

UNITED STATES PATENT OFFICE.

ALFRED VON PARAVICINI, OF HAGEN, WESTPHALIA, GERMANY.

PROCESS FOR DIMINISHING THE FORMATION OF FLAWS OR BLOW-HOLES WHEN CASTING BLOCKS AND OTHER PIECES.

No. 920,638.

Specification of Letters Patent.

Patented May 4, 1909.

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To all whom it may concern:

Be it known that I, ALFRED VON PARAVICINI, engineer, a subject of the Emperor of Austria-Hungary, and resident of Elberfelderstrasse 58, Hagen, Westphalia, Germany, have invented new and useful Improvements in Processes for Diminishing the Formation of Flaws or Blow-Holes When Casting Blocks and other Pieces, of which the following is a specification.

This invention relates to a process for diminishing the formation of flaws or blow-holes when casting blocks and other pieces, which is accomplished by preventing a rapid cooling of the feeding-head.

The object of this process, which may be called the Paravicini-process, is in the case of the present invention attained by covering the feeding-head with a protecting layer, which consists of a bottom layer of a pulverous or granular material of a great specific weight, which exerts no influence on the cast material, and of a second layer of a combustible material covering the first, which is likewise in a pulverous or granular state. A protecting layer formed, in this way, of substances of different kinds not only reduces the radiation of heat from the feeding-head, but it restores, at the same time, the lost heat by a slow combustion of the combustible top-layer, and acts as a weight on the material forming the feeding-head, which promotes the flowing of the feeding-head material into the flaws or blow-holes.

As materials for the protecting layer, with which the surface of the feeding-head is to be covered, there are to be recommended more especially, on the one side, sand, particularly the so-called silver-sand, and, on the other, pulverized coke. Especially with regard to the last named material there is to be remarked that it produces far better results than, for instance, charcoal; the reason of this appears to be that coke is less combustible and has a much greater specific weight.

The materials serving to form the protecting layer are preferably highly heated before they are put on the metal.

With regard to the time or moment at which the protecting layer should be put on, it is to be remarked that this should take place as soon as possible after the fluid metal has been poured into the mold. If between the casting and the putting on of the protecting layer there has already elapsed so much time

that a thick coat has already been formed in consequence of the cooling, it is best to add, before putting on the inert layer, a small quantity of a deflagrating compound, such, for instance, as chlorate of potassium, whereby there is reestablished the degree of fluidity of the material in the feeding-head which is requisite for success. Also in such cases in which the temperature of the feeding-head is sufficiently high so as not to require a special heating by a deflagrating compound, the protecting-layer used according to this invention may be applied in combination with an addition of a deflagrating compound, although in this case the use of a deflagrating compound is not necessary for success.

The process is preferably carried out as follows: A crucible holding 10 liters or more is half filled with fine sand, for instance so-called silver-sand, and finely ground coke, in a manner that the coke lies at the bottom and the sand at the top. The crucible thus filled is highly heated in a heating-stove. If now a block is cast or any other piece, the whole contents of the crucible are, shortly before the casting is finished, or, if this is impossible, immediately after the casting is finished, poured into the chill-mold. There is therefore lying on the surface of the fluid metal first the highly heated sand and on top of that the glowing coke. The protecting layer of sand and coke acts as a heat-store or retainer, by which the upper end of the steel-block is kept in a fluid state during the whole period during which flaws or blow-holes are formed, so that fluid steel can continuously flow into these flaws or blow-holes. As the weight of the protecting layer is considerable, it exerts a pressure which, considering the fluid state of the metal, may be called great, whereby there is effected a nearly uniform sinking down of the whole upper part of the block. This fact greatly contributes to the diminution of the formation of flaws or blow-holes. What is of a particularly practical importance with the new process is that no after-casting at all is required, as the feeding-head is kept in a fluid state to such an extent that it is at once sufficient for giving off the fluid material required for filling the blow-holes or flaws.

What I claim as my invention and desire to secure by United States Letters Patent is:—

1. The method of diminishing the forma-

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tion of flaws or blow-holes in the casting of blocks and other pieces, which consists in covering the surface of the feeding head with a bottom layer of solid incombustible material in a state of division which is substantially inert with relation to the metal to be cast and with a top layer of a combustible substance likewise in state of division.

2. The method of diminishing the formation of flaws or blow-holes in the casting of blocks and other pieces, which consists in covering the surface of the feeding head with a bottom layer of sand and with a top layer of pulverized coke.

3. The method of diminishing the formation of flaws or blow-holes in the casting of blocks and other pieces, which consists in heating pulverized combustible material and pulverized incombustible material which is inert with relation to the metal to be cast together in a suitable vessel, the combustible substance forming a bottom layer and the incombustible substance a top layer in said

vessel and in thereafter tilting over the vessel so as to bring its contents on the feeding head with the layer of inert material downside and the combustible substance topside.

4. The method of diminishing the formation of flaws or blow-holes in the casting of blocks and other pieces, which consists in putting on the feeding head a small quantity of a deflagrating mixture and in thereafter covering the surface of the feeding head with a bottom layer of solid incombustible material in a state of division which is substantially inert with relation to the metal to be cast and with a top layer of a combustible substance likewise in state of division.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this 30th day of September 1908.

ALFRED VON PARAVICINI. [L. s.]

Witnesses:

OTTO KÖNIG,

WM. WASHINGTON BRUNSWICK.