Aug. 18, 1931. V. ANTOINE 1,818,982

APPARATUS FOR THE PRODUCTION OF PAPER GLAZED AND/OR COLORED ON ONE FACE

Filed Sept. 12, 1928 3 Sheets-Sheet

Fig. 1.

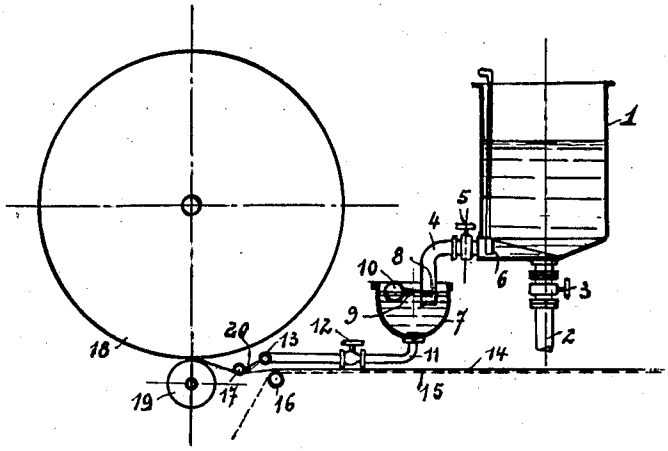
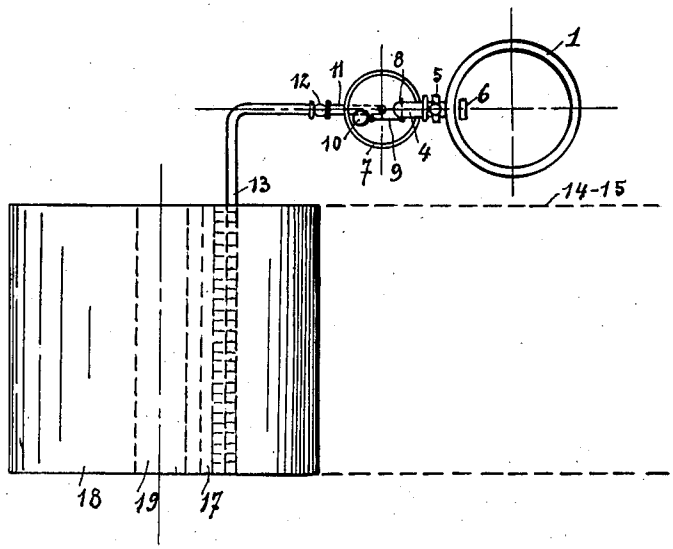


Fig. 2.



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APPARATUS FOR THE PRODUCTION OF PAPER GLAZED AND/OR COLORED ON ONE FACE

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Fig. 3.

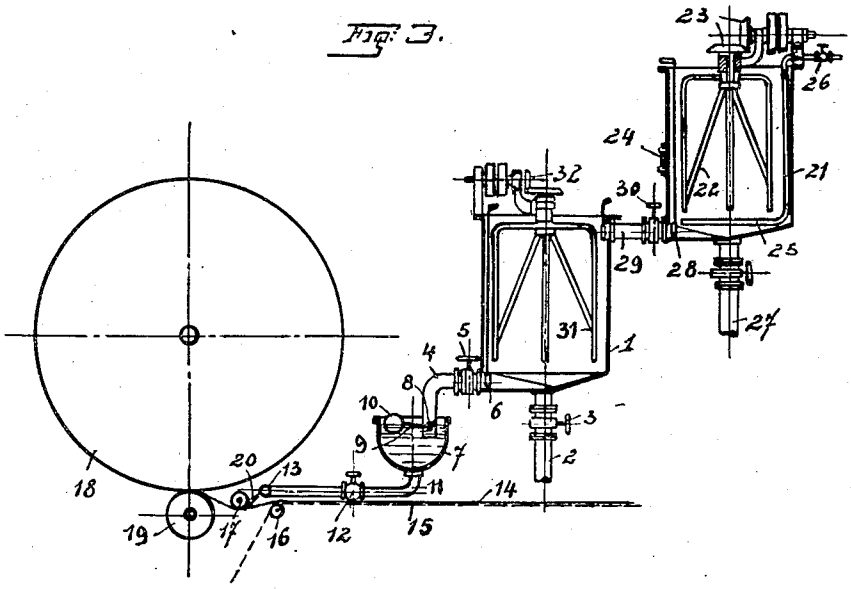
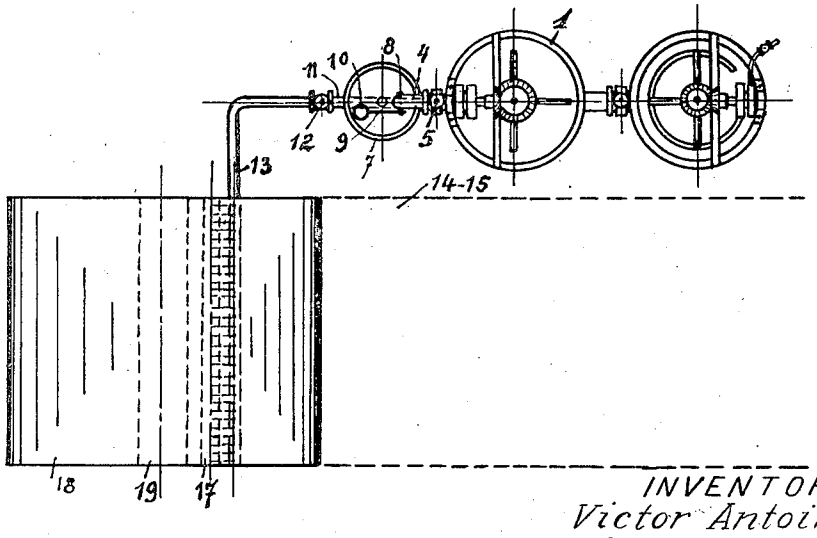


Fig. 4.



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APPARATUS FOR THE PRODUCTION OF PAPER GLAZED AND/OR COLORED ON ONE FACE

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Fig: 5.

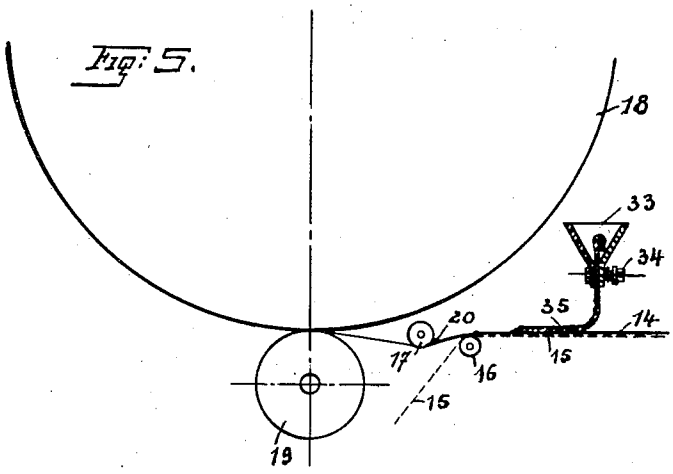


Fig: 6.

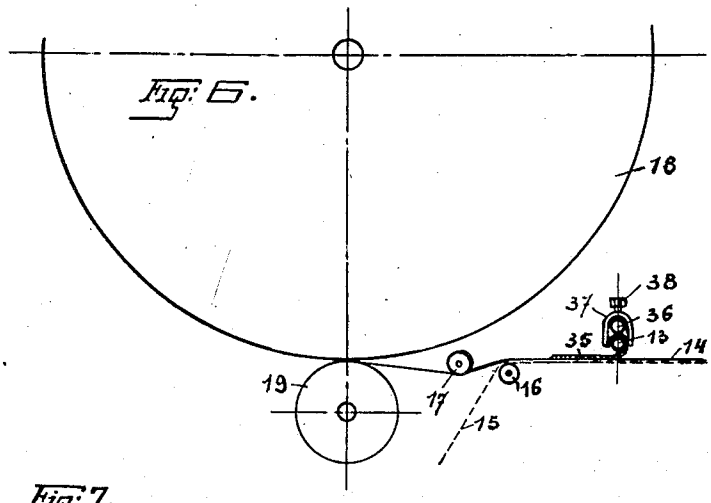
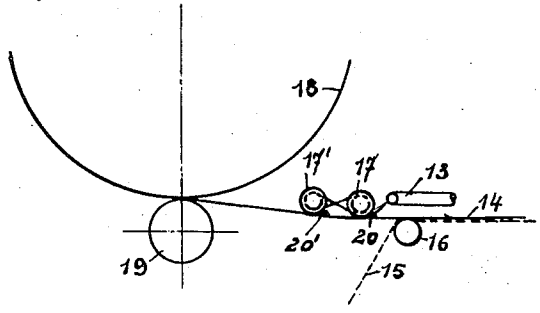


Fig: 7.



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UNITED STATES PATENT OFFICE

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APPARATUS FOR THE PRODUCTION OF PAPER GLAZED AND/OR COLORED ON ONE FACE

Application filed September 12, 1928, Serial No. 305,595, and in Belgium September 15, 1927.

This invention relates to an apparatus for the production at high speed of white or colored paper glazed and/or colored on one face.

As is well known in the paper making art, the glazing of paper involves its passage with a determinate content of water over a drying cylinder having a polished surface. Heretofore serious drawbacks were met with in the glazing of paper due to the circumstance that the water content of the paper varies considerably with its thickness at the moment of its passage over the final drying cylinder.

If the paper is thin, it frequently happens that the water content is insufficient, whereas if the paper is relatively thick, the content of water is frequently too great to permit of satisfactory glazing.

These drawbacks are avoided according to the invention by effecting the drying of the paper in a continuous machine irrespective of the glazing operation and then distributing on the face of the paper in front of the final drying cylinder or the drying cylinder having a polished surface a certain quantity of water distributed uniformly over the breadth of the web in such manner as to ensure the presence of the exact quantity of water necessary.

In practice, the water employed for moistening the paper may be clear water or it may be water with the addition of colloidal matter adapted to enhance the glazing. Further if coloring matter be added to the water there may be obtained paper glazed and in two colors, that is of different colors on the two faces, and adapted to take the place of bichrome paper heretofore produced by securing together by means of adhesive two sheets of different colors or by application of a layer of color to the paper and its passage through a machine employed for the manufacture of colored paper. Generally, the invention permits of replacing papers produced by employment of separate machines independent of the continuous machine.

An important condition in the manufacture of glazed paper or of bichrome paper glazed or not on one face being to obtain uniform distribution of the water or of the coloring liquid employed on the face to be treated, use is made of a distributor (for the clear water or coloring liquid) connected to a float regulator and receiving filtered or purified liquid from one or several reservoirs so as to ensure distribution always under the same head. In the manufacture of bichrome paper use is preferably made of two reservoirs provided with agitators for effecting solution of the coloring matter, these reservoirs being arranged in series and adapted to be isolated from or put in communication with one another in order to permit the preparation of a certain quantity of coloring solution during the use of another part of this solution or of a solution of different color.

With the above mentioned objects in view the invention essentially consists in the special arrangements and combinations of parts hereinafter fully described and pointed out in the appended claims.

On the annexed drawings:

Fig. 1 is a view in elevation showing diagrammatically the assembly of the apparatus as adapted to be utilized for glazing paper with the use of clear water.

Fig. 2 is a corresponding plan view.

Figs. 3 and 4 show modifications of this arrangement, employed in the manufacture of bichrome paper or of paper to be glazed by means of water containing colloidal matter or otherwise prepared. Figs. 5 and 6 show two alternative forms of the device for ensuring distribution of the water or liquid over the paper sheet.

Fig. 7 shows an alternative form especially for the making of bichrome paper.

In the example shown in Figs. 1 and 2, 1 denotes a reservoir adapted to contain clear water. This reservoir which is provided with a drain connection 2 with cock 3, feeds by way of a pipe 4 fitted with a regulating cock 5 and a removable sieve 6 a regulator 7 which determines the depth of the water utilized for moistening the paper. With this object the water contained in the reservoir 1 flows into the regulator 7 by way of an opening controlled by a valve 8 actuated by a lever 9 connected to a float 10 so as to maintain a con-

stant level in the regulator 7 and thus ensure uniformity of head. The water supplied to the regulator 7 passes from the latter into a tube 11 fitted with a cock 12 and flows into a tube 13 pierced with small holes and used for sprinkling the paper 14 passing with the felt 15 of the paper machine. The felt 15 is led as usual over a guide roller 16 whence it is returned to the paper machine in the usual way, whilst the paper passes first under a distributing roller 17 and then between the pressure roller 19 and the drying cylinder 18 before turning around the latter. In operation, the water flowing from the reservoir 1 to the regulator 7 passes by way of the distributor tube 13 disposed transversely of the felt above the paper. This distributing tube 13 being pierced with a large number of holes, the water is distributed over the paper so as to form a pool at 20 in front of the roller or other distributing member 17. The water is thus uniformly distributed over the surface of the paper which immediately thereafter passes into contact with the polished surface of the drying cylinder 18 of the paper machine. With this water added the paper is brought to the proper degree of humidity and is glazed at high speed in the paper machine.

If bichrome paper is to be produced, there are incorporated in the installation devices shown in Figs. 3 and 4 whereby coloring liquid is introduced into the reservoir 1. As shown, there is located at a higher level than the reservoir 1 a second reservoir 21 provided with an agitator 22 rotated through the intermediary of gearing 23.

This reservoir 21 is fitted with a thermometer 24 and receives in its interior a steam coil 25 fitted with a cock 26. 27 denotes a draining pipe connected to the bottom of the reservoir 21, and 28 a removable sieve for retaining impurities. The liquid or bath prepared in the reservoir 21 passes by way of the pipe 29, the delivery of which is controlled by a cock 30, to the reservoir 1 which may also be provided with an agitator 31 rotated through the intermediary of gearing 32. In this case coloring liquid may be prepared in the reservoir 21 while the coloring liquid previously prepared and contained in the reservoir 1 is being utilized in the manufacture of bichrome paper.

Whether the apparatus is utilized exclusively for the glazing of paper or for the manufacture of bichrome paper, the distribution of the liquid on the sheet is effected by the distribution regulator 7 co-operating with the perforated tube 13 and with the distributing roller 17 which ensures the formation of the pool or loop 20 which is essential in order to obtain a uniform distribution on the surface of the paper to be glazed or colored.

The arrangement shown in Figs. 3 and 4 may also be used if size or colloidal matter is to be added to the water.

As is understood a like arrangement may be applied to other drying cylinders of the machine, and in a given case the roller 17 may cooperate with one or two cylinders in relief not shown so as to apply different colors and designs to the paper.

The tube 13 and the roller 17 are preferably mounted so as to be movable at will vertically or laterally by means of adjustable articulated supports.

For the perforated tube 13 there may be substituted a distributing device of other type suitable for the class of paper to be produced. For example, for thin paper the perforated tube 13 may be replaced by a channel 33 of V-section as shown in Fig. 5, the lower edges of which channel may be brought together by adjustment of screws 34 so as to nip a wick of felt 35 which rubs on the paper over its width. The water whether colored or not, is delivered in the form of a regulated jet into the channel 33, passes through the wick and soaks the paper over its surface.

Fig. 6 shows a further modification of the distributing device in which a felt wick 35 is nipped at one end between the tube 13 for delivery of the liquid and a round bar 36 held against the perforated tube 13 by stirrup pieces 37 fitted with screws 38. The wick 35 rubbing at its other end over the paper soaks it with liquid received from the tube 13.

Whatever arrangement of distributor be adopted, the liquid is distributed in a sufficient quantity to form the pool of liquid already mentioned at the roller 17 which distributes it uniformly over the surface of the paper in the course of manufacture.

As shown in Fig. 7 it may be useful in some cases to make use of two rollers 17 and 17′ carried by a fulcrumed support whereby they may be raised or lowered separately or brought nearer to or spaced apart from each other at will according to the necessities of manufacture in order to obtain the best distribution of the coloring substance.

The rubbing of the paper may cause this second roller 17′ to rotate in the same direction as the roller 17. It may however be rotated in an inverted direction by means of a crossed cord passing on two little grooved pulleys mounted on one end of the axis of the rollers.

In this case the excess of coloring substance brought to the roller 17 falls on both sides of the paper sheet and is gathered into a little reservoir whence it is extracted by a little pump or other mechanical means which returns it automatically to the reservoir 21. The roller 17′ then gives rise to the formation of a light liquid pool or loop 20′ and equalizes in a thoroughly perfect manner, the distribution of the coloring substance on the whole width of the sheet of paper.

The rollers 17 and 17′ may eventually be replaced by a scraper in polished glass on

another well smoothened substance coming into contact with the sheet of paper in order to produce the formation of the liquid pool or loop 20 or 20'.

What I claim is:

1. In a paper making machine, the combination for treating one surface of the paper comprising, in combination, a pressure roller, a drying cylinder, a felt, a sheet of paper passing between the said pressure roller and the said drying cylinder, a distributor for a coloring solution arranged in front of the point where the sheet of paper passes between the said pressure roller and the said drying cylinder and across the sheet of paper, a roller disposed between the said drying cylinder and the said distributor and against which a pool is formed, whereby the distribution of the coloring solution is made uniform on the said sheet of paper, a regulator whereby the delivery of liquid is controlled, a pipe extending between the said regulator and the said distributor, means whereby a constant level is maintained in the said regulator, a reservoir connected to the said distributor and in which a charge of the coloring solution is contained, a second reservoir, means arranged in the said second reservoir and whereby the coloring solution is prepared during the utilization of the charge contained in the first reservoir.

2. In a paper making machine, the combination for treating the surface of the paper comprising a cylindrical dryer, a felt for guiding the paper over the surface of the dryer, a roller in advance of the said dryer, relative to the direction of travel of the felt, the said felt and sheet of paper guided thereby being caused to take a downward path before reaching the said roller, means for distributing a liquid along the whole width of the sheet of paper and in the fold formed by the roller and the sheet of paper to form a pool in the fold, and means for controlling the distribution of the liquid.

3. In a paper making machine, the combination for treating the surface of the paper comprising a cylindrical dryer, a felt for guiding the paper over the surface of the dryer, a roller in advance of the said dryer relative to the direction of travel of the felt, the said felt and sheet of paper guided thereby being caused to take a downward path before reaching the roller, a liquid distributor in advance of the said roller extending across the entire width of the paper, for distributing a liquid along the whole width of the sheet of paper and in the fold formed by the roller and the sheet of paper to form a pool in the said fold, and means for controlling the distribution of the liquid.

In testimony whereof I have affixed my signature.

VICTOR ANTOINE.