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(54) **Core blowing machine for forming shell-molding cores**

Kernschiessmaschine

Machine à tirer les noyaux

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EP-A- 0 359 887 **DE-C- 632 671**
DE-C- 4 128 952

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Description

[0001] The present invention relates to a core blowing machine for forming shell-molding cores.

[0002] Known from DE-C-632 671 is a core blowing machine having a sand hopper and blowing head as one unit which can be swung from a lower position where the sand hopper is filled to a working position where the unit is oriented such that the sand hopper is located above the blowing head.

[0003] A conventional core blowing machine is substantially constituted by a frame that supports the core boxes, at which a blowing head acts; said head injects and compacts inside the core boxes the mix drawn from a loading hopper.

[0004] In known solutions, the loading hopper is arranged above the blowing head, so as to convey the mix, and considerable difficulties are accordingly encountered in loading the mix in the hopper and in cleaning said hopper at the end of work.

[0005] Another drawback of conventional solutions resides in the fact that the formed-core removing means do not always allow to correctly remove the formed cores, with the risk of causing damage and breakage especially of the weakest cores.

[0006] The aim of the present invention is indeed to solve the problems described above by providing a core blowing machine for forming cores for shell-molding that allows to load and clean the mix feeding hopper and core boxes much more easily and so as to considerably aid the operators.

[0007] Within the scope of this aim, a particular object of the invention is to provide a core blowing machine that allows to always gently deposit the core on the conveyor belt, avoiding the possibility of weak-core breakages.

[0008] Another object of the present invention is to provide a core blowing machine that allows to quickly replace the molds when they are still hot or optionally to perform small adjustments when newly-made core boxes are being used.

[0009] Another object of the present invention is to provide a core blowing machine for forming cores for shell-molding that, by virtue of its particular constructive characteristics, is capable of giving the greatest assurances of reliability and safety in use.

[0010] This aim, these objects, and others which will become apparent hereinafter are achieved by a core blowing machine for forming cores for shell-molding, comprising a load-bearing frame for supporting core boxes, at which a core-forming mix blowing head acts, said mix being supplied by a mix loading hopper, said machine comprising lifting means for positioning said hopper in the working position and on the ground, characterized in that it further comprises a cleaning unit that can be interposed between said core boxes and is adapted to introduce compressed air or a spray of water and release agent.

[0011] Further characteristics and advantages will become apparent from the detailed description of a core blowing machine for forming cores for shell-molding, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a schematic elevation view of the core blowing machine; and

figure 2 is a plan view of the core blowing machine.

[0012] With reference to the above figures, the core blowing machine for forming cores for shell-molding, according to the invention, is generally designated by the reference numeral 1 and comprises a load-bearing frame 2 preferably of the bridge-like type with rectangular electrically welded steel tubes.

[0013] Guiding and supporting bars 3 are provided on the frame 2 and allow to close the core boxes 4 precisely; said bars are arranged on the opposite side with respect to the operator, so as to allow free access to all the parts of the machine.

[0014] Adjustment systems are provided to compensate for the various thicknesses of the core boxes; they are constituted by a crank 6 located on the outward side of the machine so as to give the operator the greatest assurances of safety.

[0015] For removing the formed cores, a conveyor belt 7 is provided below the core boxes; said belt is mounted on a pantograph 8 to adjust its height, so that the overturning of the corresponding core box allows to gently deposit the formed cores onto the conveyor belt.

[0016] A blowing head 10 is provided at the core boxes; said head is easily interchangeable, since it is installed with a double-bayonet system, and is provided with a forced cooling water circulation system 11 at the part which is in contact with the core box.

[0017] The mix to be fed to the blowing head is loaded by means of a loading hopper 20 having the particularity of being mounted on lifting means that allow to position the hopper 20 at the working level, above the blowing head, and can lower the hopper down to ground level, thus allowing easy and safe filling with the mix, without having to resort to ladders and considerably facilitating internal cleaning at the end of the work shift.

[0018] As shown in dashed lines in figure 2, the hopper 20 is rotatable about a vertical axis so as to be better positioned with respect to the blowing head.

[0019] An automatic metallic male mold part extractor 21 acts at the core boxes, has an axis that is parallel to the mold closing plane, and can insert the electric heating resistors, the temperature whereof is controlled by an instrument located in the electric cabinets.

[0020] A cleaning unit 30 is provided between the spaced core boxes and is operated by compressed air; as an alternative, a sprayer is used that sprays water and release agent.

[0021] The two mold supporting heads are rotatable through 90° outwards, since they are rotatable about a

vertical axis, as more clearly shown in figure 2, so that changing the still-hot molds is very easy, or to perform small adjustments when using newly-made core boxes.

[0022] The entire machine is operated by hydraulic actuators that are controlled by an electronic control unit according to a working cycle easily preset by the operator.

[0023] From the above description it is therefore evident that the invention achieves the intended aim and objects, and in particular the fact is stressed that a core blowing machine is provided which is particularly practical and functional and allows to considerably increase production and improve its quality.

[0024] In practice, the materials employed, as well as the contingent shapes and dimensions, may be any according to the requirements.

[0025] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. Core blowing machine (1) for forming cores for shell-molding, comprising a load-bearing frame (2) for supporting core boxes (4), at which a core-forming mix blowing head (10) acts, said mix being supplied by a mix loading hopper (20), said machine (1) comprising lifting means for positioning said hopper in the working position and on the ground, characterized in that it further comprises a cleaning unit (30) that can be interposed between said core boxes (4) and is adapted to introduce compressed air or a spray of water and release agent.
2. Core blowing machine according to claim 1, characterized in that it comprises, on said frame (2), guiding and supporting bars (3) for said core boxes (4), said bars being arranged on the opposite side with respect to the operator.
3. Core blowing machine according to the preceding claims, characterized in that it comprises means for adjusting the thickness of the core boxes (4) actuable by means of a crank (6) located on the outer side of the machine.
4. Core blowing machine according to one or more of the preceding claims, characterized in that it comprises, below said core boxes (4), a conveyor belt (7) mounted on a pantograph (8) to adjust its height.
5. Core blowing machine according to one or more of the preceding claims, characterized in that said

blowing head (10) is installed with a double-bayonet system and is provided with a forced cooling water circulation system (11) at the part in contact with the core box (4).

6. Core blowing machine according to one or more of the preceding claims, characterized in that said lifting means are provided with translation and rotation means for positioning said hopper (20) above said blowing head (10).
7. Core blowing machine according to one or more of the preceding claims, characterized in that it comprises an automatic metallic male mold part extractor (21) provided with an electric heating resistor.

Patentansprüche

1. Kernschießmaschine (1) zum Erzeugen von Kernen zum Maskenformen, mit einem Tragrahmen (2) zum Tragen von Kernkästen (4), an denen ein Schießkopf (10) für Kernmaterialmischung arbeitet, welche über einen Mischungseingabetrichter (20) zugeführt wird, und mit einer Hebeeinrichtung zum Positionieren des Trichters in Arbeitsposition und auf dem Boden, dadurch **gekennzeichnet**, daß die Maschine ferner eine Reinigungseinheit (30) enthält, die zwischen die Kernkästen (4) gebracht werden kann und zum Einführen komprimierter Luft oder zum Sprühen von Wasser und Ablösemittel geeignet ist.
2. Kernschießmaschine nach Anspruch 1, dadurch **gekennzeichnet**, daß sie an dem Rahmen (2) Führungs- und Tragschienen (3) für die Kernkästen (4) enthält, welche auf der der Bedienungsperson abgewandten Seite angeordnet sind.
3. Kernschießmaschine nach einem der vorhergehenden Ansprüche, dadurch **gekennzeichnet**, daß sie Mittel zum Einstellen der Dicke der Kernkästen (4) enthält, welche mit einer Kurbel (6) an der Außenseite der Maschine betätigbar sind.
4. Kernschießmaschine nach einem oder mehreren der vorhergehenden Ansprüche, dadurch **gekennzeichnet**, daß sie unter den Kernkästen (4) einen Bandförderer (7) auf einem Scherenmechanismus (8) zur Höheneinstellung enthält.
5. Kernschießmaschine nach einem oder mehreren der vorhergehenden Ansprüche, dadurch **gekennzeichnet**, daß der Schießkopf (10) mit einem Doppelbayonettssystem installiert und mit einem Kühlwasser-Druckzirkulationssystem (11) an der Kontaktstelle mit dem Kernkasten (4) versehen ist.
6. Kernschießmaschine nach einem oder mehreren

der vorhergehenden Ansprüche, dadurch **gekennzeichnet**, daß die Hebeeinrichtung mit Übersetzungs- und Drehmitteln zum Positionieren des Trichters (20) über dem Schießkopf (10) versehen ist.

7. Kernschießmaschine nach einem oder mehreren der vorhergehenden Ansprüche, dadurch **gekennzeichnet**, daß sie einen automatischen metallischen männlichen Stempel-Auszieher (21) enthält, der mit einem elektrischen Heizwiderstand versehen ist.

Revendications

1. Machine de soufflage de noyaux (1) pour réaliser des noyaux pour le moulage en coquille, comprenant un châssis porteur (2) pour supporter des boîtes à noyaux (4), sur lequel agit une tête de soufflage de mélange (10) formant les noyaux, ledit mélange étant fourni par une trémie de chargement de mélange (20), ladite machine (1) comprenant des moyens de levage pour positionner ladite trémie dans la position de travail et sur le sol, caractérisée en ce qu'elle comprend de plus une unité de nettoyage (30) qui peut être disposée entre lesdites boîtes à noyaux (4) et est adaptée pour introduire de l'air comprimé ou une pulvérisation d'eau et un agent de démoulage.
2. Machine de soufflage de noyaux selon la revendication 1, caractérisée en ce qu'elle comprend, sur ledit châssis (2), des barres de guidage et de support (3) pour lesdites boîtes à noyaux (4), lesdites barres étant agencées sur le côté opposé par rapport à l'opérateur.
3. Machine de soufflage de noyaux selon les revendications précédentes, caractérisée en ce qu'elle comprend des moyens pour régler l'épaisseur des boîtes à noyaux (4) pouvant être actionnés par l'intermédiaire d'une manivelle (6) située sur le côté externe de la machine.
4. Machine de soufflage de noyaux selon l'une ou plusieurs des revendications précédentes, caractérisée en ce qu'elle comprend, en dessous desdites boîtes à noyaux (4), un transporteur à bande (7) monté sur un pantographe (8) pour régler sa hauteur.
5. Machine de soufflage de noyaux selon l'une ou plusieurs des revendications précédentes, caractérisée en ce que ladite tête de soufflage (10) est installée avec un système à double baïonnette et est munie d'un système de circulation d'eau de refroidissement forcée (11) à la partie en contact

avec la boîte à noyaux (4).

6. Machine de soufflage de noyaux selon l'une ou plusieurs des revendications précédentes, caractérisée en ce que lesdits moyens de levage sont munis de moyens de translation et de rotation pour positionner ladite trémie (20) au-dessus de ladite tête de soufflage (10).
7. Machine de soufflage de noyaux selon l'une ou plusieurs des revendications précédentes, caractérisée en ce qu'elle comprend un extracteur (21) de parties de moule métallique mâle, automatique, muni d'une résistance de chauffage électrique.



