June 15, 1926. 1,589,119

W. S. CRANDELL

CYLINDER MOLD FOR PAPER MAKING MACHINES

Filed July 10, 1922

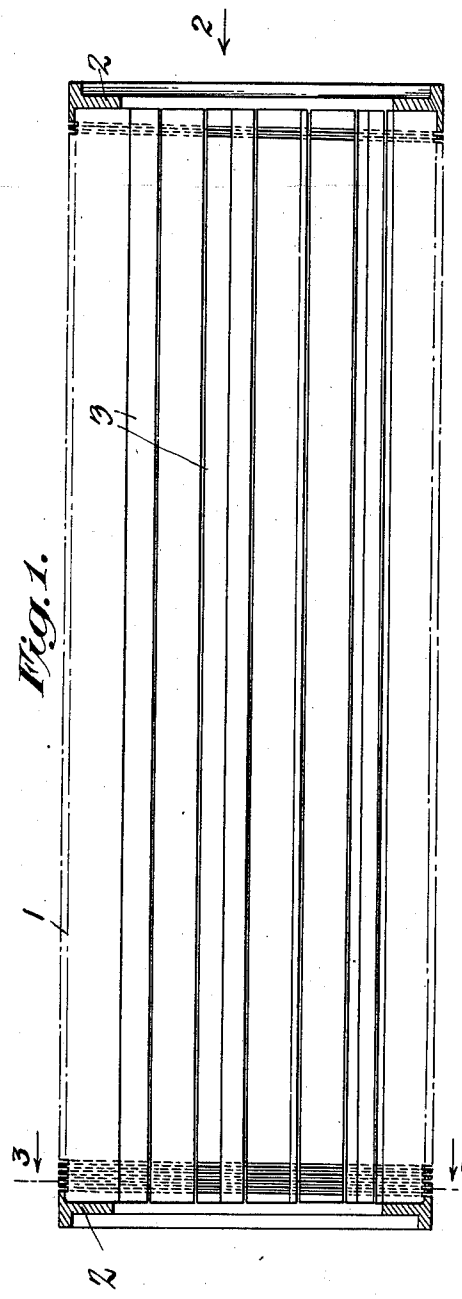


Fig. 1.

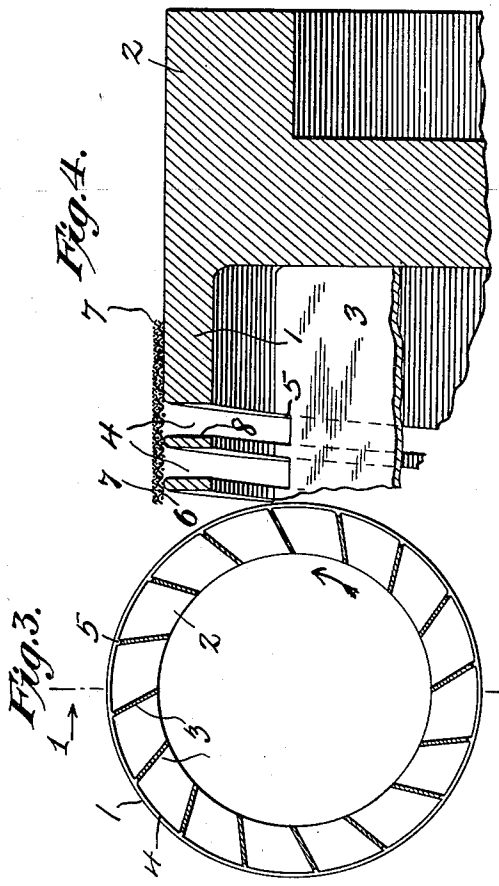


Fig. 4.

Fig. 3.

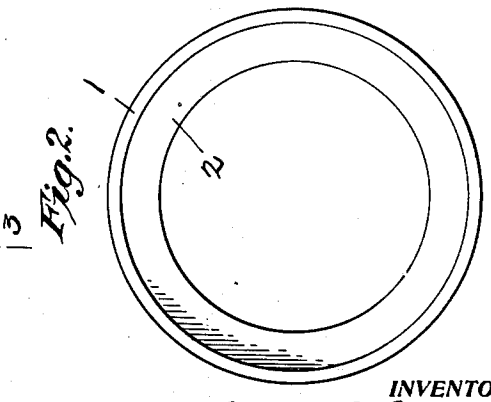


Fig. 2.

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Patented June 15, 1926. 1,589,119

UNITED STATES PATENT OFFICE.

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CYLINDER MOLD FOR PAPER-MAKING MACHINES.

Application filed July 10, 1922. Serial No. 573,901.

This invention relates to paper making machines in which there is employed a cylindrical mold on which the paper is formed, said cylindrical mold acting with a couch roll carrying a felt for carrying off the paper formed on the cylindrical mold and for driving the elements and it has more particularly reference to the construction of the cylindrical mold itself.

In the art as heretofore practiced it has been the custom to build up cylindrical molds of this character by mounting on a central shaft a series of collars or rings in endwise engagement with each other, said rings carrying spiders, these spiders being connected by means of longitudinally extending bars or rods that are secured to all the spiders at the peripheries thereof; and it has been the custom to have a ring and a spider say at every five inches throughout the length of the cylindrical mold. Usually, the spiders are recessed at their peripheries and brass rods or bars are laid in these recesses and are secured to such spiders as by soldering or other wise, said longitudinal bars or rods in connection with a coarse winding wire, say fourteen to twenty mesh, forming the under face of the mold. Over the under face or supporting structure thus formed, is placed the usual forming face consisting of wire screens of relatively fine mesh, say from sixty to one hundred fine. It will be understood that considerable work is necessary to assemble the parts into a structure of the character indicated and also that it is extremely difficult to maintain a true forming surface, the result being that water does not pass through from the outer surface to the interior of the cylindrical mold with a requisite degree of pressure with the consequence that particles of the stock will adhere and build up on the surface thereof, thereby causing a tear or other uneveness or inequalities in the paper produced. The object of this invention is to cure the above enumerated defects so that the machine may be operated at a greatly increased speed while at the same time producing more perfect paper.

The invention consists primarily in making the cylindrical structure as an integral member capable of admitting of the passage of the water from its exterior to its interior in the proper manner, the structure being so arranged that the so-called under face forms a part of the cylinder structure itself, the shaft, the numerous rings and the spiders being omitted. In this manner, the cost of manufacture is considerably lowered, the speed of the machine is increased, and the paper produced is more perfect.

In the accompanying drawings, the invention is disclosed in a concrete and preferred form in which

Fig. 1 is a central longitudinal section of the mold on the plane of line 1—1 of Fig. 3;

Fig. 2 is an end elevation of the cylinder looking in the direction of arrow 2 of Fig. 1; and

Fig. 3 is a cross section on the plane of line 3—3 of Fig. 1: and

Fig. 4 is an enlarged fragmentary detail view of the upper right hand corner of Fig. 1.

The mold is characterized by a hollow cylindrical body portion 1 having formed integrally therewith end heads 2 and having also formed integrally therewith longitudinal bars 3, these bars being arranged near the periphery of the cylindrical portion and extending between the heads from one end of the cylinder to the other, and as will be noted, they are really ribs or vanes projecting inwardly from the cylindrical portion. 4 indicates circumferential openings in this cylindrical portion that may be in the form of concentric openings, if so desired, but which are here shown as being in the form of a spiral. Preferably, these openings extend part way into the longitudinal bars 3, as indicated at 5, in order to facilitate the passage of the water through the surface of the cylinder and so as not to form an obstruction on which the stock may lodge. Preferably, the bars 3 are in the form of non-radial vanes whereby they act as baffle plates to prevent the water in the interior of the cylindrical mold from reacting outwardly. The spiral thread 8 which is thus formed may have straight vertical faces or may be tapered outwardly and, if desired, be slightly rounded at the top. Surrounding the cylindrical portion is the usual forming face indicated here by coarse wire mesh 6 and superimposed finer wire mesh 7. It will be evident that by this construction the cylindrical mold is of unusually simple formation and can be machined true so as to present a better surface for supporting the forming face of the mold and permits more thorough washing by showers, all of which tends to permit of the production of more

perfect paper and of a greatly increased speed of manufacture.

I claim:

1. An integrally formed cylinder mold for paper making machines, comprising end heads, a hollow cylindrical portion, longitudinal bars extending between the end heads and integrally connected with the latter and with the inside of the cylindrical portion, said cylindrical portion having circumferential openings in its surface.

2. An integrally formed cylinder mold for paper making machines, comprising end heads, a hollow cylindrical portion, longitudinal bars extending between the end heads and integrally connected with the latter and with the inside of the cylindrical portion, said cylindrical portion having circumferential openings arranged in the form of a spiral in its surface.

3. An integrally formed cylinder mold for paper making machines, comprising end heads, a hollow cylindrical portion, longitudinal bars extending between the end heads and integrally connected with the latter and with the inside of the cylindrical portion, said cylindrical portion having circumferential openings in its surface, the openings extending partly into the longitudinal bars aforesaid.

4. An integrally formed cylinder mold for paper making machines, comprising end heads, a hollow cylindrical portion, longitudinal bars extending between the end heads and integrally connected with the latter and with the inside of the cylindrical portion, said cylindrical portion having circumferential openings arranged in the form of a spiral in its surface, the openings extending partly into the longitudinal bars aforesaid.

5. An integrally formed cylinder mold for paper making machines comprising, end heads, a hollow cylindrical portion, nonradial longitudinal bars extending between the end heads and integrally connected with the latter and with the inside of the cylindrical portion, said cylindrical portion having circumferential openings in its surface, the openings extending partly into the longitudinal bars aforesaid.

Signed at New York city in the borough of Manhattan, county and State of New York, this 7 day of July, 1922.

WILLIS S. CRANDELL.