Jan. 15, 1929. 1,698,818

W. A. LORENZ

APPARATUS FOR MOISTENING PAPER

Filed Aug. 9, 1927

FIG. 1.

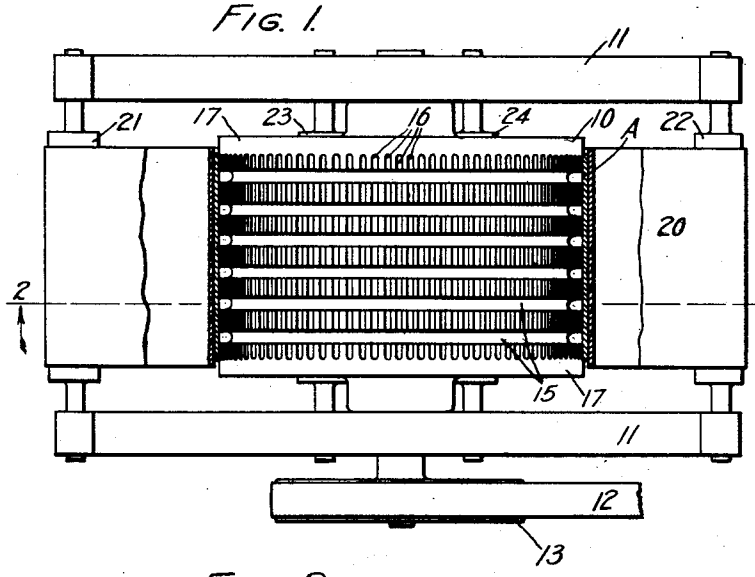


FIG. 3.

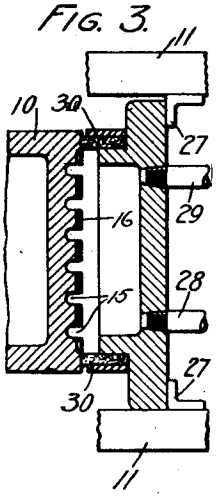


FIG. 2.

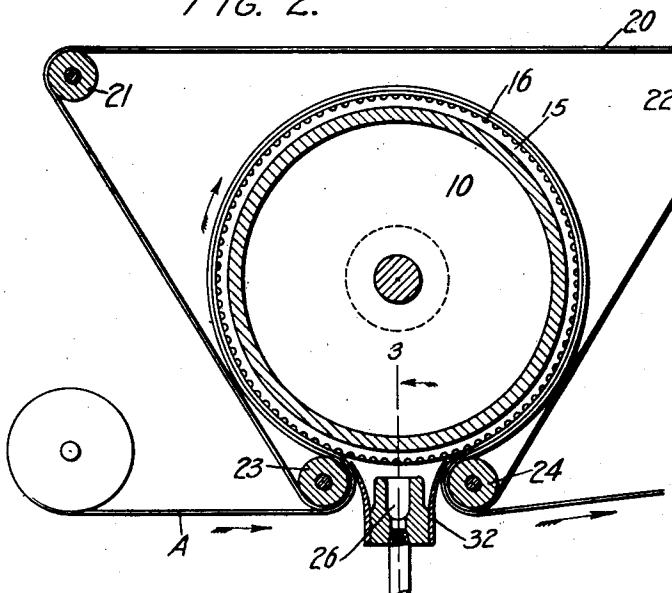
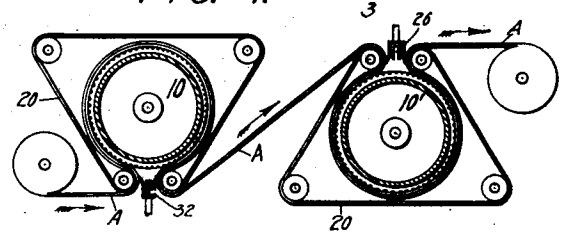


FIG. 4.



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APPARATUS FOR MOISTENING PAPER.

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The aim of the present invention is to provide a simple apparatus by means of which paper may be effectively and economically moistened or wetted by the use of steam.

In accordance with the present invention, the arrangement is such that during the steaming operation the steam is held in close confinement with the paper to be wetted.

Other objects will be in part obvious and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth and the scope of the application of which will be indicated in the appended claims.

In the accompanying drawings, wherein I have shown, for illustrative purposes, one of the many embodiments which the present invention may take:

Figure 1 is a plan view of the apparatus;

Fig. 2 is a sectional view taken substantially on line 2—2 of Fig. 1, the belt and the paper being shown in edge elevation;

Fig. 3 is a sectional view taken substantially on line 3—3 of Fig. 2; and

Fig. 4 is a view similar to Fig. 2, but illustrates a duplicate apparatus by means of which both sides of the paper may be steamed.

Referring to the drawings in detail, 10 denotes a cylinder suitably mounted for rotation in frames 11. The cylinder may be driven in any suitable manner, as by means of a belt 12 passing about a pulley 13. The external periphery of the cylinder has a plurality of circumferential grooves 15 with ribs or lands between the grooves. These lands or ribs have relatively small cross grooves 16 which lead into the circumferential grooves 15. The marginal lands of the cylinder are cross grooved only a portion of their widths so as to leave plane surfaces 17 at the margins or ends of the cylinder. The cylinder may be considered as being longitudinally corrugated or cross grooved, these grooves stopping short of the ends of the cylinder and the relatively deeper circumferential grooves 16 cut across these cross grooves.

The numeral 20 designates an endless belt which is preferably impervious. This belt passes about all but a small portion of the cylinder 10. The belt passes about suitable guide rollers 21, 22, 23 and 24 journaled in brackets attached to the frames. The rollers 23 and 24 are placed adjacent to the cylinder and to opposite sides of that space which the belt does not cover. Mounted in this space is a steam box or chest 26 suitably supported by brackets 27 carried by the frame. This box has a steam inlet pipe 28 and a drip or drain pipe 29. The box may have at each end flexible sealing members 30 of felt or the like which are adapted to bear against the plain marginal surfaces 17 of the cylinder in order to prevent leakage of steam at the ends of the box. In order to prevent the steam from escaping along the sides of the box, there is provided at each side an elastic or flexible flap 32. The paper is designated by the letter A.

The operation of the machine is briefly as follows. The paper A, which may be run from a roll, passes about the periphery of the cylinder and under the continuous belt 20 which may be of rubber. The paper is thus confined during the steaming operation between the belt and the periphery of the cylinder. The steam in the steam box will flow about the cylinder through the grooves 15 and will spread out through the cross grooves 16 so that substantially the entire surface of the paper in engagement with the periphery of the cylinder is subjected to a steaming action. The steam is closely confined between the belt and the cylinder so that the full effective use of the steam for wetting the paper is obtained.

Obviously, my improved apparatus is susceptible of various modifications. For example, two machines may be employed for wetting opposite sides of the paper, as shown in Fig. 4. This figure shows a duplication of the parts shown in Fig. 2, the two machines being so arranged that one face of the paper will engage the periphery of the first cylinder 10, and the other face of the paper will engage the periphery of the second cylinder 10′. The number of machines employed will depend, of course, upon the thickness and character of the paper to be wetted. In case of thin paper, a single machine may be found sufficient, whereas in the case of thick papers, more than one machine may be used to advantage.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from

the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

What I claim as my invention is:

1. In an apparatus for moistening paper, a surface adapted to carry the paper to be moistened, said surface having a plurality of channels, a belt movable with and adapted to hold the paper against said surface, and means for supplying a heating medium to the channels in said surface.

2. In an apparatus for moistening paper, a rotating cylinder having channels in its periphery, a belt passing about the periphery of said cylinder, the paper to be moistened being between said belt and cylinder, and means for supplying steam to said channels.

3. In an apparatus for moistening paper, a rotating cylinder having circumferential grooves and cross grooves leading into the circumferential grooves, a belt carried by the periphery of said cylinder, the paper to be moistened being adapted to be carried between said cylinder and belt, and means for supplying steam to said grooves.

4. In an apparatus for moistening paper, a rotating cylinder having channels in its periphery, an endless belt passing about all but a portion of said cylinder, and a steam chest adjacent that portion of the cylinder not covered by the belt.

5. In an apparatus for moistening paper, a rotating cylinder having circumferential channels and cross grooves, an endless belt adapted to pass about the major portion of the periphery of said cylinder, a guide roller for said belt where the belt goes onto the cylinder, a guide roller for said belt where the belt leaves the cylinder, and a steam chest between said guide rollers for delivering steam between the belt and the cylinder.

6. In an apparatus for moistening paper, a rotating cylinder having circumferential channels and cross grooves, an endless belt adapted to pass about the major portion of the periphery of said cylinder, a guide roller for said belt where the belt goes onto the cylinder, a guide roller for said belt where the belt leaves the cylinder, and a steam chest between said guide rollers for delivering steam between the belt and the cylinder, said steam chest having flexible side flaps engaging the belt as it passes about said rollers.

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