J. A. ROOF.

APPARATUS FOR CLEANSING AND STERILIZING EMPTY CANS.

APPLICATION FILED OCT. 24, 1918.

1,411,380.

Patented Apr. 4, 1922.

2 SHEETS—SHEET 1.

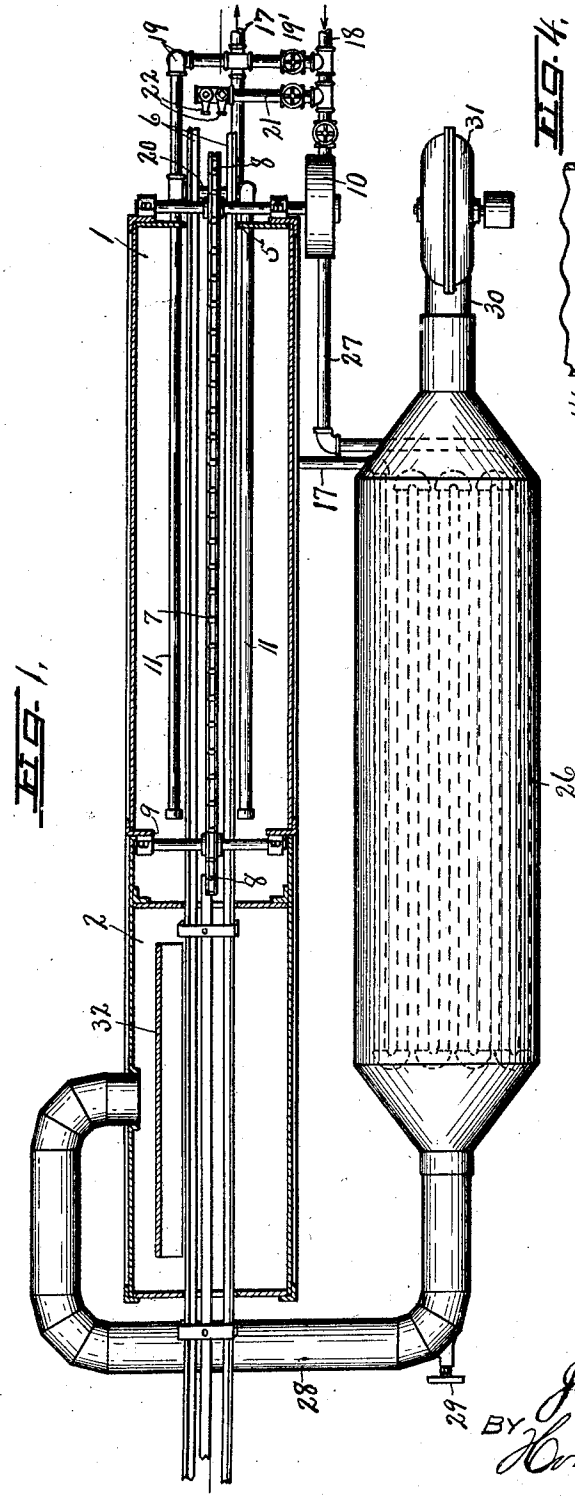


FIG. 1.

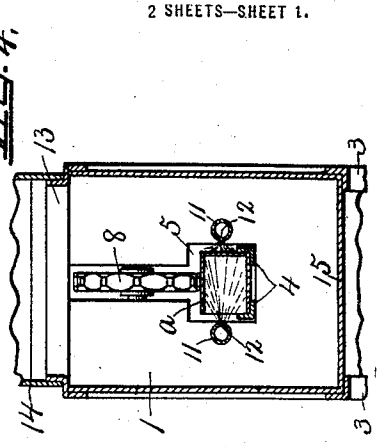


FIG. 4.

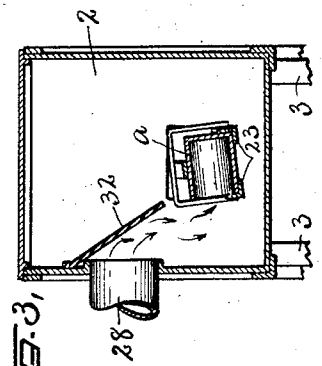


FIG. 3.

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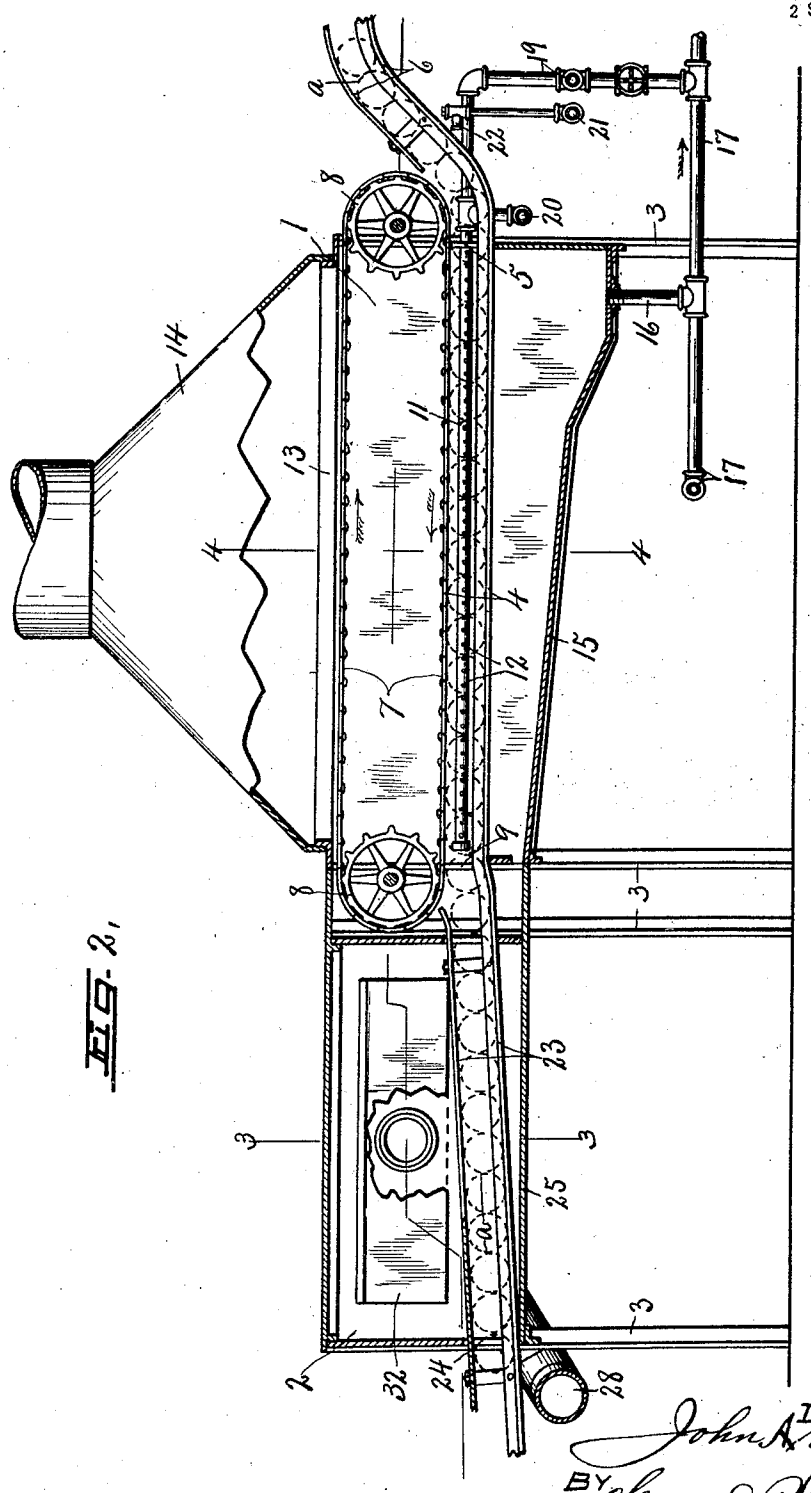


FIG. 2.

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR CLEANSING AND STERILIZING EMPTY CANS.

1,411,380. Specification of Letters Patent. **Patented Apr. 4, 1922.**

Application filed October 24, 1918. Serial No. 259,478.

To all whom it may concern:

Be it known that I, JOHN A. ROOF, a citizen of the United States of America, and resident of Canastota, in the county of Madison, in the State of New York, have invented new and useful Improvements in Apparatus for Cleansing and Sterilizing Empty Cans, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to certain improvements in apparatus for cleansing and sterilizing empty cans, involving the use of a steaming chamber and a drying chamber through which empty cans are successively passed in more or less rapid sequence to effect the desired cleansing, sterilizing and drying, while in transit therethrough.

The main object is to provide more efficient and expeditious means for cleansing and drying the cans than has heretofore been available, thereby materially increasing the output for a given period of time over the methods now commonly employed.

Another object is to render the cleaning and drying operations substantially automatic, thereby reducing the labor to a minimum.

Other objects and uses relating to specific parts of the apparatus will be brought out in the following description.

In the drawings:

Figure —1— is a top plan partly in section of an apparatus for carrying out the objects stated.

Figure —2— is a longitudinal, vertical, sectional view of a portion of the same apparatus.

Figures —3— and —4— are transverse, vertical, sectional views taken respectively in the planes of lines 3—3 and 4—4, Figure —2—.

As illustrated, this apparatus comprises a steaming chamber —1— and a drying chamber —2— arranged end to end and mounted upon suitable supporting legs —3— to form a substantially unitary structure.

A substantially horizontal can-guide or track —4— extends through the longitudinal center of the chamber —1— from end to end and between the lower and upper walls thereof, to enable said cans to be fed by rolling in a direct line through said chamber and to the drying chamber, presently described.

The end of the steaming chamber —1— at which the cans enter, is provided with an opening —5— of sufficient size to allow the cans to enter therethrough, the adjacent end of the guide —4— being inclined upwardly at —6— to cause the cans to roll by gravity through the opening —5— and upon the horizontal portion of the guide, said inclined portion being located exterior to the steaming chamber and of any suitable length to allow the cans to be placed thereon or upon an extension thereof, either by hand or otherwise.

An endless belt —7— is mounted within the steaming chamber —1— upon suitable pulleys or sprockets —8— which are journaled in bearings on the end walls of said chamber, so as to support the lower side of the belt in a substantially horizontal position parallel with and directly above the bottom of the track —4—, a distance corresponding approximately to the diameter of the can, whereby the cans which roll by gravity from the inclined portion —6— to the horizontal portion of the track —4— will be engaged and fed forwardly with a rolling motion along the track and through an outlet —9— in the end of the steaming chamber opposite the inlet —5—.

A supporting shaft for one of the sprocket wheels —8— is provided with a pulley —10— which may be connected by a belt to any available source of power not shown for moving the endless belt —7— in the direction indicated by the arrows, Figure —2—.

The empty cans are open at one end and while they may be placed upon the guide to roll along the same with their open ends facing in the same direction, they may be arranged so that their open ends face promiscuously in opposite directions.

In order that they may be thoroughly cleansed and sterilized internally and externally in one and the same operation by the same agency during their transit through the steaming chamber, I have provided a pair of steaming pipes —11—, running parallel with and at opposite sides of the track —4— in approximately the same horizontal plane as the centers of the cans while the latter are being rolled along said guide or substantially midway between the bottom of the track and lower side of the endless belt —7—.

These pipes extend from end to end of the steaming chamber, the portions of said pipes within the chamber being provided with

perforations —12— in their inner sides facing the ends of the cans so that when steam is supplied in the pipes, it will be projected directly against the closed ends of the cans or into the open ends thereof.

This steam will also envelop said cans to a greater or less extent to effect not only a thorough cleansing of the same from foreign matter but also a sterilizing of the cans internally and externally by reason of the high degree of heat of the steam.

The top of the steaming chamber —1— is preferably open at —13— and is surrounded by a flue —14— which may lead to the exterior of the building in which the apparatus is located to carry off any excess steam or vapor.

A portion of this steam, however, will be condensed within the steaming chamber in which case the water of condensation will be precipitated upon the bottom as —15— of the chamber and in order that it may be automatically removed, said bottom is inclined toward the entrance end of the chamber and its lowest point is connected by a branch pipe —16— to a common drainage pipe —17—, which in turn may be connected to a waste or soil pipe, not shown, to carry the water away from the machine.

A steam supply pipe —18— may be connected to any available source of supply and is provided with a branch —19— leading to one of the pipes —11— from which steam is supplied to the other pipe —11— through a branch —20—, the supply of steam to the distributing pipes —11— being controlled by a valve —19'— in the branch —19—.

In order to further insure a more thorough cleansing of the peripheries of the cans, a branch-pipe —21— is connected to the main supply-pipe —18— to extend transversely of and directly under the inclined portion —6— of the track —4— and is provided with a pair of steam nozzles or jets —22— for projecting steam directly against the peripheries of the cans as they roll down the inclined portion —6— onto the horizonal portion of the track —4—, it being understood that the track is composed of parallel angle irons in spaced relation to form supports and guides for the ends of the cans, leaving an intervening opening with which the steam nozzles —22— are registered to allow the steam to be projected therethrough against the peripheries of the cans.

The drying chamber —2— is located at the outlet end of the steaming chamber in approximately the horizontal plane thereof and in this chamber is located a can-guide or track —23— similar to and forming continuation of the track —4— in the steaming chamber, except that it is inclined downwardly from the outlet of said steaming chamber to allow the cans to roll by gravity along the same through the outlet, as —24— in the opposite end of the drying chamber.

The end of the track —23— which is connected to the track —4— directly under the adjacent end of the endless belt —7— is inclined more abruptly than the remaining portions so as to advance the cans away from the belt with sufficient impetus to avoid congestion of the cans which might otherwise place an excessive load upon the belt.

When the cans are fed along the tracks with their open ends facing in the same directions, the track —23—, is preferably tilted transversely in the direction of the open ends of said cans, as shown more clearly in Figure —3—, to allow any water of condensation which may tend to accumulate therein or adhere thereto, to drain off on to the bottom, as —25—, which is also inclined and forms a continuation of the inclined wall —15—.

While the cans are in transit through the drying chamber —2—, they are subjected to a current of heated air or equivalent drying agent and for this purpose I have provided an elongated heating drum —26—, running parallel with and at one side of the chambers —1— and —2— and containing a series of steam heated coils or pipes, shown by dotted lines and receiving steam from the main supply pipe —18— through a branch pipe —27— which is connected to one end of said steam coil while the opposite end of the same coil may be connected to the drain pipe —17— to allow live steam to flow through the coil to highly heat the air passing through the drum —20— in transit to the drying chamber —2—.

One end of the drum —26— is connected by a pipe —28— to one side of the drying chamber —2— near the center thereof and is provided with a thermometer —29— by which temperature of the air entering the drying chamber may be determined.

The other end of the drum —26— is connected by a pipe —30— to a pump —31— which serves to forcibly drive the air through the drum and into the drying chamber, thereby effectively drying and further sterilizing the cans in transit through the drying chamber.

A relatively long baffle-plate —32— is secured to the inner face of the side wall of the chamber —2—, just above the delivery end of the pipe —28— and extends downwardly and inwardly across the end of said pipe to deflect the inflowing heated current of air downwardly, causing it to impinge more directly against the moving cans for the purpose of expediting the drying and sterilizing thereof.

The operation, briefly described, is as follows:

Assuming that the steam is turned on to the steaming chamber —1—, the cans are

placed by hand or otherwise upon the inlet end of the inclined portion —6— of the track —4—, where they roll by gravity along said inclined portion, until engaged by the lower side of the endless belt —7—, which gradually rolls them along said track through the steaming chamber, during which they are subjected to the impact of the escaping steam from the pipes —11— and are then delivered to the inclined track —23— along which they travel through the drying chamber —2—, where they are subjected to the current of heated air and emerge therefrom in a substantially dry and sterilized condition, ready for receiving the substance to be preserved therein, the water of condensation being deposited upon the inclined bottom —15—, of the chamber —1— and then passing to the drainage pipe —16—, while the lighter steam or vapor escapes through the flue —14—.

What I claim is:

1. In an apparatus for cleansing and sterilizing empty cans, the combination with a steaming chamber and a drying chamber arranged end to end, of a can guide extending lengthwise through the steaming chamber in a substantially horizontal plane, an endless belt extending lengthwise of and within the steaming chamber from end to end thereof above the guide for engaging the upper sides of the peripheries of the cans and rolling them along the guide toward the drying chamber, a downwardly inclined guide leading from the delivery end of the first named guide through the drying chamber to form a continuation thereof and along which the cans are adapted to roll independently of the belt, means for simultaneously projecting steam against opposite ends of the cans while in transit through the steaming chamber, and separate means for projecting heated air into the drying chamber while the cans are in transit therethrough.

2. In an apparatus for cleansing and sterilizing empty cans, the combination with a steaming chamber and a drying chamber arranged end to end, of a can guide extending lengthwise through the steaming chamber in a substantially horizontal plane, an endless belt extending lengthwise of and within the steaming chamber from end to end thereof above the guide for engaging the upper sides of the peripheries of the cans and rolling them along the guide toward the drying chamber, a downwardly inclined guide leading from the delivery end of the first named guide through the drying chamber to form a continuation thereof and along which the cans are adapted to roll independently of the belt, means for simultaneously projecting steam against opposite ends of the cans while in transit through the steaming chamber, and separate means for projecting heated air into the drying chamber while the cans are in transit therethrough, said steaming chamber having a steam exit flue leading from the top thereof directly over the belt and adjacent can guide therein.

3. In an apparatus for cleansing and sterilizing empty cans, the combination with a steaming chamber and a drying chamber arranged end to end, of a can guide extending lengthwise through the steaming chamber in a substantially horizontal plane, an endless belt extending lengthwise of and within the steaming chamber from end to end thereof above the guide for engaging the upper sides of the peripheries of the cans and rolling them along the guide toward the drying chamber, a downwardly inclined guide leading from the delivery end of the first named guide through the drying chamber to form a continuation thereof and along which the cans are adapted to roll independently of the belt, means for simultaneously projecting steam against opposite ends of the cans while in transit through the steaming chamber, and separate means for projecting heated air into the drying chamber while the cans are in transit therethrough, said steaming chamber having a steam exit flue leading from the top thereof directly over the belt and adjacent can guide therein, the bottom of the steaming chamber being inclined downwardly toward the can-receiving end and provided with a drainage outlet at its lowest point for removing water of condensation.

4. In an apparatus for cleansing and sterilizing empty cans, a steaming chamber having a longitudinally inclined bottom provided with a drainage outlet at its lowest point, a steam exit flue leading from the top of the steaming chamber, a can guide extending longitudinally through the steaming chamber in a horizontal plane some distance below the flue, an endless belt extending through the steaming chamber between the flue and guide for rolling contact with the upper sides of the peripheries of the cans to roll said cans along the guide, and steam supply pipes extending lengthwise through the steaming chamber at opposite sides of the guide and in a horizontal plane between the guide and adjacent side of the belt.

In witness whereof I have hereunto set my hand this 19″ day of October, 1918.

JOHN A. ROOF.

Witnesses:
GEO. E. PHILLIPS,
F. H. STICHT.