

Nov. 29, 1955

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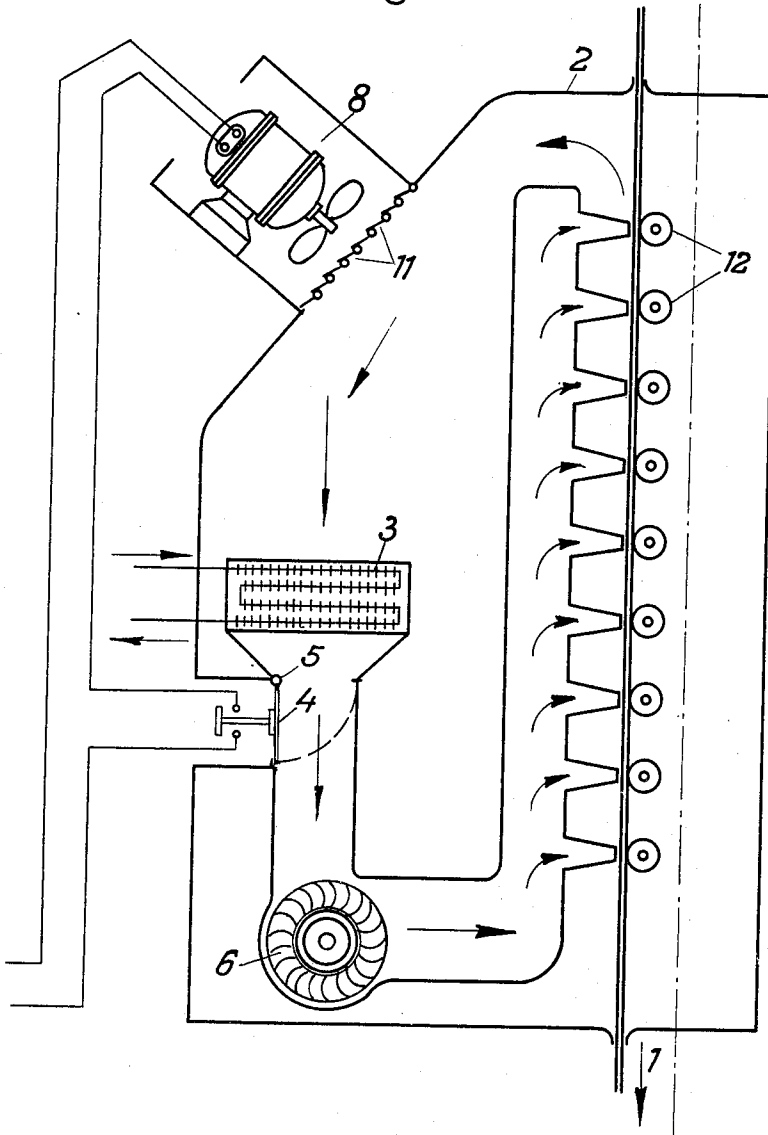
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DRIERS OPERATING IN CONJUNCTION WITH PRINTING MACHINES

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2 Sheets-Sheet 1

Fig. 1



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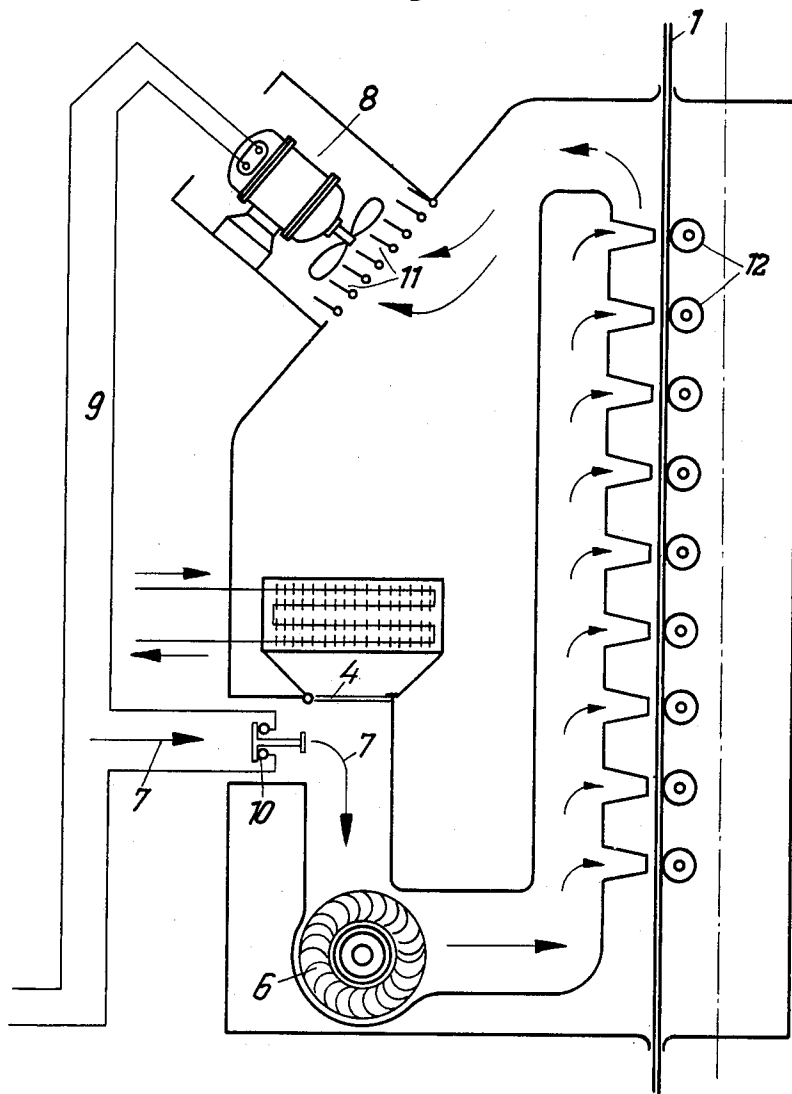
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Fig. 2



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## DRIERS OPERATING IN CONJUNCTION WITH PRINTING MACHINES

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4 Claims. (Cl. 34-87)

The increasing use of so-called nozzle driers—that is the well-known chamber-like driers, in which drying is carried out at temperatures above 100° C. with the employment of super-heated steam—naturally suggests the application of such driers in the form of mansard-type driers at the output end of machines for printing textiles, since these high duty driers present the special advantage, that at any given time only a few metres of the material are in the chamber during the drying process.

Attempts to place nozzle driers in mansard form at the output end of printing machines have, however, so far been unsuccessful, since with the unavoidable stoppages of the printing machine the printed web within the chamber will be exposed for some time to excessive temperatures and damage to the imprint becomes unavoidable. The invention is based on the consideration, that, while during the normal operation of the printing machine the web to be printed on may be exposed safely to the hot drying medium, provision must be made for a fluid of lower temperature to act on the web during its period of rest.

The main idea underlying the invention consists in this, that a change-over device is provided, which, on the web travelling at a reduced speed or being stationary, causes the web to be under the influence of a fluid of low temperature, which will not injure the colour impression, for instance the room atmosphere.

Experience has shown, that particularly good results may be obtained, if, while the web is stationary or during the period of reduced speed of travel of the material, provision be made for conveying the hot drying medium out of the chamber. Numerous experiments have shown, that, for obtaining particularly good results, it is among other things of importance to cause the action of the fluid of low temperature to become effective as rapidly as possible. This is greatly assisted by a rapid conveying away of the hot drying medium.

For carrying out the invention various possibilities suggest themselves. Particularly simple is a change-over device in the form of a flap valve which in one position allows the super-heated drying medium to circulate, whilst in the other position it conducts the fluid of low temperature (for instance the room atmosphere) against the web.

According to a further feature of the invention it is of advantage to derive from this change-over flap valve, for instance by electric means, the putting into and out of operation of the blower which conveys the super-heated drying medium out of the chamber.

Whilst the invention covers the starting of the change-over device or devices by hand, automatic changing over will presumably be adopted, preferably in dependence on the stoppage of the printing machine.

Further details of the invention will be gathered from the following description of a constructional example illustrated in the accompanying drawings, in which:

Figure 1 shows a mansard drier according to the inven-

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tion in the normal operative position in diagrammatic form; and

Figure 2 the same drier as set during the stationary period of the printing machine.

In the figures the printing machine placed before the mansard unit is not shown. It must therefore be imagined, that the web 1, after leaving the printing machine, travels through the mansard from above downwards. During the passage of the web it is hit by jets of super-heated steam in the manner usually employed in the nozzle driers above referred to, the jets acting directly on the printed side of the web. A circulatory motion is formed in the sense of the arrows shown in Figure 1. At 3 is shown the heating element for super-heating the drying medium. 4 is a flap valve which is pivoted at 5. In the position shown in Figure 1 this flap valve provides the conditions for the normal drying operation. The significance of the other devices shown in the diagrammatic view will be better understood from the description of Figure 2.

It will be seen from Figure 2, that the fan 6, which during normal working brings about the circulatory motion of the drying medium, draws, while the web is stationary, atmospheric air by suction in the direction of the arrows 7. The super-heated drying medium will then no longer be caused to act on the web, but the air from the room, which has a considerably lower temperature. This temperature is so low that any injury of the printed pattern on the stationary web is excluded. In order that the said flow of air from the room may develop, it is necessary to bring the flap valve 4 into the position shown in Figure 2. The flap 4 thus acts in the manner of a two-way cock.

Specially good results may be obtained, if provision be made at the same time for conveying the hot drying medium out of the chamber. This is effected by the fan 8 which is connected to the chamber at the place indicated and is controlled by way of the electric conductors 9 by the switch 10. The switch 10 is preferably coupled with the flap valve 4. During normal operation the Venetian blind slats 11 of the fan 8 are closed (see Figure 1). They open automatically, on the fan 3 being put in operation (see Figure 2).

At 12 the guide rollers for the web are indicated. No further explanation is required to show that it is easily possible to control the aforesaid change-over devices (4 and 10) automatically in dependence on the bringing to rest of the printing machine. The possible modifications are so numerous that it is considered unnecessary to show them in the drawings.

The invention is not confined to the constructional example, so that within the scope of the invention the greatest variety of constructions is possible. The main object is, that, on the speed of travel of the material being reduced or the material being brought to rest, the stipulated operative conditions are created.

I claim:

1. A drier for continuous web material comprising a chamber having material inlet and outlet openings, means for conveying material through the chamber via the openings, conduit means supported within the chamber adjacent the line of material travel, said conduit means including an inlet communicating with the interior of the chamber, a heating means mounted in said inlet, a branch conduit communicating between the exterior of the chamber and the conduit means adjacent the downstream side of the heating means, a circulation fan in said first conduit means downstream of said branch conduit, said conduit means including discharge nozzles downstream of the circulating fan and directed toward the material passing through the chamber, a single

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valve in the conduit means operable in one position to permit circulation of heated medium through said heating means, said conduit means, said fan and out the nozzles and in a second position to block communication between the inlet and the conduit means while opening communication between the branch conduit and the conduit means, and an exhaust fan communicating with the chamber and operative responsive to movement of said valve to said second position to exhaust from said chamber.

2. A drier as claimed in claim 1 in which said single valve is a flap valve, an electric motor for operating said exhaust fan, a switch controlling said fan, said switch being open in the first position of said valve, and the movement of said valve to said second position operating to close said switch to energize said motor and thus actuates said exhaust fan.

3. A drier as claimed in claim 2 in which said single valve is pivoted at the point of juncture between said branch conduit and said conduit at the upstream side of

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said branch conduit so that when said valve is pivoted the conduit downstream of said point of juncture is at all times in communication with either said chamber or said branch conduit.

4. A drier as claimed in claim 3 in which a switch for operating said exhaust fan motor is located in said branch conduit so that when said branch conduit is closed by said valve, said switch is opened to deenergize said exhaust fan motor.

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