E. MATHESON.

MOISTENING APPARATUS.

APPLICATION FILED JULY 15, 1915.

1,165,268.

Patented Dec. 21, 1915.

Fig. 1.

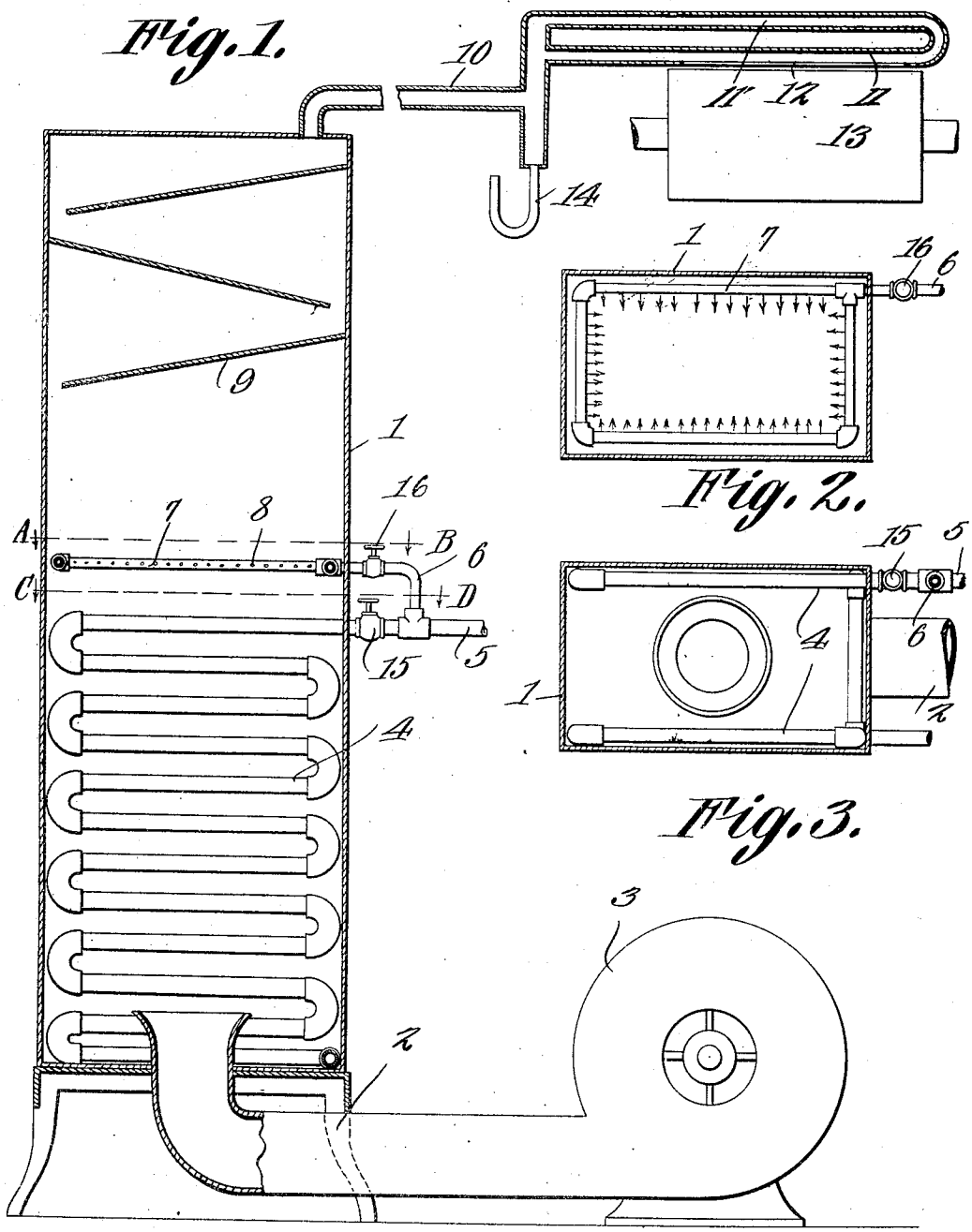


Fig. 2.

Fig. 3.

Witnesses

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UNITED STATES PATENT OFFICE.

EINAR MATHESON, OF WOODLAND, MAINE.

MOISTENING APPARATUS.

1,165,268. Specification of Letters Patent. Patented Dec. 21, 1915.

Application filed July 15, 1915. Serial No. 40,125.

To all whom it may concern:

Be it known that I, EINAR MATHESON, a citizen of the United States, residing at Woodland, in the county of Washington and State of Maine, have invented a new and useful Moistening Apparatus, of which the following is a specification.

This invention relates to moistening apparatus especially designed for use in the manufacture of paper.

One of the objects of the invention is to provide apparatus whereby heated air is charged with water vapor so as to be saturated, the air being conveyed to the point of use where it is chilled so as to condense the water held in suspension.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, can be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawings the preferred form of the invention has been shown.

In said drawings:—Figure 1 is a vertical section through the apparatus. Fig. 2 is a section on line A—B Fig. 1. Fig. 3 is a section on line C—D Fig. 1.

Referring to the figures by characters of reference 1 designates the casing of the heater, said casing being provided, at its bottom, with an air inlet flue 2 extending from the casing 3 of a blower. Arranged within the lower portion of the casing and adjacent the air inlet, are radiators 4 in communication with a steam supply pipe 5 and extending from this supply pipe is a branch pipe 6 discharging into a spraying pipe 7 which is preferably extended close to the walls of the casing 1 and has outlet openings 8 for directing jets of steam inwardly across the path of the ascending air current. Above the spraying pipe 7 are superposed oppositely inclined baffle plates 9. An outlet pipe 10 extends from the top of the casing and terminates in a nozzle 11 provided with a bypass 11′, said nozzle having one or more outlet slots or other openings 12 therein which, in the present instance, are adapted to direct air against a chilled cylinder 13. A trap 14 extends downwardly from the pipe 10 and is designed to receive moisture condensed within the pipe 10. Pipe 5 is preferably provided with a valve 15 and another valve 16 is preferably arranged in the branch pipe 6.

In using the apparatus herein described, steam is directed into the radiator 4 from the pipe 5 and air is then forced upwardly through the casing 1 by the blower so as to be thoroughly heated by the radiators. The valve 16 is then opened and portions of the steam will be sprayed into the ascending column of air and become thoroughly commingled therewith, the amount of moisture held in suspension by the air depending upon the temperature of the air. As the air laden with moisture ascends within the upper portion of casing 1, it will circulate between the baffle plates, these plates serving to separate from the air any large particles of moisture which may be mixed therewith. The moisture laden air then flows outwardly through pipe 10 to the nozzle 11, from which it is directed onto the chilled roller or cylinder 13 where condensation takes place, the moisture being here used for the purposes intended.

While the apparatus is especially designed for use in connection with paper making machinery, it is to be understood that it can be employed wherever it is desired to moisten material. Furthermore, means other than a chilled roller 13 can be employed for condensing the moisture as the air issues from the nozzle. Also instead of having the steam spraying means combined with a heating means, one form of heater can be used and the steam can be supplied from a separate source. For example, an electric heater could be employed and a steam pipe could be extended to the spraying pipe 9. This modification is so obvious that it is not deemed necessary to show or describe the same in detail.

What is claimed is:—

1. Moistening apparatus including an air heater, a nozzle in communication therewith, means for setting up a forced circulation of air through the heater and to the nozzle, and means for directing a jet of steam into the preheated air.

2. Moistening apparatus including an air heater, a nozzle in communication therewith, means for directing a current of air through

the heater and to the nozzle, means between the heater and nozzle for directing steam into the preheated air.

3. Moistening apparatus including an air heater, a nozzle in communication therewith, means for directing a current of air through the heater and to the nozzle, means between the heater and nozzle for directing steam into the preheated air, and means between the nozzle and the steam directing means for separating water from the air.

4. Moistening apparatus including an air heater, a nozzle in communication therewith, air chilling means adjacent the nozzle, means for directing a current of air through the heater to the nozzle, and means for directing steam into the preheated air.

5. Moistening apparatus including a casing, a radiator therein, a nozzle in communication with the casing, means for directing a current of air past the radiator and to the nozzle, and a steam spraying member within the casing and between the radiator and nozzle.

6. Moistening apparatus including a casing, a radiator therein, a nozzle in communication with the casing, means for directing a current of air past the radiator and to the nozzle, a steam spraying member within the casing and between the radiator and nozzle, and baffles within the casing and between the nozzle and the steam spraying means.

7. Moistening apparatus including a casing, a radiator therein, a nozzle in communication with the casing, means for directing a current of air past the radiator and to the nozzle, a steam spraying member within the casing and between the radiator and nozzle, baffles within the casing and between the nozzle and the steam spraying member, and condensing means adjacent the nozzle.

8. Moistening apparatus including a casing, a nozzle, a pipe connection between the nozzle and casing, a trap in said connection, condensing means adjacent the nozzle, air heating means within the casing, means for directing a current of air past said heating means and to the nozzle, and means within the casing for directing steam into the preheated air.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

EINAR MATHESON.

Witnesses:
WILLIAM POLLEY,
E. S. SMALL.