Jan. 4, 1949. J. M. SIMPSON 2,458,108

GRAINING APPARATUS

Filed March 25, 1946. 2 Sheets-Sheet 1

Fig. 1.

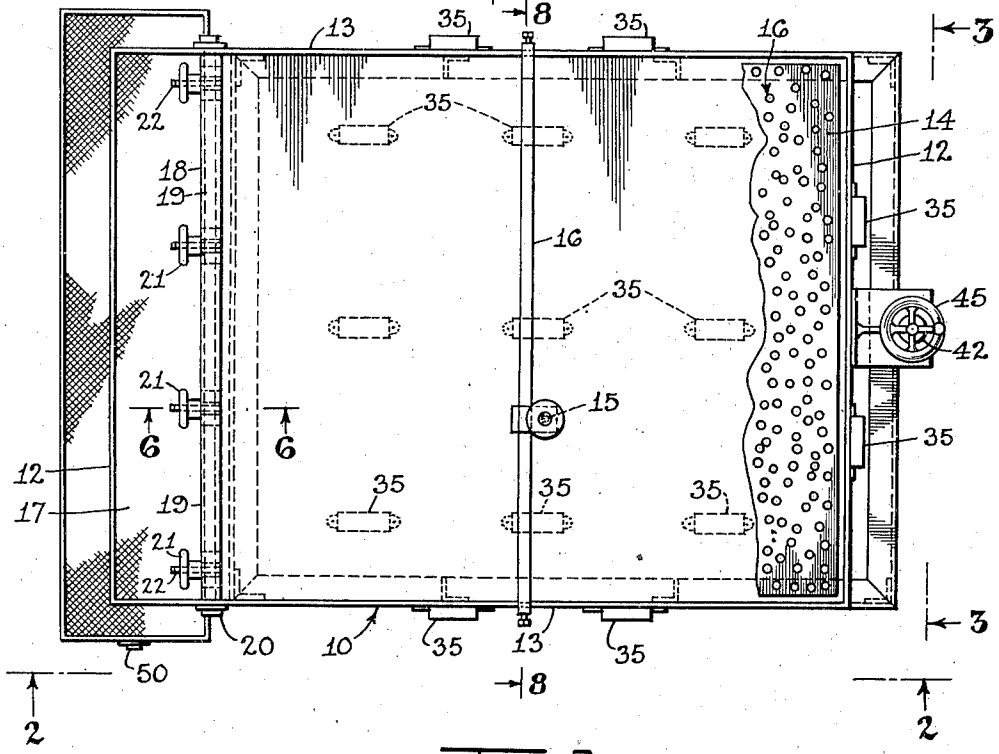
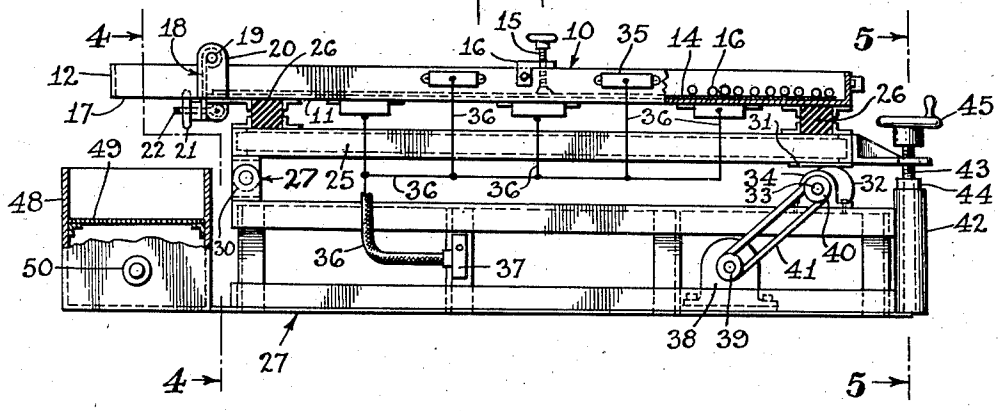


Fig. 2.



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Filed March 25, 1946 2 Sheets-Sheet 2

Fig. 3.

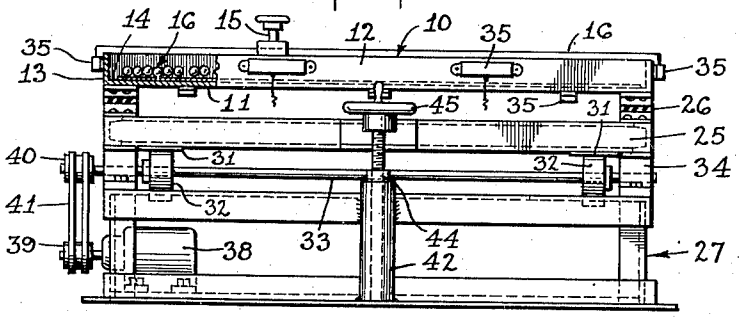


Fig. 4

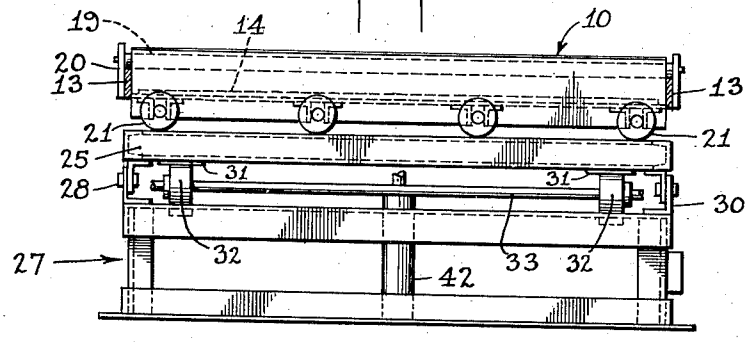


Fig. 5.

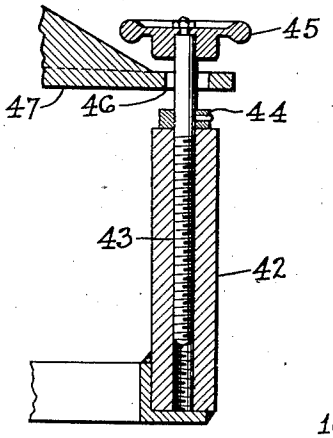


Fig. 6.

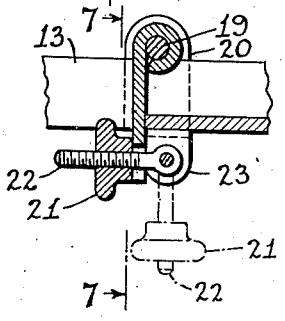


Fig. 7.

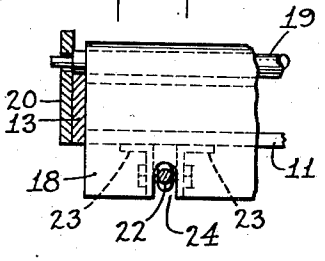
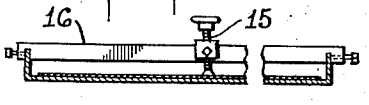


Fig. 8.



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UNITED STATES PATENT OFFICE

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GRAINING APPARATUS

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Application March 25, 1946, Serial No. 657,030

6 Claims. (Cl. 51—6)

1

This invention relates to improvements in "graining" machines and the like and more particularly to an apparatus for producing a grained surface on printing plates for use in "offset" presses.

The conventional machines now employed for this purpose generally comprise a flat tank or container into which the plates to be "grained" are inserted. The "graining" of these plates is usually accomplished by moving marbles and sand over the wet plates. This movement is usually imparted to the graining particles by rapidly gyrating the graining container or tank in comparatively large circulatory movements. The gyrating mechanisms in these conventional machines are subjected to great wear under the relatively heavy load of the graining tank with consequent reduction of the life of the machine. Furthermore, the type of grained surface produced by these conventional machines can not easily be controlled, and the texture of the grained surface usually lacks in depth and texture.

It is therefore among the objects of the present invention to provide a graining machine which will produce a more permanent texture and deeper grain and by means of which the type of grained surface can more easily be controlled.

A further object is to produce a machine of the class indicated which will have a simplified construction in comparison with those now in use with a consequent saving of cost in manufacture.

Other objects and advantages inherent in the invention will become apparent from the following specification taken in conjunction with the accompanying drawing which discloses a preferred embodiment of the inventive idea.

In the drawing:

Figure 1 is a top plan view of a graining apparatus according to the invention.

Figure 2 is a side view taken from the line 2—2 of Figure 1.

Figure 3 is an end view taken along the line 3—3 of Figure 1.

Figure 4 is an end view partly in section taken along the line 4—4 of Figure 2.

Figure 5 is a section taken along the line 5—5 of Figure 2 drawn to an enlarged scale.

Figure 6 is a fragmentary section along the line 6—6 of Figure 1 drawn to an enlarged scale.

Figure 7 is a fragmentary section along the line 7—7 of Figure 6.

Figure 8 is a section of the graining container showing how the plates to be grained are clamped in place.

Throughout the drawing the same reference

2

numerals serve to indicate the same or analogous parts.

Referring in greater detail to the drawing, the graining container or tank is generally designated by the reference numeral 10. The container comprises a bottom 11, end walls 12 and side walls 13.

The plates 14 to be grained, which usually are made of zinc, aluminum or some other suitable metal, are placed along the bottom of the container and may be clamped in position by the conventional clamps 15 which are adjustably mounted in the bar 16 which in turn is clamped over the edges of the graining container.

The graining marbles used together with sand and water to produce the grained surface are indicated by the reference numerals 16a.

Adjacent one end of the graining container, the bottom 11 is provided with an opening 17 and a hinged gate 18, which normally prevents the graining particles from escaping from the graining container. The purpose of this opening and gate will be explained in greater detail hereafter.

The hinged gate 18 is pivoted to the shaft 19, which extends transversely across the graining container, and is mounted in the brackets 20 which in turn are mounted on the side walls 13.

The hinged gate 18 is held in closed position against the interior edge of the opening 17 by means of the handwheel 21 which is adjustable on the bolt 22 which in turn is pivoted to the bracket 23. The bolts 22 are accommodated in the slots 24 of the gate 18. Thus, when the handwheel is loosened, the bolt will drop down to assume the position shown in dotted lines in Figure 6 of the drawing and the gate will be free to open.

The graining container 10 is mounted on the sub-frame 25 by means of the resilient blocks or cushions 26 of rubber or some other vibration absorbing material.

The sub-frame 25 is hinged at one end to the main frame generally indicated at 27 by means of the pivots 28 and the angle brackets 29 and 30 mounted on the sub-frame and the main frame, respectively.

The opposite end of the sub-frame 25 is provided with a bearing plate 31 which rests freely on the cams 32. These cams are keyed to the shaft 33 which is journalled in the brackets 34 on the main frame.

In terms of broad inclusion, the invention contemplates the accomplishment of the objects of the invention by imparting to the graining container a rapid vibratory pulsating movement in contradistinction to the gyrating or circular

movements usually described by containers in the apparatus heretofore used. This rapid vibratory pulsation of the container will cause the graining particles to move over the surface of the plate in such a manner as to quickly produce a greatly improved grained surface.

The means for producing the vibratory pulsating movement illustrated in the drawing comprises a plurality of electro-magnetic vibrators **35**, which are of conventional construction, and which may be attached to the bottom and to the sides of the graining container or to some other suitable part thereof. The individual vibrators **35** are connected by means of the wiring **36** to a control switch box **37**.

It will be understood that the number of vibrators or vibratory units used, depends upon the size and weight of the graining container, the speed of the graining and the type of grained surface desired.

It will also be understood that the speed of producing finished grained plates or the type of grained surface desired can be regulated by the speed and/or intensity of the pulsating vibrations imparted to the containers.

Although electro-magnetically actuated vibrators have been described herein, it will be understood that other types of vibrators may be used without departing from the spirit of the invention, such as hydraulic, pneumatic, mechanical, etc.

In addition to the pulsating vibratory movement of the container, a secondary rocking motion may be imparted thereto if desired to keep the graining particles moving over the entire surface of the plates. This rocking movement may be produced by the rotation of the cams **32** which will cause the sub-frame **25** to swing up and down about the pivot **23**. The shaft **33** carrying the cams **32** is rotated by the motor **38** through the means of the pulleys **39** and **40**, and the drive belt **41**.

The invention herein described may also be provided with means for raising the free end of the sub-frame **25** for the purpose of draining the graining particles and the sludge through the hinged gate **18** and the opening **17**. To this end a bracket **42** having a screw-threaded bore is connected to the base of the main frame **10**. The screw **43** is engaged in this bore and is provided with a collar **44** and a handwheel **45**. The portion of the screw between the collar **44** and the handwheel **45** is smooth and this part is engaged by the hole **46** in the bracket **47** which in turn is mounted on the sub-frame **25**. Normally the collar **44** rests on the bracket as shown in the drawings. Thus, there will be no interference with the rising and falling movement of the corresponding end of the sub-frame **25**. However, when the screw **43** is sufficiently turned by means of the handwheel **45**, the collar **44** will engage the bracket **47** and the further turning of the screw will cause the free end of the sub-frame to rise. Thus the graining container may be tilted to any desired angle and adjusted in such position.

A draining tank **48** of conventional construction may be placed underneath the opening **17** for the purpose of receiving the drainage from the graining container upon tilting thereof. This tank may be fitted with a perforated metal or a wire cloth **49** screen for the purpose of retaining the graining marbles. An outlet **50** may be provided for the purpose of removing excess water from the tank.

What is claimed is:

1. A grinding apparatus or the like comprising a main supporting frame, a sub-frame hinged at one end to said main frame, means carried by said main frame for movably supporting the opposite end of said sub-frame and for imparting thereto an up and down movement, a graining container, flexible means fixed on said sub-frame supporting said graining container on said sub-frame and means for reciprocatingly vibrating said graining container in a horizontal plane on said supporting means with respect to said sub-frame.

2. A graining apparatus or the like comprising a main supporting frame, a sub-frame hinged at one end to said main frame, means carried by said main frame for movably supporting the opposite end of said sub-frame and for imparting thereto an up and down movement, a graining container, flexible means fixed on said sub-frame supporting said graining container on said sub-frame, means for reciprocatingly vibrating said graining container in a horizontal plane on said supporting means with respect to said sub-frame and means for raising said opposite end of said sub-frame at will into adjusted positions out of contact with said movement imparting means so as to cause said graining container to assume various titled positions.

3. A graining apparatus or the like comprising a main supporting frame, a sub-frame hinged at one end to said main frame, means carried by said main frame for movably supporting the opposite end of said sub-frame and for imparting thereto an up and down movement, a graining container, cushion means supporting said graining container on said sub-frame, means for vibrating said graining container with respect to said sub-frame, means for raising said opposite end of said sub-frame at will into adjusted positions out of contact with said movement imparting means so as to cause said graining container to assume various tilted positions, and a hinged gate member adjacent the other end of said graining container for draining the contents thereof.

4. A graining apparatus or the like comprising a frame for supporting said apparatus on a base, a graining container, flexible means fixed on said frame for supporting said graining container on said frame, and means for reciprocatingly vibrating said graining container on said supporting means with respect to said frame.

5. A graining apparatus or the like comprising a frame for supporting said apparatus on a base, a graining container, flexible means fixed on said frame for supporting said graining container on said frame, means for reciprocatingly vibrating said graining container on said supporting means with respect to said frame, and means for imparting a rocking motion in a vertical plane to said graining container.

6. A graining apparatus or the like comprising a main frame for supporting said apparatus on a base, a sub-frame hingedly connected at one end to said main frame, a rotatable cam on said main frame for supporting the opposite end of said sub-frame, a graining container, resilient means supporting said graining container on said sub-frame, means for vibrating said graining container with respect to said sub-frame and means for rotating said cam.

JOHN M. SIMPSON.

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Certificate of Correction

Patent No. 2,458,108. January 4, 1949.

JOHN M. SIMPSON

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows:

Column 4, line 2, claim 1, for the word "grinding" read *graining*;

and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 14th day of June, A. D. 1949.

[SEAL]

THOMAS F. MURPHY,
Assistant Commissioner of Patents.