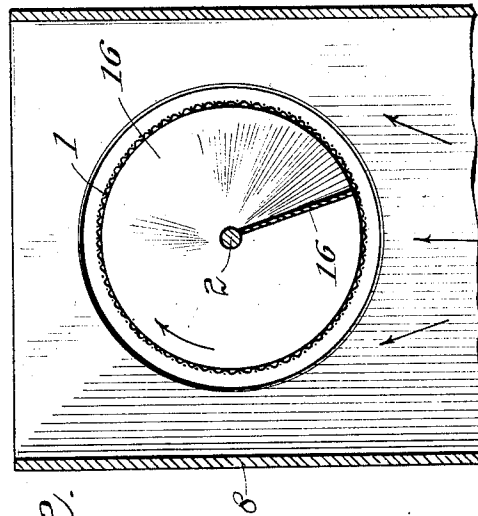
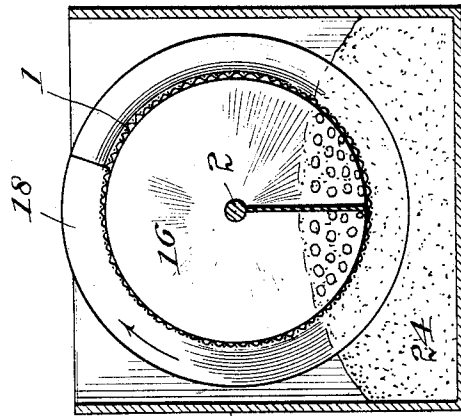
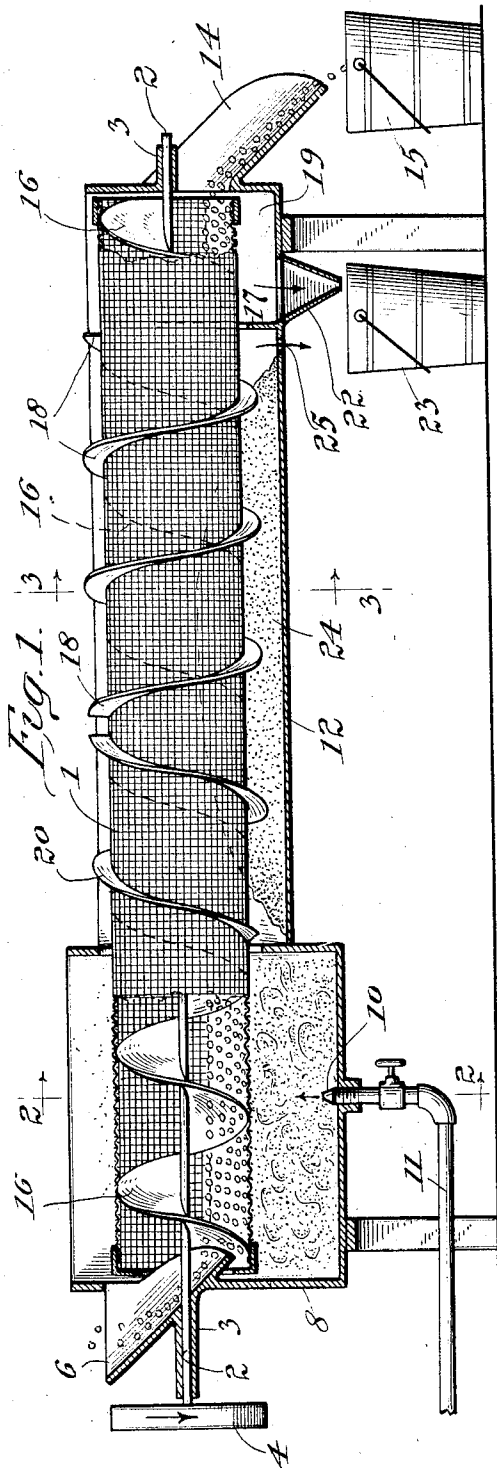


D. H. McNULTY, JR.
COATING MACHINE.
APPLICATION FILED APR. 30, 1920.

1,374,938.

Patented Apr. 19, 1921.



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UNITED STATES PATENT OFFICE.

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COATING-MACHINE.

1,374,938.

Specification of Letters Patent.

Patented Apr. 19, 1921.

Application filed April 30, 1920. Serial No. 377,961.

To all whom it may concern:

Be it known that I, DANIEL H. McNULTY, Jr., a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Coating-Machines, of which the following is a specification.

My invention relates to coating machines especially for coating candy. In the form shown it is particularly adapted for coating hard candies with granulated sugar. The general object of the invention is to provide means whereby the goods may be quickly, thoroughly and uniformly coated in a completely automatic and economical manner. To briefly describe the process of sugar coating hard candies, as carried out in my apparatus, the formed and dried pieces are first slightly moistened so that the sugar will be able to adhere. This is accomplished preferably by passing the goods for a short period through a vaporizing chamber in which steam is constantly supplied. By preference the chamber is at atmospheric pressure and the steam is therefore approximately at, and usually somewhat below, the boiling point and the steam is therefore in moist or vapor form. As soon as the candies have been slightly moistened on the outside they are "tumbled" in the presence of the coating material (in the present case granulated sugar). They are then passed out of the tumbler into a waiting receptacle. I have provided means for automatically advancing the candies and finally delivering them coated but otherwise separate from the sugar, and one of the objects of my invention is to provide means whereby the coated candies may be delivered but the loose sugar will be prevented from following them into the delivery chute.

I obtain my objects by the mechanism illustrated in the accompanying drawing in which—

Figure 1 is a longitudinal section of the complete machine,

Fig. 2 is a transverse, vertical section on the line 2—2, Fig. 1, and

Fig. 3 is a transverse vertical section on the line 3—3, Fig. 1.

Like numerals denote like parts throughout the several views.

In the particular form selected to illustrate the invention the apparatus has a long cylindrical screen 1 arranged, according to

the present design, horizontally. The screen is rotatable about its longitudinal axis, having a shaft 2 journaled in stationary bearings 3, 3. A pulley 4 or other suitable power device is provided for causing the screen to revolve. In the illustrated case the pulley is fastened directly to the shaft and in practice is revolved at slow speed. The mesh or size of the apertures of this screen will vary according to the size of the goods to be coated, the criterion being that they shall be large enough to freely admit the coating material but prevent the candies from escaping through the sides of the screen.

A chute 6 is provided at the inlet end of the screen for introducing the goods into it. This inlet or head end of the screen is housed in a vaporizing chamber 8. This chamber may or may not be provided with a cover, although a cover (not shown) is desirable. Vapor may be produced in the chamber in various ways, but a convenient method is illustrated, the chamber having a nozzle 10 entering through the bottom, this nozzle being connected with a steam supply pipe 11.

Adjoining the vaporizing chamber is a trough 12 which also houses the screen, at least at the sides and bottom thereof, and extends from the vaporizing chamber to the delivery end of the screen where a stationary chute 14 is provided for delivering the coated goods into a suitable receptacle, for example, a pail 15.

Means are provided within the screen for advancing the goods from the inlet end to the delivery end thereof and according to the preferred construction these means are in the form of a helical conveyer 16. The screen is secured to the screw 16, the latter being fastened to shaft 2, thus the screw and screen rotating with the shaft. In the design illustrated the turns or flights of this screw conveyer extend inward from the inner surface of the screen to the shaft itself, the advantage being that in such case they form a support for the screen from one end to the other.

Trough 12 is designed to contain the coating material—in the present case granulated sugar. The trough is spaced from the screen at the sides and bottom sufficiently at least to accommodate a helical conveyer 18 which is fastened to the outside of the

screen and rotates with it. A short distance from the outer or delivery end of the trough is a vertically arranged partition 17 which confines the pile of sugar at this end. It is
5 located usually about two feet from the end of the trough and forms a final compartment 19 into which will sift the sugar which may be carried over but which is not firmly set in the candies. The sugar thus sifted
10 out drops down into a hopper 22 in the bottom of compartment 19 and thence is discharged into a waiting receptacle 23. It may thus be said that the apparatus has a coating chamber 24, where the sugar is ap-
15 plied and a sifting chamber 19 where the surplus sugar is removed. It is desirable to form overflow apertures 25 in the bottom of the trough on the inner side of partition 17 to permit the escape of any surplus sugar
20 in case the operator introduces too much.

The conveyer 18, mentioned, extends from the partition 17 a considerable distance toward the opposite end thereof, and is arranged "counter current," in other words,
25 oppositely to the internal conveyer 16. The result is that when the screen revolves, the sugar is constantly brushed away from the delivery end of the screen toward the center and head thereof. This prevents the sugar
30 from piling up at the delivery end and running the risk of being carried out into the delivery chute. Instead, the sugar is constantly urged toward the vaporizing chamber so as to be brought into contact
35 with the moistened candies soon after they emerge from the vaporizing chamber. The counter current conveyer 18 preferably stops short of the vaporizing chamber, and in the form shown a third conveyer 20 is
40 fastened to the outside of the screen between the vaporizing chamber and the counter current conveyer 18. This may be regarded as a "parallel current" or "co-current" conveyer just as the inner one 16 may be re-
45 garded as a "co-current" conveyer. The function of this third conveyer is to render it certain that the counter current conveyer 16 will not force the sugar into the vaporizing chamber. The third conveyer also per-
50 forms another advantageous function in co-operation with the counter current conveyer, and that is that it tends to pile the sugar near to but at a safe distance from the vaporizing chamber, the pile rising well into the interior of the screen and thus thor-
55 oughly immersing the candies in it.

The operation will now be readily understood. Preparatory to operating, the trough is charged with sugar to such an extent that
60 the pile will rise well up into the screen. The steam is turned on and fills the vaporizing chamber and the screen is set in motion. The candies are then fed at a uniform and predetermined rate through the inlet chute
65 6 whence they drop onto the bottom of the

screen. The tumbling action resulting from the rotation of the screen and the effect of the internal conveyer subjects the candies thoroughly to the action of the hot vapor and the result is that by the time they have
70 reached the end of the vaporizing chamber their surfaces are soft and moist enough to enable the sugar to adhere. The tumbling action which occurs in the second section of the screen causes the candies to be thor-
75 oughly coated with the sugar. As the sugar is cool and the air in the trough is dry, the candies soon become dry and hard again and the sugar which has adhered becomes so firmly set that it will not be dislodged when
80 the coated pieces pass out through the chute 14 and into the receptacle 15. As soon as the candies within the screen have passed beyond the partition 17 they will have passed beyond the zone of the pile of free
85 sugar, consequently as they are tumbled in the screen they drop the sugar which is not firmly bound to them and most of this loose sugar drops into the compartment 19 from
90 which it falls into the hopper 22 and receptacle 23. The final end of the screen, therefore, acts as a sifter and the result is that by the time the candies reach the chute 14 they are free from all of the particles of sugar
95 except those which will permanently adhere to the surface of the candies.

From the foregoing it will be seen that the action is entirely automatic and produces a uniform product. The candies are advanced positively and yet as they leave
100 the screen they are thoroughly separated from the loose sugar and there is no danger of the latter escaping either into the outlet chute or into the vaporizing chamber. Hard candies, if carelessly handled, as they
105 are apt to be if coated by hand, are apt to break and thus be rendered unfit for shipment except as second class goods. With my apparatus there is no need to handle the candies at any stage of the process, and as
110 the revolution of the screen is comparatively slow, practically no breakage occurs within it.

Another very important advantage in my apparatus is that it prevents the candies
115 from adhering to each other. When candies are coated by hand they are apt to be collected in a mass in or during the moistening stage and this frequently results in a group or lump being formed thus render-
120 ing the candies unusable without being reworked. In my machine the candies are fed in a small but steady stream and they pass through the machine in this way and at no time have an opportunity to collect in any
125 one place. Furthermore the constant tumbling or agitating effect produced by the rotating screen immediately tends to break two candies apart in case they should come into contact with each other. The result is
130

that the candies all go through with certainty and no batches or masses are formed which have to be melted and reworked.

Having thus described my invention what

5 I claim as new and desire to secure by Letters Patent, is:—

1. A coating machine having a revolving screen arranged approximately horizontally, the screen having an inlet at one end
10 and an outlet at the other, a vaporizing chamber housing one end of the screen for moistening the contents, and a coating container housing the other end of the screen for the purpose described.

15 2. A coating machine having a revolving screen arranged approximately horizontally, the screen having an inlet at one end and an outlet at the other, a vaporizing chamber housing one end of the screen for
20 moistening the contents, a coating container housing the other end of the screen and spaced from it, and means between the screen and the container for agitating the contents of the container.

25 3. A coating machine having a revolving

screen arranged horizontally and having an inlet at one end and an outlet at the other, a conveyer in the screen and revolving therewith for advancing the goods to be coated from the inlet to the outlet, a vapor- 30 izing chamber housing the inlet end of the screen, means for supplying vapor to said chamber, a coating chamber housing the outlet end of the screen, and a conveyer outside of the screen for preventing the con- 35 tents of the coating chamber collecting at the delivery end of the screen.

4. A coating machine having a revolving screen passing continuously through three different compartments, the first compart- 40 ment being adapted to contain vapor for moistening the goods, the second compartment being adapted to contain the coating material and the third compartment being adapted to receive the screenings dropping 45 from the coated goods.

In witness whereof, I have hereunto subscribed my name.

DANIEL H. McNULTY, JUNIOR.