

W. E. Newton,
Rag Duster.

No. 102,854.

Patented May 10, 1870.

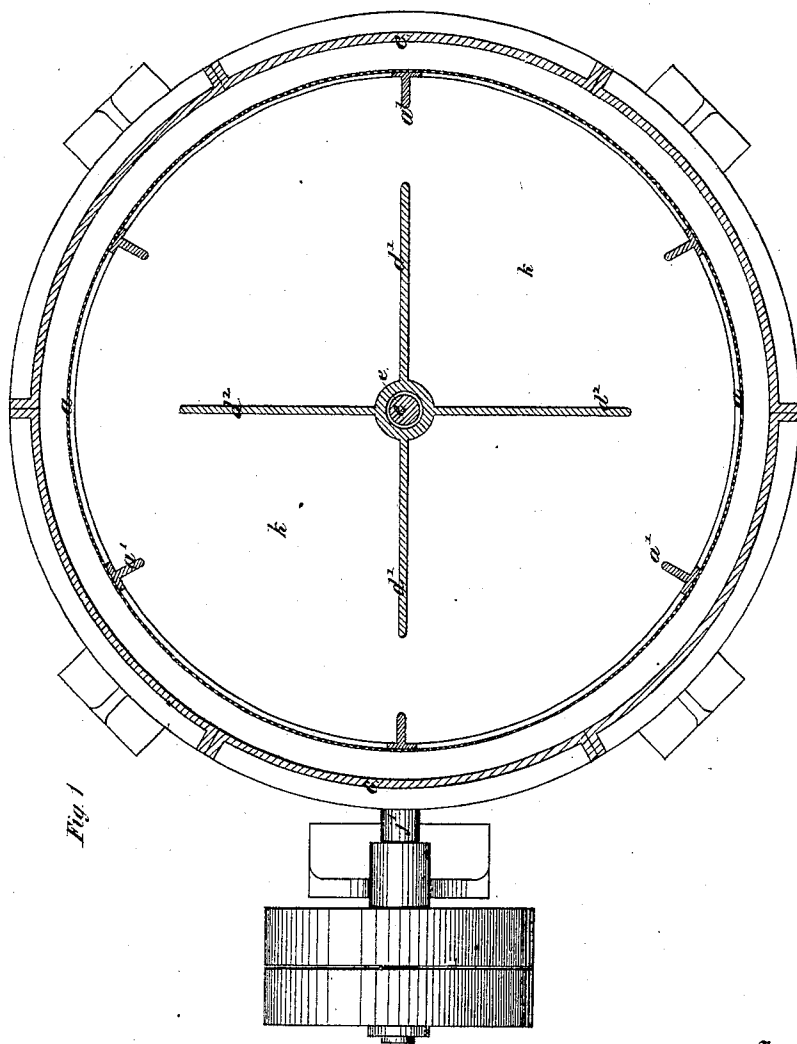


Fig. 1

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Witnesses.

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Patented May 10 1870.

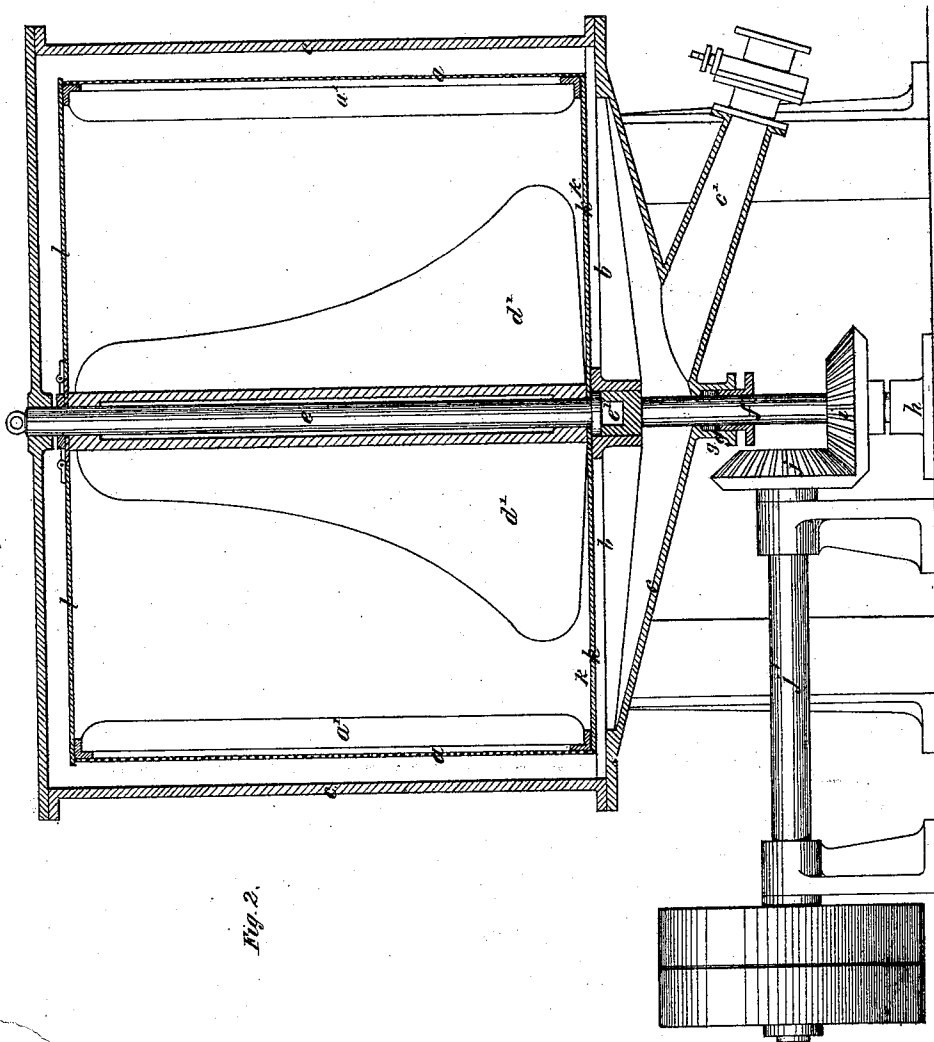


Fig. 2.

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WILLIAM EDWARD NEWTON, OF LONDON, ENGLAND.

IMPROVEMENT IN APPARATUS FOR CLEANING AND PREPARING RAGS FOR MANUFACTURE OF PAPER.

Specification forming part of Letters Patent No. 102,851, dated May 10, 1870.

To all whom it may concern:

Be it known that I, WILLIAM EDWARD NEWTON, of London, England, have invented a new and Improved Apparatus for Cleansing and Preparing Rags for the Manufacture of Paper; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification.

This invention has for its object to cleanse rags from the dirt and impurities which naturally adhere to them, before being operated upon and prepared for conversion into pulp for the manufacture of paper.

The process I propose to employ in order to effect the objects of the present invention is a combined washing or cleansing and boiling process, and this combined process is effected in an apparatus which will admit of the operations being carried on with great facility, and with much greater speed than the operation for washing rags as heretofore conducted. The rags generally have adhering to them a good deal of dirt, which can be easily removed, and this I do by washing them in plain hot water in the apparatus shown in the accompanying drawings, and hereinafter described, before I submit them to the action of any chemical solutions, for the purpose of more thoroughly cleansing and bleaching them. A very large proportion of the dirt and impurities may thus be removed in a very short time, and these particles, being heavy, will sink down into the lower part of the apparatus, and may be drawn off in the form of mud without wasting the chemical solutions used in the subsequent processes.

Figure 1, Sheet I, is a sectional plan view, and Fig. 2, Sheet II, a vertical section, of the apparatus, which consists of a cylindrical framework or cage, *aa*, covered externally with perforated metal or wire-gauze, and provided internally with any convenient number of vertical ribs, *d'*, which project radially from the circumference toward the center. This perforated metal cage *a* rests upon cross-bars *b b*, or upon a ledge fixed inside the external casing, *cc*, leaving an annular space between the external casing and the outside of the cage *a*. Inside this cage *a* is mounted a frame, which is fixed on the vertical spindle *e*, and consists of a series of beaters or stirrers, *d' d'*, of peculiar shape. The lower part of the spindle *e* is made square

at *e'*, and fits into a square socket in the end of the short shaft *f*, which passes through a stuffing-box, *g*, at the bottom of the casing *c*, and is supported in a step, *h*, below. On this shaft *f* is keyed a bevel-pinion, *i*, which gears into and is driven by a similar wheel, *j*, on the end of the driving-shaft *j'*, which is actuated by a band passing from any prime mover to the pulleys on the end of the shaft *j'*. It will be seen that the beaters *d' d'* extend from the upper part of the spindle *e* down the bottom of the cage *aa*, or nearly so, and that they are much wider at bottom than at the top. The effect of this peculiar shape will be that when they are in operation a greater amount of motion will be given to the lower part of the water than to the upper portion, so that when the beaters are rotated a kind of whirlpool action of the water will take place, and a vertical or tumbling circulation of the water and rags in contradistinction to a horizontal circular motion will be produced, and the dirt and impurities will be removed from the rags with greater facility than heretofore, and, after passing through the perforated sides of the cage *a* into the annular space between it and the external casing, will be deposited in the form of mud at the bottom of the vessel *c*, and may be drawn off through the pipe *e'* before the chemical solutions are added for the subsequent processes.

If desired, the water in the apparatus may be heated by jets of steam, which may be injected from nozzles into the annular space outside the cage *a*, or into any other convenient part of the apparatus.

It will be seen that at the bottom of the external wooden vessel, *c*, is made a space to receive the mud and sediment from the dirty rags. This may be covered over with a false bottom, *k*, as shown in the drawings, and this false bottom may be perforated or not, as may be preferred.

The operation of the apparatus is as follows: The rags are charged into the perforated cage *a* through the top, which, if desired, may be inclosed or covered in by doors, as shown at *ll*. Water is then admitted, and, if cold, it may be heated by injecting steam into it, as already mentioned. The shaft *e* with the beaters *d'* may then be rotated, and, by knocking the rags about in the water, will quickly detach therefrom the greater part of the dirt, which

will pass through the perforated sides of the cage *a* into the annular space beyond, and will gradually subside in the outside water, and descend into the mud space below the false bottom *k*, from whence it may be drawn off from time to time through the pipe *c'*. A solution of soda or other equivalent chemical substance may then be run into the apparatus, and the whole of the liquid with the rags in it may be boiled by means of the steam for any desired time, or until the rags are quite clean. They may then be bleached and reduced into pulp, and be converted into paper in the ordinary manner.

I have not shown the steam-pipes for heating the water, as it will be found that by simply causing steam to bubble up in the water from nozzles, in the manner already explained, the water will be sufficiently heated.

It will be seen that as all the driving-gear is placed below, the cage *a* and the parts contained therein, together with the central shaft, *e*, may be lifted out of the outer vessel *e*, for the convenience of emptying the rags out of the cage, which may then be replaced in its original position.

In practice I find it convenient to use three of the above-described apparatus in combination, so arranged in reference to each other that the cage *a* with its contents may be lifted out of one apparatus and placed in the next.

The first apparatus may then be used for the preliminary washing out of the loose dirt, the second for boiling the rags in any chemical solution, and the third for boiling or bleaching operation, or for simply washing in cold water.

Having now described my invention, and having explained the manner of carrying the same into effect, I claim as the invention—

1. The combination of the central shaft, *e*, provided with the beaters *d' d'*, substantially as shown, with the inner cage, *a*, the whole being so arranged and constructed as to admit of being lifted out of the outer casing, *e*, as and for the purpose herein set forth.

2. The rotating beaters *d'*, shaped so as to impart to the rags a tumbling or vertical motion, as set forth, in contradistinction to a simple horizontal circulation, for the purpose specified.

In witness whereof I, the said WILLIAM EDWARD NEWTON, have hereunto set my hand this 26th day of February, 1870.

W. E. NEWTON.

Witnesses:

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