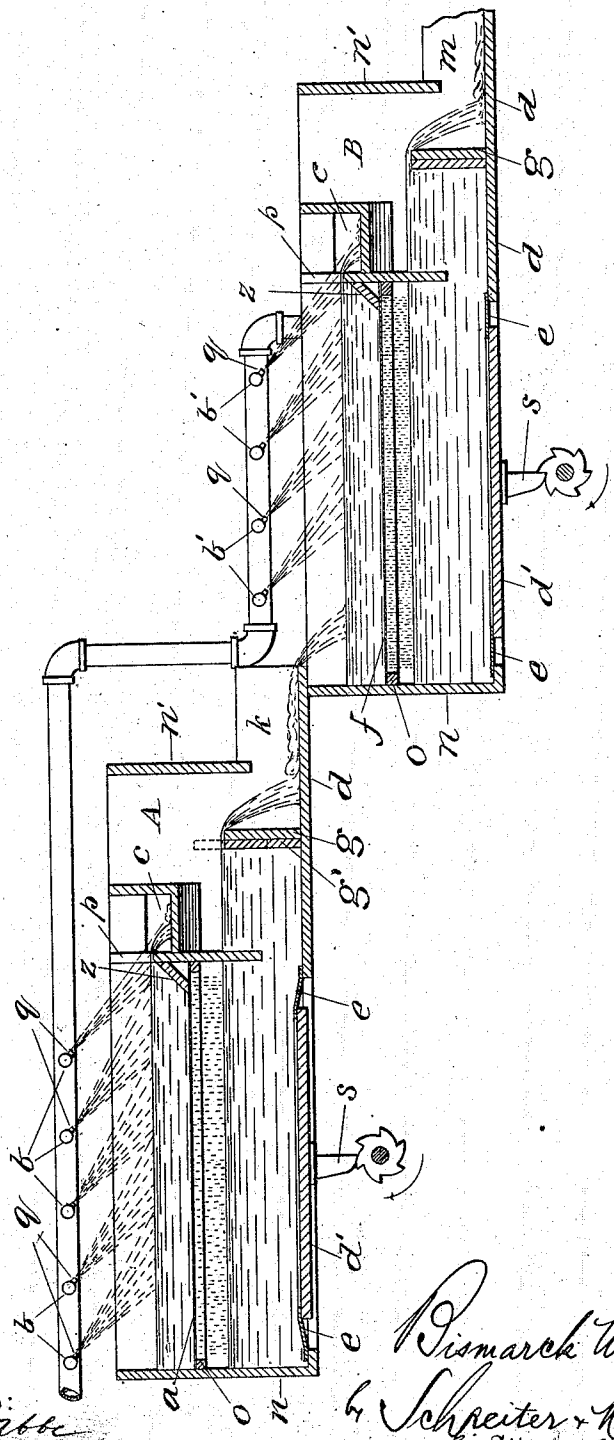
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APPARATUS FOR WASHING PULP AND FOR SEPARATING PULP FIBERS FROM IMPURITIES.

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1,193,605.

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APPARATUS FOR WASHING PULP AND FOR SEPARATING PULP FIBERS FROM IMPURITIES.

1,193,605. Specification of Letters Patent. Patented Aug. 8, 1916.

Application filed May 19, 1910. Serial No. 562,208.

To all whom it may concern:

Be it known that I, BISMARCK W. PETSCHE, a citizen of the United States, and a resident of Yonkers, county of Westchester, and State of New York, have invented certain new and useful Improvements in Apparatus for Washing Pulp and for Separating Pulp Fibers from Impurities, of which the following is a full, clear, and exact specification, reference being had to the accompanying drawings, showing a sectional view (diagram) showing the arrangement of the component parts of my improved pulp-washing apparatus.

My invention relates to manufacture of felted fabrics, particularly to paper, paper-boards, blotting and the like, and consists of the herein shown and described apparatus for washing pulp, recovered from waste printed papers, preparatory to its being used for manufacture of such felted fabrics. The apparatus is also suitable for treating the waste waters of such paper, paper-board and similar machines for the recovery of pulp fiber contained therein, and for carrying on the process of separating pulp fiber from pigments, size, filler and other impurities set forth in my U. S. Letters Patent #955,898, granted to me April 26, 1910, and for other similar purposes.

Referring to the drawing, illustrating diagrammatically the relative arrangement of the component features of such an apparatus, A designates the upper, and B the lower box, which are composed of bottoms d and d', and sides n and n'; p and g are stationary partitions, the latter having combined therewith movable extensions g'; a and f are screens, stretched on cleats o in the boxes A and B respectively, and extending between the sides n and partitions p; c are troughs running along the partitions p, one in each box A and B, and z are sloping boards, extending along the other sides of the partitions p from the screens a and f respectively to the tops of these partitions; b and b' are water-pipes connected to a pump or tank, or to any other source of water supply, and provided with perforations or nozzles q for delivery of streams of water upon the screens and over the edge of partitions p into the troughs c. The sides n' of the boxes A and B do not extend to the bottoms d thereof and the latter are extended beyond them, their extensions forming outflows, designated k and m respectively, the former (k) from box A into the box B, and the latter (m) from box B, into a settling tank. The parts d' of bottoms d, located underneath the screens a and f, are composed of rigid central portions d', and of elastic or extensible strips e, joining the central portions d' and the rigid portions of the bottoms d, so as to render the central portions d' of the bottom movable. The supports s of these movable central portions d' are connected to an eccentric or cam-shaft, so that when the latter is rotated, the movable central portions d' of the boxes A and B will be reciprocated, that is, alternately raised and lowered, to and from the screens a and f respectively.

The apparatus is employed for washing or grading of pulp in a continuous operation as follows: The pulp to be treated is delivered from the beating engine or chest upon the screen a of the box A which has been previously filled with water to a level, adjusted by extending the partition g' correspondingly. The delivery of the pulp upon the screen a is continuous and the delivery of water into the apparatus through the pipes b and b' must also be continuous, and sufficient to maintain a continuous outflow over the top of the partitions p (or sides x) into the troughs c, and also over the partition g' of the box A (through gutter k) into the box B, and from there, over the top of the partition g', into the outflow (or gutter) m into the settling tank. Screen a is made of wire netting, 18 to 24 meshes to the inch, and will pass the pulped material, except such lumps as have not been sufficiently pulped in the beating engine. These lumps and the like are driven off of the screen a, over the top of the partition p into the adjoining trough c, flowing with the water into the settling tank (not shown), by the jets of water from the nozzles or perforations q of pipes b and by the undulating movement of the water, produced by the reciprocating motions of the central portions d' of the bottom of the box A (or of

its compartments). The sloping board *e* assists materially in conveying the material, not passed through screen *a* into the adjoining trough *c*, but is not essential to the carrying on of the process in the apparatus.

The material, passed through the meshes of the screen *a*, is held in suspension in the water by the agitation produced by the reciprocating motions of the central portions *d'* of the bottom of the box A and passes with the water over the top of partition *g'* into the outflow *k*, by which it is delivered upon the screen *f* of the box B, where it is subjected to a similar treatment by the streams of water, discharged upon it from pipes *b'*, and the undulating movements of the water, produced by the reciprocating motions of the central portion *d'* of the bottom *d* of box B. Screen *f* has from 48 to 64 meshes to an inch and will not pass any pulp fibers of such length as may be used in manufacture of paper, it will, however, pass all shorter fibers, and the minutely disintegrated impurities, filler, size, particles of carbon or other pigments from printers' ink and the like. The pulp fibers retained upon the screen *f* are driven by the streams of water, discharged from pipes *b'* and by the undulating movement of the water in box B over the screen and floated over the top of the partition *p* into the adjoining trough *c* and conveyed to a vat or to a chest, or directly to a paper or board machine; the refuse and impurities, separated from the pulp, are held suspended in the water below the screen *f* and carried with it over the top of partitions *g'* and *g* into the outflow *m* and from there to the settling tank. It is advisable to make also the partitions *q* removable to facilitate the discharge, from time to time, of such of the refuse, like clay, filler and the like, which, being heavy, is liable to accumulate on the bottom of the boxes A and B; such heavy refuse may, however, be also removed, to the extent necessary for the proper operation of the apparatus, by such scrapers as are used in paper and board mills for cleaning screens and for similar purposes.

I claim as my invention:

1. An apparatus for washing pulp, and for separating pulp fibers from impurities, comprising a box, a partition, set therein not extending to the bottom; a second partition, set in the box beyond the first and extending from the bottom of the box to below the top of the first partition; an outflow from the box beyond the second partition; a screen, set, approximately parallel to the bottom of the box, between the first partition and the opposite side of the box; a trough, adjoining the screen but separated from it by a wall, extending above the screen, and means for conveying water into the box, above the screen in streams directed toward, and upon the edge of, the wall, separating the screen from the trough; substantially as herein shown and described.

2. An apparatus for washing pulp, and for separating pulp fibers from impurities, comprising a box; a partition, set therein not extending to the bottom; a vertically extensible partition, set in the box beyond the first, and extending from the bottom of the box to below the top of the first partition; an outflow from the box beyond the second partition; a screen, set, approximately parallel to the bottom of the box, between the first partition and the opposite side of the box; a trough, adjoining the screen but separated from it by a wall extending above the screen, and means for conveying water into the box, above the screen, in streams directed toward, and upon the edge of, the wall, separating the screen from the trough; substantially as herein shown and described.

3. An apparatus for washing pulp, and for separating pulp fibers from impurities, comprising a box; a partition set therein not extending to the bottom, a second partition, set in the box beyond the first and extending from the bottom of the box to below the top of the first partition; an outflow from the box beyond the second partition; a screen, set, approximately parallel to the bottom of the box, between the first partition and the opposite side of the box; a trough, adjoining the screen but separated from it by a wall, extending above the screen, means for conveying water into the box, above the screen, in streams directed toward, and upon the edge of, the wall, separating the screen from the trough, and means for imparting an undulating motion to the water in the box; substantially as herein shown and described.

4. An apparatus for washing pulp, and for separating pulp fiber from impurities, comprising a box, a partition set therein not extending to the bottom; a vertically extensible partition, set in the box beyond the first, and extending from the bottom of the box to below the top of the first partition; an outflow from the box beyond the second partition; a screen, set, approximately parallel to the bottom of the box, between the first partition and the opposite side of the box; a trough, adjoining the screen but separated from it by a wall, extending above the screen, means for conveying water into the box, above the screen, in streams directed toward, and upon the edge of, the wall, separating the screen from the trough, and means for imparting an undulating motion to the water in the box; substantially as herein shown and described.

5. An apparatus for washing pulp, and for separating pulp fiber from impurities, comprising a box, having a movable bottom;

a partition set therein not extending to the bottom; a second partition, set in the box beyond the first, and extending from the bottom of the box to below the top of the first partition: an outflow from the box beyond the second partition; a screen, set, approximately parallel to the bottom of the box, between the first partition and the opposite side of the box; a trough, adjoining the screen, but separated from it by a wall extending above the screen, means for conveying water into the box, above the screen, in streams directed toward, and upon the edge of, the wall, separating the screen from the trough; and means for moving the bottom of the box toward, and away from, the screen; substantially as herein shown and described.

6. An apparatus for washing pulp, and for separating pulp fiber from impurities, comprising a box, having a movable bottom; a partition set therein not extending to the bottom: a vertically extensible partition, set in the box beyond the first, and extending from the bottom of the box to below the top of the first partition; an outflow from the box beyond the second partition; a screen, set, approximately parallel to the bottom of the box, between the first partition and the opposite side of the box; a trough, adjoining the screen but separated from it by a wall extending above the screen; means for conveying water into the box, above the screen, in streams directed toward, and upon the edge of, the wall, separating the screen from the trough; and means for moving the bottom of the box toward, and away from, the screen; substantially as herein shown and described.

7. An apparatus for washing pulp, and for separating pulp fiber from impurities, comprising a box, a portion of the bottom of the box joined to the rest by flexible strips; a partition set in, and not extending to the bottom of the box; a second partition, set in the box beyond the first, and extending from the bottom of the box to below the top of the first partition: an outflow from the box beyond the second partition; a screen, set, approximately parallel to the bottom of the box, between the first partition and the opposite side of the box; a trough, adjoining the screen but separated from it by a wall extending above the screen; means for conveying water into the box, above the screen, in streams directed toward, and upon the edge of, the wall, separating the screen from the trough; and means for reciprocating the flexibly joined portion of the bottom of the box toward, and away from, the screen; substantially as herein shown and described.

8. An apparatus for washing pulp, and for separating pulp fiber from impurities, comprising a box, a portion of the bottom of the box joined to the rest by flexible strips; a partition set therein not extending to the bottom; a vertically extensible partition, set in the box beyond the first, and extending from the bottom of the box to below the top of the first partition: an outflow from the box beyond the second partition: a screen, set, approximately parallel to the bottom of the box; between the first partition and the opposite side of the box: a trough, adjoining the screen but separated from it by a wall extending above the screen: means for conveying water into the box above the screen, in streams directed toward, and upon the edge of, the wall, separating the screen from the trough: and means for moving the flexibly joined portion of the bottom of the box toward, and away from, the screen; substantially as herein shown and described.

9. In an apparatus for washing pulp, and for separating pulp fiber from impurities, the combination comprising a box, having a movable bottom with a screen, set in the box, approximately parallel to, and above, the bottom thereof; a trough, adjoining the screen, a wall extending above it, between the screen and the trough; means for conveying water upon the screen in streams directed toward, and upon the edge of, the wall, separating the screen from the trough; of means for moving the bottom of the box toward, and away from, the screen, substantially as herein shown and described.

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