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PAPER-MAKING MACHINE

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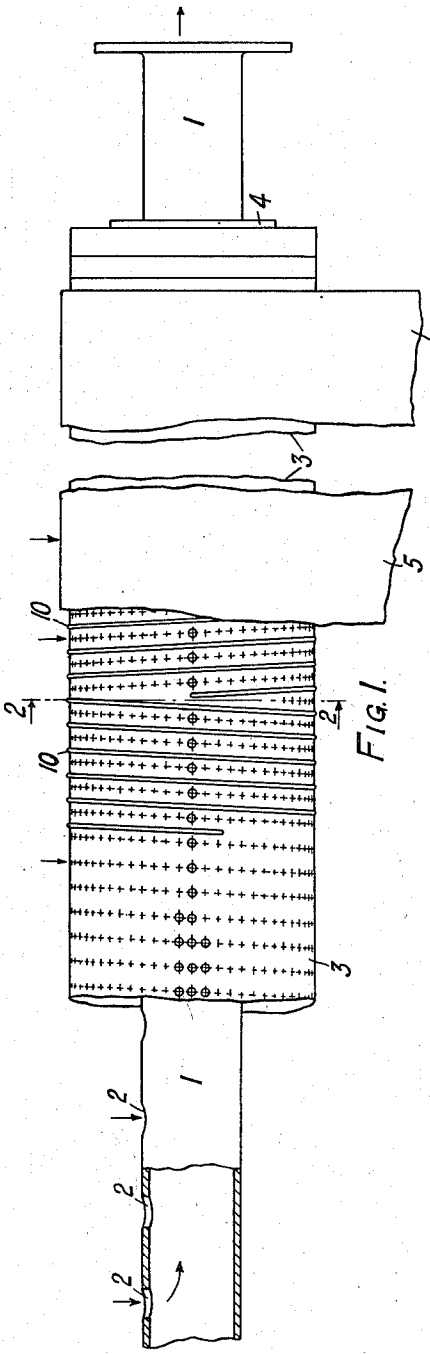


FIG. 1.

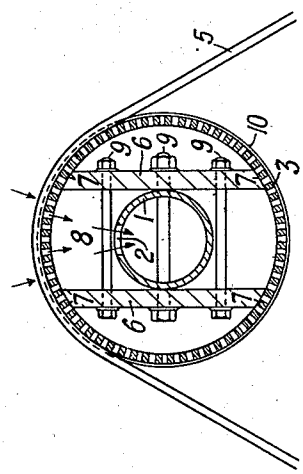


FIG. 2.

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PAPER-MAKING MACHINE

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Application December 31, 1938, Serial No. 248,696
In Great Britain February 26, 1938

2 Claims. (Cl. 92—53)

This invention relates to paper-making machines of the type including a plurality of vacuum drums embraced by and adapted to extract the moisture from the usual endless felts.

More particularly, the invention relates to vacuum drums for such machines of the type comprising a non-rotary tubular shaft of which the interior is connected to a vacuum-producing device, such as a fan or a pump, and of which the wall is perforated unilaterally, a cylindrical perforated shell journalled for rotation on the shaft and adapted to be embraced by a felt, and a pair of diaphragms secured to and arranged one on each side of the shaft with their edges in contact with the inner peripheral surface of the shell so as, in conjunction with the shaft, to define a chamber which is open to the unilateral perforations in the shaft and to those of the perforations in the shell which are surmounted by the felt and which is closed to substantially that part of the shell which is out of contact with the felt, the arrangement being such that, in the operation of the drum, atmospheric air is caused by the vacuum produced in the tubular shaft to flow through the felt and through the perforations in the shell to the chamber and from the chamber through the unilateral perforations into the tubular shaft.

The present invention consists in an improved vacuum drum for such machines incorporating a shell provided with two oppositely directed helical grooves accommodating lengths of wire which protrude beyond the outer peripheral surface of the shell and perform the function of spreading the felt and the function of permitting a quantity of air and moisture to leak between the inner side of the felt and the outer peripheral wall of the shell so as to improve the drying action on the side of the felt nearer the shell.

A vacuum drum constructed in accordance with the invention is illustrated in the accompanying drawing in which Fig. 1 is a fragmentary elevation partly in section and Fig. 2 a section on the line 2—2 of Fig. 1.

The vacuum drum shown includes a non-rotary tubular shaft 1 of which the interior is connected to a vacuum-producing device (not shown), such as a fan or a pump, and of which the wall is perforated unilaterally at 2. A cylindrical perforated shell 3 is journalled at 4 for rotation on the shaft 1 and is adapted to be embraced by a felt 5. Diaphragms 6 are secured to and arranged one on each side of the shaft 1 with their edges 7 in contact with the inner peripheral surface of the shell 3 so as, in conjunction with the shaft 1, to define a chamber 8 which is open to the perforations 2 in the shaft 1 and to those of the perforations on the shell which are surmounted by the felt 5 and which is closed to substantially that part of the shell which is out of contact with the felt. In the operation of the drum, atmospheric air is caused by the vacuum produced in the tubular shaft to flow as indicated by the arrows through the felt 5 and through the perforations in the shell to the chamber 8 and from the chamber 8 through the unilateral perforations 2 into the tubular shaft 1.

The diaphragms are constituted as plates bolted at 9 to the tubular shaft and arranged with their edges in contact with the peripheral wall of the shell. Suitable packing material may be interposed between the edges of the diaphragms 6 and the inner peripheral wall of the shell 3.

The shell as shown is provided with two oppositely directed helical grooves accommodating lengths of wire at 10 which protrude beyond the outer peripheral surface of the shell 3 and perform the function of spreading the felt 5 and the function of permitting a quantity of air and moisture to leak between the inner side of the felt 5 and the outer peripheral wall of the shell 3 so as to improve the drying action on the side of the felt nearer the shell.

We claim:

1. A suction roll for spreading and drying a paper-making felt comprising a shell having two series of perforations extending helically around the shell in opposite directions, each starting at a point about midway of the length of the shell with the convolutions thereof spaced transversely along the shell, a pair of wires wrapped helically around the shell between the respective convolutions of said two series of perforations, said wires each starting at a point about midway of the length of the shell and protruding beyond the periphery of the shell and adapted to support a felt of a paper-making machine from which moisture is to be extracted out of contact with the periphery of the shell as the felt passes thereover, the convolutions of said wires affording between them helical spaces extending circumferentially along the periphery of the shell with which spaces said perforations communicate, whereby air may pass circumferentially of the shell between the shell and the felt the entire distance the felt is in contact with the shell,

the direction of winding of said wires being such that when the shell is rotating in one direction said wires will tend to spread the felt transversely.

2. A suction roll for spreading and drying a paper-making felt comprising a shell having two series of perforations extending helically around the shell in opposite directions, each starting at a point about midway of the length of the shell with the convolutions thereof spaced transversely along the shell, a pair of wires wrapped helically in opposite directions around the shell between the respective convolutions of said two series of perforations, said wires each starting at a point about midway of the length of the shell and protruding beyond the periphery of the shell and adapted to support a felt of a paper-making machine from which moisture is to be extracted out of contact with the periphery of the shell as the felt passes thereover, the convolutions of said wires affording between them helical spaces extending circumferentially along the periphery of the shell with which spaces said perforations communicate, a tubular shaft about which said shell is rotatable, said tubular shaft being open at one end and provided with perforations in the portion of the tubular shaft adjacent the felt-carrying portion of said shell, and diaphragms secured to said shaft, one on each side of said shaft, with their edges in contact with the inner peripheral surface of said shell, said last-mentioned perforations being disposed between the planes defined by said diaphragms whereby air may pass circumferentially of the shell between the shell and the felt the entire distance the felt is in contact with the shell, the direction of winding of said wires being such that when the shell is rotating in one direction said wires will tend to spread the felt transversely.

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