July 28, 1925. 1,547,250

G. P. WILSON

STRAIGHTENING AND SOLIDIFYING MACHINE

Filed Aug. 13, 1923 2 Sheets-Sheet 1

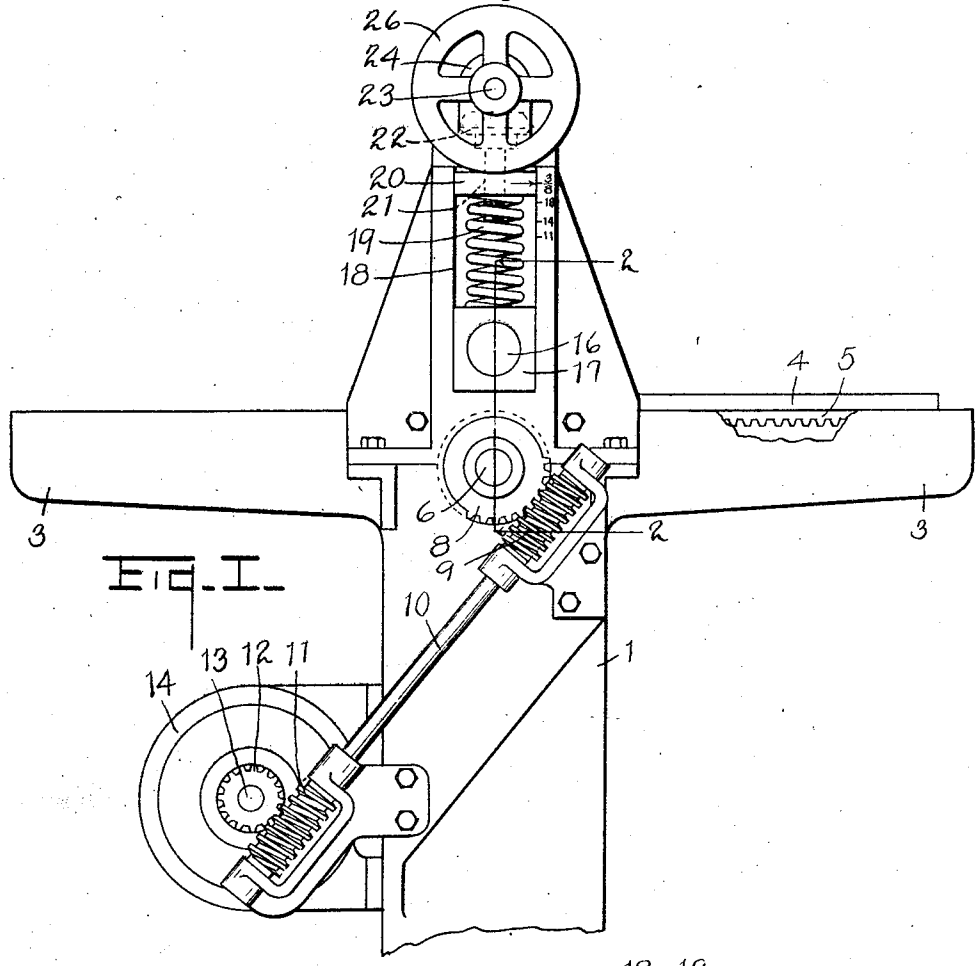


Fig. I.

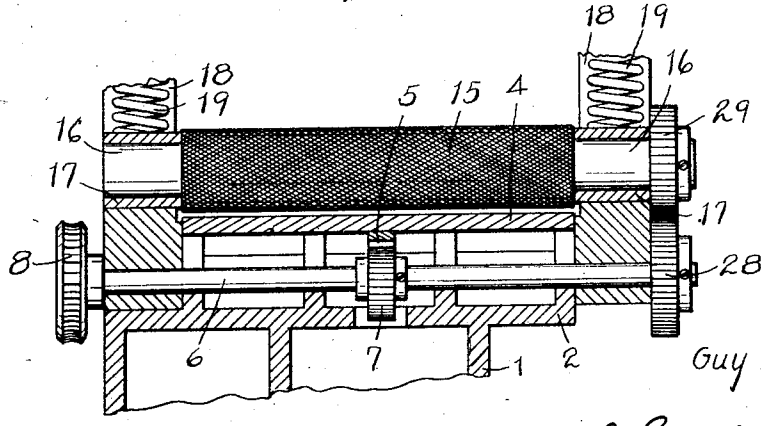


Fig. II.

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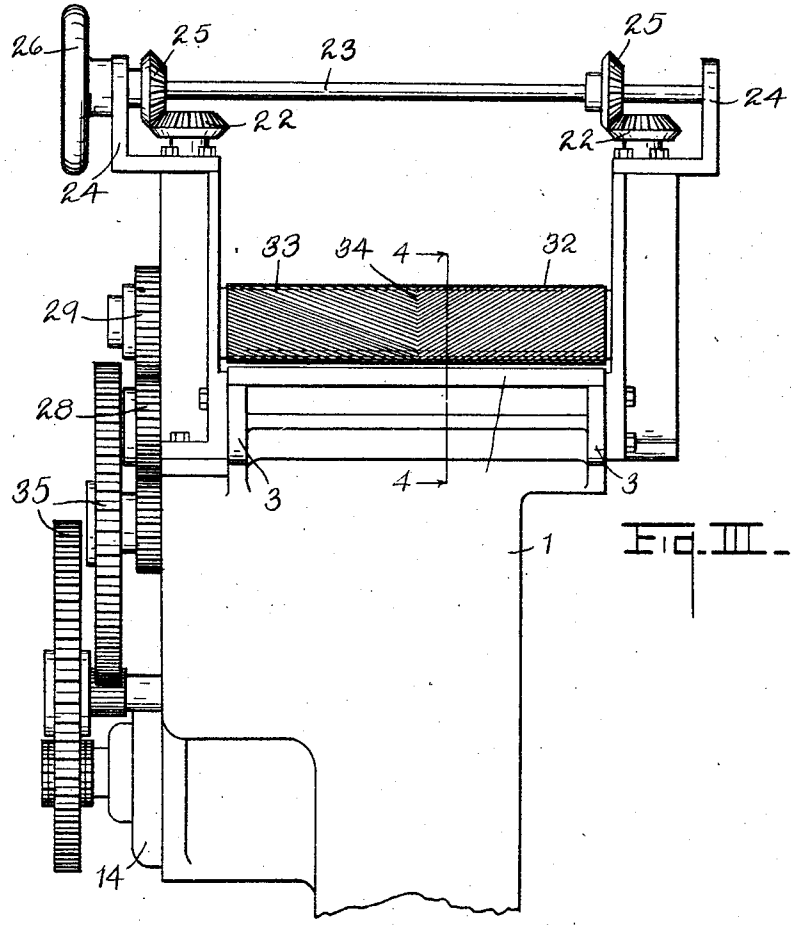


FIG. III.

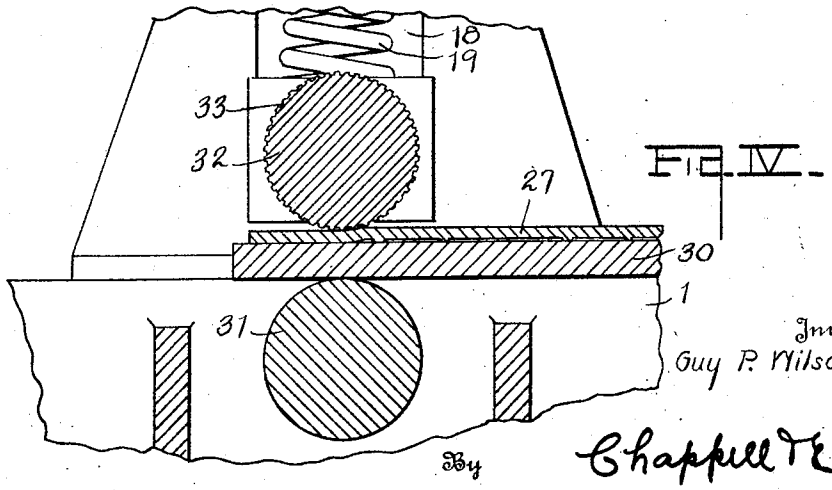


FIG. IV.

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UNITED STATES PATENT OFFICE.

GUY P. WILSON, OF KALAMAZOO, MICHIGAN.

STRAIGHTENING AND SOLIDIFYING MACHINE.

Application filed August 13, 1923. Serial No. 657,252.

To all whom it may concern:

Be it known that I, GUY P. WILSON, a citizen of the United States, residing at Kalamazoo, county of Kalamazoo, State of Michigan, have invented certain new and useful Improvements in Straightening and Solidifying Machines, of which the following is a specification.

This invention relates to improvements in straightening and solidifying machines.

In the manufacture of electroplates, etchings and the like the printing surfaces frequently have high and low spots and it is the common practice to eliminate these high and low spots by hammering. This requires great skill and judgment and the frequent use of calipers so that this operation in the making of plates is expensive.

The main objects of the invention are:

First, to provide a straightening machine which is well adapted for the straightening and solidifying of printing plates, such as electroplates and the like which frequently become distorted in steps of manufacture or the printing face has high spots and low spots.

Second, to provide an improved straightening machine adapted for the purpose indicated which is effective in the straightening and solidifying of the plates so that the printing surfaces are all in one plane or properly presented which does not distort or draw the plates so as to align or distort the figure or type on the plate.

Third, to provide a straightening machine adapted for the uses indicated which requires very little skill to successfully operate.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification. The invention is clearly defined and pointed out in the claims.

A structure which is a preferred embodiment of my invention is clearly illustrated in the accompanying drawing, forming a part of this application, in which:

Fig. I is a side elevation of a straightening machine embodying the features of my invention, a portion of the pedestal and a portion of the carriage ways being broken away.

Fig. II is a detail vertical section on a line corresponding to line 2—2 of Fig. I.

Fig. III is an end elevation of a modified form of my invention.

Fig. IV is a detail vertical section on a line corresponding to line 4—4 of Fig. III, a printing plate being shown passing through the machine.

In the drawing similar reference characters refer to similar parts throughout the several views and the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

Referring to the drawing, the main frame of the machine comprises a pedestal 1 with a suitable bed 2 extended at each side of the pedestal into ways 3. A plate-like carriage 4 is slidably mounted upon the ways 3, the ways being of such length that the carriage is slidably supported throughout, the carriage resting flat upon the ways, as illustrated, thus obviating any springing of the carriage. The carriage has a rack 5 on its under side disposed centrally and longitudinally thereof.

Extending transversely of the bed 2 is a carriage driving shaft 6 having a pinion 7 thereon meshing with the rack so that the carriage is positively driven. The shaft 6 is provided with a worm gear 8 meshing with the worm 9 on the shaft 10. The shaft 10 has a second worm 11 meshing with the pinion 12 on the driving shaft 13 of the motor, shown conventionally at 14. The pressure roller 15 is provided with journals 16 at its ends carried by the bearing blocks 17 supported in the guides 18 for vertical movement therein. Tension springs 19 are supported by thrust blocks 20 which are adjusted by means of the screws 21 having beveled pinions 22 on their upper ends.

An adjusting shaft 23 extends across the machine, it being supported by the brackets 24 and provided with pinions 25 meshing with the pinions 22.

A hand wheel 26 is provided so that both screws may be simultaneously adjusted, thus getting a uniform pressure on the roller.

The printing plate, shown conventionally at 27, is laid flat upon the carriage, the surface of which is machined and carried forward by the carriage below the pressure roller which consolidates the metal and conforms the plate so that its printing surface is in the same plane.

To prevent distortion the speed of the carriage is the same as the peripheral speed of the roller, the shaft 6 being provided with a gear 28 meshing with the gear 29 on the roller 15. The surface of the roller is serrated or knurled, the serrations being formed by cross grooves disposed diagonally; that is, the grooves are cut at an angle to longitudinal and transverse planes of the roller. This is found effective to prevent the flowing action of the printing plates which would result in distortion as the plate is passed through the machine.

In the modification shown in Figs. III and IV the rack 5 is omitted from the carriage 30 which otherwise is the same as the carriage 4, the carriage being fed and supported by the roller 31 disposed directly below the pressure roller 32. The pressure roller 32 is provided with tension springs the same as described.

The serrations of the surface of the pressure roller 32 differ slightly from those of the roller 15 in that the serrations 33 extend in both directions from a central point 34 and there are no crossing serrations.

This form is also effective in preventing distortion of the plate.

In the embodiment shown in Figs. III and IV a train of gears, designated generally by the numeral 35, is substituted for the worm and shaft driving connections illustrated in Fig. I.

My improved straightening machine is very efficient and effective for straightening and solidifying printing plates bringing the printing face into a proper plane and, as stated, the machine may be successfully operated by persons not specially skilled.

I have illustrated and described my improvements in embodiments which I have found very practical. I have not illustrated or described certain embodiments or adaptations which I contemplate as I believe the disclosure made will enable those skilled in the art to which this invention relates to embody or adapt the same as may be desired.

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

1. In a machine of the class described, the combination of a frame provided with ways, a flat plate-like carriage supported directly by and sliding on said ways, said ways being of such length that the carriage is supported throughout its length, a rack on the under side of said carriage, a feed shaft disposed on said frame transversely below said carriage and provided with a pinion meshing with said rack on said carriage, a pressure roller having journals at its ends, coacting gears on said feed shaft and pressure roller, bearing blocks for said journals, said frame having vertical guides for said bearing blocks, pressure springs for said bearing blocks, thrust blocks for said springs, adjusting screws for said springs arranged in said guides, adjusting screws for said thrust blocks provided with beveled gears at their upper ends, and an adjusting shaft mounted on said frame and having gears coacting with said gears on said thrust blocks whereby the adjusting screws may be simultaneously adjusted.

2. In a machine of the class described, the combination of a frame provided with ways, a flat plate-like carriage supported directly by and sliding on said ways, said ways being of such length that the carriage is supported throughout its length, a rack on the under side of said carriage, a feed shaft disposed on said frame transversely below said carriage and provided with a pinion meshing with said rack on said carriage, a pressure roller having journals at its ends, coacting gears on said feed shaft and pressure roller, bearing blocks for said journals, said frame having vertical guides for said bearing blocks, and pressure means for said pressure roller.

3. In a machine of the class described, the combination of a frame provided with ways, a flat plate-like carriage supported directly by and sliding on said ways, said ways being of such length that the carriage is supported throughout its length, a rack on the under side of said carriage, a feed shaft disposed on said frame transversely below said carriage and provided with a pinion meshing with said rack on said carriage, a pressure roller having a uniformly serrated surface, the serrations being formed by crossing diagonally disposed grooves, said roller having journals at its ends, coacting gears on said feed shaft and pressure roller, bearing blocks for said journals, said frame having vertical guides for said bearing blocks, and pressure means for said pressure roller.

4. In a machine of the class described, the combination of a frame provided with ways, a carriage mounted on said ways, a rack on the under side of said carriage, a feed shaft disposed on said frame transversely below said carriage and provided with a pinion meshing with said rack on said carriage, a pressure roller having a uniformly serrated surface, the serrations being formed by diagonally disposed grooves, coacting gears on said feed shaft and pressure roller, bearing blocks for said roller, said frame having vertical guides for said bearing blocks, pressure springs for said bearing blocks, and means for regulating the tension of said springs.

5. In a machine of the class described, the combination of a frame provided with ways, a carriage mounted on said ways, a rack on the under side of said carriage, a feed shaft disposed on said frame transversely below said carriage and provided with a pinion

meshing with said rack on said carriage, a pressure roller, coacting gears on said feed shaft and pressure roller, bearing blocks for said roller, said frame having vertical guides for said bearing blocks, pressure springs for said bearing blocks, and means for regulating the tension of said springs.

6. In a machine of the class described, the combination of a frame provided with ways, a plate-like carriage supported directly by and sliding on said ways, said ways being of such length that the carriage is supported throughout its length, a pressure roller having a uniformly serrated surface, the serrations being formed by diagonally disposed grooves, driving means for said carriage, a pressure roller, bearing blocks for said roller, said frame having vertical guides for said bearing blocks, pressure springs for said bearing blocks, and means for adjusting the tension of said springs.

In witness whereof, I have hereunto set my hand.

GUY P. WILSON. [L. S.]