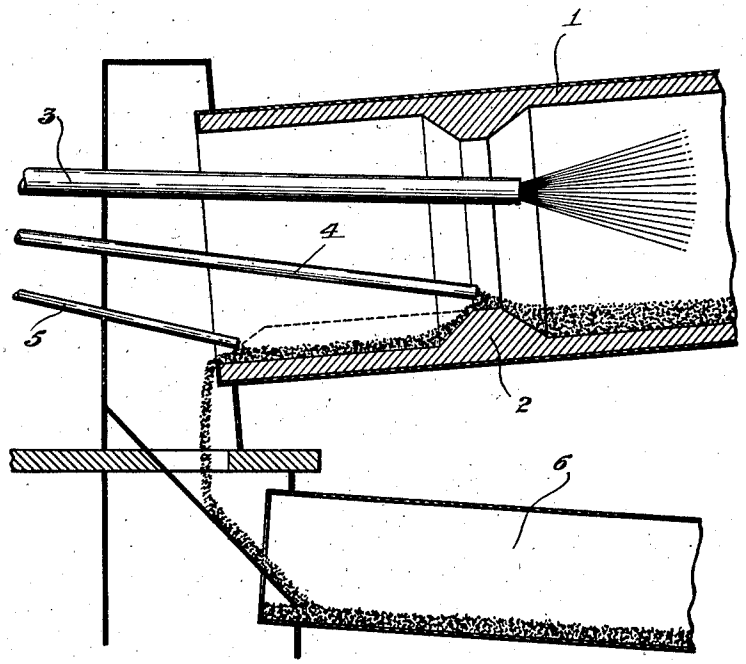
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MANUFACTURE OF CEMENT

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MANUFACTURE OF CEMENT

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This invention relates to the manufacture of white cement. If the raw material from which white cement is to be made contains even very small amounts of iron, manganese or chromium, these substances must be chemically reduced by the addition of a reducing agent, such as coal, before the discharge of the clinker and oxidation of the clinker prevented as by rapid cooling by means of a non-oxidizing cooling agent, such as water. Otherwise the finished cement will contain colored oxides of iron, manganese or chromium which will discolor the cement. It has been proposed to spray coal on the hot clinker as it issues from the mouth of the kiln and to deliver the clinker into a water bath before reoxidation can occur.

According to the present invention both the reducing agent and the cooling agent for the reduced material are introduced into the rotary kiln before the discharge of the clinker. To accomplish this there is provided a dam ring in the kiln at a suitable distance from the outlet and thereof, that is to say a distance equal to that over which it is desired that reduction should take place, so that throughout this distance no appreciable accumulation of clinker will occur, but that the clinker will pass through this distance in an even and comparatively thin stream. The reducing agent, such as coal dust, is delivered through a pipe just in advance of the dam ring, and the cooling agent, such as water, is delivered through a pipe just inside the outlet end of the kiln shell. As a result reduction will take place within the kiln while the clinker is moving in an even thin stream and the initial cooling to prevent reoxidation will also take place within the kiln. Naturally the cooling will not be completed within the kiln and accordingly a clinker cooler of any suitable design may be provided to receive the clinker from the kiln.

In order that the invention may be clearly understood and readily carried into effect one embodiment thereof will now be described by way of example with reference to the accompanying drawing, the single figure of which illustrates such embodiment diagrammatically and partly in longitudinal section.

The rotary kiln 1 is provided with a dam ring 2 which, instead of being placed immediately at the outlet end as is usual in rotary kilns, is placed materially in advance of the outlet end by such a distance as is sufficient to allow chemical reduction of the clinker to be effected before the clinker reaches the outlet end of the kiln. The fuel pipe 3, through which the fuel for heating the kiln is supplied, extends into the kiln as far as the upper side of the dam ring. The reducing agent, such as coal dust, is delivered through a pipe 4 terminating at the most constricted part formed by the dam ring while the cooling agent, such as water, is delivered through a pipe 5 terminating inside the kiln shell but very close to the outlet end thereof. As a result of this arrangement the clinker passes through the lowest part of the kiln in a uniform and suitably thin stream, so that it is possible to secure uniform distribution of the reducing agent throughout the clinker and accurately to regulate the quantities both of the reducing agent and of the cooling agent that must be added. This is a feature of considerable importance since neither too much nor too little reducing agent or cooling agent must be added.

The dam ring may extend over substantially the whole of the part of the kiln in question as indicated in dotted lines, and the same well defined uniform stream of clinker will then be obtained.

The cooling agent delivered through the pipe 5 only has to cool the clinker to such an extent that no appreciable reoxidation can take place. The partially cooled clinker falls into a cooler 6 in the form of a separate cooling drum. While the addition of such a separate cooler for the clinker is preferred it is not absolutely necessary to employ one and, of course, other coolers than the one shown may be used.

I claim as my invention:

1. In a rotary kiln, means to supply fuel at one point in the kiln, means to supply a reducing agent within the kiln at a different point materially in advance of the outlet end of the kiln, and means to supply a non-oxidizing cooling agent within the kiln at a different point also in advance of the outlet end thereof.

2. In a rotary kiln, a dam ring located materially in advance of the outlet end of the kiln, means to supply a reducing agent within the kiln at the dam ring, means to supply a fuel to the kiln at a different point, and means to supply a non-oxidizing agent within the kiln at a different point.

3. The process of manufacturing cement in a rotary kiln which comprises introducing fuel into the kiln, introducing a reducing agent into the kiln at a different point, and introducing a non-oxidizing cooling agent into the kiln at substantially the outlet end of the kiln.

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