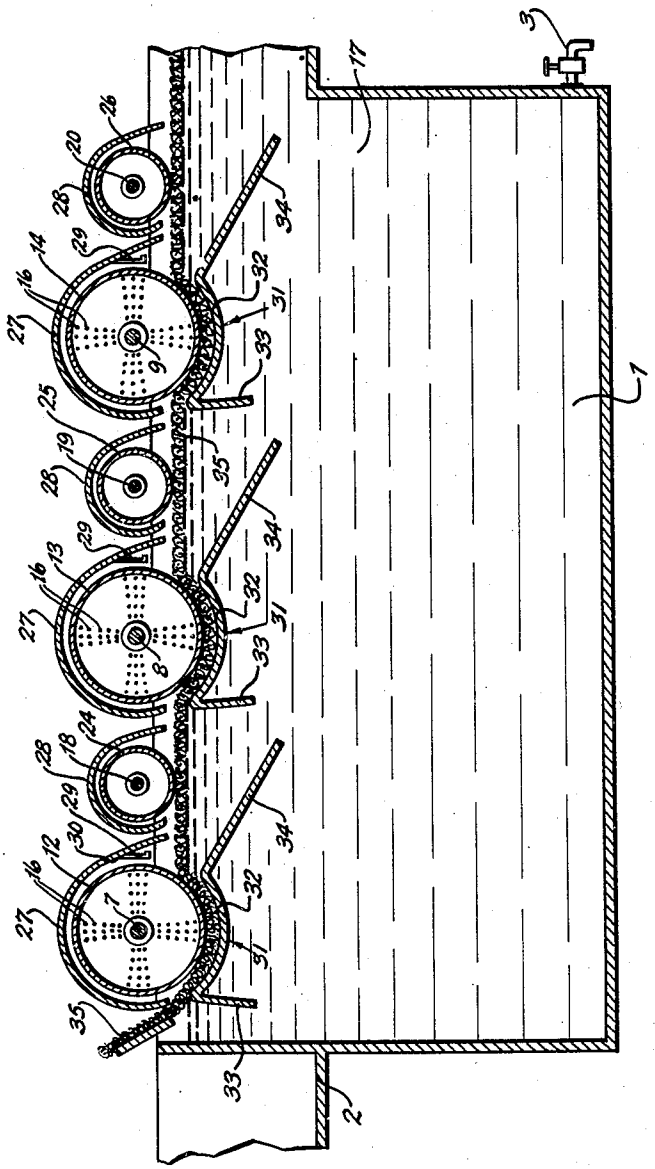
Jan. 10, 1950 E. H. BROOKS, SR 2,493,944

FIBER SCOURING AND WASHING BOWL

Filed July 12, 1946 2 Sheets-Sheet 1

Fig. 1.




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Fig. 2.

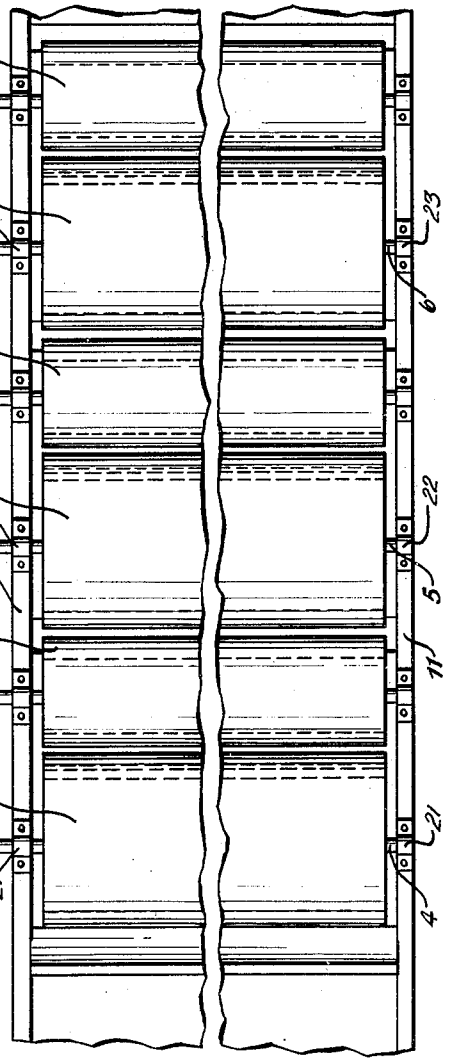



Fig. 5.

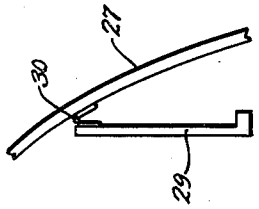



Fig. 4.

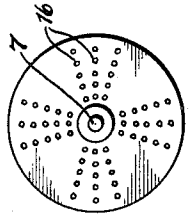
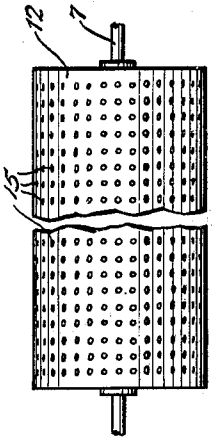



Fig. 3.




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Patented Jan. 10, 1950 2,493,944

# UNITED STATES PATENT OFFICE

2,493,944

## FIBER SCOURING AND WASHING BOWL

Edward H. Brooks, Sr., Portland, Maine, assignor of one-half to Edward H. Brooks, Jr., Portland, and one-half to Elton H. Thompson, Cape Elizabeth, Maine

Application July 12, 1946, Serial No. 683,204

9 Claims. (Cl. 68—43)

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This invention relates to improvements in fibre scouring and washing bowls or tanks and relates to similar subject matter of my copending applications Serial No. 694,991; 683,203; and 696,294.

An object of the invention is to provide an improved fibre scouring and washing tank in which one or more scouring and washing mechanisms will be incorporated for removing dirt and foreign matter from fibre stock after the same has been previously placed in a feed box to receive a preliminary combing prior to its being washed.

Another object of the invention is to provide an improved fibre scouring and washing bowl which will include a perforated rotating washer or suction roll and an adjacent small breaker roll for moving the fiber from one scouring and washing bowl to the next bowl, together with a separation plate under said suction roll for separating and receiving the dirt as it is washed from the fiber as it is acted upon by the action of the rapidly rotating perforated washer or suction roll, and a hinged pressure plate for controlling and relieving the pressure from excessive water or stock on the suction roll.

A further object of the invention is to provide an improved fibre scouring and washing mechanism which will create a pin point penetration of the stock being washed by forcing the washing fluid through the stock in process, thoroughly impregnating the fibre with washing fluid before entry into the next scouring pit or bowl.

Another object of the invention is to provide an improved fibre stock scouring and washing tank in which a plurality of separate mechanisms are received and separately operated, said apparatus being highly efficient in operation, and relatively inexpensive to manufacture and produce.

Other objects will appear as the description proceeds.

In the accompanying drawings which form a part of this application,

Figure 1 is a longitudinal sectional view taken through the improved fibre scouring and washing bowl or tank;

Figure 2 is a plan view looking down on the improved fibre scouring or washing bowl or tank;

Figure 3 is a front elevation of one of the improved washer or suction rolls;

Figure 4 is an end view of one of the washer or suction rolls, and

Figure 5 is an enlarged end view of one of the pressure plates hinged to a hood overlying a suction roll.

Like characters of reference are used throughout the following specification and the accompanying drawings to designate corresponding parts.

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In carrying out the invention, there is provided a substantially rectangular shaped tank 1 having a feed box or housing 2 formed on one end, and provided with a drain cock or faucet 3 in its lower end. In the drawings, there are illustrated three complete sets of scouring and washing mechanisms, each of which are identical in form, and are arranged so that the fibre stock when it is thrown into the washing tank passes successively through the three washing mechanisms to thoroughly and efficiently scour and wash the dirt and other foreign matter from the fibre stock.

A plurality of transversely extending shafts 4, 5 and 6 are mounted in the bearing members or brackets 7, 8 and 9 respectively, on the upper edges of the opposite sides 10 and 11 of the tank 1.

The large washer or suction rolls 12, 13 and 14 are fixed respectively to the shafts 7, 8 and 9 to rotate therewith, and are formed with the plurality of rows of transversely extending apertures 15 formed through their peripheral surface, and are also provided with the radially extending rows of apertures 16 onto their opposite ends, as clearly illustrated in Figures 1 and 4 of the drawings. These large washer or suction rolls 12, 13 and 14 are positioned so that they will extend below the surface of the water or washing fluid 17 in the tank 1 and will be separately driven by means of separate motors or other suitable devices (not shown).

The three shafts 18, 19 and 20 are mounted transversely of the tank 1 and are supported in the bearings 21, 22 and 23 secured to the opposite sides 10 and 11 of said tank, and are disposed between the adjacent large rolls 12, 13 and 14. The small breaker rolls 24, 25 and 26 are mounted respectively upon the shafts 18, 19 and 20 and are driven by separate driving means (not shown).

The covers 27 will be supported above the large washer or suction rolls in spaced relation thereto, and will be extended outwardly away from said rolls on their outer side portions, as viewed from the front of the apparatus. Similarly formed small covers 28 will likewise be supported above the breaker rolls 24, 25 and 26 in spaced relation and will prevent the water or washing fluid 17 from the tank 1 from splashing and spilling from the tank during the scouring and washing operations.

The transversely extending weighted pressure plates or baffles 29 are hinged at 30 to the under surfaces of the covers 27 so that pressure from excessive water or stock on the suction rolls will be relieved as they are rotated rapidly in a counter-clockwise direction.

The separation plates 31 are disposed transversely of the tank and are arcuate in shape to form the scouring pits 32 immediately below and spaced from the large washer or suction rolls 12, 13 and 14. The forward edges of the separation plates are bent downwardly as at 33 to form an inlet for the fibre stock as it advances from the inlet end of the tank to the discharge end thereof. The opposite end of the scouring pit 32 is provided with a downwardly angled apron portion 34 which tends to direct the dirt and other foreign matter scoured from the fibre stock downwardly to be deposited in the bottom of the tank 1.

The fibre stock 35 is fed into the front end of the tank 1 by suitable pick up means and enters the space between the depending portion 33 of the scouring pit 32 and passes between said suction roll and pit and on the top of the water or cleaning fluid 17 where the breaker roll 24 which is perforated creates a pin point penetration on the stock, forcing the washing fluid through the stock and process, thoroughly impregnating the same with washing fluid before its entry into the next scouring pit which is separately driven.

The large washer or scouring rolls which are perforated as before mentioned, pick up the water, fluid and air and provide a squeezing action upon the fibre stock which releases the dirt and foreign matter from the stock as it passes under the suction rolls over the last hump of the scouring pit.

The suction rolls 12 are positioned above the arcuate portion 32 of the said separation plate or baffle 31, thereby forming a confined zone or scouring pit. The cover 27 is supported above the roll 12, but spaced therefrom. Upon rotation of the relatively large roll 12 which is perforated and which is partially submerged in the fluid in the tank, the fluid flow (both air and liquid) about the roll creates a suction due to the baffling effects of the separation plate 31 and the cover 27.

The pressure plate 29 is hinged to the cover 27 for movement similar to a pendulum in motion. This plate 29 is at the egress side of the scouring pit (defined by the roll 12 and baffle 31) and is therefore at the relatively high pressure position in the system. The relatively low pressure portion is at the opposite side of the relatively large roll 12 wherein the fibre is introduced. When the pressure of the egress side reaches an undesired value, the hinged plate 29 will be actuated similar to a pendulum and increase the throat diameter for the swirling fluid (air and washing fluid), thereby relieving the undesired high pressure.

The fibre is carried across the tank due to the direction of rotation of the suction roll 12 and the actual suction (and relatively high pressure) produced, increases the facility of fibre travel.

The next stage of operation is further washing of the fibre and conveyance across the upper portion of the tank. The breaker roll 24 which is perforated has an air flow set up and directed (by the proximity to the cover 28) so as to urge the fibre across the tank. The perforations in the roll 24 assist in conveying the fibre and also setting up the air flow. A quantity of washing



fluid will be received in the perforations, to be hurled violently against the flowing fibre, thereby causing liquid to penetrate the fibre in extremely small but numerous quantities. The penetration is similar to inserting a plurality of pins in the moving fibre. However, washing of the fibre by this penetration is effected. This penetration also assists in breaking lumps of the fibre as they pass beneath the breaker rolls.

Due to the buoyant nature of the fibre, and also due to the urging across the top of the tank in stages (by means of the rolls), the said fibre will be maintained at the upper portion or on top of the fluid level within the tank. Certain fibre will, of course, sink. However, the amount which is lost by this means (sinking) is negligible.

From the foregoing description it will be apparent that there has been provided a highly efficient form of fibre stock scouring and washing apparatus which will include one or more separate scouring and washing bowls in which identical apparatus is received. It will be further understood that any number of these scouring and washing pits or bowls may be employed depending upon how thoroughly it is desired to clean the fibre stock before it is finally removed and transported to a drying chamber. The action upon the fibre stock is such that the stock is temporarily supported in the scouring pit while the same is thoroughly impregnated and squeezed before it is passed along to the next bowl for a similar action and treatment.

While the preferred embodiment of the instant invention has been illustrated and described, it will be understood that it is not intended to limit the scope of the invention thereto, as many minor changes in detail of construction may be resorted to without departure from the spirit of the invention.

Having thus described my invention what I claim as new and desire to secure by Letters Patent of the United States is:

1. A fibre scouring and washing device including a tank adapted to receive washing fluid, an apertured roll mounted transversely of said tank for partial submersion in washing fluid, an arcuate baffle secured to said tank and disposed in spaced relation below said roll forming a scouring chamber, a cover secured to said tank and spaced from said roll, a weighted pressure plate suspended from said cover being pivoted thereto and terminating adjacent the scouring chamber, a rotatable perforated roll mounted transversely of said tank adjacent said apertured roll, and means for rotating said rolls.

2. A fibre scouring and washing device including a tank adapted to receive washing fluid, an apertured roll mounted transversely of said tank for pivotal submersion in washing fluid, an arcuate baffle secured to said tank having an apron disposed in spaced relation below said roll, a perforated roll mounted transversely of said tank adjacent said apertured roll, covers secured to said tank for said suction roll and for said perforated roll, a depending pressure plate suspended from said cover overlying and spaced from the apron, and means for rotating said rolls.

3. A fibre scouring and washing device including a tank adapted to receive washing fluid, an apertured roll journaled transversely of said tank adapted to be partially submerged in washing fluid, an arcuate baffle secured to said tank below said roll forming a scouring chamber, a cover secured to said tank and overlying said roll, a

plate pivotally secured to said cover, and means for rotating said roll.

4. In a fibre scouring and washing device, a tank for retaining fluid, an apertured roll journaled transversely of said tank, means for rotating said roll, an arcuate baffle secured to said tank and spaced from said roll forming a scouring chamber, an arcuate cover secured to said tank and overlying the roll for confining fluid set in motion by the rotation of said roll, said cover being spaced from said baffle and forming ingress and egress zones of said scouring chamber, and means pivotally associated with said cover for regulating the size of the egress zone.

5. In a fibre scouring and washing device, a tank for retaining fluid, an apertured roll journaled transversely of said tank, means for rotating said roll, an arcuate baffle secured to said tank and spaced from said roll forming a scouring chamber, an arcuate cover secured to said tank and overlying the roll for confining fluid set in motion by the rotation of said roll, said cover being spaced from said baffle and forming ingress and egress zones of said scouring chamber, and means pivotally associated with said cover for regulating the size of the egress zone, said means comprising a plate.

6. In a fibre scouring and washing device, a tank for retaining fluid, an apertured roll, journaled transversely of said tank, means for rotating said roll, an arcuate baffle secured to said tank and spaced from said roll forming a scouring chamber, an arcuate cover secured to said tank and overlying the roll for confining fluid set in motion by the rotation of said roll, said cover being spaced from said baffle and forming ingress and egress zones of said scouring chamber, and means pivotally associated with said cover for regulating the size of the egress zone, a perforated roll journaled on said tank, means for rotating said perforated roll.

7. In a fibre scouring and washing device, a tank for retaining fluid, an apertured roll journaled transversely of said tank, means for rotating said roll, an arcuate baffle secured to said tank and spaced from said roll forming a scouring chamber, an arcuate cover secured to said tank and overlying the roll for confining fluid set in motion by the rotation of said roll, said cover being spaced from said baffle and forming ingress and egress zones of said scouring chamber, and means pivotally associated with said cover for regulating the size of the egress zone, a perforated roll journaled on said tank, means for rotating said perforated roll, a second cover secured to said tank and spaced from said perforated roll to confine fluid set in motion by the rotation of the perforated roll.



8. In a fibre scouring and washing device, a tank for retaining fluid, an apertured roll journaled transversely of said tank, means for rotating said roll, an arcuate baffle secured to said tank and spaced from said roll forming a scouring chamber, an arcuate cover secured to said tank and overlying the roll for confining fluid set in motion by the rotation of said roll, said cover being spaced from said baffle and forming ingress and egress zones of said scouring chamber, and means pivotally associated with said cover for regulating the size of the egress zone, a perforated roll journaled on said tank, means for rotating said perforated roll, a second cover secured to said tank and spaced from said perforated roll to confine fluid set in motion by the rotation of the perforated roll, said second cover having an end terminating adjacent the egress zone.

9. The combination of claim 4 and said baffle being arcuate to conform with the shape of the apertured roll, said cover being arcuate to conform substantially to the configuration of the apertured roll, an apron on said baffle for directing refuse toward the interior of the tank.

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