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ROTARY KILN FOR BURNING, ROASTING, AND SINTERING OF MINERAL MATERIALS

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Fig. 1

Fig. 2

Fig. 3

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The present invention relates to rotary kilns combined with cooling drums, especially kilns having said drums arranged separately from the kiln proper underneath the same. The invention is, however, not limited to kilns of this specific kind, but can be used as well and with similar success in connection with rotary kilns having a cooling drum which joins directly the kiln proper or burning drum, i.e., where the burning and the cooling takes place in a continuous tube.

With such rotary kiln, especially with the cooling drum underneath, the air is sucked through the whole sectional area of the drum, without any possibility for the attendant to regulate in any way the amount of that air. However, such regulation is indispensable and of utmost importance for a regular kiln process, and the object of the present invention now is to obtain the necessary regulation.

The invention consists, therefore, therein that the outlet of the cooling drum is tightly closed by a hood, in which are disposed draught regulating registers, and in order to increase the effect desired a separate regulable ventilator is provided in order to blow the cooling and combustion air into the drum. Besides, inside the cooling drum there is provided also an injector-like device for improving the sucking-in of the blow air. In order to cool the material there are arranged in the drum behind the injectors longitudinal ribs, while behind these cooling ribs there are shovels or irrigation bodies permitting the clinkers to fall through the current of air in order to be cooled down thereby. These irrigation bodies or surfaces may be angle-shaped, and are fastened with their flanged ends on the inner flange of the cooling drum shell. The apexes of these angles are projecting freely and radially into the cooling drum so that when the kiln rotates, the lifted material dribbles from above through the entire diameter of the drum upon the extremities of the dribbling surfaces and gets collected in the remaining intermediate spaces. These cooling surfaces can be combined with means for supplying cooling air or water thereto.

The invention is illustrated diagrammatically and by way of example on the accompanying drawing on which Figure 1 is in its upper part a side-view and in its lower part a longitudinal section through a kiln designed according to this invention. Figure 2 is a vertical cross-section through the lower part of the kiln in the plane A—B of Fig. 1, and Figure 3 a frontal view of the left-hand end of the lower part of the kiln, all as more fully described hereinafter.

The cooling drum 8 is arranged in known manner below the rotary kiln proper 3. In order to regulate the admission of the air for the cooling and the burning purpose the hood c is arranged at one end of the cooling drum 8 in order to close this latter tightly. Thus, the admission of false air is excluded. For the proper regulation of the sucked-in amount of air several air rosettes d are arranged in the kiln hood, as shown by way of example in Fig. 3. The amount of air which is sucked in can be regulated accurately by turning and properly adjusting the angular position of the rosettes d. The air for cooling and burning is blown in by regulable fan f. In order to permit a better sucking of the air there is an injector-like device g arranged in the front part of the cooling drum. In Fig. 2, h denotes angular dribbling bodies the sides of which extend radially. The hot clinker lifted by the rotation of the kiln now comes into contact with the combustion air and is gathered between the dribbling bodies which may be cooled, if necessary. These dribbling bodies h can be provided with shovel-like projections i and may be hollow in order to increase the distributing effect.

I claim:

1. In combination with a rotary kiln for burning, roasting and sintering mineral materials, a cooling drum so arranged as to be adapted to receive the material treated in the kiln, a hood closing the delivery end of said drum, means for blowing air into the drum and sucking thereby air into the same, and means for regulating the amount of the sucked-in air.

2. In combination with a rotary kiln for burning, roasting and sintering mineral materials, a cooling drum so arranged as to be adapted to receive the material treated in the kiln, a hood closing the delivery end of said drum, means for blowing air into the drum and sucking thereby air into the same, and rotary rosette-like air regulating means provided at said hood, substantially as and for the purpose set forth.

3. In combination with a rotary kiln for
6. In combination with a rotary kiln for burning, roasting and sintering mineral materials, a cooling drum so arranged as to be adapted to receive the material treated in the kiln, a hood closing the delivery end of said drum, a regulable fan, and means for conducting the blown air into said drum at the delivery end of the same, means adapted to permit air being sucked into the drum by the air blown thereinto, and means for regulating the amount of the sucked-in air.

7. In combination with a rotary kiln for burning, roasting and sintering mineral materials, a cooling drum so arranged as to be adapted to receive the material treated in the kiln, a hood closing the delivery end of said drum, a plurality of consecutive sets of dribbling bodies, each set comprising a plurality of angular members having radially extending legs adapted to receive and distribute the particles carried up to, and being dropped upon, them by the rotation of the said drum, means for blowing air into the drum and sucking thereby air into the same, and means for regulating the amount of the sucked-in air, substantially as and for the purpose set forth.

In testimony whereof I affix my signature.

FRITZ LUTHER.