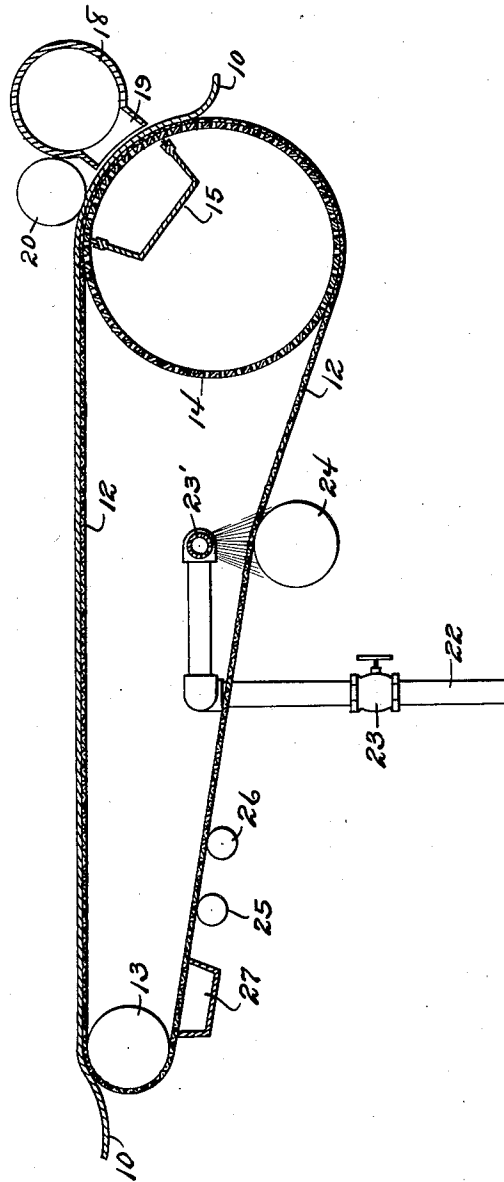


WITNESS:

PAPER MAKING MACHINE

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PAPER-MAKING MACHINE

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The object of this invention is to remove water from paper during manufacture without the use of a felt strip or belt, and without the use of wringing devices or the like.

5 A further object is to employ a woven wire supporting belt for the paper, in order to save the cost of a wool felt belt, and in order to save time otherwise lost in giving a belt of that character proper attention, 10 this attention being possible only in the hands of a skilled workman.

A further object is to provide a more effective washing operation than is possible in the machines employing felt belts, and to provide for drying the wire belt between the point where it passes a water spraying device and the point where it comes into engagement with the paper strip, thereby avoiding the unnecessary addition of moisture to the paper, which moisture has to be removed if present.

A further object is to provide for the removal of water or moisture from the paper by a suction roll opposite which a hot air pipe is positioned, the paper strip and the wire belt passing between these elements for the purpose of removing a portion of the water and pre-heating the paper before entering the steam driers usually employed, 30 but not shown in this case,—thereby diminishing the steam pressure in the driers.

A further object is to employ in connection with the hot air pipe, or separately therefrom, a smoothing roll which is 35 mounted directly above the paper sheet, adjacent to the hot air pipe.

With the foregoing and other objects in view, the invention consists in the novel features of the process disclosed, and in the novel features of construction described, illustrated, and claimed, it being understood that modifications may be made within the scope of the claim without departing from the spirit of the invention.

45 In the drawings forming part of this application, the view is in vertical section, transversely of the rollers over which the woven wire belt passes, the latter being in longitudinal section.

50 Referring to the drawings in detail, the

paper strip or sheet is designated 10, and is carried on a woven wire belt 12 passing over roll 13 at one end portion of the apparatus disclosed in the drawing, and passing over a larger roll 14 provided with a suction box 15, which may be mounted in the position 55 shown, and which produces reduced air pressure as the surface portion of roll 14, apertured as shown passes the box 15.

A considerable portion of the moisture, 60 or water, is removed, and this is especially true if a hot air 18 having an elongated nozzle portion 19 is positioned opposite the suction box, so that when desired this hot air blast pipe may be operated in conjunction 65 with the suction box. A smoothing or finishing roll 20 may be mounted adjacent to the pipe 18, and used when desired, independently, or in conjunction with the element or elements referred to, it being understood 70 that no pressure of consequence is imparted to the paper strip by the roll 20.

An important feature of any apparatus of this kind is to provide for the proper cleaning of the paper carrying elements, and 75 where a felt belt is employed either independently or in conjunction with a wire belt, it is difficult or impossible to effect proper cleaning of the belt, because the passage of water thru the fabric is retarded,—whereas 80 by the use of a wire belt independently of other paper carrying means, and by the use of effective spraying devices, and water removing devices, a thoroughly effective cleaning operation can be performed. Moreover 85 in the present case I provide for drying the wire belt between the point where the spraying apparatus is located, and the point where the belt again comes into contact with the paper sheet. 90

A water pipe is designated 22 and is controlled by a valve 23, this pipe including an upper discharge portion which passes between the upper and lower runs of the woven wire belt. That portion of the pipe designated 23' is apertured for spraying purposes, 95 and the water is directed thru the woven wire element with considerable force and at a point opposite the so called wash roll designated 24, which also constitutes a guid- 100

ing roll, and a stretching or tension producing device.

Roll 24 removes a portion of the water from the wire belt, and the rolls 25 and 26 are in sufficiently close contact to carry off additional moisture, although the surface is barely in contact, meaning that the surface of the belt lightly engages the periphery of the rolls 25 and 26, for the purpose indicated.

10 In addition to rolls 25 and 26, or independently thereof, a suction box 27 may be employed, at a point immediately adjacent to the roll 13, and only slight reduction in
15 the pressure is required in order to secure very satisfactory results by the use of a suction box at this point or between roller 24 and roller 13.

Among the advantages connected with the use of the apparatus, in addition to those
20 referred to, are the following: The wood used may be more freely ground, decreasing the amount of steam required in the driers, and increasing the production of the grinder;
25 the operation is continuous for a given period of time, say one week; highly skilled labor is not required, and time lost in the cleaning of apparatus of the type commonly used, is saved, and may be employed to better advantage.

30 What is claimed is:—

A device of the character set forth comprising a perforated drying roller and an end guide roller spaced therefrom, a woven
35 wire belt mounted on said rollers to move paper from the guide roller towards and over the drying roller, a suction box located within the drying roller, a hot air element having the discharge end disposed opposite
40 to the suction box and on the outer periphery of the drying roller and having the belt and paper passing between the discharge end thereof and said drying roller, a pressure roller in advance of the hot air element and
45 bearing against the paper and belt on the drying roller and arranged opposite the suction box, a spray cleaning means for said belt, a roller engaging said belt below said means, a second suction box located against
50 the belt and adjacent the end guide roller, and a pair of water removing rollers engaging the belt before reaching the second suction box.

In testimony whereof I affix my signature.
55 HARVEY H. JURGENSEN.