C. F. P. ANDERS.

PROCESS OF MAKING VACUUM BOTTLES.

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**1,335,544.** **Patented Mar. 30, 1920.**

Fig. 1.

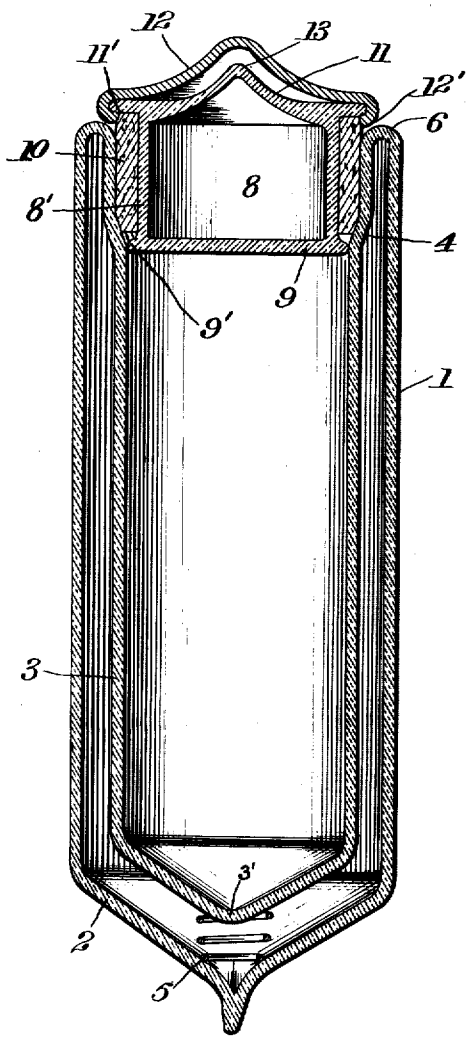
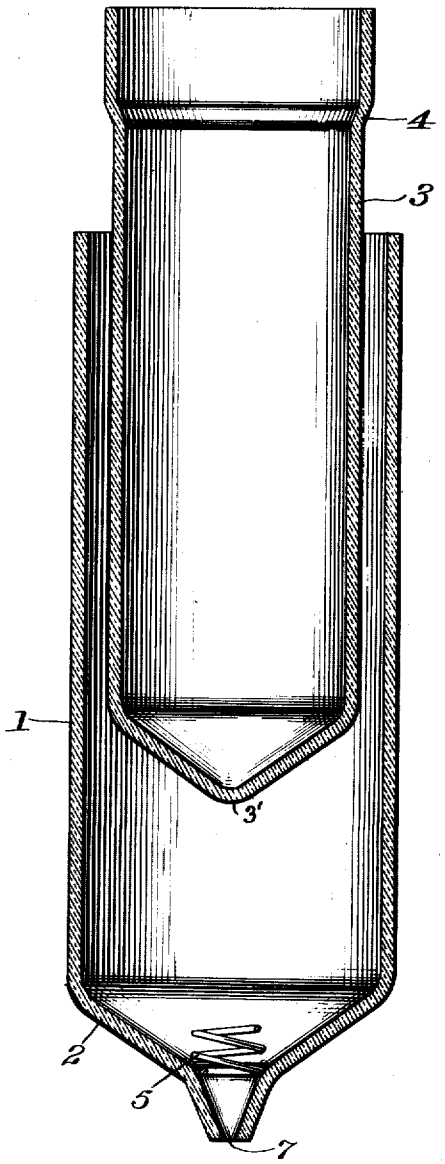



Fig. 2.




Witnesses
G. F. Baker.
H. P. Jennings.

Inventor
Charles F. P. Anders,
by Foster, Freeman, Watson & Coit.
Attorneys

# UNITED STATES PATENT OFFICE.

CHARLES F. P. ANDERS, OF URBANA, ILLINOIS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO EUGENE L. GREENEWALD, OF WASHINGTON, DISTRICT OF COLUMBIA.

## PROCESS OF MAKING VACUUM-BOTTLES.

1,335,544. Specification of Letters Patent. Patented Mar. 30, 1920.

Original application filed November 23, 1910, Serial No. 593,891. Divided and this application filed February 19, 1916. Serial No. 79,393.

*To all whom it may concern:*

Be it known that I, CHARLES F. P. ANDERS, a subject of the Emperor of Germany, and resident of Urbana, Champaign county, State of Illinois, have invented certain new and useful Improvements in Processes of Making Vacuum-Bottles, of which the following is a specification.

This invention relates to what are known as vacuum bottles and it has been my object not only to simplify the construction, making it easy and less expensive to manufacture the bottles, but also securing better heat insulation, thus retaining the heat in the bottles more effectively than has been done heretofore. The novel features of my invention will be apparent from the following description, taken in connection with the accompanying drawings.

In the drawings,

Figure 1 is a vertical section through the device embodying my invention;

Fig. 2 is a vertical section through the outer and inner receptacles before they are secured together.

As shown in these drawings, 1 represents the outer receptacle which in this instance is made cylindrical in form having the conical or tapering bottom 2. The inner receptacle 3 is made of substantially the same shape except that it has near its upper end the shoulder 4 formed by an outward bend and leaving what may be termed the neck of the bottle beyond that bend. As shown in Fig. 2, the two receptacles are formed separately and a coiled spring 5 made of metal is placed in the tapering portion of the outer receptacle and the tapering end of the inner receptacle is inserted in the upper coil of the spring, as shown in Fig. 1. The upper ends of the two receptacles are then secured together at 6, so as to form one complete article and by this construction it will be observed that the spring 5 serves to center the inner receptacle and to properly support it in position and compensates for strains and for contraction while the joint at 6 is cooling. I find that when such spring is used in the construction shown, it is not necessary to have any other support or connecting means between the outer and inner receptacles and thus the transmission of heat from the outer to the inner receptacle by conduction in the connecting means is reduced to a minimum.

The two receptacles are preferably made of glass and a space is left between them at all points including the neck and the air is exhausted from this space through the opening 7 which in the beginning is left at the lower point of the outer receptacle. This opening 7 is of course sealed in the usual way after the air is exhausted.

The upper end of the inner receptacle is closed by a stopper or closure 8 which is made hollow and which has the bottom portion 9. This closure is surrounded by a packing ring of suitable material 10.

The top 11 of the closure is originally formed with an opening at the upwardly projecting point 13 for the purpose of exhausting the air within it, but this opening is of course sealed in the usual way when the article is completed as shown. A metal cover 12 is preferably placed over the top of the closure, its edges being spun around the upper edges of the closure to hold it in place. This cover serves as a protection.

It will be understood that my device maintains the contents at practically the same temperature whether hot or cold. The outside heat cannot get in any more than the inside heat can get out.

By making the two receptacles or blanks of such shape that the inner receptacle can be inserted through the upper end of the outer receptacle in manufacturing the device the expense and trouble of manufacture is reduced to a minimum and the joints and connections can be easily made.

Having thus described the invention, what I claim is:

1. The process of manufacturing vacuum bottles which consists in forming two substantially similar open-ended vitreous receptacles of different cross-sectional areas, placing a resilient centering and spacing member in the bottom of the larger receptacle, introducing the smaller receptacle through the upper open end of the larger receptacle and supporting and centering the same on said centering and spacing member, fusing said receptacles together at their upper ends and exhausting the air from the space between said receptacles.

2. The method of making double walled vacuum insulated vessels which comprises forming an outer and inner blank with substantially similarly shaped bottoms, insert-

ing a supporting and centering means in the bottom of the outer blank and telescoping, supporting and centering the inner blank in the outer blank, uniting the blanks adjacent their mouths, and establishing and sealing a vacuum between the walls of said receptacles.

3. In the manufacture of glass vacuum bottles, the method which comprises separately forming an inner closed bottom open mouth glass blank, and a substantially similar but larger outer open mouth glass blank closed at the bottom except at the center where it is provided with an opening through which air may be withdrawn, inserting the inner blank in the outer blank, fusing the mouths of said inner and outer blanks together, supporting said inner blank centrally within the outer blank and spaced from the latter while the mouths of said inner and outer blanks are being fused together, exhausting air through said opening from the space between said blanks, and sealing said opening.

4. In the manufacture of glass vacuum bottles, the method which comprises separately forming an inner closed-bottom open-mouth glass receptacle blank and a substantially similar but larger open mouth glass outer blank closed at the bottom except at the center of the bottom where it is provided with an opening through which air may be exhausted, inserting the inner blank into the outer blank, fusing the mouths of said blanks together at their lips, yieldingly supporting said inner blank within and spaced from said outer blank while the blanks are being fused together, exhausting air through said opening from the space between said blanks, and sealing said opening.

5. The method of making hollow-wall containers that comprises forming an inner closed-bottom blank having an open end and an outer blank having an open end, inserting said inner blank in said outer blank through the open end of the latter, yieldingly supporting one of said blanks lengthwise relatively to the other blank, and uniting said blanks.

6. The method of making hollow-wall glass vacuum bottles that comprises forming an inner closed-bottom blank having an open end and an outer blank having an open end, inserting said inner blank in said outer blank through said open end of the latter, yieldingly supporting the inner blank at its lower end in a direction longitudinally of its axis and spaced from said outer blank, uniting said blanks, and withdrawing air from the space between said blanks.

7. The method of making hollow-wall containers that comprises forming a closed-bottom open-mouth receptacle blank and a substantially similar but larger open-mouth outer blank closed at the bottom except at the center of the bottom where it is provided with an opening through which air may be withdrawn, inserting said receptacle blank into said outer blank through the mouth of the latter, supporting said receptacle blank in an axial direction in said outer blank and spaced from the latter, securing said blanks together adjacent their mouths, withdrawing air through said opening from the space between said blanks, and sealing said opening.

8. The method of making vacuum bottles that comprises forming two substantially similar but different size blanks having open mouths, inserting the smaller blank into the larger blank through the open mouth of the latter yieldingly supporting one of said blanks in an axial direction relatively to the other blank and spaced from the latter, uniting said blanks adjacent their mouths, and establishing and sealing a vacuum in the space between said blanks.

9. The method of making glass vacuum bottles which comprises separately forming an inner glass receptacle blank and a hollow outer glass blank, both provided with mouths, inserting the receptacle blank into said outer blank, yieldingly supporting said receptacle blank at the end thereof opposite its mouth and in a longitudinal axial direction and spaced from said outer blank while the blanks are being fused together, fusing said blanks together at their mouths, and establishing and sealing a vacuum in the space between said blanks.

In testimony whereof, I affix my signature in the presence of two witnesses.

CHARLES F. P. ANDERS.

Witnesses:
GLEN CHRISTY,
REGINALD P. BOURASSA.