P. D. PARSONS.

WATERMARKING EMBOSSING MACHINE.

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1,408,633. Patented Mar. 7, 1922.

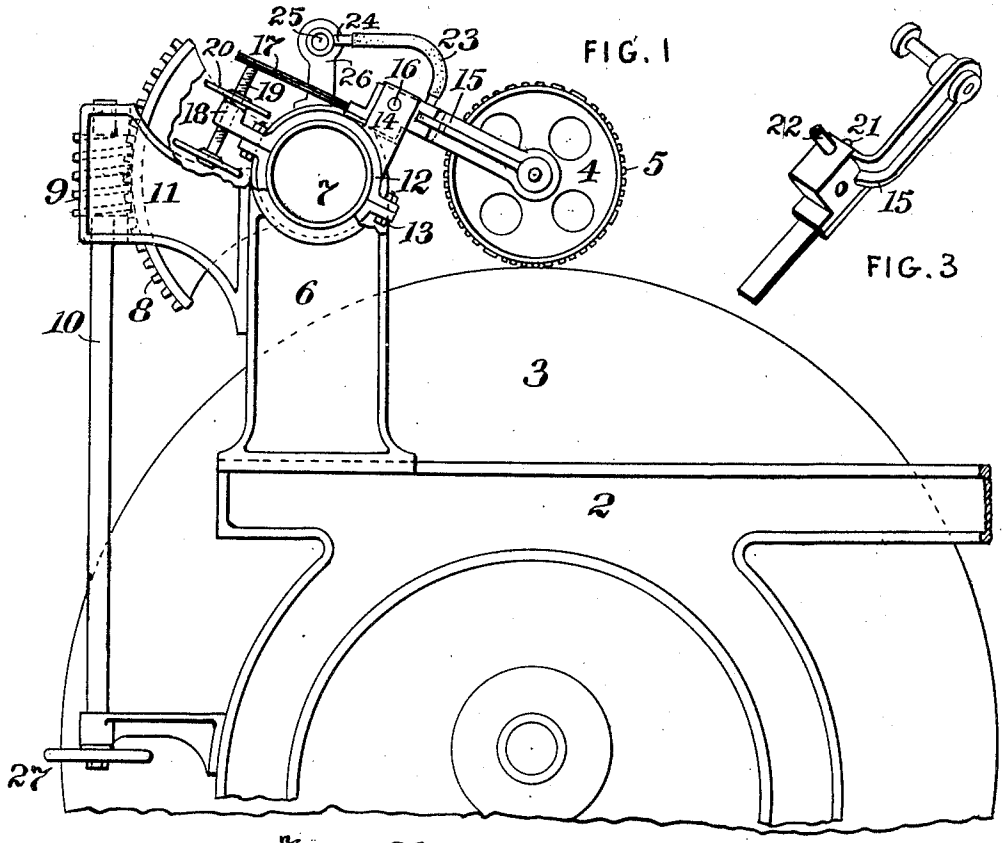


FIG. 1

FIG. 3

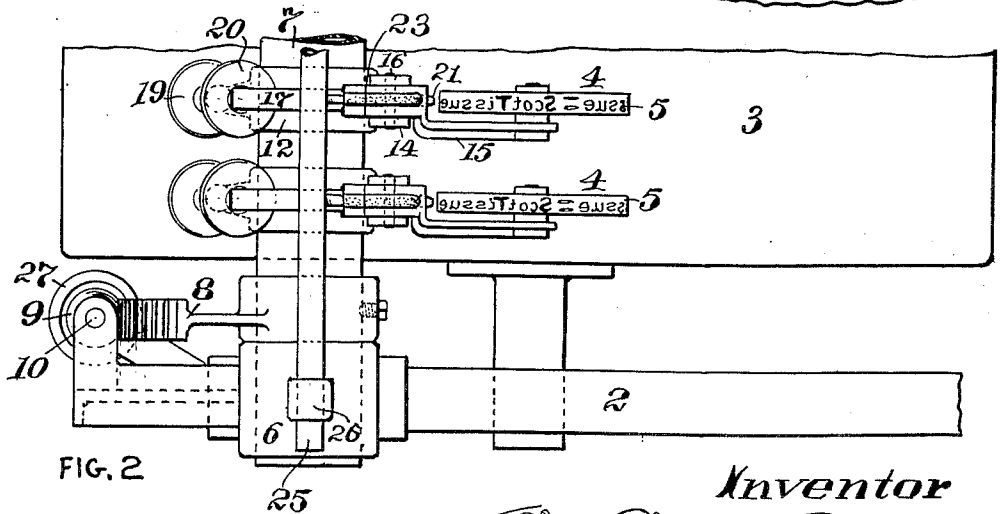


FIG. 2

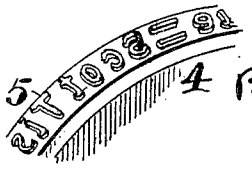


FIG. 4

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WATERMARKING EMBOSSING MACHINE.

1,408,633. Specification of Letters Patent. Patented Mar. 7, 1922.

Application filed January 7, 1921. Serial No. 435,587.

To all whom it may concern:

Be it known that I, PHILIP D. PARSONS, a citizen of the United States, and resident of Philadelphia, county of Philadelphia, State of Pennsylvania, have invented an Improvement in Watermarking Embossing Machines, of which the following is a specification.

The object of my invention is to provide a suitable construction for use in connection with a paper making machine for sharply impressing the paper web while being subjected to a drying operation, whereby a trade-mark or other character may be formed in the body of the paper to give it the appearance of "water-marking."

Heretofore, in the manufacture of paper articles, such as towels, the trade-mark was embossed on each towel by means of rolls and this was accomplished with the paper in its finished and dried condition and as part of the operation of sub-dividing and folding it in the making of the towels. The embossing so produced was not always effective and being performed on dry paper material was not sharp and distinct, and moreover occupied more of the surface than was desirable. It has also been attempted to make a proper marking of the paper web as it passes through the paper making machine by impressing the moist web with rubber dies of suitable character which were intended to densify the fiber and thereby give somewhat of an appearance similar to a watermark, but the use of impressing devices of yielding material was not satisfactory and the marking was blurred and very indistinct and uncertain.

My object in the present invention is to more specifically overcome the objections which have heretofore been embodied in the embossing of the paper by the methods above stated, and this I accomplish by providing the paper making machine itself with metal pressing wheels adapted to act upon the web of paper in the act of being dried, so that the densification of the fiber takes place in the configuration or trade-mark word simultaneously with the drying operation with the result that the impression produced upon the surface of the paper has all of the characteristic appearances of "water-marking" in that in those parts impressed, the densification of the fiber gives a smooth, clean finish to the design or trade-mark, whereas the paper web generally is of a more or less open fibrous character having absorbent qualities such as required by paper towels, napkins, etc. Furthermore, owing to the fact that the impression is formed on the paper by hard metal impressing devices while in the act of being dried, the impression is sharp and clearly defined and no rough usage can eliminate the sharpness of outline from the paper after being fully dried.

With the above and other objects in view, the nature of which will be more fully understood from the description hereinafter, the invention consists in the novel construction of a water-marking embossing machine, as hereinafter more fully described and defined in the claims.

Referring to the drawing: Fig. 1 is a side elevation of an embossing machine embodying my improvements and more particularly for use in connection with a drying cylinder of a paper making machine; Fig. 2 is a plan of a portion of the same; Fig. 3 is a perspective view of the means for carrying the embossing wheel; and Fig. 4 is a perspective view of a portion of the perimeter of the embossing wheel.

2 is the main frame of the machine and in the particular instance is a part of the side frame for the drying cylinders of a paper making machine. 3 is a drying cylinder which may be steam heated, as is customary, and about which the paper web passes in the operation of being dried. Ordinarily, there are a large number of drying cylinders to a paper making machine, but so far as the present invention is concerned, consideration to more than one cylinder need not be given. Arranged above the drying cylinder 3 and movable toward the same under spring pressure, are embossing or marking wheels 4 of hard material, such as metal, having embossing projecting portions 5 corresponding to letters or other marks to be impressed upon the paper web as it is conveyed under the said embossing wheels by the drying cylinders 3. The embossing wheels are arranged at intervals apart longitudinally of the drying cylinder and are supported in a manner to be simultaneously raised out of contact with the paper and drying cylinder by hand manipulation, or into contact with the paper and with any

desired degree of pressure, also by hand adjustment, and the details for accomplishing these operations will now be described.

A shaft 7 (made tubular for lightness) is journalled in bearing 6 at each end of the drying cylinder 3, so that it is parallel to the axis thereof and preferably somewhat to one side of the center of the drying cylinder. This shaft 7 is provided with a segmental gear 8 which is engaged by a worm 9 having a vertical shaft 10 and a hand wheel 27 by which it may be rotated. The shaft 10 is journalled in a bracket 11 extending from the opposite portion of the bearing 6. By rotating the worm 9, the shaft 7 may be given a rotary reciprocatory adjustment. Clamped at intervals along the shaft 7 are sleeves 12, the same being formed in two parts bolted together at 13 to provide a clamping action so that the said sleeves 12 move with the rotary movements of the shaft 7 but at the same time have capacity for adjustment circumferentially thereof to permit adjustment in assembling the machine. Each one of these sleeves 12 support one of the embossing wheels 4 by similar mechanism and it will suffice to describe one set of this mechanism.

The sleeve 12 is provided with upwardly extending jaws 14 between which is arranged a hinged frame 15 journalled to said jaws on a transverse pivot pin 16. The hinged frame 15 carries at its outer or free end the embossing wheel 4 in such manner that it is free to rotate under the influence of the paper web and dry cylinder. The rear end of the pivoted frame 15 is provided with leaf springs 17 which rest upon an adjusting screw 19 adjustable in an arm 18 extending from the sleeve 12, said screw being adapted to press upon the springs 17 for putting them under greater or less tension and in that manner applying greater or less pressure of the embossing wheel 4 upon the paper. 20 is a lock nut upon the screw 19 by which it may be locked in its adjusted position upon the arm 18.

It will now be understood that the embossing pressure desired may be insured by the adjustment of the screw 19 and the extent of spring pressure developed by the spring 17 in forcing the embossing wheel 4 toward the paper and cylinder 3, but this is only effective when the shaft 7 is given a rotary adjustment to bring the embossing wheel down tightly upon the paper. When the shaft 7 is rotated to lift the embossing wheel 4, the limited degree of oscillation of the frame 15 in the jaws 14 of the sleeve 12 will, after a given amount of pressure has been relieved, cause the frame 15 to contact with the metal of the collar so that it cannot fall toward the drying cylinder, and consequently a further rotation of the shaft 7 will act to entirely lift the embossing wheel from the paper and hold it suspended. The springs 17 should be sufficiently sprung to apply the desired pressure to insure the embossing while at the same time permitting of some resiliency during the embossing operation.

As it is important to maintain the projecting portions 5 of the embossing wheel 4 free from fiber or lint, I provide means for directing an air or other blast upon the perimeter of the said embossing wheels, and the air may be at ordinary temperatures or heated, if so desired. The means employed for accomplishing the supply of the air blast are the following: Arranged above the shaft 7 and parallel to it is a supply tube 25 which is supported in upright brackets 26. This tube is provided with a nipple 24 from which a rubber hose 23 extends, the said hose connecting with a nipple 22 on the pivoted frame 15. This last mentioned nipple 22 is provided with a tubular passage terminating in a blast nozzle 21 which is directed toward the raised portions 5 of the embossing wheel 4. The rubber tube 23 permits of any adjustment of the frame 15 relatively to the sleeve 14 and also permits adjustment of the shaft 7 and the connecting parts without disturbing the fixed position of the air supply tube 25. Instead of air for the blast, steam or other means and even a fine water jet may be employed for keeping the embossing wheel clear of lint, etc.

In practice, I have found that the embossing wheels 4 are best made of brass as they are easily engraved and do not rust, and moreover are sufficiently hard to make a clean sharp impression. The letters formed on the perimeter indicated at 5 may be engraved thereon with sufficient depth that, at intervals of six months, they may be slightly turned down on the face to renew their sharpness to overcome the slight wear. Also, if desired, sufficient metal may be formed in the rim of the wheel that the entire embossing letters or projections may be turned off and a new set engraved. Any change in the diameter of the wheel may readily be compensated for by the adjustment of the shaft 7 carrying the wheels and other mechanism by which they are supported and moved. It will be manifest that, if desired, instead of forming these embossing wheels 4 of metal, they may be formed of glass or other hard material which may be molded and will not be injured by the moisture arising from the damp web, though metal is preferable because of its greater security against breakage.

As indicated in Fig. 2, there are a series of the embossing devices which I have described and these may be arranged as close together or as far apart as may be desired along the length of the shaft 7 and the dry-

ing cylinder 3, so that as many lines of embossing in transverse relation may be provided upon the paper sheet, as desired. In the present instance, there would be lines of embossing of the trade-mark upon the paper web at such intervals as would suffice the requirement when the paper web is subdivided into narrow webs and then into towels after it has been dried.

When the paper web is being adjusted over the drying cylinders in the paper making machine, the shaft 7 may be adjusted so as to lift all of the embossing wheels 4 clear of the cylinder 3 and the paper web. After the paper web has been adjusted and the paper making machine is in operation, the shaft 7 may be again adjusted to lower the embossing wheels 4 into contact with the paper web and with sufficient adjustment to enable the springs 17 to firmly press the wheels in contact with the paper with a yielding pressure.

It will now be apparent that I have devised a novel and useful construction which embodies the features of advantage enumerated as desirable, and while I have in the present instance shown and described the preferred embodiment thereof which has been found in practice to give satisfactory and reliable results, it is to be understood that I do not restrict myself to the details, as the same are susceptible of modification in various particulars without departing from the spirit or scope of the invention.

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

1. In a machine of the character stated, the combination of a drying cylinder with an embossing wheel of hard resistant material having its perimeter provided with embossing projections, means for supporting the embossing wheel with capacity for adjustment to and from the drying cylinder, and hand operable means for adjusting the supporting means whereby the embossing wheel may be raised clear of the paper, and spring devices carried by the supporting means for applying a greater or less pressure between the embossing wheel and the paper web upon the drying cylinder.

2. The invention according to claim 1, further characterized by having a blast nozzle carried with the supporting means for the embossing wheel and directed toward the perimeter thereof, and means for supplying a blast medium to the nozzle.

3. The invention according to claim 1, wherein the adjustable supporting means for the embossing wheel is provided with a blast nozzle movable with it during adjustment and directed toward the perimeter of said wheel, and flexible tubular means for supplying the blast medium to the nozzle while permitting adjustment of the supporting means.

4. The invention according to claim 1, further characterized by having the spring means to force the wheel toward the drying cylinder under yielding pressure, and adjusting devices for varying the operative tension of the spring.

5. In a machine of the character stated, the combination of a drying cylinder over which a paper web travels, a transverse shaft parallel to the axis of the cylinder, a plurality of embossing wheels of hard resistant material having their perimeters provided with raised embossing projections and said wheels arranged in axial alinement parallel to the axis of the drying cylinder, a plurality of supporting devices for the respective wheels adjustably clamped upon the shaft so that they may be individually circumferentially adjustable thereon, said devices having spring means for yieldingly pressing the wheels toward the drying cylinder, and hand operable means for giving the shaft a rotary adjustment for simultaneously raising and lowering the plurality of embossing wheels.

6. The invention according to claim 5, further characterized by providing each of the adjustable supporting devices for the embossing wheels with a blast nozzle for directing a blast upon the perimeter of the wheel, a stationary blast supply pipe and a plurality of flexible connections from the blast pipe to the respective blast nozzles of the plurality of embossing wheels.

In testimony of which invention, I hereunto set my hand.

PHILIP D. PARSONS.