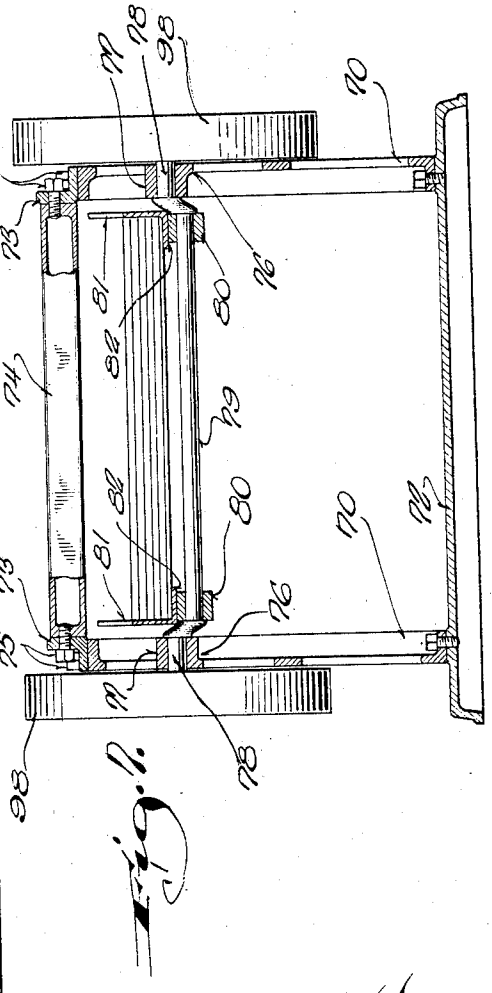


Fig. 7.

Inventor

Clarence J. Lemont

By Ira Milton Jones.

Attorneys

Patented Jan. 21, 1930

1,744,273

UNITED STATES PATENT OFFICE

CLARENCE J. LEMONT, OF SOUTH MILWAUKEE, WISCONSIN, ASSIGNOR, BY MESNE ASSIGNMENTS, TO LINE MATERIAL COMPANY, OF MILWAUKEE, WISCONSIN, A CORPORATION OF DELAWARE

APPARATUS FOR HANDLING ARTICLES SUBJECTED TO A GALVANIC ACTION

Application filed January 25, 1926. Serial No. 83,565.

Considerable difficulty has been experienced in galvanizing articles, as the excess coating forms in beads or lumps and while the coating is hardening extreme care must be employed to prevent the adherence of the articles to each other or to the support for otherwise sharp barbs or projections are produced when the articles are separated.

It is therefore an object of this invention to provide an improved method of and apparatus for handling articles as they leave a galvanic bath whereby adherence of the articles together is prevented and a smooth unbroken surface produced.

Another object of this invention resides in the provision of an improved apparatus of the character described having means for removing excess coating from galvanized articles and preventing the excess coating from hardening in lumps or heads on the articles.

A further object of this invention resides in the provision of an improved apparatus to which galvanized articles are delivered directly from the galvanizing kettle and to be automatically tumbled or discharged into a cooling trough and delivered by a conveyer to a suitable point of discharge.

A still further object of this invention resides in the provision of an improved tumbler for handling galvanized articles while in a soft state, which is in the form of a reciprocating inclined trough having a stepped bottom, the inclination and degree and speed of reciprocation of which are capable of ready adjustment.

With the above and other objects in view which will appear as the description proceeds, my invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the herein disclosed invention may be made as come within the scope of the claims.

In the accompanying drawings, I have illustrated two complete examples of the physical embodiment of my invention constructed according to the best modes I have so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a diagrammatic layout of an apparatus embodying my invention;

Figure 2 is a fragmentary view, partly in section and partly in elevation, taken longitudinally through the dumping trough on the plane of the line 2—2 of Figure 3;

Figure 3 is a view, partly in section and partly in elevation, taken through Figure 2 on the plane of the line 3—3;

Figure 4 is a large fragmentary detail view of one of the means for adjusting the reciprocation of the dumping trough, and

Figure 5 is a view, partly in section and partly in elevation, taken through Figure 4 on the plane of the line 5—5;

Figure 6 is a side elevational view of a modified form of my invention, a part thereof being broken away and in section;

Figure 7 is a transverse, sectional view, taken through Figure 6 on the plane of the line 7—7; and

Figure 8 is a fragmentary, sectional view, taken through Figure 6 on the plane of the line 8—8.

Referring now more particularly to the accompanying drawing, in which like numerals designate like parts throughout the several views, the numeral 5 designates a galvanizing kettle of suitable construction in which the articles are adapted to receive their galvanic coating. Heretofore it has been customary to dip an article in the galvanic bath, withdraw and shake the article in order to remove excess material, examine the article carefully and if any bare or uneven spots show, redip it, this step being repeated until the desired coating is obtained.

This tedious hand work is eliminated by the apparatus illustrated in Figure 1, and the articles as they are removed from the galvanic bath are deposited on a tumbling trough 6 having side walls 7 and an irregular or stepped bottom wall 8, the steps or irregularities of which extend transversely and have their high points forming shoulders or drops 9 located remote from the kettle 5. The trough 6 is mounted for longitudinal and vertical reciprocation, its ends being recip-

rocated simultaneously in opposite vertical directions, so that articles placed thereon at its elevated or receiving end 10 are conveyed directly onto a conveyer or into a cooling trough 12, to be later described.

The trough 6 is suitably carried by an approximately rectangular shaped frame including longitudinal sills 13 and transverse end members 14 and is supported for oscillatory movement by pairs of adjustable pitmen or standards 15, 16 and 17, the pitmen 15 and 16 imparting the vertical reciprocation to the trough and the pitmen 17 longitudinal movement. The pitmen 15 are connected with the side sills 13 adjacent the discharge end of the trough by a transverse rod 18 passing through the sills and through journal blocks 19 on the upper ends thereof and the pitmen 16 are connected with the sills adjacent the receiving end of the trough in a similar manner, a rod 20 traversing the trough and passing through the sills and journal blocks 21 fixed to the upper ends thereof. The lower ends of the pitmen 15 and 16 are eccentrically pivotally connected, as at 22 and 23, respectively, with discs or wheels 24 and 25 fixed to the ends of the shafts 26 and 27 journaled in bearing members 28 fixed to the base frame 29 of the apparatus. The pitmen 17 have bearing members 30 formed on their upper ends to receive a rod 31 connecting the sills and the lower ends of the pitmen are eccentrically connected with wheels or discs 32 mounted on a shaft 33 journaled in the upper ends 34 of standards 35 secured to the base or foundation frame of the device.

The shafts 26 and 27 are connected by a chain 36 trained about sprockets 37 and 38 on the shafts and the shaft 27 is connected with the shaft 33 by a chain 39 trained about sprockets 40 and 41 fixed to the shafts 27 and 33 respectively. The shaft 33 is a driven shaft being connected with the drive shaft 42 of a motor or other power unit 43 by a chain 44 trained about a sprocket 45 fixed to the shaft 33 and a sprocket 46 fixed to the drive shaft. In this manner the pitmen 15, 16 and 17 are simultaneously reciprocated and the eccentric connections with their respective shafts is such that the pitmen 15 are moved upwardly as the pitmen 16 move downwardly and the pitmen 17 move to the right with reference to the drawings as the pitmen 16 move upward, causing the trough to oscillate and progressively move the articles thereover to its discharge end, the steps 9 progressively advancing the articles as will be readily apparent.

The various pitmen are each adjustable as to length by means of a turn buckle screw 47 having its ends provided with internal right and left threads in which the inner ends of the parts forming the pitmen are threaded so that rotation of the turn buckle screw of a pitman in one direction lengthens the same and a reverse rotation contracts or shortens the same. Each pitman is connected with its wheel in the manner illustrated in Figures 4 and 5, having its lower end provided with a bearing member 48 in which a journal pin 49 is journaled, the pin 49 having two washer members 50 on its inner end confined between its head 51 and the bearing 48 and provided with bosses or enlargements 52 on their adjacent surfaces to form a recess in which are clamped the longitudinal flanges 53 of an approximate T-shaped recess 54 extending across the outer face of the wheels fixed on the shafts to which the pitmen are connected. Bearing sleeves 55 are secured in the bearings 48 and project slightly beyond the sides thereof so that the nuts 56 may be drawn tight to firmly clamp the pins 49 in place with respect to the axis of its wheel 24 by clamping the flanges 53 between the washers 50. As will be evident, the throw of a pitman is adjusted by loosening its nut 56 and moving the pin along the T-shaped slot to the desired eccentric position, when the nut 56 is again tightened.

The cooling trough 12 is preferably filled with a suitable liquid 57, such as water, and articles conveyed through the trough or conveyer 6 are discharged from its end 11 into the liquid by a chute 58 mounted on standards 59 and inclined from the discharge end of the conveyer into the trough. An approximate S-shaped conveyer 60, consisting of a supporting frame-work 61 in the ends of which shafts 62 carrying sprockets or pulleys 63 are mounted and a conveyer belt or chain 64 trained about the sprocket 63, has its receiving end 65 immersed in the liquid of the cooling tank with its intermediate inclined portion 66 extending upwardly to its discharge end 67 arranged to discharge the finished articles at a suitable point of storage or into a container, not shown. The conveyer is driven by a motor or other source of power 68 connected with one of the shafts 62 by a sprocket and chain connection 59.

In Figures 6 to 8, inclusive, a slightly modified construction of conveyer is illustrated which consists of pairs of end standards 70 and 71 fixed to a base frame structure 72 and connected at their upper ends by longitudinal side sills or beams 73 and end transverse beams 74, preferably of hollow cast construction connected to the standards by machine bolts or other means 75. The standards are preferably skeletonized for economy in weight and material and the standards 70 have transverse members 76 in which bearings 77 are formed for journaling a drive shaft 78, the medial portion of which is offset to provide a crank 79 on which rest the bearings 80 of the trough or oscillating conveyer.

In this form of my invention the conveyer 6 is constructed of a pair of spaced longi-

tudinal angle irons 81, the lower horizontal portions 82 of which are connected by the stepped bottom 8 and the bearings 80 are fixed to the horizontal portions 82 of the angle iron members. In this manner rotation of the shaft 78 moves the conveyer receiving end vertically and at the same time shifts it longitudinally. The discharge end of the conveyer is supported from the side beams 73 by a pair of suspension links 83, the upper ends of which are pivotally and longitudinally adjustably connected with beams 73 and the lower ends of which are pivotally and longitudinally adjustably connected with the side portions 84 of the angle members 81.

The upper ends of the links 83 are journaled on the reduced ends 85 of a rod 86 of a width slightly less than the space between the side sills 73, the reduced ends 85 projecting beyond the links 83 into bearing blocks 87 of approximately flange shape and adjustably securable to the inner dressed surfaces 88 of the side sills by machine screws or other means 89 engageable in threaded openings 90 therein. The point of pivotal connection of the links 83 with the side sills 73 may be longitudinally adjusted by removing the machine screws 89 and shifting the bearing blocks bodily until the openings therein register with the desired openings 90 when the machine screws are screwed home.

Flanges 91 extending along the lower portions of the dressed surfaces 88 cooperate with the members 87 to provide a support for suspending the links 83 and consequently the discharge end of the conveyer when the machine screws are removed to facilitate the adjustment of the device. The lower ends of the links 83 are adjustably connected with the conveyer in a manner somewhat similar to the connection of the upper ends thereof with the side beams 73, pivot pins 92 being carried by attaching flanges or blocks 93. The pins have heads 94 on one side and nuts 95 threaded on their opposite ends in the manner illustrated in Figure 8, the flanges 93 being longitudinally adjustably secured to the vertical portions 84 of the side beams 81 by machine screws or other means 96 engageable in threaded openings 97 in the side beams 81.

The shaft 78 has balance fly wheels 98 fixed on its ends and about one of which is trained a belt 99 connected with a pulley 100 fixed on the shaft of a drive motor 101. This construction imparts the desired movement to the conveyer and at the same time has a tendency to eliminate excessive vibrations.

The various articles to be coated are removed from the kettle 5 and placed on the receiving end of the conveyer 6 either mechanically or manually and the oscillatory movement of the conveyer previously described causes the same to be tumbled and progressed from the receiving end to the discharging end, the oscillation of the trough assisted by the stepped portions 9 preventing any two articles from remaining in contact and the jars imparted to the articles as they progress through the conveyer removing all excess coating therefrom that may tend to harden in beads and form an uneven surface. By the time the articles have passed through the length of the conveyer or tumbler 6 the excess material has been sufficiently removed and they are then discharged into the cooling fluid of the trough or tank 12 and are deposited on the receiving end of the conveyer 60 being carried thereby upwardly and then horizontally to a container, not shown, or onto a pile on the floor to be removed by an attendant.

It has been proven by actual practice that articles given a galvanic coating and handled by the improved apparatus hereindescribed and shown in the accompanying drawings, have an even coating and the formation of the sharp barbs or projections eliminated, as the articles are held out of contact with each other as the coating hardens and the necessity of breaking any two articles apart and the consequent formation of the objectionable sharp barbs is eliminated.

What I claim as my invention is:

1. The combination with means for applying a coating to articles, of a tumbling device comprising a substantially trough shaped member having a stepped bottom and arranged with its receiving end adjacent the coating means, means for imparting vertical and longitudinal reciprocation to said trough shaped member to convey articles placed thereon to the opposite end of said device to be discharged therefrom, a cooling bath into which the articles are discharged, and a conveyer having its receiving end positioned within the cooling bath to receive the articles discharged therein and convey them to a remote point.

2. In an apparatus of the character described, the combination with means for applying a coating to articles, of a tumbling device having its receiving end positioned adjacent said coating means to receive articles therefrom, said tumbling device including a flat stepped member having sides to form substantially a trough, means imparting vertical and longitudinal reciprocation to said member to cause articles placed thereon to progress toward its discharge end, a cooling bath adapted to receive articles discharged from said member, and a conveyer having its receiving end disposed in the cooling bath whereby the articles discharged into the cooling bath are picked up by the conveyer to be carried to a remote point.

In testimony whereof I affix my signature.

CLARENCE J. LEMONT.