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PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Improvements in and relating to the Cooling of Castings and the Cooling and Drying of the Mold Sand used for such Castings

We, LANDBOUWWERKTUIGEN- EN MACHINEFABRIEK H. VISSERS N.V. of 1278 Hoofdweg, Nieuw-Vennep, The Netherlands, a body corporate organized and existing under the Laws of the Netherlands, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to the cooling of castings and the cooling and drying of the mould sand used for said castings. The cooling of the contents of a mould flask, and thus the casting contained in the flask with the surrounding sand (together with the core or cores if any) requires a relatively long time, as the flask can be opened only after the temperature of the casting has decreased far enough to avoid changes of the texture of the metal of the casting occurring.

The invention has for its object to carry out the cooling of the castings rapidly without causing damage to the casting after the flasks have initially been cooled, and provides a method of cooling a casting and cooling and drying the mould sand employed for the production of the casting in a mould flask, the method comprising partially cooling the flask containing the casting and surrounding sand, opening the flask, depositing the partially cooled casting and sand therefrom in a container having an outlet for steam generated therein, and maintaining the casting in intimate contact with the sand in the container to cool the casting and dry the sand. The castings have a temperature of about 600° C when deposited in the container but the mean temperature of the mould sand is much lower and depends on the ratio of the quantities of metal and sand, and the surface area and the volume of the casting. The sand lies loosely between the castings in the container, so that the transfer of heat from the castings to the loose sand is relatively favourable and the moisture contained in the sand is rapidly converted into steam whereby the heat taken up by he sand is rapidly withdrawn. The withdrawal of heat by generation of steam may be increased by supplying an additional quantity of moisture into the container, dependent on the ratio of the quantities of metal and sand, or by maintaining a reduced pressure in the container.

In one embodiment of the invention the container is a rotary drum through which the casting and sand are passed; by the rotation of the drum the castings are continuously contacted by fresh sand whereby the withdrawal of heat from the castings is efficient. The foremost part of the drum has an imperforate circumferential wall to which a part having a perforate wall is joined.

The withdrawal of heat from the castings may be further improved by a flow of air of lower temperature through the drum, preferably in counterflow to the castings.

The invention will be further described with reference to the accompanying drawing showing a diagrammatical longitudinal section of a drum for carrying out the method according to the invention.

The drum 1 is rotatably supported on rollers 2 and at one of its ends is provided with an inlet 3 for emptying the flasks into the drum and at its opposite end with an outlet 4 for castings freed from sand and with an outlet 5 for the generated steam.

The circumferential wall of the drum is provided with perforations 6 on part of its length and said perforations may have a diameter of about 0.8 inch and a pitch of e.g. 8 inches. The length of said perforated wall part of the drum may be varied by providing one or two slidable sleeves 9 around the drum.

[*Price 4s. 6d.*] Price 25p

The sand passed through the perforations 6 is completely dry, and is free from lumps as any lumps are pulverized by the castings; the sand drops into a stationary chute 7 tightly engaging the perforate wall of the drum. If required water may be introduced into the drum by means of a conduit 9 to improve heat withdrawal as mentioned above.

Movement of the castings and sand through the drum is obtained in known manner by means of blades (not shown) secured at the inner side of the drum wall and which preferably are adjustable for varying the speed of the movement of the mass and thus the cooling of the castings. The evaporation of water contained in the sand and therefore the cooling of the castings and of the sand may be accelerated by maintaining a reduced pressure in the drum.

For obtaining favourable results the degree of filling of the drum should be maintained between predetermined limits. The castings leaving the drum through the outlet 4 are already partly cleaned so that the treatment thereof by means of shot blasting may be shortened and beating out the cores if any is not necessary. It appears that by the short duration of treatment in the drum the shape and the dimensions of the sand grains are not affected. As the sand is obtained completely free of moisture the addition of water when mixing sand for repeated use for making moulds may be maintained within narrow limits. Also the advantage is obtained that the moisture free sand in a thin layer of e.g. 0.2 inch may be moved over a magnet for withdrawing particles of iron. Moreover the completely dry sand grains when stored will not tend to adhere together.

WHAT WE CLAIM IS:—

1. A method of cooling a casting and cooling and drying the mould sand employed for the production of the casting in a mould flask, the method comprising partially cooling the flask containing the casting and surrounding sand, depositing from the flask the partially cooled casting and sand into a container having an outlet for steam generated therein, and maintaining the casting in intimate contact with the sand in the container to cool the casting and dry the sand.

2. A method according to claim 1 wherein the container is a rotating drum, the casting and sand being deposited in one end of the drum and being caused to advance towards the other end of the drum.

3. A method according to claim 2 wherein the said one end of the drum has an imperforate circumferential wall, the drum having a further portion with a perforate circumferential wall through which the dried sand passes.

4. A method according to any of claims 1 to 3 wherein water is added to the casting and sand in the container to assist in cooling the casting by the generation of steam.

5. A method according to any of claims 1 to 4 wherein a reduced pressure is maintained in the container.

6. A method according to any of claims 1 to 5 wherein cool air is passed through the container to enhance the cooling.

7. A method for cooling castings and for cooling and drying the mould sand used for said castings, substantially as described with reference to the accompanying drawings.

8. A rotary drum for cooling castings and for cooling and drying the mould sand used for said castings, substantially as described herein with reference to the accompanying drawings.

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