Sept. 10, 1963 G. JOLY 3,103,044

MOULD STRIPPING MACHINE

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FIG_1

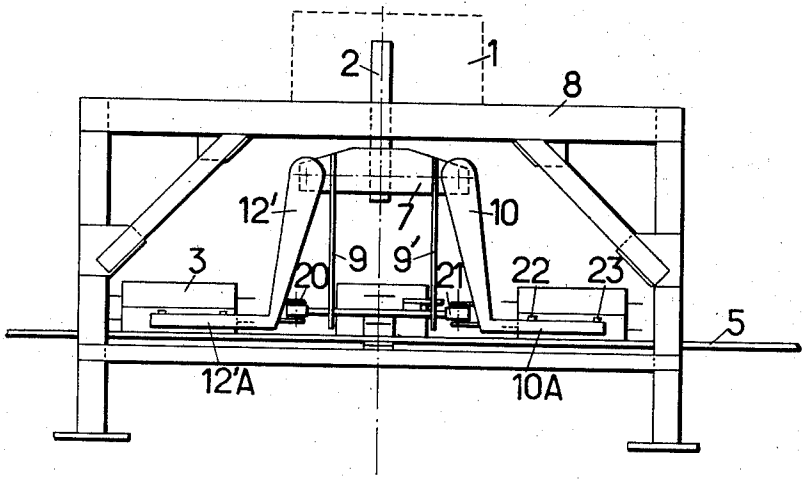
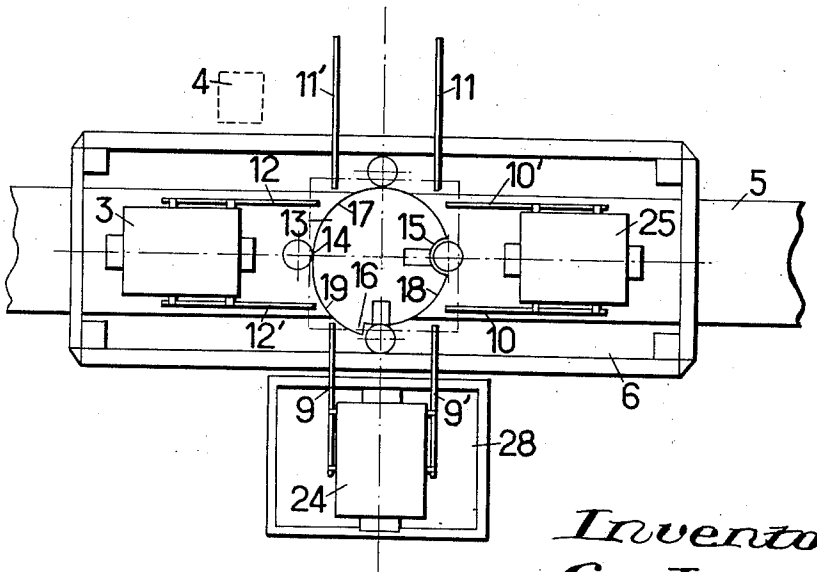


FIG_2



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FIG. 3

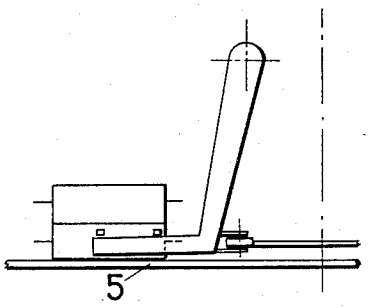


FIG. 4

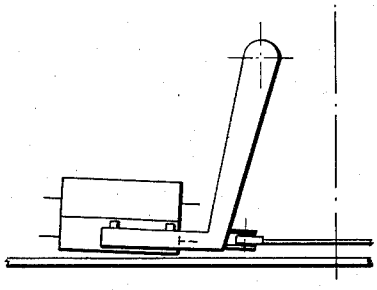


FIG. 5

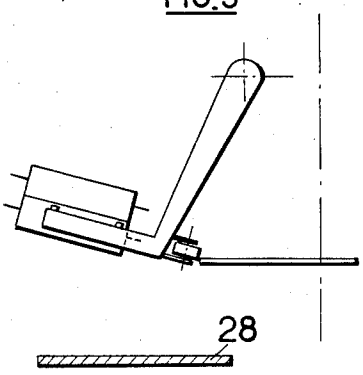


FIG. 6

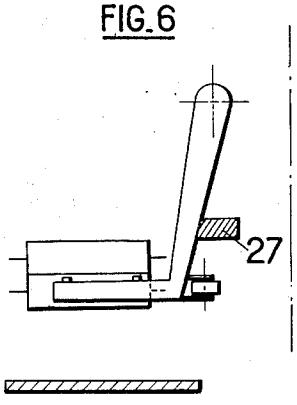
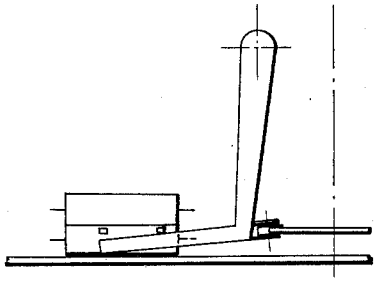


FIG. 7



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MOULD STRIPPING MACHINE

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3 Claims. (Cl. 22—34)

The invention relates to foundry stripping i.e. to the separation of the moulded pieces from the sand and from the flask, and mainly relates to the stripping of the moulds poured on the conveyor.

Stripping machines are already known which comprise a conveyor and a lifting and transporting device suitably articulated and controlled so as to lift the flask from the conveyor and impart to it a movement of vertical component, and so as to give the flask a curved trajectory, preferably approximately circular, between the point at which lifting occurs as the conveyor approaches the device and the point where the flask is set down as the conveyor leaves the device, this trajectory passing through the stripping station.

The object of the invention is an installation of this type wherein the stripping station can be kept outside the closed trajectory of the conveyor and at a considerable distance from the conveyor.

In order to achieve this object the machine according to the invention is characterised in that the lifting and transporting device is a device turning, in a manner known per se, about a vertical axis of rotation, and in that the axis or rotation is arranged in such a manner that the stripping station can be disposed outside the closed trajectory of the conveyor.

Although the said lifting and transporting device can be used in combination with any stripping device compatible with the fact that the flask, during stripping, stays held and supported by the lifting and transporting device (stripping by piston, or by shaking), the installation according to the invention preferably comprises a new device permitting stripping of the flask by shock, the flask remaining held and supported by the lifting and stripping device.

Once it is possible to provide a rapid performance of the stripping apparatus allowing the delivery from the conveyor to be increased, according to a development of the inventive idea a movement can be imparted to the lifting and transporting device whose upwards and downwards movement will be equal to the delivery from the conveyor, and it will be possible to control this movement, as a function of this delivery, by the flasks themselves.

The invention is hereinafter further described, reference being made to the accompanying drawings, wherein:

FIGURE 1 is a diagrammatic elevational view of an apparatus according to the invention.

FIGURE 2 is a diagrammatic plan view of the machine shown in FIGURE 1.

FIGURES 3 to 7 are diagrams explaining the functioning of part of the apparatus.

Referring now to FIGURES 1 and 2 of the drawings, **1** indicates the driving assembly of the installation it being possible for the drive motor to be electric, hydraulic and pneumatic; said drive motor is subject only to the condition that it can impart a rotary movement to the shaft **2** of the installation. Conventional means are provided for, on the one hand, stopping the motor after it has rotated for one quarter of a revolution and, on the other hand, for starting up the motor when a flask **3** reaches a determined position; the starting up of the motor can be triggered-off either by the member of the conveyor carrying the flask or by the flask itself. In the drawings **4** indicates, by way of example, the position of a photo-electric cell which controls an electric contact series-

connected in the feed circuit (not shown) of the motor. **5** designates the conveyor, and **6** the platform of the station. The shaft **2**—whose vertical axis meets the horizontal displacement axis of the conveyor—carries a support frame **7** and the whole assembly is shown as supported by a main frame **8**; conventional supplementary means (not shown) can be provided for holding the shaft **2** and the support frame **7**.

According to the invention the support frame **7** carries 4 groups of articulated arms **9**, **9'**, **10**, **10'**, **11**, **11'**, **12**, **12'**. These groups are distributed about the axis of the shaft **2** at an angle of 90° to one another; the arms can each freely pivot about a horizontal spindle mounted on the support frame **7**.

Each of these arms are similarly cranked or angled, the angled part being indicated by the reference numeral of the relative arm followed by the letter A. It can be seen that the angle of bending is selected so that—in the position shown in FIGURE 1 the angled parts (in this case **12'A** and **10A**) are horizontal.

Arranged at the axis of the installation is a horizontal plane cam **13** of roughly circular shape and having, above the displacement axis of the conveyor, a depression **14** facing in the direction of the conveyor as it approaches the apparatus and a deeper depression **15** facing in the direction of the conveyor as it leaves the apparatus or device; this cam also has a nose **16** located a short distance in front of—in the direction of movement—the cam diameter perpendicular to the diameter **14—15**. The portion **17** of the cam between points **14** and **15** can have the same radius; the portion **19** however has a radius which increases from point **14** to point **16**.

On each of the arms are fixed supporting brackets **20** carrying a roller **21** of such height that it can bear on the cam, whatever the inclination of the arm may be.

Each flask, such as **3**, is provided laterally with two pairs of lugs such as are shown at **22**, **23** arranged at such height that they are slightly above the angled part of the arm, in the position of FIGURE 1.

This diagrammatic arrangement does not preclude any special flask construction adapted to a special formation of the arm.

The manner of operation is as follows:

The flasks are transported onto the conveyor from the pouring station, and reach the position of the flask **3**; in this position the flask starts up the motor. The arms carried by the frame start their rotational movement, and at the same time bear on the cam by way of their rollers.

The roller **20** of the flask **3**—which at the commencement of the movement was located at the depression **14** (FIGURES 2 and 3)—at once climbs on to the portion **19** of the cam; arms **12**, **12'** are raised and consequently flask **3** is also raised and lifted up from the conveyor (FIGURE 4). The movement is continued until the roller reaches the nose **16** of the cam. The roller is then lowered by a certain distance but, in accordance with an auxiliary inventive feature, the roller—instead of falling directly on to the portion **18** of the cam—falls against an anvil **27** (FIGURES 5 and 6) which receives the shock. The shock is all the stronger for the reason that, in the course of rolling along the portion **19** of the cam, the roller has caused substantial raising of the arm (FIGURE 5). Experience has shown that in this way a sufficiently violent shock can be obtained to ensure the stripping operation each time. The moulded piece and the sand fall on the grating **28** immediately after the shock and the motor, having effected the quarter revolution, stops; the flask is then in the position **24**.

When the next flask is brought by the conveyor into position 3, it causes the photo-electric cell to act and the motor then starts up again; the flask located at **24** then

shifts, and its roller follows the portion 18 of the cam until it falls into the depression 15 which causes the angled arms to be lowered and the flask to be set down on the conveyor at 25, the pivotal system at the same time being fixed in position. The motor stops after this latest revolution until a new flask occupies position 3 and, in so doing, starts up the movement again.

As position 25 is diametrically opposite to position 3, the flask takes up exactly the same position on the conveyor, always at an equal distance from the flask previously set down; this arrangement ensures every ease in the mechanical recovery of the empty flask.

The stripping operation can evidently be effected in all cases by a vertical electric jack working hydraulically or pneumatically and controlled by the rotation of the apparatus, or by any other device.

If it is necessary—for the purpose of automatically feeding the moulding machines with emptied flasks—not to set the latter down on the conveyor, use can of course be made of position 11, 11′ for setting down the emptied flask at a suitable height on to a suitable mechanism. For this purpose it will be sufficient to modify the cam.

What I claim is:

1. An apparatus including a continuous conveyor for handling mold flasks being transported, said continuous conveyor traveling along a rectilinear path, including a rotatable flask handling structure supported in overlying relation to said conveyor intermediate the ends thereof and having an axis of rotation vertically perpendicular to the longitudinal center line of the conveyor, said flask handling structure operable to move mold flasks sequentially from a first position on said conveyor to a stripping station, said structure further operable to move the mold flasks from the stripping station to a second position on said conveyor diametrically opposite the first position whereby the mold flasks are moved along the same rectilinear path, at least one flask receiving unit mounted on said structure for raising and lowering the flasks carried on said conveyor, said flask receiving unit comprising two parallel bell crank levers, each lever having one extremity articulated on said structure, each lever having a cranked portion opposite said extremity, and a cam fixed to said flask handling structure adjacent the cranked portions of said bell crank levers and engageable thereby to guide said cranked portions during the rotating movement of said structure.

2. An apparatus as defined in claim 1 wherein the profile of said cam includes a nose portion to allow disengagement of said bell crank levers therefrom when the same have moved flasks from the conveyor to the stripping station, an anvil adjacent said cam, said bell crank levers swingable upon disengagement thereof from said cam and engageable against said anvil to impart a shock to mold flasks carried by the bell crank levers to cause stripping of the molds.

3. An apparatus for handling mold flasks being carried by a conveyor traveling in a rectilinear path comprising a rotatable flask handling structure having an axis of rotation perpendicular to and spaced above said conveyor, at least one flask receiving unit comprising two parallel bell crank levers pivotally mounted on said structure, a cam fixed to said flask handling structure adjacent said bell crank levers and engageable thereby, portions of said bell crank levers engageable with a flask carried on said conveyor and operable upon rotation of said flask handling structure to move a mold flask sequentially from a first position on said conveyor to a stripping station, said stripping station including an anvil, means on said cam to allow disengagement of said bell crank levers therefrom to cause the same to fall freely on said anvil imparting a shock to a mold flask carried by said flask receiving unit, said flask handling structure further operable to move the flask from said stripping station to a second position on said conevyor diametrically opposite said first position.

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