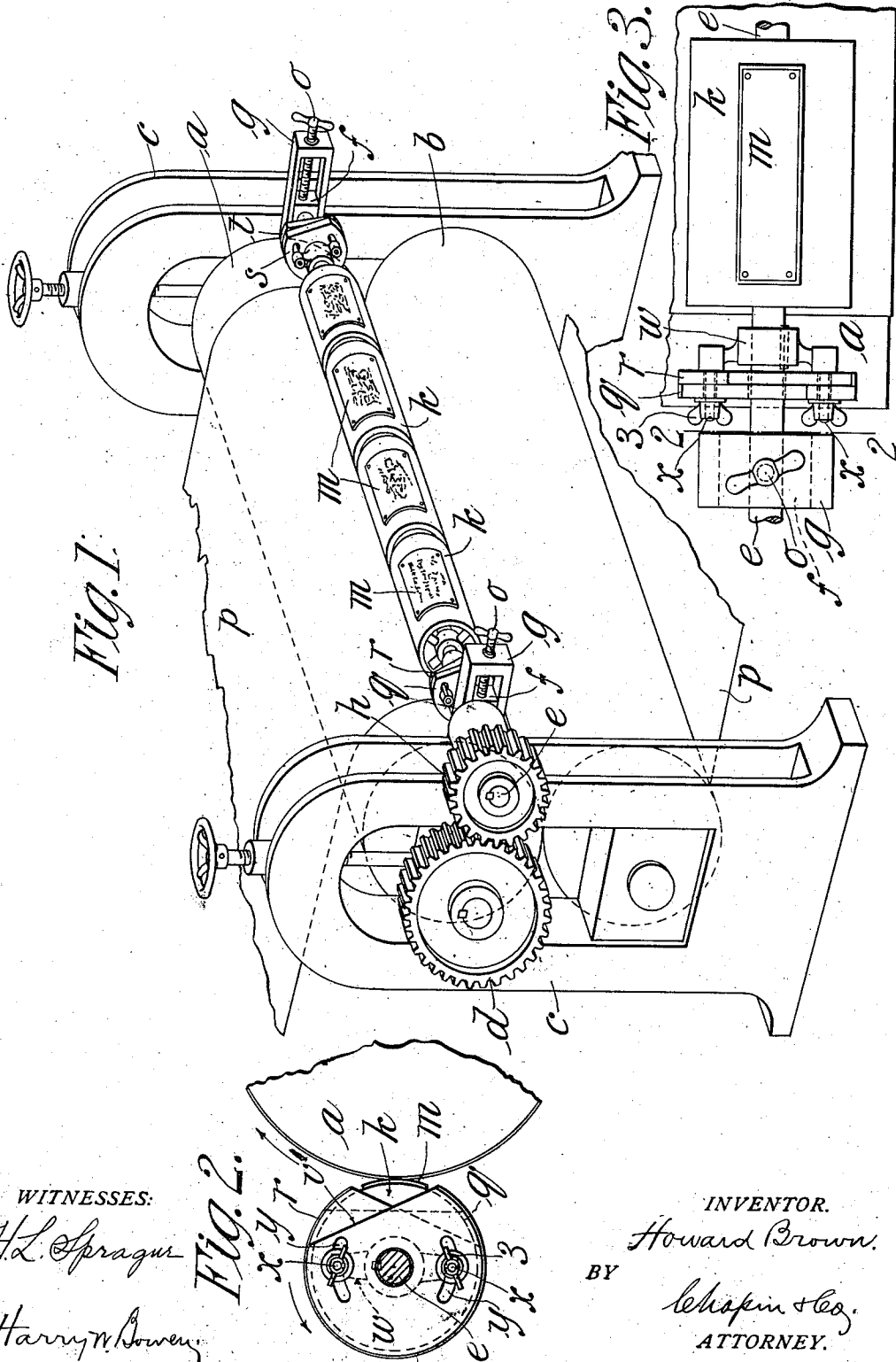


H. BROWN.
 WATERMARKING DEVICE FOR PAPER.
 APPLICATION FILED MAR. 28, 1911.

1,014,635.

Patented Jan. 16, 1912.



WITNESSES:
H. L. Sprague
Harry W. Bowen

INVENTOR.
Howard Brown
 BY
Chapin & Co.
 ATTORNEY.

UNITED STATES PATENT OFFICE.

HOWARD BROWN, OF SPRINGFIELD, MASSACHUSETTS.

WATERMARKING DEVICE FOR PAPER.

1,014,635.

Specification of Letters Patent.

Patented Jan. 16, 1912.

Application filed March 28, 1911. Serial No. 617,493.

To all whom it may concern:

Be it known that I, HOWARD BROWN, a citizen of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Watermarking Devices for Paper, of which the following is a specification.

This invention relates to paper making machines and particularly to devices to impress on the paper, during the process of manufacture, any desired mark having the general characteristics of the so-called water-mark, but differing from the latter in that it is not applied until after the web of pulp has taken definite form as a self-supporting sheet, but before it reaches the driers.

The object of the invention is to provide means whereby a mark of a relatively intricate design and having relatively fine lines, as compared with the ordinary water-mark, may be impressed in the paper by the use of an ordinary stereotyped plate applied to the paper under pressure and applied thereto at such a point during the course of its travel through the paper machine as will best adapt the sheet to receive such impressions, that is to say, preferably as the paper is passing over one of the press-rolls.

Applicant is aware that, broadly, it is not new to impress a mark upon the paper after it leaves the couch-rolls and before it reaches the driers, and this invention consists in certain improvements which will be described and claimed in the specification and clearly illustrated in the accompanying drawings, in which,—

Figure 1 is an isometric view of one of the presses of the ordinary Fourdrinier paper-making machine having the invention applied thereto in its preferred form. Fig. 2 is a sectional elevation on an enlarged scale showing a portion of the press-roll and showing the construction and arrangement of the bearing disks which are applied to each end of the roll which carries the stereotyped plates,—the plane of the section being on line 2—2, Fig. 3. Fig. 3 is a front elevation, also on an enlarged scale, of the stereotyped plate-roll as viewed from the front of Fig. 1, this view showing means whereby the bearing disks are connected with the shaft of said roll to permit the adjustment of the disks and permit their rotation as one with the roll.

Referring to the drawings, *a* and *b* are the upper and lower press-rolls carried in suitable standards *c* in the usual manner. On the end of the roll *a* is a gear *d* and in front of this roll, parallel with the axis thereof, is a shaft *e* running in suitable bearings *f* which are slidably mounted in brackets *g* supported on the standards *c*. A gear *h* on the shaft *e* meshes with the gear *d* and rotates the shaft *e* at the same circumferential speed as the press-roll *a*. On the shaft *e* are secured the rolls *k*, which, preferably, are made separate, as shown in Fig. 1, instead of in one piece, and are non-rotatably secured to the shaft *e* in any suitable way, provision being made to secure to the surface of these rolls the stereotyped plates *m* which are formed on a curve to fit the rolls *k* accurately,—the face of the plates being concentric with said rolls.

The bearings *f*, carrying the shaft *e*, may be moved by means of the screws *o* toward and from the face of the press-rolls *a* to bring the plates *m* into contact with the web of paper *p* running over the rolls, and with the requisite degree of pressure to impress the design on the plates *m* in the web. As the plates *m* have to bear against the paper with considerable pressure, and as the contact of these plates is not a continuous one, it is necessary to provide means whereby said contact shall be, in effect, continuous to prevent the shaft *e* from jumping or springing when the edge of the plates *m*, in their rotative contact with the web, either comes in contact with the paper or runs off therefrom after the impression has been made. To make this contact as nearly continuous as possible, the bearing rolls *q* and *r* on one end, and *s* and *t* on the opposite end of the shaft *e*, are provided and so located that they will bear on the face of the roll *a*, as shown in Figs. 1 and 3 beyond the borders of the paper. As shown in Fig. 2, these two rolls have an equal portion of the peripheries thereof cut off from each, as indicated by *v*, this cut-away portion indicating the maximum width of any stereotyped plate which it is desired to use on the rolls *k*. These rolls *q* and *r* are rotatably adjustable,—one relative to the other,—as shown, and at the same time are rotatable as one with the shaft *e*. The means for supporting the rolls and permitting this adjustment being provided by securing to the shaft *e* a yoke *w* (as shown most clearly in Fig. 3)

in each end of which is a bolt w extending through concentric slots y in the rolls. These slots y in each roll register one with the other when the two surfaces v are in parallelism. On each bolt w is a suitable thumb-screw z to clamp the disks in their adjusted position.

If a relatively narrow stereotyped plate m is to be used, as shown in Fig. 2 for example, the two rolls q and r , are rotated in opposite directions to bring one end of the cut-away part thereof on each roll in such position relative to the front and rear borders of the plate m that during the rotation of the shaft e the bearing rolls will be relieved of contact with the press-rolls a and b just prior to the time when the front edge of the stereotyped plate m comes in contact with the paper on the press-rolls and during the entire period that the plate and paper are in contact. Thus the contact of the roll r with the press-roll will be interrupted just before the forward edge of the plate m touches the paper, and just as the rear edge of the plate leaves the paper the roll q comes to a bearing on the press-roll. In this way there is practically no interruption of the continuous rotative contact of the elements on the shaft e with the press-rolls. It will be observed that the diameter of the bearing-rolls is equal to the diameter of the rolls k and the plate m plus the thickness of the paper as it runs over the press-rolls a and b .

By means of the construction of the bearing-rolls, as described, stereotyped plates m of any desired width may be used from the maximum width (which is indicated by the length of the cut-away portion v of the rolls) to one as narrow as could be affixed to the rolls k .

The devices described herein provide means whereby a distinctive mark of a comparatively intricate nature may be very cheaply and clearly applied to the paper instead of the ordinary water-mark, it being possible, by the well known cheap method of producing these plates, to apply to the paper a most fanciful design which it would be impossible to produce as the ordinary so-called water-mark is produced, and this invention possesses great utility on account of the fact that many large dealers in paper now require or desire the mill to provide special marks for the paper made for them, which, by the use of the devices herein described, can be done by the mills at a relatively small expense.

What I claim, is:—

1. In a paper machine, a rigid roll having thereon an impression plate whose surface

is concentric with the roll, means to support said roll in rotative contact under pressure with the web of paper at a point in the machine in advance of the driers, and disks on said roll having a portion of their peripheries cut away, said disks bearing on an unyielding surface of the machine beyond the borders of the paper, said disks being out of contact with their supporting surface when said impression plate is in contact with the paper.

2. In a paper machine, the combination with a roll having means for impressing a mark on the paper, of bearing disks on the roll having a portion of their peripheries broken away, said broken away portion corresponding substantially to the width of the mark, together with means to press the roll forcibly against the paper, said disks serving to support the roll against said pressure when the means for impressing the paper are out of contact therewith.

3. The combination with the press-roll of a paper machine, of a second roll supported in parallelism therewith, gears on said rolls to rotate them at the same circumferential speed, a stereotype plate on said second roll whose surface is concentric therewith, and means to adjust said second roll to bring the surface of said stereotype plate periodically in forcible contact with the paper running over the press-roll.

4. In a paper machine, a roll having a rigid design plate in relief extending beyond the surface of the roll and partially around the roll, means to adjust said roll whereby during its rotation said design plate will come in forcible periodic contact with the paper, and means to maintain the position of the roll relative to the surface of the paper when said design plate is out of contact with the paper.

5. In a paper machine, the combination with a roll having a rigid design plate thereon whose surface comes in periodic contact with the paper to impress a mark thereon, of two disks mounted on, and rotating with the roll to bear on an unyielding surface beyond the borders of the paper, said disks having a part of their peripheries broken away, and means to adjust said disks rotatively one relative to the other, whereby the extent of the interrupted peripheral contact of said disks with the surface on which they bear may be made to agree substantially with the width of that portion of the design plate which bears on the paper.

HOWARD BROWN.

Witnesses:

K. I. CLEMONS,
HARRY W. BOWEN.