

W. B. HUTCHINSON.
DRIER.
APPLICATION FILED MAY 23, 1919.

1,338,731.

Patented May 4, 1920.

Fig. 1

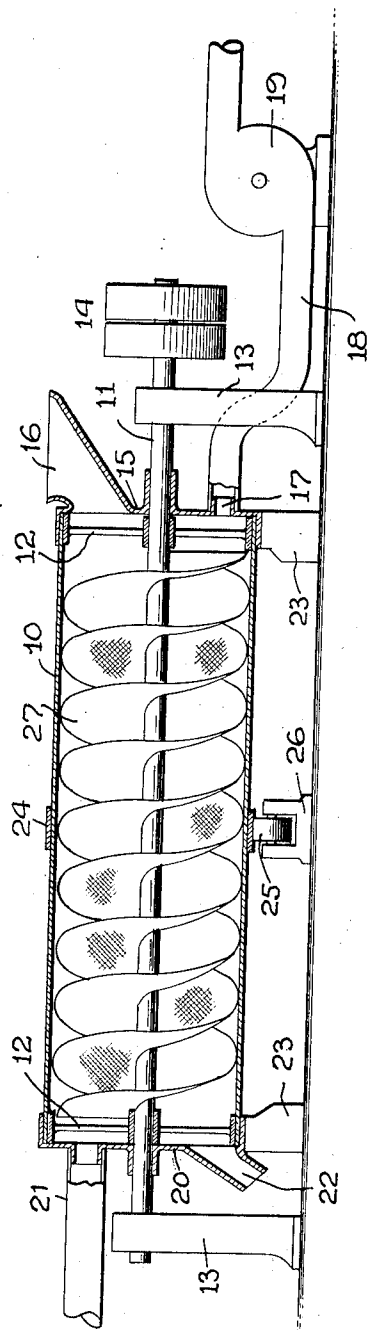
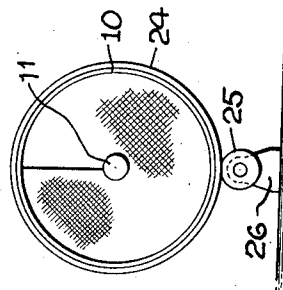


Fig. 2



INVENTOR
Warren B. Hutchinson.

UNITED STATES PATENT OFFICE.

WARREN B. HUTCHINSON, OF NEWARK, NEW JERSEY, ASSIGNOR OF ONE-HALF TO
ALBERT BLACKBURN, OF NEW YORK, N. Y.

DRIER.

1,338,731.

Specification of Letters Patent.

Patented May 4, 1920.

Application filed May 23, 1919. Serial No. 299,253.

To all whom it may concern:

Be it known that I, WARREN B. HUTCHINSON, a citizen of the United States, and a resident of the city of Newark, county of Essex, and State of New Jersey, have invented a new and useful Improvement in Driers, of which the following is a full, clear, and exact description.

My invention relates to improvements in driers for drying loose materials or more or less finely divided materials, such for instance as match sticks, toothpicks, cotton seed hulls, shavings, and the like, and the object of my invention is to produce a simple and inexpensive drier in which the materials can be rapidly, efficiently and economically dried. In drying materials of this kind, and especially where the materials are very wet as they enter the drier, it is customary to admit hot air at one end of the rotary drum or cylinder, and admit the wet material at the same end, so that the air charged with vapor picked up from the material under treatment, has to pass out at the same end as the dried material. This means that the drying medium has to be at an abnormally high temperature at the hot end of the drier, and that the drier must be very large in cross section to permit the vapor to become attenuated and pass out without leaving the material still damp, and in any event it is difficult to properly dry the material in driers of this sort. The air or heating medium cannot be forced through the drier in the opposite direction, that is against the feed of material, because if it is an open cylinder, the air current will pick up the material as it becomes dry and carry it back into the wet end of the cylinder. To overcome these difficulties and provide for better and more economical drying, I provide the rotary cylinder with a screw feed which fills the cylinder, and which will force the material under treatment through the cylinder, but the screw is made of perforate material so that the air or other heating medium can pass freely through the cylinder, but the material under treatment will be forced by the screw or the like against the current and out at the dry end. In this way it will be seen that by using a large volume of air or other drying medium, the temperature need not be very high because as it becomes saturated with moisture it passes out at the wet end of the

drier. In this way I am enabled to make a relatively small drier and a current of air which has not been very highly heated, do the work of a much larger drier and a more highly heated drying medium, thereby effecting great economy.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar reference characters indicate corresponding parts in all the views.

Figure 1 is a broken longitudinal section of the drier showing my improvements, and

Fig. 2 is an end view of the same with one of the ends removed.

The structure I have shown is by way of example merely, and it will be seen from the description below that this construction can be departed from considerably without affecting the principle of the invention.

The rotary drum 10 is preferably cylindrical, and I have shown it mounted on and driven by a shaft 11 with which it connects by suitable spiders 12. The shaft is mounted in supports 13 and has pulleys 14 for rotating it. In larger driers this form of rotating is not used, and the cylinder is not provided with a shaft, but is rotated from its exterior; but the driving means has nothing to do with the invention. The inlet end of the drier is closed by a stationary head 15 which has a hopper 16 at the upper part to provide for the intake of material to be dried, and it has an outlet 17 connecting with a pipe 18 and exhauster 19. The opposite end of the drier likewise has a closing head 20 through which is an inlet 21 for air or other drying medium, which is preferably heated, and an outlet 22 for the dried material. The heads are supported on suitable brackets 23, and if the drier body is large and heavy, it is provided with a wear-plate 24 running on a roller 25 which is pivoted in a suitable support 26.

A spiral blade 27 like an ordinary screw extends longitudinally through the cylinder 10 to which it is preferably made fast at the edges so that no material can work in between the edges and the shell of the cylinder. This blade is preferably of wire mesh which can be made coarse or fine according to the nature of the material to be treated, and consequently the air or other drying medium drawn through the cylinder will pass freely through the blade 27, while the material un-

der treatment will be forced by the blade toward the dry end of the cylinder and against the current of the heating medium. Obviously the blade of the screw can be of sheet material perforated with the same effect, and while I prefer to have the screw rotate with the cylinder 10, as I find that this feeds perfectly, still the principle would be the same if the screw rotated independently of the cylinder.

In practice provision should be made for a large volume of air or other drying medium to pass through the drier against the feed, and the blade of the screw prevents the material from being driven back by the air but offers no substantial resistance to the air.

Another advantage of this drier is that in forcing the material against the current of a drying medium, the dust which is freed by tumbling the material in the drier is carried off with the air current, and the material is thus left cleaner than is usual in drying.

It will be seen that I have thus not only provided a very simple and efficient drier, but have also evolved a method of drying loose material which is novel.

I claim:—

1. A rotary imperforate drier having a screw feed for material therein, the screw being perforate for the passage of air, and means for forcing a drying medium through the screw and drier in the opposite direction to the feed of the screw.

2. A drier comprising a rotary imperforate drum having a spiral or screw blade of perforate material extending therethrough and of the full diameter of the drum, and means for forcing a drying medium through the drum and blade in a direction opposite to the feed of the blade.

3. A drier comprising a rotary drum having stationary heads, an inlet for material at one end, an outlet for material at the other, a spiral or screw blade of perforate material extending through and substantially filling the drum, and means for forcing a drying medium through the drum and blade in a direction opposite to the feed of the blade.

WARREN B. HUTCHINSON.

Witnesses:

M. G. O'DONNELL,
THERON DAVIS.