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PROTECTING MAGNESIUM AND MATERIAL RICH IN MAGNESIUM AGAINST OXIDATION DURING MELTING AND POURING

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3 Claims. (Cl. 75—67)

My invention relates to methods of protecting magnesium and material rich in magnesium such as magnesium waste and magnesium alloys, against oxidation during melting and pouring.

According to the present invention, the material to be treated is wetted in the solid state with a hydrocarbonaceous liquid which becomes vaporized under the temperature conditions of the melting and pouring operation, and then gradually heated to melting temperature. In this way losses by burning are avoided, without the occurrence of blistering in the solidified melt or in the casting.

The new method is of particular importance when used in conjunction with the recovery of metallic magnesium by the reduction of magnesium compounds with the aid of carbon. This method has been developed by the applicant in recent years to the point of industrial applicability, by condensing to dust the metallic vapor formed, and causing the precipitated dust to flow together as a liquid metal in a second working phase, conducted in an atmosphere of an indifferent or reducing gas, by distillation or by heating to a temperature in the vicinity of the boiling point, and to be thereby converted into compact metal. (Patent No. 1,884,993 and Patent No. 1,943,601). Since the carbon monoxide formed during reduction gives rise during the condensation of the vapors to partial reoxidation of the metallic magnesium with the formation of carbon, the magnesium dust primarily produced by this method is always accompanied by magnesium oxide and carbon. Moreover, also the compact metal which is subsequently obtained from this dust in the manner indicated is superficially contaminated with these two accompanying substances. In the subsequent remelting these contaminating substances pass unavoidably into the molten metal from which they are hard to eliminate on account of the slight difference in specific gravity.

It has now been found that the metallic material recovered in accordance with this prior method from the originally obtained magnesium dust, by distillation or heating to the point of coalescing, can readily be freed in the solid state from these troublesome accompanying substances by washing with hydrocarbon oils. If for example, in the case of distillation, grains be obtained by dripping of the liquid deposit resulting from condensing the vapor evolved, and solidifying of the drops, these grains may be washed with petroleum or mineral oil, or with the distillation products of either, such as high-boiling benzines. The surface of the grains becomes entirely cleansed of the pulverulent impurities. The magnesium oxide and the carbon remain in suspension in the hydrocarbon oils, and can readily be separated therefrom by filtration, so that the hydrocarbon oils can be kept in circulation in the process. After the described treatment the surface of the metallic material is coated with the adhering hydrocarbon oils, and thus will in likewise be protected against oxidation in the subsequent melting and pouring. Thus in this manner two technically different needs, namely that of purifying the metallic material, and that of preventing disturbances and losses by burning in treatment involving the use of elevated temperature, are satisfied by the employment of a single expedient.

I claim:—

1. In a process of converting dusty material rich in magnesium into reguline magnesium metal by heating the magnesiferous material to a temperature at which the magnesium content is disengaged in the vaporous state, and condensing the vapor evolved to a liquid deposit which is then caused to solidify in granulated form, the steps which consist in subjecting the solid metal to a subsequent washing by means of a hydrocarbonaceous liquid which will vaporize at the melting temperature of magnesium, to thoroughly clean the surface of the metal from pulverulent impurities, and then gradually heating the material to the molten condition.

2. A process of converting dusty material rich in magnesium into reguline magnesium metal, which comprises heating the magnesiferous material to a temperature at which the magnesium content is disengaged in the vaporous state, condensing the vapor evolved to a liquid deposit, causing the said deposit to solidify in a granulated condition, washing the granules produced with hydrocarbonaceous liquid capable of evolving vapors at a temperature in the neighborhood of the melting point of magnesium, to thoroughly clean the surface of the granules from pulverulent impurities, removing so much of the washing liquid as to leave an adhering residue on the surface of the granulated metallic material, and then gradually heating the material to melting temperature.

3. In the process as defined in claim 1 the step that the hydrocarbon oil serving as washing liquid is kept in circulation in the process.

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