Dec. 27, 1966 A. D. L. MAIGRET 3,293,702

MACHINE FOR THE PREPARATION OF FOUNDRY MOLDS FROM MATCH-PLATES

Filed April 13, 1964

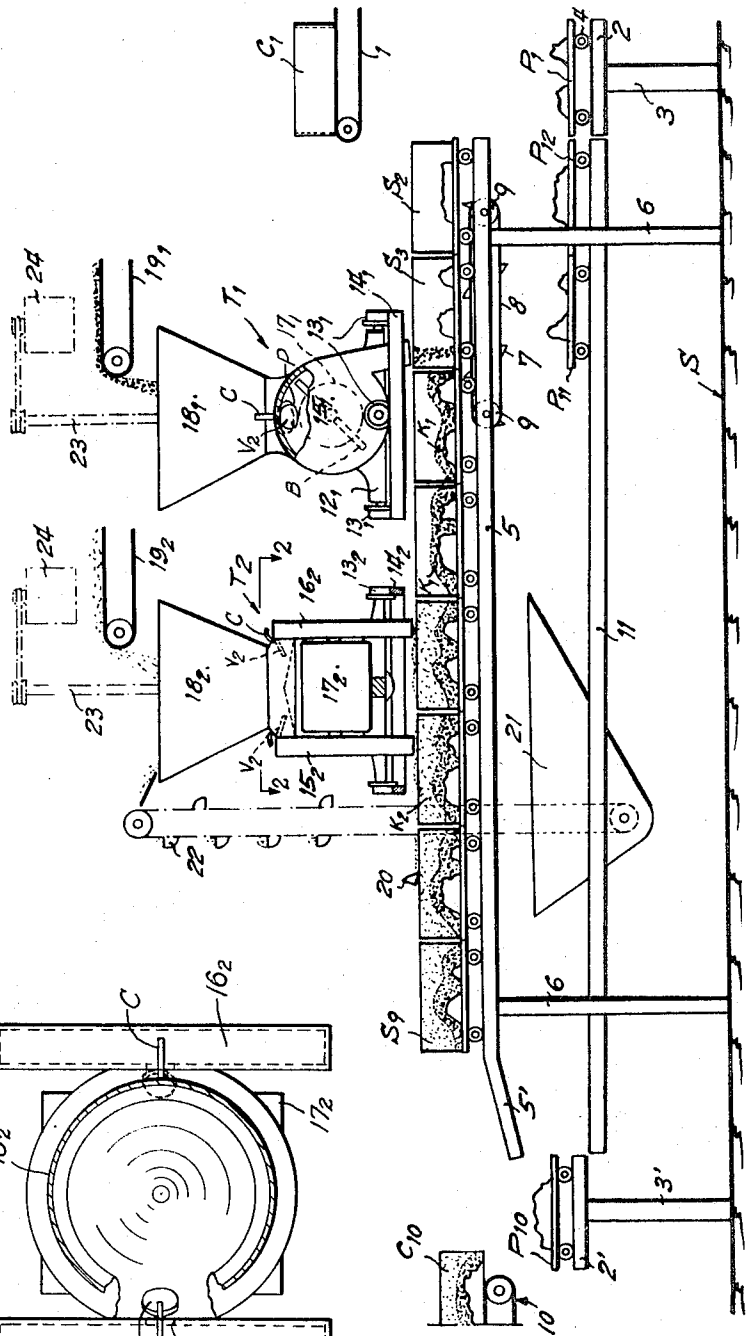


FIG. 1

FIG. 2

INVENTOR
ANDRÉ DENIS LUCIEN MAIGRET

BY
Woodhams, Blanchard and Flynn
ATTORNEYS

United States Patent Office 3,293,702
Patented Dec. 27, 1966

3,293,702

MACHINE FOR THE PREPARATION OF FOUNDRY MOLDS FROM MATCH-PLATES

André Denis Lucien Maigret, 4 Ave. de la Grange, Saint-Maur-des-Fosses, France

Filed Apr. 13, 1964, Ser. No. 359,248
Claims priority, application France, June 12, 1963, 937,839
2 Claims. (Cl. 22—20)

The present invention relates to a machine for the preparation of foundry molds from match-plates.

It is known that this preparation has hitherto required a relatively large labor force as well as costly equipment consisting of dissimilar types of apparatus. The large number of match-plates must in fact be covered by a foundry flask or half-flask and the combined assembly must then be placed beneath one or a number of equipment units which effect the placing and ramming of sand of one or a number of different grades, whereupon the match-plates must be separated from the half-flasks which are directed together with the sand towards the foundry proper, whilst the match-plates are returned for a further series of identical operations.

The invention has for its object a machine which permits the possibility of carrying out this series of operations with the minimum labor and under favorable economic conditions.

To this end, a machine according to the invention is essentially characterized in that it consists of a bench and means for placing on said bench and for causing to progress thereon in continuous succession trucks which carry the match-plates surmounted by the half-flasks, at least one impeller which is placed above the bench and designed to project sand into the trucks which travel along said bench, as well as means at the end of said bench for separating the half-flasks from the trucks.

As a preferable feature, the trucks are pushed by each other along rails from a loading station so as to reach the separating means which consist of a vibratory pattern-remover of known type whilst an inclined plane ensures the return of the trucks from the separating means to the truck-positioning means.

It can be understood that a machine as thus designed permits the preparation of foundry-flasks or half-flasks at a constant and uniform rate and that such a machine can be serviced by a single operator at the loading station, that is to say, if it is assumed that this station continues to be manually operated, although in point of fact this is not even an essential condition.

In a preferred form of embodiment of the invention, provision is made above the bench for one or a number of double impellers or impellers comprising two successive elements which are caused to rotate about a vertical axis by application of motive power at the axes of rotation of said elements or, preferably, by a differential supply of sand to each element.

There is thus obtained, apart from the possibility of utilizing a number of molding sands having different characteristics, a very good distribution of the sands and excellent compaction in all parts of the mold. In fact, the projection of sand is inclined at an angle to the vertical so as to pack the sand against the vertical walls of the half-flasks, the jets of sand from both impellers being inclined and directed parallel to each other. The two sides of the pattern are thus more effectively compacted than in the case of a single vertical projection of sand.

Finally, provision can be made for a scraper located downstream of the impellers and for a sand recovery hopper located beneath the bench. The impeller-ducts can also serve as scrapers.

A clear understanding of the invention will in any case be gained from the following description, reference being made to the accompanying drawings in which FIGURE 1 is a diagrammatic side view of a machine in accordance with the invention together with a succession of half-flasks as represented in cross-section. FIGURE 2 is a fragmentary horizontal cross sectional view taken along the plane of the line 2—2 in FIGURE 1 and having parts broken away.

There can be seen in the drawings the left-hand extremity of a band conveyor 1 which is intended to bring a succession of foundry flasks or half-flasks, one of which can be seen at C_1, in proximity to a plate 2 which is adapted to move vertically by virtue of a jack which is anchored in the floor S and the shaft of which can be seen at 3.

As will be explained below, the plate 2 carries a match-plate P_1 on which there has been shown, as on the following match-plates P_2, P_3 . . . P_n, a raised portion which represents the pattern. It will be noted that, by virtue of wheels 4, the match-plate constitutes a truck or trolley, the design purpose of which will appear hereinafter.

The assembly as thus described constitutes the loading station. When the plate 2 is lifted by the shaft 3, a workman can in fact place the flask C_1 on the match-plate P_1 so as to form an assembly as shown in a succession of similar assemblies S_2, S_3 . . . S_9 which have already been deposited by the workman on the rails 5 which cooperates with the wheels 4 of the trucks. The rails 5 which are carried on the upright members 6 form the central bench of the machine. Said rails are horizontal or very slightly inclined downwards towards the left-hand side of the figure, and terminate in a downwardly sloping section 5'.

The series of trucks S_2, S_3 . . . S_9 is driven towards the left-hand side by means of the studs or spurs 7 of a chain conveyor 8 which are placed beneath the first trucks and which come into abutment, for example, with the axle of the wheels 4. The means for driving the stud-chain or the guide pulleys 9 thereof have not been illustrated in the drawings and can be of any suitable type.

When a truck S_9 arrives on the downwardly sloping section 5', it runs down to the separating station which is represented diagrammatically by a plate 2' of similar design to the plate 2 and provided with its jack-shaft 3'. A workman, or advantageously an automatic vibratory pattern-remover separates the half-flask from the match-plate so as to place said half-flask, namely C_{10}, on a conveyor 10 which will carry this latter to the foundry proper whilst the match-plate P_{10} is placed on the plate 2'. The plate 2' can then be lowered and present the match-plate P_{10} opposite the track which slopes downwardly towards the right and which is also carried on the upright members 6, whereupon the match-plates move of their own accord so as to take up the positions P_{11}, P_{12} opposite the plate 2. When said plate 2 subsequently moves down after withdrawal of the match-plate P_1, the match-plate P_{12} will accordingly be able to take up the postiion designated by the reference P_1 and thus be ready for a following cycle which is identical to that which has just been described. The system is in any case not necessarily linear. The bench can, for example, be circular, the only condition attached to such an arrangement being that it should permit of continuous operation.

It is during their progression along the bench 5 that the assemblies S_2 . . . S_3 are filled with sand of different grades as supplied by means of the impellers T_1 and T_2.

The first impeller T_1 will therefore be described below,

it being understood that the second impeller is identical.

The impeller T_1 consists of a frame 12_1 provided with four runner-wheels 13_1 which are mounted on two perpendicular axles so as to be capable of cooperating with a circular rail 14_1 which is supported by means not shown. The frame 12_1 carries two identical impeller elements 15_1 and 16_1 of which only the element 15_1 is shown in the figure (the elements 15_2 and 16_2 of the impeller T_2 can be seen more clearly). The drive to the impellers is by motors 17_1 (or 17_2). Sand is supplied to the impellers through ports or openings P from hoppers 18_1 (or 18_2) which are filled in their turn by conveyors 19_1 (or 19_2); the impeller elements, hoppers, feed-chutes and motors will not be described in greater detail since they are of conventional type. It is known that each element is preferably provided with one or two blades B which project the sand into the successive assemblies at each revolution of the motor. It will be noted only that the blades of the elements of one impeller can be angularly displaced. In addition, and this feature is of primary importance, it is possible to regulate the supply to the two elements by means of shutters V_2 having handles or controls C by which the position of the shutters may be adjusted in such a manner that one element has a slightly higher output than the other, with the result that the torques exerted by the two elements with respect to the general vertical axis of the impeller are different. The perceptible result thereby achieved is a rotation of the assembly on circular tracks 14_1 (or 14_2), with a resulting improvement in the distribution and packing of the sand.

Finally, the impeller T_1 deposits a layer K_1 of sand which is completed by a layer K_2 supplied by the impeller T_2.

Finally, the installation comprises a scraper **20**, a recovery hopper **21** mainly for the sand which is withheld by the scraper, and an elevator **22** which brings back said sand into the hopper 18_2 of the impeller T_2.

The half-flask which is thus filled with sand and in a clean state arrives at S_9 at the pattern-removing station so as to be subsequently conveyed to the foundry proper.

It will be noted that the trucks **12**, the wheels **13** and the rails **14** can be replaced by a suspension shaft such as the shaft **23** which is driven by a motor **24**.

It will in any case be readily apparent that the form of embodiment of the invention which has just been described has been given solely by way of non-limitative example and that a large number of modifications can be made therein without consequently departing from the scope of the invention as defined in the appended claims.

What I claim is:

1. Apparatus for placing mold sand in open-topped foundry flasks having match-plates therein and supporting means for the match-plates and flasks, the combination comprising:

a support for said supporting means located at a loading station;

sand discharging means including two upright impellers, each impeller having an inlet opening for receiving sand and a generally downwardly directed discharge spout;

drive means connected to rotate said impellers;

means supporting said sand discharging means for rotation about an upright axis with said discharge spouts being located over said support at said loading station, the downwardly directed discharge spouts of the impellers being positioned eccentrically to the upright axis of rotation of said sand discharging means and being arranged at angles to the vertical and on opposite sides of the upright axis of rotation of said sand discharging means;

means arranged to rotate said sand discharging means about its upright axis of rotation, said last-named means comprising means for delivering sand at different rates to said inlet openings to said impellers whereby the reaction forces of sand discharged from said impellers are different and create a rotating force on said sand discharging means;

said means for delivering sand to said impellers comprising a common sand receiving chamber with openings to the impellers opening therefrom and valve means positioned to selectively vary the relative effective size of said openings to said impellers.

2. Apparatus for placing mold sand in open-topped foundry flasks having match-plates therein and supporting means for the match-plates and flasks, the combination comprising:

a support for said supporting means located at a loading station;

sand discharging means including two upright impellers, each impeller having an inlet opening for receiving sand and a generally downwardly directed discharge spout;

drive means connected to rotate said impellers;

means supporting said sand discharging means for rotation about an upright axis with said discharge spouts being located over said support at said loading station, the downwardly directed discharge spouts of the impellers being positioned eccentrically to the upright axis of rotation of said sand discharging means and being arranged at angles to the vertical and on opposite sides of the upright axis of rotation of said sand discharging means, said discharge spouts being arranged at equal radii on opposite sides of the upright axis of rotation of said sand discharging means and being inclined at equal angles in the same direction; and

means arranged to rotate said sand discharging means about its upright axis of rotation, said last-named means comprising means for delivering sand at different rates to said inlet openings to said impellers whereby the reaction forces of sand discharged from said impellers are different and create a rotating force on said sand discharging means.

References Cited by the Examiner

UNITED STATES PATENTS

910,718	1/1909	Parks	22—36
1,779,230	10/1930	Furman	22—36
2,093,028	9/1937	Bolk	22—36
2,291,710	8/1942	Hagemeyer	22—36
2,817,127	12/1957	Beech	22—56
2,882,937	4/1959	Kay	222—55 X
2,942,761	6/1960	Jungmayr	222—168 X

J. SPENCER OVERHOLSER, *Primary Examiner.*

MARCUS U. LYONS, *Examiner.*

E. MAR, *Assistant Examiner.*