UNITED STATES PATENT OFFICE.

JOS. G. KENDALL, OF WORCESTER, AND J. H. KENDALL, OF LEOMINSTER, MASSACHUSETTS.

IMPROVEMENT IN BLEACHING PAPER-PULP.

Specification forming part of Letters Patent No. **4,616**, dated July 2, 1846; antedated January 2, 1846.

To all whom it may concern:

Be it known that we, JOSEPH G. KENDALL, of Worcester, and JONAS H. KENDALL, of Leominster, both in the county of Worcester and Commonwealth of Massachusetts, have invented, jointly, a new and useful process or method of using and applying the bleaching substances hereinafter named in the bleaching of rags, cotton waste, bagging, and other materials of which paper is made after the same have been washed or reduced to half-pulp in the washing-engines and are discharged into the common chests or drainers, which are nearly filled with such washed stock or rags, &c., the water being first drained from such stock in said chests or drainers; and we do hereby declare that the following is a full and exact description of such process or method.

The improvement for which a patent is sought consists in the application of well-known bleaching substances to the material used in making paper—as cotton, linen, hemp, &c.—after the same has been washed in the engines of a paper-mill and is discharged into chests or drainers; or, in other words, the improvement consists in the process or mode of application of such bleaching substances in such chests or drainers.

Before describing this process it may be well to premise that an "engine" is a vat holding water, wherein revolves a heavy "roll" having thereon fixed bars of iron and steel, whereby the rags, &c., are washed and reduced to half-pulp and afterward "beat" or reduced to pulp. This machinery is the engine. The chests or drainers are large wooden vats or cisterns holding from one to ten or more tons of washed stock or rags, &c., reduced to half-pulp. It may be further premised that in using this improvement it is understood that when the washing process is nearly completed the washed stock or rags, &c., is bleached in the engines, and, if it be colored stock, that it has been boiled in lime or alkali before the washing in the engine. The said bleaching in the engine is the using of three or four pounds of chloride of lime dissolved and put into the engine at the close of the washing process, and the usual quantity of alum or acid is also added to the stock in the engine, and after a suitable time the whole is discharged into a chest or drainer, and from that the water in a few hours runs out and the washed stock or rags remains in the chest or drainer. All this is well known and is no part of the improvement aforesaid. In this way let successive engines of stock be washed and bleached, as aforesaid, and discharged into a chest or drainer till it is five-sixths or seven-eighths filled with washed stock. The chests or drainers are either not made water-tight or, if so, are so made that the water can be run or drained off and leave the chest filled, as aforesaid, with the washed stock in a wet state. In twelve hours after the last engine of washed stock is discharged into the chest or drainer, and it is as full of washed stock as aforesaid, or as is desired, the water will be so drained off that the process herein claimed as an improvement may be commenced. The upper surface of the washed stock in the chest must be made level. It will not be so at this stage, for as the water drains off and the stock closes an interval is made between the sides of the chest or drainer and the washed stock. This interval must be filled up by taking the stock from the highest or central parts of the same and putting it into this interval and pressing it down therein, and so making the top or upper surface of the bleached stock level and nearly horizontal. By this leveling and pressing down the stock the bleaching and the water containing it, hereinafter described, will, when first discharged on the top of the washed stock so leveled, cover the top of the washed stock of an equal depth, and so, when it passes down through the same, every part of the same will have an equal portion of bleaching and the mass be uniformly bleached. Then fill the engine (one by which the washed stock has been prepared) with clear white water, and into the water pour and well mix with it forty pounds of sulphuric acid for each ton of washed stock to be bleached in the chest or drainer. Here and elsewhere in this specification, when a ton or tons of washed stock or rags, &c., are mentioned, a ton or tons of dry stock is intended, and not a ton or tons of wet stock, so that a ton of washed stock means a quantity which, if dried, would weigh a ton. The above forty pounds of acid per ton of washed stock is suf-