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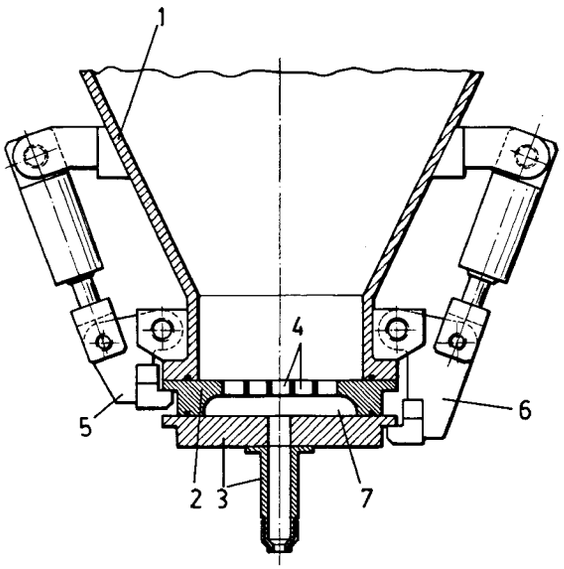
(54) Core blowing machines.

(57) Core blowing machines comprise a mid-plate (2) between the blowing head (1) and the blowing plate (3), the MID-PLA (2) having holes (4) that whilst allowing the free passage of sand and its binder towards the blowing mouth (3) when the head (1) acts and blowing comes about, however prevent the passage of sand through the same simply due to gravity, specifically when the blowing plate is changed or replaced.

The mid-plate (2) has hydraulic attachments (5) that are independent from the hydraulic attachments (6) of the blowing plate (3), so that when replacing the latter the mid-plate (2) shall remain duly fixed to the blowing head (1). It is thereby possible for the plate change to be far quicker, for the said plate to be hardly soiled and for the classic loss of sand during the change to be eliminated.



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SPECIFICATION

OBJECT OF THE INVENTION

The present invention relates to a number of improvements to core blowing machines, such improvements aimed towards changing the tool kit in the least possible time, each time it is necessary to change the type of corebox, and hence the relevant blowing plate, and at the same time losing as little sand, or more specifically the sand-binder mixture, as possible, and soiling the blowing head at its coupling to the blowing plate less, or almost negligibly.

BACKGROUND OF THE INVENTION

In foundry core blowing machines it is well-known that the raw material, namely the sand, is supplied by means of a blowing head to the respective corebox, through a blowing plate that is appropriately coupled both to the mouth of the corebox and to the mouth of the blowing head, when the sand is blown into the box.

While the same kind of coreboxes are being used, the several boxes are assisted by a single blowing plate, that is kept permanently attached to the blowing head and to which each of the coreboxes placed under the said head are coupled one after the other.

The problem arises when it is necessary to change production, and the kind of corebox that was being used must be replaced by another, which is when, naturally, the appropriate blowing plate must be substituted. In such event, the blowing plate is placed upon a tray, upon releasing the attachments, which means that the sand in the blowing head will fall due to gravity and be deposited for the most part upon the plate, at the same time as the said sand, on falling, soils the edge of the blowing head, specifically the area where the new blowing plate must be coupled.

This means on the one hand that a considerable amount of sand is lost, which can depending upon the size of the machine range between 50 and 120 kg per change, and on the other it is necessary to clean both the blowing head and the plate.

Specifically, various mechanisms are known for replacing and cleaning the blowing plate, for instance as set forth in Spanish patents of invention 8800929 and 8902034, held by the applicant himself, which solutions comprise providing the carriage or tray used to remove the blowing plate from the machine with means of attachment for the said plate and side tipping means capable of suddenly tilting the said plate, by almost a right angle, in order for the plate to take up an almost vertical position, causing the sand remains lying on the same to conveniently drop due to gravity.

However, these solutions, in addition to being structurally complex and hence expensive, considerably slow down the operation to replace the blowing plates, which can last up to around five minutes.

DESCRIPTION OF THE INVENTION

The improvements subject of the invention fully solve the above twofold problem. More specifically, the said improvements allow, on the one hand, the plate replacement time to be cut down to less than a minute, viz. five times less than the conventional operation, and on the other to fully eliminate the loss of sand, so that the said sand remains within the blowing head during the replacement operation, hence at the same time preventing the edge or mouth of the said head from being soiled.

More specifically and in order to achieve the above, the improvements subject hereof lie in establishing a mid-plate between the blowing head's outlet mouth and the blowing plate, provided with its own means of attachment to the said head, independent from the other means used to attach the blowing plate, so that during the operation to replace the latter, the mid-plate is held fixed to the blowing plate. Specifically, and in order for the said mid-plate to fully solve the above problem, the said mid-plate is provided with a number of holes which are suitable in number and size so as not to hinder the passage of the sand and its binder towards the blowing plate, during the blowing operation in which the head is operative, but which are the same time of appropriate size to prevent sand from dropping simply due to gravity, such mixture being relatively consistent given the nature of the additives that the sand carries.

Thus it is possible at the start of an operative cycle in the core blowing machine, for the first blowing plate to reach the head vertical together with the respective corebox, where it shall be attached to the said blowing head, to which it is held fixed throughout the repetitive process, right until completion of the cycle pertaining to this type of corebox, which is when the blowing plate shall be taken from the machine together with the last corebox, with very little sand lying upon its upper surface, such being the sand lying in the interstice between the said blowing plate and the mid-plate, which remains can be easily removed by any means and are negligible from the volumetric standpoint.

DESCRIPTION OF THE DRAWINGS

In order to provide a fuller description and contribute to the complete understanding of the characteristics of this invention, a single sheet of drawings is attached to the specification which, while purely illustrative and not fully comprehensive, contains a single figure showing in part a side elevation and cross-

section of the blowing head provided in a core blowing machine, a blowing plate and a mid-plate, with the means for the attachment thereof, all in accordance with the improvements subject of the present invention.

PREFERRED EMBODIMENT OF THE INVENTION

It can be observed in this figure that the improvements subject hereof comprise coupling a mid-plate (2) to the blowing head (1) of the core blowing machine at issue, such that, as its name points out, it lies between the said head (1) and the blowing plate (3), the said mid-plate (2) being universal, viz. valid for any type of corebox (not shown in the drawings), or in other words for any type of blowing plate (3), of which a specific type does exist for each type of corebox.

As above mentioned, this mid-plate (2) is provided with a number of bores (4) that are appropriate in size to prevent the passage of air through the same by simple gravity, and yet not to hinder the free passage of the said mixture towards the blowing plate when true blowing takes place in the head (1).

The mid-plate (2) is fixed to the blowing head (1) through hydraulic attachments (5) that are independent from the other hydraulic attachments (6) used in turn to attach the blowing plate (3), and the latter can thus be detached from the head as many times as may be required, without the mid-plate (2) attachment being affected.

More specifically, and in accordance with a preferred practical embodiment of the invention, three hydraulic attachments (5) will be provided for the mid-plate (2), distributed equiangularly, viz. at an angle of 120°, and three hydraulic attachments (6) will be provided for the various blowing plates (3), also in equiangular distribution but at an angle of 60° to the hydraulic attachments (5) of the mid-plate (2).

With this structure and as above mentioned, the first blowing plate (3) shall reach the head (1) vertical together with the appropriate corebox that is not shown, and will in such position be fixed to the said head (1) by means of the relevant attachments (6), such attachment being maintained until such a time as the type of corebox is changed, i.e. until such a time as a different blowing plate (3) is required.

When the machine completes a working cycle and it is necessary to change the type of corebox, it will be sufficient once the last of such boxes has been blown, for the hydraulic attachments (6) to release the blowing plate (3) in order for the latter to be dragged together with the last corebox, the only remains being a small portion of sand on its upper surface, such being the sand lying in the chamber (7) defined between both plates, viz. between the blowing plate (3) and the mid-plate (2), the quantity being very little and negligible from the standpoint of sand waste, and can be easily eliminated from the said plate by any means, given the scarcity thereof.

We feel that the device has now been sufficiently described for any expert in the art to have grasped the full scope of the invention and the advantages it offers.

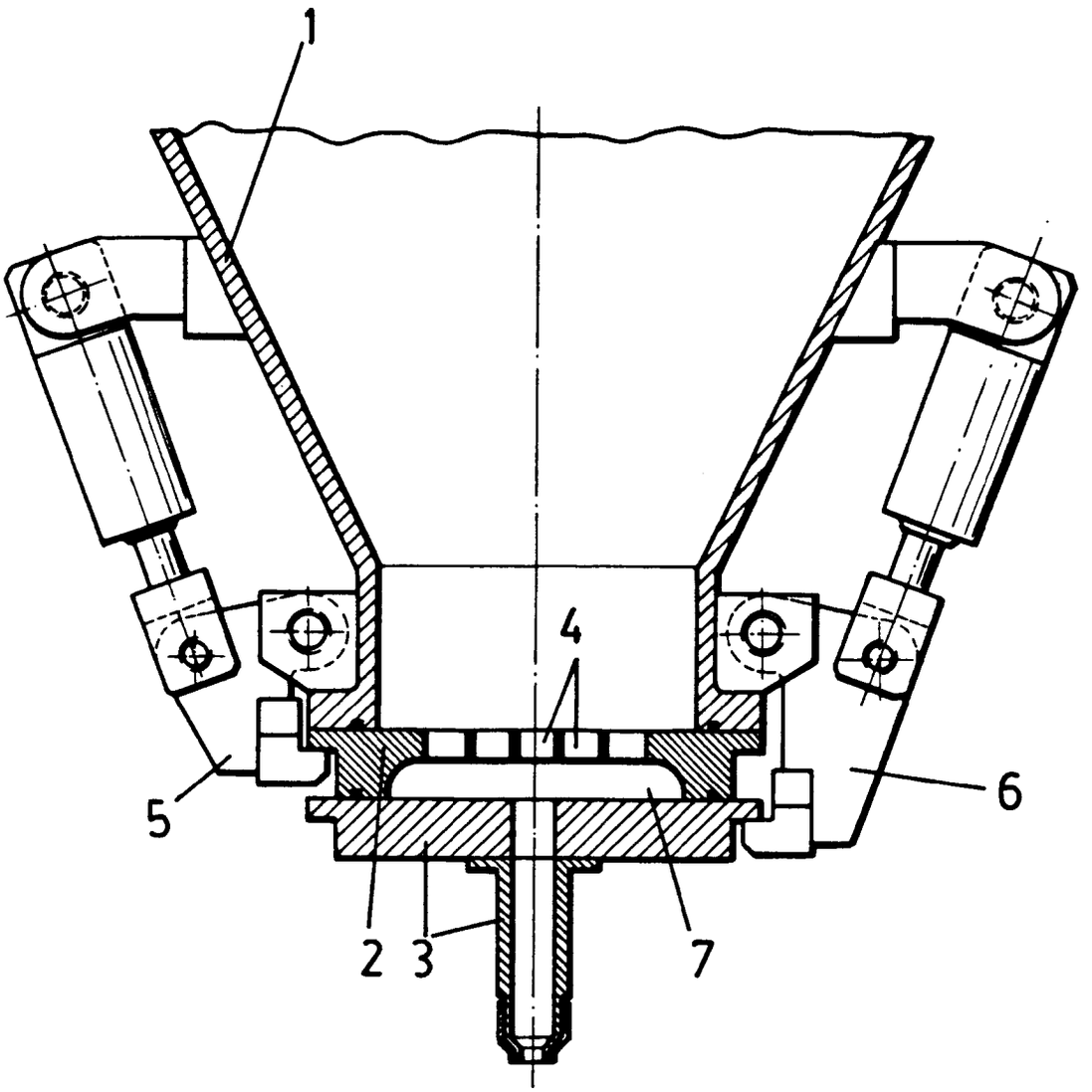
The materials, shape, size and layout of the elements may be altered provided that this entails no modification of the essential features of the invention.

The terms used to describe the invention herein should be taken to have a broad rather than a restrictive meaning.

Claims

1.- Improvements to core blowing machines, specifically to machines having a blowing plate (1), its outlet mouth having a specific blowing plate (3) coupled to it for each type of corebox, to which mouth it is in turn tightly coupled during the blowing stage, essentially characterised in comprising the provision between the said blowing head (1) and the blowing plate (3) of a mid-plate (2) carrying a number of holes (4) that are appropriate in number and size to allow the passage of sand towards the blowing plate (3) when the said sand is "blown" by the head, and in turn insufficient to allow the said sand to drop simply due to gravity.

2.- Improvements to core blowing machines, as in claim 1, characterised in that the mid-plate (2) is provided with means of attachment to the blowing head (1), preferably hydraulic attachments (5) that are physically independent from the means of attachment, specifically hydraulic attachments (6), of the blowing plate (3), such that the said blowing plate (3) can be detached from the head (1) whilst the mid-plate (2) is held fast to the latter.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EUROPEAN SEARCH REPORT

Application Number
EP 92 50 0130

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	US-A-3 187 391 (CUMMINGS ET AL) 8 June 1965 * column 1, line 65 - column 2, line 65 * * figures *	1	B22C15/24
X	FR-A-2 386 967 (SERAM S.A.S. DI VALLI F. & C.) 3 November 1978 * page 1, line 6 - page 2, line 26 * * page 3, line 7 - line 10 * * figure *	1	
A	FR-A-2 333 593 (SOCIETÉ ANONYME DES FONDERIES ET ATELIERS DE MOUSSEROLLES) 1 July 1977 * page 1, line 18 - line 33 * * page 2, line 35 - page 3, line 12 * * figures 1A,1B,2 *	1,2	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B22C B28B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	15 FEBRUARY 1993	RIBA VILANOVA M.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
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