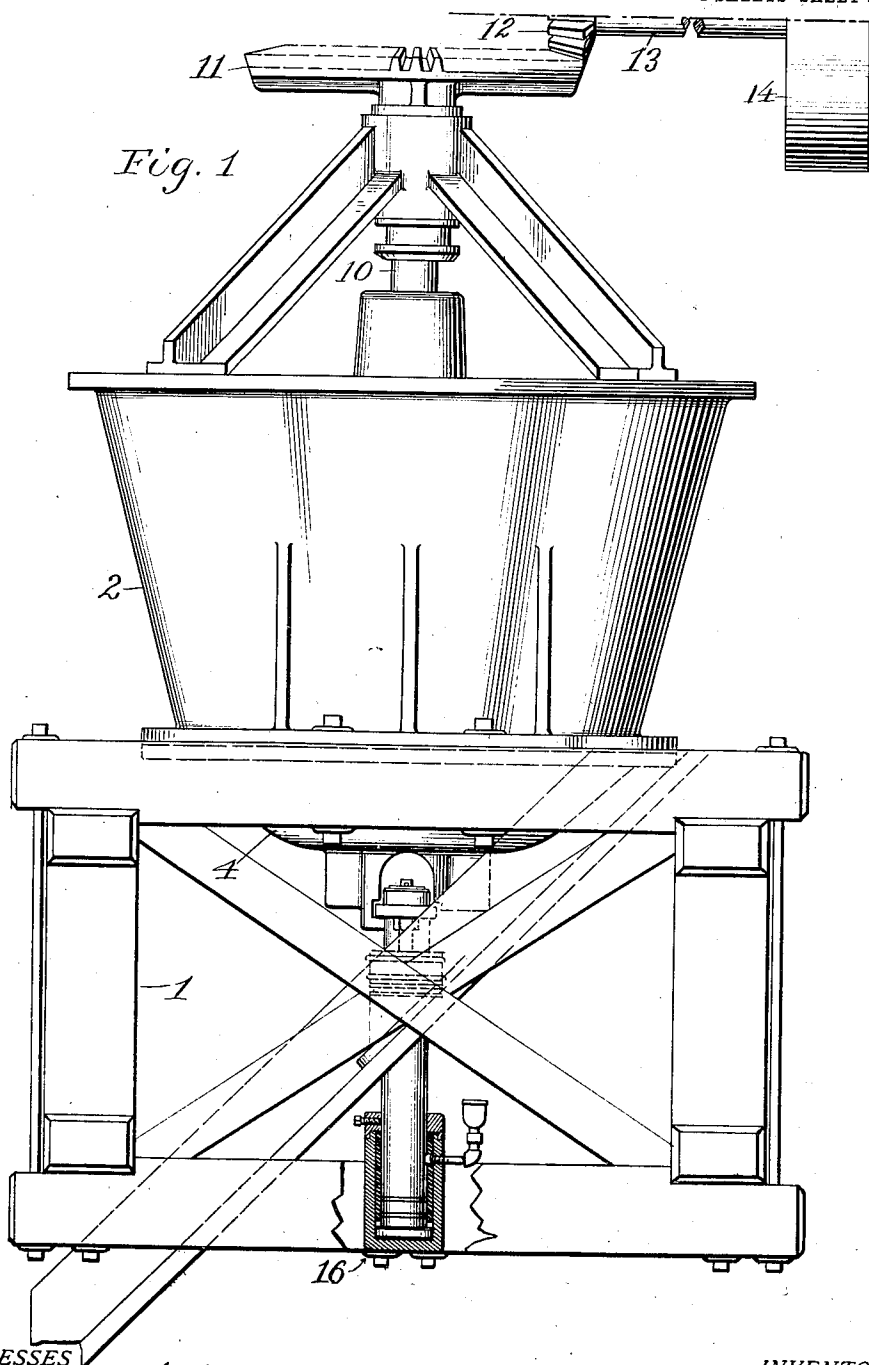


1,057,773.

N. P. PRATT.
STONE RUBBING MACHINE.
APPLICATION FILED MAY 27, 1912.

Patented Apr. 1, 1913.

4 SHEETS-SHEET 1.



WITNESSES

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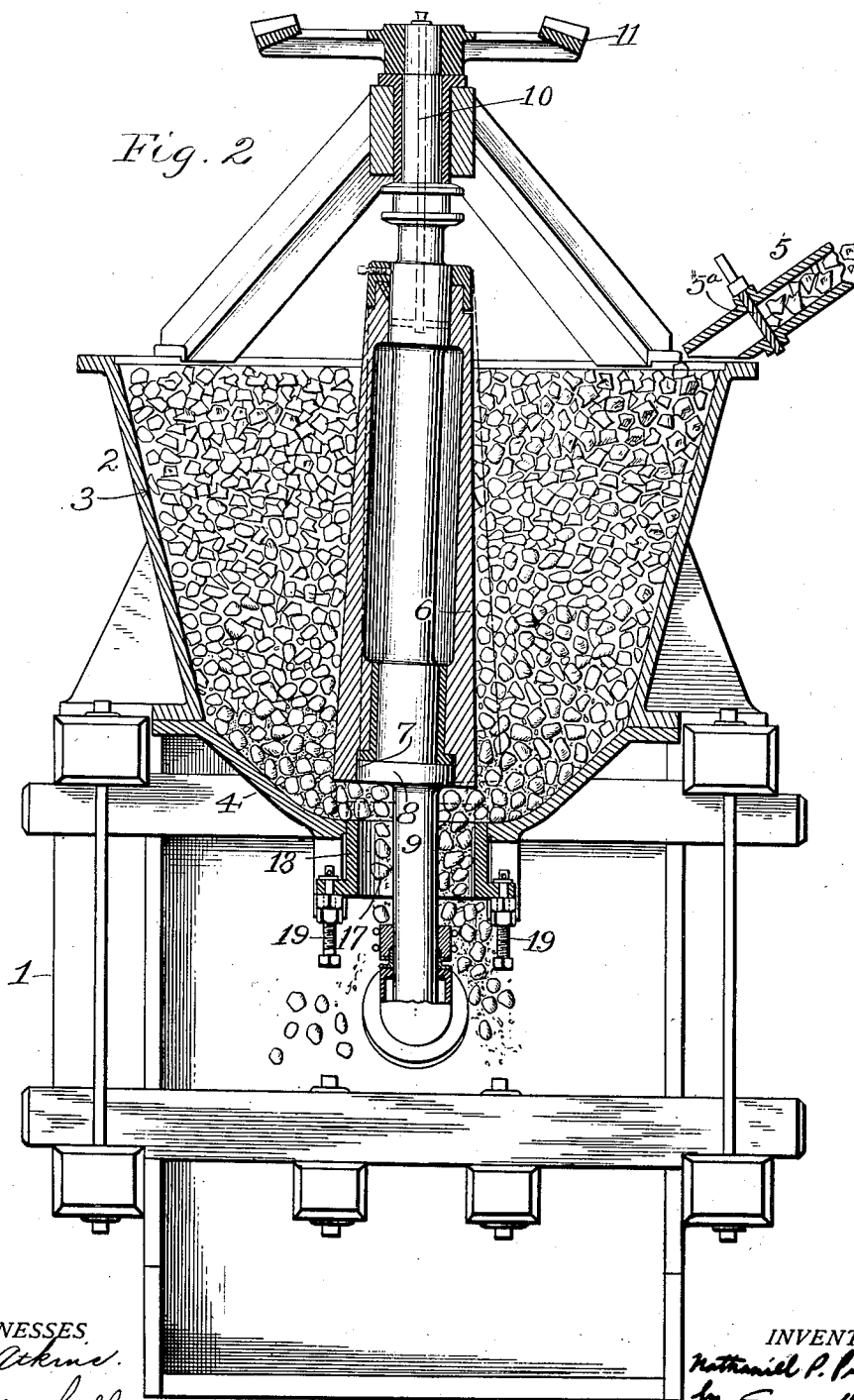
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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

Fig. 3.

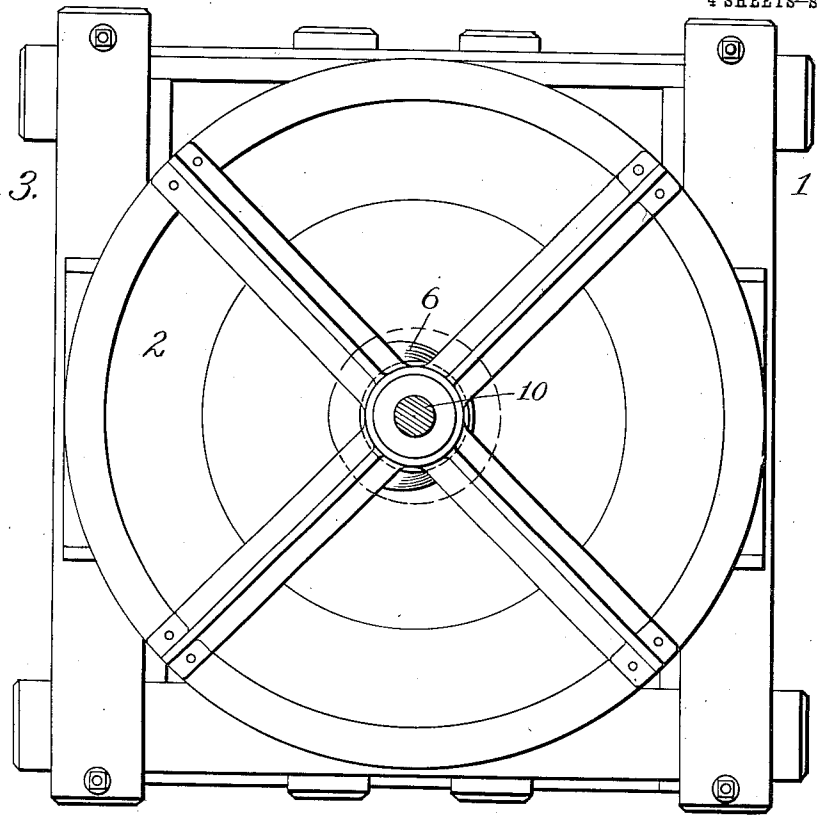
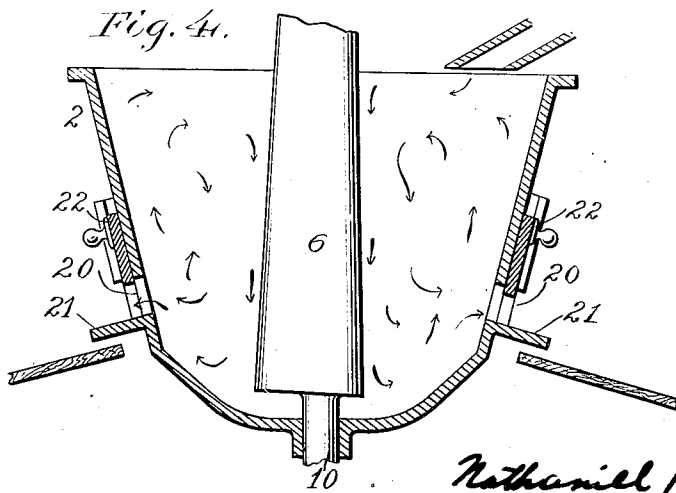


Fig. 4.



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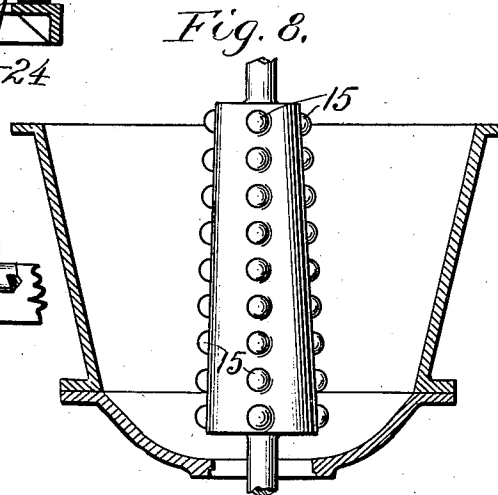
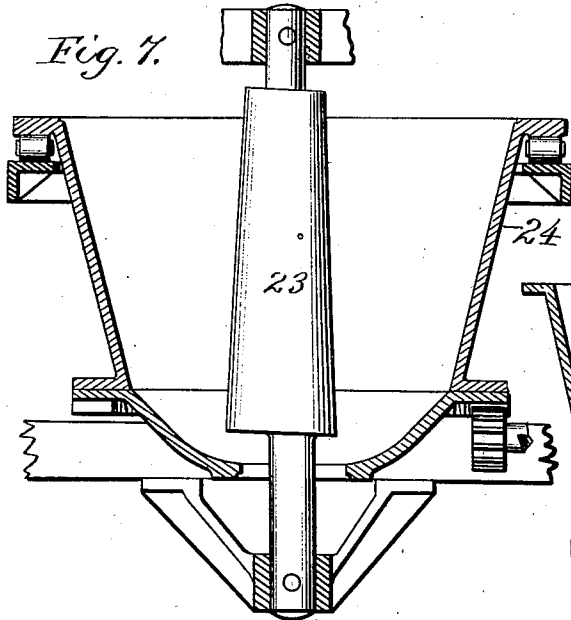
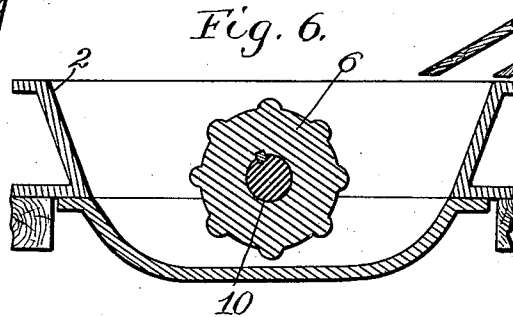
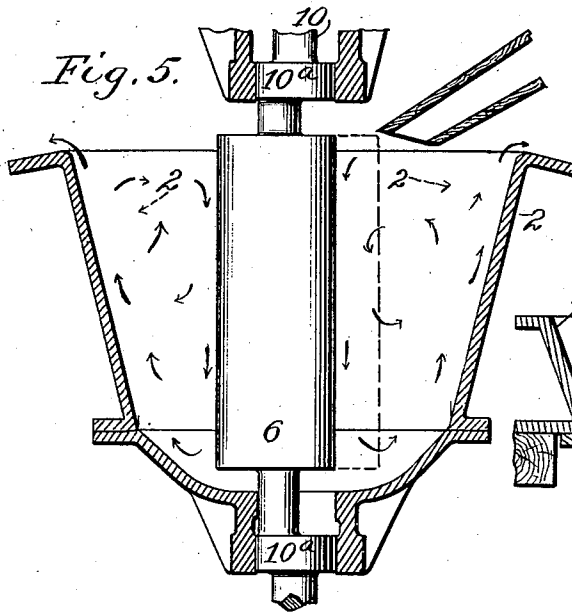
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

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STONE-RUBBING MACHINE.

1,057,773.

Specification of Letters Patent.

Patented Apr. 1, 1913.

Application filed May 27, 1912. Serial No. 700,059.

To all whom it may concern:

Be it known that I, NATHANIEL P. PRATT, a citizen of the United States, residing at Decatur, in the county of Dekalb and State

- of Georgia, have invented certain new and useful Improvements in Stone-Rubbing Machines, of which the following is a specification, reference being had therein to the accompanying drawing.
- 10 This invention relates to machines for rubbing lumps or particles of stone, marble, and the like, usually utilized in laying certain concrete floors, such as Venetian or terrazzo.
- 15 The object of the invention is to produce a simple and inexpensive structure but one having a maximum capacity, and adapted to perform its function of removing the angular corners or edges from particles of the stone, etc., without, at the same time, effecting any substantial crushing action upon the material. In a machine of this kind, the desideratum is to subject the material to such action that the aggregants
- 20 thereof are moved in a zone of predetermined dimension sufficiently large, and between surfaces so relatively positioned, as to preclude any substantial crushing of the aggregants: To this end, the operative parts of the machine which determine the zone of movement of the mass are so disposed relatively as to provide a space or chamber between a plurality of walls or surfaces, between which the material is treated, and
- 25 which zone is never reduced below a predetermined area, wherefore, while the lumps or particles, forming aggregants of the mass, are caused to rub against, upon and around each other, they nevertheless are not placed
- 30 between surfaces so arranged as to result in any substantial crushing, but are made to slide outward and upward along the walls of the chamber in which they are being circulated while the constant contact of the particles with, and their movement against each other, effects a gradual but effective rubbing off and smoothing of the edges and surfaces of these aggregants.

The invention in its broadest aspect contemplates the use of a suitable mass-holding receptacle, a mass-moving member disposed therein, and means for actuating one of said members relatively to the other to move the mass successively in a plurality of relatively

different directions.

In another of its aspects the invention

contemplates the use of a suitable mass-holding receptacle, a mass-moving member disposed therein, and means for actuating one of said members relatively to the other to move the mass first in one direction and then successively in a relatively different direction.

The invention, in another of its aspects, contemplates the use of a suitable receptacle, with a movable member disposed within said receptacle and with means for actuating said movable member variably to its normal axis, the area or zone between the effective wall of the receptacle and the effective surface of said movable member being of predetermined position and dimension, whereby a mass of material of comparatively large body is treated, such treatment contemplating the setting into motion, in a plurality of directions, of the aggregants of the mass and, finally, the discharge of these aggregants out of the receptacle.

The invention includes, in a more specific aspect, means for changing the normal relation between said movable member and the receptacle, whereby the effective area or zone in which the mass is to be treated may be increased or diminished, as may be desired.

The invention also contemplates various novel details and the aggroupment or a combination of these whereby a machine of relatively large capacity is possible, all as more fully hereinafter described and claimed.

In the accompanying drawings, I have illustrated certain embodiments of my invention, in which the underlying principles thereof are clearly exemplified, it being understood that these are shown only by way of example as some of the forms which I propose to employ.

In these drawings: Figure 1 is a view in elevation of a preferred embodiment of the structure, a portion of the lower part of which is sectioned more clearly to illustrate certain parts; Fig. 2 is a view, partly in vertical section, illustrating the interior of the receptacle and the mass as therein contained; Fig. 3 is a plan view of the structure; Fig. 4 is a fragmentary view of a modification. Fig. 5 is a similar view of another modification. Figs. 6, 7, and 8 are similar views of still other modifications.

Referring to the drawings, and to Figs. 1 to 3, the numeral 1 designates, generally, a suitable support for the structure now to be described. Suitably secured to this support,

in any desirable manner, is a mass-holding member, receiver or receptacle, 2, which preferably and as shown may be of an inverted bell-shaped form to provide an upwardly and outwardly inclined inner wall 3. The receptacle may have a bottom portion 4. The material is fed into the receptacle through a chute 5, though it may be delivered into the same in any other preferred manner. Within the receptacle is a mass-moving and rubbing member 6, which, in the forms illustrated in Figs. 1 to 6 and 8, is movable and preferably conical, as shown, and preferably provided in its lower end with a recess 7 in which an eccentrically formed head 8, carried by an upstanding spindle 9, is seated. The movable member 6 is preferably suspended from and actuated by a drive shaft 10 upon the upper end of which is keyed a gear-wheel 11 adapted to be driven by a pinion 12 carried by a horizontal shaft 13 which, in turn, is driven by a band-wheel 14, said wheel being, itself, driven by any suitable power-device, not shown.

As is clearly shown in Fig. 3, the connection between the movable member 6 and the drive-shaft 10 is such that said member 6 may have a movement eccentric or variable to its normal axis, and which movement is controlled by the eccentric head 8 on the spindle 9. Or the movable member 6, if preferred, and as shown in Fig. 8, may be fixed to the spindle and, instead of receiving an eccentric motion therefrom, it may be provided with irregular protuberances 15 which, in motion, will compel motion of the stone particles outward and upon each other. The spindle is suitably journaled in a bearing 16 secured in the lower portion of the support 1, as shown particularly in Fig. 1. The bottom portion 4 of the receiver 2 is, adjacent to the spindle 9, preferably provided with an aperture 17 of a size appropriate to permit the discharge of the aggregants of the mass as they are being treated. Mounted in the bottom portion or basin 4 of the receiver 2 is a cylindrical ring 18, and which encircles the spindle 9. This device may be given any other preferred shape. It is vertically adjustable to increase or reduce the distance between its upper end and the lower end of the movable member 6, whereby the discharge, in this particular embodiment of the invention, of the aggregants from the receiver may be controlled at the will of the operator, the adjustment of said ring being effected by means of the adjusting bolts 19. The ring 18 is, as shown in this instance, of an inside diameter greater than that of the spindle 9, wherefore a space is provided between the walls of the ring and the spindle. Obviously, if the ring is raised and thus positioned nearer the lower end of the movable member 6, the

distance between it and the ring is reduced, whereby the flow of the aggregants out of the receiver and through the space aforementioned may be changed. If desired the discharge of the aggregants may be entirely stopped without interfering with the rubbing action of the machine. It is found that, while in some instances it is preferable to effect a discharge of portions of the mass (while it is being treated and while fresh particles of stone are being introduced) out of the receiver 2 through the bottom, yet this discharge may also be effected in other ways: As shown, for instance, in Fig. 4, discharge openings 20 are formed in the sides of the receiver, and are provided with chutes 21 in which slides or gates 22 are provided to close the chutes or to control the amount of material which may be discharged there-through. Or, as shown in Fig. 5, the discharge, instead of being through the bottom or side portions of the receiver, may be effected over its upper edge, it being understood that while the inflowing feed continues, the aggregants, during their movement in the receiver, will flow down along the movable member and, being propelled thereby, will gradually pass outward and upward toward the top and be forced out over the upper edge of the receiver.

Operation: In operating the particular form of machine described, the feed-chute 5 is opened, as by the slide-gate 5^a, so that the receiver may be filled from a suitable storage bin, not shown, with stone particles, or lumps which may already have been reduced to proper size in a crusher or the like. Thereupon, the machine is started and the conical movable or rubbing member 6 is given an oscillatory movement by reason of the eccentric head 8 on the spindle 9. The variable sidewise movement of the rubbing member 6 sets in motion the aggregants constituting the mass A within the receptacle, and these aggregants are caused to rub against each other for a sufficient time to remove the angular corners and edges which they have when fed into the receiver. The discharge of the mass is effected gradually, since it is desirable to keep the aggregants in motion until they have been operated upon to a desirable extent, this being controlled, as already described, by means of the adjusting ring 18. As rapidly as the rounded stone particles pass out of the receiver, fresh additions automatically accrue at the top so as to preserve the proper volume of stone in the receiver. The rapid pushing and rubbing of the stone particles on each other results in wearing away the sharp corners and edges and yields a finished product as free from angularity as may be desired.

Instead of the rubbing member 6 being conical, as shown in Fig. 3, it may be cylindrical, or as shown in Fig. 5, the drive-

shaft 10 may be provided with an eccentric head 10^a whereby the rubbing member may have an eccentric movement imparted to it at its bottom or top or wherever preferred.

5 As shown in Fig. 7, it is also within the spirit of my concept to make the member 23 stationary and rotate the mass-holding member 24 around the same, eccentrically or in any other manner that will impart motion to the mass of material to be treated. In lieu of disposing the receptacle and rubbing member vertically as shown in the Figs. 1 to 3 and 7 and 8, said receptacle may be arranged in a horizontal plane as shown in Fig. 6 in which instance the rubbing member would preferably occupy a corresponding position.

As will now be clear, a salient feature of my invention is the disposition of the effective wall of the mass-holding receiver a substantial distance from the mass-moving member whereby the variable change of relation between the surface of the said member and the wall of the mass-holding member will set in motion the aggregants of the mass of material without at the same time effecting any substantial crushing action thereon. The provision of a substantial working area or zone between the surfaces of the mass-holding receiver and the mass-moving member, with the consequent discharge of the aggregants from the receiver without the substantial crushing of the aggregants, is a novel feature, so far as I am advised.

I am aware that there are in use constructions employing a mass-holding receiver in which is gyrated a rotary member; but the action, in this instance, is one of crushing, and this is due to the fact that the inner wall of the mass-holding receiver is located in close proximity to the gyratory member, whereby the walls of these two elements become effective surfaces between which the aggregants of the mass are caught and crushed, after which the crushed mass is discharged from the receiver while moving merely from a higher to a lower position in practically a straight path. My invention operates upon exactly the opposite principle, in that I seek to avoid any crushing action such as is aimed at in the form of machine just mentioned, and also the mass is moved first in one direction and then in a relatively different direction. My machine is utilized to treat the mass after it has passed through such a crushing machine.

Having now described my invention, its construction, and the manner of carrying it into effect, what I claim and desire to secure by Letters-Patent is:

1. A rubbing machine, including in combination, a suitable mass-holding receptacle, a mass-moving member disposed therein, and means for actuating one of said members angularly to its axis and relatively to

the other to move the mass successively, first in one direction for a substantial distance and, then, in a direction at a distinct angle to that of its first movement.

2. A rubbing machine, including in combination, a suitable mass-holding receptacle having a discharge-opening, a mass moving member disposed therein, and means for actuating one of said members angularly to its axis and relatively to the other to move a mass of material in the receptacle, first in one direction and, then, successively, in a direction at a distinct angle to that of its first movement and for a substantial distance away from said discharge opening.

3. A rubbing machine, including in combination, a surrounding mass-holding member including a bottom-portion, a movable member disposed therein, and means for actuating said member angularly to its axis to push a mass of material away from itself and, then, in a relatively different direction and initially away from said bottom-portion.

4. A rubbing machine including in combination, a rotary member adapted to swing at an eccentric to its axis, a relatively stationary encircling mass-holding member provided with interior walls arranged at an angle to the surface of the rotary member, and including a bottom-portion and adapted to contain a mass of material, means for actuating said rotary member to set said mass in motion first in one direction and then in a distinctly different direction and away from said bottom-portion and, in consequence, to effect a movement of its aggregants upon each other to smooth them.

5. A rubbing machine including, in combination, a rotary member adapted to swing at an eccentric to its axis, a relatively stationary encircling mass-holding member provided with interior walls arranged at an angle to the surface of the rotary member and provided with an opening for the egress of material and adapted to contain a mass of material, means for actuating said rotary member to set said mass in motion first in one direction and then in a distinctly different direction and away from said bottom-portion and, in consequence, to effect a movement of its aggregants upon each other to smooth them and to effect their discharge out of the encircling member.

6. A rubbing machine, including in combination, a rotary member adapted to swing at an eccentric to its axis, a relatively stationary encircling mass-holding member provided with interior walls arranged at an angle to the surface of the rotary member and provided with an opening for the egress of material and adapted to contain a mass of material, means for actuating said rotary member, and thereby to set said mass in motion first in one direction and then up-

wardly away from said egress-opening and, in consequence, to effect a movement of its aggregants upon each other to smooth them and to effect their discharge out of the encircling member, and means for changing the relation between said rotary member and said encircling element whereby the discharge of the aggregants of the mass under treatment may be regulated.

7. A rubbing machine, including in combination, a rotary member adapted to swing at an eccentric to its axis, a relatively stationary encircling mass-holding member provided with interior walls arranged at an angle to the surface of the rotary member and provided with an opening for the egress of material, and thereby to set said mass in motion first in one direction and then upwardly away from said egress-opening and, in consequence, to effect a movement of its aggregants upon each other to smooth them and to effect their discharge out of the encircling member, means for changing the relation between said rotary member and said encircling element whereby the discharge of the aggregants of the mass under treatment may be regulated, and means for effecting a rotary and angular movement of said rotary member in relation to the walls of said encircling element.

8. A rubbing machine, including a rotary member, an encircling receptacle having an outwardly inclined interior wall and adapted to contain a mass of material, said wall being disposed at a substantial distance from said rotary member, means for rotatably supporting said rotary member in said receptacle and adapted to permit a movement of said member angularly to its

axis while rotating, whereby the mass contained in said receptacle may be set in motion and given a movement outwardly toward the wall of said receptacle and, then, successively, upwardly along and contiguous to said wall to effect a discharge of the aggregants of the mass under treatment, and means for regulating the angular movement of said rotary member in relation to the wall of said receptacle whereby movement of said aggregants is effected upon each other without crushing action.

9. A rubbing machine, including a rotary member, an encircling receptacle having an outwardly inclined interior wall and adapted to contain a mass of material, said wall being disposed at a substantial distance from said rotary member, means for rotatably supporting said rotary member in said receptacle and adapted to permit a movement of said member angularly to its axis while rotating, whereby the mass contained in said receptacle may be set in motion and given a movement outwardly toward the wall of said receptacle and, then, successively, upwardly along and contiguous to said wall and, finally, downwardly to effect a discharge of the aggregants of the mass under treatment, and adjusting means for changing the normal relative distance between said rotary member and the wall of said receptacle whereby the discharge-space for said aggregants is varied.

In testimony whereof I affix my signature in presence of two witnesses.

NATHANIEL P. PRATT.

Witnesses:

EDGAR REANES,
PALMER PRATT.