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CORE BOX VENT

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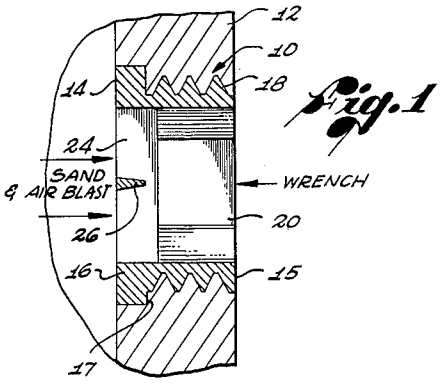


Fig. 1

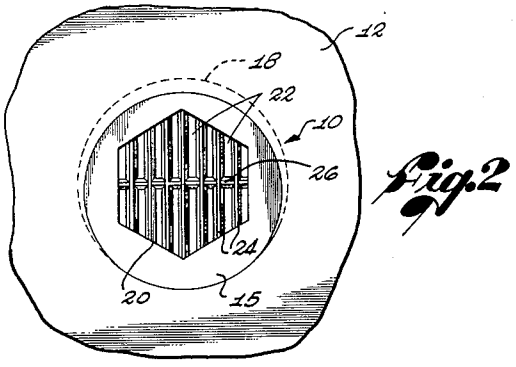


Fig. 2

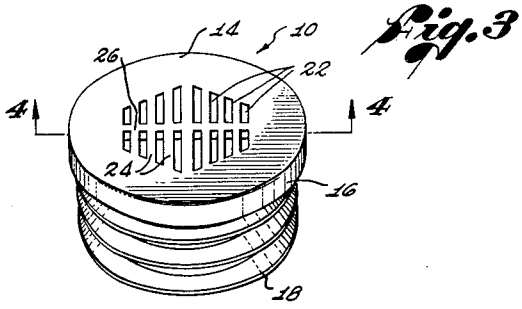


Fig. 3

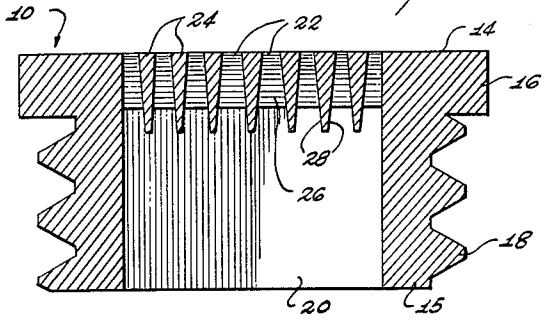


Fig. 4

INVENTOR.
KENNETH R. McINTYRE

BY Fulwider, Patton, Rieber, Lee, and Utecht
ATTORNEYS

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CORE BOX VENT

Kenneth R. McIntyre, Los Angeles, Calif.
(8628 Lavela Ave., Whittier, Calif.)

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This invention relates generally to sand casting, and more particularly to new and improved venting apparatus for core boxes used in manufacturing sand molds.

In making sand cores or molds for subsequent casting purposes, the sand mixture is delivered to the core box cavity by means of compressed air. It has been a general practice in molding such cores to provide screens, vents or plugs in the molding surfaces of the core box in positions which will do the most good in obtaining sound cores. In this regard, when a blast of airborne sand is received by the core box, the air must be rapidly vented while the sand remains entrapped within the core box cavity. For each specific core box design, the core box vents are located in positions which encourage the complete filling of the core box, for adequate mold density, and such vents must also be capable of maintaining an unclogged state for allowing air to escape.

Unfortunately, the various core box venting apparatus heretofore available for accomplishing the above objectives have all suffered from one or more deficiencies tending to limit core box operating efficiency. Primary among these difficulties has been the tendency for such venting arrangements to clog up in a short period of time, i.e., a single working day or less. In such instances, the vents or screens must be removed from the core box and cleaned, the latter resulting in a considerable amount of down time with consequent loss of production efficiency.

Additional difficulties encountered with core box vents have been the lack of ability to withstand the high temperatures used in baking a core, the difficulty of installing the vents in the core box, lack of structural strength and consequent vent distortion, the tendency for vent plugs and the like to pop out of the core box surface, and the expense of manufacturing such core box venting devices.

The importance of providing proper venting in core boxes cannot be overemphasized, since improper venting frequency results in the sand not being packed firmly enough in the core box cavity, with consequent inadequacy of mold density. This results in a spongy core which, when used in a casting operation, will produce castings with poorly finished surfaces and which often must be scrapped.

Accordingly, it is an object of the present invention to provide a new and improved core box vent which overcomes the above and other disadvantages of the prior art.

Another object is to provide a new and improved core box vent providing non-clogging release passages for gas escape.

A further object of the invention is the provision of a new and improved core box vent which is simple and rugged in construction, economical of manufacture, and efficient in operation.

Still another object is to provide a new and improved core box vent which is easily installed or removed from the core box and which will not pop out.

Yet another object of the present invention is the provision of a new and improved core box vent capable of withstanding the high temperatures of a core baking process and which will not distort during use.

The above and other objects and advantages of this invention will be better understood by reference to the following detailed description, when considered in connection with the accompanying drawings of an illustrative embodiment thereof, and wherein:

FIGURE 1 is a fragmentary sectional view illustrating a typical core box vent installation in accordance with the present invention;

FIGURE 2 is a right-side elevational view of the vent installation of FIGURE 1 and shows the socket for mounting the vent;

FIGURE 3 is a perspective view of a core box vent in accordance with the invention;

FIGURE 4 is an enlarged sectional view, taken along the line 4—4 of FIGURE 3, and illustrates the reverse funnel action which prevents clogging of the vent by core box sand.

Referring now to the drawings, and particularly FIGURES 1 and 2 thereof, a core box vent in the form of a plug **10** is shown installed in the wall **12** of a core box. The plug **10** has a generally circular, cylindrical appearance providing a front face **14** and a rear face **15**. The front face **14** of the plug **10** is directed into the core box to receive the blast of sand and air within the core box cavity.

Adjacent the front face **14**, the plug **10** is provided with an integral, peripheral flange **16** of uniform axial thickness and adapted to mate with a corresponding countersunk seat **17** in the core box wall **12**. The remainder of the plug **10**, between the rear surface of the flange **16** and the rear face **15** is threaded, as at **18**, and is adapted to engage corresponding threads in the plug mounting hole. The helical thread is continuous to the point where it intersects the flange **16**, as shown in FIGS. 1 and 4.

As best observed in FIGURE 2, the plug **10** is provided with a central, coaxial socket **20** extending into the plug body from the rear face **15**. The socket **20** has a uniform polygonal cross section along its length, e.g., the hexagon shown in FIGURE 2, so that the socket may receive a tool of the Allen wrench variety for rotating the plug within its mounting hole during installation and removal.

The plug **10** is installed from the inside of the core box. The wrench (not shown) is inserted from the outside of the core box, through the plug mounting hole, and into the socket **20** of the plug **10**. The wrench is then rotated to draw the plug **10** into the core box wall **12**, until further motion of the plug is inhibited by seating of the peripheral flange **16** in the countersunk seat **17** of the core box wall. Installation of the plug **10** in this manner is not only simple and reliable, but the flange **16** and seat **17** also provide positive means for preventing the plug **10** from popping out of the core box when the plug is struck by the high pressure blast of sand and air. Moreover, the flange and seat arrangement permits precise, flush alignment of the front face **14** of the plug **10** with the inner surface of the core box wall **12**, so that a relatively smooth surfaced core can be produced.

The plug **10** is preferably manufactured by casting, to facilitate mass production at low cost. Moreover, the plug **10** is preferably fabricated of a high temperature material, such as brass or the like, so that the plug can withstand the high temperatures frequently encountered during the baking of cores within the core box.

Referring now additionally to FIGURES 3 and 4, it will be observed that the front face **14** of the plug **10** is provided with a plurality of slotted apertures **22** defined by a plurality of parallel ribs **24** and a transverse rib **26**. Each of the ribs **24** is made sufficiently wide and deep to provide a relatively rigid structure with minimal tendency to distort under the high pressure of the sand and air blast. The transverse rib **26**, intersecting all of the ribs **24** at

right angles, serves to further brace the rib and aperture latticework against distortion.

As best observed in FIGURE 4, the sides **28** of each rib **24** are tapered to present a rib of progressively narrowing width proceeding into the plug **10** away from the front face **14**. The effect of these tapering ribs is to provide the slots **22** with a progressively widening cross section proceeding into the plug **10**, away from the surface **14** in FIGURE 4. Hence, the slots **22** provide a plurality of pyramidal, small reverse funnels, so that the resistance of the slots to passage of material therethrough is progressively decreased in proceeding inwardly from the front face **14** to the rear face **15** through the core box wall **12** in FIGURE 1. In this connection, the plug **10** is self-cleaning, since any sand which may lodge in the portions of the slots **22** nearer the front face **14** will be cleared through the slots to the outside of the core box by the next blast of air escaping through these slots from the interior of the core box.

The core box vent of the present invention satisfies a long-existing need in the casting art for inexpensive, efficient, easily installed, non-distorting and non-clogging venting devices.

It will be apparent from the foregoing that, while a particular form of my invention has been illustrated and described, various modifications can be made without departing from the spirit and scope of my invention. Accordingly, I do not intend that my invention be limited, except as by the appended claim.

I claim:

A core box vent, comprising:

a circular, tubular, cylindrical plug body of high temperature material, said plug body presenting a forward face and a rear face, said faces being disposed at right angles to the longitudinal axis of said cylindrical body;

an end wall adjacent to and flush with said forward face of said plug body;

a central, polygonal, coaxial wrench socket extending into said plug body from said rear face and terminating adjacent said end wall;

an external, peripheral flange having a uniform thickness and being integral with said plug body, said flange having a surface lying flush with said forward face of said plug body and said end wall;

a helical thread cast upon the external cylindrical surface of said plug body between the rear face of said peripheral flange and said rear face of said plug body, said thread being continuous to a point where it intersects said flange; and

a plurality of spaced, parallel slots defined by longitudinal ribs in said end wall, the side surfaces of said ribs tapering to provide progressively widening, reverse funnel openings proceeding into said plug body away from said forward face; and a reinforcing rib extending transverse to and intersecting said ribs in said end wall.

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J. SPENCER OVERHOLSER, *Primary Examiner.*

ROBERT F. WHITE, MARCUS U. LYONS, *Examiners.*