Nov. 15, 1960 E. O. VANDERCOOK 2,959,870

PROOF DRYING CABINET

Filed July 24, 1957 3 Sheets-Sheet 1

Fig. 1

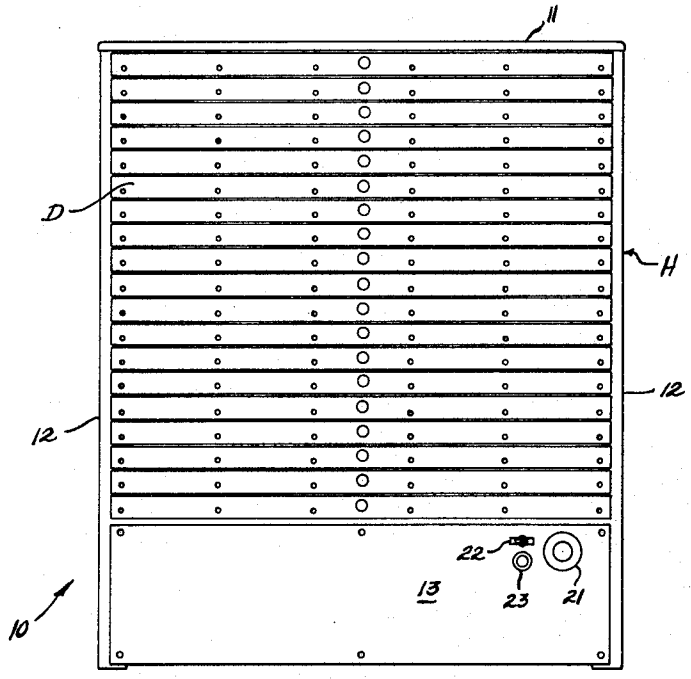
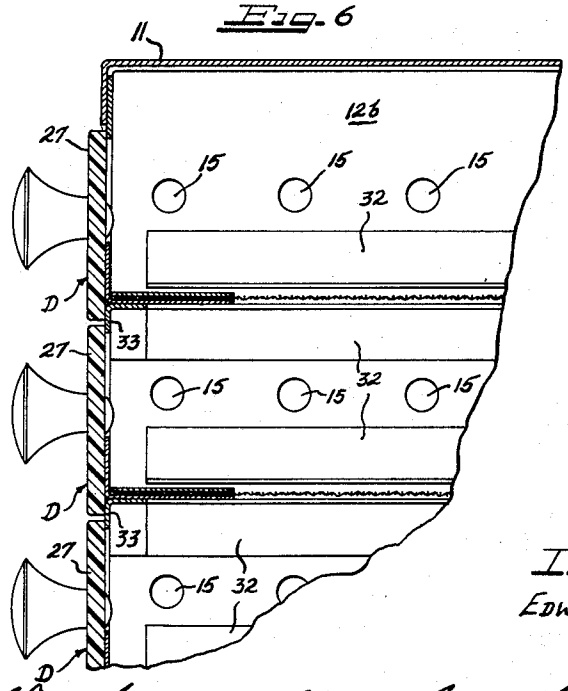


Fig. 6



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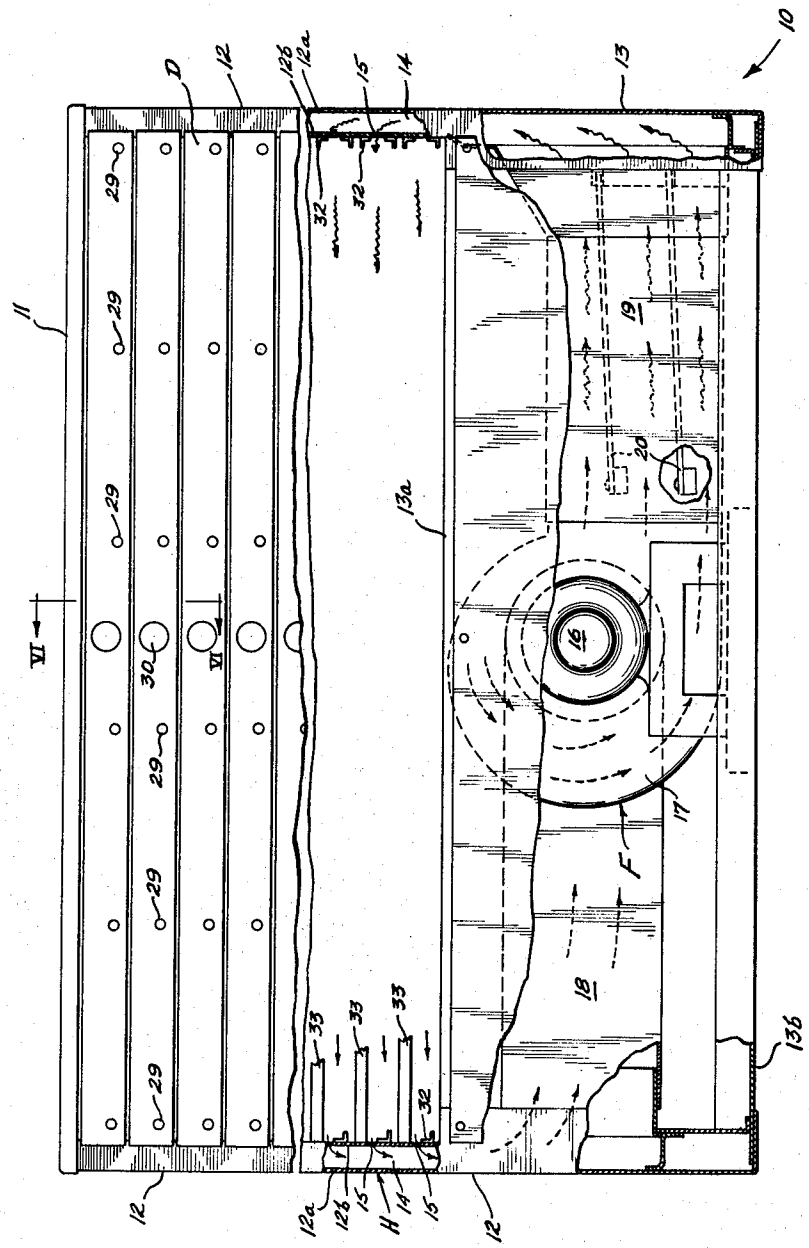


Fig. 2

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PROOF DRYING CABINET

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Fig. 3

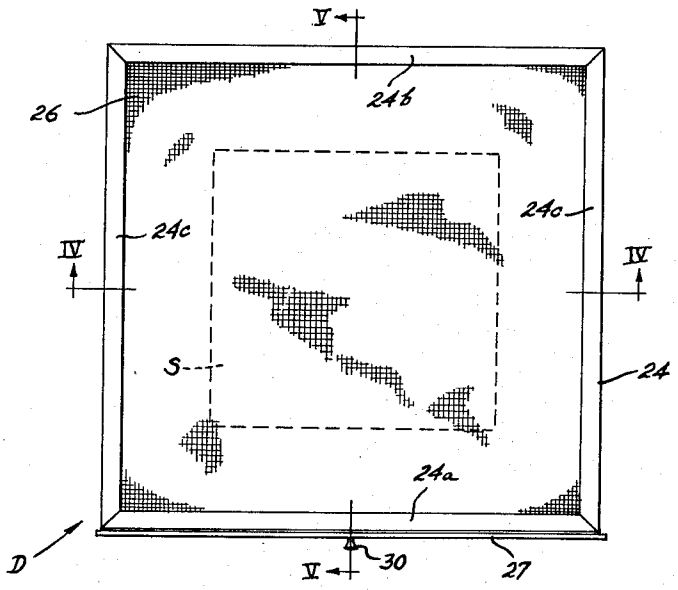


Fig. 4

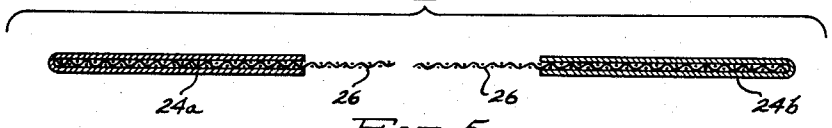
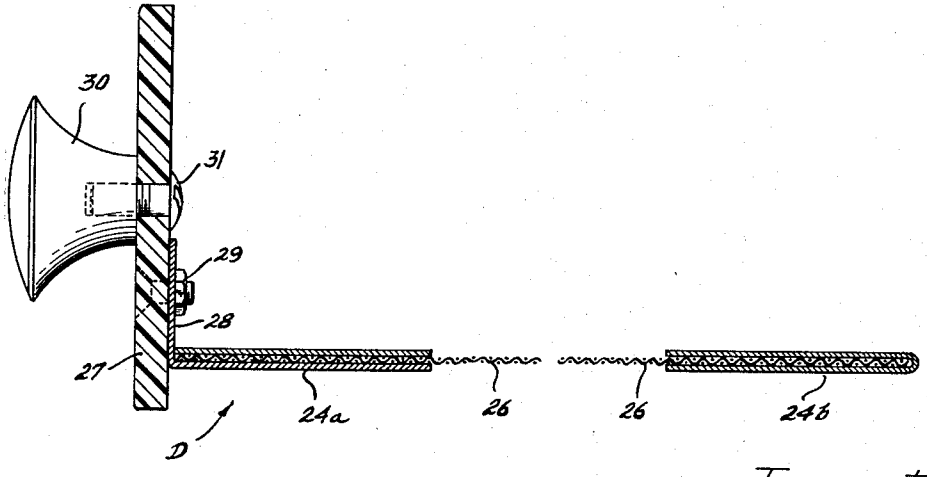


Fig. 5



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2,959,870

PROOF DRYING CABINET

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2 Claims. (Cl. 34—151)

This invention relates to an improved proof drying cabinet construction, and more particularly relates to proof drying cabinet construction utilizing a double walled housing and a tiered series of slidable, perforate shelf drawers having transparent front walls, together with a hot air circulating system in the housing for circulating warm air over the upper and lower surfaces of the drawers to evenly and rapidly dry proof sheets and the like, placed on the drawers, without curling or buckling.

In the past, commercially available proof drying cabinets were not wholly satisfactory, primarily because of their uneven heating, which tended to curl the proof sheets and because of their slowness of operation, in that only a single sheet could normally be dried at a time. In addition, the early proof drying cabinets were large, bulky and cumbersome to operate.

The present invention offers a solution to several of these problems in the form of an improved proof drying cabinet construction that utilizes an evenly distributed flow of heated air across a plurality of shelf-drawers or trays having perforated bottoms and transparent front wall portions. This ensures even drying of both the upper and lower surfaces of proof sheets or other material placed on the drawers. The construction also permits a plurality of proof sheets to be dried at one time while affording visual inspection of the proofs at any state of the drying operation through the transparent drawer end wall, thereby permitting a user to at all times view the sheets being dried and to remove selected sheets from the drying cabinet as desired.

Briefly described, the present invention generally contemplates a cabinet or housing having a double-walled base and side walls, which slidably receive a plurality of shelf-drawers or trays therein. The inner opposed wall portions of the double side walls are formed with a plurality of apertures arranged in vertically spaced rows between the drawers, in registry with the spaces between the drawers. A fan and heating element assembly are provided between the double walls in the base portion of the housing which communicate with the space between the double side walls to provide a circulating flow of air through the double side walls and base and between the tiered drawers or trays to thus rapidly dry proof sheets, and the like, supported on the drawers.

To this end, the perforated drawers are preferably formed with screen mesh bottoms and rigid enclosing frames to simultaneously expose the upper and lower surfaces of a proof sheet supported thereon to the drying flow of air circulating between the drawers while maintaining the proof sheet substantially flat, thereby minimizing any tendencies of the proofs to curl or buckle during the drying process.

The temperature of the drying air circulating between the drawers of the housing is controlled by a thermostatic switch device, which, together with the aligned rows of vertically spaced apertures in the inner wall portions of the double side walls of the housing, assures a

rapid and uniform drying action over the entire surface area of the proof sheet, without curling or buckling.

In addition, by utilizing a multiple tiered drawer construction and vertically spaced rows of drying air dispensing apertures between the drawers, heat losses from the cabinet are minimized when a particular drawer is open for insertion or removal of a proof sheet from the drawer.

Accordingly, it is an object of the present invention to provide an improved sheet drying cabinet construction.

Another object of the present invention is to provide an improved proof drying cabinet that will assure a rapid and uniform drying of proof sheets inserted therein.

A further object of the present invention is to provide an improved proof drying cabinet that will rapidly dry a plurality of proof sheets without curling or buckling.

Still another object of the present invention is to provide an improved proof drying cabinet utilizing a plurality of drawers having perforated bottoms, together with multiple level rows of apertures in the inner wall portion of the double side walls of the cabinet for circulating a flow of drying air between the drawers, thereby assuring a uniform drying of the proof sheets.

A further object of the present invention is to provide an improved proof drying cabinet utilizing a plurality of tiered drawers having transparent front wall portions, which permit visual inspection of the sheets of material being dried during the drying operation and a removal of selected proof sheets therefrom when one or more different proof types are being dried.

Still another object of the present invention is to provide an improved proof drying cabinet that is simple to operate and economical to use, and which requires little or no maintenance.

Many other objects and advantages of the present invention will become manifest to those versed in the art upon making reference to the accompanying sheets of drawings and detailed description that follows, that form a part of this specification, and in which like reference numerals and letters are used to identify identical parts.

In the drawings:

Figure 1 is a front elevational view of the proof drying cabinet construction of my invention;

Figure 2 is a fragmentary enlarged front elevation view, partly in section and partly in elevation, and with some parts broken away to show underlying parts;

Figure 3 is a reduced top plan view of a typical drawer used in the cabinet construction of the invention.

Figure 4 is an enlarged, broken cross-sectional view, taken substantially along the line IV—IV of Figure 3;

Figure 5 is an enlarged, broken cross-sectional view taken substantially along the line V—V of Figure 3; and

Figure 6 is an enlarged, fragmentary cross-sectional view, taken substantially along the line VI—VI of Figure 2.

As shown on the drawings:

In Figures 1 and 2, the proof drying cabinet assembly of the invention is designated generally by the reference numeral **10**, and includes a generally rectangular housing H, a plurality of shelf-drawers D, or trays, that are slidably carried in the housing H, and a hot air recirculating system F (Figure 2) that is positioned in a hollow base portion of the housing H.

The housing H is preferably formed from sheet metal, though any other suitable materials could be employed instead, as for example wood or plastic, and includes a top wall **11**, a pair of double side walls **12** having outer wall portions **12***a* and inner wall portions **12***b*, a back wall (not shown), and a double wall base portion **13**, having an upper base wall portion **13***a* and a lower base wall portion **13***b*.

As thus shown in Figure 2, the outer and inner wall portions **12***a* and **12***b* of the double side walls **12**, are sufficiently spaced from each other to provide air spaces or passages **14** therebetween. The air spaces **14** communicate with the hot air recirculating system F in the base portion **13** and serve to direct a flow of air between the drawers D in the housing H, through a series of apertures **15** formed in the inner side wall portions **12***b*, as will be explained in more detail later.

As best shown in Figure 2, the hot air recirculating system F is preferably positioned in the base portion **13** of the housing H, between the upper and lower base walls **13***a* and **13***b* respectively, and generally includes a fan **16**, that is enclosed in a suitable housing **17**, and which receives air through an inlet duct **18** and discharges air through a tangential exhaust duct **19**, a heater element assembly **20**, and a thermostatic switch assembly **21** (Figure 1), for controlling the duration of energization of the heater elements **20**.

The fan **16** may be any of the commercially available types, having sufficient size and rating to provide the desired air flow through the hot air passages **14** and across the shelf drawers D when the latter have been slidably engaged in the housing H, as will be explained in more detail later.

The heating element assembly **20** may similarly be of any of the commercially available types, such as nichrome wire or bar stock having sufficient size and capacity to assure adequate heating of the air discharging from the tangential exhaust duct **19** into the hot air ducts or passages **14** and apertures **15**, when the proof drying cabinet assembly **10** is filled to capacity.

As illustrated in Figure 1, the hot air recirculating system F, also includes an on-off switch **22**, and an indicator light **23**, to activate the system F and indicate its energized operating condition, respectively.

Thus it will be appreciated that the hot air recirculating system F, located in the hollow base portion **13** of the housing H, together with the air passages **14**, define a closed circuit flow path for hot air flowing through the housing H and between the drawers D, the temperature of which may be automatically controlled by the thermostatic switch **21** to maintain a predetermined temperature of the drying air circulating through the housing H.

Referring now more particularly to Figures 3–6, a description of the novel perforated drawers D will follow. As best shown in Figure 3, the drawers D generally include a rigid rectangular frame **24**, having a front edge portion **24***a*, a rear edge portion **24***b*, and side edge portion **24***c*, respectively, a perforate central body or shelf portion **26**, and a transparent elongated vertical front wall portion **27**, connected to the frame front edge **24***a*.

A typical proof sheet or other article to be dried, is illustrated in dotted line in Figure 3 in a representative drying position, and is designated generally by the reference letter S.

As best shown in Figure 4, the rectangular U-shaped frame **24** has a U-shaped cross-sectional configuration, the parallel leg portions of which marginally enclose the perforated shelf portion **26** in clamping engagement, though it should be understood that any other suitable fastening techniques could be used to connect the perforated shelf portion **26** to the frame **24**, such as by brazing or welding, or the utilization of conventional fasteners.

The perforate shelf or tray portion **26** of the drawer D is preferably formed from a fine wire mesh or screen, though an apetured sheet metal plate construction could be utilized as well, so long as the assembled frame and perforated tray portion of the drawer D has sufficient strength and rigidity to support a proof sheet in a substantially flat position while being dried.

The elongated transparent vertical front wall **27** is preferably formed from Lucite, but could also be formed from any other suitable transparent, heat-resistant material such as thermoplastic or Pyrex glass.

As best shown in Figure 5, the front edge portion **24***a* of the frame **24** is formed with an upturned flange portion **28**, to facilitate attachment of the elongated transparent front wall portion **27** of the drawer D, as for example by fasteners **29**. A pull knob **30** may be connected to the front wall **27** by a fastener **31**, to facilitate movement of the drawers D into and out of the housing H.

Thus it will be appreciated that the drawers D are substantially flat perforate trays each having an elongated transparent front wall portion which serves to close the open end of the housing H when each of the drawers are fully engaged therewith, to thus prevent the escape of hot circulating air from the housing while other proof sheets are being inserted in or removed from the cabinet assembly **10**.

Referring now more particularly to Figure 6 in conjunction with Figure 2, the assembled relationship of the drawers D in the housing H and their pressure sealed relationship therein will be explained.

In order to maintain the drawers D properly oriented in the housing H in relation to the apertures **15**, the inner wall portions **12***b* of the housing H are provided with a plurality of flanged rails or guides **32** that are mounted in spaced relationship along the inner wall portions **12***b*. The rails **32** extend substantially between the front and back of the housing H to slidably support and engage the side portions **25***c* of the rectangular frame **24**. As best shown in Figure 6, the rails or guides **32** are mounted on the inner walls **12***b* in pairs, and in vertically spaced relationship, substantially corresponding to the vertical height of the front wall portion **27** of the drawers D.

It should be understood however that any other suitable support means could be utilized to slidably support the drawers D on the inner wall portions **12***b* of the housing H, as for example, brackets, spaced pins or rollers.

In order to assure a substantially air tight seal between the transparent front wall portions **27** of the drawers D and the front face of the housing H, a series of vertically spaced horizontally extending bars or strips **33** are provided, which define a rectangular frame around each drawer opening for engagement with the upper and lower marginal edge portions of the transparent front wall portions **27** of the drawers D, when the drawers are fully inserted in the housing H.

Thus, when each of the drawers D is in its fully engaged position in the housing H, the transparent front wall portions **27** of the drawers D, together with the laterally extending bars **33**, form a substantially air tight front wall for the housing H, which presents a neat appearance and also permits rapid visual observation of the contents in each drawer without opening the same.

Referring again to Figure 6, it will be observed that the apertures **15** in the inner wall portion **12***b* are arranged in aligned rows between the flanged drawer rails or guides **32**, and extend substantially for the full length of the drawers.

As previously described, the apertures **15** register with the hot air passages **14**, between the double side walls **12** of the housing H, to thus complete the closed circuit flow path for air entering the hot air recirculating system F, through the inlet duct **18** and that is discharged through the exhaust duct **19** and past the heater element **20**. The general path of the air through the housing H is illustrated by arrows in Figure 2, the wavy arrow in the exhaust duct **19**, adjacent the heater element **20**, indicating the heated condition of the drying air discharging through the exhaust duct **19** after passing through the heater element assembly **20**.

The number, size and location of the apertures **15** in the inner wall portion **12***e* is largely a matter of choice, and may be varied with the size of the housing H, the

capacity and flow rate of the hot air circulating system F, and the type of material to be dried.

Thus it will be appreciated that the perforated drawers D of the proof drying cabinet assembly **10**, together with the horizontally extending vertically spaced rows of apertures **15**, mutually cooperate to define a drying air flow path through the double side walls **12** and base portion **13** of the housing H, and between the drawers D, such that proof sheets or other material to be dried in the cabinet assembly **10**, will be exposed to a recirculating flow of air on both its upper and lower surfaces, to thus assure a rapid drying of the proof sheets without curling or buckling.

In operation, the thermostatic control switch **21** is initially set at a desired operating temperature to be maintained in the proof drying cabinet assembly **10**, and the hot air recirculating system is energized by the switch **22**, which condition is indicated by the indicator light **23**. When the desired operating temperature is reached, the wet proof sheets may be individually placed on the perforated shelf or tray portion **26** of the drawers D, such that both the upper and lower surfaces of the proof sheets are exposed to a drying air flow.

As illustrated in Figure 1, up to 19 individual proof sheets may be inserted in the drawers D for drying in the proof drying cabinet assembly **10**, though it should be understood that more or less than this number of drawers could be employed in the construction of the proof drying cabinet assembly **10**, depending upon the average number of sheets to be run in a particular job.

Differing sizes and types of sheets may continue to be inserted on separate drawers and slid into the housing H and removed therefrom at the completion of the drying operation, without appreciably reducing the flow of drying air around adjacent sheets, due to the substantially separate air flow path around each sheet.

The transparent front wall portion **27** of the drawers D permits ready visual inspection of the proof sheets throughout the full drying operation, as well as permitting an operator to remove selected sheets from the cabinet assembly **10** where the sheets bearing different indicia or legends are concurrently being dried.

While only one embodiment of the invention has been herein illustrated and described, it should be understood that various modifications and variations may be effected without departing from the scope of the novel concepts herein disclosed.

I claim as my invention:

1. A drying device for proof sheets comprising a housing having a pair of opposed, hollow side walls including flow channels defined by inner and outer wall portions for each of the walls, a removable tray having a flat, planar and perforate construction over the major portion of its area formed by a foraminous material and coplanar frame means surrounding and holding the foraminous means, a wall portion secured in perpendicular relationship to said tray along one edge of said frame, a guide rail on each of said inner wall portions of said housing, said guide rails being disposed in registration with one another and slidably supporting opposed frame portions of the frame of said tray, said inner wall portions each having an upper row of flow orifices of relatively small dimension and extending in predetermined spaced relationship substantially in parallelism to the guide rail for each wall portion, and a lower row of relatively small flow orifices extending substantially in parallelism to the guide rail of each of said wall portions and in parallelism to the upper row of flow orifices thereof, said upper and lower rows of flow orifices being substantially equally spaced from the guide rails on said inner wall portions and being in proximate relationship thereto, said housing having a wall forming an opening which is closable by the wall portion on said tray and air flow means for effecting the flow of air through the flow channels in said side walls and through said flow orifices substantially in equal volume above and below said tray as a result of the equal spacing of said rows of flow orifices from said guide rails supporting said tray, the proximate relation of said flow orifices to said guide rails and to said tray, effecting an equal drying action on the upper and lower surfaces of said tray whereby a sheet of material or the like which may be disposed on the tray for drying is dried at an equal rate on the upper and lower surfaces thereof so that deformation of the sheet of material due to unequal drying action on such surfaces is eliminated.

2. A drying device for proof sheets comprising a housing having a pair of opposed, hollow side walls including flow channels defined by inner and outer wall portions for each of the walls, a removable tray having a flat, planar and perforate construction over the major portion of its area formed by a foraminous material and coplanar frame means surrounding and holding the foraminous means, a wall portion secured in perpendicular relationship to said tray along one edge of said frame, a guide rail on each of said inner wall portions of said housing, said guide rails being disposed in registration with one another and slidably supporting opposed frame portions of the frame of said tray, said inner wall portions each having an upper row of flow orifices of relatively small dimension and extending in predetermined spaced relationship substantially in parallelism to the guide rail for each wall portion, and a lower row of relatively small flow orifices extending substantially in parallelism to the guide rail of each of said wall portions and in parallelism to the upper row of flow orifices thereof, said upper and lower rows of flow orifices being substantially equally spaced from the guide rails on said inner wall portions and being in proximate relationship thereto, said housing having a wall forming an opening which is closable by the wall portion on said tray and air flow means for effecting the flow of air through the flow channels in said side walls and through said flow orifices substantially in equal volume above and below said tray as a result of the equal spacing of said rows of flow orifices from said guide rails supporting said tray, the proximate relation of said flow orifices to said guide rails and, to said tray, effecting an equal drying action on the upper and lower surfaces of said tray whereby a sheet of material or the like which may be disposed on the tray for drying is dried at an equal rate on the upper and lower surfaces thereof so that deformation of the sheet of material due to unequal drying action on such surfaces is eliminated, said flow orifices being equally spaced axially in each of said rows of flow orifices and disposed at a distance from each other such as to maintain an even flow of air across said tray with respect to both axes of the tray.

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