Nov. 4, 1924. 1,513,881

E. B. AYRES

PROCESS OF DRYING HOLLOW ARTICLES

Filed July 27, 1922

Fig. 1.

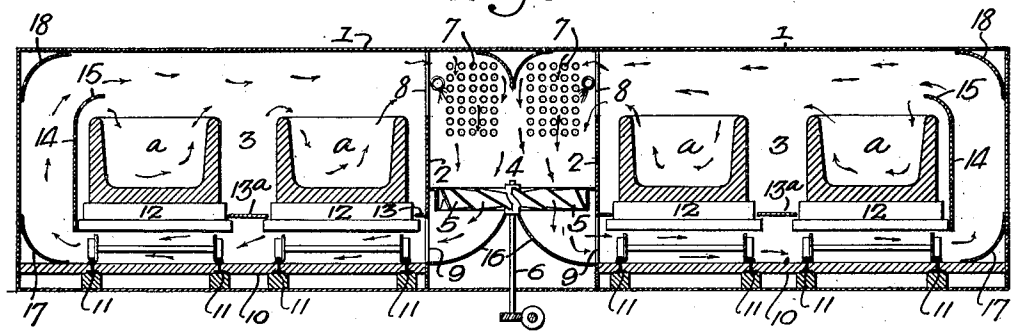


Fig. 2.

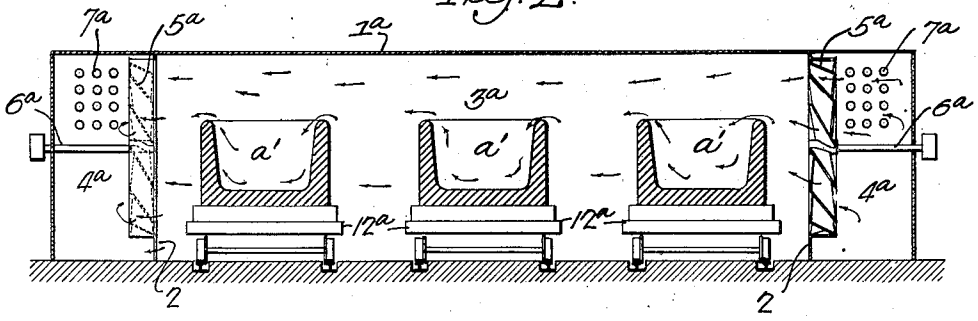
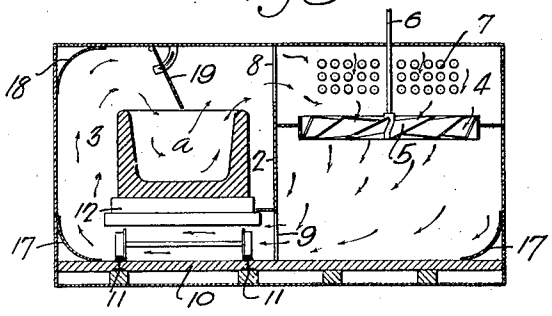


Fig. 3.



Inventor—
Elwood B. Ayres.
by his Attorneys.—
Abuson & Abuson

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UNITED STATES PATENT OFFICE.

ELWOOD B. AYRES, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO PROCTOR & SCHWARTZ, INCORPORATED, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

PROCESS OF DRYING HOLLOW ARTICLES.

Application filed July 27, 1922. Serial No. 577,899.

To all whom it may concern:

Be it known that I, ELWOOD B. AYRES, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in a Process of Drying Hollow Articles, of which the following is a specification.

The object of my invention is to improve the process of drying hollow ceramic articles, such as bath tubs; glass pots and hollow sanitary ware.

This object I attain in the following manner, reference being had to the accompanying drawings, in which:

Fig. 1 is a sectional view of a drier for drying glass pots used in the manufacture of glass ware;

Fig. 2 is a sectional view of a drier adapted for drying large articles, such as porcelain bath tubs; and

Fig. 3 is a view of another form of drier used for drying hollow articles and illustrating my improved process.

In drying open, hollow articles of clay, or porcelain, it is difficult to dry the interior of the articles by the usual method of slowly circulating heated air around the articles. I have found that by increasing the speed of the circulating means the air in circulation will travel at such a speed as to produce a partial vacuum in the open, hollow articles, due to the suction of the currents of air passing over the openings therein, with the result that the heated air in circulation passes into the interior of the articles and the moist air is withdrawn therefrom.

Referring in the first instance to Fig. 1, which illustrates one method of carrying out my improved process, 1 is a casing of a drying apparatus having two longitudinal partitions 2 separating the casing into three compartments. The compartments 3 are the drying compartments and the compartment 4 is the circulating compartment.

The drying apparatus is of any length desired and the articles are conveyed through the drier while the fans, which are located at intervals throughout the drier, circulate heated air in the drying compartments.

In the circulating compartments are fans 5, mounted on vertical shafts 6, driven in any suitable manner. Above the fans is a series of heating pipes 7, which heat the air in circulation. In the partitions 2 are openings 8 and 9 through which the air circulates.

Each drying compartment has a floor 10 on which are rails 11. 12 are cars having wheels adapted to the rails. These cars support the articles *a* to be dried, which, in the present instance, are glass pots in which glass is melted. Between the partitions 2 and the cars 12, nearest the partitions, are horizontal partitions 13. Between the cars are continuations 13^a of the partitions 13.

In the present instance, between the side walls of the casing and the cars nearest the side walls is a vertical partition 14 curved at the top 15 so as to direct the air over the top of the open, hollow articles mounted on the cars.

16 are curved deflectors directly under each fan 5 for directing the air under the cars 12. At the corners of the drying compartments are curved deflectors 17 and 18. The air in circulation passes under the cars and over the hollow articles mounted on the cars and between the steam pipes, or other heating means for reheating the air. The fans are driven at a high rate of speed so that the air, in traveling over the open, hollow articles, will draw the moist air from the interior of the articles—forming a partial vacuum therein—which is replaced by a certain quantity of heated air in circulation, which passes into the articles so that the air will circulate freely in the interior of the articles, as well as over the surface thereof, thoroughly drying each article.

While the fans are illustrated as located in a certain position, it will be understood that the location of the fans may be varied without departing from the spirit of the invention.

Fig. 2 is a view illustrating another type of drier for carrying out my improved process. In this figure, 1^a is a casing in which are two partitions 2 at each side separating the drying compartment 3^a from the heating or circulating compartments 4^a. In the openings in the partitions are circulating fans 5^a mounted on horizontal shafts 6^a.

7^a are the heating coils for heating the air in circulation. *a'*, in the present in-

stance, represent porcelain bath tubs mounted on the cars 12ª. The fans are driven at such a speed that the air in circulation passes rapidly over the open bath tubs, drawing the moist air from the interior thereof. As this moist air is drawn out, it is replaced by heated air so that the interior of each tub is dried substantially at the same time as the exterior.

In Fig. 3, another form of drier is illustrated, somewhat similar to that shown in Fig. 1. In this figure, an adjustable deflector 19 is used. This deflector is mounted directly above the hollow article so that the air in circulation will be deflected into the opening in the hollow article. This deflector can be used when the opening in the article is deep.

It will be seen that by rapidly circulating heated air in a drier and over the open, hollow article, the air in circulation will draw the moist air from the interior of the article being dried. This moist air will be immediately replaced by a portion of the heated air in circulation.

I claim:

The process herein described of drying hollow articles having open tops, said process consisting in circulating heated air first under each article and then past the opening therein at a speed sufficient to cause a partial vacuum to be formed within each article to cause a circulation of heated air in the articles.

ELWOOD B. AYRES.