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M. BURGER

POTTERY FORMING MACHINE

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Fig. 2.

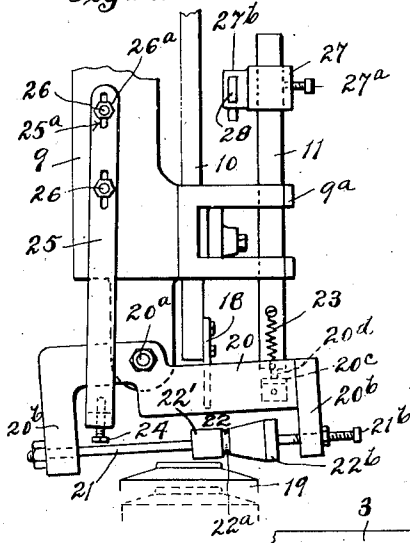


Fig. 1.




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# UNITED STATES PATENT OFFICE.

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## POTTERY-FORMING MACHINE.

Application filed February 28, 1923. Serial No. 621,855.

*To all whom it may concern:*

Be it known that I, MARTIN BURGER, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Pottery-Forming Machines, of which the following is a specification.

My invention relates to improvements in pottery forming machines, and more particularly to that class or type particularly designed and adapted for forming articles, such for instance, as cups, saucers, plates, etc., from plastic clay preparatory to the final drying and burning thereof.

More specifically speaking, the present improvements relate to improved clay distributing and former tools, together with improved means for mounting and actuating the same in connection with suitable intermittently actuated mold carrier and mold rotating mechanism, the present embodiment of the invention being particularly designed and adapted for use in connection with pottery forming machines of the class or type disclosed and claimed in my pending application filed February 20th, 1922, Serial No. 537,944.

The primary object of the invention is to provide improved mechanism of the class indicated which will be cheap of manufacture, simple in construction, and efficient in operation.

A still further object is the provision of a mechanism of this class adapted to carry and actuate clay distributing and former tools of any desired class or type, the improved mechanism being designed to be quickly attached to or detached from the main support and plunger mechanism of the machine above the path of travel of the molds as carried by the carrier or table and to cooperate with the molds as successively elevated and rotated in the article molding or forming operations.

With the above mentioned and other ends in view, the invention consists in the novel construction, arrangement and combination of parts, hereinafter described, illustrated in one of its embodiments in the accompanying drawings, and particularly pointed out in the appended claims.

Referring to the drawings, forming a part of this specification, Figure 1 is a fragmentary side elevation of a pottery forming machine of the general type indicated in my application above referred to and equipped with clay distributing and former mechanism constructed in accordance with this invention.

Fig. 2, a fragmentary front elevation of the guide head and the tool and tool actuating mechanism.

Similar numerals of reference designate like parts throughout all the figures of the drawings.

The frame of the machine may be of any suitable and convenient form. In the present instance, it comprises a suitable supporting base or bed 1, provided with side and cross frame members $1^a$ and $1^b$, surmounted by a supporting top $1^c$. The frame members $1^a$ and $1^b$, inclusive, are adapted to carry and support the various working parts and bearings therefor, and the supporting base is provided with a standard or pedestal 2, surmounted by a supporting bracket $2^a$, having upwardly extending arms $2^b$, terminating in bearing heads $2^c$.

As a means of properly supporting and feeding the molds whereby the latter may be brought successively into proper position to be operated upon by the clay distributing and former tools and the supporting and actuating mechanism therefor,—and to which this invention particularly relates,—and in conjunction with the mold elevating and rotating mechanism, a mold carrier 3, is provided, said mold carrier being preferably in the form of a rotatably mounted table provided about its periphery with a plurality of equally spaced mold receiving openings adapted to receive the subjacent mold engaging, elevating and rotating mechanism as referred to in my previous application above mentioned.

As a means of supporting the carrier or table upon the frame, the supporting top $1^c$ may be provided with a cylindrical support or column $1^d$, provided at its top with suitable bearings, and the carrier may be provided with a driving or actuating shaft extending downwardly and provided at its lower end with suitable mechanism for inter-

mittently actuating the same and bringing the molds to predetermined positions for cooperating with the clay distributing and former tools and the mold rotating mechanism.

The table or carrier 3 and the vertically movable rotatably mounted shaft 4 and the mold engaging and actuating head $4^a$, are adapted to receive their motion through suitable intermediate mechanism communicating with a main drive shaft 5, and such intermediate mechanism forming no specific part of the present invention need not be shown nor described herein. The main driving shaft 5 is mounted in suitable bearings and is adapted to receive its motion through a suitable worm 6, and worm gear 7.

As a means of suitably supporting and guiding the clay distributing and former tools hereinafter referred to, the top of the pedestal 2 is preferably provided with a suitable support 8, and guide head 9, the latter, in the present instance, being provided with a guide bracket $9^a$, for the former tool carrying plunger 10, and the clay distributing tool actuating plunger 11. The main plunger 10 is provided at its top with links 12 connected to a lever 13, the latter being pivotally mounted between the bearing heads $2^c$ of the arms $2^b$ of the bracket. As a means of actuating the main or primary plunger 10, the short end of the lever 13 is provided with links 14, connected to a vertically movable link or bar 15, the latter being mounted in suitable guide brackets 16. The link or bar 15 is adapted to be positively operated by means of a suitable cam 17, on the main driving shaft 5. The former tool 18 is mounted upon the lower end of the main plunger 10 and as shown is mounted above the path of travel of the molds 19 in the table or carrier and is adapted to cooperate with the charge of material in the molds as the latter are successively elevated and rotated in the dotted line position shown in Fig. 1 of the drawings.

As a means of carrying the clay distributing tool in proper cooperative relation to the former tool 18 and to the subjacent charge of plastic material in the molds, the guide bracket $9^a$ is provided at its lower end with a rocker 20, pivotally secured on a bearing member or bolt $20^a$. The rocker 20 is provided at its ends with depending bearing brackets or heads $20^b$, adapted to removably receive and contain a suitable bearing member or rod 21. The latter may be provided with a rotatably mounted clay distributor roller designated generally by the numeral 22, and if desired, a suitable cooperating adjusting bolt or bearing member $21^b$, may be provided. The clay distributor 22, may be mounted on suitable antifriction bearings so as to rotate freely and may be of any suitable and convenient form adapted to impart the desired contour to the articles to be formed. In the present instance, the distributor roller 22 is provided with a cylindrical section 22′ adapted to form the central relatively flat bottom portion of the dish or plate and with an annular groove or recess $22^a$ to form the usual annular bearing ring portion, together with a conical shaped section $22^b$, to form the outwardly tapered rim portion of the article being formed.

As a means of depressing such clay distributor roller 22 upon the article when the mold is raised to the full line position shown in Fig. 2, one end of the rocker may be provided with a bracket $20^c$, carrying an adjusting bolt $20^d$, adapted to be engaged by one end of the second plunger 11 when the latter is depressed by the link mechanism hereinafter referred to. As a means of elevating the rocker 20 and the distributor tool 22 carried thereby when the plunger is returned to its initial or elevated position, the latter may be provided with a spring 23, connected to the end of the rocker, as shown most clearly in Fig. 2 of the drawings. When the rocker is returned to its initial or elevated position the relative up movement or inclination of such rocker may be controlled through a stop element 24, the latter being in the specific form of an adjusting bolt or screw mounted in the lower end of a bracket 25, the latter, in the present instance, being adjustably mounted on the bearing or guide head 9 by means of adjusting bolts 26 and nuts $26^a$, said bolts passing through adjusting slots $25^a$ in the bracket 25.

By adjusting the adjusting bolt $20^d$ in the bracket $20^c$ it will also be obvious that the downward movement of the rocker carrying the distributor roller 22 may be regulated as well as regulating the inclination of such tool 22. As a means of moving the rocker 20 and the tool 22 in proper cooperative relation to the former tool 18 and in advance of the latter, as well as in synchronous relation thereto and to the subjacent rotatably mounted molds and the plastic material carried thereby, the second plunger 11 is provided with an adjustable head 27 and an adjusting or set screw $27^a$, said head 27 being provided at one side with a bracket $27^b$, adapted to removably receive and contain the end of a lever 28, the latter being pivotally mounted on a bracket 29 through the medium of a pivot or bearing member 30. One end of the lever 28 is connected to a second lever 31, the latter being mounted on a pivot member 32, and being connected to the main plunger lever 13 by means of a link 33. One end of the lever 31 is provided with a bearing screw 34 adapted to operate in a slot $28^a$ of the lever 28.

By reason of the construction and arrangement of the parts described it will be

obvious that the distributor roller 22 will be operated simultaneously with and in proper relation to the former tool 18 so as to initially distribute the clay in advance of such former tool.

Having thus described one of the embodiments of my invention, without having attempted to set forth all the forms in which it may be made, or all the modes of its use, what I claim and desire to secure by Letters Patent, is,—

1. In a pottery forming machine, a rotatable mold carrying a charge of plastic material, and a material distributing roller engaged and rotated by said rotating charge of material whereby the latter is prevented from being thrown off by centrifugal force and is given the desired form.

2. In a pottery forming machine, in combination with a horizontally rotating support carrying a charge of plastic material, a horizontally disposed material distributing roller arranged above and engaged and rotated by said rotating charge of material preventing the latter from being thrown off by centrifugal force.

3. In a pottery forming machine, a movable tool carrier, a rotary clay distributing tool carried thereby, and means for limiting the movements of said carrier and tool to vary the inclination of the latter.

4. In a pottery forming machine, the combination with mold carrying and rotating mechanism; of clay distributing and former tools arranged above the path of travel of said mechanism, means for supporting and actuating said tools, and means for changing the inclination of said tools relatively of the clay being operated upon.

5. In a pottery forming machine, a reciprocatory tool carrier, a horizontally disposed clay distributing roller carried thereby, means for actuating said reciprocatory tool carrier and roller to bring the latter into and out of contact with the plastic material being operated upon, and means for changing the relative throw and inclination of said carrier and roller.

6. In a pottery forming machine, a reciprocatory tool carrier, a horizontally disposed adjustably mounted clay distributing roller carried thereby, means for actuating said reciprocatory tool carrier and roller to bring the latter into and out of contact with the plastic material being operated upon, and means for changing the relative throw and inclination of said carrier and roller.

7. In a pottery forming machine, a plunger provided with a former tool, an oscillatory support provided with a horizontally disposed clay distributing roller, means for actuating said former tool and roller to bring the same into the path of travel of the subsequent charge of material being operated upon and an adjustable connection between said oscillatory support and its actuating mechanism.

8. In a pottery forming machine, the combination with circularly arranged molds and mold carrying and rotating mechanism; of a rotary clay distributing tool and a relatively fixed vertically movable former tool arranged above the path of travel of said molds, means for actuating said tools relatively of each other, and means for changing the inclination of said rotary clay distributing tool relatively to said molds.

9. In a pottery forming machine, a plunger provided with a former tool, an oscillatory support provided with a clay distributing roller, means for actuating said former tool and roller to bring the same into the path of travel of the subjacent charge of material being operated upon whereby said roller will act upon the same in advance of said former tool, and means for changing the inclination of said clay distributing roller.

10. In a pottery former machine, a carrier provided with vertically movable molds, means for successively engaging and rotating the latter when said carrier is at rest, a support provided with a rocker member above the path of travel of said molds as carried by said carrier, a rotary clay distributor in said rocker, and means for actuating said rocker and rotary distributor in cooperative relation to said molds and mold elevating and rotating mechanism.

11. In a pottery forming machine, a plunger provided with a former tool, means for intermittently actuating said plunger, a second plunger, means for actuating said second plunger simultaneously with and in cooperative relation to said first plunger and its actuating mechanism, a rocker provided with a clay distributing roller adapted to be actuated by said second plunger, and means for limiting the movements of said rocker and roller and changing the inclination of the latter.

12. In a pottery forming machine, a plunger provided with a former tool, means for intermittently actuating said plunger, a second plunger, means for actuating said second plunger in cooperative relation to said first plunger, a reciprocatory carrier provided with a clay distributing roller adapted to be actuated by said second plunger, a resilient connection between the latter and said second plunger when the latter is returned, changing the inclination of said carrier and roller.

13. In a pottery forming machine, the combination with an intermittently moving horizontal carrier provided with circularly arranged molds capable of relative vertical movement, and intermittently operating mechanism elevating and rotating said

molds successively when said table is at rest; of a support, a guide head carried by said support, a plunger guided by said guide head, a former tool on said plunger, means for reciprocating said plunger and former tool, a second plunger, a rocker on said guide head, a rotary clay distributor on said rocker, means for actuating said second plunger and rocker and rotary clay distributor in advance of said former and first plunger, and means for limiting the movements of said rocker and distributor.

In testimony whereof I have affixed my signature.

MARTIN BURGER.