W. H. HOWES.

PAPER MAKING.

APPLICATION FILED SEPT. 25, 1909.

995,602.

Patented June 20, 1911.

2 SHEETS—SHEET 1.

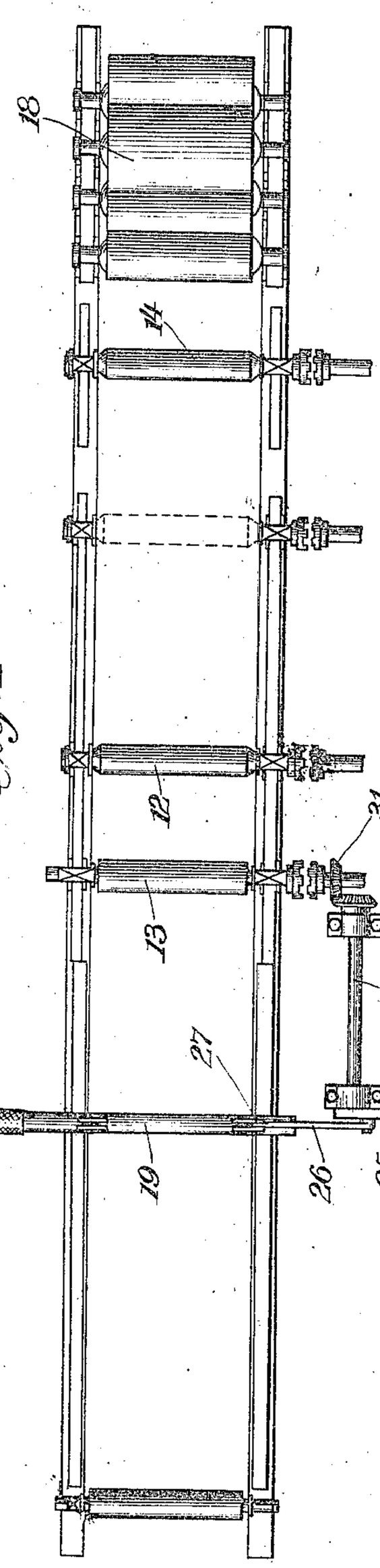

Fig. 1.

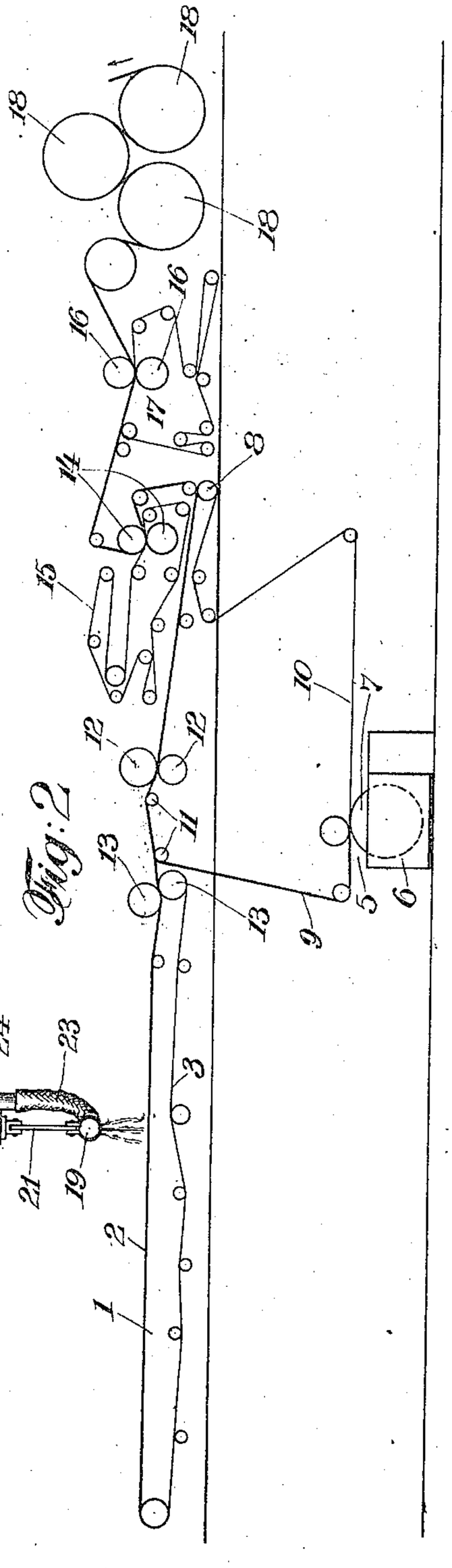

Fig. 2.

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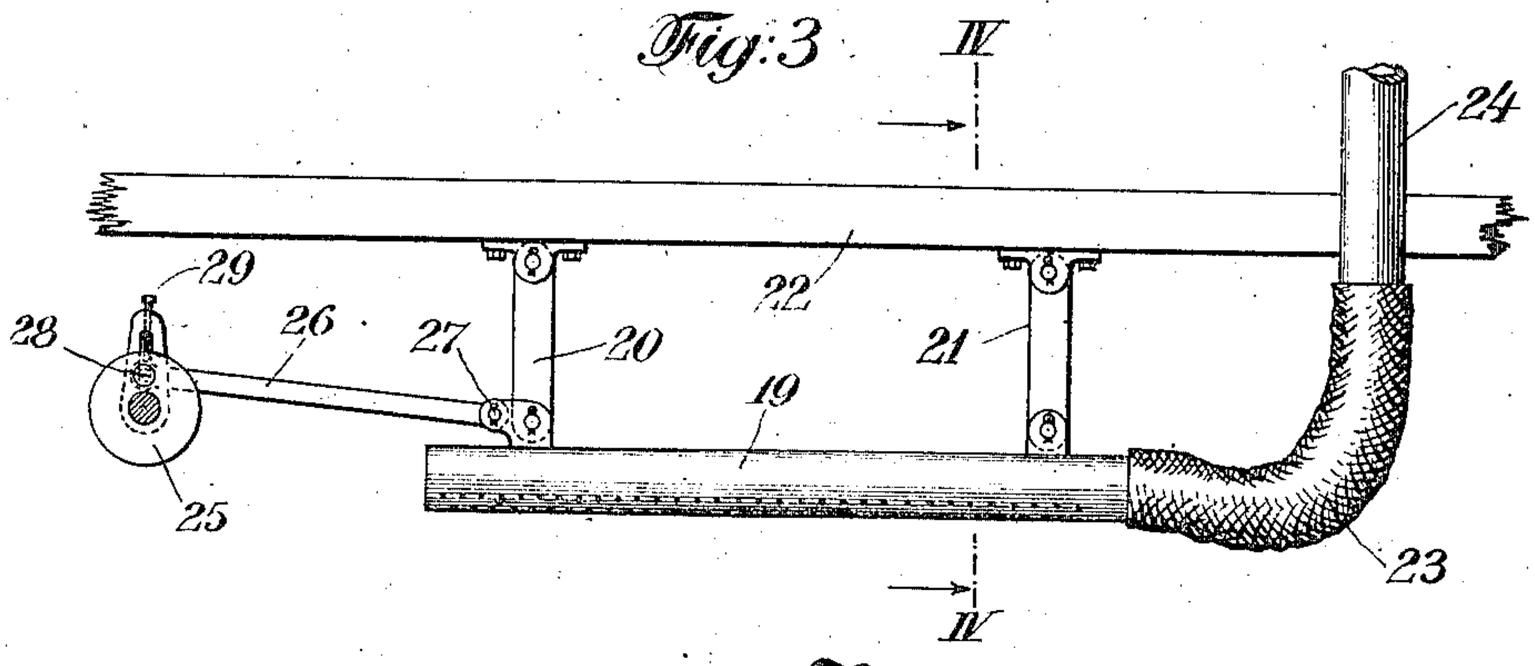
2 SHEETS—SHEET 2.

Fig: 3



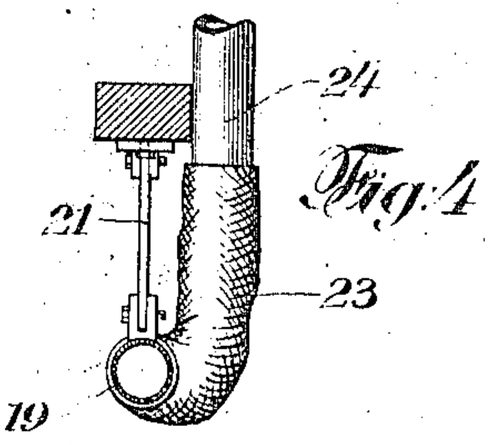


Fig: 4

Fig: 5

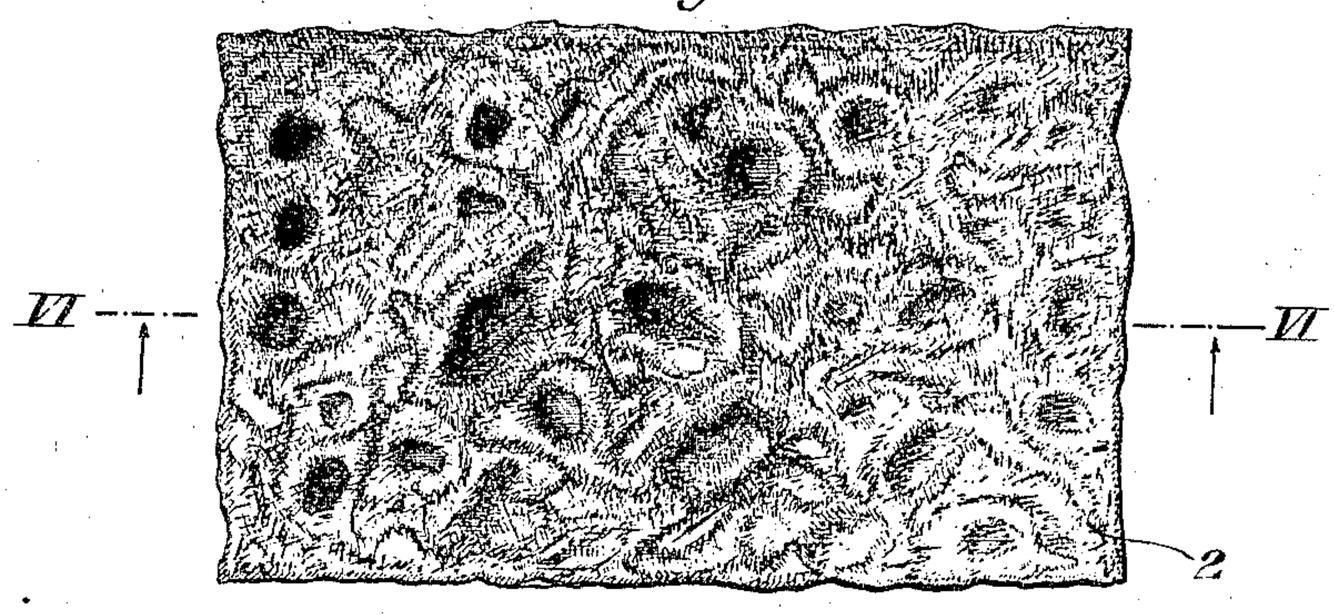


Fig: 6

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UNITED STATES PATENT OFFICE.

WILLIS H. HOWES, OF WATERTOWN, NEW YORK, ASSIGNOR TO KNOWLTON BROTHERS, OF WATERTOWN, NEW YORK, A CORPORATION OF NEW YORK.

PAPER-MAKING.

995,602. Specification of Letters Patent. Patented June 20, 1911.

Application filed September 25, 1909. Serial No. 519,609.

To all whom it may concern:

Be it known that I, WILLIS H. HOWES, a citizen of the United States, and a resident of Watertown, county of Jefferson, and State of New York, have invented certain new and useful Improvements in Paper-Making, of which the following is a specification.

My invention relates to improvements in paper making and the like and one main object of my invention is to provide an improved process for producing an artistic paper or the like of novel form.

Various other objects features and advantages will more clearly appear from the detailed description given below taken in connection with the accompanying drawings which form a part of this specification.

In the drawings, Figure 1 is an outline top plan view of apparatus which I use in carrying out my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a detailed vertical view of my spraying apparatus. Fig. 4 is a vertical section taken on the line IV—IV of Fig. 3. Fig. 5 is a plan view of the mottled surface of my improved paper. Fig. 6 is a cross section of the same taken on the line VI—VI of Fig. 5.

It will, of course, be understood that Figs. 1, 2, 3 and 4 of the drawings do not illustrate all the details of construction of the mechanism, since such details are well understood by those skilled in the art and many parts which are unnecessary for an understanding of this invention have been omitted. The views shown in Figs. 5 and 6 are somewhat exaggerated and of course cannot show the exact appearance of the product as it really is.

Referring to Figs. 1 and 2, 1 indicates a Fourdrinier machine which produces a web 2 sustained upon endless wire 3. A cylinder machine indicated at 5 is arranged near the machine 1 and is provided with a vat 6 having therein a cylinder 7. Cylinder 7 delivers its web 9 to the felt 10. The felt 10 extends over suitable supporting rolls 11 and is then passed between the first press rolls 12 and is then extended onto suitable supporting rolls back to the cylinder machine, the felt being, of course, continuous. The web 2 of the Fourdrinier machine 1 passes between press rolls 13 and then the web 2 leaves the wire 3 and passes between the rolls 12 and is united with the web 9, whence the two are carried along together by the felt 10. The two webs thus joined after passing the supporting roll 8 leave the felt 10 and pass upwardly about supporting rolls and between the second press rolls 14. The usual felt 15 is provided adjacent the rolls 14 for removing a certain quantity of moisture from the paper. The two combined webs are then passed over suitable supporting rolls to the third press rolls 16 where the web is subjected to the drying by pressure. After passing the roll 16 the paper web is passed over drying rolls 18 heated by steam and during these operations the two webs become firmly united.

Suitably placed above the web 2 is a spraying pipe 19 pivotally mounted upon two links 20 and 21 (see also Figs. 3 and 4). The links 20 and 21 are pivotally mounted to some fixed member, as a beam 22. One end of the spraying pipe 19 is closed while a rubber tube 23 connects the other end of the spraying pipe 19 with a supply pipe 24, which feeds the spraying pipe 19 with a liquid under pressure. For the purpose of spraying, the pipe 19 is provided with apertures on its underside, through which the spray is emitted. The spray or shower from the pipe 19 is directed upon the upper outside surface of the web 2 and in order to cause the same to be properly and irregularly distributed thereover the pipe 19 is given a back and forth motion by means of a rotating disk 25 which reciprocates a link 26 pivotally mounted to the pipe 19 at 27. In order to vary the throw of the pipe 19 the link 26 is pivotally mounted to the disk 25 at 28, and the pivotal point 28 is arranged to be adjusted at various distances from the axis of the disk 25 by means of a screw 29. The disk 25 may be driven in any suitable manner, as by a shaft 30 driven from gear 31 of the main machine.

The operation relating to the separate formation of the two webs by the cylinder and Fourdrinier machines is well understood, and, therefore, need not be described.

While the web 2 is on the wire of the Fourdrinier machine, it is sprayed or showered from the pipe 9 with water or other suitable fluid, the drops or streams of water

displacing the pulp of the web or particles thereof in an irregular manner forming in most cases irregular and uneven crater-like depressions of various depths in the web at such stage in the formation of the web that the depressions will not refill so that the web varies in translucency and thickness, although the under side of the web will remain comparatively smooth. That is, the pulp is displaced by the spraying at such a stage that the displacement for the most part remains. This gives the sprayed surface of the web a wild appearance caused by the spraying so that a wild sheet is produced, with its cloudiness appearing on the face of the sheet. The web 2 is then united with the web 9 in the well known manner and since the web 2 is formed with uneven depressions and varying thickness and translucency the resulting paper has a mottled appearance, which Fig. 5 is intended to represent. The uneven and irregular depressions may perhaps be more clearly understood from the cross section shown in Fig. 6. The webs 2 and 3 may be made of different shades or colors of pulp, in which case the mottled appearance is much more apparent since the color of the web 3 may be seen through the thinner portions of the web 2. It may happen in some instances that the drops or spray may entirely form a complete aperture in the web 2, as shown at 32, in which case the under web would be clearly visible therethrough. To further increase the effect the spraying may be produced with water having therein colored material either in solution or suspension. The resulting product has a peculiar and distinctive artistic appearance which makes it especially advantageous for wall-papers, catalogue covers and many other purposes.

Although I have described my invention in great detail, nevertheless I do not desire to be limited thereto, except as specified hereinafter in the claims, but

Having fully and completely described my invention what I claim as new and desire to secure by Letters Patent, is:

1. The improved treatment in paper making, and the like, which consists in irregularly spraying a web with sufficient force to cause the pulp of the web to be displaced at such a stage in the formation of the web that the displacement remains.

2. The improved treatment in paper making and the like, which consists in spraying a web with a fluid shower with sufficient force to cause the pulp of web to be displaced and remain displaced to form a wild sheet.

3. The improved treatment in paper making, and the like, which consists in forming two webs, irregularly spraying one of the webs while moist with sufficient force to cause the pulp of the web to be displaced irregularly at such a stage in the formation of the web that the displacement remains and uniting said webs into a single sheet.

4. The improved treatment in paper making, and the like, which consists in forming two webs, irregularly spraying one of the webs while moist with a fluid shower with sufficient force to cause the pulp of the web to be displaced at such a stage in the formation of the web that the displacement substantially remains and uniting said webs into a single sheet so that the sprayed surface will be on the outside of the sheet and said surface will have a wild appearance.

5. The improved treatment in paper making, and the like, which consists in forming two webs, irregularly spraying one of the webs while moist with drops of a colored liquid and with sufficient force to cause the pulp of the web to be displaced irregularly and form depressions therein at such a stage in the formation of the web that the depressions will not refill and uniting said webs into a single sheet so that the sprayed surface will be on the outside of the sheet and said surface will have a mottled appearance.

6. The improved paper, or the like, which consists in two webs pressed together, one of which has been irregularly sprayed with a fluid shower with sufficient force to irregularly displace the pulp of the web, and give one surface thereof a wild appearance, said surface being on the outside of the paper, or the like.

7. The improved paper, or the like, which consists in two webs pressed together, one of which has been irregularly sprayed with sufficient force to irregularly displace the pulp of the web and make uneven depressions therein at such a stage in the formation of the web that the depressions will not refill and give one surface thereof a wild appearance, said surface being on the outside of the paper, or the like.

8. A wild sheet having its wild effect produced by spraying with sufficient force to displace particles of the pulp of the web at such a stage in the formation of the web that they will remain so displaced.

9. The improved treatment in paper making, and the like, which consists in spraying a web of pulp to produce crater-like depressions on the surface of the web at such a stage in the formation of the web that the depressions will not refill.

10. The improved treatment in paper making, and the like, which consists in spraying a web of pulp with drops of water to produce crater-like depressions on the surface of the web at such a stage in the formation of the web that the depressions will not refill.

11. An improved paper, or the like, having crater-like depressions on an exposed

surface thereof, formed by spraying at such a stage in the formation of the web that the depressions will not refill.

12. Paper or the like produced by showering a fluid upon the same, forming uneven crater-like depressions which do not refill and which give the paper a cloudy or wild appearance.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

WILLIS H. HOWES.

Witnesses:
J. S. KNESUTTON,
H. E. HARMON.