



**I/We claim:**

1. A method for treating combustible material, comprising:  
5 providing a pipe which is opened to a molten substance surface  
above the molten substance surface of molten substance stored in a  
furnace body for smelting nonferrous metals; and

blowing combustible material containing valuable metals and  
oxygen-enriched air onto the molten substance surface of the molten  
10 substance from the pipe thereby immersing the combustible material in  
the molten substance to mix the combustible material with the molten  
substance.

2. The method for treating combustible material according  
to Claim 1,

15 wherein a lance pipe for blowing mineral ores containing  
nonferrous metals and oxygen-enriched air onto the molten substance  
surface of the molten substance is used as the pipe.

3. The method for treating combustible material according  
to Claim 1 or 2, using a continuous copper-smelting installation  
20 including a smelting furnace, a separating furnace and a copper-  
producing furnace, which are connected to one another with launders,  
the method further comprising:

heating and melting copper ores to produce molten substance

including matte and slag in the smelting furnace;

separating the matte and the slag produced in the smelting furnace from each other in the separating furnace;

5 oxidizing the matte separated in the separating furnace to produce blister copper and slag in the copper-producing furnace; and

blowing the combustible material and the oxygen-enriched air onto the molten substance surface of the molten substance from the pipe in the smelting furnace.

10 4. The method for treating combustible material according to any one of Claims 1 to 3,

wherein the amount of coal charged into the molten substance is adjusted according to heat quantity contributed to the molten substance from the combustible material charged into the molten  
15 substance:

5. The method for treating combustible material according to any one of Claims 1 to 4,

wherein the furnace body is used for copper smelting, and the molten substance is treated in a post-process to recover the  
20 valuable metals in a state in which the valuable metals are contained in blister copper.

6. A smelting furnace used for implementation of the

method for treating combustible material according to Claim 1,

wherein a pipe which is opened to the molten substance surface is provided above the molten substance surface of the molten substance stored in the furnace body,

5           and combustible material containing valuable metals and oxygen-enriched air are able to be blown onto the molten substance surface of the molten substance through the pipe.

7.       The smelting furnace according to Claim 6,

          wherein the pipe is a lance pipe capable of blowing mineral  
10       ores containing nonferrous metals and oxygen-enriched air onto the molten substance surface of the molten substance.

8.       The smelting furnace according to Claim 6 or 7,

          wherein a mixing region in which the combustible material and the oxygen-enriched air are mixed is provided in the pipe.

15       9.       A continuous copper-smelting installation comprising:

          a smelting furnace for heating and melting copper ores to produce molten substance including matte and slag;

          a separating furnace for separating the matte and the slag produced in the smelting furnace from each other;

20       a copper-producing furnace for oxidizing the matte separated in the separating furnace to produce blister copper and slag; and

launders for connecting the smelting furnace, the separating furnace, and the copper-producing furnace to one another,

wherein the smelting furnace according to any one of

Claims 6 to 8 is used as the smelting furnace.

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Additionally, each configuration (components) described in the above-described embodiments, modification examples, provisions, and the like may be combined within a range not departing from the spirit of the present invention and addition, omission, replacement and other modifications of the configuration can be made. In addition, the present invention is not limited to the above-described embodiments and is limited only by the claims.

#### Examples

[0067]



Hereinafter, examples of the present invention will be described in detail.

10 However, the present invention is not limited to the examples.

[0068]

[Example]

First, as Example of the present invention, an operation of pulverizing combustible scrap (combustible material, referred to as simply scrap below) containing valuable metals and blowing the pulverized scrap onto a molten substance surface of molten substance Lin an S furnace (smelting furnace 10) of a Mitsubishi continuous copper-smelting process from lance pipes 15 with oxygen-enriched air was performed.

The scrap is mainly composed of substrate scrap and includes a combustible resin material which is the main component, Cu, SiO<sub>2</sub>, CaO, Al<sub>2</sub>O<sub>3</sub>, and a trace amount of Au and Ag. In addition, the scrap was crushed by a crusher so as to have a particle size of 10 mm or less.

[0069]

The crushed scrap and copper ores were mixed and dried using a rotary drier, and then charged into the furnace from ten lance pipes 15 provided on the ceiling wall 11 of the S furnace. Regarding the amount of the charged copper ores and scrap, the