(Specimens.)

2 Sheets—Sheet 1.

Z. CRANE, Jr.

WATERMARKED PAPER.

No. 353,666. Patented Dec. 7, 1886.

Fig: 1.

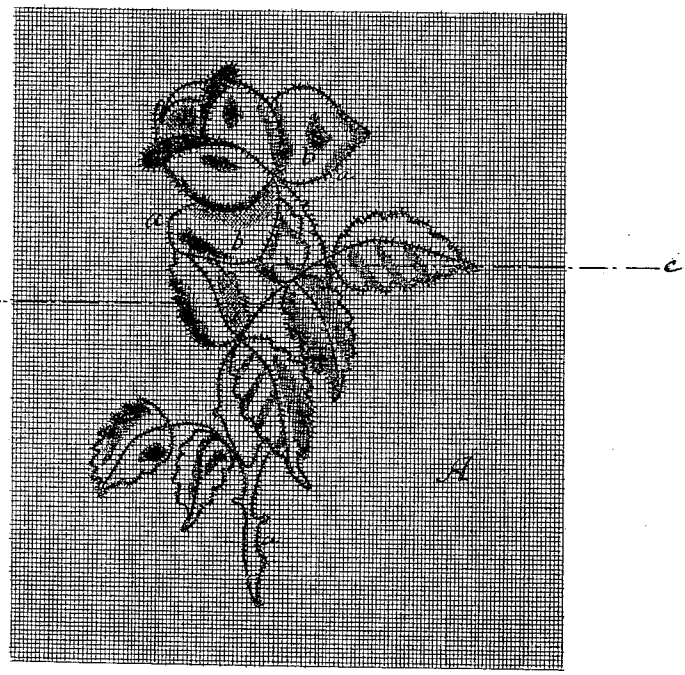
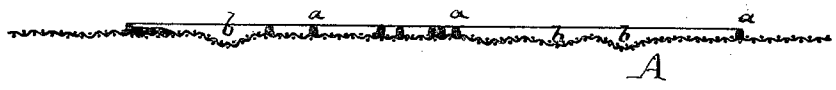


Fig: 2.



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(Specimens.)

2 Sheets—Sheet 2.

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Fig. 3.

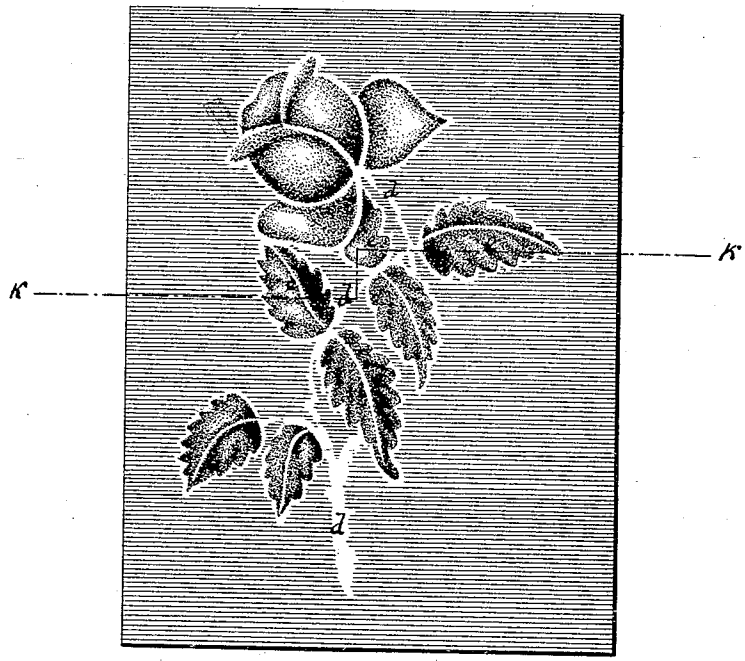
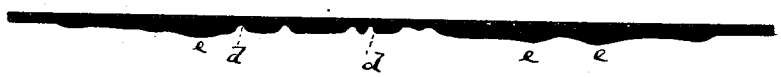


Fig. 4.



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UNITED STATES PATENT OFFICE.

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WATERMARKED PAPER.

SPECIFICATION forming part of Letters Patent No. 353,666, dated December 7, 1886.

Application filed April 16, 1886. Serial No. 199,048. (Specimens.)

To all whom it may concern:

Be it known that I, ZENAS CRANE, Jr., a resident of Dalton, in the county of Berkshire and State of Massachusetts, have invented an Improved Watermarked Paper, of which the following is a full, clear, and exact description, reference being made to the accompanying drawings, in which—

Figure 1 is a face view of the wire cloth used in making my improved watermarked paper. Fig. 2 is a section of the same on the line *c c*, Fig. 1. Fig. 3 is a face view of the improved paper; and Fig. 4, a diagram of a section thereof on the line *k k*, Fig. 3.

This invention relates to a new method of watermarking paper so as to produce a peculiar shaded effect, and also to the new style of paper which results from the process.

The invention consists, principally, in indenting the wire-cloth at or near the places where it is provided with the usual watermarking projections, so that in the indentations or recesses of the cloth an increased thickness of pulp will accumulate, while the pulp will be decreased in thickness where the wire-cloth has projections, and by this means beautifully-shaded water-marks will be produced.

In the drawings, Fig. 1 shows at A a part of the wire-cloth that passes around the dandy-roll of the paper-making machine, illustrating that portion of the wire-cloth which is to produce the water-mark. This wire-cloth, at the side which is to come in contact with the pulp, has the usual projections, *a*, (see Fig. 2,) which upon touching the pulp will cause the ordinary reduction of thickness in the paper and production of water-mark. Between and near these projections the wire A is made with recesses or indentations *b*, in which a greater thickness of the pulp will be permitted to accumulate. When a wire, A, of this kind is used on a paper-making machine of the ordinary kind, the pulp will be formed substantially as shown in Fig. 4—that is, each projection *a* of the wire will produce an indentation, *d*, in the pulp, and each recess *b* of the wire will produce an increased thickness, *e*, of pulp, as is more clearly indicated in Fig. 4. When the paper thus produced is examined against the light, it will appear lighter where it is depressed, as at *d*, and darker where it is extra thick, as at *e*. Thus any suitable design may be made in the form of a water-mark, but properly shaded in imitation of nature, and I have already succeeded in producing the most striking representations of flowers, leaves, and the like by this new process.

The indentations *b* of the wire may be sharp where well defined shade-lines are to be produced, or they may be gently bulged where gently-shaded surfaces are to be produced.

I am well aware that the projections *a* in the wire-cloth are old, and these by themselves I do not claim.

What I claim is—

1. The process herein described of forming water-marks in paper, which process consists in alternately reducing and increasing the thickness of the pulp as it passes through the dandy-roll under the wire-cloth, as specified.

2. As a new article of manufacture, paper having shaded water-marks with light or thinner portions, *d*, and dark or thicker portions, *e*, substantially as described.

ZENAS CRANE, JR.

Witnesses:
FRANK B. ROBINSON,
JOHN A. NEW.