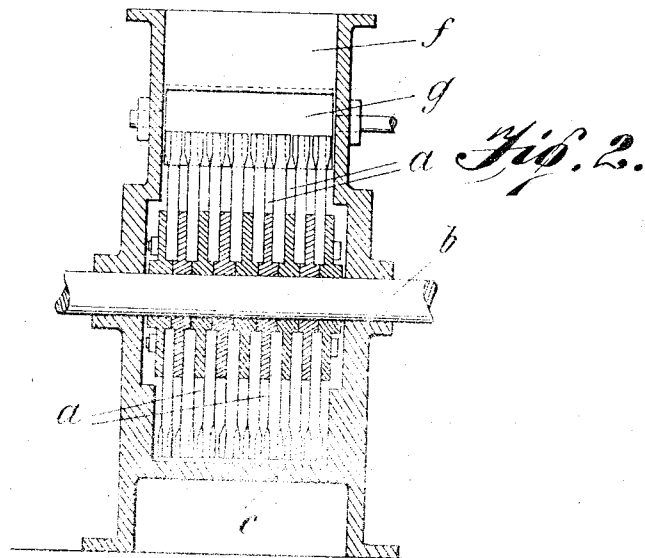
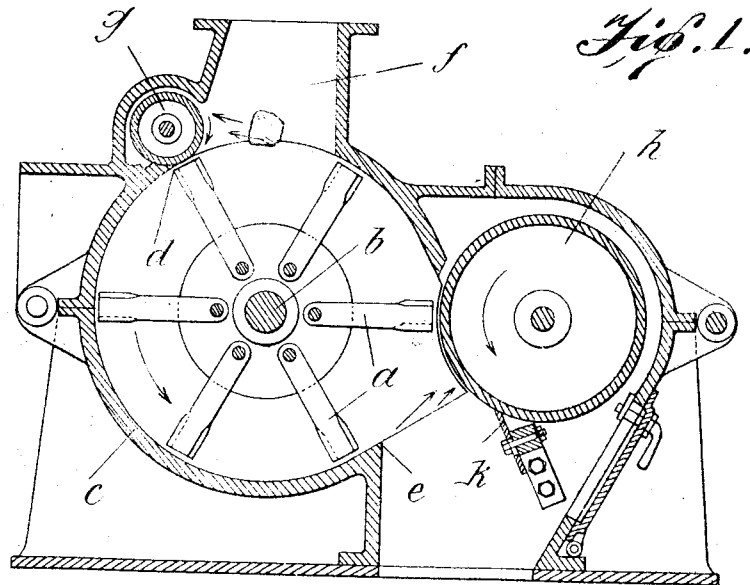


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METHOD OF AND APPARATUS FOR TREATING PLASTIC MATERIAL.
APPLICATION FILED MAY 13, 1911.

1,049,712.

Patented Jan. 7, 1913.



WITNESSES
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METHOD OF AND APPARATUS FOR TREATING PLASTIC MATERIAL.

1,049,712.

Specification of Letters Patent.

Patented Jan. 7, 1913.

Application filed May 19, 1911. Serial No. 628,281.

To all whom it may concern:

Be it known that I, ALBIN BERTHOLD HELBIG, chief engineer, a subject of the German Emperor, and resident of Frankfort-on-the-Main, Germany, with post-office address Varrentrappstrasse No. 73, have invented new and useful Improvements in Methods of and Apparatus for Treating Plastic Materials, of which the following is a specification.

The method of this invention serves for the preparation of plastic masses whether for the purpose of merely rendering the mass homogeneous or for effecting the mixing of masses of different kinds, crushing the mixture and drying the mass.

Externally, the machine employed bears a certain resemblance to a so-called beater mill which however, being only intended and only suitable for crushing hard substances, has been modified to adapt it for the new method. The new machine moreover, contains a series of rotary beaters arranged like the spokes of a wheel which rotate at a very high speed inside a casing which has two openings, one for the insertion of the crude mass and the other for discharging the product.

The peculiar method of operation is characterized by three novel features. The mass, in the form of lumps, is thrown in through a charging hopper. Underneath this charging hopper the beaters rotate at such a high rate of speed, for example 1000 revolutions per minute, that the lumps of clay (for instance) thrown in cannot fall down between the beaters but are at first maintained in a state of uniform flotation by the beaters which follow one another in succession. Each of the beaters now scrapes a thin stratum from the under side of the lump of clay by means of its front edge, the action resembling that of the rotary cutters of a planing machine. These thin shavings are transported by the beaters from the opening in the hopper into a portion of the machine that is surrounded by a continuous cylindrical wall; and here these scraped-off flat slices or plates are brought into powerful frictional contact with the surrounding cylindrical wall in consequence of the high centrifugal force. In this way each of the slices or cake-like pieces is completely broken down into small flakes. These flakes are then carried onward by the beat-

ers until they reach a larger opening in the cylindrical wall through which they are projected tangentially outward under the influence of centrifugal force.

In carrying out this method several difficulties had to be overcome that arose from the moist, sticky character of the mass and the high velocity of rotation of the beaters. The pieces scraped from the introduced lumps are forced outward by the centrifugal force, and would tend to stick on the walls of the charging hopper, and particularly against the entering edge of the cylindrical working chamber. On this account a roller has been arranged at this point and forms a portion of the wall of the hopper, against which roller the detached cuttings or slices of clay impinge. By the rotary motion of this roller the slices which are projected against and adhere to it, are fed to the entering edge of the cylindrical casing and are there carried on farther by the beaters. A similar process goes on during the escape of the fine flakes from the cylindrical casing. If these flakes be simply allowed to discharge into a receptacle, they reunite to coherent masses, since the tangential velocity of ejection is extremely high and is sufficient to cause the projected flakes to coalesce again. In many instances this is undesirable, especially when the flocculent form is intended to be utilized for drying the clay quickly. In such cases therefore, the flakes are also allowed to impinge against a rotary drum, conveyer, belt or the like moving at such a velocity that the flakes are deposited singly side by side without becoming reunited and these flakes are then detached from the drums by means of a scraper.

The new machine is illustrated in the accompanying drawings, in which—

Figure 1 is a central longitudinal section and Fig. 2 is a transverse section through the beater mechanism.

a are the beaters which are secured to the revolving shaft *b* in the known manner; *c* is the cylindrical casing which extends continuously from the entering edge *d* to the exit edge *e*.

f is the charging hopper and on the side of this hopper that is situated in the direction of rotation, is mounted the feed roller *g* which takes up the particles detached from the mass by the beaters and projected in the

direction, and feeds them to the entrance edge *d*, whereupon the process already described goes on in the section between *d* and *e*. It should also be mentioned that the free mobility of the various adjacently situated beaters also contributes to the better breaking down of the separated fragments into fine flakes. Beyond the edge *e* the flakes travel in the direction indicated by the arrow, on to the surface of the rotary drum *k* and remain sticking to the said surface until they are detached by the scraper *k* and fall down one by one. The particles may be dried in any suitable or preferred manner either before or after removal from said surface.

It will be evident that the machine may be modified in various ways, without altering its novel method of action or departing from the spirit and scope of the claims.

Now what I claim and desire to secure by Letters Patent is the following:

1. The process of comminuting moist plastic material which consists in slicing the material from lumps, comminuting the slices of material by beating and friction, spreading the moist comminuted particles over a surface substantially in a single layer wherein the particles do not overlap, permitting the particles to become dry and then removing them from said surface in such manner that they remain in comminuted form.

2. In a machine for comminuting moist plastic material, the combination of a casing provided with inlet and outlet openings, the portion of said casing between said openings being cylindrical, beaters axially arranged with respect to said cylindrical portion of the casing, the ends of said beaters being adapted to rotate in close proximity to the inner surface thereof whereby moist plastic material may be comminuted therebetween,

the arrangement of said inlet and outlet opening being such that the moist plastic material is introduced into the casing radially and projected therefrom tangentially with respect to said rotating beaters, a revoluble cylinder arranged to receive the tangentially projected particles and means for removing the particles from the surface of said cylinder in comminuted form.

3. In a machine for comminuting moist plastic material, the combination of a partially cylindrical casing provided with inlet and outlet openings, beaters adapted to revolve about the axis of the cylindrical portion of said casing in close proximity to the inner surface thereof for the comminuting of plastic material therebetween, the inlet opening in said casing being adapted for the introduction of moist plastic material in a substantially radial direction with relation to said revoluble beaters, while the outlet opening in said casing is adapted to permit the projection of comminuted particles in a plane tangential to said revoluble beaters, a smooth surfaced cylinder having its axis located substantially in said tangential plane to receive the projected comminuted particles, said cylinder being adapted to rotate so that projected particles strike on successive portions of the surface thereof, and means for removing the particles from the surface of said cylinder in such manner that they remain comminuted.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this eighth day of May, 1911.

ALBIN BERTHOLD HELBIG.

Witnesses:

JEAN GRUND,
CARL GRUND.