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R. J. WILKIE

2,280,208

PRESS ROLL

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Fig. 1.

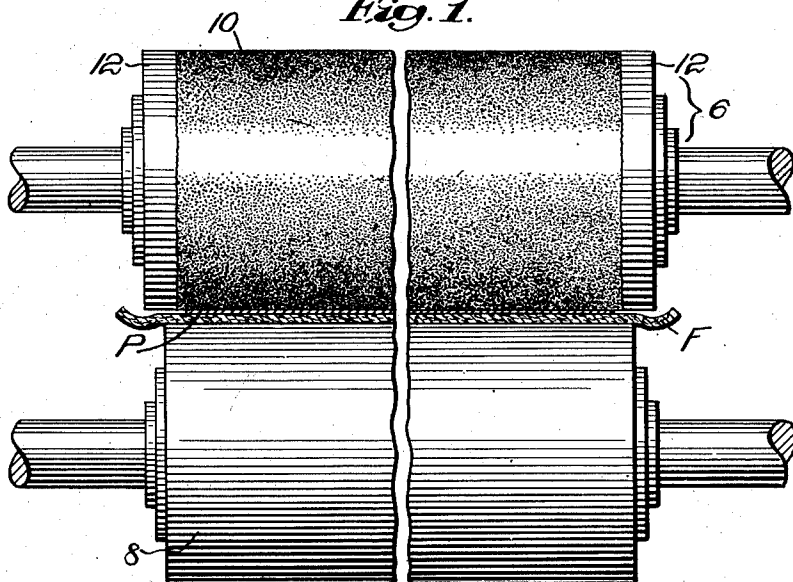


Fig. 2.

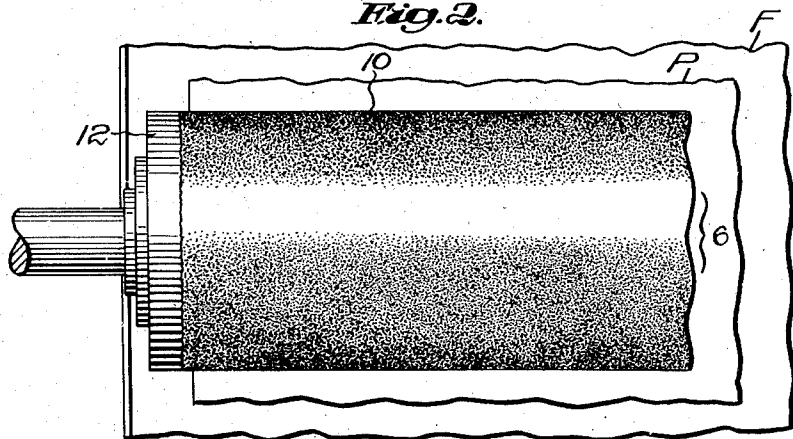
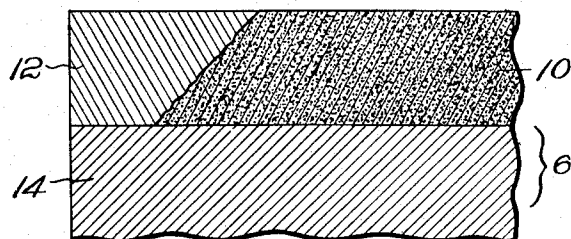


Fig. 3.



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PRESS ROLL

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2 Claims. (Cl. 92-49)

This invention relates to press rolls for paper making machines and the object is to provide a structure efficiently meeting the demands on such a roll and having certain advantages over those previously known, as will more fully appear from the following description of an illustrative embodiment thereof shown by way of example in the accompanying drawing, wherein:

Figure 1 is a broken elevation of a pair of press rolls with the interposed felt and paper, the thickness of the latter being necessarily exaggerated;

Fig. 2 is a broken plan view of the same; and
Fig. 3 is a fragmentary section through the top press roll.

In the presses of paper machines the partially formed web of paper P is carried on a felt F between a top press roll 6 and a lower press roll 8, the latter usually being of rubber. Frequently, as illustrated in Fig. 1, the top press roll is made slightly longer than the bottom roll to facilitate the discharge of water. The felt, particularly after it has widened in use, may project beyond the edges of the lower roll 8. Where exposed beyond the paper it is subject to wear from the top roll, and, particularly under conditions similar to those illustrated in the drawing where the edges of the felt project substantially beyond the ends of the under roll 8 and are free to vibrate against the overhanging portion of the upper roll 6, the wear may be severe.

A top press roll having a surface formed of rubber and pieces of rock, as described in Woodward Reissue Patent No. 18,111, June 23, 1931, has been found to be exceedingly effective in avoiding so-called pick-up of the paper web during the pressing operation. As an example of my invention, I provide a press roll 6 of which the central portion 10, constituting the greater portion of the length and being the part which contacts with the paper, is constructed as described in that patent, while the end portions 12 which engage the felt where the latter is unprotected by the paper are of plain rubber without any admixture of rock.

As an example of my invention and without limitation thereto, the roll covering, which may be built in the usual manner on a metal core 14, may consist as to the major portion of the roll of a mixture of rubber and crushed granite particles in the proportion of about one to five by weight, the granite particles being of twenty to forty mesh, that is, such as would pass through a screen having twenty openings per square inch and be retained on a screen having forty open-

ings per square inch. The stippling in the figures diagrammatically indicates the presence of the rock particles. The rubber may be vulcanized with about 20% of sulphur and other ingredients usual in preparing rubber compounds. The end portions 12 may be of similar rubber composition, omitting the rock particles, and may extend inwardly for about three inches on either end of the surface of the roll and be cured to the portion 10 in a homogeneous joint. In the proportions given, the end portions will give a plastometer reading of about seven. Because of the presence of the rock, the central portion will give a reading of substantially zero to one. These figures are, of course, by way of example merely, but I prefer to have the end portions of a consistency giving a reading between zero and fifteen. The roll, after being vulcanized, is finished in the usual manner by grinding.

While the freedom from pick-up in a roll surface compounded of rock and rubber as described has been empirically demonstrated, the reason for its satisfactory operation is not definitely known. However, an examination of such a roll discloses that when ground, because of the characteristic brittleness of the mineral particles, they will chip under the action of the grinding wheel, providing in the finished roll a multiplicity of depressions which are minute yet not microscopically so and which may be characterized as palpable as they are readily observed under a small degree of magnification, as by means of a hand glass. In the case of a relatively small number of the particles which are less deeply embedded beyond the line of the finished surface, a total removal or "shelling out" of the particles may occur. These are distributed through the entire area of the surface but not in any definite pattern. On the other hand, the end portions 12, being of a homogeneous character, are smoothly finished by the grinding wheel.

The provision of a roll as described, while avoiding pick-up of the paper web, minimizes the wear on the felts where they are exposed beyond the edges of the paper.

By the word "rock" in the appended claims, I refer generally to hard, insoluble, non-metallic, mineral materials which may be rocks of natural occurrence or rock-like materials, such, for example, as the slag described in the patent to Joseph No. 2,062,317, Dec. 1, 1936, or other artificially prepared substances. Granite is readily available and has proven satisfactory by extensive use and may therefore be considered a preferred material.

I am aware that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and I therefore desire the present embodiment to be considered in all respects as illustrative and not restrictive; reference being had to the appended claims rather than to the foregoing description to indicate the scope of the invention.

I claim:

1. A press roll for paper making machines comprising a rubber binder having pieces of rock intermingled therewith and forming a portion of the active surface of the roll, the end portions of the roll being of the same diameter as the intervening portion and being free of rock at the surface thereof.

2. A press roll for paper making machines comprising a rubber binder having pieces of rock distributed therethrough, throughout the central portion of the length of the roll, said central portion presenting a smoothly ground surface of binding material interspersed with minute depressions at the locations of such pieces as characteristically resulting from the chipping away and removal of parts thereof and presenting at its ends cylindrical surfaces of the same diameter as the intervening portion and of smoothly ground material similar to the binder free of such depressions.

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