

May 18, 1943

J. F. PRICE

2,319,474

MACHINE FOR COOLING COATED CONTAINERS

Original Filed July 26, 1939

4 Sheets-Sheet 1

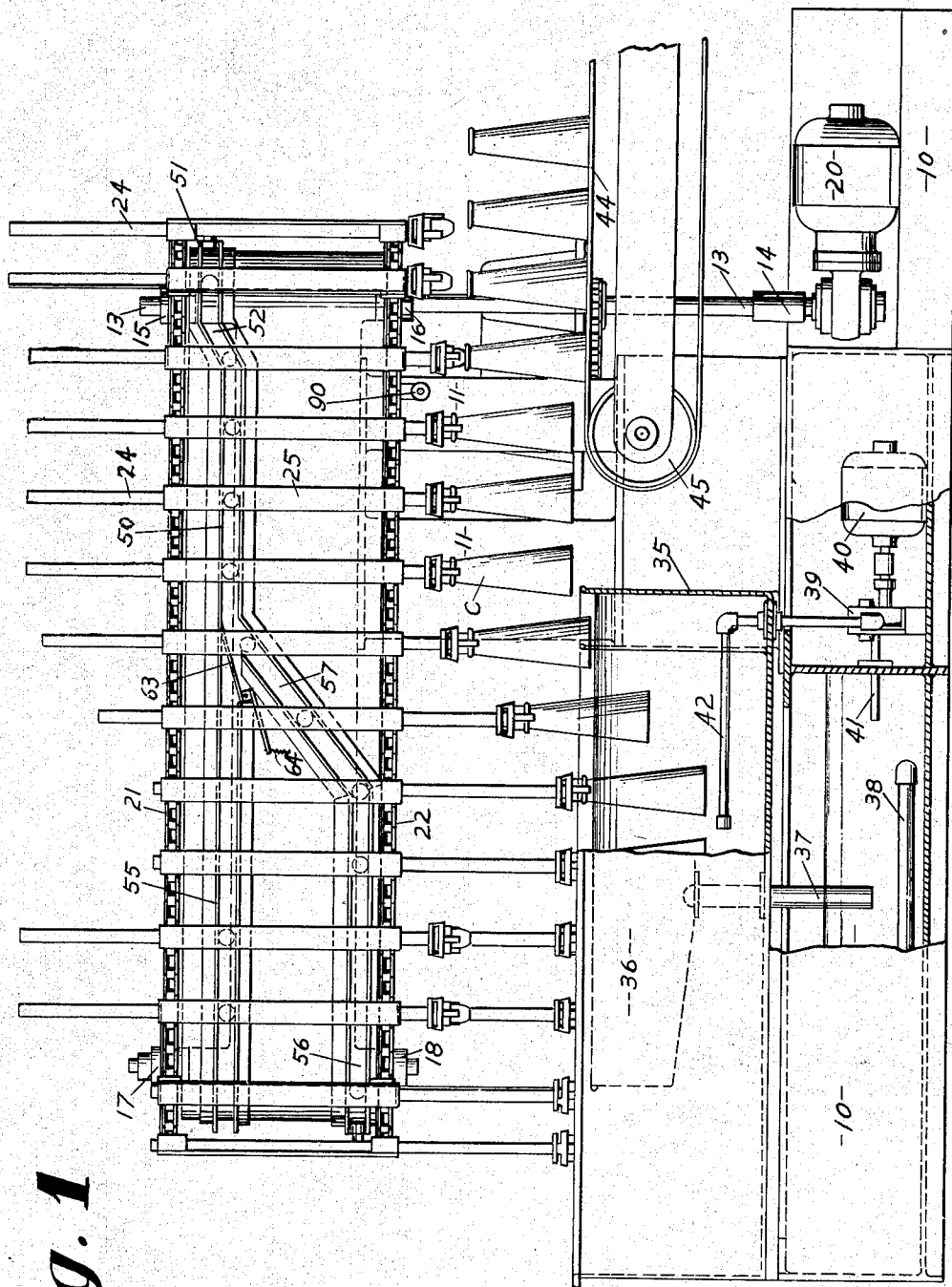


Fig. 1

INVENTOR.
John F. Price
BY *Redell & Thompson*
Atty.

May 18, 1943

J. F. PRICE

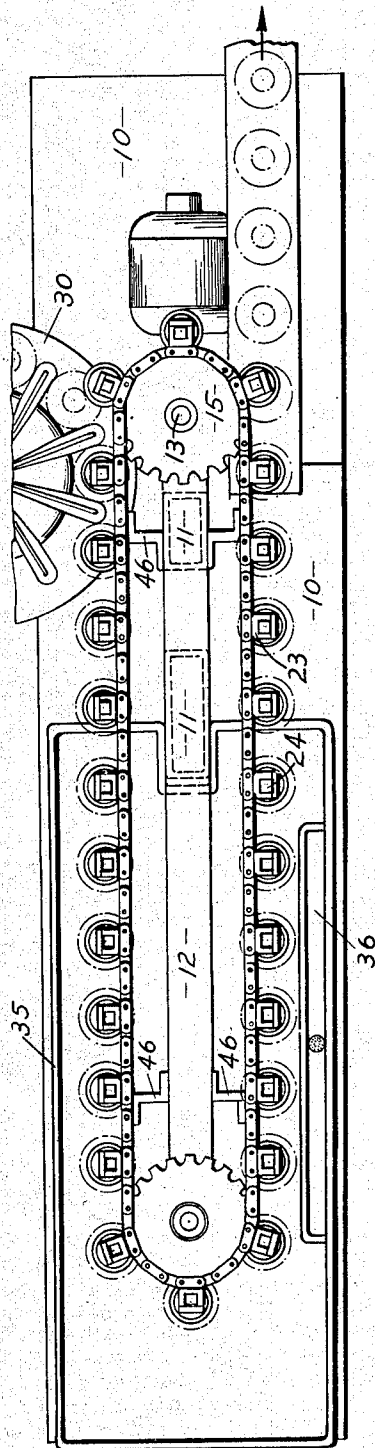
2,319,474

MACHINE FOR COOLING COATED CONTAINERS

Original Filed July 26, 1939

4 Sheets-Sheet 2

Fig. 2



INVENTOR.
John F. Price
BY *Redell + Thompson*
attys.

May 18, 1943

J. F. PRICE

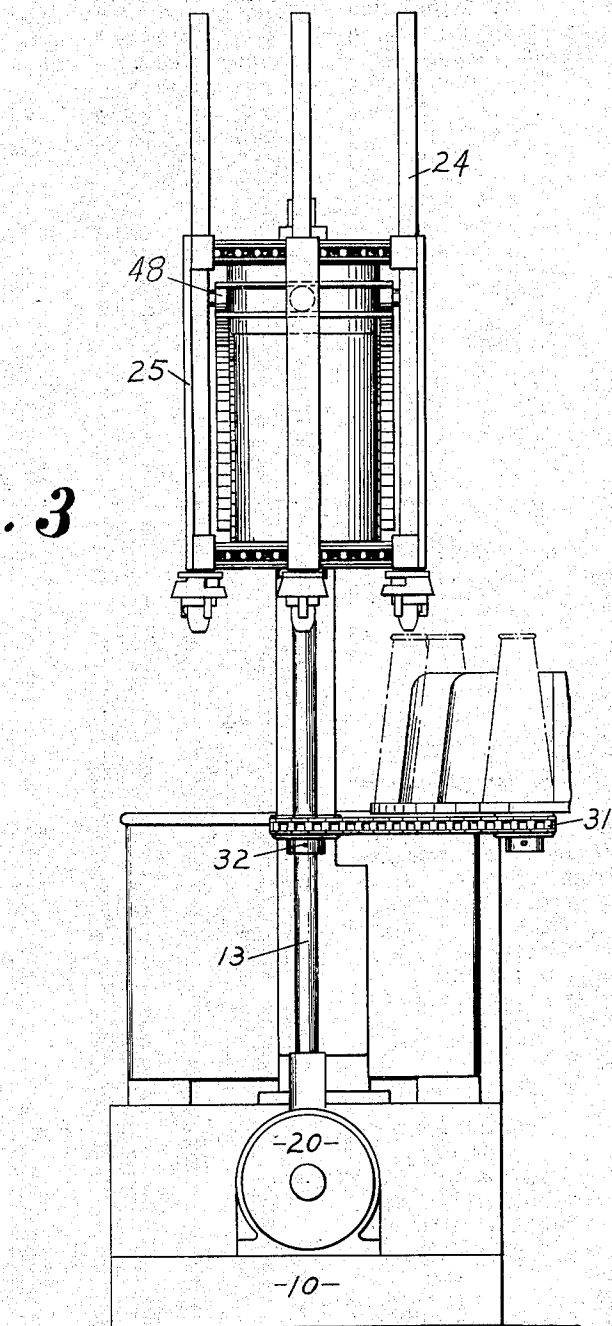
2,319,474

MACHINE FOR COOLING COATED CONTAINERS

Original Filed July 26, 1939

4 Sheets-Sheet 3

Fig. 3



INVENTOR.
John F. Price
BY *Redell + Thompson*
Atty.

May 18, 1943

J. F. PRICE

2,319,474

MACHINE FOR COOLING COATED CONTAINERS

Original Filed July 26, 1939

4 Sheets-Sheet 4

Fig. 4

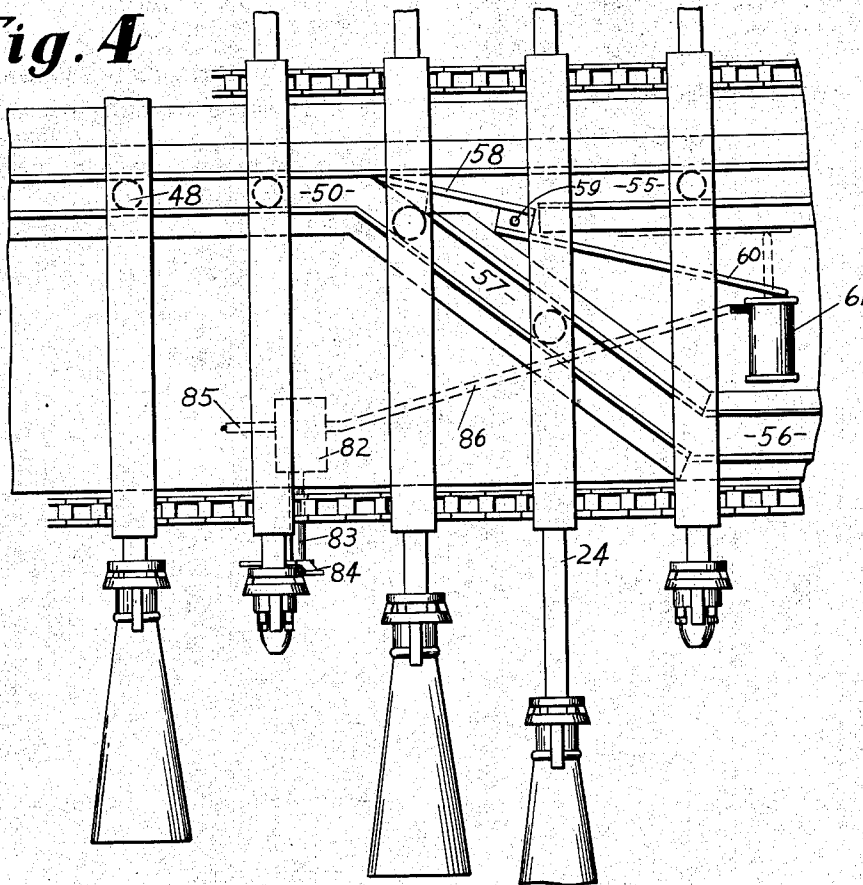


Fig. 5

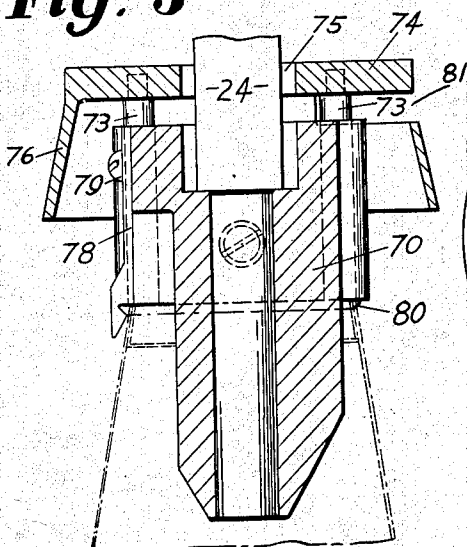
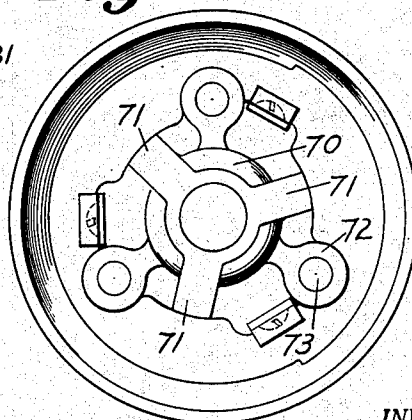


Fig. 6



INVENTOR.
John F. Price
BY *Bodell + Thompson*
Attys.

UNITED STATES PATENT OFFICE

2,319,474

MACHINE FOR COOLING COATED
CONTAINERS

John F. Price, Fulton, N. Y., assignor to Oswego
Falls Corporation, Fulton, N. Y., a corporation
of New York

Original application July 26, 1939, Serial No.
286,637. Divided and this application April 23,
1942, Serial No. 440,185

7 Claims. (Cl. 62—104)

This invention has to do with a machine for cooling containers which have been coated. Containers formed of fibrous materials, such as paper board, are usually coated with a substance to make the container non-absorbent and liquid tight. The coating material may consist of a wax, such as paraffin, or a lacquer formed of synthetic resinous material. This application is a division of my application Sr. No. 286,637, filed July 26, 1939, Patent No. 2,302,053.

If the container is coated with wax, the coating is usually applied by immersing the container in a bath of molten wax and in order to obtain the desired finish and to hasten the setting of the wax to permit volume production the containers, immediately after being coated, are immersed in a cooling medium which may also contain a substance to sterilize the container. The lacquer coating may also be applied by the immersion method, but more frequently is sprayed onto the container and, in both instances, the coating is sometimes chilled or cooled by passing the coated container through a refrigerated atmosphere instead of immersing the container in a cooling liquid.

While this invention is suitable for carrying out various cooling processes, it has to do more particularly with a machine for cooling containers by immersing the same in a cooling liquid.

The invention has as an object a machine of the type referred to embodying a mechanism for successively conveying the coated containers from a loading station through the cooling medium and discharging the containers at a discharge station, the operation being continuous at relatively high speed and the containers being handled from their top edges, whereby the cooling medium, when in liquid form, does not enter the interior of the container.

The invention further includes a particularly simple and efficient means for automatically engaging the tops of the coated containers and supporting the same during conveyance through the cooling medium and subsequently releasing the containers after the coating has become properly chilled.

The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is made to the accompanying drawings in which like characters designate corresponding parts in all the views.

Figure 1 is a side elevational view of a machine

embodying my invention, with parts removed and parts shown in section.

Figure 2 is a top plan view of the machine.

Figure 3 is an end elevational view of the machine.

Figure 4 is an enlarged fragmentary side elevational view of a portion of the conveyor mechanism looking to the left Figure 3.

Figure 5 is a vertical sectional view of one of the container carrying members.

Figure 6 is an inverted plan view of the container carrying member.

The machine consists of a base 10 on which are vertically arranged columns 11 on which is mounted a horizontally extending support 12. A vertically arranged shaft 13 is journaled at its lower end in a bearing 14 mounted on the base and at its upper end in one end of the support member 12. A pair of sprocket wheels 15, 16, are secured to and rotatable with the shaft 13, and a similar pair of sprockets 17, 18, are journaled at the other end of the member 12. The shaft 13 is rotated at a proper speed by a motor 20 mounted in the base.

The container conveyor consists of an upper chain 21 trained about the sprockets 15, 17, and a lower chain 22 trained about the sprockets 16, 18. Each of the chains is provided, at uniform spaced intervals, with brackets 23 formed with square apertures, or otherwise provided to receive spindles 24 and permit the same to move vertically in the brackets without rotation. Due to the fact that the sprockets 15, 16, are secured to the shaft 13, both chains operate synchronously and corresponding brackets 23 on both chains may be connected together as by connecting members or straps 25.

The lower ends of the spindles are provided with container carrying members and as the spindles are moved in the orbital path by the chains, the spindles pass over a container loading station, are thereafter lowered to immerse the containers carried by the spindles into a tank containing a cooling medium and subsequently the spindles are elevated and the containers released at a discharge station.

The container loading station is here represented as a turret 30 on which the containers are placed as they come from the coating mechanism. This turret is rotated in synchronism with the movement of the spindles by means of a chain 31 trained over a sprocket 32 secured to shaft 13. The arrangement at the loading station may be any structure which will present

the coated containers in proper timed relation to the movement of the spindles 24.

The cooling medium is arranged in an elongated tank 35 mounted upon the rear portion of the base, the arrangement being such that the containers are maintained in the cooling medium for a substantial portion of the travel of the orbital movement of the spindles. The tank is preferably provided with an overflow member 36 discharging through a pipe 37 into a sump formed in the lower portion of the base 10 and which preferably contains one or more refrigerating coils 38. The cooling medium is circulated by being pumped out of the sump back into the tank 35 by a pump 39 operated by a suitable motor 40 arranged in the base 10, the pump being provided with a suction pipe 41 and a discharge pipe 42.

The discharge station is located in proximity to the shaft 13 on the opposite side of the conveyor from the loading station 30. As here shown, the discharge station is in the nature of a conveyor belt 44 trained over a pulley 45 mounted on the frame of the machine, the belt extending to a suitable collecting table, or the like, not shown.

The conveyor further includes a track arranged coextensive with the chains 21, 22, the track being supported by a number of angle brackets 46 extending laterally from the support member 12. The track is channel shaped in cross section to receive rollers 48, one of which is secured to each of the spindles 24. The track consists of upper sections 50 extending along each side of the support member 12 at the forward portion thereof in proximity to the upper chain 21. These side portions 50 are connected by a curved portion 51 extending around the forward end of the frame in a plane slightly above the sections 50 and is connected thereto by short inclined sections 52. Accordingly, while the spindles 24 are traveling about the front end of the machine, they are in elevated position.

The track further includes a rear section 55 extending around the rear portion of the machine above the tank 35 and in the plane of the sections 50. There is also a lower track section 56 arranged below the section 55, that is in proximity to the lower chain 22, and is connected to the section 50 by inclined portions 57. This arrangement is such that when a container C is secured to the lower end of one of the spindles 24 at the loading station, the roller 48, associated with that spindle, travels along the rear track section 50, down the rear incline section 57 around the lower track section 56, during which time the container is positioned in the cooling medium, then up the forward inclined section 57 along the forward section 50, up the forward inclined section 52, to the front circular portion 51, at which time the container is discharged upon the belt 44.

If in the event however that a spindle does not engage a container at the loading station, the spindle is maintained in its elevated position throughout its orbital movement. This is accomplished by a switch member 58 interposed between the rear track sections 50, 55. The switch is pivotally mounted as at 59 and is provided with a tail piece 60 terminating in juxtaposition to a solenoid 61. The switch member 58 is normally maintained in the position shown in Figures 1 and 4, and in this position the rollers 48 are directed on the downwardly inclined rear section 57 of the track. When there is no con-

tainer carried by a spindle however, the solenoid is energized, in a manner hereinafter explained, to move the tail piece 60 upwardly as indicated in dotted outline Figure 4, causing the switch member 57 to move downwardly and from a continuation of the track 50, whereby the roller of the spindle will be directed onto the track section 55. The reason for this arrangement is to keep the container carrying members on the lower ends of the spindles away from the cooling medium to prevent the likelihood of some of the medium being splashed on the carrying member and thereafter, the possibility of the cooling medium being carried to the interior of a container. It is common practice to use a germicide in the cooling medium, such as chlorine, the presence of which in a container might render the contents of the container distasteful.

A switch member 63 is arranged between the track sections 55, 50, on the front side of the machine. This switch member bridging the upper end of the inclined section 57 and being normally positioned, as shown in Figure 1, by a spring 64. The purpose of the switch member 63 is to form a continuation of the upper track section 55 to permit a roller traveling on that track section to pass onto the forward section 50.

The container carrying members consist of a body portion 70 secured to the lower end of each of the spindles 24. The body 70 is formed with depending circumferentially spaced apart ribs 71 for entering the mouth of the containers, and with radially extending bosses 72 formed with apertures to slidably receive pins 73, the upper ends of which are secured into a disk 74 having a central clearance aperture 75 and a depending skirt portion or flange 76. The pins 73 are of such length that when the chuck or container carrying member is moved into engagement with the top of a container, the lower ends of the pins 73 engage the top edge of the container and are moved upwardly to position the disk 74, as illustrated in Figure 5. The container carrying members are completed by a plurality of spring members 78 secured at their upper ends to the body 70 as by screws 79, and the lower ends of the springs 78 are notched to receive a bead 80 at the top of the container, if the container is formed with such a bead, as shown in Figure 5. The function of the spring members 78 is to firmly, but detachably, hold the containers to the carrying members.

As previously stated, when the body 70 of a container carrying member enters the top of a container at the loading station 30, the pins 73 are moved upwardly thereby raising the disk 74 to the position shown in Figure 5. The flange 76 is formed with a notch or cut-out portion 81. The solenoid 61 is energized by a switch 82 having an actuating member 83 depending and provided at its lower end with one or more laterally extending arms 84. The switch 82 is positioned in proximity to the rear run of the lower conveyor chain intermediate the loading station 30 and the forward end of the cooling tank 35. The arrangement is such that the end of the arm 84 will pass through the notch 81 in the container carrying member when it is carrying a container. That is, when the disk 74 is in its upper position, as shown in Figure 5. Under these circumstances, the switch member 82 directs the roller associated with that spindle on the downwardly inclined section 57 of the track, as shown in Figure 4, and the roller then travels

on the lower rear section 56 of the track positioning the container in the cooling medium.

If however a container carrying member does not engage a container at the loading station 30, the disk 74 will be positioned on the top of the body 70 and accordingly the notch 81 will be below the plane of the switch actuating arm 84, and as the spindle advances on its course the switch arm 84 will be engaged and the switch will be actuated completing a circuit from the source 85, through wires 86 to the solenoid, and the solenoid will thereupon elevate the tail piece 60 of switch 58 and the roller associated with that spindle will be directed on the upper track section 55 and thus the empty container carrying member will complete its orbital path in the elevated position well above the surface of the cooling medium in tank 35.

On the forward side of the machine in proximity to the discharge station, there is a roller 90 depending in the path of the container carrying members and is so positioned as to engage the disk 74 and force the same downwardly causing the pin 73 to push the container out of the spring members 78 and permit it to drop on the discharge belt 44.

It will be apparent that this cooling device operates continuously and automatically, yieldingly grasping the containers by their tops at the loading station, submerging them in the cooling medium in tank 35, elevating or withdrawing the containers from the tank, as illustrated in Figure 1, and depositing the cooled or chilled containers on the discharge belt 44. The machine functions such as to prevent the cooling medium from entering the interior of the containers and also prevents the possibility of contamination by keeping the empty container carrying members out of proximity to the cooling medium.

What I claim is:

1. A machine for cooling coated containers comprising a suitable frame, a tank mounted on the frame containing a cooling medium, a container loading station, a container discharge station, a series of vertically movable spindles, means operable to move said spindles in an orbital path over said loading station and said cooling tank and said discharge station, a container carrying member secured to the lower end of each of said spindles and being operable when moved into engagement with a container to detachably secure the container to the spindle, and means operable, during movement of said spindles over said loading station, to effect a partial downward movement of the spindles to position the container carrying members in engagement with the containers at said station and to effect further downward movement of said spindles during movement of the same over said cooling tank to position the containers in the cooling medium and to subsequently move said spindles to elevated position, and means operable to cause said container carrying members to release the containers carried thereby at said discharge station.

2. A machine for cooling coated containers comprising a suitable frame, a tank mounted on the frame containing a cooling medium, a container loading station and a container discharge station, a series of vertically movable spindles, each of said spindles being provided with a container carrying member at the lower end thereof and operable upon engagement with a container to detachably secure the same to the spindle, means operable to move said spindles successively in an orbital path over the loading station, the

cooling tank and the discharge station, and means carried by the frame and cooperable with said spindles during the orbital movement thereof to cause the same to move said container carrying members into engagement with containers at said loading station, and to subsequently lower said containers in the cooling medium in said tank during a portion of said orbital movement and to thereafter remove the containers from the cooling medium, and means operable as each of said spindles approaches said discharge station to cause said container carrying members to release the containers.

3. A machine for cooling coated containers comprising a suitable frame, a series of vertically moving spindles, a container loading station and a container discharge station, means operable to move said spindles in an orbital path successively over said stations, a container carrying member secured to the lower end of each of said spindles and being operable upon engagement with a container to detachably secure the same to the spindle, means cooperable during such orbital movement of the spindles to cause the same to move downwardly to position the container carrying members carried thereby into engagement with the containers at said loading station, and means operable to cause each container carrying member to release the containers at said discharge station, and means operable to cool said containers while the same are secured to said spindles.

4. A machine for cooling coated containers comprising a frame, a tank mounted on the frame containing a cooling medium, a container loading station and a container discharge station, a series of vertically movable spindles, means operable to successively move said spindles in an orbital path over said loading station, cooling tank and discharge station, a track carried by the frame, a container carrying member operable when moved into engagement with a container to detachably secure the same to the spindle, a track carried by the frame, a roller secured to each of said spindles and operable in said track, said rollers and track being cooperable to effect partial downward movement of said spindles during movement of the same over said loading station to cause said container carrying members to engage the containers at said station and to thereafter effect further downward movement of said spindles during movement of the same over said tank to position the containers carried by said spindles in said cooling medium, and to subsequently move said spindles to elevated position to remove the containers from the cooling medium, and means cooperable with said container carrying members to cause the same to release the cooled containers at said discharge station.

5. A machine for cooling coated containers comprising a suitable frame, a tank mounted on the frame containing a cooling medium, a container loading station and a container discharge station, a series of vertically movable spindles and means operable to move said spindles in an orbital path over said loading station, said cooling tank and said discharge station, a container carrying member secured to the lower end of each of said spindles and being operable upon engagement with a container to detachably secure the same to the spindle, a track carried by the frame and being formed with an elevated section, a downwardly inclined section arranged in juxtaposition to said loading station, said track being also formed with an upper and

lower section in juxtaposition to said cooling tank, a movable switch member arranged in said track intermediate said inclined section and said upper and lower sections, a roller secured to each of said spindles and arranged to travel in said track during the orbital movement of said spindles, said inclined section being cooperable with said rollers to effect partial downward movement of said spindles to effect engagement of said container carrying members with containers at said loading station, and said lower track section being cooperable with said rollers to effect further downward movement of the spindles to position containers carried thereby in the cooling medium in said tank, means cooperable with said switch member to cause the same to direct rollers of said spindles carrying containers downwardly to the lower track section and to direct spindles, to which no container is secured, onto said upper track section, said track also including an inclined section extending upwardly from said lower section and being cooperable with said rollers to elevate said spindles to remove containers carried thereby from said tank, and means cooperable with said container carrying members to cause the same to release the cooled containers therefrom.

6. A machine for cooling coated containers comprising a suitable frame, a tank mounted on the frame containing a cooling medium, a container loading station, a container discharge station, a series of vertically movable spindles and means operable to move said spindles in an orbital path over said loading station, cooling tank and said discharge station, each of said spindles being provided at their lower ends with a container carrying member operable when moved into engagement with a container to detachably secure the same to the spindle, track

means carried by the frame and being cooperable to effect vertical movements of said spindles to cause said container carrying members to move into engagement with containers at said loading station, thereafter position said containers in said cooling medium for a portion of the orbital travel of the spindles and thereafter remove the containers from the cooling medium, and means cooperable with said container carrying members to cause the same to release the containers at said discharge station.

7. A machine for cooling coated containers comprising a suitable frame, a tank mounted on the frame containing a cooling medium, a container loading station and a container discharge station, a series of vertically movable spindles and means operable to move said spindles in an orbital path over said loading station, said cooling tank and said discharge station, a container carrying member secured to the lower end of each of said spindles and being operable when moved into engagement with a container to detachably secure the container to the spindle, means operable to effect relative vertical movement between containers at said loading station and said spindles to effect engagement of said containers by said container carrying members, and means cooperable with said spindles to cause the same to move successively downward to position the containers carried thereby in said cooling medium for a portion of the orbital travel of the spindles and thereupon effect vertical movement of said spindles to remove the containers from the cooling medium, and means cooperable with said container carrying member to cause the same to release the containers at said discharge station.

JOHN F. PRICE.