Dec. 5, 1933. J. W. VEDDER 1,938,444

PRESS ROLL

Filed June 29, 1932

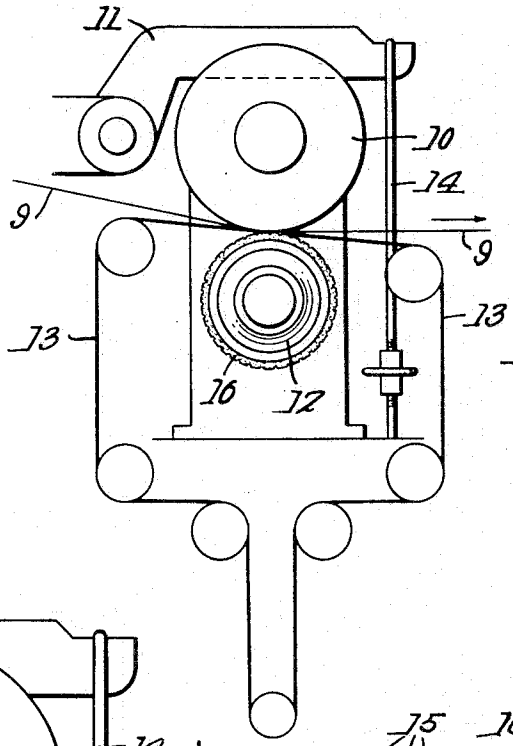


Fig. 1.

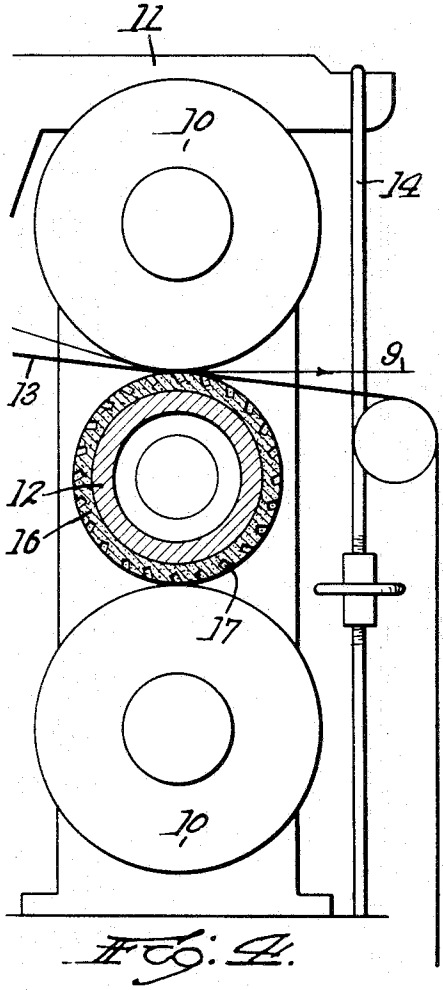


Fig. 4.

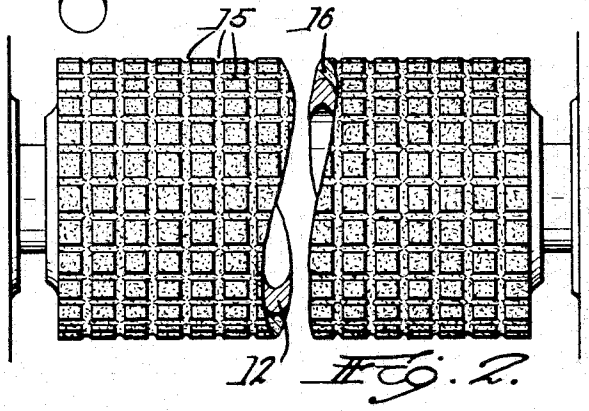


Fig. 2.

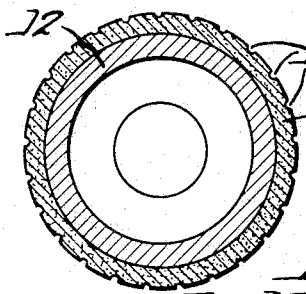


Fig. 3.

Inventor
John Warren Vedder
By Attorneys.

Southgate Fay & Hanley

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PRESS ROLL

John Warren Vedder, Worcester, Mass., assignor to Rice, Barton & Fales, Incorporated, Worcester, Mass., a corporation of Massachusetts

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3 Claims. (Cl. 92—49)

In making paper, the web of paper is run from the Fourdrinier in a very wet condition. It is customary to run the web directly from the Fourdrinier through a series of press rolls, in contact with a felt running under the paper web. The rolls are employed to squeeze the moisture out of the paper through the felt which is below the paper and down on the lower press roll from which it can be removed in various ways.

The principal object of this invention is to provide means whereby the lower roll which contacts with the felt is constructed in such a way that it will have more effect than a smooth roll and more specifically to provide it of such material and configuration that it will exert suction on the felt by its being pressed against the other roll and then released from this pressure as any point on its surface moves away from the bite. Thus it takes up additional water and is more effective. The lower roll is made of yielding material and provided with interstices which will be pressed together by the pressure of the rolls at the bite and receive moisture in them when they are expanded as the surface of the lower roll moves away from the upper roll. At that time they will take up additional moisture and not return it to the felt.

Other objects and advantages of the invention will be hereinafter described.

Reference is to be had to the accompanying drawing, in which

Fig. 1 is an end view of a two roll press constructed in accordance with this invention;

Fig. 2 is a side view of the lower roll;

Fig. 3 is a transverse sectional view of the lower roll, and

Fig. 4 is a sectional view of a three roll press showing the roll under the felt modified.

This invention can be applied to two-roll or three-roll presses as desired but the operation is the same in each. The paper 9 coming from the Fourdrinier machine to the pair of press rolls 10 and 12 is squeezed between them and passes along in the direction of the arrow in the usual way. The smooth surfaced metal roll 10 is supported in a frame 11 arranged to provide the necessary pressure through a rod 14 or the like which is adjustable. Under the web of paper passes an endless felt 13 guided by guide-rolls and movable along with the paper at the same speed by the operation of the two press rolls which are driven positively.

The roll 12 is formed of metal with an outside layer 16 of yielding rubber and this layer is provided with a series of indentations or interstices 15. These are shown in Figs. 1, 2 and 3 as in the form of numerous circumferential and longitudinal grooves dividing the projecting rubber portions into squares or other figures.

In the form shown in Fig. 4 holes 17 are formed in the surface of the rubber which may be made at an inclination as indicated and will serve the same purpose as the grooves.

In the operation of the press, the web of paper comes from the Fourdrinier over the felt 13 and the two press rolls, by their rotation, move it along as indicated. Water is squeezed out of the paper and absorbed by the felt but the felt is under pressure from the two rolls so water is squeezed out of the felt and comes down on the roll 12. On account of the yielding surface of this roll and the grooves or openings in its surface, it will be seen that the portions of the surface of the roll 12 which form a part of its maximum cylindrical surface will be compressed and therefore extended laterally at the point of bite between the two rolls. This reduces the size of the interstices, grooves or openings in this surface and when they are released from pressure as the rolls turn away from the bite, these interstices are increased in size and thereby automatically provide suction which takes more moisture from the felt than would be the case with a smooth lower roll. Thus the amount of moisture removed from the felt and likewise from the paper is increased. The water that is squeezed out at the beginning of the application of pressure to the paper web and felt is mostly squeezed out on the left side as indicated in Fig. 1 but on account of the interstices in the roll some of it will pass around under the top roll and be discharged on the right side without being taken up by the felt again. It is obvious that additional water which otherwise would not be removed, is taken up by the soft surfaced roll and delivered on the right side.

It has been stated that the invention can be applied to a two-press roll as shown in Fig. 1 but in showing the modification in Fig. 4, it is illustrated as applied to a three-roll press. In either case, the results are substantially the same.

Another advantage of this invention lies in the fact that the working of the felt between the interrupted yielding surface of the lower roll and the smooth surface of the upper roll, as it comes into the nip, while in the nip and leaving the nip, tends to keep the felt open and clean.

Although I have illustrated and described only two forms of the invention, I am aware of the fact that other modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish to be limited to all the details of construction herein shown and described, but what I do claim is:—

1. In a press for the purpose described, the combination of an upper smooth hard surfaced roll, a felt movable in contact therewith to hold a web of paper against said roll, and a lower roll having a yielding surface provided with grooves extending into the same for the purpose of drawing water into them as they expand when moving away from the bite of the rolls.

2. In a press for the purpose described, the combination of an upper smooth hard surfaced roll, a felt movable in contact therewith to hold a web of paper against said roll, and a lower roll having a soft rubber surface provided with inclined openings, the center lines of said openings being tangent to a concentric circle smaller than the roll and extending into the roll for the purpose of drawing water into the openings, as they expand when moving away from the bite of the rolls.

3. In a liquid extracting press, the combination of an upper smooth hard surfaced roll and a lower roll having a soft rubber surface provided with crossing grooves.

JOHN WARREN VEDDER.