

No. 854,170.

PATENTED MAY 21, 1907.

F. I. MATTHEWS.
GRAINING MACHINE.

APPLICATION FILED MAY 7, 1906.

2 SHEETS—SHEET 1.

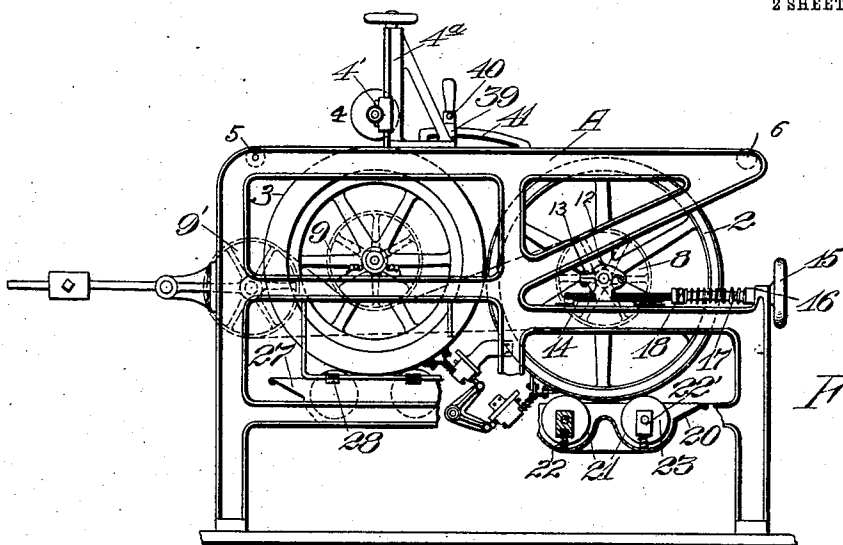


Fig. 1.

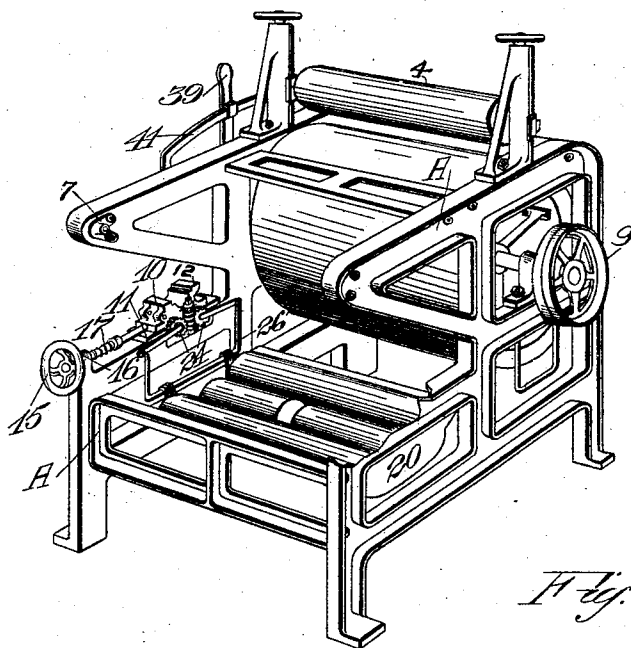


Fig. 2.

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Hastberg
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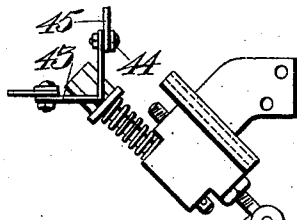


Fig. 3.

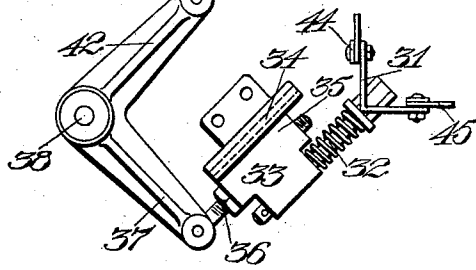


Fig. 4.

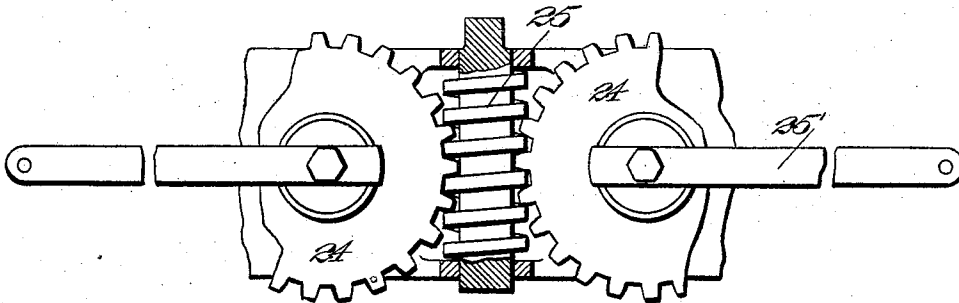


Fig. 5.

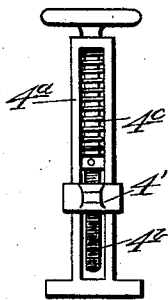


Fig. 6.

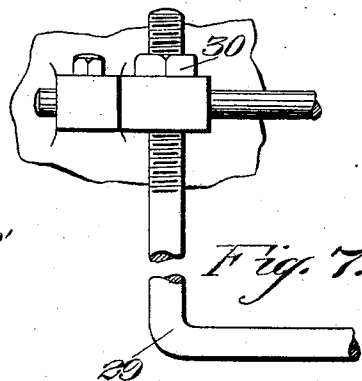
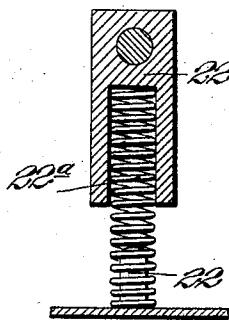


Fig. 7.

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UNITED STATES PATENT OFFICE.

FRANCIS I. MATTHEWS, OF OAKLAND, CALIFORNIA, ASSIGNOR TO THOMAS M. GARDINER AND MARSHALL C. HARRIS, OF SAN FRANCISCO, CALIFORNIA.

GRAINING-MACHINE.

No. 854,170.

Specification of Letters Patent.

Patented May 21, 1907.

Application filed May 7, 1906. Serial No. 315,544.

To all whom it may concern:

Be it known that I, FRANCIS I. MATTHEWS, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented new and useful Improvements in Graining-Machines, of which the following is a specification.

My invention relates to improvements in graining machines of the type in which a composition roller is adapted to take an impression from a pattern roller and to transfer this impression to a board, door, timber, strip of paper or other receiving body which is to be grained.

The principal objects of my invention are to provide means for the ready insertion or removal or change of the pattern roll; to provide for the proper adjustment of the pattern roll; to provide a simple and practical, and at the same time, a delicately adjusted form of scraper for the pattern and impression rolls, with means for quickly throwing the scrapers into and out of operative position; to provide novel and improved means for hanging and for adjusting the paint and cleansing-pans or fonts, and for supporting the paint rollers in the paint font; and generally to simplify construction and to produce a thoroughly practical and efficient machine.

The invention consists of the parts and the construction and combination of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a side elevation of the machine partly broken away and showing the paint font in partial section. Fig. 2 is a perspective of the machine with the pattern roller omitted. Fig. 3 is a detail of the scrapers. Fig. 4 is a detail of the mechanism for raising and lowering the paint font. Fig. 5 is a detail of the adjustable support for the presser roller. Fig. 6 is a detail of the spring-support for the end of the distributing roller. Fig. 7 is a detail of the means for supporting the pan which contains the cleansing agent.

A represents a frame of suitable construction supporting the several parts of the apparatus. This frame preferably consists, as here shown, of two main side castings suitably connected together and braced to form a rigid, substantial structure; these side castings being formed with re-entrant rear por-

tions in which the pattern or design roller 2 is adapted to be journaled. The importance of making the frame open at the rear by means of the re-entrant portions will be apparent later on.

The pattern roller 2 may be of any suitable construction and may have any form or pattern or design upon its periphery desired.

In the class of work for which this machine is particularly designed, it is usual to bend a veneer of the wood of which the grain is to be simulated around and secure it to the face of the roller. The bending of the veneer operates to project the growth or grain of the wood outward to produce the desired printing surface.

Suitably journaled in the frame and in proper relation to the pattern roller 2 and to the material to be operated on, is an impression cylinder 3, having a composition surface of soft, elastic material similar to the inking rollers of printing presses. Suitably positioned in relation to the impression cylinder 3 is a spring support presser roller 4 between which and the roller 3, the material to be grained is adapted to be passed.

5 and 6 are work supporting rollers suitably journaled in the ends of the frame; the rear roller 6 having its trunnions supported in radially slotted adjustable bearings 7 to permit of the ready removal of this roller when it is necessary or desired to take out or change the pattern roller 2.

The bearings for the rollers 5 and 6 are made adjustable as shown, so as to vary, if desired, the pressure of the material to be grained on the composition roller; the adjustment being effected by having these journals cast in the form of angles, which are pivoted at one end and slotted at the other to receive a set screw or bolt.

Motion is imparted to the impression cylinder 3 from any suitable source of power; and the pattern roller may be driven from the impression cylinder by frictional contact alone or by suitable belting passing over the pulleys 8—9 on the shafts of the respective rollers and around the weighted idler 9'. The advantage of driving by belting and idler as here shown, is that it permits the pattern roller to be backed up out of contact with the impression cylinder and to be revolved so that it can be thoroughly cleaned at the end

of a run or before it is removed from the machine. The positive drive of the two rollers in unison is also preferred in order to prevent slippage and possible blurring of the transferred pattern.

The journal boxes of the pattern roller are of a special design, and like the frame construction are intended to permit of a ready removal or change of the pattern roll. To this end the journals are made in two parts; the one part 10 which supports the weight of the roller, being slidable on suitable horizontal guides 11 on the frame; the other or cap portion 12 of the journals being hinged to their respective parts 10 and adapted to close over the shaft and to be locked by suitable means as shown at 13. Each journal is adapted to be independently reciprocated on its particular track 11, so as to move the pattern rollers up into contact with the impression cylinder or to carry it out of contact therewith. Therefore, each journal carriage 10 has an adjusting screw 14 provided with a hand-wheel 15, and journaled in a part 16 of the frame A. The screw 14 is threaded into the journal carriage 10, but has a smooth portion which is freely slidable in the bearings 16. A spring 17 surrounds the screw and has one end bearing against the part 16 and the other against an adjustable collar 18 on the screw. The purpose of the spring 17 is to press the pattern roller always in toward the composition roller as far as the screw 15 will permit it to go, or until further movement in that direction is limited by contact of the two rollers; at the same time the springs will allow the pattern roller to adapt itself to any unevenness or inequalities in the surface of the impression cylinder. This latter has a tendency after long use to become more or less irregular in outline. The springs can be set at any desired tension, so that the maximum pressure of the pattern roller on the impression roller can be definitely determined, and this pressure can be so regulated that no possible injury from too great a pressure by the rollers can come to either of them. The advantage of shiftable journal boxes of this type and the open construction of frame is apparent when it is considered that these pattern rolls are usually two or three feet in diameter, and even sometimes larger, and are very heavy, and there are usually a number of pattern rollers for each machine. Each roller having a different character of veneer or pattern adapted to the particular style of work or character of graining to be simulated. For instance, one roll will represent a mahogany pattern, another an oak pattern, another a maple pattern, and so on; each time a different pattern is wanted, a different roll must be inserted into the machine.

In my machine it is a very simple matter to make a change by merely backing up the

journals by means of the screws 14, opening the caps 12, removing the rear work supporting roller 6 and lifting out the pattern roller.

The presser roller 4 is supported and adjustable in much the same manner as the pattern roller; the presser roller having its ends journaled in the carriages 4', sliding on the vertical guides 4^a, while a screw 4^b having an operating hand-wheel, is journaled slidably in each guide 4^a and is threaded into a corresponding carriage 4'. A spring 4^c surrounds each screw 4^b and presses on an adjustable collar thereon and against a fixed part of the guide 4^a. Each end of the roller being independently adjustable it is possible to adapt the pressure of this roller to any kind of irregular work, like in graining moldings and the like, which may be considerably thicker at one side than at the other. The springs permit the roller to adapt itself to any inequalities in the work or in the impression cylinder, and thus avoid breakage. By having the screws 4^b threaded in the boxes 4' and slidable lengthwise in their bearings in the guides 4^a, and by having the springs supported against the collars of the screws, the tension of the springs is unaffected whether the roller 4 is perfectly level, or inclined, or whether it is half an inch or four inches, or any other working distance from the impression cylinder.

Suitably supported beneath the pattern roller when the same is in position in the end of the machine is a paint font or pan 20. This pan is preferably made with two trough-like longitudinally extending depressions 21, having vertical guides 22 at their ends for the receipt of the spring supported journals 22' of the distributing rollers 23; a roller 23 being contained in each of the depressions 21 and adapted to contact with the surface of the pattern roller when the latter is in position. The journals 22 each consists of a block supporting and housing a spring 22^a; the spring being adapted to rest on the bottom of the pan and sustaining the weight of an end of the roller.

The pan 20 is adapted to contain a suitable paint or coloring medium and the two channels 21 are centrally connected so that the level of the liquid in the two channels may be maintained uniform. Inasmuch as the pattern roller is adapted to be moved back and forth, to and from the impression cylinder, it is desirable that the pan 20 should partake of the same reciprocatory movement of the roller and to always be maintained in the same position relative to the roller, consequently it is for this reason that I suspend the pan 20 direct from the boxes 10, so that when the boxes move the pan moves with them. Accordingly, each box 10 carries two pinions 24 turning on horizontal axes and engage an intermediate worm 25, which may be turned by suitable means as a wrench

engaging a polygonal end of the worm. Secured to the pinion 24 are oppositely extending radial arms 25, and from the ends of these arms, an end of the pan 20 is pivotally suspended by suitable means, as the links 26. This worm and double pinion arrangement permits of a very satisfactory adjustment of the pan to bring the rollers 23 into contact or to carry them out of contact with the pattern roller, and at the same time forms a positive lock to maintain the rollers in position after once being adjusted. By having the pan carried by the journals, the distributing rollers 23 can be adjusted relative to the pattern roller and the latter afterward moved up into contact with the impression cylinder. It is usually a matter of considerable difficulty to adjust the paint-font and distributing rollers nicely to the pattern roller where the font is supported independently in the frame.

A pan 27, similar in construction to pan 20 and provided with distributing rollers 28, similar to and similarly supported as rollers 23 is adjustably hung beneath the impression cylinder 3. The pan 27 is adapted to contain a suitable solvent or cleansing agent, as gasoline, by which the paint remaining on the cylinder after each impression is removed.

As it is not necessary to change the position of the impression cylinder after it is once set into the machine, a somewhat simpler arrangement for supporting the pan 27 is provided than that described in connection with the paint-font 20. As here shown, I employ bails or stirrups 29, which are pivotally and adjustably hung at their upper ends, and into which the ends of the pan are set. The bails are pivotally hung to permit them to be swung outward to release the pan, and they are adjusted by means of the screws 30 to raise or lower the rollers 28.

In order to remove any excess paint or coloring matter from the pattern roller as it leaves the distributors in the paint-font, and also to remove any dirt and specks that might otherwise be carried over onto the impression cylinder, I provide an angle iron scraper 31, removably supported at the ends in the slotted spring pressed pins 32, which latter are carried by a limited sliding movement in the carriages 33; each carriage 33 is slidable in a guide 34 on the frame A. Sleeves 35 are threaded in the carriages 33 and bolts 36, pivoted on arms 37 on a rock shaft 38, are threaded in the sleeves. The rock-shaft may be operated by a hand-lever 39, which has a suitable locking device 40 engaging a rack 41 whereby the shaft after being turned as desired may be held in that position. The shaft 38 has another set of arms 42 operating an angle iron scraper 43 by means of a similar arrangement of screw, sleeve, carriage and spring pressed pin. The scraper 43 is adapted to bear on the impres-

sion cylinder and clean and dry the same after it passes through the cleansing bath any before contact with the pattern cylinder.

If desired the arms 37 and 42 at each end of the rock-shaft 38 may be made in one piece in the form of a bell crank lever as here shown. By throwing the lever 39 in one direction, both scrapers 31 and 43 are carried simultaneously into contact with the respective rollers; moving the lever in the opposite direction carries the scrapers out of engagement with the rollers.

Each of the angle bars 31 and 43 have suitable means as the clamp bars 44, between which and the body of the angle bars are clamped strips 45 of leather or rubber or the like; it being understood that the strips 45 constitute the scraping surfaces of the scrapers.

The advantage of the double or V-shaped scraper of the present construction is that all vibration is prevented which sometimes occurs with single line scrapers and results in an imperfectly cleaned surface, or a surface on which the paint is imperfectly distributed. This angle iron scraper prevents any spring in the center which is liable to occur with a long cylinder and with a single bar scraper. My scraper bears with equal pressure the entire length of the cylinder, and anything to be removed which is not caught by one wing of the scraper is very sure to be caught by the second wing. The collars 35 and the screws 36 permit of a perfect adjustment of both scrapers, and the springs on the pins 32 prevent either scraper or either end of a scraper from bearing too hard on its cylinder.

When the machine is standing idle it is essential that the scrapers as well as the various distributing rollers should be out of contact with the respective cylinders, and that the latter should be out of contact with each other. The several adjustments and improvements which I have provided, permit this to be quickly and easily done.

In operation with the various parts assembled and the proper adjustment made, the cylinders are set in motion and the pattern cylinder is adapted to take up the filler from the paint-font and apply by contact with the impression cylinder the precise pattern on the latter, which is delineated on the pattern cylinder. The matter to be grained being passed between the impression cylinder and the presser roller 4 receives from the impression cylinder a pattern or design similar to that which the impression cylinder received from the pattern cylinder. The cylinder 3 after depositing its impression passes through the cleansing bath and is cleansed and afterward dried ready to receive a fresh impression from the pattern cylinder.

This machine is adapted for graining on wood, paper, or other surfaces, and when the

grain product is dried and finished up it is almost impossible to tell it from the original wood pattern which it simulates.

It is possible that various modifications in my invention may be made without departing from the principle thereof, and I do not wish to be understood as limiting myself to the specific construction as herein shown and described.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. In a graining machine, the combination of a frame open at the rear, an adjustably, yieldingly-mounted pattern roller journaled in the open portion of said frame and readily removable therethrough, a transfer roller, a spring supported presser roller, sliding carriages for the journals of the pattern roller and a paint-font carried by and movable with said carriages.

2. In a graining machine, the combination of a frame, comprising two side castings suitably supported to form a rigid structure, said side castings having re-entrant portions at one end, track-ways formed in said re-entrant portions, sliding carriages on said track-ways and an adjustable, yieldingly-mounted pattern roller journaled on and movable with said carriages.

3. In a graining machine, the combination of a frame, comprising two side castings suitably supported to form a rigid structure, said side castings having re-entrant portions at one end, track-ways formed in said re-entrant portions, sliding carriages on said track-ways and a pattern roller journaled on and movable with said carriages, and spring-pressed screws for reciprocating said carriages.

4. In a graining machine, the combination of a frame, comprising two side castings suitably supported to form a rigid structure, said side castings having re-entrant portions at one end, track-ways formed in said re-entrant portions, sliding carriages on said track-ways and a pattern roller journaled on and movable with said carriages, and a paint-font supported by and movable with said carriages.

5. In a graining machine, the combination of a frame comprising two side castings having re-entrant portions at one end, horizontal trackways formed in said re-entrant portions, carriages slidable on said trackways, a pattern roller journaled on and movable with said carriages, horizontally disposed screws in the re-entrant portions of the side castings and engaging the carriages for adjusting said carriages, said screws each having a threaded portion engaging a carriage and having another and unthreaded portion slidable horizontally in a side casting of the frame.

6. In a graining machine, the combination with a suitable frame, an adjustable pattern

roller, and sliding boxes for the roller, of a paint-font and means whereby it is supported from the boxes, and means including a pair of pinions and intermediate operable means for adjusting the paint-font relative to the pattern roll.

7. In a graining machine, the combination of a frame, a pattern roller, sliding boxes therefor, a paint-font, means for adjustably supporting said font from said boxes, said means including a pair of pinions and an intermediate worm.

8. In a graining machine, the combination of a frame, a pattern roller, a paint-font and means for adjustably supporting said paint-font relative to said roller, said means including a worm and a pinion on each side thereof, and suspending means between the pinions and the font.

9. In a graining machine, the combination of a frame, a pattern roller and paint-font, a means for adjustably supporting said paint-font relative to said roller, said means including a worm and pinion and bail connections between the pinion and the font.

10. In a graining machine, the combination with a frame and a pattern roller journaled therein, of a paint-font, and means for adjustably supporting the same relative to said roller, said means including a pair of pinions and an intermediate worm for operating them, arms on the pinions and connections between the arms and the font.

11. In a graining machine, the combination of a frame, pattern roller and a transfer cylinder, of a cleansing font for the latter, and means for adjustably supporting said font relative to said roller, said means including a bail pivotally supported to swing outward from the machine, said bails having their upper ends threaded, and nuts engaging said ends whereby the font may be raised and lowered.

12. In a graining machine, the combination of a frame, pattern and transfer cylinders carried thereby, respective fonts for said cylinder, scrapers for said cylinders, and means for carrying said scrapers simultaneously into contact with their respective cylinders or for removing them out of contact there-

with.

13. In a graining machine, the combination with a frame and roller, and means to apply a pigment or other coating thereto, of a spring-pressed scraper for said roller, said scraper being essentially V-shaped in cross section and having a plurality of scraping parts to engage the roller, a movable support for the scraper and means to move the scraper into and out of engagement with the roller.

14. In a graining machine, the combination with a frame and roller, and means to apply a pigment or other coating thereto, of a scraper for said roller, said scraper being essentially V-shaped in cross section and hav-

ing a plurality of scraping parts to engage the roller, and means to move the scraper into and out of engagement with the roller, said last named means including a rock-shaft and operating lever.

15. In a graining machine, the combination with a frame and roller, and means to apply a pigment or other coating thereto, of a scraper for said roller, said scraper being essentially V-shaped in cross section and having a plurality of scraping parts to engage the roller, and means to move the scraper into and out of engagement with the roller, said last named means including a spring support for the ends of said scraper and adjustable sliding carriages for said support.

16. In a graining machine, the combination with two suitably supported rollers, one a pattern roller and the other a transfer roller, of a paint-font in connection with the pattern roller, and a cleansing-font in connection with the transfer roller, a spring supported scraper for each roller, and means for simultaneously moving said scrapers into engagement with their respective rollers and for moving them simultaneously out of engagement therewith.

17. In a graining machine, the combination of a pattern roller, a transfer roller, respective liquid applying devices for said rollers, spring pressed scrapers for the rollers, adjustable sliding carriages for each scraper and operative means common to both carriages for actuating the scrapers simultaneously.

ers, spring pressed scrapers for the rollers, adjustable sliding carriages for each scraper and operative means common to both carriages for actuating the scrapers simultaneously.

18. In a graining machine, the combination of a pattern roller, a transfer roller, respective liquid applying devices for said rollers, spring-pressed scrapers for the rollers, adjustable sliding carriages for each scraper, operative means common to both carriages for actuating the scrapers simultaneously, and means for adjusting the tension of each scraper independently.

19. In a graining machine, the combination with a suitably supported pattern roller, of a paint-font for said roller, said paint-font comprising a pan having parallel depressions, distributing rollers journaled in said depressions, means for adjusting said pan to carry said rollers into and out of contact with said pattern roller and means for resiliently supporting said distributing rollers in said pan.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

FRANCIS I. MATTHEWS.

Witnesses:

HARRISON S. ROBINSON,
FREDA R. GROTHUR.