Oct. 6, 1959 J. A. BLACK 2,907,120

MACHINE FOR DRYING COATED SHEET STOCK

Filed July 26, 1957 2 Sheets-Sheet 1

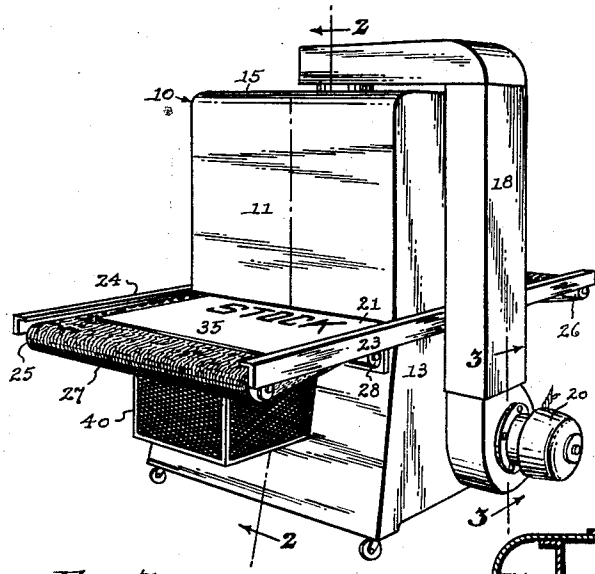


Fig. 1

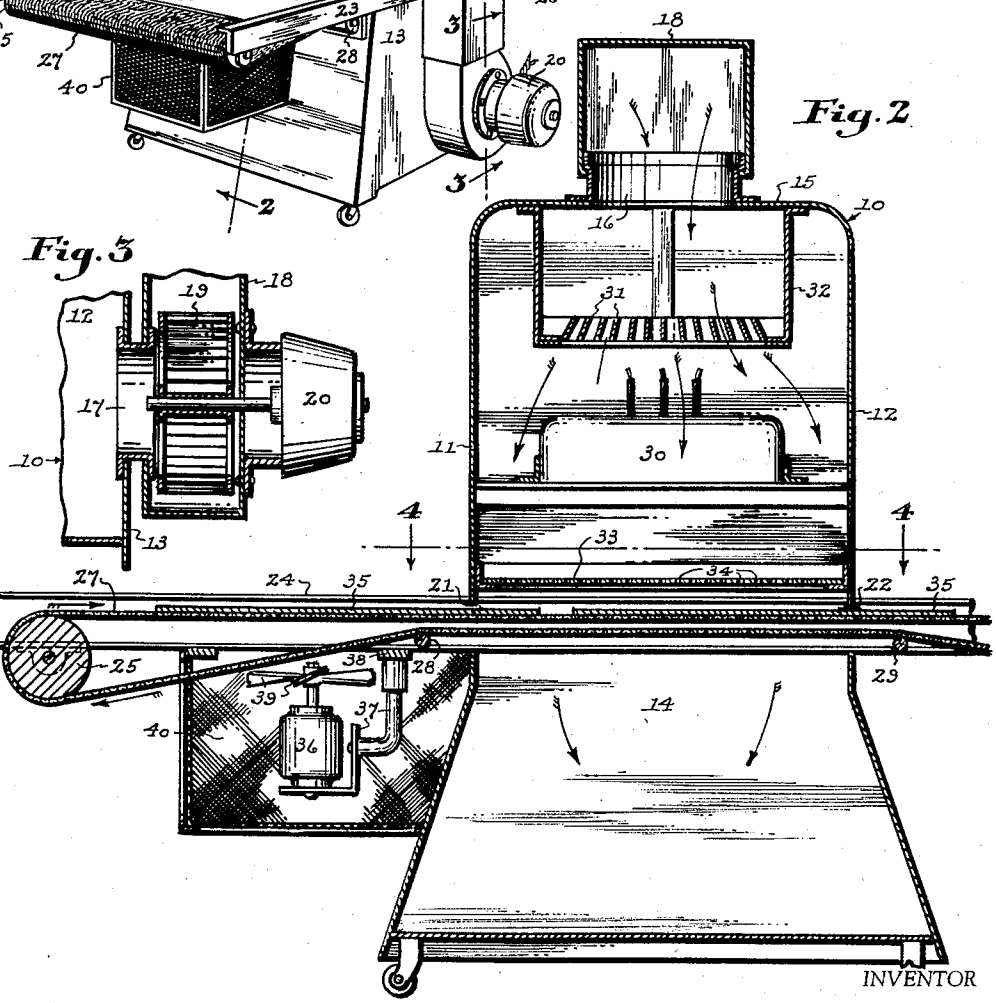


Fig. 2

Fig. 3

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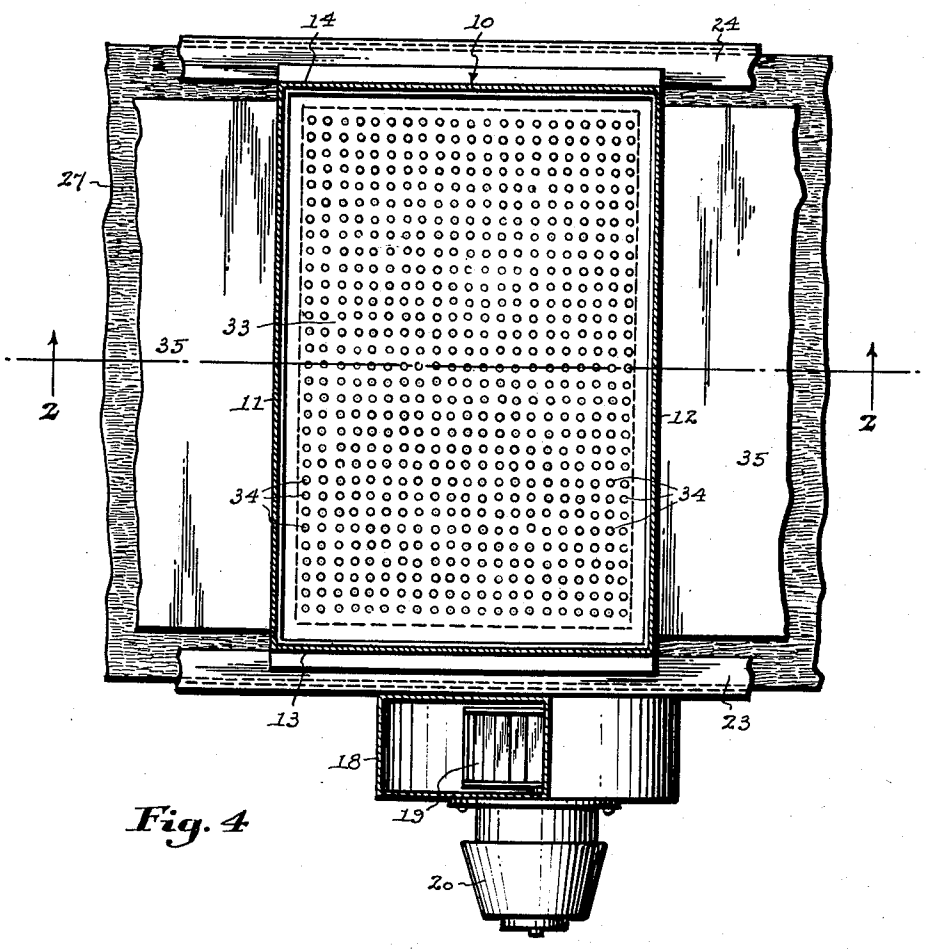


Fig. 4

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MACHINE FOR DRYING COATED SHEET STOCK

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3 Claims. (Cl. 34—216)

The present invention relates to machines for drying coated sheet stock, and the primary objects of the invention are to provide such a drying machine in which heated air is circulated and re-circulated for drying the sheets, and in which the air is distributed evenly over the surfaces of the sheets of stock passing through the machine so that the sheets are uniformly dried; in particular to provide a drying machine which is especially well adapted for the drying of paper stock which has been coated by the silk screen process; and in general to provide such a machine which is simple and sturdy in construction, reasonably economical in manufacture and attractive in appearance.

An illustrative embodiment of the invention is shown in the accompanying drawings, wherein:

Figure 1 is a perspective view of the sheet stock drying machine;

Figure 2 is an enlarged longitudinal vertical sectional view thereof, the plane of section being indicated by the lines 2—2 of Figures 1 and 4;

Figure 3 is a fragmentary vertical sectional view of parts of the machine taken on line 3—3 of Figure 1; and

Figure 4 is a horizontal sectional view of parts of the machine taken on line 4—4 of Figure 2.

Referring now in detail to these drawings, the drying machine there shown comprises a housing generally designated 10 which has a front wall 11, rear wall 12, side walls 13, 14 and a top wall 15. An air inlet port 16 is provided in the center of the top wall 15, and an air outlet port 17 is provided at the bottom of the housing through the side wall 13. A duct 18 extends from the air outlet port 17 to the air inlet port 16. A blower 19 (see Figures 3 and 4) is installed in the lower portion of the duct 18 adjacent the air outlet port 17. An electric motor 20 having suitable electrical connections (not shown) is mounted on the outer wall of the duct 18 and is operatively connected to the blower 19. The blower is adapted to continuously circulate and recirculate air upwardly through the duct 18 and through the housing 10 from top to bottom.

The housing 10 has a front conveyor opening 21 in the front wall 11 thereof and a rear conveyor opening 22 in the rear wall 12. Horizontal side rails 23, 24 are mounted on the side walls of the housing 10 and extend forwardly and rearwardly through the openings 21, 22. A conveyor roll 25 is journalled in the side rails, 23, 24, at the stock receiving end of the machine and a similar conveyor roll 26 is journalled in the side rails 23, 24 at the stock discharge end of the machine. An endless conveyor 27 passes around the conveyor rolls 25, 26 and is perforated to permit the circulation of air therethrough, being desirably made up of wire mesh. Suitable means, not shown, are provided for driving the conveyor in the direction of the arrows (see Figure 2). The underneath part of the conveyor 27 passes over idler rolls 28, 29 and is elevated thereby, thus permitting

the conveyor openings 21, 22 to be of small dimension. The conveyor passes through the middle of the housing 10, dividing it into an upper compartment and a lower compartment.

An electric heater 30 is mounted in the approximate middle of the housing's upper compartment and has suitable electrical connections (not shown) for heating the air passing downwardly around the heater. Baffles 31 are secured to a frame 32 depending from the housing's top wall 15 for diffusing the incoming air around the heater. Between the heater 30 and the conveyor 27 is disposed a perforated plate 33 which extends the full length and width of the housing 10 and is secured to the housing's walls. The perforations 34 in the plate 33 are very small and very close together so that heated air passing downwardly therethrough is uniformly streamlined over the entire surfaces of coated stock sheets 35 passing therebeneath on the conveyor 27.

An electric fan 36 having suitable electrical connections (not shown) is mounted on a bracket 37 depending from a cross-bar 38 secured to the side rails 23, 24. The blades 39 of the fan 36 are arranged to direct a stream of air downwardly. This downwardly directed air effects adherence of the coated stock sheets 35 to the conveyor as they enter the housing so that the leading edge of each sheet will not be blown upwardly by downwardly circulating air deflected from the trailing part of the preceding sheet.

The fan 36 also serves to exhaust a part of the circulated air from the housing through the front conveyor opening 21, and the air thus exhausted is replaced by fresh air entering the housing through the rear conveyor opening 22. Thus the air circulated in the housing is gradually replaced by fresh air and the vapors from the coating material on the stock sheets are gradually withdrawn from the housing, but this replacement of air is relatively slow so as to permit maximum utilization of the heated air in the housing during its circulation and re-circulation. The fan 36 is desirably guarded by a screened enclosure 40.

While but one specific embodiment of the invention has been herein shown and described, many modifications thereof are conceivable such as the substitution of gas heat for electric heat or enlargement and compartmentation of the housing to accommodate larger stock sheets, and it will be understood that such modifications might be made without departing from the spirit of the invention as the same is defined by the following claims.

I claim:

1. Apparatus for drying sheet material comprising a vertically elongate housing having narrow, horizontally disposed openings in opposite sides thereof and in horizontal registry with each other, support means extending beyond said opposite sides of the housing, roller members journalled at the opposite ends of said support means, a foraminous conveyor trained over said rollers, means for driving at least one of said rollers for moving said conveyor, the intermediate portion of said conveyor being disposed within said housing and passing into and out of the same through said openings in the opposite sides thereof, said housing having an opening in the top thereof and an opening in one of its sides, the latter opening being below said conveyor, a heater supported within said housing below the top thereof but above said conveyor, a duct interconnecting the last two mentioned openings and a circulating fan in said duct for circulating air from the lower portion of said housing down through the top thereof and toward said conveyor after passing over said heater, said housing having an extension on one side thereof immediately below one of said first mentionoed openings, an exhaust fan

in said housing extension for withdrawing air downwardly through said conveyor and to withdraw a predetermined small quantity of air from said housing through said opening which said extension was adjacent.

2. The assembly as defined in claim 1 wherein said rollers are of a diameter materially greater than the height of said first mentioned openings, said conveyor having its upper flight extending tangentially between said rollers and there being idler rollers mounted on said housing at the lower edges of said first mentioned openings over which the lower flight of said conveyor passes.

3. An assembly for drying coated sheet material comprising a housing provided with narrow, horizontally elongate generally rectangular openings in opposite sides thereof, a conveyor assembly supported by said housing having upper and lower flights passing through the housing through said narrow openings, a heater supported within said housing above said conveyor, means for circulating air from the lower portion of said housing to and through the upper portion thereof downwardly over said heater to pass through said conveyor for effecting a continuous recirculation of air within the housing, and means for withdrawing a predetermined small quantity of air continuously from said housing through one of said narrow openings with the opposite narrow opening acting to induct fresh air to replace that quantity withdrawn, wherein said means for withdrawing a predetermined small quantity of air from the housing comprises a fan mounted exteriorly of the housing immediately adjacent and below one of said narrow openings for withdrawing air therethrough through said conveyor and to maintain, by such movement of air, sheet material in face-to-face contact with the upper flight of said conveyor.

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