

(No Model.)

J. BORST.
WASHING APPARATUS.

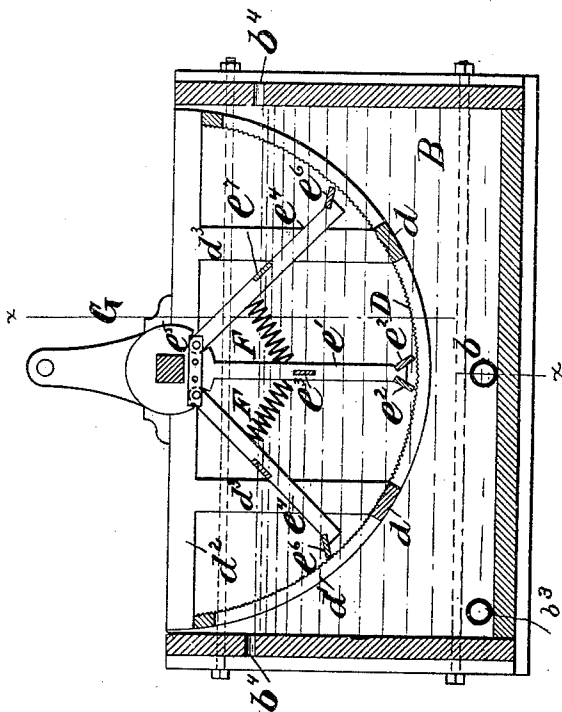
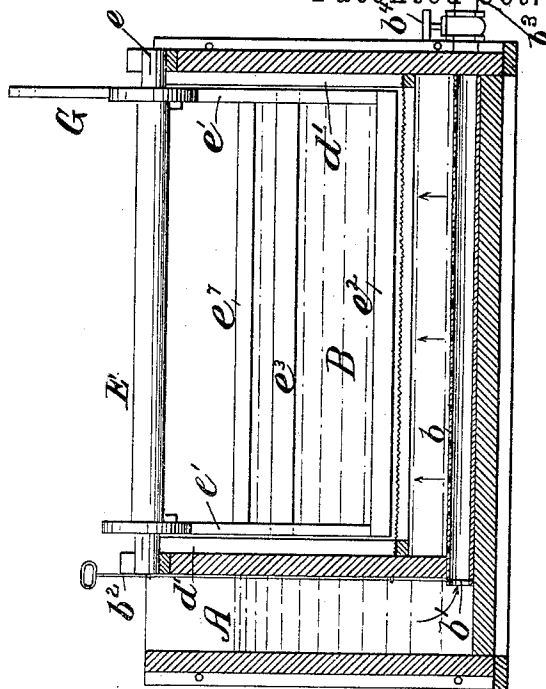
No. 461,125.

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Fig. 2.

Fig. 3.

Fig. 1.



Witnesses:
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JACOB BORST, OF BROOKLYN, NEW YORK.

WASHING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 461,125, dated October 13, 1891.

Application filed May 25, 1891. Serial No. 393,934. (No model.)

To all whom it may concern:

Be it known that I, JACOB BORST, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Apparatus for Washing Filtering Material, of which the following is a specification.

My invention relates to an improvement in apparatus for washing filtering material, and more particularly for washing filtering material employed in connection with the manufacture of malt liquors.

The particular filtering material which it is found advantageous to use in filtering beer is of such a nature that it is liable to dissolve if submitted to water at too high a temperature and is liable to suffer material waste if submitted to a stirring or a chafing action. On the other hand, it is desirable that the pure water employed as a cleansing agent should be used as hot as possible without danger of dissolving and wasting the filtering material, and it is also desirable that the material should be thoroughly rinsed and cleansed.

The object of my present invention is to provide means for submitting the filtering material to the water as hot as may be used without danger of injury and waste of the filtering material and at the same time provide for squeezing and thoroughly rinsing the material without stirring or seriously chafing it.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 is a view in vertical section through the tub and washer transverse to the axis upon which the washer vibrates. Fig. 2 is a vertical section through the tub, washer, and supply-tank on the line $x x$, Fig. 1, one pair of yielding arms being removed, in a direction lengthwise of the axis upon which the washer vibrates; and Fig. 3 is a view in detail showing in transverse section a portion of the woven-wire fabric which forms the bottom or curved floor of the washer.

The supply-tank is represented by A, and the tub by B. In the present instance I have shown the tub as located within and forming a subdivision of the supply-tank A. Water is admitted from the supply-tank into the

tub through a perforated pipe b , leading from the bottom of the supply-tank along the bottom of the tub and provided with openings throughout its length to admit the water into the tub. The said supply-pipe is provided with an inlet valve or gate b' , which may be operated by a rod b^2 , extending upwardly within convenient reach at the top of the tank. In the present instance the valve b' is shown as having a vertical sliding engagement in a slit in the pipe b , near the end which projects into the chamber A. The tub B is provided with a discharge-pipe b^3 , provided with a valve or cock b^4 to regulate the discharge.

The floor D of the washer is semicircular in form and consists of woven-wire fabric held in position by means of a suitable framework consisting of longitudinal ribs d and end supports d' , the ribs d and the end supports d' being united at or near the ends of the tub by means of cross-girders d^2 and standards or braces d^3 . It is intended that the lowermost point of the curved floor D shall be a short distance above the bottom of the tub, so as to leave a free circulation of water.

The agitator consists of a hub or shaft E, provided at its ends with journals e , adapted to rest in suitable bearings in the sides of the tub. At the ends of the hub or shaft E and in proximity to the ends of the curved floor of the washer depending arms e' are located, fixed at one end to the shaft E and having fixed to their opposite ends oppositely-diverging paddles or wings e^2 . The depending arms e' are further united by a strengthening brace or girder e^3 . Upon opposite sides of the arms e' , at each end of the hub or shaft E, yielding arms e^4 are located, the said arms being pivotally secured to the hub or shaft E, in the present instance to disks e^5 , fixed on the shaft, the lower ends of the said arms e^4 being provided with wings or paddles e^6 , set at an inclination to the arms, the direction of the inclination being away from the central arm or arms e' . The two corresponding arms e^4 at opposite ends of the washer upon each side of the central arms e' are preferably connected by braces or girders e^7 , and the said arms are held normally away from the central arms e' by means of

springs F, inserted between the arm e' and the arms e^4 . It is intended that the arms e' and e^4 shall be of such length as to bring the lower edges of the wings or paddles e^2 and e^6 near the inner surface of the curved floor of the washer. The agitator may be rocked back and forth within the tub, with its wings or paddles in proximity to the curved floor D, by means of a crank G, fixed to the shaft E.

10 The height of the water within the tub is determined by means of suitable overflow-openings b^4 .

The operation is as follows: Before admitting the water to the tub its temperature is carefully ascertained in the supply-tank A, and such temperature may be raised or lowered by the admission to the supply-tank of steam or hot water and cold water through suitable supply-pipes. (Not shown.) When that temperature of the water has been obtained which is as high as the filtering material will safely stand without danger of becoming injured, the gate b' may be opened and the water admitted to the tub and to the filtering material held suspended therein upon the curved floor D. The rocking of the agitator back and forth within the tub will, because of the inclination of the wings or paddles in opposite directions from the center, tend to lift the filtering material up toward the top of the tub as the agitator is swung in that direction, while the paddle upon the descending side of the agitator will ride smoothly over or through the filtering material, allowing the same to accumulate upon the upper or outside of it. When the agitator is moved in the opposite direction, it will tend to lift the material upon that side toward which it is rocking, and the side which before lifted will in turn ride over or through the material without seriously chafing or stirring it. A constant and thorough rinsing of

the material is thus obtained. In addition to this, the yielding support of the arms upon the opposite sides of the center will cause the load lifted by the arms e^4 to exert back-pressure against the tension of the springs F, and thereby squeeze the material which shall be left between the paddle upon the arm e^4 and that upon the central arm e' . A squeezing and rinsing of the material are thus effected without seriously stirring or chafing the material, and the cleansing operation is rapid and complete.

What I claim is—

1. The combination, with a tub having a curved open-work support for the filtering material and means for admitting water to the tub, of a vibratory agitator provided with an arm having a yielding motion toward the central portion of the bottom against the tension of a spring, and an outwardly-slanting paddle on the yielding arm adapted to travel in proximity to the curved support, whereby the material is gently lifted as the paddle is swung toward the outer edge of the bottom and the paddle allowed to ride smoothly over the material as it is swung in the opposite direction, substantially as set forth.

2. The combination, with a tub and a supply-tank having a valved communication therewith, of a curved open-work bottom within the tub for holding the filtering material, an agitator having a vibratory movement within the tub, the said agitator being provided with rigid arms and pivoted swinging arms, paddles at their free ends, said paddles being fixed at an angle to the arms, and springs interposed between the rigid and swinging arms, substantially as set forth.

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