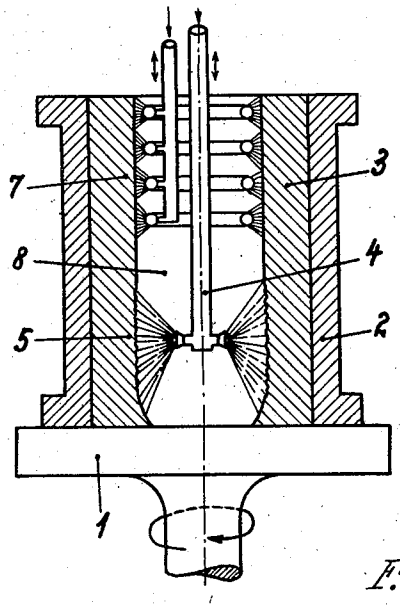
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METHOD FOR PRODUCING HOLLOW BODIES IN CENTRIFUGAL CASTING MOLDS ROTATABLE ABOUT THE VERTICAL AXIS

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METHOD FOR PRODUCING HOLLOW BODIES IN CENTRIFUGAL CASTING MOLDS ROTATABLE ABOUT THE VERTICAL AXIS

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1 Claim. (Cl. 22—212)

Hollow bodies, especially those of cast steel, which are produced in centrifugal casting molds rotating about their vertical axis have, if the centrifuging is carried out in the correct manner, thin wall thickness and dense wall cross sections without piping or segregation. However, in the case of hollow bodies with thick walls traces of piping pores and segregations often occur on the inner surface, especially in the lower half of the body. In order to obtain a uniformly good and clean surface also in hollow bodies with thick walls, all piping and segregation must be avoided. Piping and segregation is due to that the solidifying of the material in the solidifying hollow cylinder progresses more quickly from the top than from the bottom surface. The formation of piping pores and segregations is favoured particularly in the lower half of the block where the material remains liquid longest. The wall of the hollow body, however, is mostly clean in the upper zone and also a distance above the bottom plate especially when a refractory bottom plate and a refractory mold cover are employed during the casting of the hollow body.

For regulating the solidifying process of hollow bodies which are made in centrifugal casting molds rotatable about their vertical axis, it is known to additionally cool rapidly the inner wall of the hollow body during the solidification.

The invention is based on the recognition of the fact that it is sufficient to additionally cool rapidly only the lower portion of the solidifying inner wall of the hollow body. The artificial cooling can be effected by blowing on compressed air, if desired mixed with steam or water, or some other suitable cooling medium or by introducing a cooling body adapted to the inner side of the hollow mold.

According to the invention, however, it may also be advantageous to additionally heat the upper part of the solidifying inner wall of the hollow body. This is preferably effected by hot gas sheets of combustible gases. By heating the upper part of the solidifying inner surface the solidification of the upper cylinder wall can be retarded until the traces of piping and segregation impurities have arrived at the top from the lower portion of the hollow cylinder wall.

An apparatus for carrying out the process is illustrated by way of example in vertical section in the accompanying drawing.

Referring more particularly to the drawing there is provided a chill 2 arranged vertically on the centrifuging device 1 and in which the just solidifying hollow body 3 of centrifuged metal is contained. The formation of pipings and segregation during the solidifying of the hollow cylinder wall is prevented by the additional accelerated cooling of the lower portion of the inner wall by a cooling medium, such as compressed air, steam, or water mist, which is projected onto the inner wall of the hollow cylinder 3 by a cooling pipe 4 shiftable in the axial direction of the chill. Only the cooling of the lower portion 5 of the hollow cylinder is accelerated thereby. An additional simultaneous heating of the upper portion of the inner wall is effected by a heating device 8 which directs a sheet of hot gas of combustible gases thereagainst.

The great advantage of the method according to the invention consists in that not only the outmolding of good hollow bodies is increased in the centrifuging process but also and chiefly in that the quality of the inner side of the wall is considerably improved. The clean inner surface of the hollow body thus produced enables the subsequent machining expenses in the case of finished machining of the cylinder to be reduced to a minimum so that a great economical saving is obtained.

The method according to the invention is not restricted to the production of hollow bodies by centrifuging of carbon steel, but it can be advantageously applied to alloyed steels and metal alloys and also to the production of hollow compound castings in the centrifuging method.

I claim:

A method for the production of heavy hollow bodies having a relatively thick wall in centrifuging casting molds rotatable about the vertical axis with additional direct cooling of the inner wall of the hollow body, consisting in additionally directly heating only the upper portion of the solidifying inner wall of the hollow body whilst leaving the outside of the body uninfluenced.

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