

# UNITED STATES PATENT OFFICE.

ZENAS M. CRANE, OF DALTON, MASSACHUSETTS.

## MANUFACTURE OF PAPER.

SPECIFICATION forming part of Letters Patent No. 296,928, dated April 15, 1884.

Application filed March 14, 1884. (No specimens.)

*To all whom it may concern:*

Be it known that I, ZENAS M. CRANE, a citizen of the United States, and a resident of Dalton, in the county of Berkshire and State of Massachusetts, have invented certain new and useful Improvements in the Manufacture of Paper, of which the following is a specification.

In the manufacture of paper to serve the various uses and purposes to which it is to be applied the principal characteristic other than quality is that of thickness; and this is generally designated to dealers and users by specifying the paper as of a certain weight per ream, the sheets composing the same being of a certain well-understood superficial area, and the number of sheets in a ream being fixed by long custom. It is a matter of importance in the trade and in the use of paper by consumers to have some arbitrary scale, whereby the different thicknesses of the paper may be described, both to facilitate the giving and filling of orders, to prevent errors and confusion therein, and to insure accuracy and uniformity in the material used for books, newspapers, &c., and various means of securing this result have been devised. Hitherto it has been necessary either to compare the sheets with a set of samples provided by the manufacturer, or to refer to the marks or labels placed by the manufacturer upon the envelopes of the packages as sent out from the paper-mill.

My invention is designed to provide an efficient and convenient means for giving information to the dealer and to the user, whereby they are enabled to know the weight given by the manufacturer to every sheet of paper handled by them, and to obtain a further supply of the same weight when required, without liability to error. I effect this result by means of what is technically known as a "water-mark," which is a mark impressed upon the web of pulp as it is passing through the paper-machine, and which is plainly visible only when the sheet is held between the eye and the light. This species of mark is produced by the action of the "dandy-roll" in the machine, any letters or characters which

are desired to be impressed upon the sheet being formed upon the exterior of said dandy-roll in a manner well understood. Heretofore the name of the manufacturer or of the mill, and in some cases the commercial name or trade-mark of the paper has been thus impressed upon the several sheets; but this device has never been used to describe or indicate the thickness or weight of the sheets, and its use for this purpose constitutes my invention. I mark every sheet with a designating water-mark, which indicates the weight of the paper per ream of a certain predetermined size. Thus a sheet bearing a water-mark of a certain number gives the information that a ream of such sheets of a certain superficial area will weigh so many pounds; or any arbitrary device or mark may be used and its meaning interpreted in a predetermined manner. I do not, therefore, confine myself to the simple use of numbers or to any certain kind of mark; but my invention comprises any device, system, or set of marks whereby a water-mark in a sheet of paper is made to indicate its thickness or weight.

The advantages of this invention are great. It is not necessary to resort to a sample and compare the paper it is desired to order therewith, but every sheet carries its number, so that no errors can arise, as is the case frequently when samples are used, on account of the great number of thicknesses of paper made and the slight differences between them. All the transactions connected with the purchase, sale, and use of the paper are thus greatly facilitated. Besides this, every sheet bears the guarantee of the makers that it is of the thickness designated, and that an order for the particular kind of paper thus marked will be filled without error.

The designating-mark for the weights as above described may of course be used in connection with or in addition to the ordinary mark or marks which designate the grade or quality of the paper.

I claim as my invention—

1. The method herein described of designating the thickness or weight of paper of any description, which consists in impressing up-

on each sheet during the process of manufacture a water-mark indicating the said thickness or weight.

5 2. As a new article of manufacture, a sheet of paper having impressed upon it by a water-mark an arbitrary character which shall indicate the thickness or weight of said paper per unit of superficial area.

In testimony whereof I have hereunto subscribed my name this 12th day of March, A. 10  
D. 1884.

ZENAS M. CRANE.

Witnesses:

IRVING D. FERREY,  
HARRY A. DUNBAR.