

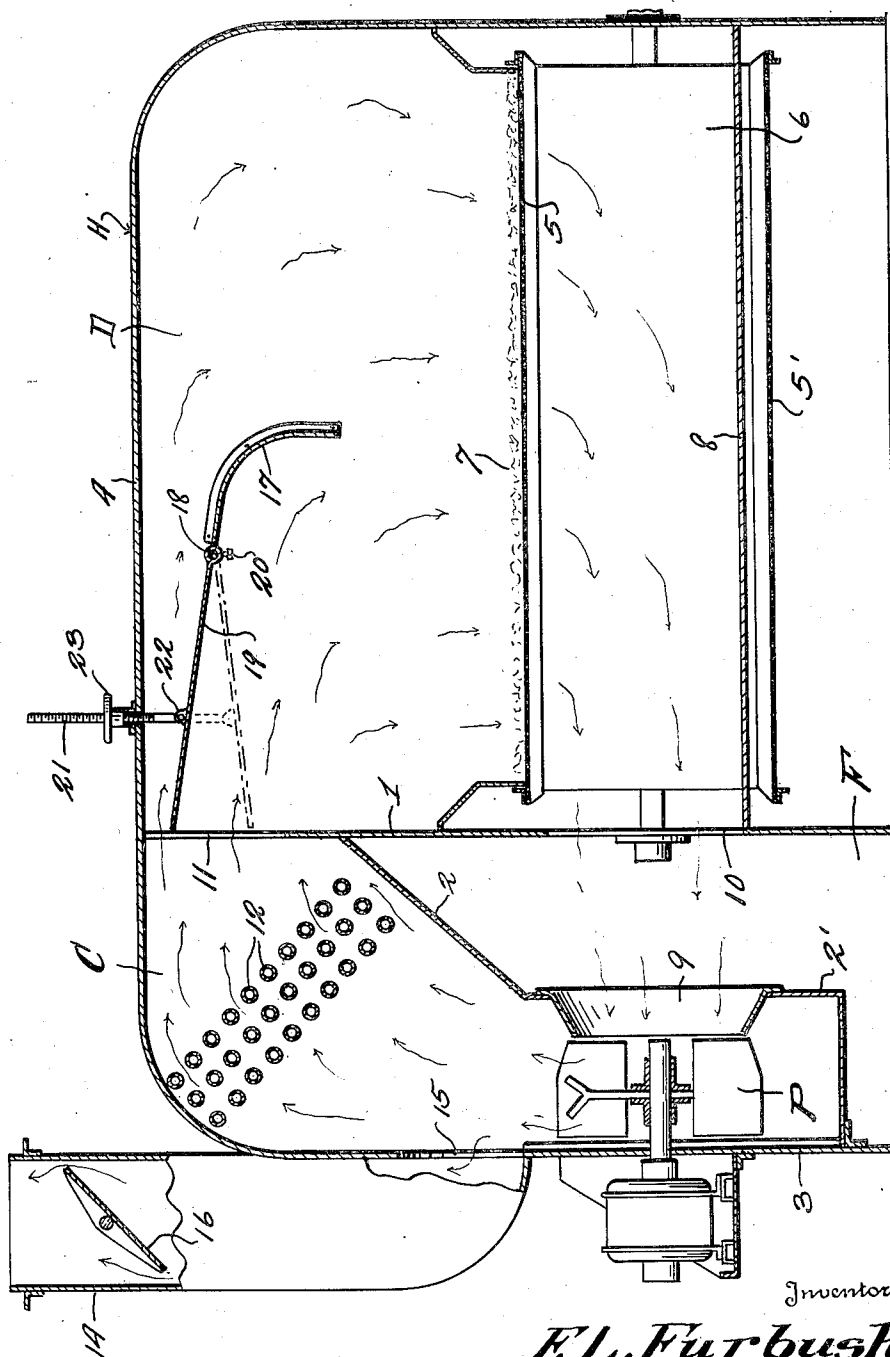
March 26, 1935.

F. L. FURBUSH

1,995,675

DRIER

Filed Dec. 12, 1933



Inventor

F.L. Furbush

By

Watson E. Coleman

Attorney

UNITED STATES PATENT OFFICE

1,995,675

DRIER

Frank L. Furbush, Graniteville, Mass., assignor
to C. G. Sargent's Sons Corporation, Granite-
ville, Mass., a corporation of Massachusetts

Application December 12, 1933, Serial No. 702,074

1 Claim. (Cl. 34—12)

This invention relates to improvements in driers of that character in which there is a drying chamber and a fan chamber, a perforated conveyor passing through the drier chamber, the fan in the fan chamber drawing air from beneath the conveyor and discharging this air upward and into the upper portion of the drying chamber.

The general object of this invention is to provide a construction which is particularly suited for this purpose and in which the fan chamber has a relatively large opening discharging into the drying chamber, one wall of this opening being approximately right angular and the other wall diagonal and to provide in connection therewith means whereby the air discharged from this fan chamber may be directed downwardly in the drying chamber upon the perforated conveyor therein and the material carried on the conveyor, this means being such that an even distribution of air may be secured even though the peculiar form of the fan chamber at its upper end is such as to discharge a greater amount of air at one side of the middle of the conveyor than on the other side.

The novel features of my invention will hereinafter be definitely claimed.

In order that my invention may be the better understood, I will now proceed to describe the same with reference to the accompanying drawing, wherein is illustrated a view in cross section taken through a drier constructed in accordance with an embodiment of my invention.

As disclosed in the accompanying drawing, H denotes a housing of desired dimensions and configuration, the upper interior portion of which providing a drying chamber D. A side portion, however, of the interior of the housing H is divided off by a vertical partition 1 disposed lengthwise of the housing to provide a lower fan chamber F and an upper air heating chamber C, said chambers F and C being separated by the vertical partition 2 extending from the lower portion of the adjacent side wall 3 of the housing H to the upper portion of the partition 1 at a desired point below the top wall 4 of the housing.

The bottom or floor for the drying chamber D comprises the upper stretch 5 of a screen or kindred perforated endless conveyor travelling from end to end along the housing H and passing at each end around a suitably mounted guide or driving drum 6 diagrammatically illustrated in the accompanying drawing. This stretch 5 is adapted to carry through the lower portion of the chamber D a layer 7 of the material to be

treated. The chamber D at a material distance below the upper stretch 5 of the conveyor is provided with a stationary imperforate bottom wall 8 under which the lower or return stretch 5' of the conveyor passes.

The partition 2 separating the chambers F and C has a lower vertical portion 2' provided with one or more funnel-like openings 9 occupying a position in substantial horizontal alignment with and of substantially the same diameter as an opening 10 provided in the partition 1 and substantially bridging the space between the stationary bottom 8 of the housing H and the upper stretch 5 of the conveyor.

Positioned between the opening 9 and the end wall 3 of the housing H is a power driven fan P which operates to draw air within the housing H down through the layer of stock 7 upon the upper stretch of the conveyor and through the openings 10 and 9 and through the heating chamber C back into the upper portion of the housing H.

The partition 1 above the partition 2 and adjacent to the top 4 of the housing H is provided with an opening 11 affording the desired communication between the chambers C and D. The chamber C has mounted therein and extending thereacross heating pipes 12 whereby the air as it passes through the chamber C into the chamber D attains a desired temperature. While any desired medium may be employed for heating the air as it passes through the chamber C the present embodiment of the invention contemplates the use of steam flowing through the pipes 12.

Extending upwardly from the end wall 3 is a flue 14 of desired height and the lower portion of which is in communication with the chamber C with an exhaust air outlet 15 positioned between the power fan P and the pipes 12 and preferably closely adjacent to the fan. Interposed in the flue 14 is a controlling damper 16 of a conventional type.

Extending lengthwise of the chamber D and in the upper portion thereof is a stationary deflector 17 arcuate in cross section and disposed on a desired radius and preferably of a cross sectional width approximating an arc of 90°.

The inbow face of the stationary deflector 17 is disposed toward the opening 11 with the upper and forward edge of the deflector 17 occupying a plane substantially midway of the vertical dimension of the opening 11 and the depending edge portion of the deflector 17 occupies a

plane substantially intersecting the middle of the upper stretch 5 of the conveyor.

Immediately adjacent to the upper and forward margin or edge of the deflector 17 is pivotally mounted, as by a rod 18 or otherwise as may be preferred, the rear marginal edge portion of a vertically swinging deflector 19. This deflector 19 is flat and extends from one end of the chamber D to the other and its free edge closely approximates the wall 1 which defines the opening 11. By vertically adjusting the deflector 19 such regulation or control can be had of the heated air entering the chamber D through the opening 11 to assure substantially the same amount of heated air passing above and below the deflectors 19 and 17, thus assuring the most effective distribution of the air within the chamber D and particularly for its passage through the layer 7 of material carried by the upper stretch 5 of the conveyor. In other words, the deflectors 19 and 17 assure an even distribution of air over the layer or stock 7.

The necessity of this deflector formed of the portions 17 and 19 is due to the peculiar shape of the upper portion of the fan chamber C. In order to secure a relatively large opening 11, it is necessary that the wall 2 shall be diagonal with reference to the walls 1 and 2' while it is necessary that the exterior wall 3 at its upper end shall be merely a right angle. As a consequence, the air traveling from the fan P to different portions of the chamber C will have paths of travel of different lengths and furthermore, the air passing upward adjacent the wall 2 will tend to be shot up against the drying chamber D and the air will be likely, therefore, to be discharged toward the right hand side of the drying chamber D as shown in the figure. Thus there will be more air likely to be discharged downward toward the right side of the conveyor than on the left side. This is compensated for by providing the deflecting plate 19. As this deflecting plate is adjusted in the figure, the air discharged directly upward over the wall 2 will strike this deflecting plate and will be discharged directly downward on to the left hand side of the conveyor. The other air traveling adjacent the outer wall of the fan chamber C will be prevented from striking directly downward and will be carried over toward the right hand side of the drying chamber D so that a uniform quantity of air is discharged downward against both sides of the conveyor. This deflector 19, it is obvious, may be shifted from the full line position to the dotted line position in case it is found that too much air is being forced down on the left hand side of the conveyor and too little on the right hand side. The deflector plate can be quickly adjusted to secure an even distribution of this air, a very necessary thing in driers of this character. A further reason for using the adjustable deflector 19 is that the stock on the conveyor on that side of the conveyor where the fans and coils are located dries faster than on the opposite side and by adjusting the deflector the air flow can be regulated to get the required results. In other words, the stock on the side of the conveyor toward the heating coils 12 is naturally the hottest and does not require as much drying air as on the opposite side of the conveyor. Therefore, the adjustable deflector 19 is necessary in order to secure uniform drying under all circumstances of operation.

The deflector 19 may be secured to the pivot

18 in any desired manner as by a suitable number of set screws 20 and the rod or shaft 18 is rotatably supported, as desired, by the end walls of the chamber D. While any means may be employed to effect the desired adjustment of the deflector 19 the present embodiment of my invention contemplates the use of one or more threaded rods 21 extending within the chamber D through the top wall 4 of the housing H and operatively engaged, as at 22, with the deflector.

Engaging the threads of each rod 21 exterior of the housing H is a nut 23 coacting with the top wall 4 whereby to adjust the deflector 19.

The compartment F constitutes a dead air space and is used for cleaning out small pieces of stock that the conveyor is liable to carry around with and prevent these pieces of stock from passing into the fan itself. The lower end of the fan compartment C, is relatively narrow so that a relatively narrow fan P may be used. These fans P are mounted upon the ends of the $1\frac{1}{2}$ h. p. motor shafts and if these fans were wide, vibration would be caused, hence the fans are made narrow but discharge into the relatively wide upper portion of the chamber C.

From the foregoing description it is thought to be obvious that a drier constructed in accordance with my invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated, and it will also be obvious that my invention is susceptible of some change and modification without departing from the principles and spirit thereof and for this reason I do not wish to be understood as limiting myself to the precise arrangement and formation of the several parts herein shown in carrying out my invention in practice except as hereinafter claimed.

I claim:—

In a drier, a drying chamber, a perforated element therein for supporting the material to be dried, a fan chamber located on one side of the drying chamber, the fan chamber having an outer wall extending upward and then at right angles and merging into the wall of the drying chamber, the inner wall of the fan chamber having an opening and above this opening having a wall extending diagonally upward, the wall of the drying chamber adjacent the fan chamber having an opening opposite the opening of the fan chamber and disposed below the perforated element, and the upper end of the drying chamber having an opening leading directly into the upper end of the fan chamber, a fan disposed in the fan chamber immediately behind the opening therein, and withdrawing air from the drying chamber and forcing it into the upper end of the fan chamber, and a deflector for equalizing the distribution of air in the drying chamber comprising a fixed arcuate plate extending longitudinally of the drying chamber and having a portion extending down toward the middle of the perforated element, and a portion extending toward the center of the opening from the upper end of the fan chamber, and a pivoted plate forming a continuation of the laterally directed portion of the arcuate plate and having its free end disposed in continuity with the wall of said opening, and means extending through the top of the drying chamber whereby said plate may be swung vertically across the air inlet opening to the drying chamber.

FRANK L. FURBUSH.