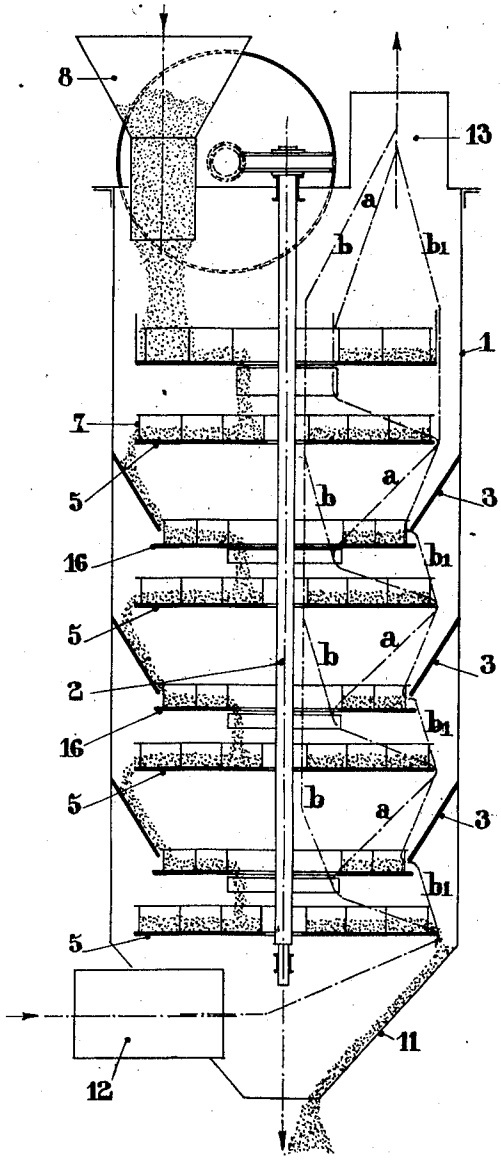
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VERTICAL DRYING AND DEHYDRATING APPARATUS

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VERTICAL DRYING AND DEHYDRATING APPARATUS.

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Vertical cylindrical dryers are already known containing truncated cones arranged one above another and horizontal stationary or rotating plates provided with turn blades which revolve and mix the material to be dried and which cause said material to fall from one plate onto the next one. In these dryers an ascending stream of hot air is caused to circulate so as to ensure intimate contact of this hot air with the material to be dried during their entire downward travel.

The present invention relates to improvements in drying apparatus of the above mentioned type so as to ensure a better distribution and circulation of the heat inside of the drier by the creation of secondary currents therein. Its main features are that the truncated cones are so arranged, as are also intermediate plates, which latter are provided with revolving or stationary blades which are located and alternate with the truncated cones, so that a passage is left between the base of the truncated cones and the intermediate plates and an opening is left in the center of each of the plates, so that secondary air streams passing through said passages and through said openings, thereby effecting a circulation of hot air at the center of the dryer and also along the walls.

In the figure of the drawing accompanying the present application a special embodiment of this invention is shown schematically by way of illustration.

As in the existing dryers the improved drying apparatus embodying the present invention comprises a vertical cylinder 1, a vertical shaft 2 and plates 5 supporting blades 7. Said cylinder is provided at its top with a hopper 8 and at its bottom with a truncated cone 11, which serves as a collector and through which opens a hot air inlet pipe 12.

In accordance with this invention the truncated cones 3 are of less depth than usual and the materials are conveyed towards the center of the plates 5, used in the known devices, by means of intermediary plates 16 and the blades 7. When the plates 16 are not perforated, as for example in the drying of pulverized materials a central opening is formed in these plates for the passage of a stream of hot air as at b for the purpose of re-heating the plate. Furthermore, a space of variable height is left between the intermediate plates 16 and the base of the truncated cones 3, allowing the passage of a secondary stream of hot air as at b'. Finally, it should be noted that no plate touches the wall of the drying apparatus and that there are therefore no dead spaces and circulation of hot air over the walls is permitted.

The plates are thus exposed freely and from all sides to the ascending stream of air ensuring in this way their uniform and continued heating which is essential to the effective utilization of heat.

By means of the apparatus embodying the invention, the air stream is divided up in a main air stream a which has the same function as the unique air stream of existing dryers and secondary air streams b and b', which ensure a uniform circulation of heated air inside of the drying apparatus, thus avoiding condensation. The construction of the apparatus to produce these air streams is studied and calculated specially for each case.

The hopper for the entering air, the driving system, the inlet and the outlet of the hot air are shown on the accompanying drawing but only by way of illustration; they may vary according to the material to be treated or according to the size of the apparatus without altering the spirit of the invention.

Claims:

1. In drying apparatus of the class described, a vertical casing, means at the top thereof for supplying thereto the material to be dried, means at the bottom of the casing for delivering the material, means for delivering hot air into the casing at the bottom thereof, a shaft journaled for rotation axially within the casing, means for rotating the shaft, a plurality of circular, horizontal plates mounted within the casing in spaced relation to one another and concentric to the shaft, the plates having centrally located openings of greater diameter than the shaft to provide for the circulation of hot air centrally of the interior of the casing, inverted frustro-conical cones supported within the casing with their upper margins contacting the wall of the casing, the said cones being positioned between certain alternate ones of said plates with their lower margins spaced from the lower

ones of the respective plates to provide for circulation of hot air along the wall of the casing and upwardly within the casing and about the said plates as well as through the central openings therein, and means, actuated by the shaft for delivering the material from the plates throughout the series from the top to the delivering means at the bottom thereof.

2. In drying apparatus of the class described, a vertical casing, means at the top thereof for supplying thereto the material to be dried, means at the bottom of the casing for delivering the material, means for delivering hot air into the casing at the bottom thereof, a shaft journaled for rotation axially within the casing, means for rotating the shaft, a plurality of circular, horizontal plates mounted within the casing in spaced relation to one another and concentric to the shaft, the plates having centrally located openings of greater diameter than the shaft to provide for the circulation of hot air centrally of the interior of the casing, inverted frustro-conical cones supported within the casing with their upper margins contacting the wall of the casing, the said cones being positioned between certain alternate ones of said plates with their lower margins spaced from the lower ones of the respective plates to provide for circulation of hot air along the wall of the casing and upwardly within the casing and about the said plates as well as through the central openings therein, and means actuated by the shaft for delivering the material from each upper alternate plate, at its periphery, to the respective lower plate, and means actuated by the shaft for delivering the material from each lower alternate plate through its central opening and to the respective upper alternate plate beneath it.

In testimony whereof I have signed my name to this specification.

MAX BAECHLER.