July 20, 1954 R. L. MELTZER ET AL 2,683,939

ELECTRIC DRYING AND EXHAUST UNIT

Filed May 12, 1952

Fig. 1.

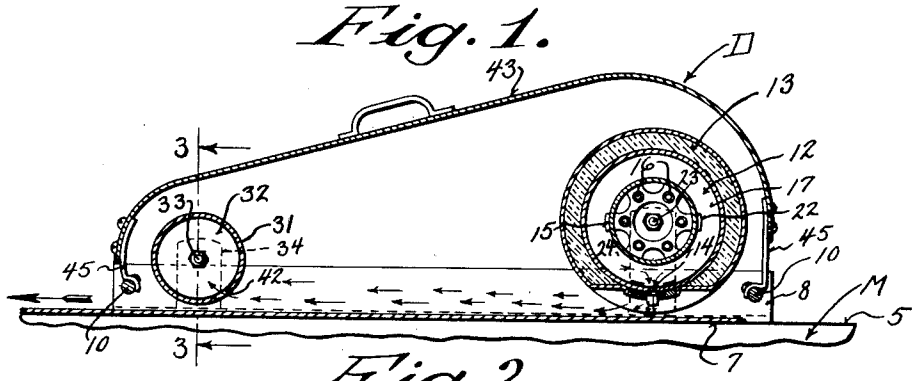



Fig. 2.

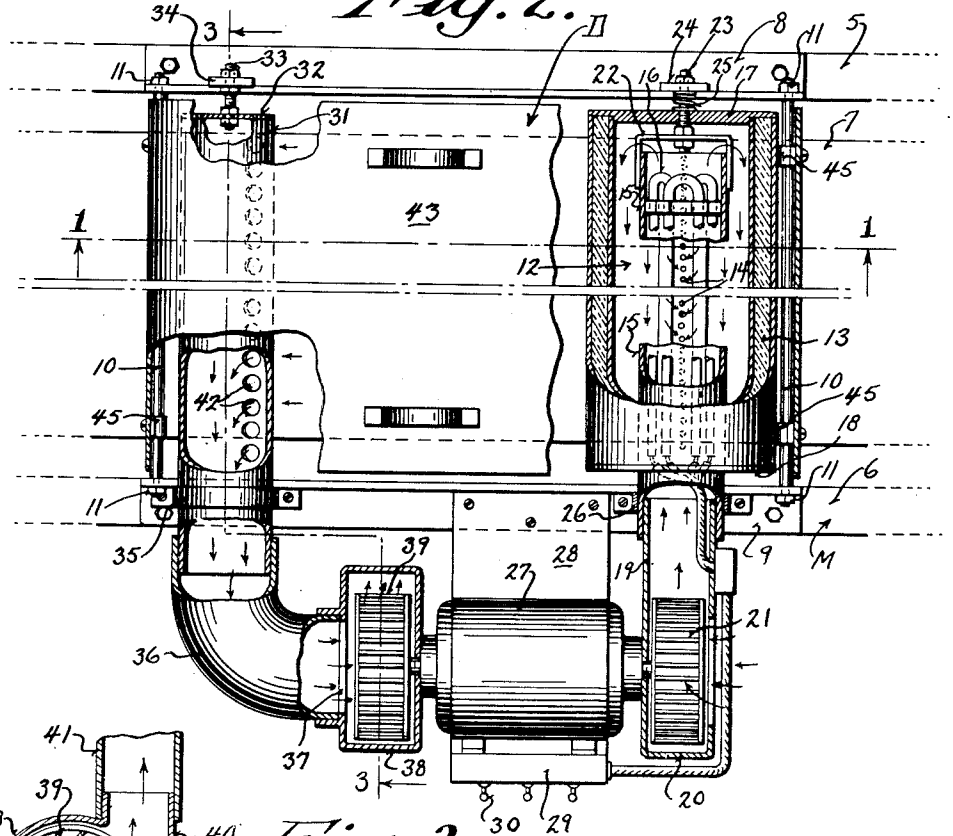
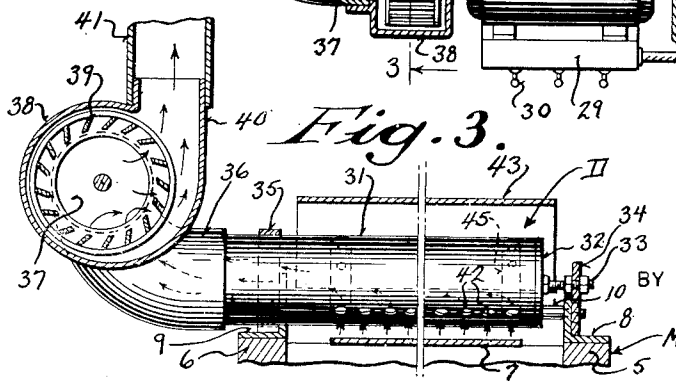



Fig. 3.




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## ELECTRIC DRYING AND EXHAUST UNIT

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1 Claim. (Cl. 34—155)

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This invention appertains to dryers for delivering hot air to a desired area of a surface to be dried and is an addition to our dryer shown and described in our application for patent executed September 6, 1951, now matured into Patent No. 2,658,798 on November 10, 1953.

One of the primary objects of our present invention is to provide means for confining the hot air to the surface of the web or sheet to be dried, and for effectively withdrawing the air and fumes from the drying area after the travel of the web or sheet a desired distance.

Another salient object of the invention is to provide a suction intake manifold arranged in spaced, parallel relation to a hot air blower and in such a manner that the air and vapors from the sheet will be withdrawn from the surface of the traveling sheet or web.

A further object of the invention is the provision of novel means for operating the suction fan for the intake or suction manifold directly from the motor employed for driving the fan for the hot air blower.

A still further object of the invention is to provide a novel and simple means for combining a hot air blower and suction intake on a single frame, whereby the device can be readily mounted as a single unit on a printing press or other desired machine.

With these and other objects in view, the invention consists in the novel construction, arrangement and formation of parts, as will be hereinafter more specifically described and claimed and illustrated in the accompanying drawing, in which drawing,

Figure 1 is a central longitudinal sectional view through our improved device, the section being taken on the line 1—1 of Figure 2, looking in the direction of the arrows, the view showing our device mounted on the frame of a printing press or other desired machine.

Figure 2 is a top plan view showing our device mounted upon a fragment of a printing press or other machine, parts of the drawing being shown broken away and in section to illustrate structural detail.

Figure 3 is a transverse sectional view through our device, taken on the line 3—3 of Figures 1 and 2, looking in the direction of the arrows, the view illustrating more particularly the suction intake.

Referring to the drawing in detail, wherein similar reference characters designate corresponding parts throughout the several views, the letter D generally indicates our improved dryer

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and M a machine with which the same can be associated. The dryer is particularly adapted for the quick drying of paper or like webs or sheets, the drying of ink on continuously moving webs, and the drying of chemicals and other coatings on webs or sheets. In the present instance, the machine M can be considered as a rotary printing press embodying side beams 5 and 6 between which passes a paper or like web or sheet 7, upon which desired matter has just been printed.

The improved dryer D comprises a pair of spaced parallel base rails 8 and 9 rigidly connected together by end tie rods 10. The ends of the tie rods can be reduced in diameter and these reduced ends can be passed through openings in the rails 8 and 9, after which nuts 11 can be threaded on the ends of the tie rods in tight contact with the rails. These rails, in turn, are bolted, or otherwise fastened to the side beams 5 and 6 of the machine M over the web 7 at the desired point.

Rigidly secured to the rails 8 and 9 at the forward ends thereof is the transversely extending hot air heater 12. This hot air heater 12 is the same as shown in our application for patent above-mentioned, and hence the same will not be described in detail. The same does include an insulated jacket 13 having a row of outlets 14. Disposed centrally within the insulated jacket 13 is a shell or cylinder 15 carrying electric heating elements 16. The opposite ends of the jacket 13 are closed by heads 17 and 18. The cylinder or shell 15 extends through the head 18, and has connected therewith the outlet 19 of a blower 20. Rotatably mounted in the blower casing is a blower fan 21. It is to be noted that the open end of the shell or cylinder 15 faces the head 17, and has secured thereto a bridge strap 22. Fastened to the bridge strap is a threaded rod 23, which passes through a supporting plate or bracket 24. An expansion spring 25 is coiled about the threaded rod and bears against the bracket 24 and the head 17. This bracket 24 is welded or otherwise secured to the rail 8. The extended end of the shell or cylinder 15 is securely fastened to the rail 9 by a strap 26.

The blower fan 21 is driven from an electric motor 27 of the desired rating and the blower fan can be connected directly to the armature shaft of the motor. A platform 28 is rigidly fastened to the rail 6, and this platform in turn carries the electric motor 27. The platform 28 can also carry a panel 29 for control switches 30 for the electric motor and the heating elements 16.

The row of openings 14 faces downward toward the traveling web or sheet 7, and as the air from the blower fan 21 travels through the shell or cylinder 15, the air becomes heated by the electric heating elements 16, and this air then flows against the head 17 and is directed back into the jacket and then out of the openings directly on the web or sheet.

In accordance with our present invention, we arrange in spaced parallel relation to the hot air heater 12, a suction intake manifold 31. This manifold 31 is in the nature of a drum or cylinder and has one end thereof closed by a head 32. The head has secured thereto a threaded rod 33 which is in turn fastened to a bracket plate 34. This bracket plate is welded or otherwise secured to the rail 8. The opposite end of the manifold is rigidly secured to the rail 9 by a strap 35. The end of the manifold opposite to the head 32 protrudes beyond the rail 9, and has connected therewith a conduit 36, which communicates directly with the inlet 37 of an air intake casing 38. This casing has mounted therein a rotary suction fan 39, and this fan, in turn, is secured directly to the armature shaft of the motor 27. It is to be understood that the armature shaft protrudes beyond the opposite ends of the motor and into the blower casing and into the suction casing. The suction casing 39 is provided with an outlet 40 to which can be connected an outlet pipe 41, and this pipe can be extended outside of a building, if such should be preferred. The intake manifold 31 is provided with a series of air intake openings 42 and these intake openings are at one side of the extreme bottom of the manifold, and open toward the web 7 in the direction of its travel. As is clearly shown by the large arrow in Figure 1, the web 7 travels under the hot air blower toward and past the intake manifold.

A cover plate 43 is arranged above the hot air blower 12, and the intake manifold 32, and functions as a guard for these elements and as a means for confining the heated air over the sheet or web 7. The cover plate 43 can be secured in place in any desired way, such as by the use of depending bracket arms 45, and these arms are rigidly secured to the tie rods 19. The ends of the cover plate 43 preferably curve over the air blower 12 and the manifold 31.

With our device positioned as shown, and the web or sheet 7 traveling under the blower 12 toward and past the manifold 31, hot air will be blown down directly on the upper surface of the sheet or web and the air will tend to travel in



the direction of the movement of the web or sheet. This is augmented by the suction manifold 31, and the air will be sucked in through the openings 42 from the surface of the sheet. The hot air blowing on the sheet or web will tend to dry the sheet or web or ink, or other matter thereon to be dried, and fumes arising from the ink, or other matter being dried, will also be drawn into the intake manifold and forced out through the outlet pipe 41.

From the foregoing description, it can be seen that we have provided a single unit for connection with a machine for drying a web or matter deposited upon the web, and for removing exhaust air and fumes from the web.

Changes in details may be made without departing from the spirit or the scope of our invention, but what is claimed as new is:

A combination dryer and exhaust unit comprising a frame adapted to be secured to a machine having a travelling web, a cover plate carried by the frame, a hot air distributor secured to one end of the frame within the cover, a suction intake manifold secured to the opposite end of the frame within said cover, said distributor and suction intake manifold being arranged in spaced parallel relation and disposed transversely of the frame and said web, the distributor having outlet openings facing toward said web and said manifold having inlet openings disposed at one side of the bottom of the manifold and facing the web in the direction of the travel of the web whereby to create a draft over the face of the web in the direction of travel thereof and toward said suction intake manifold, said frame including spaced parallel side rails, a platform secured to one of the rails between the distributor and manifold and projecting laterally beyond the frame, an electric motor on the platform, a blower fan for the distributor, a suction fan for the manifold, and means connecting the fans to the motor.

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