

# UNITED STATES PATENT OFFICE.

JOSEPH PROSPER OLIER, OF PARIS, FRANCE.

## IMPROVEMENT IN SAFETY-PAPER.

Specification forming part of Letters Patent No. 38,835, dated June 9, 1863.

*To all whom it may concern:*

Be it known that I, JOSEPH PROSPER OLIER, of Paris, in the Empire of France, have invented Improvements in the manufacture of paper and card - paper or card - board with the object of preventing forgery in checks and other documents, and which improvements are also applicable to the manufacture of playing-cards and railway and other tickets; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed samples, making part of the same.

My invention relates to a safety - paper intended to prevent any forgery and alteration in shares, bank-notes, checks, bills of exchange, stamp-paper, postage-stamps, &c., and also alteration in public or private writings. A similar process of fabrication may be employed for playing-cards and tickets made use of by railway companies or by public and private administrations.

As regards bank-notes, which I generally make of two kinds of pulp, the one being made from rags and the other from hemp, as the latter, which gives great solidity to paper, is by its nature not well adapted for the reception of a fine impression, it may be laid between two layers of rag-pulp. Should it be desired to give great boldness to the water-mark, and also to increase the difficulties of forgery, this middle internal layer may be colored, and thus a sheet be obtained the surfaces of which are white, while the middle is colored. The same process may be employed with the object of preventing forgery in industrial or other shares.

To prevent the falsification of public or private writings or deeds, it suffices to dye the pulp intended for the middle layer with a color that is easily extracted—common ink, for instance. In the latter case chemical agents made use of for extracting or obliterating the writing would infallibly destroy the internal color, which cannot be restored again, as the surfaces of the paper are to remain white.

As regards playing-cards, by interposing a layer of colored pulp between two layers of white pulp the desired opacity is obtained, and cards thus made are not liable to split, as is generally the case when they are made in the usual way. By the same process, and by placing a water-mark inside, the collection of the tax

(in certain countries) for the fabrication of the playing-cards will at all times be secured to the state, and forgery in railway or other tickets effectively prevented.

I will now describe the manner in which the said invention is carried into effect.

Three vats are disposed. The first, containing the white pulp, need not contain so much material relatively to the quantity of water. The second, containing the hemp or common colored pulp, requires to be more fully supplied with material, and the third is to contain a much larger amount of white pulp. A layer of white pulp is first taken in the mold, which is afterward dipped into the second vat for taking a second layer of hemp or colored pulp; and dipped again into the third vat, which covers and incloses the middle one between the two layers of white pulp. When the sheet thus formed is curdled or coagulated it is to be laid on a felt, and the operation is continued by the ordinary process. In order to prevent the first layers from being broken when immersed into the next vats, the mold should be lined with wire-work, and the intermixing of the colored pulp with the white or the pulps of different nature when the molds are immersed will be avoided by placing the mold which has received the first layer in a casing with a wire-work or other suitable bottom, so as to prevent the parts uncovered by the first layers from coming in contact with the pulp in the next vat, such a casing being merely intended to take up the pulp intended to form the middle or colored layer. The same process also holds good for the fabrication of cards and railway or other tickets with or without a shaded water-mark; but when a single-stroke water-mark is desired the operation is to be carried on as follows: A layer of colored pulp is first taken up with the water-mark mold and covered over with a white layer by being immersed into the vat. This first part of the sheet is then laid upon the felt, when a layer of white pulp is next taken up with a mold without water-mark and applied on the said first part properly curdled, and the operation is proceeded with in the ordinary way. There will then appear a single-stroke water-mark on the surface of the paper.

Each layer may be taken out of the vat either separately, and be superposed after being co-



agulated, or otherwise; but I prefer the successive dippings, as described, immediate immersion allowing of the better collection of the fibers, and thus rendering the various layers unseparable.

In order to obtain a white surface, and yet not injure the middle layer, I add pulverized talc (silicate of magnesia) or other mineral or vegetable soft unctuous substances—such as magnesia, magnesite, alumina, &c.—to the white pulp intended for external layers. This mode of fabrication not only facilitates the smoothing and glossing of papers, cards, and tickets, but also permits the obtaining of a better and finer impression even on paper made of raw materials. It procures, besides other advantages, a thin, soft, smooth paper and a very apparent water-mark, and also cards of perfect opacity, the superposed layers of which are not liable to separate, as is generally the case.

The following are other means of applying my process: Three vessels or receptacles are disposed containing each a different kind of pulp. It would be needless to describe these receptacles, which are of the same construction as those used in paper-works for containing the pulp and dropping it out on the working-table, save as regards their size, which is to be suited to that of the products it is desired to obtain. The mold is placed under the first receptacle and receives the pulp dropped out therefrom, a rocking motion is imparted to it, and the first layer is allowed to coagulate. The mold is then placed under the second receptacle to receive a layer of different nature, and when this is properly coagulated the third layer is to be superposed thereon from the third receptacle. The sheet thus composed is laid upon a felt, and the operation goes on in the usual manner. Vats and receptacles may be used simultaneously for these superpositions—viz., by dipping or immersing the mold into the vat and placing it afterward

under a receptacle, there to receive the second layer. The third layer may be taken out either by immersion in the vat or by the mold being placed under a third receptacle. I must observe that the pulps forming the second and third layers are to be thicker than the pulp intended to form the first. The mold should also be placed under the receptacle as near as possible to the feed-cloth, so as to prevent the first layers from being broken by the contact of the next as it drops in. The same result may also be obtained by placing over the working-table, at a machine for manufacturing continuous paper, three receptacles, from which the pulp should drop at proper intervals to afford the first layers time to curdle before receiving the next layers, the superposition and draining being accomplished prior to the passing of the sheet under the cylinders. Two layers may also be superposed at first, and then a third layer be prepared by means of a second machine, which last layer would be superposed afterward on the first ones being united thereto by compression of the drying-cylinders; but I prefer the mode of lubrication which I have described at the commencement of this specification.

I do not claim, broadly, the idea of making paper of two or more layers, nor the giving of color or water-mark to the internal layer; but,

Having thus described my invention, I claim as an improved article of manufacture—

A paper composed of three layers of different thicknesses, of which the central layer is or may be colored with a deleble or easily-removable color and the external layers are or may be charged with silicate of magnesia or other mineral or vegetable matter, all made in the manner herein shown and described.

J. P. OLIER.

Witnesses:

D. H. P. CREUILLE,  
GEO. HUTTON.