A. E. BINNS.

SUCTION APPARATUS FOR PAPER MACHINES, &c.

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Fig 1

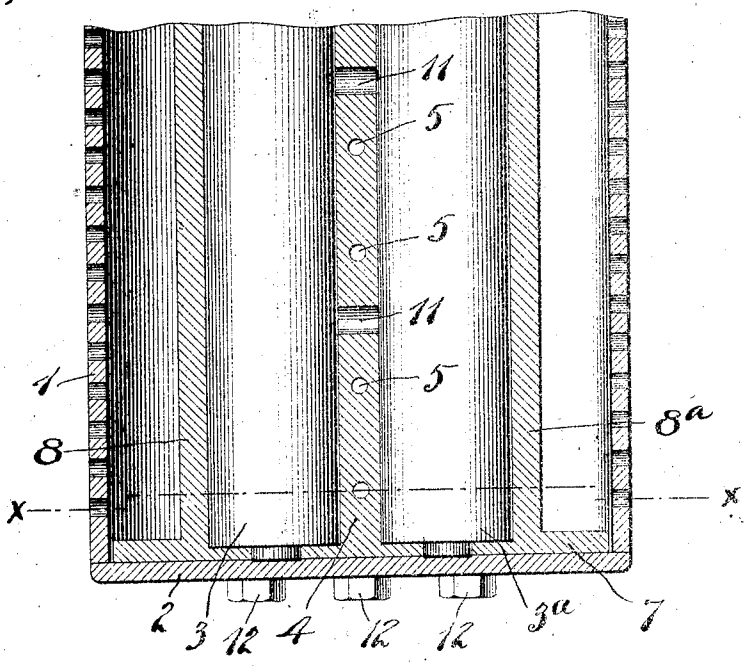
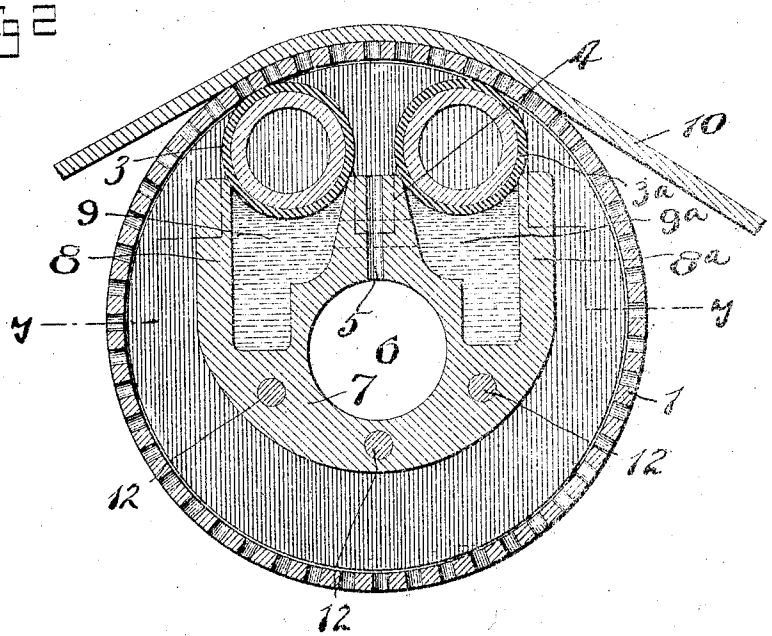


Fig 2



WITNESSES

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SUCTION APPARATUS FOR PAPER-MACHINES, &c.

1,040,126. Specification of Letters Patent. Patented Oct. 1, 1912.

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To all whom it may concern:

Be it known that I, ARTHUR EUGENE BINNS, a citizen of the United States, residing at South Windham, Windham county, State of Connecticut, have invented certain new and useful Improvements in Suction Apparatus for Paper-Machines, &c., of which the following is a full, clear, and exact description.

My invention relates to apparatus for removing water from blankets and fabrics and is of particular utility when employed in connection with paper making machines wherein it is necessary to remove from the so-called "blanket" and the pulp thereon all excess moisture.

The object of the invention, broadly speaking, is to provide a simple and effective suction apparatus which may be employed to very great advantage in connection with paper making machines.

In the drawings, Figure 1 is a horizontal sectional view on the line *y—y* of Fig. 2. Fig. 2 is a vertical sectional view on the line *x—x* of Fig. 1.

1 represents a perforated rotatable cylinder which constitutes the blanket supporting or carrying roll. The ends of the cylinder 1 are preferably closed in by non-rotatable heads 2, one of which is seen in Fig. 1. Within the cylinder 1 and bearing against the inner wall thereof near the top are two rolls 3—3ª which may have suitable end bearings to support the same in such a manner that they will occupy the proper relation to the adjacent coöperating parts. The surface of each roll 3—3ª is such as to make a tight joint where the cylinder 1 contacts therewith.

4 is an elongated rib-like portion extending from end to end of the cylinder and projecting up into the space between the rolls 3—3ª and bearing against the same so as to make a substantially tight joint. The pressure of the rolls 3—3ª against the adjacent parts should be only such as to make the proper joint for the purpose hereinafter described, leaving said rolls, however, free to turn.

By the arrangement thus far described, it will be observed that a space is provided between the two rolls 3—3ª and above the rib 4, which I will term the suction space. The rib 4 is provided with one or more suction or drain passages 5—5 which lead into a central relatively large suction space or passage 6 in a stationary frame or casting 7. This frame or casting preferably has two upright walls 8—8ª which bear respectively against the rolls 3—3ª and which form water spaces, which spaces may be filled with water as indicated at 9—9ª to form a liquid seal for the under side of the rolls.

10 conventionally represents a blanket arranged to travel over that part of the cylinder 1 between the rolls 3—3ª.

Any suitable means may be employed to support the main frame 7, said supporting means entering through the space 6 and properly engaging the frame or casting 7.

12—12 represent bolts for securing the heads 2 to the main frame or casting 7.

Obviously suitable clearance should be provided between the ends of the heads 2 and the cylinder 1 to permit the latter to turn with sufficient freedom, although this space should be sufficiently snug to prevent unnecessary leakage and may, indeed, be packed, if desirable.

When suction is created within the space 6, it is obvious that a corresponding vacuum is created in the space between the rolls and under that part of the cylinder 1 which is covered by the blanket 10; hence, any excess moisture contained in the blanket will be drawn through the perforations in the main cylinder 1 into the space between the rolls, and thence through the passage 5 and out through the space 6. Part of this water may flow through passages 11 into the aforesaid water spaces to form the liquid seal aforesaid. It is obvious that by this arrangement the blanket 10 may travel freely over the cylinder 1 without undue wear since the latter will revolve very readily upon and with the rolls 3—3ª. The heads 2 of the cylinder are carried by the cylinder and do not sustain the weight thereof, said weight being sustained mainly, if not entirely, by the freely turning rolls 3—3ª. The rolls 3—3ª are supported, of course, by the main frame or casting 7. It is obvious, since the suction on the blanket is confined only to the zone represented by the space between the rolls 3—3ª, that said blanket will be entirely free on its approach to and departure from said cylinder 1.

Any suitable packing means may be provided at any desired point to prevent leakage, the application of such packings being merely the work of the skilled mechanic.

The roll 1 may be of any desired size and

wall thickness and should be provided with an adequate number of perforations of proper size and shape to effectively draw the water from the blanket, said perforations being only conventionally shown herein.

It should be understood that the mechanical construction of the various parts may be modified at will to facilitate the assembling of the various parts, including the assembling of the rolls with the ends of the casting or main frame 7.

What I claim is:

1. In an apparatus of the character described, a main perforated cylinder, two internally located cylinder supporting rolls spaced apart but arranged adjacent to each other and longitudinally of the cylinder, a stationary filler to close the space between said rolls to form a suction space above said filler, between said rolls and underneath that part of the main cylinder above and between the latter, and means for exhausting air from said space including a suction passage extending through said filler and into the space between said rolls.

2. In an apparatus of the character described, a main perforated cylinder, two spaced cylinder supporting rolls located interiorly and longitudinally thereof and adjacent to each other and having a rotating frictional engagement with the interior of said cylinder, a stationary filler closing the space between said rolls and frictionally engaged thereby and forming a suction space between said rolls and that part of the cylinder therebetween and above the filler, a plurality of passages extending longitudinally of said filler and communicating with said suction space, and air exhausting means in communication with said passages.

3. In an apparatus of the character described, a main perforated cylinder, two internally located cylinder supporting rolls spaced apart but arranged adjacent to each other, a filler to close the space between said rolls to form a suction space above said filler, between said rolls and underneath that part of the main cylinder above and between the latter, means for exhausting air from said space, and means for providing a water seal under each of said rolls and within the main cylinder.

4. In an apparatus of the character described, a main supporting frame or casting, two rolls rotatably mounted therein parallel with each other and free to rotate, part of said frame closing the space between said rolls, a perforated main cylinder supported by and revolving on said rolls; a stationary filler carried by said frame and closing the space between and beneath said rolls, forming a suction space above said filler between said rolls and beneath that part of the cylinder, between said rolls, and a suction passage formed in said filler between said rolls and communicating with said suction space aforesaid.

5. In an apparatus of the character described, a main perforated cylinder, two spaced cylinder supporting rolls located interiorly thereof and adjacent to each other and having a rotating frictional engagement with the interior of said cylinder, a body supported below said rolls having a filler portion extending up and closing the space between said rolls and frictionally engaged thereby, and forming a suction space between said rolls and that part of the cylinder therebetween and above said filler portion, a suction and draining chamber formed in said body below said filler portion and rolls, and a passage formed in said filler portion communicating with said suction space and said suction chamber.

6. In an apparatus of the character described, a main perforated cylinder, two spaced cylinder supporting rolls located interiorly thereof and adjacent to each other and having a rotating frictional engagement with the interior of said cylinder, a body supported below said rolls having a filler portion extending up and closing the space between said rolls, and forming a suction space between said rolls and that part of the cylinder therebetween and above said filler portion, and water chambers formed in said body beneath said rolls and on either side of said filler portion providing a water seal under each of said rolls and between said rolls and said filler portion.

7. In an apparatus of the character described, a main perforated cylinder, two spaced cylinder supporting rolls located interiorly thereof and adjacent to each other and having a rotating frictional engagement with the interior of said cylinder, a body supported below said rolls having a filler portion extending up and closing the space between said rolls, and forming a suction space between said rolls and that part of the cylinder therebetween and above said filler portion, water chambers formed in said body beneath said rolls and on either side of said filler portion providing a water seal under each of said rolls and between said rolls and said filler portion, means for exhausting air from said suction space, and a passage formed in said filler portion communicating with said suction space and said water chambers and supplying water drawn through said cylinder to said water chambers.

8. In an apparatus of the character described, a main perforated cylinder, two spaced cylinder supporting rolls located interiorly thereof and adjacent to each other and having a rotating frictional engagement with the interior of said cylinder, a body supported below said rolls having a

filler portion extending up and closing the space between said rolls and frictionally engaged thereby, and forming a suction space between said rolls and that part of the cylinder therebetween and above said filler portion, a suction and draining chamber formed in said body below said filler portion and rolls, a passage formed in said filler portion communicating with said suction space and said suction chamber, water chambers formed in said body beneath said rolls and on either side of said filler portion providing a water seal under each of said rolls and between said rolls and said filler portion, and another passage formed in said filler portion communicating with said suction space and said water chambers and supplying water drawn through said cylinder to said water chambers.

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Witnesses:
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