Oct. 9, 1928. 1,687,140

A. PLEYER

WATERMARKED PAPER

Filed Nov. 2, 1922

Fig. 1

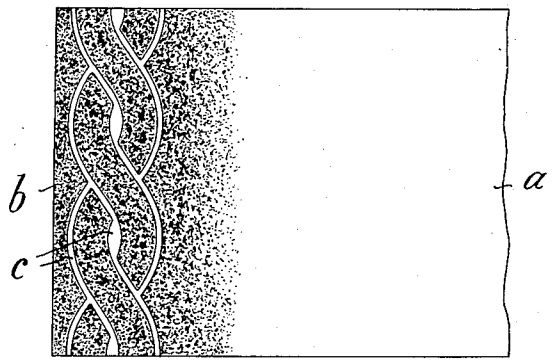
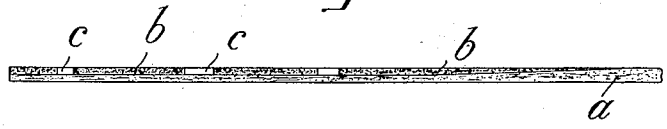


Fig. 2



Inventor:
ANTON PLEYER
BY
Peter, Kleinbrack & Haibi
ATTORNEYS.

Patented Oct. 9, 1928. 1,687,140

UNITED STATES PATENT OFFICE.

ANTON PLEYER, OF SPECHTHAUSEN, NEAR EBERSWALDE, GERMANY, ASSIGNOR TO GEBR. EBART, OF BERLIN, GERMANY, A CORPORATION OF GERMANY.

WATERMARKED PAPER.

Application filed November 2, 1922, Serial No. 598,471, and in Germany November 19, 1921.

My invention relates to improvements in water-marked paper. As is known in the art water-marks are impressed in the body of the paper by means of a gauze wire cylinder provided in the paper making machine and having the design of the water-mark applied thereto in the form of wires soldered to the cylinder, or having the said design pressed thereon in intaglio or in relief. The water-mark produced in the body of the paper is more distinct in paper made from pulp composed of short fibers, than in paper made from long fiber pulp. However, the strength of paper made from pulp consisting of short fibers is small. Therefore, where paper of high strength is required, such for example as is used for making bank notes, legal documents, and the like, the pulp is prepared as far as possible without reducing the fiber material. But in a paper made from such pulp the water-marks are not very distinct.

One of the objects of the improvements is to provide a water-marked paper of high strength is obtained in which the water-marks are sharp and distinct. With this object in view my invention consists in making the paper from two layers of pulp of different character, and producing the water-mark in one of said layers. In the preferred form, the body of the paper is made from pulp having long fibers and having a layer applied thereto which consists of pulp composed of short fibers, the water-mark being applied to the layer composed of short fibers.

For the purpose of explaining the invention an example embodying the same has been shown in the accompanying drawing, in which,

Fig. 1, is a plan view showing the improved paper, and

Fig. 2, is a diagrammatical cross-section illustrating the composition of the improved paper, the paper being shown enlarged in cross-section.

In the manufacture of my improved paper I first make a body by passing pulp composed of long fibers over the wire gauze of a paper making machine, and thereafter while this long-fiber body or layer still in a pulpous condition passing thereon pulp of a composition suitable for producing distinct water-marks, and more particularly a pulp composed of short fibers, which pulp provides a thin layer on the body composed of long fiber material. The water-marks are produced in the thin layer composed of short fiber material, where they appear in sharp lines.

In a modification of the process the water-marks are made more conspicuous by combining layers of pulp of different colors. For example, if the body of the paper is white, while the surface layer is blue, the design made on the gauze wire cylinder in relief will pass through the thin colored layer and press the same aside, so that the white paper will be visible through the blue surface and the water-mark appears in distinct lines. Where the design of the water-mark is made on the cylinder in intaglio the bluish pulp will be drawn together along the lines of the design, and the water-mark appears more distinctly than in paper prepared according to known methods. The method in which layers of pulp of different colors are combined gives good results also if the composition of the layers of pulp is the same and if both consist of long fibers, because even with pulp composed of long fibers the effect described above is attained to a certain degree, though, of course, the best results are obtained if one or both of the layers of pulp are composed of short fibers.

In a further modification of the process I apply the second or surface layer of short fiber pulp in the form of a stripe which is narrower than the body of the paper. In this case the margins of the stripe will gradually and irregularly merge into the body and impart a characteristic appearance to the surface. The imitation of the paper thus prepared for example by printing is difficult and almost impossible, so that the paper thus prepared gives valuable protection as against counterfeiting documents or bank notes, particularly if the pulp applied to the body of the paper and the body are different in color, in which case the irregular and gradual merging of the colored stripe into the body of the paper is particularly conspicuous. In each case, however, the second pulp layer is formed on top of the first while the latter is still in a pulpous condition. I do not form two separate layers or webs of pulp and then bring these two webs together, as has been done in the prior art, but I form a second layer of pulp directly upon the first, that is I deposit the pulp of

the second layer as such and not in the form of a previously formed layer or web. When two previously formed layers or webs are brought together, even if they are still in a moist condition, they cannot hold together as well as when loose pulp is applied to a previously formed layer or web which is still moist, since the loose pulp will as it were flow into the layer of pulp forming the foundation of the paper, and the fibers will become interlocked to a much greater degree.

In the figures I have shown a sheet of paper made according to my improved method. The body *a* of the sheet is made from a pulp composed of long fibers and it has a narrow stripe *b* applied thereto which is made from short fiber pulp. The layers of the paper are made from sorts of pulp which are different in color. The stripe *b* shows a water mark *c* and its margins merge gradually and irregularly into the body *a*.

I claim:

Paper comprising a body consisting of long fibers and a short fiber layer deposited as loose pulp upon only a predetermined section of said body while the latter is still in a pulpous state, the fibers of said body and layer being intimately interlocked and said short fiber layer merging into said body along an irregular line visible upon a surface thereof.

In testimony whereof I hereunto affix my signature.

ANTON PLEYER.