

- [54] **NOZZLE FOR A PNEUMATIC-HYDRAULIC HEAD FOR CLEANING OF MOLDS FOR PRESSURE CASTING OF METAL**
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- [58] Field of Search.239/403, 405, 424, 424.5, 434.5

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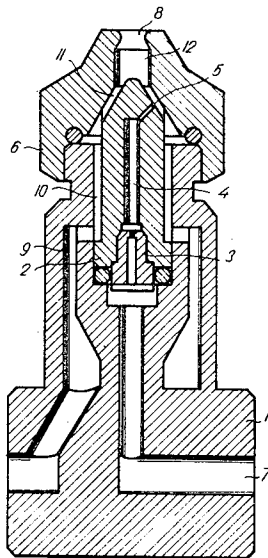
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[57] **ABSTRACT**

A nozzle for a pneumatic-hydraulic head for cleaning molds for pressure casting of metal, having independent supplies of pressurized air and separating material. The nozzle has a chamber and spiral shaped mixing channels creating in the chamber prior to the discharge through the nozzle spout a vortex in the pressurized air. A transfer channel is also provided connected to the supply of the liquid separating material terminating into one of the mixing channels.

4 Claims, 3 Drawing Figures



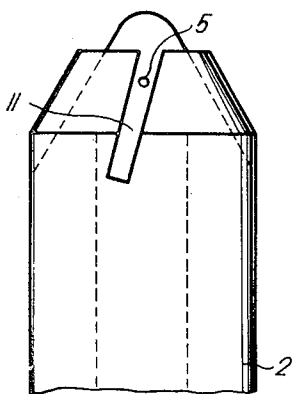


Fig. 2.

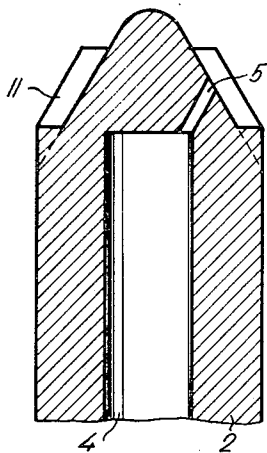


Fig. 3.

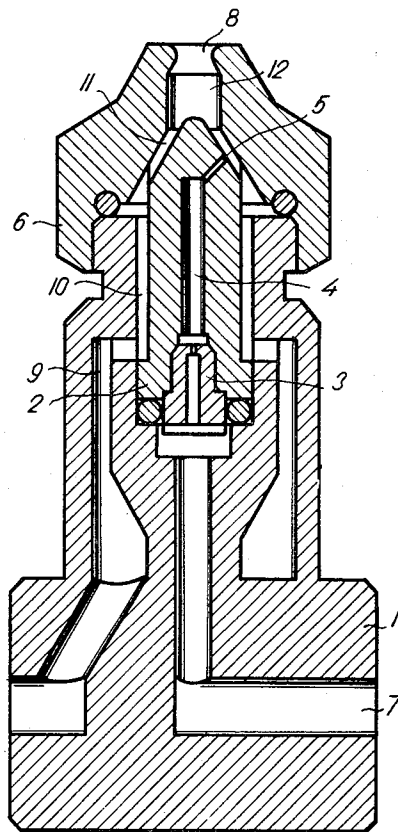


Fig. 1.

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NOZZLE FOR A PNEUMATIC-HYDRAULIC HEAD FOR CLEANING OF MOLDS FOR PRESSURE CASTING OF METAL

BACKGROUND OF THE INVENTION

This invention relates to the arrangement of a spray nozzle particularly adapted for cleaning of molds for pressure casting of metal in a pressure casting machine and for applying a layer of separating material on the surface of the mold. The molds of similar casting machines are generally composed of two halves which are closed for casting. The molten metal is introduced under pressure into the hollow space of the closed mold. After the metal has solidified, the mold is opened and the casting removed. It is however frequently necessary to clean both parts of the mold between successive casting operations and to remove, above all, the burn-off. Several arrangements are known for applying the separating material, which operate satisfactorily only when using high grade separating material. In such arrangements the liquid separating material is stored in a container, wherefrom it passes due to the application of a vacuum caused by the flow of pressurized air with which it mixes. Pressurized air is generally caused to flow around the outlet of the separating material and by adjustment of its volume and by adjustment of the size of the nozzle the ratio of the mixture of air and separating material can be adjusted. A drawback of this arrangement is that the mixture is collected on the wall of the discharge tube and causes drops of the liquid separating material to fall on the surface of the mold at places where they are undesirable. A further drawback is also in the fact that such apparatus cannot be used to clean the mold with pressurized air only, and must simultaneously apply the separating material.

Another arrangement is known which operates so, that the separating material is mixed with the air just prior to application on the surface of the mold. Pressurized air is supplied around the supply tube for the separating material, which is coaxial with the axis of the nozzle. The stream of air passing through a conical annular space comes to the outlet of the nozzle and strikes the surface of the mold. The proper application of the separating material is accomplished by dosing means which supplies a predetermined amount of liquid separating material at a certain time interval into the nozzle where it is taken along by the stream of air and applied on the surface of the mold. A drawback of this arrangement is that the speed of the streaming air is partially throttled in the supply ports, so that the proper mixing of the separating material with air in the nozzle is not perfect. A drawback lies also in the complicated assembling of this arrangement.

SUMMARY OF THE INVENTION

It is an object of this invention to provide a nozzle for a pneumatic-hydraulic head for cleaning of press molds for pressure casting of metal which would allow the efficient cleaning of the surface of the mold either by a stream of air alone, or by the simultaneous application of a separating material.

It is another object of this invention to achieve a perfect atomizing and mixing of the separating material with air under pressure and for permitting an independent adjustment of the stream of air and of the separating material.

According to this invention at least one mixing channel is provided in the external surface of the nozzle body. The nozzle body is provided with a transfer channel, terminating therein, and interconnecting a central hollow space in the nozzle body with a chamber in the nozzle head, the transfer channel being inclined with respect to the axis of the nozzle.

An advantage of the nozzle according to this invention is, that a rotational movement of the air stream is accomplished by the passage of the pressurized air through the mixing channels in the nozzle body, achieving thus an improved cleaning of the molds. Another advantage is, that the liquid separating material is taken along into the mixing channel by a branch of the stream, creating a vortex in the nozzle, whereby a perfect mixing of the mixture is achieved. Another advantage is, that the mixture can within very short time intervals be applied in a uniform layer to the surface of the mold.

DESCRIPTION OF DRAWINGS

An exemplary embodiment of a nozzle for a pneumatic-hydraulic head for cleaning of press molds used for pressure casting of metal according to this invention is shown in the attached drawings, where

FIG. 1 shown the whole head in longitudinal cross section,

FIG. 2 an elevation of the proper nozzle body and

FIG. 3 a longitudinal cross section of the nozzle body.

DESCRIPTION OF PREFERRED EMBODIMENT

With reference to the drawings the nozzle body 2 is formed with four mixing channels 11 (see FIGS. 2 and 3) provided on its external circumference. These mixing channels extend in a spiral direction from the external surface to the center of the nozzle body 2. A transfer channel 5 connecting an internal central hollow space 4 of the nozzle body 2 with its external part terminates into one of said mixing channels 11. The axis of this transfer channel 5 is inclined with respect to the longitudinal axis of the nozzle body.

The nozzle body 2 is placed in the body 1 of an enlarged hollow nozzle head so as to create between the nozzle body 2 and the body 1 of the nozzle head an annular chamber 10. This chamber 10 is connected by means of a channel 9 in the body 1 of the nozzle head with a source of pressurized air. The nozzle body 2 is fixed in the body 1 of the nozzle head by a hood 6, creating above the nozzle body 2 a second chamber 12, terminating in the nozzle spout 8. The separating material is supplied to the central hollow space 4 of the nozzle body 2 via a supply channel 7 and a filter screen 3 under an overpressure. The pressurized air is supplied by way of a channel 9 in the body 1 of the nozzle head into the annular chamber 10 and passes over the spiral shaped mixing channels 11. The separating material mixes with pressurized air as it leaves the transfer channel 5 and is carried along by air passing through the mixing channels 11. A thorough mixing is thereby accomplished with the pressurized air supplied via the annular chamber 10. The separating material is atomized by the vortex created by the atomized air as it passes through chamber 12, and exits through the nozzle spout 8 to be applied on the surface of the mold. Both

supply channels 7 and 9 have independently controlled control means, advantageously controlling the supply of the pressurized air and of the separating material.

It is thus possible to clean the opened mold either by the stream of air solely, or to combine the stream of pressurized air with the atomized separating material or to allow only the atomized separating material to be discharged through the nozzle spout 8.

We claim:

1. A spray nozzle comprising in combination:
a nozzle head,
a nozzle body inserted in said nozzle head, and
a nozzle hood enclosing said nozzle body and provided with a nozzle spout,
at least one mixing channel formed on the external surface of said nozzle body and communicating with said spout,
said nozzle body and said nozzle head be arranged to provide an annular space coaxial with the longitudinal axis of the nozzle head and terminating in

said mixing channel,
a supply channel for feeding pressurized air into said annular space,
a central hollow space formed in the nozzle body,
a channel for supplying a separating material under pressure terminating in the central hollow space,
a transfer channel interconnecting the central hollow space of the nozzle body with said mixing channels.

2. The nozzle according to claim 1 wherein said mixing channels are spirally shaped.

3. The nozzle according to claim 1 wherein the transfer channel is inclined at an angle with respect to the longitudinal axis of the nozzle body.

4. The nozzle according to claim 1 wherein said nozzle hood and said nozzle body define a second chamber between the mixing channel and the spout through which said pressurized air and material flows.

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