

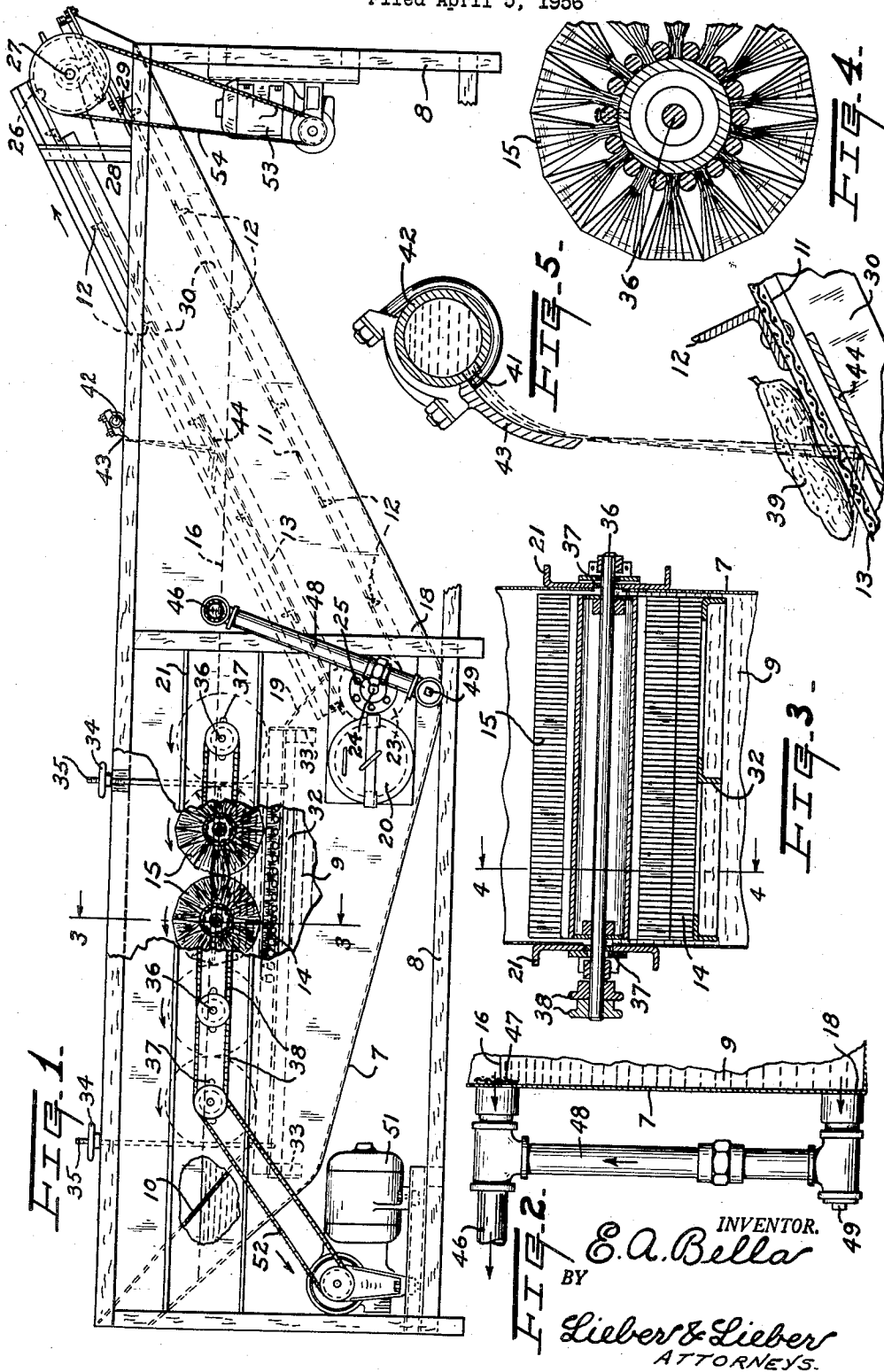
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WASHER FOR PICKLES OR THE LIKE

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1

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WASHER FOR PICKLES OR THE LIKE

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The present invention relates in general to improvements in the art of cleansing miscellaneous bulk commodities, and relates more specifically to improvements in the construction and operation of machines for washing vegetables such as pickles delivered in bulk into a basin of water or the like containing scrubbing brushes.

The primary object of this invention is to provide an improved washer for miscellaneous articles such as pickles, which is simple in construction and highly effective in operation.

Many vegetables such as pickles and cucumbers which have relatively irregular external surfaces and repose upon the ground while developing, are naturally coated with sand and earth when picked, and this foreign matter must be effectively removed before the commodity is packed into receptacles for marketing. In order to commercially cleanse such articles their bounding surfaces must be thoroughly scrubbed while the individual vegetables are being agitated and advanced through a basin of washing liquid; and while some washing mechanisms have heretofore been proposed and utilized, these prior machines either did not effectively remove the dirt from crevices in the commodity, or they failed to properly conduct the articles through and away from the washing zone so as to insure maximum speed and capacity, or they did not provide for effective final rinsing in order to remove the loose debris, or they could not be conveniently adjusted to cooperate with vegetables of different sizes and shapes, or they were not adapted to vary the speed of the scrubbing brushes independently of the discharge mechanism.

It is therefore an important object of my invention to provide an improved automatic washer for pickles and similar irregular articles, which obviates all of the above mentioned objectionable features.

Another important object of this invention is to provide a relatively compact cleansing device for bulk commodities, which can be readily adjusted to effectively cooperate with articles of various sizes and shapes and is therefore flexible in its adaptations.

A further important object of the invention is to provide an improved cleanser for relatively buoyant vegetables or the like, in which the commodity is rapidly advanced through a scrubbing zone and is prevented from returning to the inlet end of the washing basin by reverse flotation across such zone.

Still another important object of the present invention is to provide an improved washing unit for pickles or the like, in which the pickles are most effectively soaked and scrubbed and thoroughly rinsed before they are finally discharged from the unit.

An additional important object of this invention is to provide various improvements in the construction and functioning of a vegetable washer of the type wherein the articles are subjected to brush scrubbing while being advanced through a liquid basin, which may be manufactured, installed and operated at moderate cost to rapidly and effectively cleanse such articles.

2

Another important object of the invention is to provide a durable electrically driven pickle washing mechanism of compact dimensions but having enormous capacity, in which both the floating and the sinkable debris may be readily removed from the scrubbing and rinsing zones of the machine in order to prevent pollution of the cleansing liquid.

These and other more specific objects and advantages of the invention will be apparent from the following detailed description.

A clear conception of the several features constituting my present improvement, and of the construction and operation of a typical commercial pickle washer embodying the invention, may be had by referring to the drawing accompanying and forming a part of this specification wherein like reference characters designate the same or similar parts in the various views.

Fig. 1 is a part sectional side elevation of a complete washing unit with a portion of the tank broken away at the feed chute and the brush scrubbing zone in order to more clearly show the soaking area and the cooperation of the stationary and revolving brushes;

Fig. 2 is an enlarged vertical section through a fragment of the wash water confining tank showing the spent liquid discharging piping assembly;

Fig. 3 is a similarly enlarged fragmentary vertical section through the scrubbing brush zone of the washing unit, taken along the line 3—3 of Fig. 1;

Fig. 4 is a further enlarged transverse vertical section through one of the revoluble scrubbing brushes of the machine taken along the line 4—4 of Fig. 3; and

Fig. 5 is an enlarged transverse fragmentary vertical section through the fresh water supply device for depositing fresh liquid onto the perforated commodity discharge conveyor of the unit.

While the invention has been shown and described herein as having been embodied in a typical pickle washer especially adapted for use in the canning industry, it is not the instant to confine the use of the improved features to such machines; and it is also contemplated that specific descriptive terms employed herein be given the broadest possible interpretation consistent with the actual disclosure.

Referring to the drawing, the improved commercial vegetable washing unit illustrated therein comprises in general, an elongated tank 7 mounted upon a frame 8 and having a liquid basin 9 therein; a commodity supply or inlet chute 10 at one end of the tank 7 and being downwardly inclined and extending beneath the liquid level in the basin 9; an endless perforated commodity discharge conveyor 11 provided with transverse conveying flights 12 and having its upper active stretch 13 extending upwardly from beneath the liquid level in the basin to a point above such level near the opposite end of the tank 7 to provide an upwardly advancing pervious and inclined deck; an elongated approximately horizontal normally stationary brush 14 mounted within the tank 7 between the chute 10 and the conveyor 11; an approximately horizontal series of revolving brushes 15 journaled in the tank 7 with the common plane of their axis being approximately coincident with the liquid level 16 in the basin 9; means for supplying fresh liquid to and for delivering spent liquid from the basin; and means for driving the conveyor 11 and the brushes 15.

The tank 7 may be formed of sheet metal and has its deepest medial portion 18 provided with an inclined transfer plate 19 for conducting the scrubbed articles from the brushing zone onto the lower portion of the discharge conveyor deck 13, and the tank portion 13 is also provided with a side opening which is normally sealed by a removable manhole cover 20, as shown in Fig. 1. The main frame 8 which supports the liquid confining tank

7 may be fabricated from structural steel, and is provided with horizontal channel braces 21 coacting with the opposite sides of the tank 7 along the scrubbing zone, see Figs. 1 and 3. The inclined commodity supply chute 10 may also be formed of sturdy sheet metal and extends from the extreme inlet end of the tank to a point beneath the level 16 of the liquid in the basin 9 somewhat in advance of the scrubbing zone so as to provide a commodity soaking zone near the chute 10.

The endless commodity discharge conveyor 11 is preferably formed of durable but flexible matting having perforations throughout its entire area, and the lower bend of this conveyor 11 coacts with an idler pulley 23 carried by a transverse shaft 24 journalled in fixed bearings 25 secured to the opposite sides of the deep tank portion 13, while the upper bend coacts with a driving pulley 26 secured to a transverse drive shaft 27 journalled in adjustable bearings 28 carried by a bracket 29 mounted on the frame 8, and the upper deck 13 and the lower stretch of the conveyor 11 are slidable along rails 30 secured to the opposite sides of the tank 7 and frame 8. The transverse commodity elevating flights 12 may be angle irons firmly secured to the perforated conveyor belt by rivets or otherwise, and the adjustable bearings 28 may be utilized to properly tension this perforated belt, see Figs. 1 and 5. The upper transporting deck 13 of the discharge conveyor extends from beneath the lower end of the transfer plate 19 to a point well above the liquid level 16 in the basin 9 so as to provide a substantial commodity drainage area for the cleansed pickles.

The scrubbing brushes 14, 15 may be of any suitable type adapted to effectively perform their intended functions, and the lower normally stationary brush 14 is mounted upon a vertically adjustable support 32 coacting with guideways 33 secured to the opposite sides of the tank 7. The support 32 is adjustable vertically along the guideways 33 by means of handwheels 34 coacting with the main frame 8 and with threaded suspension rods 35 which carry the support, as depicted in Fig. 1, thus providing convenient adjustability for the lower horizontal brush 14. Each of the upper revoluble brushes 15 is mounted upon a transverse horizontal shaft 36 the axes of which lie in a common horizontal plane which is substantially coincident with the liquid level 16 of the basin 9, and each of the shafts 36 is journalled in bearings 37 secured to the adjacent channel braces 21, see Figs. 1, 3 and 4. The shafts 36 of the successive rotary brushes 15 are all drivingly interconnected so as to cause all of these brushes to revolve in the same direction as indicated by the arrows in Fig. 1, by means of chain drives 38, and it is important that the liquid level 16 be constantly maintained below the tops of the brushes 15 especially when operating on buoyant articles such as pickles 39 shown in Fig. 5.

Some fresh washing liquid may be supplied as required directly to the basin 9 from any suitable source and in an obvious manner, but it is important that the scrubbed pickles 39 be thoroughly rinsed before they are finally delivered from the unit by the discharge conveyor 11. In order to accomplish such final rinsing, some fresh liquid is also supplied through spaced orifices 41 in a transverse feed pipe 42 mounted upon the frame 8, along local aprons 43 secured to the pipe 42 and this liquid is permitted to cascade upon the upwardly advancing pre-scrubbed pickles 39 somewhat above the liquid level 16 in the basin 9 as illustrated in Figs. 1 and 5. Located beneath the perforated conveyor deck 11 in vertical alinement with the depending ends of the aprons 43 is an inclined splash plate 44 which is secured to the side rails 30 and is formed to deflect the fresh cascading rinsing liquid dropping from the aprons 43 and which passes through the perforations of the conveyor deck 13, back through these perforations and against the undersides or bottoms of the advancing pickles 39, after

which this rinsing liquid together with the removed debris flow or drop into the basin 9.

In order to positively maintain the liquid level 16 of the basin 9 beneath the tops of the revolving brushes 15, a special spent liquid system such as shown in Figs. 1 and 2, is also provided. This system comprises a horizontal liquid overflow pipe or conduit 46 communicating with the upper portion of the basin 9 in substantial horizontal alinement with the liquid level 16 past a screen 47, and another pipe or conduit 48 communicating with the lowermost portion of the basin 9 at the deepest tank portion 18 and with the conduit 46 outwardly of the tank 7. The conduit 48 is preferably provided with a clean-out plug 49; and when liquid is being discharged at relatively high velocity from the basin 9 through the overflow conduit 46 large pieces of floating debris and articles will be held back by the screen 47, while this outwardly flowing liquid will also produce a flow of liquid upwardly through the conduit 48 thereby withdrawing solid particles of sand and dirt from within the lower portion of the basin 9.

The revolving scrubbing brushes 15 are adapted to be rotated by means of an electric motor 51 through a chain drive 52 or the like, cooperating with the chain drives 38; and the endless commodity elevator and conveyor 11 is adapted to be independently driven by another electric motor 53 through a chain drive 54. Both of these motors 51, 53 are mounted upon the main frame 8 so as to provide a self-contained and relatively portable unit, and by controlling the speed of these motors the relative rotation of the brushes 15 and speed of advancement of the conveyor 11 may be varied to meet various conditions of operation required from the mechanism.

When the improved pickle washer has been properly constructed and assembled as hereinabove described, and the basin 9 has been supplied with fresh cleansing liquid such as water up to the level 16, the pickles 39 received from the field may be deposited en masse upon the inclined inlet chute 10 and permitted to accumulate in the soaking area in advance of the brushes 14, 15. The motors 51, 53 may then be placed in operation to cause the rapidly revolving brushes 15 to withdraw successive layers of the soaking pickles 39 and to agitate and advance the same horizontally along the stationary brush 14 through the scrubbing zone. During this advancement and thorough scrubbing the sand, dirt and other foreign matter is effectively removed from the pickles and descends through the lower brush 14 and over the delivery end thereof through the liquid basin 9 and toward the deepest portion 18 of the tank 7.

Upon leaving the scrubbing zone, the pickles 39 drop onto the inclined transfer plate 19 which conducts them onto the lower end of the upwardly moving conveyor deck 13. The flights 12 of the conveyor 11 then advance the scrubbed pickles in relatively thin layers upwardly into and through the final rinsing zone above the liquid level 16 where each pickle 39 is subjected to thorough rinsing from above by the fresh liquid cascading from the orifices 41 in the feed pipe 42, and from below by the liquid which is deflected upwardly through the perforations in the conveyor deck 13 by the deflector plate 44. This rinsing action removes all adhering sand and dirt from the pickles 39 before they are finally delivered from the unit by the flights 12, and the foreign matter thus removed from the commodity passes into the basin 9 with the rinsing liquid. The pickles 39 are thus successively thoroughly automatically soaked, scrubbed and rinsed, and while most of the debris is carried away by the spent liquid flowing through the conduits 46, 48, floating debris may be periodically removed from the screen 47 by hand and heavier debris which accumulates in the deepest tank portion 18 may likewise be ejected by removal of the plug 49 or of the manhole cover 20 when the tank 7 is drained after the machine is stopped.

From the foregoing detailed description of the construction and operation of the unit it should be apparent that the present invention in fact provides a compact washing mechanism of large capacity adapted to automatically and effectively cleanse bulk commodities such as vegetables. The improved washer is flexible in its adaptations by virtue of the adjustability of the lower fixed brush 14 with the aid of the hand wheels 34, and also due to the provisions of independent variable speed motors 51, 53 for driving the revolving brushes 15 and the discharge conveyor 11. The improved chain drives 38 for simultaneously rotating the brushes 15 in the same direction permits the use of any desired number of these brushes, and the adjustable bearing 28 for the driving pulley 26 of the discharge conveyor 11 enables this endless conveyor to be conveniently tensioned.

It is extremely important to maintain the liquid level 16 in the basin 9 below the tops of the revolving brushes 15 at all times in order to prevent buoyant pickles or other articles from floating back toward the inlet chute 10, and the level control system including the conduits 46, 48 does effectively control the level 16. If so desired one of these systems may be applied to each side of the tank 7 and the conduit 48 also functions to constantly remove sand and dirt which descends to the bottom of the basin 9. The final rinsing of the pre-scrubbed pickles 39 by the cascading liquid delivered from the orifices 41 and by the liquid deflected upwardly through the perforated conveyor 11 by the plate 44 is also important in order to insure clean final product devoid of adhering foreign matter, and the improved washing units may be effectively utilized to operate on diverse commodities and especially vegetables.

It should be understood that it is not desired to limit this invention to the exact details of construction or to the precise usage, herein shown and described, for various modifications within the scope of the appended claims may occur to persons skilled in the art.

I claim:

1. In a washer for pickles or the like, a tank having therein an elongated liquid basin provided at one end with a commodity inlet chute and at its opposite end with an upwardly inclined and advancing perforated discharge conveyor deck while its intermediate portion is provided with an approximately horizontal lower stationary brush extending over the lower commodity receiving end of said deck and cooperating with an approximately horizontal series of cylindrical revolving brushes superposed over and coacting with the lower stationary brush to scrub and advance the admitted commodity from said inlet toward said discharge end of the basin, means for rotating said revolving brushes, means for delivering fresh liquid onto the top of the commodity resting upon said discharge deck and downwardly through the deck perforations, and means for deflecting said fresh liquid upwardly through the deck perforations and against the bottom of the advancing commodity being removed from said basin by said deck.

2. In a washer for pickles or the like, a tank having therein an elongated liquid basin provided at one end with a commodity inlet and at its opposite end with an advancing perforated discharge conveyor deck extending above the liquid level in said basin while its intermediate portion is provided with lower and upper cooperating stationary and revolving scrubbing brushes extending over the lower commodity receiving end of said deck, means for rotating said revolving brushes, means for cascading fresh liquid downwardly onto the top of commodity delivered by said brushes onto and while resting upon said discharge deck and through the deck perforations, and means for deflecting said fresh cascading liquid upwardly through the deck perforations and against the bottom of the advancing commodity.

3. In a washer for pickles or the like, a tank having therein an elongated liquid basin provided at one end with a commodity inlet and at its opposite end with an upwardly inclined and advancing perforated discharge conveyor deck extending above the liquid level in said basin while its intermediate portion is provided with lower and upper cooperating stationary and revolving scrubbing brushes extending over the lower commodity receiving end of said deck, means for rotating said revolving brushes, means for cascading fresh liquid downwardly onto the top of commodity delivered by said brushes onto and while resting upon said discharge deck and through the deck perforations, and means for deflecting said cascading liquid upwardly through the deck perforations and against the bottom of the advancing commodity.

4. In a washer for pickles or the like, means forming an elongated liquid basin provided at one portion with a commodity inlet and at another portion with an upwardly inclined and advancing perforated discharge conveyor deck extending above the liquid level in the basin while its intermediate portion is provided with cooperating commodity advancing scrubbing brushes extending over the lower commodity receiving end of the deck, means for cascading fresh liquid downwardly onto the commodity delivered by said brushes onto and while resting upon said deck and through the deck perforations, and means for deflecting said fresh liquid upwardly through the deck perforations and against the bottom of the advancing commodity.

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