Jan. 12 , 1926. 1,569,558

G. J. MANSON

DISTRIBUTING DEVICE FOR MOVING FLUIDS AND GASES

Filed Dec. 12, 1924

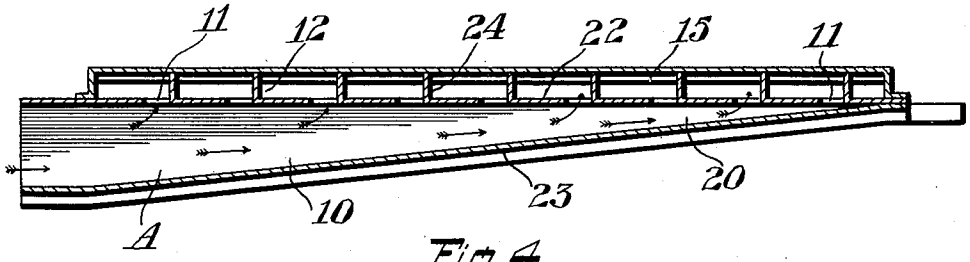


Fig. 4.

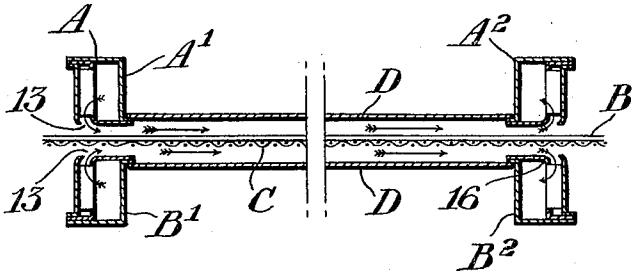


Fig. 2.

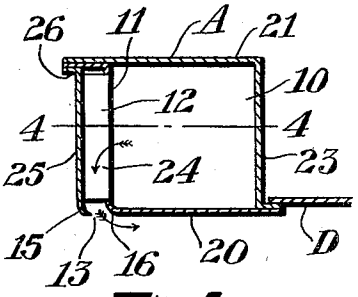


Fig. 3.

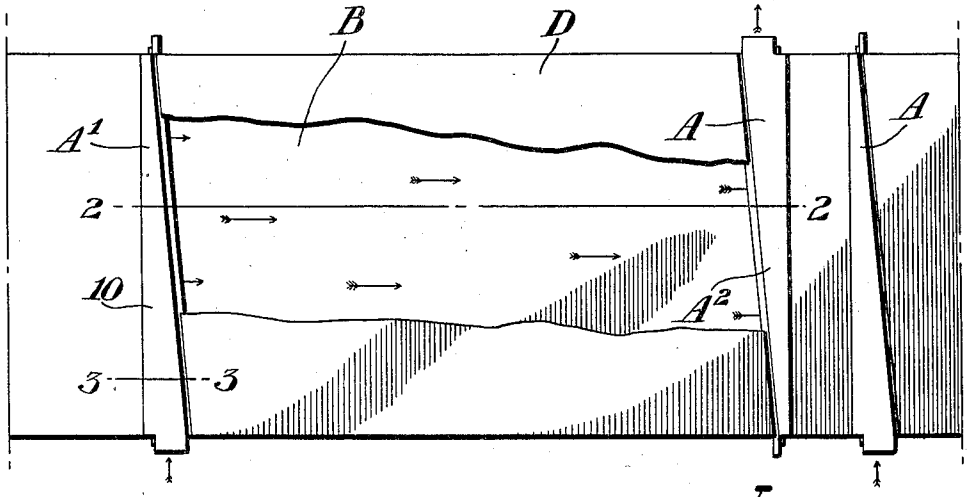


Fig. 1.

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UNITED STATES PATENT OFFICE.

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DISTRIBUTING DEVICE FOR MOVING FLUIDS AND GASES.

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To all whom it may concern:

Be it known that I, GEORGE JAMES MANSON, a subject of the King of Great Britain, and resident of the town of Hawkesbury, in the Province of Ontario and Dominion of Canada, have invented certain new and useful Improvements in Distributing Devices for Moving Fluids and Gases, of which the following is a specification.

This invention relates to improvements in distributing devices for moving fluids or gases and the objects of the invention are to provide for more uniform lateral distribution of a gas or fluid current across the width of a moving sheet or the like which is to be dried, whereby the moving current or blast would be uniform in intensity and velocity throughout the width of the material being operated upon. The device is particularly applicable to the extraction of moisture from and the drying of moving sheets, felts or boards of fibrous material such as paper, pulp or fibre-board or the like.

Further objects of the invention still are generally to improve and simplify a device of this character to enable it better to perform the functions required of it.

The invention consists essentially of the improved construction hereinafter described in detail in the accompanying specification and drawings and more particularly pointed out in the claims.

Figure 1 is a plan view of an embodiment of my invention partly broken away, showing a plurality of distributing devices in operative position.

Figure 2 is a section on the line 2—2 of Figure 1.

Figure 3 is a cross section to an enlarged scale on the line 3—3 of Figure 1.

Figure 4 is a section on the line 4—4 of Figure 3.

In the drawings like characters of reference indicate corresponding parts in all the figures.

Referring to the drawings, A indicates one of my improved distributing members which may be operated either as a blast or suction distributor. It is provided with a gradually converging distributing channel 10 conveniently formed with parallel upper and lower plates 20 and 21 and an inner side plate 22 and an outside plate 23, the latter gradually converging towards the plate 22, as indicated in Figure 4. The inner plate 22 is formed with a plurality of spaced ports 11 extending substantially from bottom to top of the channel 10 and opening into a plurality of cross channels 12, greater in width than the ports themselves and designed to conduct the gas or fluid to a common outlet or channel 13 which may be formed more or less in the form of a nozzle with curved edges 15 and 16 designed to discharge or draw in the gas or fluid in a tangential direction in respect to the moving sheet. The cross channels 12 may be conveniently formed from the material struck out from the ports 11, such material constituting cross partitions 24 by which the cross channels are formed, the outside of the cross channels being formed by a suitable plate 25 having a flange 26 by which it may be attached to the plate 21.

The various plates and channels may be formed of any convenient material, such as sheet iron, or steel, which is suitably shaped and formed in the various channels and cross channels, as indicated, and held together by any convenient fastening means such as spot welding or riveting.

In using the device to dry a moving sheet of pulp or fibre-board B or the like, carried on suitable endless conveyors C, I preferably provide a plurality of pairs of distributing devices A^1 and A^2, B^1 and B^2, the part A^1 and A^2 being opposed in direction to each other and located above the sheet while the pair B^1 and B^2 are opposed to each other and located below the sheet. Each of these distributing devices is similar in construction to the device A already described and the devices of each pair are preferably connected by a guide or deflecting plate D which guides the air or fluid in its passage from one device to the other and retains it in contact with the sheet of material to be dried.

In operating the device to extract the moisture from a sheet of fibre-board, which for instance may have come from the usual wet machine, the drying air, preferably heated, is introduced through the devices A^1 and B^1 while the sheet is carried at a suitable rate on the conveyor C. The air passes at a suitable velocity, governed by the speed at which it is desired to have the drying operation take place, from the devices A^1 and B^1 to the devices A^2 and B^2. In passing from one device to the other the air will pick up moisture from the sheet to be dried and a suitable suction will be created within

the devices A^2 and B^2 causing the moisture laden air to pass into the devices and thence to be relieved of its moisture and to be dried in any suitable manner.

It will be observed that the current of air entering each of the devices A is first delivered from the cross channels and is then combined when discharged. In combining the direction of the current is changed to thereby insure the effective combination and commingling of the various currents passing through the cross channels. It will also be noted that a current of air or gas or fluid is discharged tangentially through the surface of the material to be dried and may move either with or against the direction of the movement of such material.

It will be seen that the tapered or gradually converging arrangement of the inlet channel 10 of the device will, taken together with the ports 11 in one side thereof, enable a uniform distribution of the drying current to be made whereby all parts of the sheet to be operated upon will be uniformly treated.

As many changes could be made in the above construction and many apparently widely different embodiments of my invention within the scope of the claims, constructed without departing from the spirit or scope thereof, it is intended that all matter contained in the accompanying specification and drawings shall be interpreted in an illustrative and not in a limiting sense.

What I claim as my invention is:

1. A distributing device for moving fluids or gases comprising a gradually converging channel having a plurality of spaced ports in the side thereof, cross channels communicating with the ports and arranged to discharge or take in together to produce a uniformly distributed flow.

2. The combination with the device as claimed in claim 1, of a nozzle member through which the cross channels discharge.

3. The device as claimed in claim 1 in which the distributing device is rectangular in cross section.

4. A distributing device for the purpose specified comprising a distributing channel, a plurality of cross channels opening into the same, a common channel opening from the cross channel, said common channel having a suitable outlet nozzle.

5. The combination of one or more devices as claimed in claim 1 of a moving conveyor designed to carry the material to be operated upon by the fluid or gas distributed by said device or devices.

6. The herein described means for distributing a moving fluid or gas which comprises means for drawing successive lateral currents from a gradually converging current of gas or fluid, means for then combining these lateral currents, and means for changing the direction thereof, and discharging the same.

7. The means as claimed in claim 6 in which the current is discharged tangentially of the surface to be dried.

8. The means as claimed in claim 6 in which currents are caused to flow above and below the material to be dried.

9. A distributing device for the purpose specified comprising a distributing channel, a plurality of lateral channels communicating with same, designed to discharge together to thereby combine the currents and means for directing the combined currents from the common channel tangentially of the material to be dried.

10. A distributing device for the purpose specified comprising a distributing channel, a plurality of lateral channels communicating with same, designed to discharge together to thereby combine the currents and means for directing the combined currents from the common channel tangentially of the material to be dried and a conveying means below the device for conveying the material to be dried.

11. A drying apparatus of the character described comprising a conveyor, a pair of opposed distributing devices on one side of the conveyor, said devices including means for uniformly distributing the current of fluid or gas transversely across the material to be dried and a guide plate extending between the two devices.

12. A device as claimed in claim 11 in which one pair of devices is arranged above the material to be dried and a second pair is arranged below the material to be dried, whereby both surfaces of the material to be dried are operated upon simultaneously.

13. A distributing device for moving gases or fluids comprising a gradually converging channel having a plurality of ports therein and cross channels communicating with the ports and being of greater width than the same, and being arranged to discharge together.

14. The herein described method of drying a moving sheet of material which comprises passing uniformly distributed currents of air tangentially and simultaneously along both surfaces of the material to be dried.

15. A distributing device of the character described comprising a channel having converging walls, one of said walls having a plurality of ports therein, and a plurality of cross channels communicating with the ports and having a common discharge.

16. A device of the character described, comprising a channel having converging walls, one of said walls having a plurality of spaced ports therein, the material previously in said ports being struck up to form

a plurality of dividing partitions, means cooperative with said dividing partition to form a plurality of cross channels having a common discharge.

17. A device of the character described, comprising a channel having converging walls, one of said walls having a plurality of spaced ports therein, the material previously in said ports being struck up to form a plurality of dividing partitions, means cooperative with said dividing partition to form a plurality of cross channels having a common discharge, and means for directing the discharge tangentially of the sheet to be dried.

18. A device of the character described comprising a channel having converging walls, one of said walls having a plurality of spaced ports therein, a plurality of cross channels communicating with said ports, a discharge nozzle communicating with the cross channels.

In witness whereof I have hereunto set my hand.

GEORGE JAMES MANSON.