C. E. GLESSNER.

VACUUM CONTAINER.

APPLICATION FILED JAN. 20, 1919.

1,421,685.

Patented July 4, 1922.

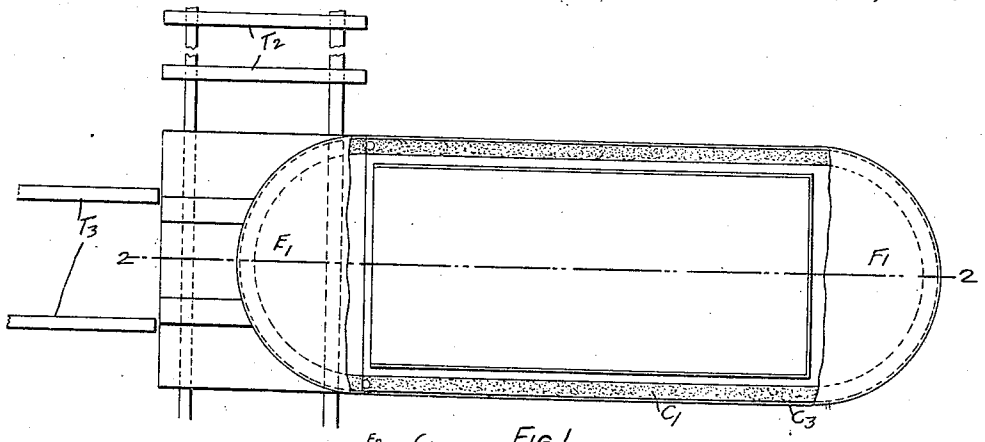


FIG. 1

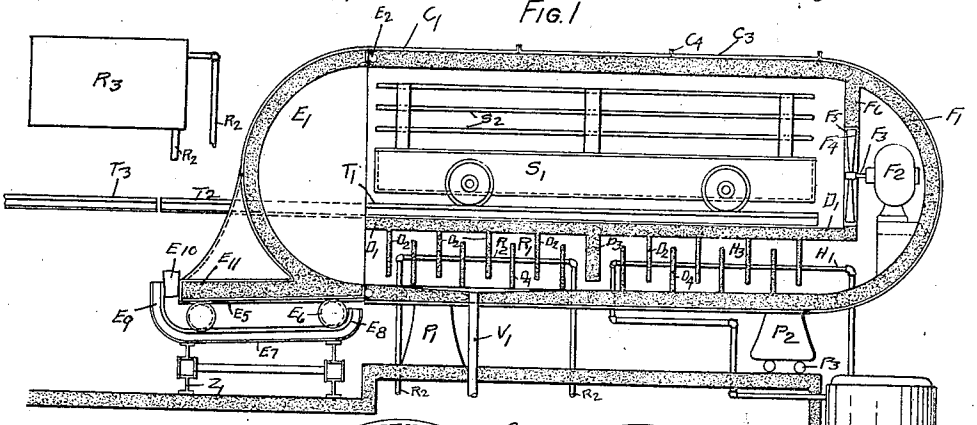


FIG. 2

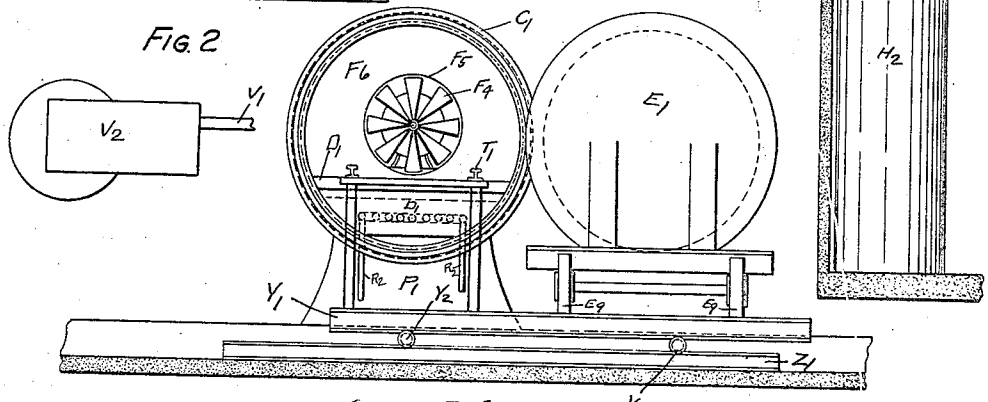


FIG. 3

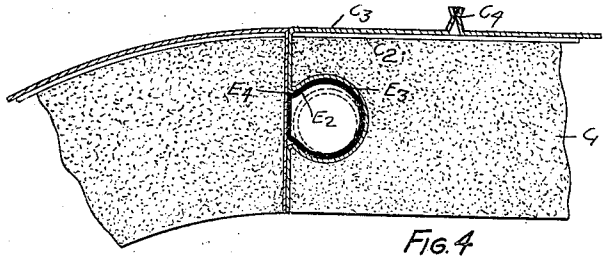


FIG. 4

INVENTOR.

Charles E. Glessner.

BY David E. Lofgren

ATTORNEY.

UNITED STATES PATENT OFFICE.

CHARLES E. GLESSNER, OF PORTLAND, OREGON.

VACUUM CONTAINER.

1,421,685. Specification of Letters Patent. Patented July 4, 1922.

Application filed January 20, 1919. Serial No. 272,068.

To all whom it may concern:

Be it known that I, CHARLES E. GLESSNER, a citizen of the United States, residing in Portland, county of Multnomah, and State of Oregon, have invented a new and useful Vacuum Container, of which the following is a specification.

My device relates more particularly to that class of inventions pertaining to the extraction of moisture from substances without subjecting same to extremely hot temperatures.

The object of my invention is to render it possible to commercialize a process to dehydrate substances by means of a vacuum system which will remove the liability of injury to the objects being dehydrated by the increased temperatures necessary when a vacuum is not used.

To accomplish these results I have arranged the elements of my invention in the manner set forth in the specification following and as illustrated in the appended drawing, which forms a part of the specification.

It is obvious that since the evaporation of water is increased with the reduction of atmospheric pressure, it will not be necessary to increase the temperature materially in order to secure a desired degree of evaporation, providing that the surrounding air is sufficiently rarefied. It is also a well known fact that the subjection of many substances to heat for the purpose of extracting the moisture is injurious, inasmuch as substances containing sugar may caramel, or lumber may check unduly.

Referring to the drawing, Figure 1 is a plan of my device; Figure 2 is a sectional elevation through 2—2; Figure 3 is a front elevation of the device showing cover removed; Figure 4 is an enlarged detail of the sealing device and of the expansion joints.

Referring in detail to the drawing, C^1 is a cylindrical concrete vacuum chamber which is completely covered with a felt insulation C^2, outside of which is the air-tight jacket C^3 which is supplied with expansion joints C^4. One end of the vacuum chamber C^1 is closed by the dome F^1 which forms a part of said vacuum chamber. Within said dome F^1 is an electric motor F^2 upon whose shaft F^3 is mounted the fan F^4, which occupies a circular opening F^5 in the wall F^6 which is constructed across the chamber C^1 near the point of tangency of said chamber C^1 and the dome F^1 and extending downwardly to the floor D^1, which floor extends the full length of the cylindrical portion of the device and joins in front of the motor F^2 with the wall F^6 in a manner that any air which passes through the opening F^5 must pass under the full length of the floor D^1. Underneath the floor D^1, and joining to same at regular intervals, are the partitions D^2 which do not reach the bottom of the chamber C^1. The partition nearest the center, which I shall designate as D^3, which is heavier than are the partitions D^2 is insulated for heat. From the bottom of the chamber C^1 and between each adjacent pair of partitions D^2 and D^3 are the partitions D^4 which do not reach the floor D^1 at their uppermost part, and have a small opening at their lower side for drainage purposes.

Hot water pipes H^1 are passed through the partitions D^2 and D^4 under the half of the chamber C^1 which is nearest the fan F^4, or placed in the most convenient position, and heat is supplied to the pipes H^1 by boiler H^2 to which they are connected. A similar set of pipes R^2 connected to a cooling medium such as running water or a brine tank R^3 is placed under the half of the chamber C^1 which is nearest the front or open end of the chamber C^1. Drain pipe V^1 is connected to a vacuum creating means V^2 of the most convenient type, and also serves to carry off the water formed by the condensation of moisture in the cold air chamber R^1.

Upon the floor D^1 is located the track T^1 upon which is placed the car S^1 upon which are mounted the shelves S^2, which will vary according to the peculiar requirements of the work. The entire chamber C^1 is mounted upon the pedestals P^1 and P^2, but is separated from them by the metallic jacket C^3. The pedestal P^2 rests upon the rollers P^3 which will permit of the expansion or contraction of the chamber without serious results. The chamber C^1 is closed by the dome E^1 which is insulated and covered, as is the rest of the chamber, and the seal necessary for maintaining a vacuum is produced by the inflated tube E^2 which encircles the mouth of the chamber within the recess E^3.

When the tube E^2 is deflated it takes the position shown in dotted lines in Figure 4, at which time no portion of the tube is exposed beyond the mouth E^4 of the recess E^3 in order that it will not be worn or torn by

movement of the dome E^1. The dome E^1 has a flat base E^{11} on the under side of which are secured the two track members E^5, which ride between the flanges of the rollers E^6. Said rollers roll on tracks E^7 which slope away from the chamber and are turned up at the forward and backward end. The upper end E^8 prevents the dome E^1 from leaving its carriage when it is in the open position, and the lower end E^9 prevents the dome E^1 from leaving its carriage at the lower end of the incline which is formed by the tracks E^7. The wedges E^{10} hold the dome E^1 against the chamber C^1 and the tube E^2 is inflated making a perfect seal at the union of the dome E^1 and the chamber C^1, regardless of the roughness of the line of contact.

On the under side of track E^7 are secured the rails Y^1 which ride on the rollers Y^2 which, in turn, ride on the track Z^1. From the tracks Y^1 are supported the tracks T^2 which are so located on track Y^1 that when the dome E^1 has been moved away from the front of the chamber C^1, the track C^2 will line up with track T^1 and also with the track C^3 which carry the articles to and from the dehydration chamber.

The operation of my dehydrator is as follows: The car S^1 is loaded with the articles to be dehydrated and moved into the chamber C^1, as shown in Figure 2, and the dome E^1 is then moved up the inclined tracks E^7 until the dome touches the chamber. The wedges E^{10} or an equivalent are now inserted between the base of the dome E^1 and the bent rails E^9. The tube E^2 is now inflated making a seal between the dome E^1 and the chamber C^1. A cooling medium is now admitted to the pipes R^2 in the cold air chamber R^1. Heat is also admitted to the pipes H^1 in the hot air chamber H^3 and the fan F^4 is started, which takes the air from the heated chamber H^3 and passes it over the articles in the car S^1. The vacuum pump also having been started and the atmospheric pressure reduced it is apparent that the fan F^4 will need to be driven at a greater speed than would be necessary at the usual atmospheric pressure in order to circulate the rarefied air. Under the vacuum the moisture in the articles is quickly evaporated and circulated through the cold air chamber R^1 where the moisture is condensed and drawn off through pipe V^1 by the vacuum pump V^2. The cold air now passing from the chamber R^1 has lost its moisture there and passes on to chamber H^2 where it is warmed before it reaches the fan F^4 from which it is again sent to the dehydrating chamber for more moisture.

It will be seen that by my process only moderately warm, dry, rarefied air comes in contact with the articles to be dehydrated, which furnishes the ideal condition for this operation. It will be remembered that when heat is used to remove moisture that the process is not only slow but extremely liable to injure the quality of the product.

I have constructed my device of concrete thereby combining the maximum of strength with the minimum of cost.

While I have thus described my device it is not my intention to limit myself to this precise form, but intend that it shall cover all forms and modifications that fall fairly within the appended claims.

What I claim as new and desire to protect by Letters Patent of the United States, is:

1. A vacuum container consisting of a concrete tank of sufficient strength to withstand atmospheric pressure, enveloped by an air-tight metallic covering, having expansion joints in said covering produced by butting the angular flanges formed on the edges of the sheets to form an X with the upper V hermetically joined with solder, a means for permitting the expansion of the tank and its covering as a whole without injury to the latter, and a closure means adapted to hermetically seal said tank consisting of a cover removably placed in front of the entrance to said tank, a pneumatic gasket placed between said closure and said tank and lying in a groove in said tank in a manner that when deflated said gasket will not project beyond the face of said tank.

2. A vacuum container consisting of a concrete tank of sufficient strength to withstand atmospheric pressure, enveloped by an air-tight metallic covering, and having expansion joints in said covering produced by butting the angular flanges formed on the edges of the sheets to form an X with the upper V hermetically joined with solder.

3. A vacuum container consisting of a concrete tank of sufficient strength to withstand atmospheric pressure, enveloped by an air-tight metallic covering, having expansion joints in said covering produced by butting the angular flanges formed on the edges of the sheets to form an X with the upper V hermetically joined with solder, and a means for permitting the expansion of the tank and its covering as a whole without injury to the latter.

CHARLES E. GLESSNER.