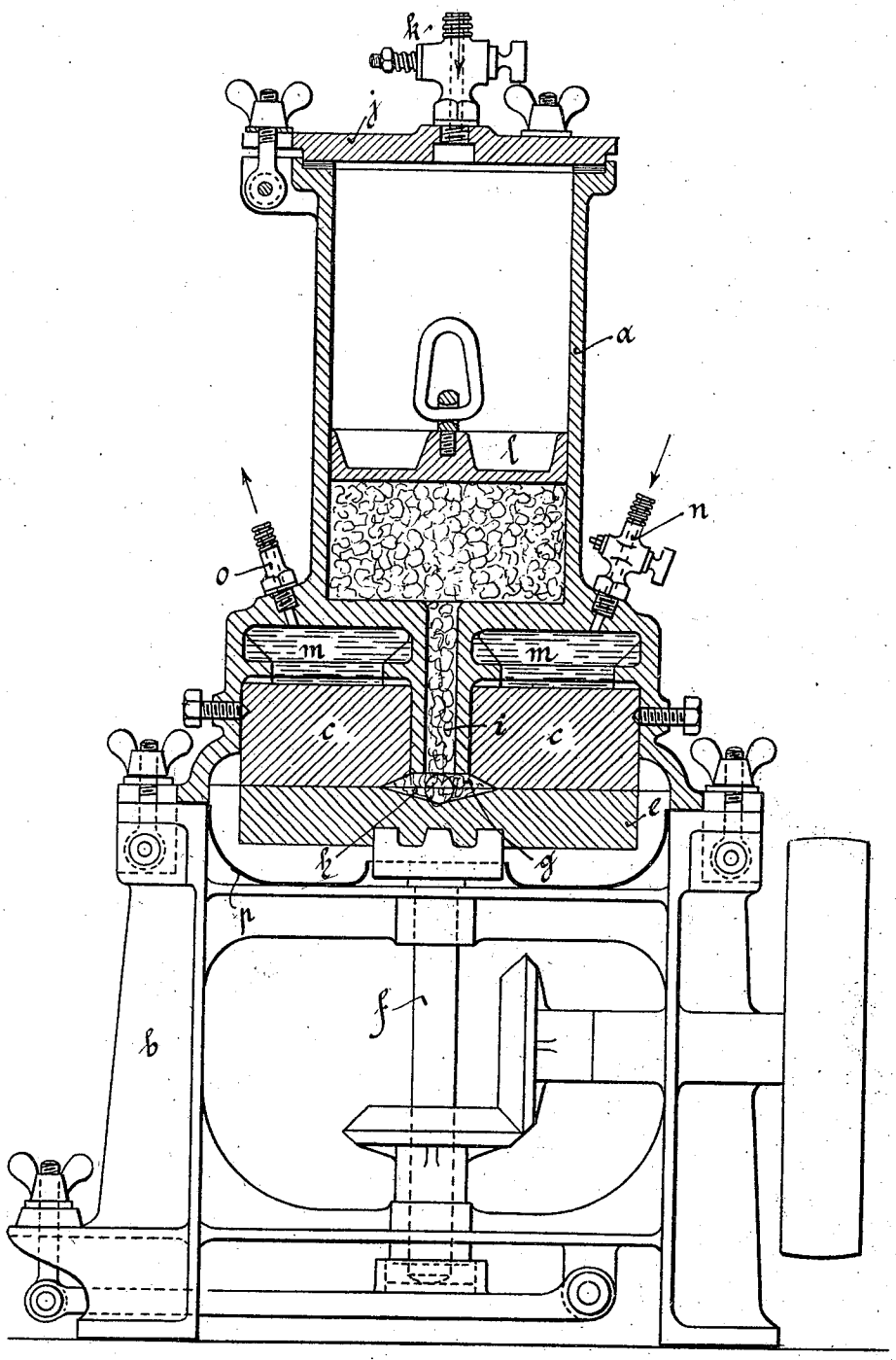
No. 683,976. Patented Oct. 8, 1901.

C. J. PALMIÉ.

GRINDING MILL.

(Application filed Aug. 30, 1900.)

(No Model.)



Witnesses:
John Hickman,
William Schulz

Inventor:
Charles J. Palmié
by his attorneys
Roesler & Briesen

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES J. PALMIÉ, OF MUNICH, GERMANY.

GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 683,976, dated October 8, 1901.

Application filed August 30, 1900. Serial No. 28,521. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. PALMIÉ, a citizen of Germany, and a resident of Munich, Germany, have invented certain new and useful Improvements in Grinding-Mills, of which the following is a specification.

This invention relates to a mill for grinding colors, chocolate, cocoa, chemicals, and other substances, in which the material ground is subjected to additional pressure while being acted upon by the grinding-bodies.

The accompanying drawing represents a vertical longitudinal section, partly in elevation, of my improved grinding-mill.

The letter *a* represents a chamber or cylinder supported upon legs *b* and adapted for the reception of the material to be ground. The grinding-stones *c* and *e* are arranged beneath the cylinder, the lower stone *e* constituting the runner and being rotated by shaft *f*. The contiguous grinding-surfaces of both stones are centrally cut away to form a stellated pocket *g h*, into which the material to be ground is conducted from cylinder *a* by channel *i*, formed by a central transverse perforation of upper stone *c*. During the rotation of the runner *e* the points of the star will cause a reduction of all the larger lumps of color, &c., which otherwise would not be able to enter between the stones.

The material to be ground is subjected to pressure while between the grinding-surfaces, and thus the output of the machine is greatly increased. For producing this pressure, liquid, as well as gas, and also levers, screws, eccentrics, weights, and springs may be employed, or the pressure may be obtained by gearing or in any other suitable manner. The drawing shows the apparatus adapted for liquid or gas pressure.

The cylinder *a* is closed by an air-tight cover *j*, and the liquid or gas, such as air, is introduced through cock *k*. The pressure is transmitted by piston *l* to the material to be treated.

To prevent the stones *c e* from running hot through the increased friction created by the pressure upon the material, I provide the apparatus above the stone *c* with a cooling device that prevents heating of this stone as well as of the runner. The cooling device consists of a chamber *m*, arranged between cylinder *a* and stone *c*, into which during the working of the machine cold air or water may be introduced through inlet *n*, which is discharged at *o*. If desired, this chamber *m* may also be used for holding ice.

In grinding materials that are first liquefied by heat and can then only be ground—such as chocolate, cocoa, &c.—the chamber *m* can be used as a heating-chamber by being charged with hot air or hot water. While these materials are ground a cooling of the grinding-surfaces is not necessary, because the butter or other fatty matter melting out of them prevents the stones from running hot.

My improved grinding-mill is particularly adapted for all colors which are to be ground in oil, varnish, water, alcohol, or ethereal oils, as well as for cocoa, chocolate, and all chemicals, liquid or pasty and in thick or dilute form. It possesses the following advantages: By placing the material under additional pressure even the thickest color may be completely ground by passing once through the machine. The pressure also permits the two grinding-surfaces to be brought much nearer together, whereby a greater fineness of the color is obtained in a much shorter time. The machine does not require any attention after the cylinder has been charged and after it is started, as the piston presses all material automatically downward and off the cylinder-walls. The speed of the feed may be accurately regulated by setting the pressure. The air-tight cover *j* over piston *l* prevents a drying up of the color or evaporation of the water and prevents oils from turning resinous or evaporating. The runner can rotate more quickly than heretofore on account of the cooling-chamber, which prevents a heating of the grinding-surfaces. The machine can be easily and quickly cleaned, as it contains smooth surfaces only. The pressure on the material also permits the grinding of color-skins and permits thick color residues of color pots, tubes, and other receptacles to be ground into a serviceable condition.

What I claim is—

A grinding-mill provided with a lower and an upper grinding-body, a duct extending through the upper grinding-body, a pocket intermediate the grinding-bodies into which

the inner end of said duct opens, a chamber communicating with the outer end of the duct and adapted to receive the material to be ground, means for compressing said material within said chamber, and an air-tight cover for closing the chamber, substantially as specified.

Signed by me at Antwerp, Belgium, this 10th day of July, 1900.

CHARLES J. PALMIÉ.

Witnesses:
STANISLAS H. HAINE,
JON. EONYDORFF.