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DOCTOR BLADE FOR ROLLS, CYLINDERS, AND THE LIKE

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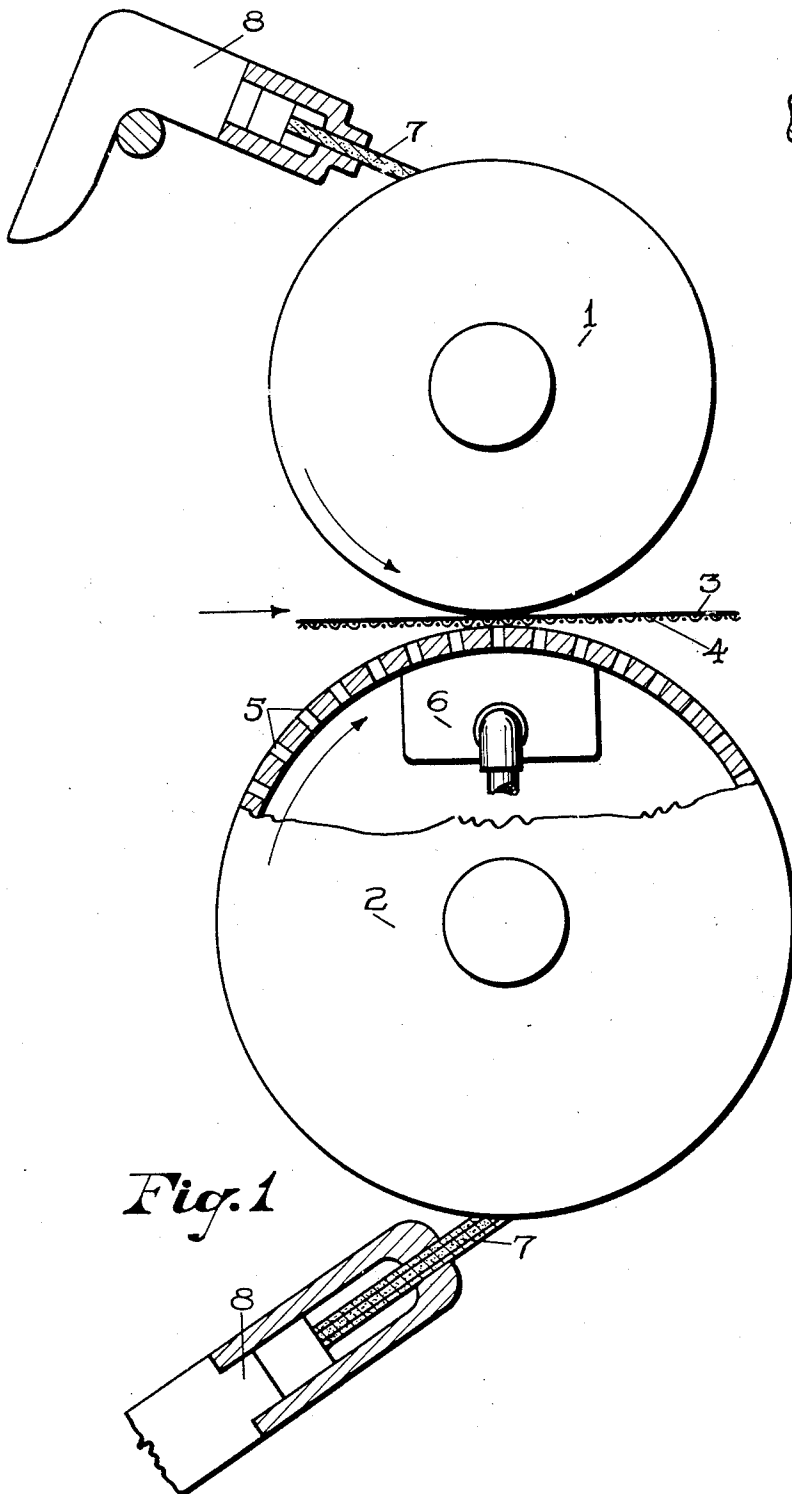


Fig. 1

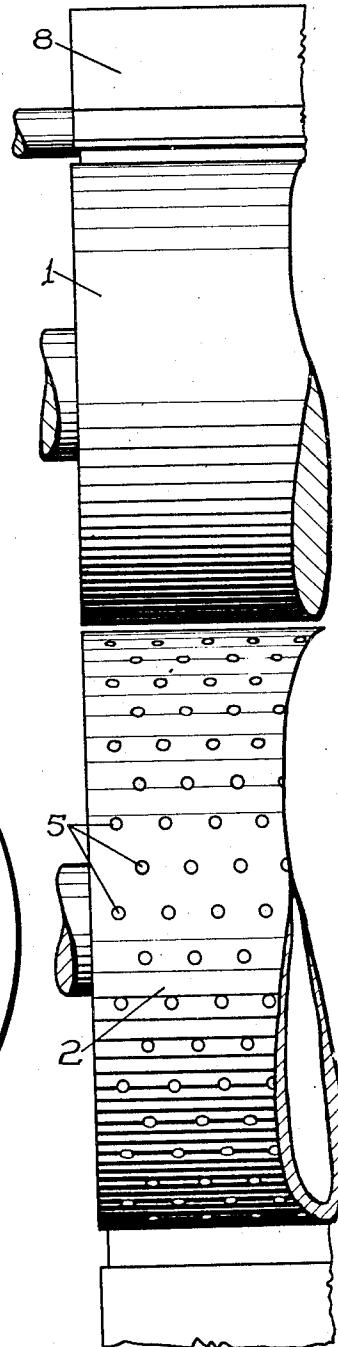


Fig. 2

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DOCTOR BLADE FOR ROLLS, CYLINDERS,
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5 Claims. (Cl. 92—74)

The present invention relates to devices known in the paper making art as doctors, or scrapers, such doctors being customarily employed in connection with rotating press rolls, calender rolls, drier cylinders and the like, for the purpose of cleaning the surfaces thereof.

The object of the present invention is to provide an improved doctor blade characterized by the fact that material having abrasive properties is incorporated therein, so that engagement of the blade with a rotating surface exerts a scouring action. Abrasive doctor blades embodying the present invention are adapted for a wide variety of uses in the paper making art so as to maintain the various roll surfaces in proper condition, all as will hereinafter more fully appear from the following description with reference to the accompanying drawing, in which:—

Fig. 1 is a view partially in vertical section, illustrating the application of doctor blades embodying the present invention to a pair of press rolls of a paper making machine.

Fig. 2 is a view in front elevation of a portion of the parts shown in Fig. 1.

Like reference characters refer to like parts in the different figures.

Referring to the drawing, there is shown for purposes of illustration, the application of abrasive doctor blades embodying the present invention to the top and bottom press rolls 1 and 2 of a paper making machine, the rolls being adapted by their rotation to press between them a web 3 of paper, as conveyed by a suitable apron, or wire 4. The lower roll 2 is in the form of a hollow cylinder with a large number of perforations 5 around its surface, with a suction box 6 disposed within the roll 2, the function of which is to extract moisture from the paper web 3 through the perforations 5 as the web is held close to the roll 2 by the upper press roll 1. Each of the rolls 1 and 2 has cooperating therewith a doctor blade 7 mounted to engage the roll surface at an angle opposed to the direction of rotation of the roll, each blade 7 being carried by a suitable holder 8 adapted to swing about a pivotal axis parallel to the longitudinal roll axis.

As previously pointed out, the present invention contemplates the incorporation in each doctor blade 7 of material possessing abrasive qualities, so that each blade 7 exerts a scouring action on the rotating surface of its associated roll 1 or 2. The abrasive material may be incorporated in each blade 7 in a number of different ways, for example,—the body of the blade

may be composed of synthetic material, such as bakelite, capable of being molded or formed, with or without reinforcement, with a predetermined proportion of abrasive material, such as carborundum, uniformly dispersed throughout the composition. Thus, as shown in the enlarged section of the blade 7 cooperating with the suction roll 2, the blade is composed of layers of fabric integrally united with and embedded in the synthetic material, with particles of abrasive uniformly distributed. Or, as shown in connection with the doctor blade cooperating with the top press roll 1, the blade may be in the form of a metal casting, such as brass, with abrasive material included in the metal. The invention further contemplates varying the amount of abrasive material incorporated in different doctor blades to obtain the desired scouring effect under different conditions of operation, and with different types of rolls and cylinders.

In the operation of the top press roll 1, the abrasive doctor 7 besides keeping the roll surface clean, exerts a scouring action which effectively prevents any glazing of the roll surface such as often results from the polishing action of ordinary non-abrasive doctor blades on rolls composed of metal, wood, or stone. Such glazing is extremely undesirable, owing to the fact that the wet paper pulp tends to stick to a glazed surface, and in practice it has been found that the scouring action of my abrasive doctor blade keeps the roll surface in just the right condition, thereby eliminating the necessity for the laborious operation of removing the rolls for grinding or dressing the surfaces thereof.

In connection with the operation of the suction press roll 2, the abrasive action of the doctor blade 7 effectively prevents uneven wearing of the roll due to the passage of water through the perforations 5, as it is drawn into the suction box 6. It is evident from a consideration of Fig. 2 that the water, in being drawn into the perforations 5, will have a tendency to wear the metal between the perforations unevenly, due to the many different directions in which the water flows in entering the perforations. However, the abrasive action of the doctor blade 7 on the surface of the roll 2 is such as to continuously compensate for any uneven wearing of the roll material as fast as it occurs, so that the areas of the roll surface between the perforations 5 are kept uniform. In other words, the abrasive action of the doctor blade 7 on the perforated roll surface prevents the formation of surface irregularities, such as might tend to damage the apron or

wire 4, and require replacement of the suction roll 2 at great expense.

While for purposes of illustration the abrasive doctor blades 7 have been shown in connection with a pair of press rolls of a paper machine, obviously abrasive doctor blades embodying the invention may be advantageously employed in connection with other types of rolls and cylinders, such as calender rolls, or drier cylinders. In the operation of calender rolls, the abrasive action of the doctor blades is very useful in preventing the formation of scale on the roll surfaces, due to the accumulation of the sizing customarily employed in processing paper. Obviously, the abrasive doctor blades can be employed in cooperation with non-abrasive doctor blades in connection with the same roll, the abrasive doctor blades being employed only intermittently to dress the roll surface as conditions require.

I claim,

1. A doctor blade having abrasive properties for cooperation with the cylindrical surface of a roll, said blade being mounted to engage its edge

with the roll surface at an acute angle opposed to the direction of rotation of said roll.

2. A doctor blade for cooperation with the surfaces of rolls and cylinders, characterized by a scouring action of the blade due to the presence of abrasive material in the blade.

3. A doctor blade for cooperation with the surfaces of rolls and cylinders, characterized by a scouring action of the blade due to the presence of abrasive material in the blade, the proportion of abrasive material depending upon the degree of scouring action desired.

4. A doctor blade for a cylindrical roll, composed partially of material having abrasive properties, said blade being mounted to engage its edge with the roll surface at an acute angle opposed to the direction of rotation of said roll.

5. A doctor blade for rolls and cylinders, formed of a composition having abrasive material incorporated therein, said blade being mounted to engage its edge with the roll surface at an acute angle opposed to the direction of rotation of said roll.

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