

(No Model.)

P. LINDEMAYER, Jr.
ROLLER MILL FOR GRINDING INK, &c.

No. 566,920.

Patented Sept. 1, 1896.

Fig. 1.

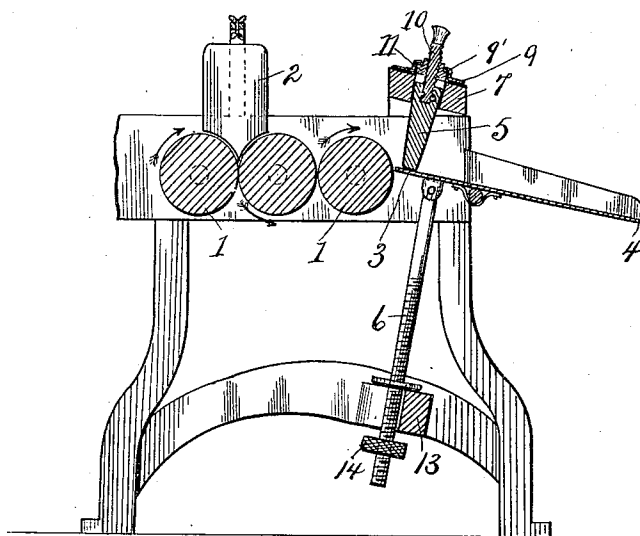


Fig. 3.

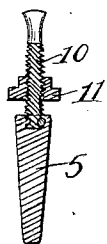


Fig. 2.

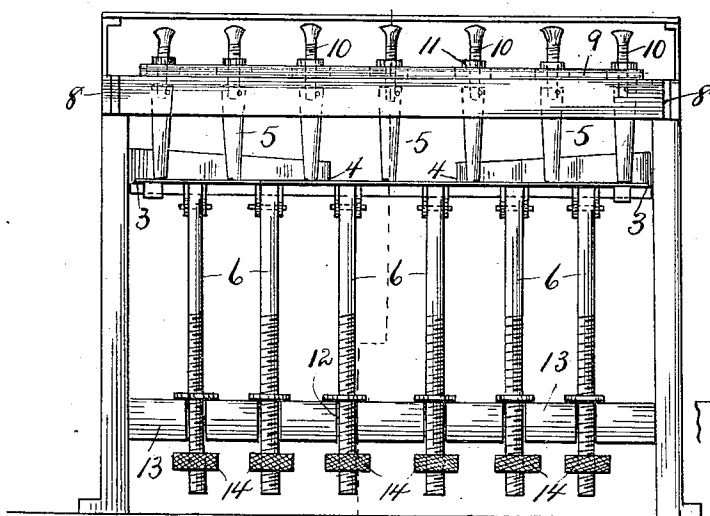


Fig. 5.

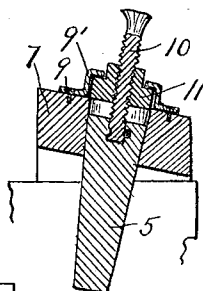
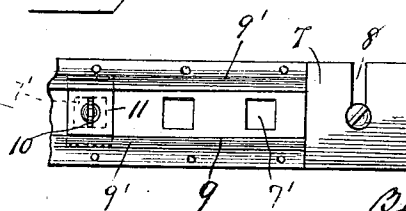


Fig. 4.



WITNESSES

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ROLLER-MILL FOR GRINDING INK, &c.

SPECIFICATION forming part of Letters Patent No. 566,920, dated September 1, 1896.

Application filed February 10, 1896. Serial No. 578,747. (No model.)

To all whom it may concern:

Be it known that I, PHILIP LINDEMeyer, Jr., a resident of the city of Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Roller-Mills for Grinding Ink and Like Purposes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

The invention relates to roller-mills for grinding paint, inks, and other like substances, and its object is to improve the efficiency and durability of the "doctors" used in such mills and in other machines comprising rollers that need to be scraped, thereby increasing the uniformity of the product and diminishing the number of grindings necessary and insuring other advantages; and the invention consists in the construction hereinafter described and particularly pointed out.

In the accompanying drawings, Figure 1 is a partial vertical longitudinal section of an ink-mill on line 1 1 of Fig. 2. Fig. 2 is an end elevation, the rollers being omitted. Fig. 3 is a section of a detail, and Fig. 4 is a plan of another detail. Fig. 5 is an enlarged section of a detail.

Numerals 1 denotes grinding or crushing rollers to be driven in the direction indicated by arrows by the usual or any convenient and suitable mechanism.

2 denotes one of the plates used in ink-grinding mills to prevent the materials from spreading to and over the ends of the rollers.

3 denotes a doctor consisting of a plate having an edge contiguous the roller and adapted to scrape its surface to remove adherent material. It is usual to make the upper edge of a discharge-chute 4 serve as a doctor, as represented in the present instance, though such construction is not essential to the present improvement, which relates to the device considered as a scraping or cleaning plate and not to the functions of a chute or spout.

In roller-mills for grinding ink and paint and in other machines using rollers in contact with viscous substances it is necessary that material adhering to the surface of one or more of the rollers be closely scraped and removed therefrom by a plate having a thin or sharp edge bearing against the roller in

manner to remove the sticky substance which otherwise would remain adherent, become compacted and accumulate thereon, and particularly upon the last or discharge roller. It is desirable that the edge of such scraping-plate be thin, and that its body also should be thin, to obviate as far as practicable the dulling thereof by mineral elements of the substances that are ground; but a thin plate, preferable for the above reason, is liable to buckle and become distorted to such a degree as to interfere with its operation. In some cases more or less semihardened material or "skins" pass under the edge of the scraper and accumulate in a hardened and compacted layer on the roller. The ends of the doctor are stiffened by end flanges or the like or by their attachments to the frame and are more firmly held and thus more continuously and efficiently remove the material near the ends of the roller, which may be thereby kept comparatively clean. The ground material passing from them to the upper side of the doctor moves freely in some cases than at intermediate points, with the effect to interfere with the uniformity of the ground product, thereby rendering necessary more regrinding to produce the best results than would otherwise be required. To overcome these and other evils, I provide doctor-staying fingers or bars 5 and support them in such manner that their ends bear on the doctor near its scraping edge in manner to hold it in close contact with the roller and to obviate buckling or bending and to take off the adherent substances evenly across the entire length of the roller, thereby insuring even grinding and doing the work much quicker. Intermediate these pressing-fingers and on the opposite side of the doctor and attached to its bottom are ties or tying-fingers 6, adapted to draw the doctor onto the roller. The fingers 5 may be variously supported. In the instance shown they are made angular in cross-section and held in similarly-shaped holes in a detachable bar 7. Said bar is preferably bolted or screwed to the machine-frame and the screws are situated in slots 8, which provide for the easy removal of the bar without the entire removal of the bolts. On the upper side of the bar are fixed channel wall-plates 9. These plates have a Z form in

cross-section, being bent at 9' to overhang the long or lower part of button 11 when the latter is suitably disposed, as shown in Fig. 5. This channel in the present instance is included between two Z-shaped plates 9', fastened to the top of the bar 7. (See Figs. 1 and 4.) In the bar 7, at the bottom of the channel, are angular holes 7' to receive similarly-shaped fingers 5.

10 10 denotes thumb-screws, each connected with a finger 5, substantially as represented, so as to turn freely therein without turning the finger.

11 denotes a screw-threaded button adapted to be moved on the screw by turning the latter. The ends of the button, when suitably adjusted, engage under the channel-walls 9, and by suitably operating the screw they can be made to press against the under surface of said walls with the effect to thrust the fingers, which are held against turning, down upon the doctor, thereby holding its edge upon the roller. The small upper part of the button 11 is a finger-piece for turning the button to move it from under the walls 9 when it is either desired to remove its corresponding finger or to lock it under said walls when inserted. The upper part of the button 11 is in each of its dimensions less than the width of the opening at the top of the two plates 9', while its lower part, which is also narrower than said opening, is larger and is sufficiently long when suitably turned to be held under the overhanging parts of the Z-shaped plates, as indicated in Fig. 1. Each screw 10 can be screwed through a button or nut 11 to vertically adjust a finger 5, said finger 5 and the screw being connected, as shown, to permit free rotation of the latter.

By the above-described construction the upper part of button 11 can be manipulated to turn the longer part to a position either parallel with or transverse to the plates and to the opening between them, according as it is desired to engage said longer part of the button with the overhanging edges of the plate or not. Said longer part of the button, being narrower than the opening, can be passed between and below the plate edges or removed when suitably turned for the purpose.

The local adhesion of skins or the accumulation of exceptionally viscous or adherent material occurs, for example, toward the time of the passage of the remnants of a charge, which remnants are heavy and immobile. Such material falls behind that which is more fluid or tractable and it requires frequently to be removed with a spatula or the like operating near the edge of the doctor. To permit this, one or more fingers can be raised sufficiently for the purpose without disturbing others or releasing the main part of the doctor. It is preferred to combine with the plate-staying fingers 5 the tying-fingers 6. These may be secured in any convenient manner to the under side of the plate. In the present

instance these ends are pinned between ears made fast on the plate. Their opposite ends are held in the slots 12 of a bar 13, fixed to the frame by milled nuts 14, which can be screwed on the ties and up against the bar with the effect to pull down the edge of the doctor. The ties 6 diminish the number of fingers 5 which would otherwise be necessary to produce the best effect, and to this extent they facilitate the cleaning of the roller and plate in the manner just above described, because fewer fingers have to be lifted for the purpose. A good effect would be produced were either the fingers 5 or the ties 6 used alone in suitable numbers, but the use of both has been found to work very successfully. In a mill having a roller thirty-eight inches long seven fingers and six ties will give good results. The invention is not limited to the use of both the fingers and the ties, nor to any particular number of either, and the means for holding, adjusting, and forcing these devices home may be varied.

Having thus described my invention, what I claim is—

1. In a machine for grinding viscous material or the like, the combination with a roller, of a doctor and devices for holding the same intermediate its ends to obviate buckling or bending, said devices being adjustable transversely of the operative edge of the doctor and contiguous thereto; substantially as described.

2. In a machine for grinding viscous material or the like, the combination with a roller, of a doctor and devices for holding the same intermediate its ends to obviate buckling or bending, said devices consisting of removable fingers and means for applying them to the doctor near its edge, substantially as described.

3. In a machine for grinding viscous material or the like, the combination with a roller, of a doctor and devices for holding the same intermediate its ends to obviate buckling or bending, said devices consisting of separately-removable fingers and means for applying them to the doctor near its edge, substantially as described.

4. In a machine for grinding viscous material or the like, the combination with a roller, of a doctor and devices for holding the same intermediate its ends to obviate buckling or bending, said devices acting upon opposite sides of the doctor, substantially as described.

5. The combination of a roller, a doctor, fingers adapted to stay or hold the doctor and obviate its bending or buckling, a supporting-bar to receive the ends of said fingers and buttons or the like to lock the fingers in the bar and against the doctor, substantially as described.

6. The combination in a machine for grinding viscous material or the like, of a roller, a doctor, fingers adapted to stay or hold the doctor and obviate its bending or buckling, a

slotted supporting-bar to receive the ends of
said fingers and buttons or the like to lock
the fingers in the bar and against the doctor,
and bar-retaining bolts or screws entered in
5 the slots of the bar, substantially as described.

7. In a machine for grinding viscous material or the like, the combination with a roller,
of a doctor and devices for holding the same
intermediate its ends to obviate buckling or
10 bending, said devices comprising tying-fin-

gers to draw the doctor upon the roller, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

PHILIP LINDEMEYER, JR.

Witnesses:

ALBERT POPKINS,
HARRY Y. DAVIS.