

Jan. 25, 1938.

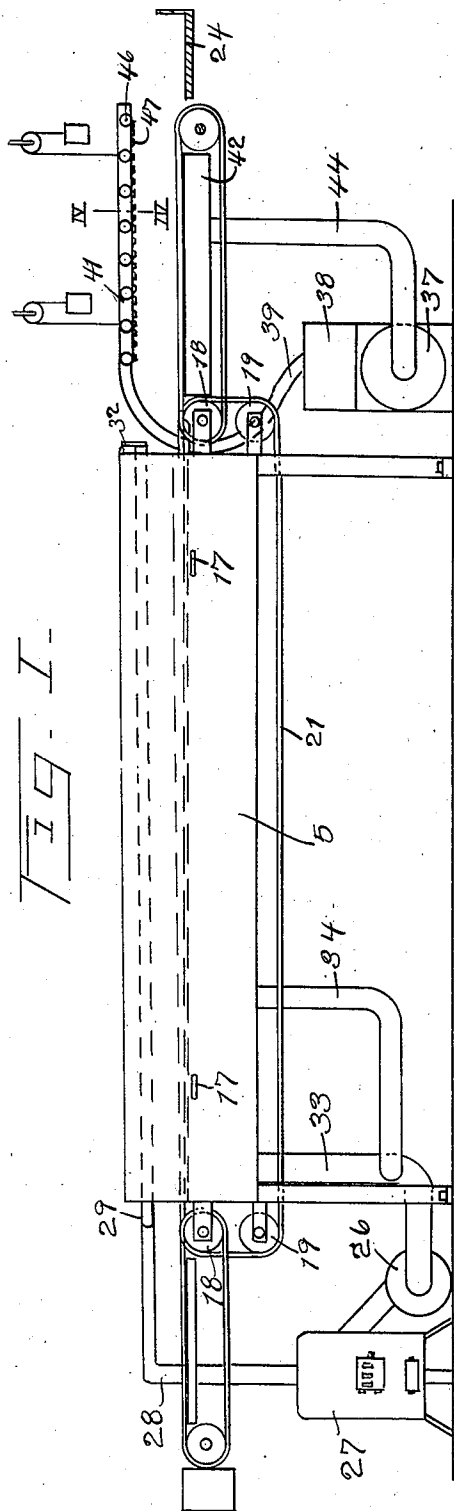
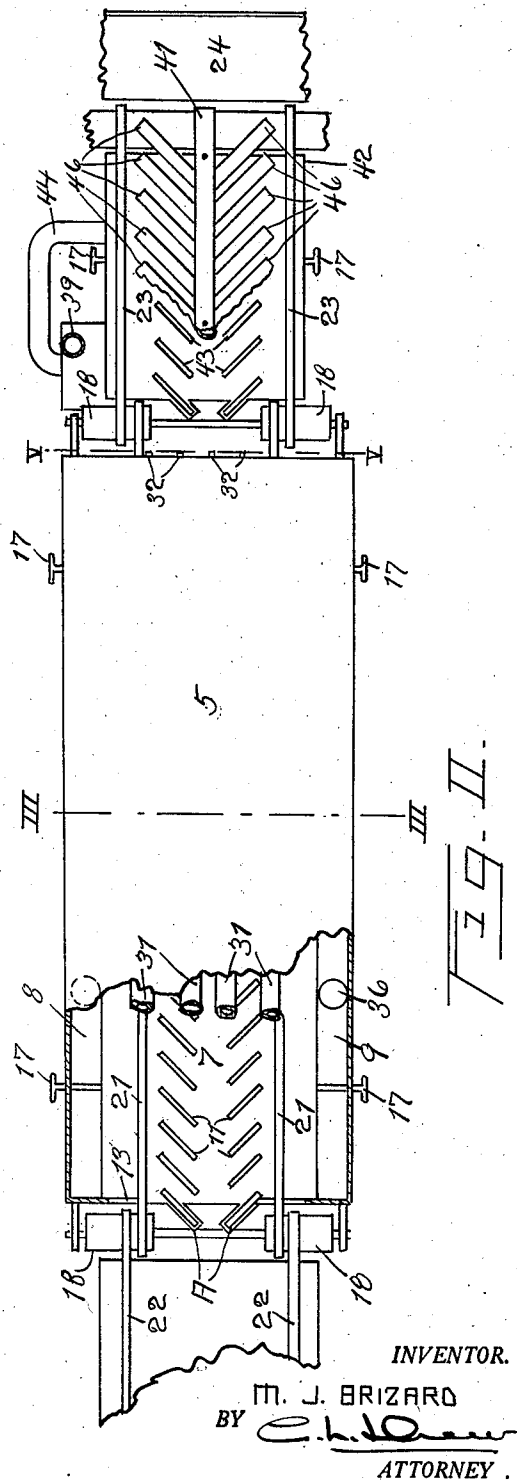
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VARNISH AND PAPER DRYING MACHINE

Filed Nov. 25, 1935

2 Sheets-Sheet 1



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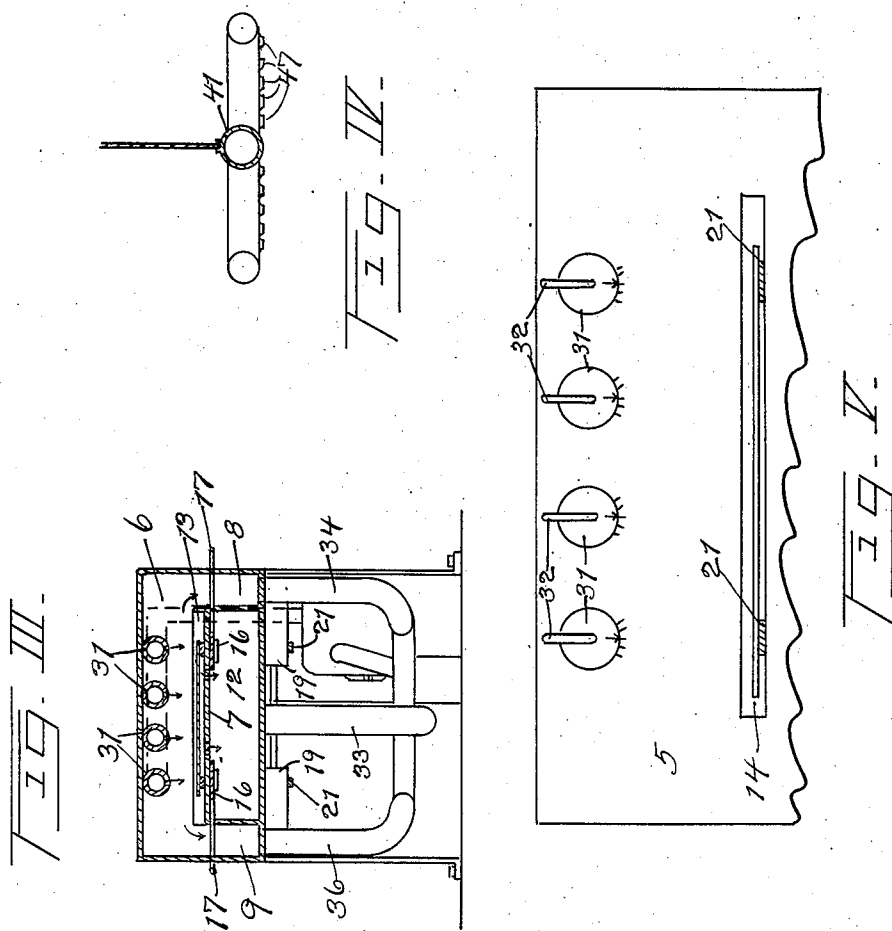
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2 Sheets-Sheet 2



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VARNISH AND PAPER DRYING MACHINE

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4 Claims. (Cl. 34—12)

This invention relates to improvements in varnishing and paper drying machines.

The principal object of this invention is to produce a machine which will take coated sheets in a wet condition and dry them and deliver them cooled and ready to stack without mutilation.

A further object is to provide means for holding sheets during the drying process against curling.

A still further object is to provide means for cooling the sheets after drying so that latent heat in the sheets will not cause sticking when the sheets are piled one upon the other.

A further object is to produce a device of this character which will effect an even drying of the sheets, thus eliminating warping or wrinkling.

A further object is to produce a machine of this character which is economical to manufacture and economical to operate.

A further object is to provide means for controlling the flow of air over the sheets during the drying process and to control the suction below the sheets during its travel through the machine.

Other objects and advantages will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same,

Fig. 1 is a side elevation of my machine;

Fig. 2 is a top plan view of Fig. 1 having a portion thereof broken away;

Fig. 3 is a cross sectional view taken on the line 3—3 of Fig. 2;

Fig. 4 is a cross sectional view of the cooler pipe and distributing nozzles;

Fig. 5 is a fragmentary cross sectional view taken on the line 5—5 of Fig. 2.

In the printing of labels, and particularly lithograph work, the sheets are varnished and stacked.

It has been customary to pass these varnished sheets through a long heated chamber, and it often occurs that due to the sudden changes in temperature as the sheet passed into the chamber that the sheet would fold over upon itself through a curling action, not only spoiling that particular sheet but often the sheets ahead and the sheets following. As these sheets are quite expensive it is obvious that such a condition results in a heavy loss.

I have, therefore, devised a machine wherein these same varnished sheets are conducted into a dryer, passed therethrough, and delivered to a stacking machine in dried and cooled condition and without curling, as above described.

This I accomplish in a machine in which an

elongated box like structure 5 serves as a drying chamber. By referring to Fig. 3 it will be noted that this drying chamber 6 has a table surface 7 which is raised so as to form channels 8 and 9 at the sides thereof. This table 7 has a plurality of slits 11 diagonally arranged therein, which slits open into a vacuum box 12. Entrance to the chamber 6 is through an opening 13; an exit therefrom is through an opening 14. The slits 11 are regulated by dampers 16 connected to handles 17. Mounted at each end of the chamber 6 are rollers 18 and idlers 19. Over these rollers and idlers are arranged belts 21 which serve to carry sheets through the chamber 6. Conveyor belts 22 serve to deliver sheets from the varnishing machine to the conveyor belts 21 and belts 23 receive the sheets from the belts 21 and deliver the same to the table 24. A blower 26 delivers air to a heater 27, from which the air passes through a pipe 28 to a header 29 to which pipes 31 are attached. These pipes run longitudinally of the chamber 6 and are each provided with a series of openings whereby air may be blown downwardly as shown by the arrows in Fig. 3. By referring to Fig. 5 it will be noted that the ends of each of the pipes 31 are closed and provided with handles 32 through the medium of which the pipes may be rotated so as to direct the jets of air in any desired direction. Indicia markings may be arranged adjacent the ends of the pipes 31 so that the operator may readily discern the position of the jets. A pipe 33 has one end communicating with the vacuum chamber 12 and has the opposite end connected to the blower 26. Pipes 34 and 36 each have one end connected to the channels 8 and 9, respectively. At 37, I have shown a blower from which air is directed through a cooler 38 to a pipe 39 which connects to a header 41 suspended above a vacuum box 42. This vacuum box has slits 43 corresponding to the slits 11. A pipe 44 connects to the vacuum box and to the intake of the blower 37. The header 41 is provided with a plurality of pipes 46 diagonally arranged and each having downwardly extending jets 47.

The result of this construction is that when a sheet of varnished or coated material is delivered to the belts 22 these belts will advance the sheet to the opening 13 and onto the belts 21, and it will be here noted that two of the slits 11, designated by the letter A in Fig. 2, project beyond the chamber 6 and consequently a down draft will hold the sheet against rising as it enters the chamber. As the sheet proceeds through the chamber it will be progressively held down-

wardly by the slits 11 over which it passes and at the same time the jets of air issuing from the pipes 31, which air is heated, will expel the moisture from the sheets, which moisture will be carried to the channels 8 and 9. As the sheet leaves the chamber 6 it will pass onto the belts 23 where it will receive a down draft of cold air from the pipes 46 which may be adjusted up or down as best suits the condition encountered. The slits 43 will function in the same manner as those described at 11.

It will be apparent that with my device I can perform all the objects above set forth.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same and that various changes relative to the material, size, shape and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, I claim:—

1. In a device of the character described, an elongated box-like structure, a second box-like structure forming a vacuum box positioned in said first-mentioned box-like structure in such a manner as to form channels at the side of said first mentioned box-like structure, slits formed in the top of said vacuum box, said slits being diagonally disposed with relation to the length of the chamber, means for conducting sheets of material through said machine and over said vacuum box and slits therethrough, and means for directing a current of air downwardly on said sheets.

2. In a device of the character described, an elongated box-like structure, a second box-like structure forming a vacuum box positioned in said first mentioned box-like structure in such a manner as to form channels at the side of said first mentioned box-like structure, slits formed in the top of said vacuum box, said slits being diagonally disposed with relation to the length of the chamber, means for conducting sheets of material through said machine and over said vacuum box and slits therethrough, and means for directing a current of air downwardly on said sheets, said means including a plurality of longitudinally arranged pipes hav-

ing jets formed therein and capable of being rotated about their axis.

3. In a device of the character described, the combination with an elongated box-like structure having openings at both ends thereof, conveyor belts passing through said openings whereby a sheet of material may be transported through said structure, a vacuum box positioned in said structure, the top of said vacuum box supporting said belts, slits formed in the top of said box, said slits being diagonally arranged with respect to the longitudinal dimension of said structure, pipes longitudinally arranged above said vacuum box and capable of directing jets of air downwardly against sheets carried by said belts, means for rotating said pipes to change the angle of said jets issuing from said pipes, a channel formed at each side of said vacuum box, and exhaust means communicating with said channels, whereby air from said jets will pass over said sheets of material toward the edges thereof and to the channels, thereby holding the edges of said sheets against curling.

4. In a device of the character described, the combination with an elongated chamber having openings at both ends thereof, conveyor belts passing through said openings whereby a sheet of material may be transported through said chamber, a vacuum box positioned in said chamber, the top of said vacuum box supporting said belts, slits formed in the top of said box, said slits being diagonally arranged with respect to the longitudinal dimension of said chamber, pipes longitudinally arranged above said vacuum box and capable of directing jets of air downwardly against sheets carried by said belts, means for rotating said pipes to change the angle of said jets issuing from said pipes, and means for cooling the sheets passing from said box to a remote point, said cooling means including a header pipe suspended above the delivered sheet, said header pipe having a plurality of angularly disposed pipes connected thereto, each of said last mentioned pipes having downwardly directed nozzles, and a vacuum box positioned beneath said header, said vacuum box having slits formed in the top thereof whereby a suction will be exerted on the bottom of the sheet being delivered.

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