

Oct. 17, 1933.

J. WYND ET AL

1,930,575

APPARATUS FOR DRYING SHEETS

Filed Nov. 18, 1931

2 Sheets-Sheet 1

Fig. 1.

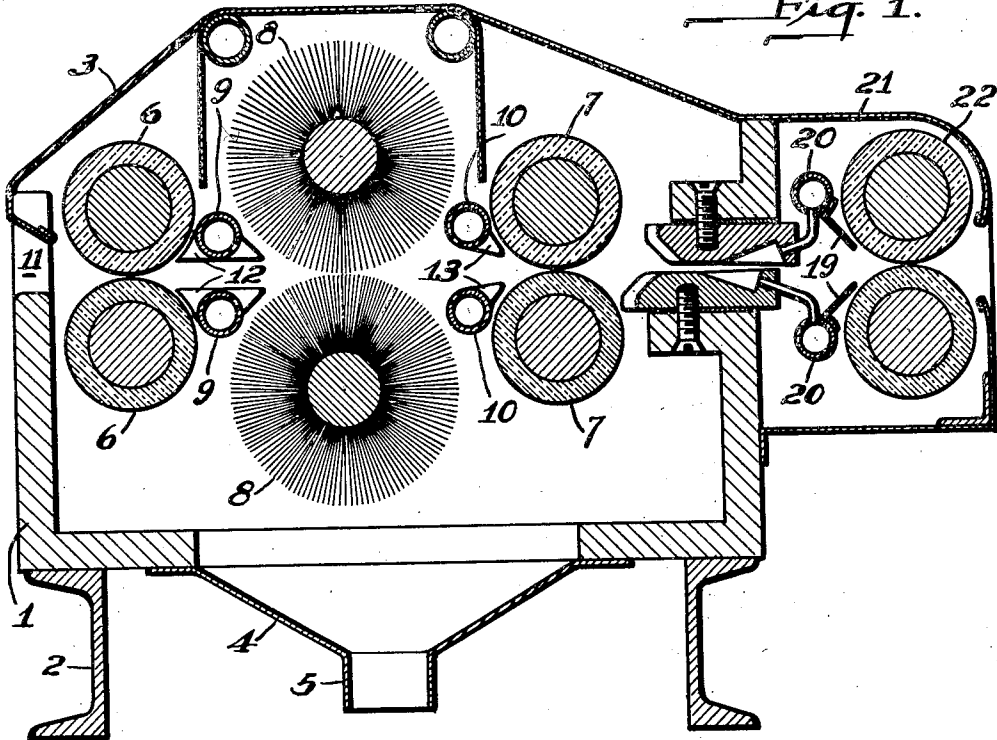
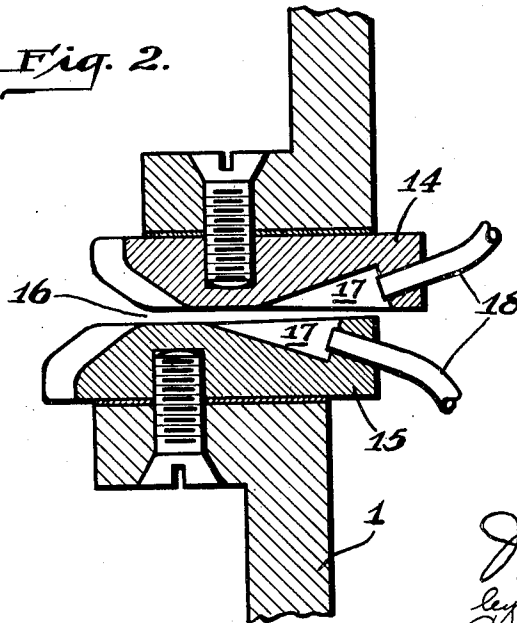


Fig. 2.



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2 Sheets-Sheet 2

Fig. 3.

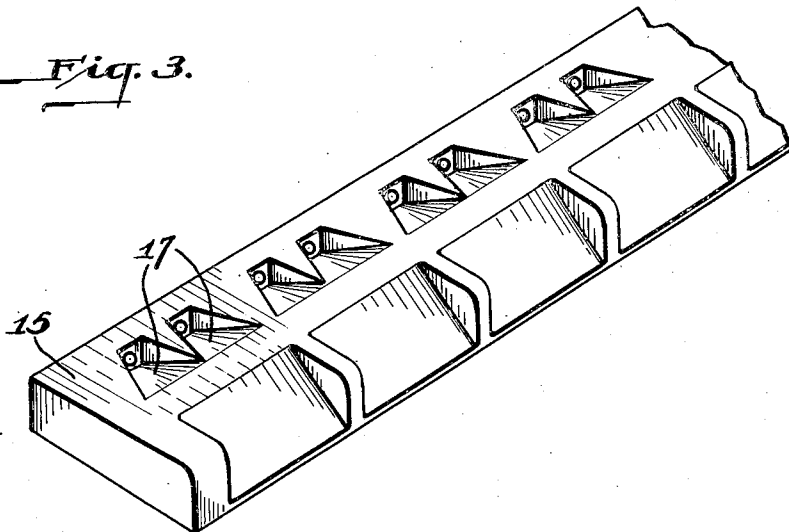
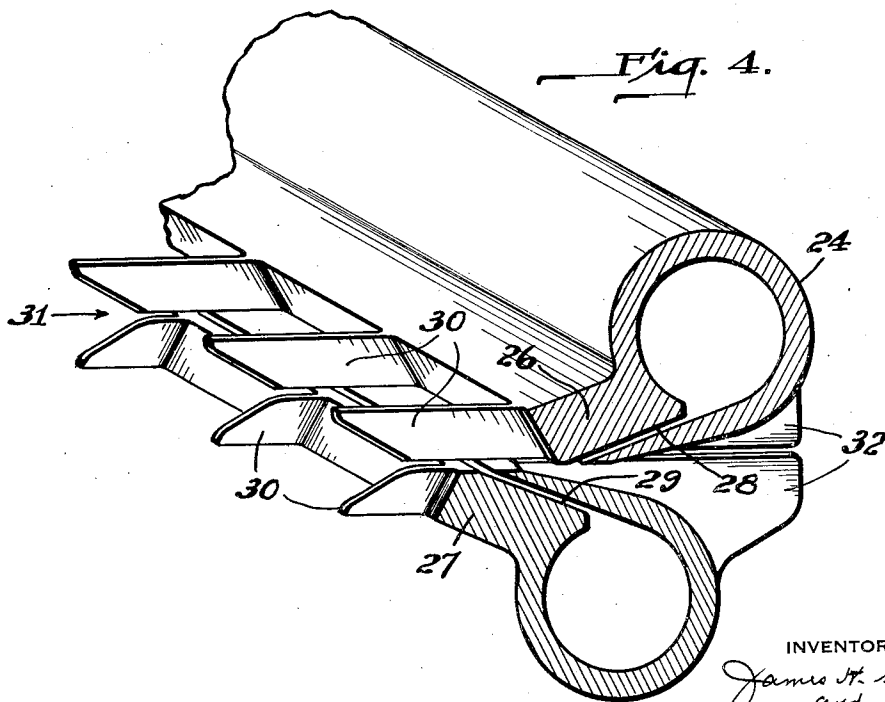


Fig. 4.



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UNITED STATES PATENT OFFICE

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APPARATUS FOR DRYING SHEETS

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Application November 18, 1931
Serial No. 575,786

4 Claims. (Cl. 34—48)

The invention relates to apparatus for washing and drying sheets of material, such as the glass and celluloid used in the manufacture of the so called laminated or safety glass, which requires a very thorough cleaning and drying before compositing the sheets into a sandwich or plate. The objects of the invention are the provision of an improved form of apparatus, which will very thoroughly clean and dry the sheets, and which is of simple construction, and easily operated at a low cost. A further object is the elimination of noise due to vibration where thin flexible sheets such as celluloid are treated. Certain embodiments of the invention are illustrated in the accompanying drawings, wherein:

Figure 1 is a vertical section through the apparatus. Fig. 2 is an enlarged detail section. Fig. 3 is a perspective view of one of the parts. And Fig. 4 is a detail view partially in section showing a modification.

Referring to the general arrangement as shown in Fig. 1, 1 is a casing mounted upon the base 2 and provided with a cover 3 preferably of thin sheet metal. The casing is provided with a hopper bottom 4 and a drain pipe 5, to which a pipe is attached for carrying away the drainage from the apparatus. Mounted in the casing 1 are two sets of rolls 6, 6, and 7, 7, for feeding the sheet to the drying apparatus at the right hand side of the machine after they have been washed. The upper member of each pair of rolls is an idler roll, while the lower member of each pair is suitably driven by means not shown. These rolls are preferably covered with rubber in order to give the rolls a good grip upon the sheets that are being handled. Interposed between the two sets of rolls 6, 6 and 7, 7 are a pair of brushes 8, 8, preferably of the bristle type and suitably driven by mechanism not shown. Just in advance of the brushes 8, 8 are a pair of spray pipes 9, 9 provided with suitable outlet passages directed toward the sheets being fed through the apparatus and supplied with water or other cleaning liquid under pressure. A second pair of spray pipes 10, 10 is located intermediate the brushes 8, 8 and the feed rolls 7, 7, such pipe being supplied with a cleaning liquid under pressure as in the case of the pipes 9, 9. A feed slot 11 is provided through the casing and the sheets to be cleaned are sent through this opening and between the first pair of feed rolls 6, 6. The sheets of material to be cleaned are then carried between the brushes 8, 8 and the rolls 7, 7. Suitable guide fins 12, 12 and 13, 13 are preferably

provided upon the pipes 9, 9 and 10, 10 to assist in guiding the sheets through the casing.

The device to which the invention particularly relates is mounted upon the right hand wall of the casing 1. This device comprises a pair of plates 14 and 15 having their faces cored out, as indicated in Fig. 3. These plates are placed in opposition as indicated in Fig. 2, being spaced apart so as to provide the throat 16 whose width will depend upon the material being treated. In all cases this throat is to permit the material to pass freely thereto with a slight amount of clearance. In case the sheets are of celluloid, such as is used in the manufacture of laminated glass, the width of the throat will be about twenty-eight thousandths of an inch. The walls of the plates 14 and 15 with their cored out faces opposite will provide a series of chambers 17 having the inclined walls as shown in Fig. 2 leading to the throat 16. Extending through the rear wall of each of the chambers 17 is a pair of pipes 18, 18, to which air under pressure is supplied. These air jet pipes provide the means for drying out the sheets of material as they are fed between the plates 14 and 15. The air supplied is under sufficient pressure to entirely clear the opposite faces of the sheets of material of moisture as they pass through the throat 16.

The plate 14, as indicated in Fig. 2, is placed somewhat to the rear of the plate 15 so that the air is applied to the sheet of material at different points upon its lower and upper sides. The purpose of this non-symmetrical arrangement of the plates 14 and 15 is to avoid causing a vibration of the sheet of material, which vibration, in case the sheets are of celluloid, produces loud penetrating noise of high pitch. The cleaning effect is equally as good where the plates 14 and 15 are exactly opposite each other producing a symmetrical chamber 17, and in the case of glass sheets, this arrangement is not objectionable, but in the case of very thin sheets such as celluloid, the noise produced by the symmetrical arrangement of the plates 14 and 15 is most objectionable.

When the plates emerge from between the plates 14 and 15, they are supported and guided by suitable plates 19 carried by the transverse pipes 20, 20. The sheets of material are fed from the casing 21 by means of rolls 22 and 23, 22 being an idler roll and 23 being a roll driven by suitable mechanism not shown.

Fig. 4 illustrates a modification in which the air is applied to the sheets to be dried in a different manner. In this case the air supply pipe manifolds 24 and 25 are provided with nozzles 26

and 27 through which slots 28 and 29 extend for directing the air against the faces of the sheets to be dried. The nozzles 26 and 27 are provided with forwardly projecting flanges 30, 30 with V-shaped openings 31 therebetween to serve as a guide means for the sheets of material. Other guide fins 32 are provided on the pipes 24 and 25 for supporting the sheets after they pass the air jet slots 28 and 29.

10 What we claim is:

1. In combination in a sheet washing and drying machine having a slot or throat of a width sufficient to permit the sheets to be dried to pass therethrough with a slight amount of clearance, 15 means for carrying the sheets through the slot, and air jet means on opposite sides of the slot to the rear thereof and directed toward such slot in opposition to the direction of travel of the sheets so that the air thus supplied is forced between the faces of the sheet and the walls of the slot.

2. In combination in a sheet washing and drying machine having a slot or throat of a width sufficient to permit the sheets to be dried to pass therethrough with a slight amount of clearance, 25 means for carrying the sheets through the slot, and air jet means on opposite sides of the slot and to the rear thereof and directed toward such

slot in opposition to the direction of travel of the sheets, with the air jet means on one side of the sheet in advance of the air jet means on the other side of the slot.

3. In combination, in a sheet washing and drying machine having a slot or throat of a width sufficient to permit the sheets to be dried to pass therethrough with a slight amount of clearance, means for carrying the sheets through the slot, a plurality of air chambers on the side of the slot 85 toward which the sheets are moved with their opposing side walls inclined away from the plane of travel of the sheets, and air jet means in each of said chambers directed toward the slot in opposition to the direction of travel of the sheets. 90

4. In combination in a sheet washing and drying machine having a slot or throat of a width sufficient to permit the sheets to be dried to pass therethrough with a slight amount of clearance, means for carrying the sheets through the slot, 95 oppositely facing chambers opening toward each other to the rear of the slot with their forward ends in communication with the slot and means for supplying air under pressure to said chambers. 100

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