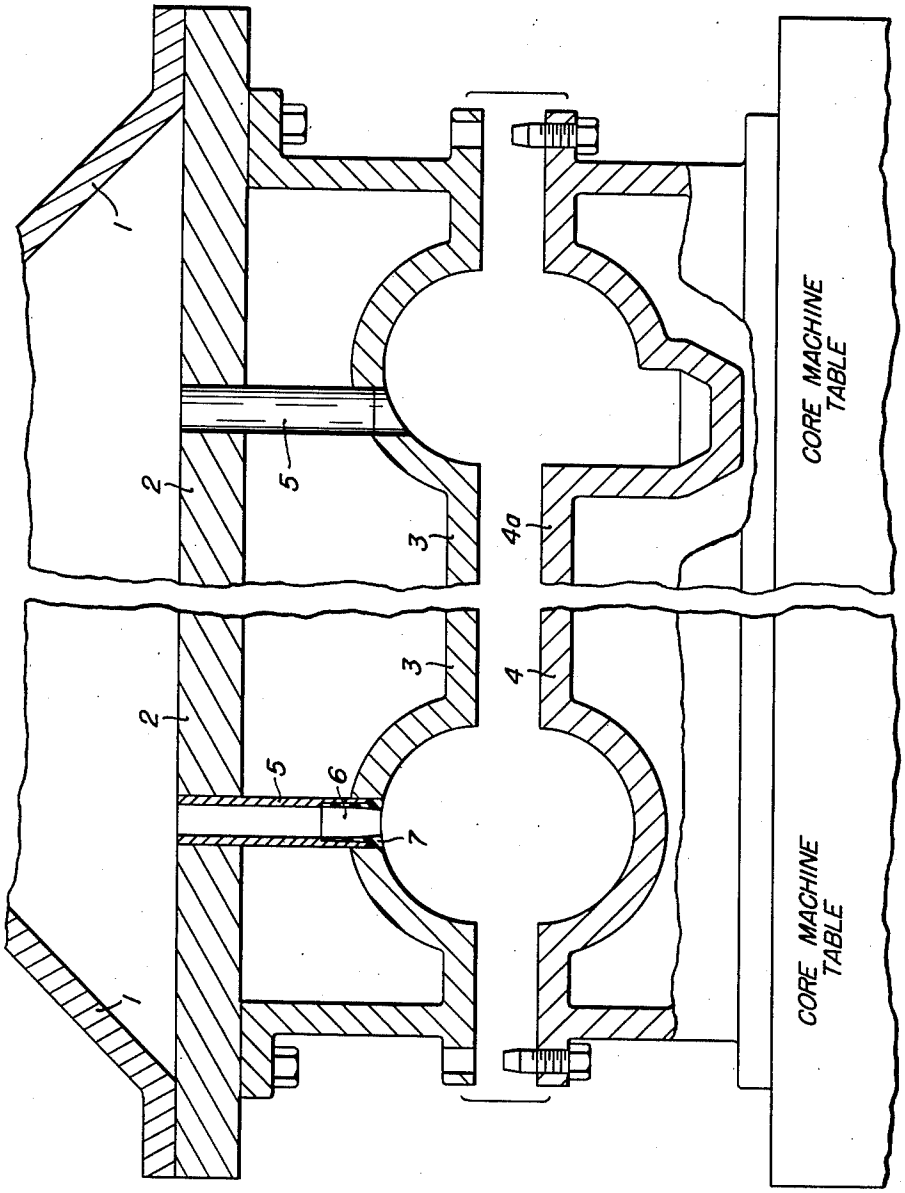
May 12, 1953 E. F. PETERSON 2,637,881

COREMAKING MACHINE

Filed Jan. 22, 1949

2 Sheets-Sheet 1

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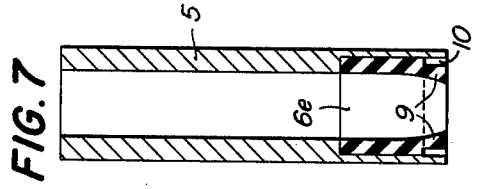


FIG. 7

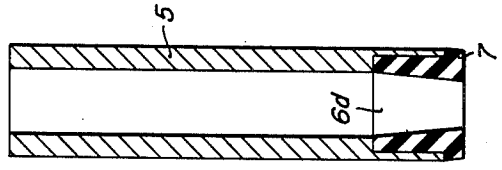


FIG. 6

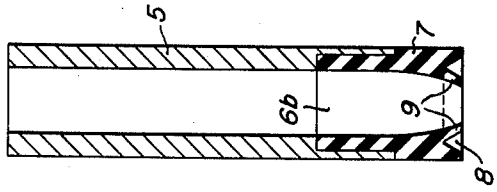


FIG. 4

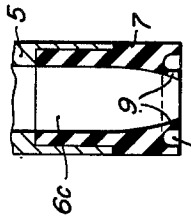


FIG. 5

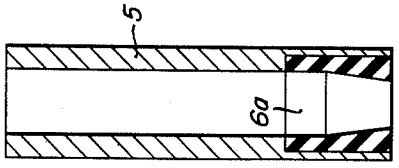


FIG. 3

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## COREMAKING MACHINE

Edwin F. Peterson, Kewanee, Ill.

Application January 22, 1949, Serial No. 72,224

11 Claims. (Cl. 22—10)

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My present invention relates to improvements in air operated machines for making sand cores and, among the objects thereof are the provision of improved means for use in conveying sand from a core machine hopper or magazine to the core box whereby the sand column in the pipe leading to the core box is held in place and prevented from drawing out or falling out of the delivery end of the tubular means by which the core sand is carried from the blow plate to the core box, thereby keeping the finished surface or cope side of the core clean and free of loose sand and such further objects, advantages and capabilities as will hereafter appear and as are inherent in the structure disclosed herein. My invention further resides in the combination, construction, and arrangement of parts illustrated in the accompanying drawings and, while I have shown therein what is now regarded as the preferred embodiment of this invention, together with certain modifications thereof, I desire the same to be understood as illustrative only and not to be interpreted in a limiting sense.

In the drawings annexed hereto and forming a part hereof.

Fig. 1 shows one application of this invention;

Fig. 2 shows the application of this idea to another shape of core box;

Fig. 3 represents a longitudinal section of a tubular sand delivering unit having its delivery end lined with rubber or a rubber-like material, for example, "neoprene";

Figs. 4, 5, 6, and 7 are longitudinal sections showing modified forms of the liner illustrated in Fig. 3.

Reference will now be made in greater detail to the annexed drawings for a more complete description of this invention. The sand magazine is indicated at 1 and, of this magazine the blow plate is indicated at 2. The cope of the core box is indicated at 3 and the drag at 4. A modified form of the drag is indicated in Fig. 2 by the numeral 4a. Leading from the core sand magazine 1, through the blow plate 2, are tubular members 5 which serve to convey sand from the magazine into the core box, as is clearly illustrated in Fig. 1. The lower ends of the tubular members 5 are hollowed out for the reception of sleeves 6 which taper from a hole the size of the tube bore to a smaller end opening, resulting in a choke effect.

In the structures of Figs. 1 and 2, the sleeve or bushing 6 has a flange 7 which protrudes beyond the end of the metal tube 5 but the ex-

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ternal surface of which is a continuation of the external surface of the tube with the internal surface a constricted continuation of the internal surface of the tube 5. In Figs. 4, 5, and 6 there is a similar structure. The bushing of Fig. 3 is indicated by the numeral 6a; of Fig. 4, by the numeral 6b; of Fig. 5, by the numeral 6c; of Fig. 6, by the numeral 6d; and of Fig. 7, by the numeral 6e. It will be noted that, in Fig. 3, the lower end of the bushing does not protrude beyond the end of the tube 5 and is thickened because of the taper of the internal bore. However, this structure is solid rubber, or rubber-like material, with no relief for extra cushioning. In Fig. 4, the bushing 6b has a groove 8 in the end thereof which, in cross-section, is V-shaped, and this allows the flange 9 to yield outwardly whereby to reduce the wear on the rubber as the sand is blown through the tube 5. In the structure of Fig. 5, the groove in the end of bushing 6c is U-shaped in cross-section, as shown at 8a, and this serves the same purpose as the groove 8 of Fig. 4. Likewise, the flange 9 has the same function as the flange 9 of Fig. 4. The bushing 6d of Fig. 6 is similar to that in Fig. 3, except that it has the protruding flange 7 extending beyond the end of the tube 5. In the structure of Fig. 7, the bushing 6e has a circumferential recess 10 which permits the flange 9 to yield, as in Fig. 4. Otherwise, this is the same as Fig. 3.

It is of course understood that the specific description of structure set forth above may be departed from without departing from the spirit of this invention as disclosed herein and as defined by the appended claims.

Having now described my invention, I claim:

1. Means for molding sand cores including, as a part thereof, a tubular member or members connecting the interior of the core machine magazine with the interior of the core mold for conveying sand from the magazine to the mold, said tubular member being lined at its delivery end with yielding and resilient material, the inner face of which forms a continuation of the inner face of the unlined portion of the body of the tube, but the inner face of the lining is constricted to form a discharging opening of less diameter than the internal diameter of the tube.

2. In a sand core making machine having a core sand box and a sand mold; a tubular metallic member connecting the interior of the sand box with the interior of the core mold, the wall of the tubular member at its delivery end being partly removed internally to form an internal

substantially cylindrical recess having a thin cylindrical wall, and a rubber bushing set into the recess and adhering to the wall thereof, said bushing having a longitudinal opening therethrough, the opening at its inner end being substantially the same diameter as the internal diameter of the metallic tubular member, and from a location approximately midway of its length being of a decreasing diameter toward the outer end.

3. Means for molding sand cores including, as a part thereof, a tubular member or members connecting the interior of the core machine magazine with the interior of the core mold for conveying sand from the magazine to the mold, said tubular member being lined at its delivery end with yielding and resilient material, the inner face of which forms a continuation of the inner face of the unlined portion of the body of the tube, but the inner face of the lining is constricted to form a discharging opening of less diameter than the internal diameter of the tube, and in which the exposed end of the yielding and resilient member is made yielding by forming it with an annular cavity surrounding the opening of the tube and spaced from the inner wall of the tubular resilient member.

4. In a sand core making machine having a core sand box and a sand mold; a tubular metallic member connecting the interior of the sand box with the interior of the core mold, the wall of the tubular member at its delivery end being partly removed internally to form an internal substantially cylindrical recess having a thin cylindrical wall, and a rubber bushing set into the recess and adhering to the wall thereof, said bushing having a longitudinal opening therethrough, the opening at its inner end being substantially the same diameter as the internal diameter of the metallic tubular member, and from a location approximately midway of its length being of a decreasing diameter toward the outer end, the rubber bushing, at its outer end, having a recess rendering the wall of the bushing more flexible.

5. A blow pipe in combination with a core sand magazine of a core making machine and with a core box with openings in said magazine and said core box respectively to receive spaced portions of said blow pipe therein for connecting the cavity of said core machine magazine and the interior of said core box, said blow pipe comprising a tubular metallic member having its core box end lined with a rubber-like material adherent thereto in which the delivery orifice is tapered slightly to form a constricted opening, the character of said rubber-like material being such as to enlarge the delivery orifice therethrough during core sand discharge from said magazine into said core box and to retract into its original constricted shape after core sand delivery to pinch off core sand remaining within the core box end of said blow tube from the core sand filling the interior of said core box.

6. In a sand core making machine, a core sand delivery magazine, a core box, and at least one core sand conducting blow tube extending between said magazine and said core box, said magazine and core box having wall openings therethrough to receive said blow tube at spaced points therein to connect the core sand supply cavity of said magazine with the core forming interior of said core box, said core sand conducting blow tube being constructed and arranged to have one end thereof terminate adjacent to the inner core forming surface of the core box wall, and said core box end of said blow tube comprising a metallic sleeve portion tightly fitting into the opening in said core box wall, and a resilient hollow rubber insert secured into said metallic sleeve portion to form a continuation of the internal wall of said blow tube, said insert terminating adjacent to the core box end of said tube, and said hollow rubber insert having its core sand discharge end internally constricted and subject to radial expansion under the action of core sand flow through said tube and into the core box from the core sand magazine.



7. In a sand core making machine, a core sand delivery magazine, a core box, and at least one core sand conducting blow tube extending between said magazine and said core box, said magazine and core box having wall openings therethrough to receive said blow tube at spaced points therein to connect the core sand supply cavity of said magazine with the core forming interior of said core box, said core sand conducting blow tube being constructed and arranged to have one end thereof terminate adjacent to the inner core forming surface of the core box wall, and said core box end of said blow tube comprising a metallic sleeve portion tightly fitting into the opening in said core box wall, and a resilient hollow rubber insert secured into said metallic sleeve portion to form a continuation of the internal wall of said blow tube, said insert terminating adjacent to the core box end of said tube, and said hollow rubber insert having its core sand discharge end internally tapered to a reduced final opening terminating in coincident relation with respect to the core forming surface of the core box wall that receives said blow tube, and said rubber insert being of such a character as to expand radially under the pressure of the core sand passage through said blow tube into said core box and being retractible at its tapered end into its original shape to pinch off and retain blow tube sand apart from the formed core surface disposed adjacent the core box wall at said blow tube location.

8. In a sand core making machine, a core sand delivery magazine, a core box, a tubular member or members extending between said magazine and said core box, said magazine and said core box having wall openings therethrough to receive each tubular member at spaced points therein to connect the core sand supply cavity of said magazine with the core forming interior of said core box, and each of said tubular members being lined at its delivery end with yielding and resilient material, the inner face of said material forming a continuation of the inner face of the unlined portion of the body of said tubular member, but wherein the inner face of the lining material is constricted to form a discharging opening of less diameter than the internal diameter of the body of said tubular member.

9. In a sand core making machine, a core sand delivery box, a sand mold, a tubular metallic member extending between said box and said mold, said box and mold having wall openings therethrough to receive said metallic member at spaced points therein to connect the core sand supply cavity of said box with the core forming interior of said sand mold, and said tubular metallic member having a portion of the wall thereof partly internally removed at the delivery end of said member to form an internal substantially cylindrical recess having a thin cylindrical wall, and a rubber bushing set into the recess and adhering to the thin wall portion thereof, said bushing having a longitudinal opening there-

through, the opening at its inner end being substantially the same diameter as the internal diameter of the metallic tubular member, with said bushing opening decreasing in internal diameter toward its outer end and beginning from a location intermediate the length thereof, said rubber bushing material being of such a character as to expand radially outwardly at its outer end during core sand passage through said metallic tubular member and to automatically retract into its original restricted shape and form to pinch off and to hold the core sand confined within said tubular member separate and apart from the formed sand core within said sand mold.

10. In a sand core making machine, a core sand supply magazine, a core sand mold, a tubular member or members extending between said magazine and mold, said magazine and mold having openings therein to receive the ends of said members therethrough to connect the core sand supply cavity of said magazine with the core forming interior of said mold, and each of said tubular members being constructed and arranged to have its delivery end lined with an element constructed of yielding and resilient material with the inner face portion of said element forming a continuation of the inner unlined face portion of the body of said tubular member, but wherein the inner face of the lining element is constricted to provide a discharging opening of less diameter than the internal diameter of said tubular member, and wherein the exposed terminal end of said yielding and resilient element is made yieldably flexible by forming said element with an annular cavity surrounding the discharge opening of said element and spaced radially outwardly from the inner wall of said element.

11. In a sand core making machine, a core sand delivery box, a sand mold, a tubular metallic



member extending between said box and said mold, said box and mold having wall openings therethrough to receive said metallic member at spaced points therein to connect the core sand supply cavity of said box with the core forming interior of said sand mold, and said tubular metallic member having a portion of the wall thereof partly internally removed at the delivery end of said member to form an internal substantially cylindrical recess having a thin cylindrical wall, and a rubber bushing set into the recess and adhering to the thin wall portion thereof, said bushing having a longitudinal opening therethrough, the opening at its inner end being substantially the same diameter as the internal diameter of the metallic tubular member, with said bushing opening decreasing in internal diameter toward its outer end and beginning from a location intermediate the length thereof, said rubber bushing, at its outer end, having a recess formed therein rendering the wall portion of said bushing more flexible.

EDWIN F. PETERSON.

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