

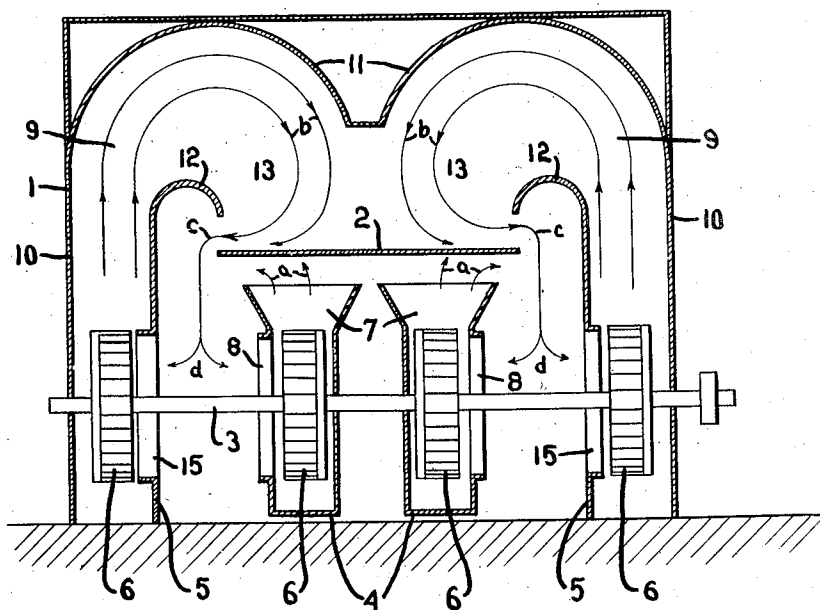
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AIR CIRCULATING DEVICE FOR DRYING FLAT FABRICS

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UNITED STATES PATENT OFFICE

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AIR CIRCULATING DEVICE FOR DRYING FLAT FABRICS

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This invention relates to the drying of material in sheet or web form and particularly to means for producing a circulation of the drying medium. In the drying of material in flat form, such for instance as paper sheets, pieces of cloth, etc., it is customary to blow the air onto both sides of the sheet or web. The efficiency of a drying apparatus depends somewhat upon the amount of air or drying medium which is brought in contact with the surface of the sheet or web in a given time. The larger the volume of air which is passed over or directed against the surface of the sheet or web material, the more rapidly will be the drying operation.

It is the object of the present invention to provide an improved means for moving or circulating the drying air within the drying chamber, which means is adapted to efficiently move large quantities of air and direct the air against the web or sheet material in a manner to secure efficient drying.

In accordance with my present invention I propose to employ in the drying chamber one or more circulating units, each comprising a plurality of centrifugal fans located on a single shaft and situated beneath the goods, the construction being such that certain of the fans on each shaft direct the air against the under side of the goods while the other fans direct the air against the upper side of the goods. In the preferred embodiment of my invention I propose to arrange the fans which are situated centrally of the shaft so that they will deliver the air to the under side of the goods while the fans on the ends of the shaft are arranged to deliver air to the upper side of the goods.

The drawing illustrates a cross section through a drying chamber equipped with my improvements.

In said drawing 1 represents the drying chamber which may be of any suitable length and in which the web or sheet of material 2 to be dried is located. If the material is in the form of a web, such for instance as a web of cloth or paper, then such web may be passed through the chamber 1 from one end to the other as usual in drying of cloth.

Situated beneath the material 2 and extending from one side to the other of the

chamber is a shaft 3 from which a plurality of centrifugal fans are operated. In the illustrated embodiment of the invention there are four such fans indicated generally at 4-4 and 5-5. The rotors 6 of these fans are all mounted on the shaft 3 so that they operate as a unit.

The casing of each of the center fans 4 is provided with a discharge 7 which is arranged to direct the air moved by the fan against the under side of the web or sheet 2 as shown by the arrows *a*, each fan having the usual side inlet 8. The other two fans 5 which are located at the outer ends of the shaft are arranged to deliver air against the upper side of the web or sheet 2. For this purpose each of the fans 5 is provided with a discharge duct 9 which extends upwardly along the side walls 10 of the chamber 1 and the mouth 13 of which is formed between the two curved walls 11 and 12, the latter being shaped so that the air which is delivered through said mouth 13 will be directed against the upper side of the web 2 as shown by the arrows *b*.

The air current which is delivered against the upper side of the web flows off the edge of the web as shown by the arrows *c* and the air which is delivered against the under side of the web flows outwardly to the edge thereof and mingles with the downwardly-directed current of air, the two mingled currents passing then to the inlets of the fans as shown by the arrows *d*. With this arrangement each fan delivers its air freely against the web and without meeting any particular resistance so that high efficiency is secured. Furthermore, the suction inlets 8 and 15 are arranged at a suitable distance from the surface of the goods 2 so that any suction produced at the suction inlets does not impair the ventilating process.

Furthermore, all the bearings for the moving parts are located below the goods and there is, therefore, no possibility that the goods will become stained from oil which might drip from these bearings.

Any desired number of these units may be employed depending on the length of the

drying chamber 1 and the character of the material being dried.

I claim:

5 1. In a drying apparatus for drying sheet material, the combination with a drying chamber to receive the sheet material to be dried, of a plurality of axially-aligned centrifugal fans situated below the sheet material, a common driving shaft on which the
10 rotors of all the fans are mounted, part of the fans having their discharge outlets situated to direct air against the under face of the sheet material, discharge ducts connected to the outlets of the remaining fans and extending above the material, and semi-circular
15 baffle plates at the discharge end of said ducts which direct the air delivered from said fans downwardly onto the upper face of the sheet material.

2. In a drying apparatus for drying sheet material, the combination with a drying chamber to receive said sheet material, of a plurality of axially-aligned centrifugal fans situated on one side of the sheet material, a
20 common drive shaft for the rotors of said fans, the central fans having discharge openings to deliver air against that side of the sheet material which faces the said shaft, the fans at the ends of the shaft having associated therewith discharge ducts which lead
30 to the other side of the sheet material and terminate in semi-circular baffle plates by which the air delivered from said end fans is directed against the opposite face of the sheet
35 material.

In testimony whereof, I have signed my name to this specification.

HERMANN HAAS.