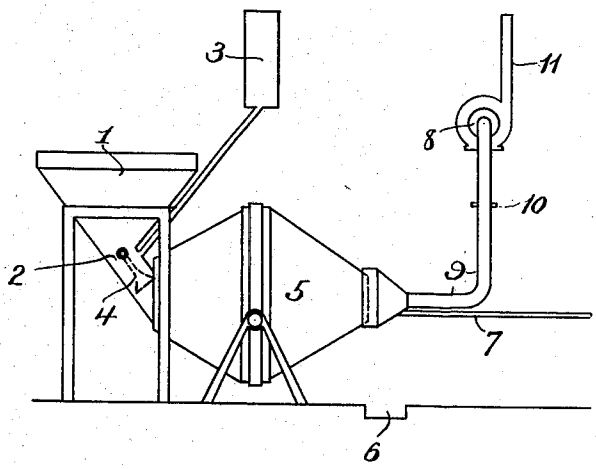
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J. P. RICH

METHOD OF HYDRATING LIME

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UNITED STATES PATENT OFFICE.

JOHN P. RICH, OF SWANTON, VERMONT.

METHOD OF HYDRATING LIME.

Application filed December 29, 1924. Serial No. 758,772.

To all whom it may concern:

Be it known that I, JOHN P. RICH, a citizen of the United States, and resident of Swanton, in the county of Franklin and State of Vermont, have invented certain new and useful Improvements in Methods of Hydrating Lime; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention is a method of hydrating lime having for its object the elimination of sorting to remove cores and of all grinding; saving in labor and power, and conserving lime which is wasted by the methods now generally practiced; also securing a chemically pure product.

The accompanying drawing represents conventionally one form of apparatus which may be employed in the practice of the invention.

According to my invention, lump lime, as drawn from the kiln, is delivered into a receptacle constructed to hold a charge of definite bulk, and this charge is weighed, the ascertained weight being compared with the standard weight of a like bulk of perfectly calcined lime free from cores. The excess weight in the charge to be treated, if any, discloses the exact weight of any unburned lime present. Therefore the weight of each charge is the basis for determining by calculation the quantity of water to be added in order to reduce the lime, by the method now to be described, to a fine dry powder.

The measured and weighed charge of lime, with or without cores contained, is fed into a hopper 1 having the discharge spout 2; and piping from a tank 3 is arranged to discharge simultaneously. The tank 3 contains water, and it may be constructed in any desired manner or provided with any approved means to control the flow of water whereby a proper measured charge of water may be added to each charge of lime. The flow through the discharge spout 2 is controlled by a gate, indicated at 4, which may be of any suitable construction which will restrain, for each batch, the charge of lime but permit excess steam from a previous batch to enter the charged hopper. A perforated slidable plate meets the requirement.

The charges of lime and water are delivered simultaneously into a mixer or agitator 5, preferably of the rotary type, in which the material is mildly agitated by being caused to roll or tumble over and over: and I have found that the desired result can be obtained just as quickly in this manner as by the use of hoes, blades or other forms of stirrers now generally employed.

As is well known, the heat due to slaking generates steam which penetrates the mass of lime and by its expansive force aids in splitting and reducing the larger lumps. It also causes the surplus water to evaporate and thereby aids in drying the lime powder. I utilize the excess steam by providing for its access to the incoming charge, and I thereby accelerate the final result, recover all lime dust carried by the steam, and eliminate the necessity for any exhaust stack. The agitation of the lime brings the water into contact with all its particles while the tumbler action separates any cores present from the lime without any grinding. All cores or stones will accumulate at the bottom of the agitator, whence they may be removed from time to time as necessary or convenient. A trough 6 may be provided for their disposition. Following the heat of slaking for each batch, a jet of compressed air may be introduced into the agitator as by a pipe 7, and this compressed air will assist in the rapid separation of the lime and the cores and in floating the fine particles of lime, and in cooling the mass. The air jet may be regulated so as to admit to the mixer the same volume of air as is drawn out carrying the hydrated lime by the suction fan 8 located in the outlet conduit 9, which is also provided with a valve 10 to prevent escape of steam during the heat of slaking. From the fan 8 a discharge conduit 11 carries the hydrated lime to the sorting and storage tanks.

The water added with each charge of lime is exactly calculated to effect complete hydration, and the jet of air impinges forcibly against the cores and circulates around them so as to clean them of all particles of slaked lime, the entire mass being, in a sense, poured through the moving air in the agitator. The product sucked from the agitator is a fine dry powder free from impurities.

Having fully described my invention what I claim as new and desire to secure by Letters Patent, is:—

1. The method of hydrating lime which consists in adding to a charge of unground lime of known weight during agitation a calculated quantity of water to slake all the lime, continuing the agitation while admitting a jet of air to assist agitation and separate impurities, and withdrawing by suction the hydrated lime.

2. The method of hydrating lime which consists in adding to a charge of unground lime of known weight a calculated quantity of water to slake all the lime, conducting steam from the reaction into a succeeding charge of lime, agitating the slaking lime and admitting thereto a jet of air to assist agitation and separate impurities, and withdrawing by suction the hydrated lime.

3. The method of hydrating lime which consists in delivering to a rotating agitator a charge of unground lime of known weight and a calculated quantity of water to slake all the lime, admitting a jet of compressed air to the agitator to impinge upon the mass whereby the impurities will be separated and caught in the agitator by the agitation and tumbler action, and withdrawing the hydrated lime from the agitator by suction, the volume of air in the agitator being constant.

In testimony whereof, I have signed this specification.

JOHN P. RICH.