

# UNITED STATES PATENT OFFICE.

FREDERICK BECK, OF NEW YORK, N. Y.

## MANUFACTURE OF PAPER.

**SPECIFICATION** forming part of Letters Patent No. 342,315, dated May 25, 1886.

Application filed January 2, 1886. Serial No. 187,408. (No specimens.)

### *To all whom it may concern:*

Be it known that I, FREDERICK BECK, a citizen of the United States, and a resident of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in the Manufacture of Paper, of which the following is a specification.

My invention relates to an improvement in paper and in its process of manufacture. The papers made by me are especially intended for wall-papers and other decorative purposes, although adapted to many other uses.

The invention consists in attaching to the surface of the paper while in process of manufacture certain bodies, which will give to the finished paper a glistening, colored, velvet-like, or other ornamental appearance.

The papers made by me under this invention are similar to those patented to me by Letters Patent dated July 14, 1885, No. 322,034. In the manufacture of papers as stated in that patent, however, the foreign bodies are admixed with and throughout the mass of the pulp, instead of being applied to the surface thereof only and pressed in and upon the same, as by this present application, during the process of pressing or weaving the pulp into sheets of paper.

My invention more particularly described is as follows: In the manufacture of papers as ordinarily practiced the pulp is taken from the pulp vat or tank and received in a thin layer on an endless belt or apron, which moves continuously between or around heated rollers or cylinders, the pressure of the rollers or of the belt against them, as the case may be, pressing and drying the film of pulp more and more as it progresses through the machine until it has attained the requisite solidity and dryness. It is then transferred to the calenders, &c., for the finishing process. When the pulp has passed the first roller or rollers with which it comes in contact, it is still quite soft and in a quasi pulp state, the excess of moisture, however, having been removed by the pressure and heat. At this stage in the manufacture of the paper I apply to the surface of the sheet of partially compressed and dried pulp finely comminuted mineral, vegetable, or animal bodies—such as mica, talc, sand, glass, flock, tinsel, chopped or long hair, the

various metallic powders or foils, and the like bodies. These bodies I will hereinafter designate as "foreign bodies."

The particular method by which the foreign bodies are applied to the surface of the pulp is not essential, and will depend somewhat on the particular body employed. For instance, they may be sifted, blown, sprinkled, or otherwise brought in contact with the surface of the partially-solidified pulp, and they will then pass through the machine with the pulp, being pressed down and partially or entirely embedded therein, and caused to adhere thereto by reason of the pressure, so that when the paper is completed, whether calendered, embossed, or otherwise finished, these particles of foreign bodies will adhere thereto and appear on the surface of the sheet and ornament the same.

The pulp may be colored or not, as desired, and the foreign bodies applied to it, as stated, may be of the same or different color from the pulp; and there may be more than one kind of foreign body applied to the same paper. For instance, mica and sand may be applied, or mica and flock, or any combination of two or more such foreign bodies. I also, to secure greater adhesion of the foreign bodies to the surface of the paper when finished, frequently apply to the paper during the sheet-forming process a film or coating of adhesive substance—such as dissolved glue, starch, the gums, and like bodies or substances in solution—the solution being preferably somewhat thin; but the stiffness thereof will depend on the special use and special foreign body or bodies which it is to aid in holding in place on the paper. This adhesive material is applied before the application of the foreign bodies (they being applied, however, before it is dry) or simultaneously therewith, and it may be applied in any suitable manner—such as by spraying, printing, brushing, flowing, rolling, sprinkling, or otherwise—and in some instances it will be beneficial to mix the foreign body with the adhesive substance before applying the same to the pulp, and so that they will be applied at the same time, although they may be applied simultaneously, as before stated, without being mixed together—as, for example, the adhesive substance may be sprayed onto the pulp

and the foreign body sifted on at the same time, these substances meeting in the air before they touch the surface of the pulp or immediately on reaching the same. The effect of the pressure of the rollers will be to partially embed the foreign bodies in the adhesive substance as well as in the surface of the pulp, whereby they will be firmly held in place, and the calendering operation, if the same be desired, may be better performed and without rubbing off the foreign bodies.

Although I have heretofore stated a method of manufacturing paper—to wit, by the use of the rollers or cylinders and endless belt—and a preferred stage in the manufacture at which I prefer to apply my foreign matter and adhesive substance, if it be used, still I do not limit myself to any special apparatus or process for making the paper, nor to any special consistency of the pulp or place at which to apply the foreign bodies and adhesive material, because my invention may be successfully practiced by applying the foreign bodies and adhesive substance, if it be used, to the surface of the pulp while yet in the pulp vat or tank, or while on the apron before it has received the pressure or heat of any of the rollers; and, also, these substances may be applied after the pulp has been considerably advanced toward its perfected state of finished paper. The adhesive material may be applied in the form of a design, if desired, so that the resulting ornamentation will appear in the form of such design.

I am aware that papers have been ornamented by applying to the surface of finished paper a coating or film of adhesive substance, and then sifting on finely-divided mica; but this is not my invention, because it requires a separate process after the completion of the paper, and also because there is no pressure applied, which causes the more perfect adhesion of the foreign bodies, and also materially changes the appearance of the resulting paper.

I am also aware that for the purposes of producing a paper suitable for bank-notes, promissory obligations, bonds, &c., which cannot be tampered with after having been filled out or printed, metallic filings and metallic powders, both mixed with benzine and without such admixture, have been embedded in the in-

terior of a sheet of paper not appearing on the surface thereof, so that if chemicals were employed to remove or alter the writing or printing on the paper the action thereof on the metals just below the surface of the paper would at once disclose, by discoloration or otherwise, the attempted tampering. This is not my invention, because the metal does not appear on the surface of the paper, which is my special object for the purposes of decoration.

Having described my invention I claim—

1. The described improvement in the manufacture of paper, consisting in applying foreign bodies to the surface of the pulp while the same is still soft and during the process of manufacture of the paper, the foreign bodies appearing on the surface of the completed paper, substantially as and for the purposes set forth.

2. The described improvement in the manufacture of paper, consisting in applying foreign bodies and an adhesive substance to the surface of the pulp while the same is still soft and during the process of manufacture of the paper, the foreign bodies appearing on the surface of the finished paper, substantially as set forth.

3. As a new manufacture, decorative paper ornamented by having foreign bodies applied to the surface thereof only and adhered thereto by embedment therein, substantially as and for the purposes set forth.

4. As a new manufacture, decorative paper ornamented by having foreign bodies attached thereto on the surface by an adhesive substance applied between the surface of the paper and the foreign bodies and by pressure, whereby the foreign bodies will be embedded in the adhesive substance and in the surface of the paper, and will appear on the surface of the paper, substantially as and for the purposes set forth.

Signed at New York, in the county of New York and State of New York, this 31st day of December, A. D. 1885.

FREDERICK BECK.

Witnesses:

JOHN H. IVES,  
PHILLIPS ABBOTT.