J. J. WARREN.

PAPER MAKING APPARATUS.

APPLICATION FILED AUG. 14, 1918.

1,344,603. Patented June 22, 1920.

Fig. 1,

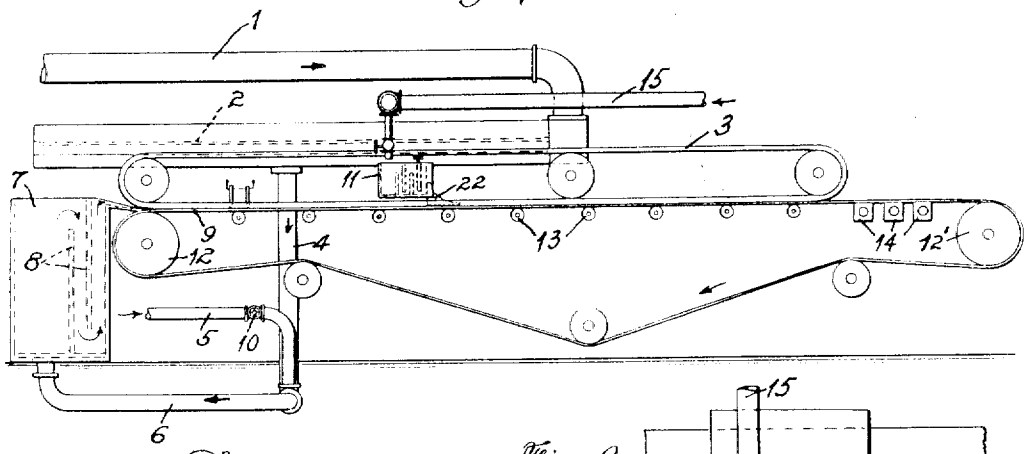


Fig. 3,

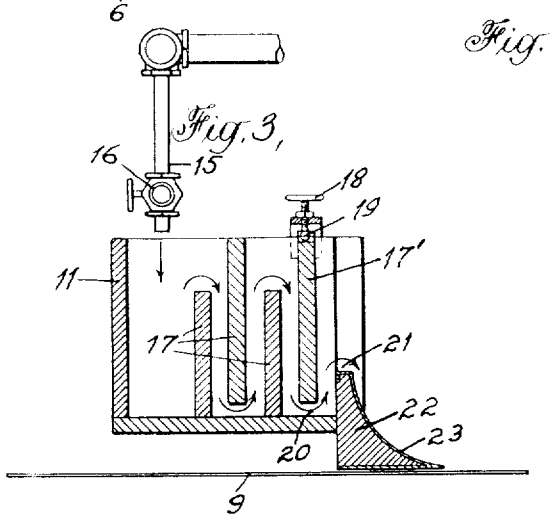
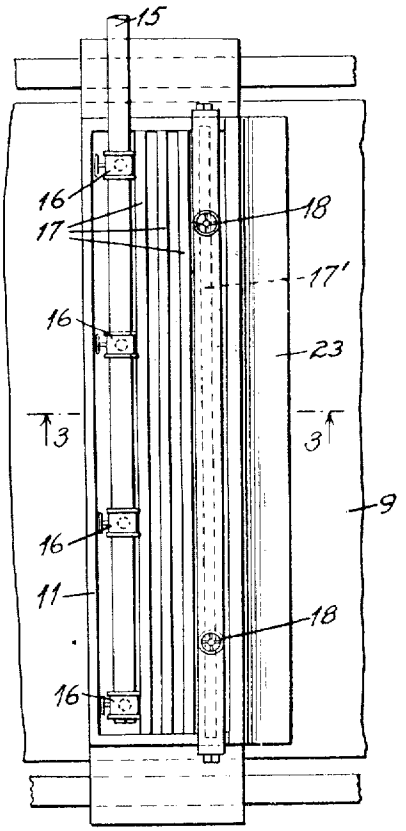


Fig. 2,



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UNITED STATES PATENT OFFICE.

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PAPER-MAKING APPARATUS.

1,344,603. Specification of Letters Patent. Patented June 22, 1920.

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To all whom it may concern:

Be it known that I, JOHN J. WARREN, a citizen of the United States, residing at Brownville, in the county of Jefferson, State of New York, have invented certain new and useful Improvements in Paper-Making Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to paper making apparatus with particular reference to an arrangement for applying a coating to the paper base with a degree of uniformity heretofore impossible.

In applying a coating to a paper base, it is sometimes essential that the coating should be spread as uniformly or evenly as possible. For instance, a blending stock of thin consistency is flowed on to the surface of a paper base to give visionary depth, as disclosed and claimed in my co-pending application filed concurrently herewith, and in such application of the blending stock, as well as in others, the effectiveness of the result depends upon the uniformity of the flow of the blending stock onto the paper base and also upon the thickness of the layer applied.

In accordance with the invention, the blending stock is applied to the surface of a paper base by means of an apron or facing slip having a curved surface over which the blending stock or other coating material flows from the flow box. The curved surface of the apron or facing slip is arcuate and preferably conforms to a segment of a circle to which the paper base is substantially tangential, whereby the coating material flows over the apron or facing slip with a gradually reduced rate of acceleration. Furthermore, by providing the apron or facing slip with a smooth surface, as by a metal sheathing devoid of local irregularities, the result is further improved.

In connection with the curved apron or facing slip, my invention also comprehends the use of means for causing the coating material to issue from the flow box with a predetermined thickness; said means consisting, in the preferred form of construction, of one or more baffles beneath and over which the blending stock or other coating material flows in the flow box, one of the baffles, preferably the last one encountered, being adjustable for regulating the depth of the passage for the coating material.

When used conjointly, the facing slip or apron serves to apply the blending stock or other coating material in a uniform layer on the paper base, and the adjustable baffle provides means for regulating the thickness of the layer and also for rendering the layer still more uniform.

The invention also comprehends, supplementary to the curved apron or facing slip, with or without the adjustable baffle, distributed valved inlets for the flow of the coating material into the flow box, thus providing means for equalizing the distribution of the stock to the different parts of the flow box regardless of the velocity of flow in different portions of the pipe.

In the accompanying drawings illustrating the preferred form of embodiment of the invention in application, as an example, to apparatus for applying blending stock to a paper base to form a wall paper with a cloud effect of visionary depth,—

Figure 1 represents diagrammatically a side view of the paper making apparatus; Fig. 2 is an enlarged view of the box from which the blending stock or other coating material flows onto the paper base, and Fig. 3 is a section on line 3—3 of Fig. 2.

The paper stock is delivered through a pipe 1 from a source of supply (not shown) to the flat screen 2 from which the screened stock is conducted by the pipe 4 to a union with the pipe 5 carrying wood flour from a source of supply (not shown). The mixture of wood pulp and wood flour is then conducted by the pipe 6 to the flow box 7 where the two are more thoroughly mixed in passing over and under the baffles 8 onto the Fourdrinier wire 9. The valve 10 provides for regulation of the proportion of wood flour to wood pulp in the mixture thereof.

The speed of travel of the wire apron 9 is that commonly employed in the manufacture of ordinary paper, and the location of the blending box 11 is such that the paper base formed on the wire by the mixture of paper stock and wood flour is then suitable to receive the coating material or blending stock. The deckle apron 3, the breast roll 12, the table rolls 13, the suction boxes 14, and the couch roll 12′, are provided in accordance with well known practice in the

art. After the paper is taken off the wire, it is dried, pressed and rolled like other wall papers.

Referring particularly to Figs. 2 and 3, it will be observed that the inlet pipe 15 for the coating material or blending stock extends from a source (not shown) over substantially the full width of the blending box 11 and has a plurality of depending nozzles controlled by individual valves 16 and discharging into the box. The coating material or blending stock then passes over and under the plurality of vertical baffles 17, the last one 17′ of which is adjustable up and down by means of the regulating screws 18 and the connections 19 near the two ends, to provide a predetermined depth of passage at 20 for the coating material or blending stock just before it flows over the discharge outlet at 21.

The facing slip or apron 22 is preferably curved to conform to the arc of a circle to which the wire apron 9 is substantially tangential at the place at which the coating material flows therefrom onto the paper base formed on the wire apron. The facing slip or apron 22 is covered with a smooth copper sheathing 23 devoid of local irregularities. As a result of the circular contour, the coating material or blending stock flows over the curved surface of the facing slip or apron with a gradually reduced rate of acceleration, and is deposited uniformly or evenly over the entire width of the upper surface of the paper base. The uniformity of the coating is further improved, and the thickness of the layer is predetermined, by means of the adjustable baffle 17′.

The valves 16 provide means for equally distributing the flow of the coating material or blending stock into the blending box, and by regulating the velocity or pressure of flow through the blending box by means of the baffle 17′, and by providing the curved facing slip or apron 22, the coating is deposited on the paper base with an unusually high degree of uniformity or evenness. As a result, the wall paper produced in this way has a cloud effect of exceptional visionary depth.

It will be understood, of course, that the invention may be applied to the manufacture of paper generally, wherein any kind of coating material or blending stock is to be deposited on a paper base.

Having thus described my invention, what I claim is:

1. In paper making apparatus, the combination with means for forming a paper base, of means for applying a coating thereto comprising a flow box having a plurality of baffles, one of which is adjustable to vary the thickness of the layer of coating material issuing from the flow box, and an apron having a curved surface to which the paper base at the point of application of the coating material is substantially tangential.

2. In paper making apparatus, the combination with means for forming a paper base, of means for applying a coating thereto comprising a flow box having a plurality of baffles, one of which is adjustable to vary the thickness of the layer of coating material issuing from the flow box, an apron having a curved surface to which the paper base at the place of application of the coating material is substantially tangential and distributed valved inlet nozzles for supplying the coating material to the flow box.

In testimony whereof I affix my signature.

JOHN JAMES WARREN.