C. P. STIRLING.

MACHINE FOR GRAINING LITHOGRAPHIC CYLINDERS.

APPLICATION FILED APR. 29, 1919.

1,328,603. Patented Jan. 20, 1920.

Fig. 1.

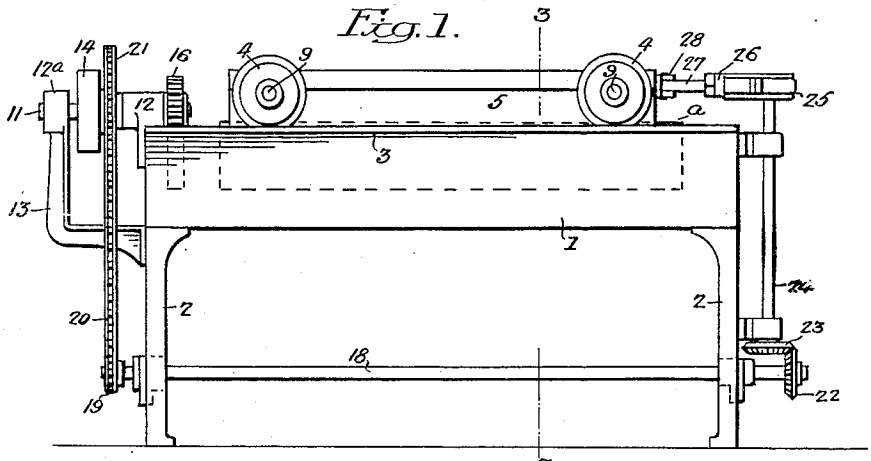


Fig. 2.

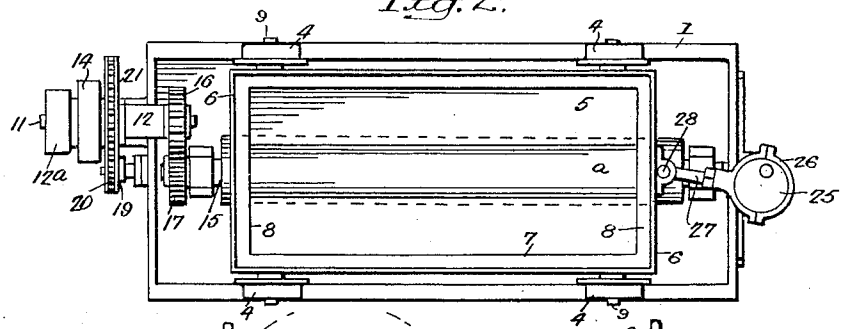


Fig. 3.

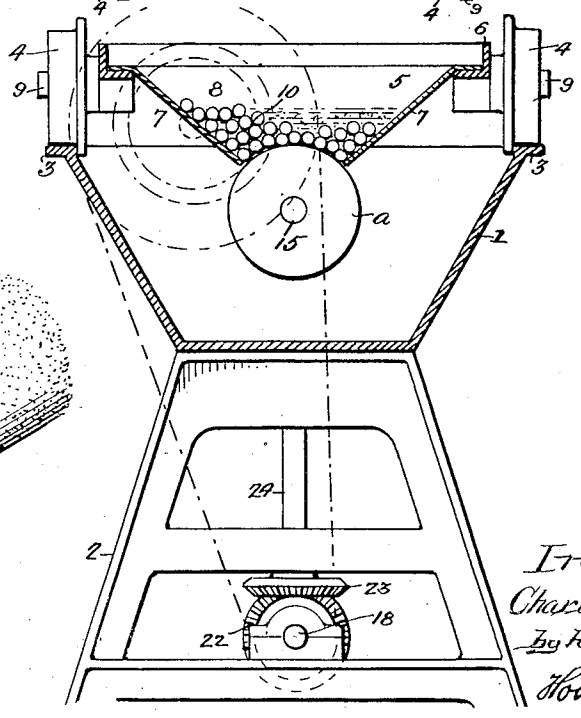
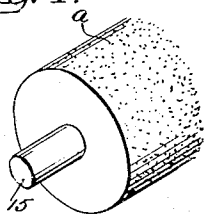


Fig. 4.



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MACHINE FOR GRAINING LITHOGRAPHIC CYLINDERS.

1,328,603. Specification of Letters Patent. Patented Jan. 20, 1920.

Application filed April 29, 1919. Serial No. 293,513.

To all whom it may concern:

Be it known that I, CHARLES P. STIRLING, a citizen of Austria, and a resident of Somerville, county of Somerset, State of New Jersey, having declared my intentions of becoming a citizen of the United States, have invented certain Improvements in Machines for Graining Lithographic Cylinders, of which the following is a specification.

The object of my invention is to construct a machine for graining the surface of a lithographic cylinder in such a manner that it will properly receive the design and will hold the ink and water during the printing operation.

In the accompanying drawings:

Figure 1 is a side view of my improved machine for graining the surface of lithographic cylinders;

Fig. 2 is a plan view;

Fig. 3 is a transverse sectional view on the line 3—3, Fig. 1; and

Fig. 4 is a perspective view of a portion of one of the grained cylinders.

1 is the bed of the machine made in the form of a trough in which is located the cylinder *a* of suitable material, such as zinc or aluminum, the surface of which is to be grained. This bed is carried by suitable supports 2. On the upper edge of the trough-shaped bed 1 are rails 3 on which travel the flanged wheels 4 mounted on studs 9 projecting from a hopper 5, which has inclined sides and which is open at the bottom, as shown in Fig. 3, so that the upper portion of the cylinder *a* extends into the hopper and forms the bottom thereof. In the present instance, the hopper has an angle iron frame 6 and sheet metal inclined sides 7 and is closed at each end by sheet metal end sections 8. The form of this hopper may be modified, if desired.

I provide mechanism for rotating the cylinder *a* and for reciprocating the hopper 5. Mounted in the hopper are a number of small balls 10, which are preferably of steel, although they may be of any suitable material, and, in some cases, of wood. These steel balls are agitated by the reciprocation of the hopper and to a certain extent by the rotation of the cylinder. The character of the material of the balls will depend upon the amount of graining required.

I place in the hopper a suitable quantity of flint, preferably mixed with water so as to form a paste. The surface of the roll is coated with water and flint held in suspension so that when the balls are agitated they tend to drive the particles of flint into the surface of the cylinder, roughening it to such an extent that it will be properly grained so that it can be used for lithographic purposes.

11 is the driving shaft adapted to suitable bearings 12 and 12^a, the latter being carried by a bracket 13 and on this driving shaft is a pulley 14 around which passes a driving belt. The spindle 15, which carries the cylinder *a*, is driven by the shaft 11 through gear wheels 16 and 17. Extending longitudinally of the machine, and under the bed 1, is a shaft 18 adapted to bearings on the supports 2. On one end of this shaft is a sprocket wheel 19 around which passes a chain 20 from a sprocket wheel 21 on the shaft 11. On the opposite end of the shaft 18 is a beveled gear wheel 22 which meshes with a beveled gear wheel 23 on a vertical shaft 24. On the upper end of this shaft is an eccentric 25 around which passes a strap 26 connected by a rod 27 to the pivot pin 28 on the hopper 5 so that as the shaft rotates the hopper 5 will be reciprocated and at the same time the cylinder will be turned.

When it is wished to grain a cylinder, it is located in the machine and the hopper placed in position, after which the balls are placed in the hopper with flint or sharp sand preferably moistened sufficiently so that it will coat the cylinder and when a rotary motion is imparted to the cylinder and a reciprocating motion is imparted to the hopper, the balls will be agitated. As the particles of flint pass under the balls, they will be driven by the balls into the surface of the cylinder and will roughen the surface sufficiently for lithographic purposes.

When it is desired to make deep impressions in the cylinder, then heavier balls are used with comparatively coarse flint or sand, but when the impression is to be comparatively light, then a fine grained flint is used and comparatively light balls are also used.

Water and flint passing through the hop-

per will be caught by the trough-like bed and can be returned to the hopper, if desired.

I claim:

1. The combination of a bed; means for supporting a cylinder in the bed; a hopper arranged to reciprocate above the bed, said hopper being open at the center to receive a portion of the cylinder; means for rotating the cylinder; and means for reciprocating the hopper, said hopper being adapted to receive balls and granular material for graining the cylinder.

2. The combination in a machine for graining a lithographic cylinder, of a bed; means for supporting a cylinder in the bed; a hopper having wheels mounted on the bed, said hopper being open at the center to receive the upper portion of a cylinder to be grained; means for reciprocating the hopper; and means for rotating the cylinder so that when balls and a granular material are placed in the hopper, the surface of the cylinder will be grained.

3. The combination of a bed; supports therefor, said bed having a rail at each side; a hopper having wheels mounted on the rails, said hopper having inclined sides and open at the center to receive the upper portion of the cylinder; a vertical shaft having an eccentric connected to the hopper; a longitudinal shaft geared to the vertical shaft; means for driving the longitudinal shaft from the power shaft; and gearing between the power shaft and a spindle on which the cylinder is mounted.

CHARLES P. STIRLING.