

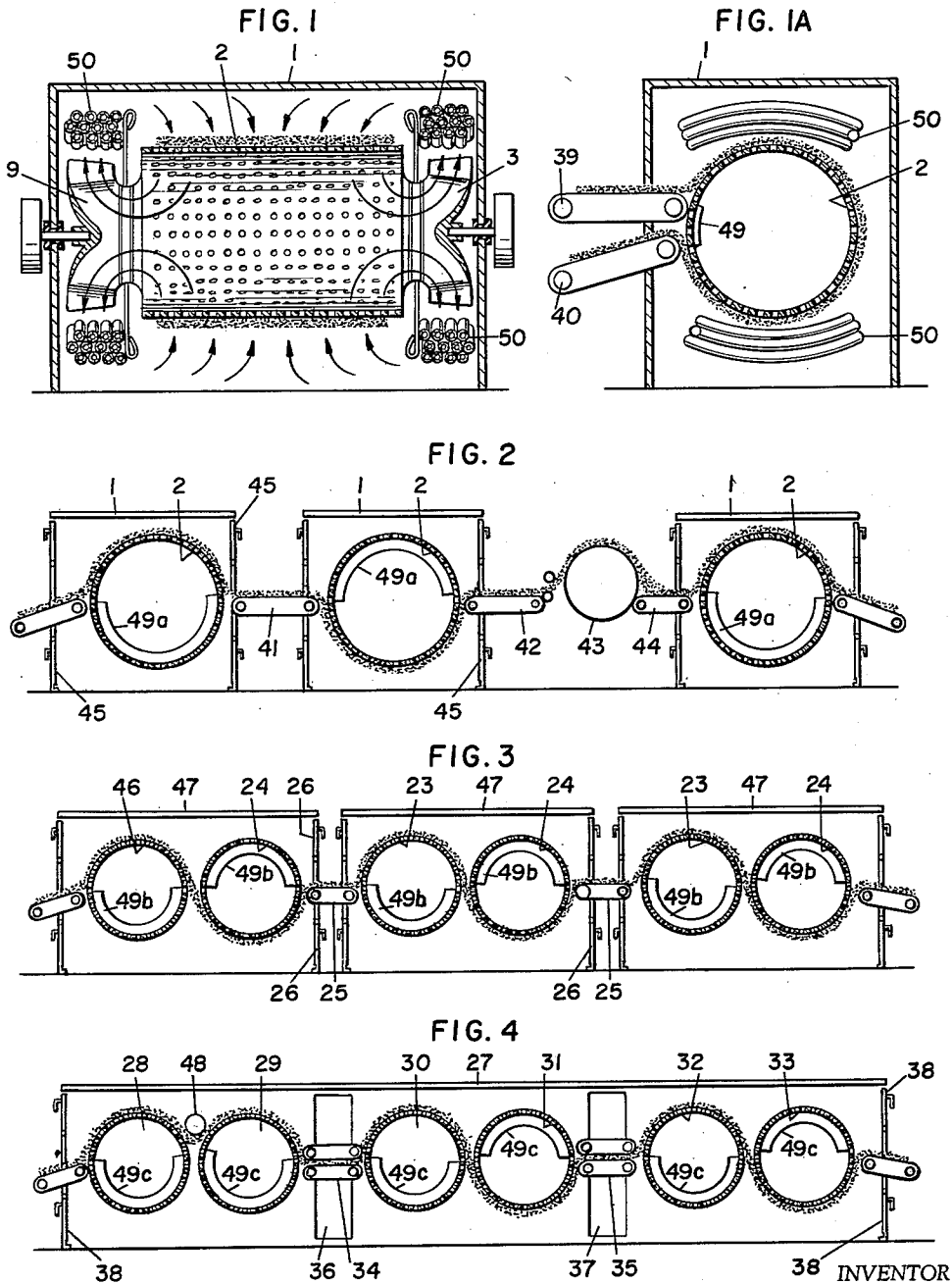
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SCREEN CYLINDER DRIER FOR FIBROUS MATERIAL

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3,043,018 SCREEN CYLINDER DRIER FOR FIBROUS MATERIAL

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The invention relates to a screen cylinder drier for fibrous material in which a partial vacuum is produced inside the drum, thus inducing the fibrous material to adhere firmly to the screen drum.

According to the invention a blower is arranged on each side of every screen cylinder, preferably in coaxial alignment. This constitutes a considerably more economical set-up, because the efficiency of such a screen cylinder drier per cubic meter of enclosed space is at a maximum.

The basic considerations in judging a drying plant are drying time and drying efficiency. Temperature and an even flow of air per unit time are of importance for the drying process, but there are limits beyond which temperature cannot be increased because in some circumstances the material that is to be dried would suffer. Consequently, according to the invention, greater efficiency is achieved—assuming plants of equal dimensions—by stepping up the flow of air.

The fan diameter should be at least 60% of the cylinder diameter.

This increased air-flow must be balanced with the applied heat. In the areas in which suction action is not desired, conventional guard plates are mounted inside the cylinder.

Conveyor mechanisms may be provided between individual screen cylinders or groups of screen cylinders. This permits a greater distance between the individual screen cylinders so that the inspection hatches are more easily accessible. The inspection hatches of the cylinders are preferably in the form of closable slits and should be located at the periphery of each cylinder.

To each blower heaters should be assigned whose calorific values correspond to the air throughput. To achieve better heat utilization all screen cylinders may be enclosed in a housing.

The invention is illustrated and explained in more detail in the drawing and the following description.

The drawing shows:

FIG. 1 is a vertical sectional view of a single cylinder drier;

FIG. 1a is a vertical sectional view taken through the center of FIG. 1 and viewed toward the right;

FIG. 2 illustrates several groups of single cylinder driers with intervening conveyor mechanisms;

FIG. 3 is an illustration of a multi-cylinder drier subdivided into groups of two screen cylinders, and

FIG. 4 is an elevational view of an arrangement similar to that shown in FIG. 3, but in which a perforated roller is provided between the first two cylinders in order that the fleece may be conveyed smoothly from cylinder to cylinder.

FIGURE 1 illustrates the housing 1 of a single cylinder drier with a screen cylinder 2 at the sides of which are two axially located fans 9 and 3. The two fans 3 and 9 are of a diameter of at least 60% of the cylinder diameter and exhaust air from the screen cylinder 2, causing the fiber fleece, which is fed in by the apron conveyor 39 and led round the periphery of the cylinder, to be held firmly on the periphery. The fiber fleece is discharged at 40. Due to the strong suction action of

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the two fans 3 and 9, even a heavy fiber fleece can be led round the entire periphery of the screen cylinder 2 and will adhere well. The area of the screen cylinder not covered by the fibre fleece is closed off by a cover 49, as in all the following possible examples of the invention, by at least one cover plate inside the cylinder at locations where it is desired to have the suction discontinued since the fiber fleece is not carried at such locations. A heater section 50 is arranged adjacent each fan discharge.

The possible arrangement shown in FIGURE 2 is a multi-cylinder drier sub-divided into a number of screen cylinder groups each of which has a housing 1 in which a screen cylinder 2 is located, which should be provided with a fan on both sides such as the fans 9 and 3 of FIG. 1 but with the fan corresponding to fan 3 of greater capacity than fan 9. The individual groups of screen cylinders are interconnected by a conveyor mechanism for instance an apron conveyor 41. Between the individual groups of the fiber fleece may also be led over an apron conveyor 42, a drum 43 and a further apron conveyor 44, for instance to loosen up the fiber fleece. Closable openings 45 give access to the screen cylinders of the individual groups. These openings may be used to get at the drums for cleaning purposes. Covers or baffles 49a are located in the interiors of the drums at locations where the fleece is not to be carried to shut off the suction at such location.

FIGURE 3 shows an arrangement of pairs of screen cylinders 24, 46, each of which is equipped with suction fans on both sides identical with the FIG. 1 showing, enclosed in a housing 47, the individual groups being connected by apron conveyors 25. The openings 26 give access to the screen cylinders. Cover plates 49b are located where the fleece is not carried on the drums.

FIGURE 4 shows a further possible arrangement. Here a single overall housing 27 encloses screen cylinder groups 28, 29, connected by apron conveyors 34 with a screen cylinder group 30, 31; the latter are connected, in turn, via apron conveyors 35 with a screen cylinder group 32 and 33, which likewise has suction fans on both sides as indicated in the FIG. 1 showing. Access to the openings of the individual screen cylinders, which are located at the periphery of the cylinders, is gained through the doors 36 and 37 at the side of the housing where, for instance, entry can be made below the apron conveyor 34 or 35; access to the screen cylinders is possible from here. Additional inspection openings 38 are provided at the ends of the housing, through which the operator can gain access to the screen cylinders 28 and 33. Covers 49c are located as indicated to shut off suction to the drum perforations.

A special feature of the possible arrangement shown in FIG. 4 consists in the fact that from the entry point the fiber fleece is led over the top of the screen cylinders 28 and 29. Being still very moist, the fiber fleece is relatively heavy and, in the case of inherently heavy fiber fleeces in particular, there is a risk that it may fall off if led over the underside of cylinder 29. This risk is avoided in the arrangement shown in FIG. 4. A perforated roller is mounted between the two adjacent cylinders 28 and 29. Such a roller 48, as mounted here for example, leads the fleece smoothly from one cylinder to the other (28, 29). The fiber fleece having been freed of the majority of the moisture after passing over the screen cylinder 29, there is no objection to it being passed alternately over and under the following screen cylinder groups.

What I claim is:

1. A drier comprising a plurality of spaced housings, a pair of screen cylinders in each of said housings, a blower arrangement for each of said cylinders in said housings for producing a partial vacuum in said cylinders to hold

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fibrous material on said cylinders, each said blower arrangement comprising a pair of coaxially aligned blowers disposed at opposite ends of the respective cylinder, said blowers being also axially aligned with said respective cylinders and having a fan diameter of at least 60% of the diameter of said respective cylinders, each blower having an axial inlet toward the associated cylinder and a pair of diametrically opposite discharge outlets to provide a pair of air circulating paths each including the respective blower and the perforated wall and the interior of the associated cylinder, a perforated roller disposed between the pair of screen cylinders in at least one of said housings for transferring the fibrous material between such last named pair of cylinders, each of said cylinders having its inner surface provided with at least one cover plate to render the section of said cylinder associated with said cover plate not subject to suction, and conveyor means extending between said housings for transferring fibrous material from a cylinder in one housing to a cylinder in an adjacent housing.

2. A drier according to claim 1, wherein said blowers for each cylinder are of different dimensions.

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3. A drier according to claim 1, wherein, in said one housing, the cylinders of the pair rotate in opposite directions and the material passes over both cylinders and under said perforated roller; the cylinders of each pair in the other housings rotating in the same direction and the material passing over one cylinder and under the adjacent cylinder of each pair.

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