Sept. 20, 1949. C. A. DUDZINSKI 2,482,330

CORE VENT

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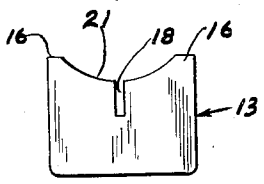
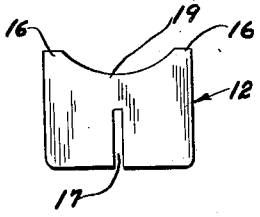
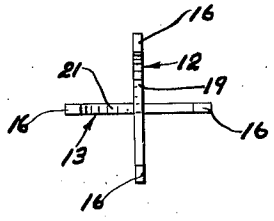


Fig. 1.





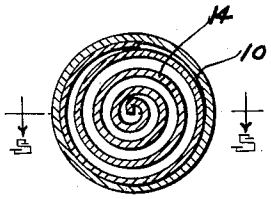
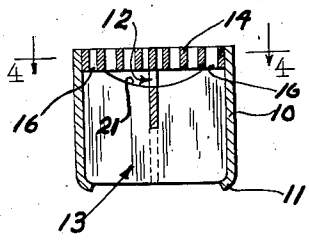
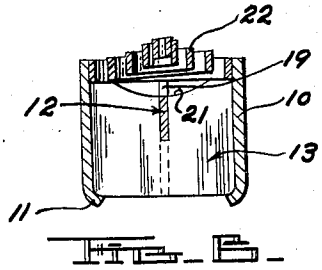


Fig. 4.





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CORE VENT

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6 Claims. (Cl. 22—13)

1

This invention relates to foundry art generally, and more particularly to a core vent or sand retainer for use in the mass production of sand cores.

Mass production of foundry cores is conventionally accomplished by forming or molding the core material to the desired shape in a metal core box. The cores are made from a mixture comprising moist sand and a binding agent. To economically produce the cores under mass production requirements, it is essential that the core mixture be rapidly deposited in the core box under sufficient pressure to form a compact and strong core. This is conventionally accomplished by transporting the sand pneumatically into the core box under considerable pneumatic pressure. As the core box fills with the core mixture, it is necessary to provide a means for the rapid escape of the air already in the core box in addition to the air used in transporting the sand into the core box. Such means must also provide for a minimum retention of the core mixture in the core box.

Efforts to accomplish these objectives have not proven generally satisfactory. The core vents used in modern foundry production methods vary widely from a simple screen to complicated and expensive vents. Typical examples of the above structures are described in U. S. Letters Patents 2,060,350, 2,126,047, 2,176,328, and 2,238,506.

As the air escapes, some core mixture is unavoidably carried through the vent causing considerable abrasive action resulting in a short life of the core vent. Inasmuch as there is a considerable number of such core vents on each core box, it is desirable that replacement of worn out vents may be made rapidly, easily, and economically. The core vent, in addition to the above requirements, must mar the core as little as possible due to deformation of the core vent under pneumatic pressure.

It is therefore an object of this invention to provide a core box vent that is economical in production, highly durable, and efficient in use.

Other objects and advantages of the invention will become apparent as the description proceeds, especially when considered in connection with the drawings in which:

Figure 1 is a side elevation of one cross supporting member.

Figure 2 is a side elevation of a mating cross supporting member.

Figure 3 is a top elevation of the cross members assembled.

Figure 4 is a cross sectional view of the core vent taken on the line 4—4 of Figure 5.

Figure 5 is a cross sectional view of the core vent taken on the line 5—5 of Figure 4.

Figure 6 is a cross sectional view of a core vent showing an alternate spring construction.

2

Reference is now made to the drawings in which the reference character 10 denotes a core vent shell. One end 11 of the shell 10 is curved inwardly as shown in Figures 5 and 6 for the dual purpose of providing a seat for the crossed supporting members 12 and 13, and also to facilitate the insertion of the core vent into the cavity provided in the core box (not shown).

Escape of the air from the core box and retention of the sand is actually accomplished by the resilient spiral spring 14, as shown in Figure 4. This spiral spring 14 is inserted into the shell 10 and is supported securely in the said shell by crossed supporting members 12 and 13, as best shown in Figure 5. The outer convolutions of said spiral spring 14 rest on the shoulders 16 of the cross supporting member.

The cross supporting members 12 and 13, as shown in Figures 1 and 2, are preferably formed from sheet metal and are so shaped as to give sufficient support to the spiral spring 14 and still permit a rapid escape of air through the vent. It will be noted that slots 17 and 18 are formed in the respective supporting members in such a manner that when supporting member 12 is fitted over supporting member 13 and the respective slots 17 and 18 are engaged, there results a crossed supporting member the planes of which are approximately 90° apart, as shown in Figure 3. Similar curved depressions 19 and 21 are provided in the upper portion of each of the crossed supporting members. These depressions permit an oscillating movement of the spring under the varying air pressures impressed upon the core vent. These oscillations render the spiral spring member self-cleaning by permitting a gradual axial movement of core particles which become entrapped in the convolutions of the spring. It will be readily seen that this feature prevents clogging of the vent with the concomitant inefficiency.

The manufacturing costs of the spiral spring 14 are minimized since the crossed supporting members 12 and 13 eliminate the necessity of having a tightly wound center convolution. In many core vent constructions other than that described herein, the spring must have a tightly wound center convolution so that the opening between the inner spring convolutions will be small enough to retain the core mixture while permitting the rapid escape of air. If the opening between the center convolutions of the spring are too large there would be a resultant sand blast effect through the opening and a consequent short life of the spring due to the abrasive wear caused by the rapid flow of air and core mixture through the opening. There would also be a considerable loss of core mixture, and a consequent inefficiency of the core vent. The cost of a spring having tightly wound center convolutions is high

due to the time and skill required to wind a satisfactory spring.

The spring construction contemplated by this invention need not have such a tightly wound center convolution, because the opening between center convolutions of the spring are partially blocked by the crossed supporting member. The opening between the center convolutions of the spring is actually broken up into four segmental openings that permit the escape of the air, but will retain the core mixture. This construction has proven highly efficient and is economical to produce.

It will be noted that the bottom corners of the respective crossed supporting members are rounded to facilitate easy and accurate positioning of the crossed supporting members in the core vent shell.

An alternate spring construction is shown in Figure 6, in which the spring **22** has a vaulted structure. Such vaulting of the spiral spring permits a wider range of oscillation, and a resultant more rapid escape of the small amounts of sand that may be entrapped in the spring. Inward movement of the spring under the pressure of the escaping air is limited by the arcuate depressions of the crossed supporting members.

It will be noted that the above described core vent construction consists of elements that may be rapidly and economically produced without the necessity of any special machinery by utilizing machinery already available in any machine shop. The core vent shell may be produced from tube stock cut to the desired length. The cross supporting members are preferably stamped from sheet steel of the proper gauge. The spiral spring is easily wound from flat spring stock on any lathe.

Longer life may be imparted to the spring and crossed supporting members by coating these parts with a latex emulsion. It has been found that a rubber emulsion coating on parts subjected to the abrasive action of said particles appreciably lengthens the usable life of such coated articles without in any way impairing their efficiency.

While the spring construction described and shown in this specification is rectangular in crossed section, it will be understood that there are many possible types of spring constructions that could be satisfactorily employed. An example of such possible construction would be a resilient spiral spring having a circular crossed section.

It will be understood that this invention is not to be limited to the exact structure shown and described, but that various changes and modifications may be made without departing from the spirit and scope of the invention as defined in the appended claims.

What is claimed is:

1. A core vent adapted for use in a core box comprising an outer shell, a resilient spiral spring mounted in said shell, said spiral spring having its axis substantially parallel to the axis of the shell, and crossed supporting members within the shell and adapted to support said spiral spring.

2. A core vent adapted for use in a core box comprising a tubular outer shell, a resilient spiral spring mounted within said shell, said spiral spring having its axis substantially parallel to the axis of the shell and two crossed supporting members within the shell, said crossed supporting members having upper and lower edges, an arcuate portion cut out of said upper edges and forming a concave surface and forming shoulders near the shell periphery, said shoulders supporting the outer convolutions of the spiral spring.

3. A core vent adapted for use in a core box comprising a tubular outer shell, a resilient flat spiral spring mounted therein, said flat spiral spring having its axis substantially parallel to the axis of the shell, and two crossed supporting members within the shell and having upper and lower edges, one of said cross supporting members having a slot cut upwardly from said lower edge and intermediate the sides, the other of said supporting members having a slot cut downwardly from the upper edge and intermediate the sides, said slots being interengaged to form a cross shaped supporting unit, and having shoulders formed on said supporting members adjacent the periphery of the shell to support the outer convolutions of said spiral spring.

4. A core vent adapted for use in a core box comprising a tubular outer shell, a resilient vaulted spiral spring mounted therein, said vaulted spiral spring having its axis substantially parallel to the axis of the shell and two crossed supporting members within the shell, said crossed supporting members having similar arcuate portions cut out therefrom, said arcuate cutout portion forming shoulders, said shoulders supporting the outer convolutions of said vaulted spiral spring.

5. A core vent adapted for use in a core box comprising a tubular outer shell, a resilient spiral spring mounted therein, said spiral spring and tubular shell being substantially coaxial, and two crossed supporting members, said crossed supporting members having similar arcuate portions cut out therefrom forming a concave surface and forming shoulders near the shell periphery, said shoulders supporting the outer convolutions of the spiral spring.

6. A core vent adapted for use in a core box comprising a tubular outer shell, a resilient spiral spring mounted within one end of said shell and having its axis substantially coincident with the shell axis, and a pair of slotted supporting members interengaged at substantially right angles, the eye of the spiral resilient spring being arranged to be supported by the intersection of the supporting members whereby the filtering action of the spiral spring is aided by the partial closure by the eye by the crossed supporting members.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,480,747	Demmler	Jan. 15, 1924
2,060,350	Siler	Nov. 10, 1936
2,083,148	Coulombe	June 8, 1937
2,202,379	Hewel	May 28, 1940
2,263,974	Rienacker	Nov. 25, 1941