

No. 859,966.

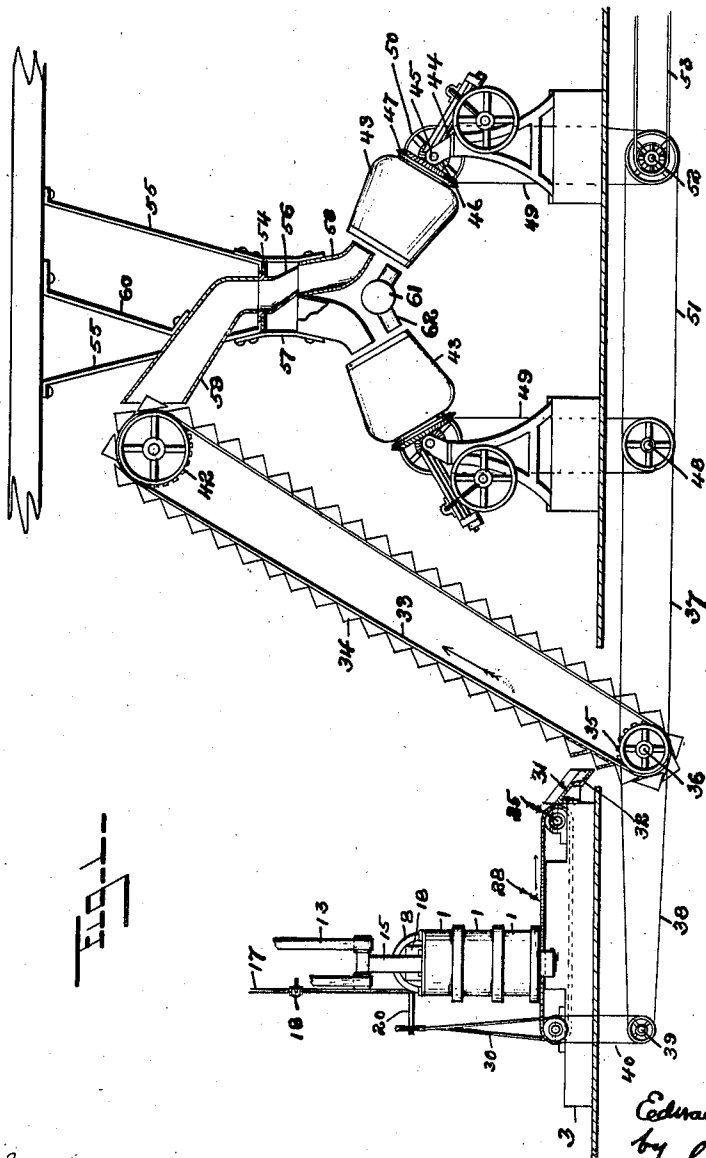
PATENTED JULY 16, 1907.

E. S. MOWRY.

APPARATUS FOR COOLING AND FINISHING METAL COATED ARTICLES.

APPLICATION FILED JUNE 14, 1906.

2 SHEETS—SHEET 1.



Witness

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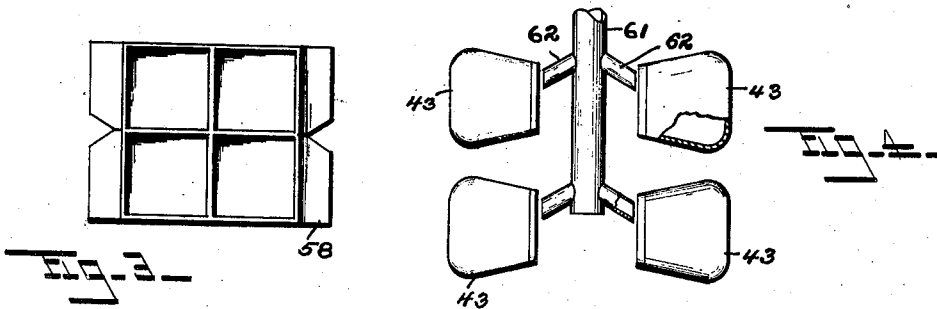
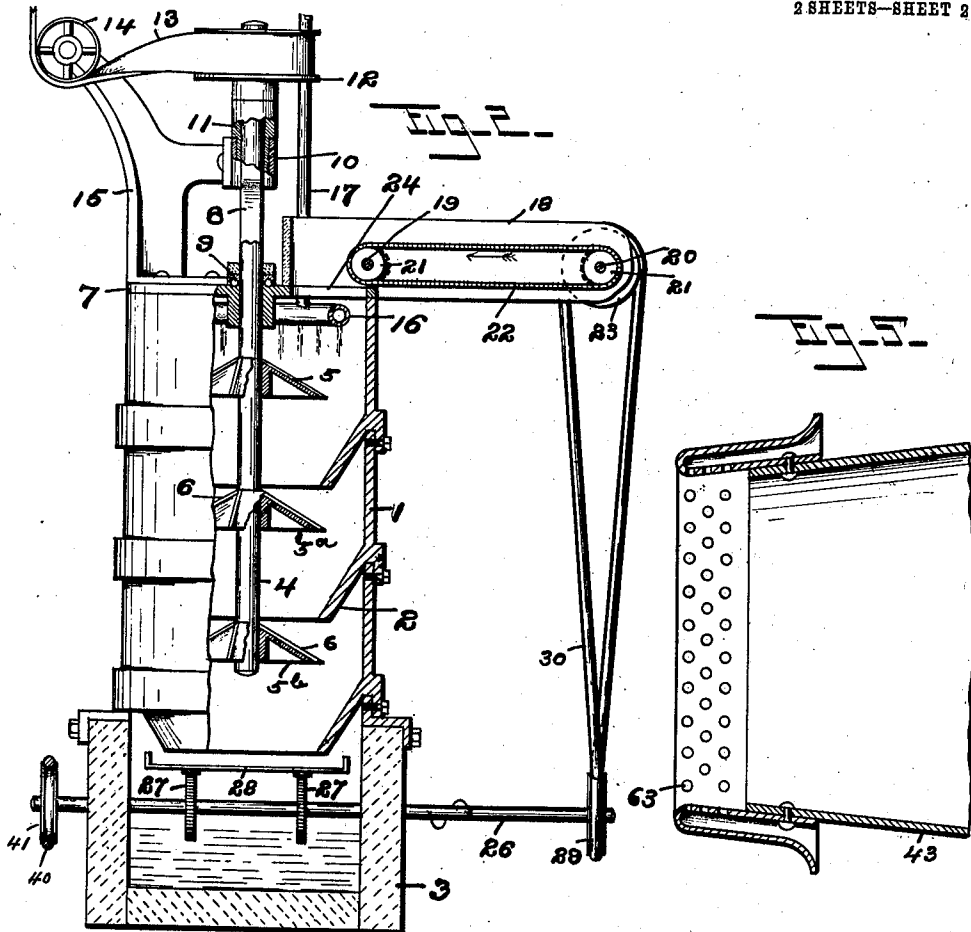
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2 SHEETS—SHEET 2.



Witness

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UNITED STATES PATENT OFFICE.

EDWARD S. MOWRY, OF MIDDLETOWN, CONNECTICUT, ASSIGNOR TO WILCOX, CRITTENDEN AND COMPANY, OF MIDDLETOWN, CONNECTICUT, A CORPORATION OF CONNECTICUT.

APPARATUS FOR COOLING AND FINISHING METAL-COATED ARTICLES.

No. 859,966.

Specification of Letters Patent.

Patented July 16, 1907.

Application filed June 14, 1906. Serial No. 321,667.

To all whom it may concern:

Be it known that I, EDWARD S. MOWRY, a citizen of the United States, residing at Middletown, in the county of Middlesex and State of Connecticut, have invented certain new and useful Improvements in Apparatus for Cooling and Finishing Metal-Coated Articles, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to new and useful improvements in apparatus for cooling and finishing metal coated articles, and refers more particularly to a device that receives metal articles after they have been coated with zinc, tin, or other similar substance for cooling and removing the excess metal therefrom; and it is the object of my invention, among other things, to construct a device of this character, of the fewest possible parts, so designed as to be economically constructed and readily assembled, that will effectually remove every particle of excess metal, will cool the articles as soon as possible after they have been placed in the machine, and will produce a more satisfactory product than is possible under present methods.

To these, and other ends, my invention consists in the apparatus for cooling and finishing metal coated articles, having certain details of construction and combinations of parts as will be hereinafter described and more particularly pointed out in the claims.

Referring to the drawings, in which like numerals of reference designate like parts in the several figures; Figure 1 is a side elevation of my improved apparatus complete; Fig. 2 is an enlarged fragmentary sectional elevation of the separator and adjacent mechanism; Fig. 3 is an enlarged plan view of the distributing chute; Fig. 4 is a plan view of the tumbling barrels and the air blast mechanism adjacent thereto; and Fig. 5 is an enlarged sectional view of the open end of one of the tumbling barrels.

In the practice of my invention I provide a separator which is preferably constructed with a plurality of concentric sections I secured one above the other with the lower section fastened to a trough 3. Each of these sections terminates at its bottom end in an inwardly flaring shell 2. A shaft 4 is rotatable within said separator and journaled within the cover 7 and bushing 11 in the hub 10 of the stand 8 fixed to said cover, a ball bearing device 9 taking the weight of said shaft and reducing the friction. This shaft is rotated by a belt 13 driven by any convenient means and passing over pulley 12 and idler pulleys 14 that are mounted on a bracket 15 fixed to the cap 7 and stand 8. Fixed on said shaft are the conical disks 5, 5^a and 5^b having beater ribs or wines 6 upon their upper surfaces.

Within the separator, below the cap 7, is a perforated pipe 16 that is connected with a water supply by an inlet pipe 17 having a valve 18 conveniently fixed therein. Fixed to the cap 7, and projecting laterally therefrom, is a casing 18, within which shafts 19 and 20 are journaled. Each of said shafts has a sprocket wheel 21 thereon which engages and actuates an endless carrier 22 of any preferred form or type which moves in substantially a horizontal plane with the inner end thereof over an aperture 24 in the cap 7.

Rotatably connected with the trough 3 are the shafts 25 and 26, to which are fixed sprocket wheels 27 which engage and actuate a substantially horizontal carrier 28 that moves through the trough 3 and beneath the separator. On the shaft 26 is a pulley 29 that is connected by a belt 30 with a pulley 23 fixed on the shaft 20. Attached to the trough 3 adjacent to the shaft 25 is a chute 31 which is preferably made of two sections with an opening 32 therebetween. Conveniently located adjacent to the end of chute 31 is an elevator 33 having a plurality of buckets 34 thereon. This elevator may be actuated by any convenient means, those herein shown consisting of a sprocket wheel fixed upon a shaft 36 which is driven by a belt 37 and an idler sprocket wheel 42 which supports the upper end of said elevator. A belt 38 connects the pulley upon shaft 36 with a pulley on shaft 39 and rotates said shaft which is connected by a belt 40 with the pulley 41 on shaft 26.

The tumbling barrels are herein designated 43 and are preferably of that type which are open at one end and mounted so as to be moved to any of its inclined positions. In the drawings I have shown four of these barrels but a greater or less number may be used equally as well within my invention. The mechanism for actuating these barrels does not constitute a part of my invention, and therefore I shall not describe it in detail, it being sufficient, however, to state that the barrels are fixed upon a shaft 44 and rotated from a shaft 45 having a pinion 46 thereon which meshes into a gear 47 connected with said barrel, the shafts 45 being driven from shafts 48 and 52 by belts 49 engaging the pulleys 50. The shaft 52 is rotated by a belt 53 and the shafts 48 and 52 are operatively connected with each other by the belt 51.

Above the barrels 43 is a plate 54 which is held in a fixed position by suitable braces 55 and rotatable therein is a turn head 56, below which a distributing chute 58, preferably having four separate compartments therein corresponding in number to the tumbling barrels, is fixed by the brackets 57.

A chute 59 is held by a bracket 60, or other similar

means, with one end thereof adjacent to the upper end of the elevator 33, and the other end substantially coaxial with the turn head 56.

In operation, the articles, after being immersed in a molten mass of zinc, or other similar coating material, are dropped onto the continually moving carrier 22 which carries and drops them through the opening 24 into the separator and onto the disk 5. As they strike the disk they are either thrown outwardly by centrifugal force or by the action of the beaters or wings 6 to the wall of the separator, whence they drop downwardly and are again moved inwardly toward the center of the separator by the conical shell 2 and drop onto the disk 5^a and the above operations are continued until the articles drop out of the separator onto the carrier 28. As the water passes down through the separator it is moved toward and away from the center of the separator by the disks 5, 5^a and 5^b and conical shells 2. The operations just described cool the articles, separate them from each other, and remove the excess material therefrom which drops through said separator onto said carrier with the coated articles. A continuous stream of water is passing through said separator from the perforated pipe 16 for cooling the articles passing therethrough. The carrier 28 drops the articles onto the chute 31 which conducts them into the buckets 34. As the carrier 28 moves through the water in trough 3 the excess material adheres thereto and is not dropped onto the chute 31 but continues around with the carrier 28 and is washed therefrom, being thus deposited in the bottom of the trough where it is afterward removed. The articles are thus delivered into the buckets 34 substantially free from all excess material.

Chute 31 is preferably made in two parts, as shown, so that if any water is dropped thereon from the carrier 28 it will escape through the opening 32, while the coated articles will be deposited in the buckets. This type of chute prevents either water or excess material being delivered into the buckets, and materially aids in the manufacture of a superior product. From the elevator the articles are delivered into the chute 59 and thence into the turn head 56 which is manually adjusted to deliver the articles into any one of the four buckets in the distributing chute 58, from which they are delivered into one of the four tumbling barrels 43. The tumbling process knocks off the fine dust particles from the coated articles, as well as reduces them to an absolutely cooled state. Into each of the barrels is delivered a blast of air to drive out the accumulating dust particles which would otherwise prevent the coated articles from acquiring a high polish or finish. This blast of air is derived from a convenient source through a pipe 61 and thence through its branches 62 into each of said barrels. I prefer that the blast of air should be driven into said barrel and drive the dust particles therefrom, but they may, however, be drawn out of said barrels and through the pipe 62 by a suction blast, if desired, and within my invention. After the articles have been in the tumbling barrel a sufficient length of time the barrel is tilted manually and the contents thereof permitted to drop therefrom into a convenient receptacle arranged to receive them. I have provided means whereby during this operation any dust particles remaining in the barrel may be

collected. Said mechanism comprises a screen 63 secured to the open end of the barrel and projecting in front thereof.

By the use of a plurality of barrels and the turn head 56, each of the barrels may be operated on different classes of articles at the same time, and each of said barrels may be rotated during varying periods, it being practical to operate at the same time one of said barrels with screws, another with washers, still a third with a different character of articles, and so on without having to disarrange the parts of the machine, or cause confusion, or accidental mixing of the different kinds of articles. By the device herein shown and described the articles are relieved of every particle of excess material and are cooled as soon as possible after being coated, and when completed have a high polish or finish that makes them far superior to any product heretofore possible.

There are minor changes and alterations that can be made within my invention, aside from those herein suggested, and I would therefore have it understood that I do not limit myself to the exact construction herein shown and described, but claim all that falls fairly within the spirit and scope of my invention.

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

1. In an apparatus of the character described, the combination with a separator having a plurality of conical shells therein lying in a substantially horizontal plane; of a shaft rotatably suspended within said separator with its axis substantially parallel with the axis of said conical shells; and beaters fixed to said shaft adjacent to said conical shells.
2. In an apparatus of the character described, the combination with a separator having a plurality of conical shells therein with an opening therethrough of less area than the other portions of said separator; a shaft suspended in said separator and journaled above the upper of said conical shells; and a beater, whose outside dimensions are greater than the area of the opening through said shells, fixed to said shaft.
3. In an apparatus of the character described; a separator composed of a plurality of cylindrical sections having inwardly converging conical bottoms with apertures therethrough, secured together; a cover for the upper of said sections having an opening therethrough; a shaft journaled in said cover and suspended within said separator; and a beater fixed on said shaft adjacent to the apertures in said conical bottoms.
4. In an apparatus of the character described; a separator composed of a plurality of cylindrical sections having inwardly converging conical bottoms with apertures therethrough, secured together; a cover for the upper of said sections having an opening therethrough; a shaft journaled in said cover and suspended within said separator; beaters fixed on said shaft adjacent to the apertures in said conical bottoms; and a moving carrier connected with said cover and operative adjacent to the opening therethrough.
5. In an apparatus of the character described; a separator composed of a plurality of sections 1 having conical bottoms 2, secured together; a cover 7 fixed to the upper of said sections and having an opening 24 therethrough; a shaft 4 journaled in said cover and suspended within said separator; beaters fixed to said shaft adjacent to said conical bottoms; and a carrier 22 operatively connected with said cover adjacent to the opening therein.
6. In an apparatus of the character described, the combination with a separator having a plurality of conical shells therein and disks rotatable adjacent to said shells; of a carrier below said separator and mounted so as to receive the contents of said separator as the same drop therefrom; and means for actuating said carrier.
7. In an apparatus of the character described, the com-

5 combination with a separator having a plurality of conical shells therein and disks rotatable adjacent to said shells; of a trough of liquid below said separator; a carrier mounted so as to receive the contents of said separator as the same drop therefrom; and means for actuating said carrier.

10 8. In an apparatus of the character described, the combination with a separator having a plurality of conical shells therein and disks rotatable adjacent to said shells; of a trough of liquid below said separator; a carrier mounted so as to receive the contents of said separator as the same drop therefrom; means for actuating said carrier; and a chute fixed adjacent to one end of said trough and in the path of the articles as they pass from said carrier.

15 9. In an apparatus of the character described, the combination with a separator having a plurality of conical shells therein and disks rotatable adjacent to said shells; of a trough of liquid below said separator; a carrier mounted so as to receive the contents of said separator as the same drop therefrom; means for actuating said carrier; and a two shelved chute having a transverse opening therein between its ends fixed adjacent to one end of said trough and in the path of the articles as they pass from said carrier.

20 10. In a device of the character described, the combination with the separator; a liquid trough below said separator; a carrier movable within said trough and mounted so as to receive the contents of said separator as the same drop therefrom; means for operating said carrier; an elevator; a chute for conveying the articles from said carrier into said elevator; a tumbling barrel; and a chute for conducting the articles from said elevator to said barrel.

25 11. In a device of the character described, the combination with the separator; of a carrier below said separator lying in a plane at substantially a right angle to said separator; means for imparting motion to said carrier; a tumbling barrel; means for conveying the articles from

said carrier to said tumbling barrel; and means for admitting a blast of air into said barrel. 40

12. In a device of the character described, the combination with the separator; a liquid trough below said separator; a carrier movable within said trough and mounted so as to receive the contents of said separator as the same drop therefrom; means for operating said carrier; an elevator; a chute for conveying the articles from said carrier into said elevator; a plurality of tumbling barrels; a chute for conducting the articles from said elevator to said barrels; and means for actuating said chute whereby the articles may be delivered into separate barrels. 45

13. In an apparatus of the character described, the combination with a separator having a plurality of conical shells therein; beaters rotatable adjacent to said shells; and means for delivering a stream of water into said separator whereby the interior thereof and said beaters are cleansed and the temperature of the articles passing there-through lowered. 50

14. In an apparatus of the character described, the combination with a separator having a plurality of conical shells therein with an opening therethrough of less area than the other portions of said separator; a shaft suspended in said separator and journaled above the upper of said conical shells; and a beater fixed to said shaft. 55

15. In an apparatus of the character described, the combination with a separator having a plurality of downwardly projecting interior conical walls with an opening therethrough; of a shaft rotatably suspended within said separator; and beaters fixed to said shaft adjacent to said conical walls. 60

In testimony whereof I affix my signature in presence of two witnesses. 65

EDWARD S. MOWRY.

Witnesses:

THOMAS HOOPS, Jr.,
H. C. WHITLSEY.