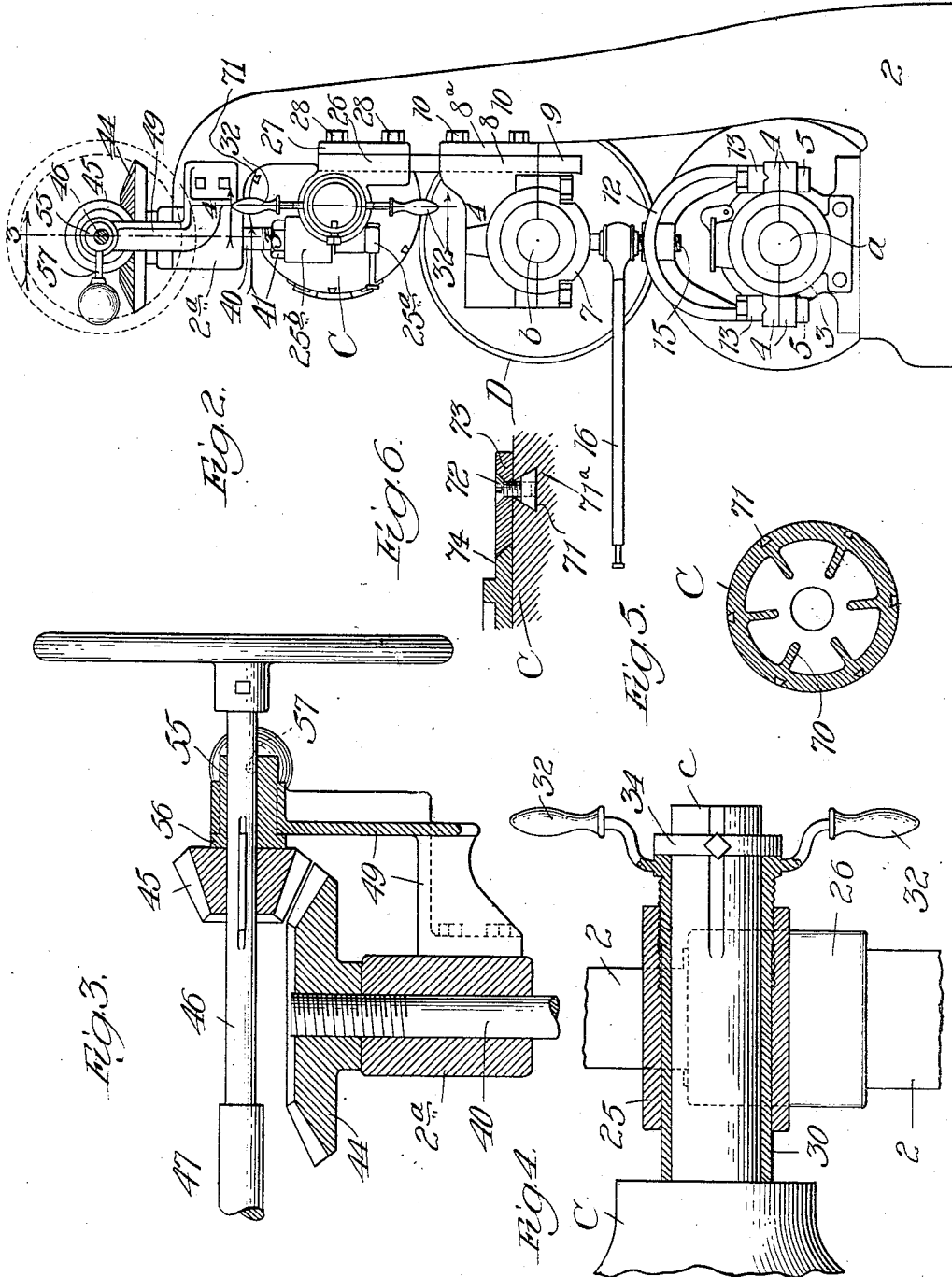


C. G. OBERLEY.
 APPARATUS FOR WATERMARKING PAPER.
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2 SHEETS—SHEET 2.



Witnesses:
Wm. L. Bowman

Inventor:
Charles G. Oberley
 By *Wm. Fisher Delapp*
Att'y

UNITED STATES PATENT OFFICE.

CHARLES G. OBERLEY, OF MUNISING, MICHIGAN.

APPARATUS FOR WATERMARKING PAPER.

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To all whom it may concern:

Be it known that I, CHARLES G. OBERLEY, a citizen of the United States, residing at Munising, in the county of Alger and State of Michigan, have invented certain new and useful Improvements in Apparatus for Watermarking Paper, of which I do declare the following to be a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

The present invention has for its object to provide improved means for effecting the water marking of paper and the invention consists in the features of novelty hereinafter described, illustrated in the accompanying drawings and particularly pointed out in the claims at the end of this specification.

Figure 1 is a view in front elevation of the machine embodying my invention. Fig. 2 is an end view of said machine. Fig. 3 is an enlarged detail view in vertical section on line 3—3 of Fig. 2. Fig. 4 is an enlarged detail view in vertical section through one of the journals of the impression roll and the adjusting sleeve thereon. Fig. 5 is a view in vertical cross section through the marking roll. Fig. 6 is a detail sectional view through a part of the marking roll, showing a preferred manner of holding the electrotype thereon.

My improved water marking mechanism will preferably be located between the last press rolls and the first driers of a paper making machine, although it may be located at any other point at which it will be found adapted to mark the web of paper while the latter still retains sufficient moisture; or in some cases, the improved mechanism may be used with advantage even after the paper has been calendered. Inasmuch as the invention relates to the marking mechanism itself, regardless of its relation to the paper making machine in connection with which it will be used, I have not deemed it necessary to illustrate a paper making machine in the accompanying drawings.

In the preferred embodiment of my invention, I employ a set of three vertically arranged rolls, viz., a bottom roll, an intermediate or impression roll and a marking roll, although in some instances the use of a bottom roll may be dispensed with. These several rolls, which are designated respectively A, B and C, are mounted in suitable bearings on the side frames 2. As shown,

the bearings 3 for the journals *a* of the bottom roll are supported on a forwardly extending portion of the side frames 2, these journal bearings 3 being shown as divided bearings, the flanges 4 of which are connected together by the through bolts 5. Revolution will be imparted to the bottom roll A by means of a suitable pulley fixed to the end of one of the journals *a* of the roll A.

The intermediate or impression roll B is preferably driven by frictional contact with the roll A and the journals *b* of this roll B are mounted in sectional bearings 7 that are adjustably mounted upon the side frames 2 of the machine. As shown, the upper portions of the bearings 7 are provided with extensions 8 to engage the vertical side ribs 9 of the frames 2 and the bearings 7 are held in place by cleats or plates 8^a through which pass the set screws 10, the ends of which screws enter threaded sockets formed in the extensions 8. Preferably, the intermediate or impression roll B is a rubber covered roll and the covering of this roll may consist of rubberized cloth D. Provision is made for effecting the vertical adjustment of the roll B, such provision consisting preferably of yoke-shaped frames 12 having offset lower ends 13 that rest upon the flanges 4 of the journal bearings of the roll A, these frames 12 being held in place by the bolts 5 that pass through the offset ends 13 and through the flanges 4 beneath them (see Fig. 1). In the crown of each of the yoke-shaped frames 12 is formed a threaded opening to receive a correspondingly threaded ratchet screw 15, the upper end of which bears against the bottom of the corresponding journal bearing 7 of the impression roll B, this ratchet screw 15 being adjusted by a suitable handle 16. By means of the ratchet screw 15 the vertical adjustment of the roll B may be readily effected, in order to lift the roll B away from forcible bearing on the roll A when the machine is out of action and thus prevent the "setting" of the rubber cover D of the roll B.

Upon the end of one of the journals *b* of the impression roll B is mounted a gear wheel 20 that meshes with a gear wheel 21 upon the journal *c* of the marking roll C, these gears 20 and 21 serving to insure substantially the same peripheral speed of the impression and marking roll.

The marking roll C has its journals *c* mounted in vertically adjustable bearings 25,

these bearings being preferably split at the front for adjustment by means of the screws 25^a. These bearings 25 are formed with extensions 26 to engage the vertical side ribs 5 of the frames 2 and the bearings are held in place by cleats or plates 27 through which pass the set screws 28, the ends of these set screws entering threaded sockets formed in the extensions 26.

10 In order to enable the marking roll C to be longitudinally adjusted for the purpose to be presently stated, I place within one of the bearings 25 of the marking roll a sleeve or bushing 30 in which the journal *c* 15 of the roll C is free to revolve and through which said journal passes, the inner end of this sleeve or bushing 30 bearing against the end of the roll C. This bushing 30 is formed near its outer end with a screw threaded 20 portion 31 that engages with the correspondingly threaded outer end of the bearing 25. The end of the bushing 30 is provided with handles 32 that may be formed integral therewith, whereby the bushing may be conveniently turned. At the outer end of the bushing 30 a collar 34 is secured to the shaft. Hence, it will be seen that when it is desired to longitudinally adjust the roll C, this can be effected by turning the bushing 30 by 30 means of its handles 32. The marking roll C carries the type or desired design that is to be impressed upon the web of paper and the longitudinal adjustment of the roll C enables the accurate positioning or alinement 35 of such design with respect to the web of paper to be marked.

Each of the journal bearings 25 is formed at its front with an extension 25^b having a threaded socket therein to receive the correspondingly threaded lower end of an adjusting screw shaft 40, the lower end of the shaft 40 being held in its threaded seat preferably by a jam nut 41. Each of the shafts 40 passes upward through a hole formed in 45 the forwardly projecting upper end 2^a of the side frame and the threaded upper ends of each of the shafts 40 pass through a correspondingly threaded hole in a beveled gear wheel 44 the hub of which rests upon the 50 top of the frame extension 2^a. With this gear wheel 44 meshes a correspondingly beveled gear pinion 45 that is fixed to the end of a shaft 46 that extends from side to side of the machine. Preferably, the shaft 46 55 is made up of short shaft sections rigidly connected to an intermediate pipe section 47, as shown in the drawing, although this is not essential. The shaft 46 is journaled in angular brackets 48 and 49 that are bolted to 60 the upper end extensions 2^a of the side frames. The outer end of the shaft 46 is provided with a hand wheel 50 whereby the shaft may be conveniently turned, and when the shaft is turned it will cause the beveled 65 gears 44 and 45 to turn the shafts 40 and

correspondingly adjust the bearings of the marking roll C in vertical direction.

In order to permit the raising or lowering of either end of the marking roll to be independently effected so that an arcuate and 70 uniform action of the marking roll shall be had, I prefer to provide means whereby the bevel gears that control the vertical movement of one end of the marking roll may be thrown out of action. As shown, (see 75 Fig. 3) this is effected by providing in the top of one of the brackets 49 a sleeve 55 through an eccentric opening in which the shaft 46 passes. This sleeve is revoluble 80 within the bracket and is provided at one end with a flange 56 and in the periphery of its opposite end has a threaded hole to receive the threaded end of a weighted lever 57 that serves to hold the sleeve 55 in either 85 of two positions. Thus, when the pinion 45 adjacent the sleeve 55 is in mesh with its corresponding pinion 44, the weighted lever will be in the position shown in Fig. 2 but if the weighted lever be turned to the opposite 90 side of the shaft 46, as shown in Fig. 3, it will cause the corresponding end of the shaft to be raised until the pinion 45 is disengaged from the bevel gear wheel 44. Hence, it will be seen that when the bevel pinions 95 and gear wheels at the opposite sides of the machine are in mesh, the turning of the shaft 46 through the medium of the hand lever 50 will cause a unison adjustment at both ends of the marking roll C, but when the bevel pinion at one end of the shaft 46 is 100 disengaged from its corresponding bevel gear wheel, the turning of the shaft 46 will raise or lower the opposite end only of the marking roll.

The preferred construction of the marking roll is illustrated in Figs. 1, 5 and 6 of the 105 drawings. This roll is of cylindrical character, its interior being preferably reinforced by longitudinal ribs 70 formed integral with the roll. The periphery of the roll is 110 provided with a series of dovetailed grooves 71 adapted to receive the correspondingly dovetailed plates or blocks 71^a that have threaded holes therein to admit the lower 115 ends of set screws 72. These set screws 72 pass through clips or plates 73 having beveled inner ends to engage the correspondingly beveled edges of the electrotype 74 that constitutes the design to be impressed 120 upon the web of paper. The grooves 71 may extend in any desired direction along or across the periphery of the roll C, but preferably these grooves are arranged around the periphery of the roll C spirally or 125 obliquely to the axis of the roll, as this will permit a wider and more accurate range of adjustment of the electrotype upon the surface of the roll. It will be understood, of course, that the electrotype will be curved 130 to conform to the periphery of the marking

roll C and when the electrotpe is to be fixed to the periphery of the roll, the screws 72 will be passed through the retaining clips or plates 73 and into the blocks 71^a that are adjustable in the dovetailed grooves 71, the ends of the clips overlapping the edges of the electrotpe.

The bottom roll A is desirable, particularly where the rolls are of considerable length, as in such case this bottom roll serves to firmly support, throughout its length, the impression roll above it; but if the rolls be comparatively short, the bottom roll A may be omitted. So, also, if desired, an endless rubber belt extending around the impression roll B may be employed instead of the more tightly fitting elastic cover D, and other modifications of the invention may be made without departing from the scope thereof.

In using the machine, the web of paper will be passed between the impression roll B and the marking roll C, being fed thereto and drawn therefrom in any suitable manner, and the electrotypes on the marking roll will serve to slightly indent or impress the design upon the roll at any desired point according to the positions of the electrotypes on the marking roll. The longitudinal adjustment of the marking roll through the medium of the threaded sleeve 30 enables a very nice adjustment of the position of the marks upon the web to be effected and by means of the screw shafts 40 and the gearing connected therewith, the marking roll can be lifted bodily, or when it is desired to increase or diminish the pressure lengthwise of the roll, this can be accomplished by disengaging the beveled gear wheels 45 and 46 at one side of the machine, while allowing the beveled gears at the opposite side to remain in engagement. When the weighted lever 57 is in the position shown in Figs. 1 and 2 of the drawings, the gears 45 are in engagement, but when the weighted lever is thrown to the opposite side of the shaft 46, a partial revolution will be given to the sleeve 55 which will cause the lifting of one end of the shaft 46 and the disengagement

of the beveled gear wheels 44 and 45 at such end of the shaft.

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

1. In a machine of the character described, the combination with a pair of rolls, of means for effecting both the simultaneous and the relative adjustment of the journal bearings of one of said rolls, comprising screw shafts connected to said journal bearings, a cross shaft extending from side to side of the machine above said adjustable roll, bevel gears connecting said cross shaft to said screw shafts, and means for lifting one end of said cross shaft to disengage the gears at said end of said cross shaft.

2. In a machine of the character described, the combination with a pair of rolls, of means for effecting both the simultaneous and the relative adjustment of the journal bearings of one of said rolls, comprising screw shafts connected to the journal bearings of said adjustable roll, a cross shaft extending from side to side of the machine and geared to said screw shafts, bevel gears upon said cross shaft and said screw shafts, and a shiftable eccentric bearing for one end of said cross shaft, whereby the gears at one end of the cross shaft may be disengaged.

3. In a machine of the character described, the combination with a pair of rolls, of means for longitudinally adjusting one of said rolls, said adjusting means comprising a threaded bearing, an adjustable threaded sleeve in said bearing and through which the journal of the adjustable roll passes, and means for turning said sleeve.

4. A machine of the character described, comprising the combination with a pair of rolls, of means for longitudinally adjusting one of said rolls, comprising a threaded sleeve adjustably mounted in said bearing and through which sleeve the journal of said adjustable roll passes, and means for holding said sleeve against longitudinal movement on the journal of said roll.

CHAS. G. OBERLEY.