No. 667,229. Patented Feb. 5, 1901.

F. KNÜTTEL.

PNEUMATIC MALTING APPARATUS.

(Application filed Oct. 20, 1900.)

(No Model.)

fig. 1.

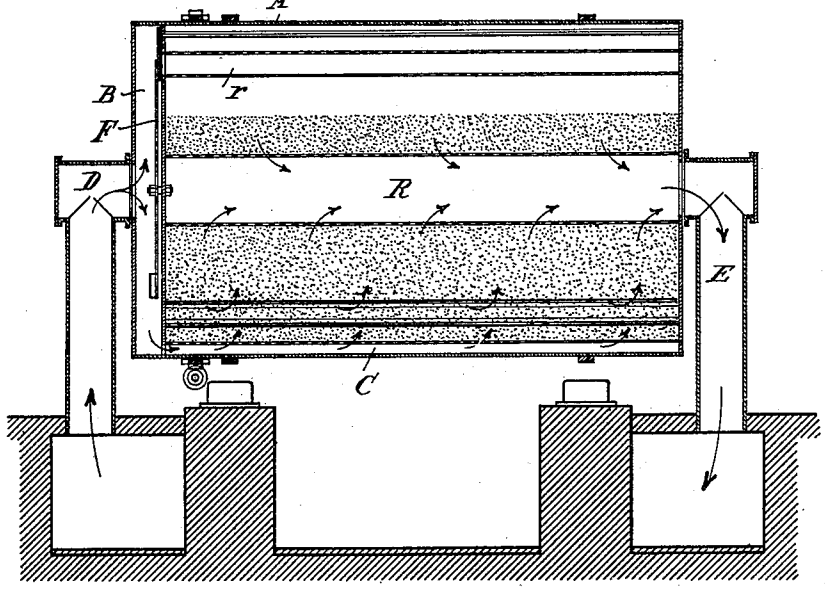


fig. 2.

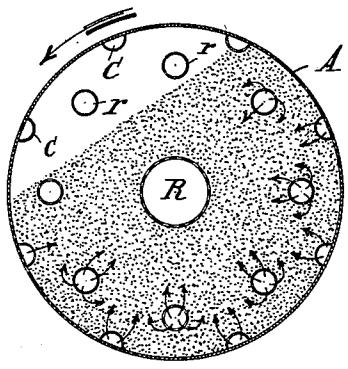
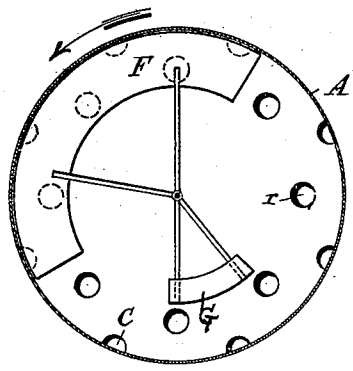


fig. 3.



Witnesses:
Edwin King Lindy
Wellington

Inventor:
Friedrich Knüttel
by Marcellus Bailey
his Atty

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UNITED STATES PATENT OFFICE.

FRIEDRICH KNÜTTEL, OF CHARLOTTENBURG, GERMANY.

PNEUMATIC MALTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 667,229, dated February 5, 1901.

Application filed October 20, 1900. Serial No. 33,773. (No model.)

To all whom it may concern:

Be it known that I, FRIEDRICH KNÜTTEL, a subject of the King of Prussia, Emperor of Germany, and a resident of No. 6 Franklinstrasse, Charlottenburg, near Berlin, in the Kingdom of Prussia, German Empire, have invented new and useful Improvements in Pneumatic Malting Apparatus, of which the following is a specification.

My invention relates to certain improvements in the pneumatic malting apparatus described in the United States Patent No. 513,467. This kind of malting apparatus presents, when the diameter of its drum exceeds 2.5 millimeters, disadvantages which I will now first explain. In order to secure a good ventilation of the grain, the drum must be filled to such a height that the central tube is well covered. In this case the intermediate tubes must be brought so near to the casing of the drum that when the volume of the malt reaches its maximum—that is to say, when it swells up—two of these intermediate pipes lie above the level of the malt, thus rendering a turning over of the latter possible while the drum is rotated. In order to secure the turning over of the malt during the last stage of the growth of the grain, a space of at least fifty millimeters must be left between the upper surface of the green malt and the aforesaid two tubes extending above the said upper surface. If the space were less, the malt would be too firmly packed between such tubes or would stow up behind the upper tube, and thereby be prevented from turning. In the use of the drum constructed as described in the Patent No. 513,467 it was found that the places near the periphery thereof are not uniformly ventilated and that a sufficiently uniform ventilation of the malt is effected only by these tubes up to certain distance from their peripheries, so that the spaces between the central pipe, two intermediate tubes, and one auxiliary air-passage are not exposed to ventilation to a sufficient degree.

The object of my invention is to remedy this disadvantage by providing on the inner periphery of the drum special auxiliary air-supply passages and to arrange the intermediate tubes at a certain distance from the casing and from the central pipe, these auxiliary air-passages and intermediate tubes being connected to an air-chamber provided at the front end of the drum, while the central tube communicates with an air-evacuating passage.

For the purpose of rendering my invention clearly understood I have attached to my present specification a sheet of explanatory drawings, in which—

Figure 1 is a longitudinal section of my improved malting apparatus, while Fig. 2 is a sectional view through the drum-casing, and Fig. 3 a sectional view through the air-chamber of the drum-casing.

Like letters of reference refer to like parts.

On the inner periphery of the drum A, which is provided at the end D, through which the air enters, with an air-chamber B, I dispose auxiliary air-passages C, which are, together with the intermediate tube *r*, connected to the air-chamber B, so that the air flows not only from the auxiliary air-passages, but also from the intermediate tube *r* toward the central tube R, which is connected to the air-exhausting passage E. The ventilation of the auxiliary air-passages C is, on account of their greater distance from the central tube, never as intense as that produced by the intermediate tubes *r;* but it is, as shown by exhaustive experiments, sufficient to insure the germination of the layers of malt that are near them. The distances of the intermediate tubes from the casing and from the central tube must in malting-drums having a diameter of more than 2.5 millimeters be so selected that they are in the ratio of one to three. The distance of the intermediate tubes from the casing can only be reduced by a small amount, because with considerably-reduced interspaces the malt, which has increased in bulk, would get packed and could not be turned over, which would give rise to an entanglement of the radicals and the formation of lumps.

F, Figs. 1 and 3, is a pendulum-damper provided with a counterweight G for the purpose of maintaining it in proper position and preventing air from passing from the chamber B into those of the ventilation-tubes which are not covered by the malt.

It is obvious that the ventilation of the

drum may be effected either by a fan working by suction at the exhaust end E or by a fan forcing the air at the entrance end D and that the direction of the current of air passing through the drum may be reversed.

Having thus described my invention, what I claim, and wish to secure by Letters Patent of the United States, is—

In a pneumatic malting apparatus the combination with a rotatable drum of a perforated central tube, intermediate perforated tubes located at a distance from the casing equal to about one-third of that between the central tube and the intermediate tubes, auxiliary perforated tubes on the inner periphery of the drum, a chamber at one end of the drum, and connected with the intermediate and auxiliary tubes for supplying the air to the drum, and an exhaust-pipe at the other end of the drum and connected with the central tube essentially as and for the purpose described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

FRIEDRICH KNÜTTEL.

Witnesses:
WOLDEMAR HAUPT,
HENRY HASPER.