June 22, 1926. 1,589,452

N. P. BACH

METHOD OF AND APPARATUS FOR VACUUMIZING MATERIALS

Filed June 16, 1923

Fig. 2.

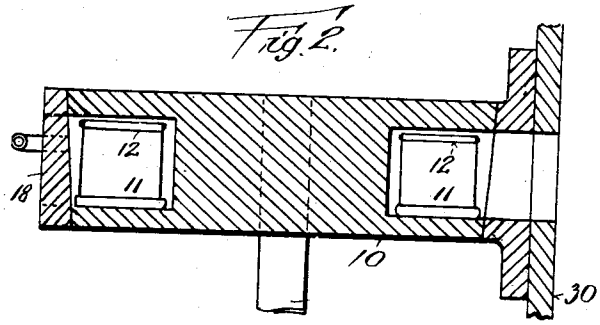


Fig. 3.

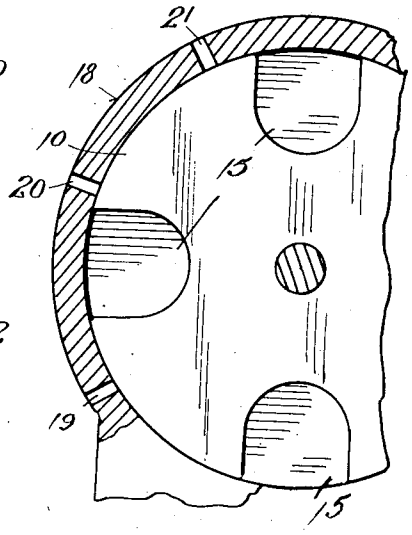
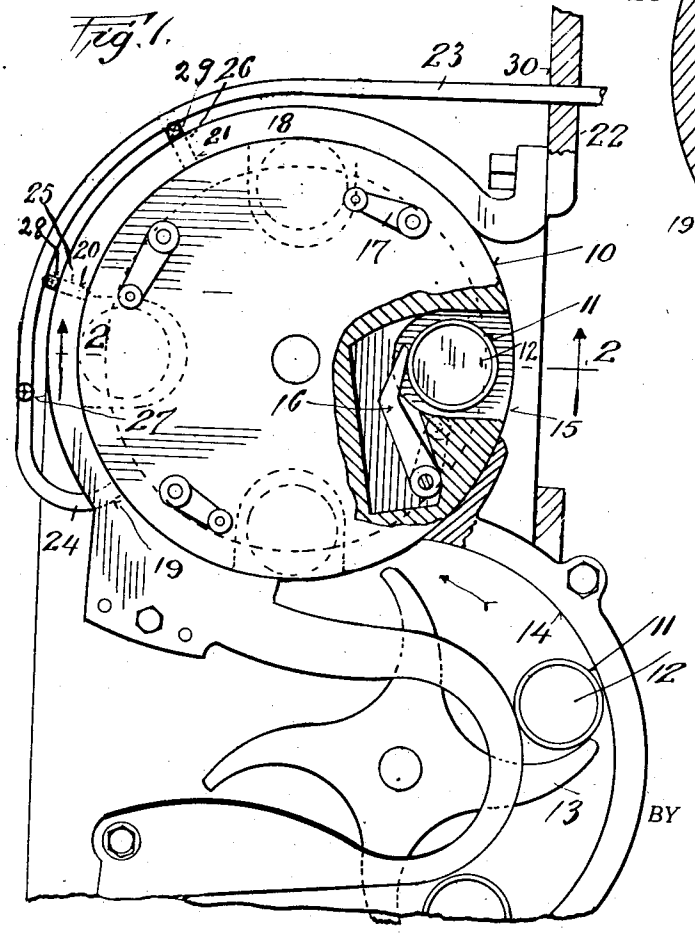


Fig. 1.



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UNITED STATES PATENT OFFICE.

NEILS P. BACH, OF MILLBURN, NEW JERSEY, ASSIGNOR TO THERMOKEPT CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

METHOD OF AND APPARATUS FOR VACUUMIZING MATERIALS.

Application filed June 16, 1923. Serial No. 645,931.

This invention relates to a method for subjecting successive containers uninterruptedly to successively increased vacuumization, and has for its object a mode of procedure whereby containers and their contents are moved into gradually increased vacuumizing influence and whereby it is possible to apply a high degree of vacuumization in gradually increasing degrees to thus enable powders and light fluffy products to be vacuumized, preferably in their containers, without the annoyance of dusting and loss of material due to sudden changes in pressure.

A further object includes the provision of means for carrying out the above mode of procedure in an efficient and economical manner.

It has heretofore been proposed to submit containers to vacuumization in a continuous stream through a self-centering gate or valve, whereby it is possible to maintain a constant degree of vacuumization within the chamber into which said containers are continuously fed and from which they are as continuously removed. It is found, however, that where materials in containers are thus suddenly admitted into decreased pressure conditions, the abrupt changes in pressure will cause disturbances in the contents of said containers for many materials and will cause such materials to suddenly spread or even fly about, thereby causing not only considerable loss of material and annoyance but preventing also a safe seal to be formed. I have discovered that by causing materials in containers to be gradually subjected to increased vacuumization, that is, causing the containers to travel into constantly higher degrees of vacuumization, said materials will not be disturbed but the air will be removed therefrom quietly and without ebullition or any explosive effects due to abrupt changes in pressure.

It is therefore one of the prime objects of my invention to cause a succession of containers and their contents to be subjected to constantly decreased pressure while said containers are traveling into a vacuumizing chamber to be vacuumized and preferably though not necessarily, be also sealed and then as constantly removed from said chamber, while the degree of vacuumization is constantly maintained therein.

In the accompanying drawing I have shown my invention in a practical manner. It is self-evident that, however, my mode of operation is capable of being carried out by other instrumentalities than the specific embodiment illustrated in the accompanying drawing, wherein—

Fig. 1 is a plan view of a portion of standard can feeding mechanism and a continuous can feeding pressure seated gate provided with means for effecting my invention.

Fig. 2 is a section taken on lines 2—2 of Fig. 1; and

Fig. 3 is a view partly in section, of a portion of the pressure seated gate and the outer jacket showing several pressure ports therethrough.

Similar numerals refer to like parts throughout the several views.

In my Patent No. 1,423,591, dated July 25, 1922, I have disclosed apparatus whereby containers are fed in a continuous stream into a vacuumizing chamber wherein a constant vacuum is maintained for vacuumizing said contents, and wherein said containers are capped and sealed under said conditions.

In the illustrative embodiment as shown in the accompanying drawing, I have disclosed a pressure seated valve 10 for moving into constantly higher vacuumization a continuous stream of containers, having materials to be vacuumized and preferably, though not necessarily, being provided with covers 12 which may be loosely held for sealing under vacuumization. The cans may be moved into position by the star wheel 13, to travel along a track 14 and into pockets 15 of the pressure seated valve 10. The valve itself may be supplied with suitable can moving kickers 16 which may be operated in any suitable manner as by cams 17. The valve is so constructed and mounted as to be seated in its jacket 18 by the difference of external and internal pressure. In order to facilitate this feature and the assembly of the valve, I prefer to construct the valve in the shape of an inverted truncated cone which fits into its seating jacket 18. This jacket is supplied with a number of ports 19, 20 and 21 which are located at proper intervals and are in direct connection with the vacuumizing chamber by a conduit 23. This conduit is supplied with branches 24, 25 and

26 which connect with the respective ports 19, 20 and 21. Valves 27, 28 and 29 are supplied in conduit 23 at proper points to control the pressures at the several regions within the jacket, and conduit 23 is in direct communication with vacuum chamber 22 through the vacuum chamber wall 30.

From the illustrative device as herein disclosed, the mode of operation which embodies my invention is readily apparent to those versed in the art. By proper adjustment of valves 27, 28 and 29, varying degrees of vacuumization are maintained in the regions of port openings. By this means I maintain a successively higher vacuumization as the can travels towards the vacuumizing chamber, thus, as a specific example, if the gauge reading for port 19 is, say, 10 for certain materials, I so adjust the successive valves as to give a successively higher vacuumization for each port provided. The adjustments are so made that there will be no abrupt change of pressure as the containers pass any one port, or into the chamber itself, and the material in the container will not be caused to spill or to fly about. My method of gradation of vacuumization may obviously be applied to liquids, as condensed milk, as well as to powdery materials, such as milk powders, baking powders, cocoa and the like.

Having now described my invention and given a specific embodiment thereof, what I claim as new and useful, of my own invention, and desire to secure by Letters Patent is:

1. The method of submitting materials in containers to successively increased stages of vacuumization, which comprises causing containers to move through successively higher vacuumization areas and maintaining in said successive areas controlled gradations of vacuumization of a degree as will cause no disruption of the materials vacuumized.

2. The method of submitting materials to successive stages of vacuumization which comprises causing said materials to be subjected to successive higher stages of vacuumization and causing said vacuumization to be controlled at said stages.

3. The method of submitting materials in containers to successive stages of vacuumization, which comprises causing said containers to move into areas for maintaining said stages of vacuumization and causing gradations of vacuumization to be maintained in said areas under positive control, said gradations of vacuumization being maintained to a degree insufficient to cause disruptive effects upon said materials as they are moved into said successive stages of vacuumization.

4. The method of submitting materials in uniformly moving containers to different degrees of vacuumization, which comprises causing said containers being moved into successive areas of vacuumization and causing the degree of vacuumization of each successive area to be controllably maintained by gradations insufficient to cause disruptive agitations in the materials as the containers move from one area to the other.

5. An apparatus for vacuumizing materials without causing said materials to be agitated by variations in degrees of vacuumization, which comprises means for continuously moving a succession of containers, means for receiving said containers, and for moving them into areas maintained under differing degrees of vacuumization, means for maintaining gradations of vacuumization in said areas while the containers pass therethrough and means for positively controlling said vacuumization to prevent any disruptive action in the material vacuumized.

6. In an apparatus for subjecting materials in containers to successively increased vacuumization areas, a port for admitting a stream of containers into a vacuumizing chamber while maintaining a uniform degree of vacuumization therein, a valve for said port, said valve being seated by atmospheric pressure, and said port walls being provided with a plurality of openings, and a conduit pipe connecting the vacuumizing chamber and said port through a plurality of port wall openings whereby the materials passing said openings are subjected to vacuumizing influences of varying degree.

7. In an apparatus for subjecting materials in containers to successively increased vacuumization areas, a port for admitting a stream of containers into a vacuumizing chamber while maintaining a uniform degree of vacuumization therein, a valve for said port, said valve being seated by atmospheric pressure, and said port walls being provided with a plurality of openings, and a conduit pipe provided with a plurality of branches for connecting the vacuumizing chamber to said port, and valves in said branches for controlling the degree of vacuumization of the materials while passing said openings.

8. A vacuumizing apparatus for subjecting materials in moving containers to gradations of gradually increased vacuumization before being introduced into the vacuumizing chamber, a port for said chamber through which said containers are caused to move uninterruptedly, a pressure seated valve for conveying said containers through said port, and means in said port for subjecting said containers to gradually increased vacuumization.

9. A vacuumizing apparatus for subjecting materials in moving containers to gradations of gradually increased vacuumization for preventing disruption in the mass of said

materials when admitted into the vacuumizing chamber, a port for said chamber, a pressure seated truncated conical valve in said port, pockets in said valve for carrying containers into said chamber while maintaining a constant degree of vacuumization therein, and means associated with said port for causing varying degrees of vacuumization to be established in said pockets while conveying containers into said chamber.

In testimony whereof I have hereunto set my hand on this 15th day of June A. D. 1923.

NEILS P. BACH.