May 6, 1947. R. E. HUTCHINS, JR 2,419,933

EGG CLEANING MACHINE

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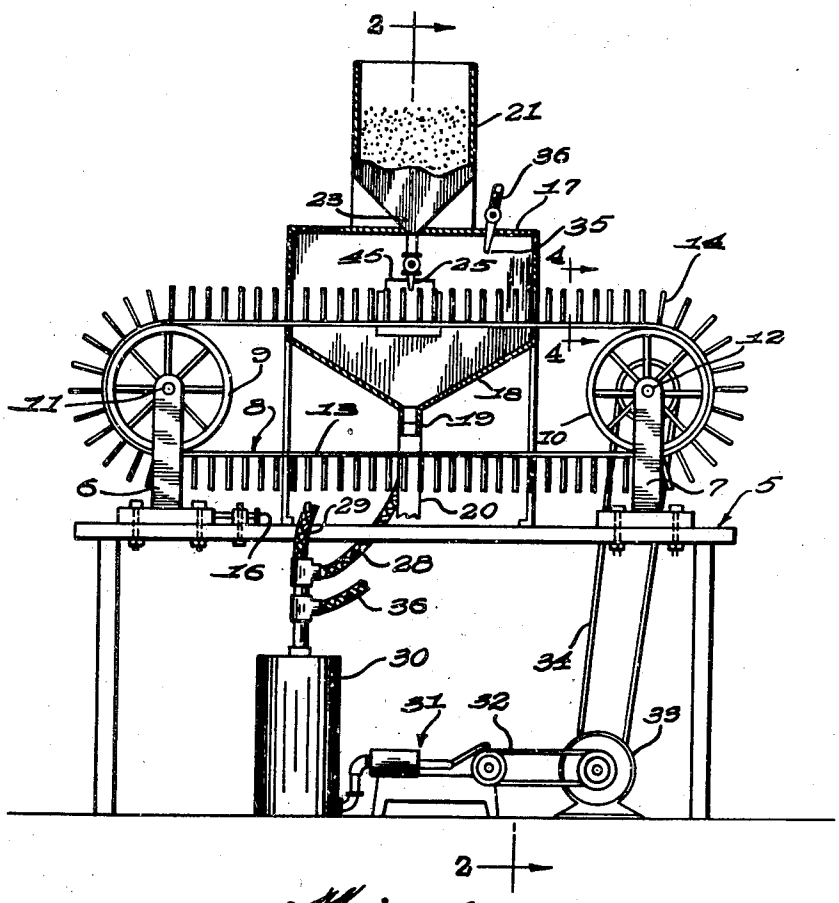

Fig. 1

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Fig. 2

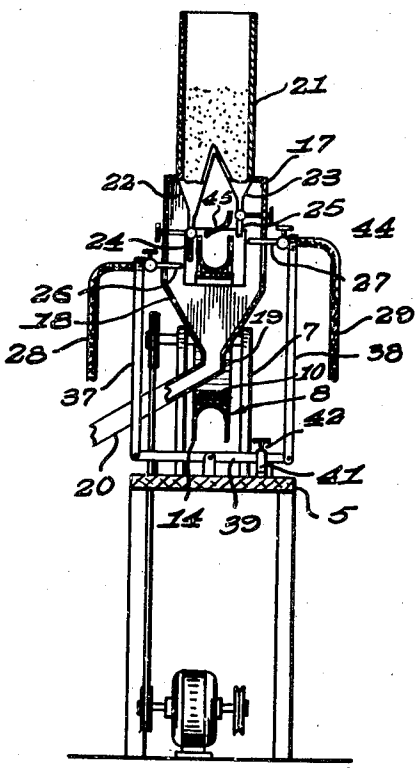


Fig. 3

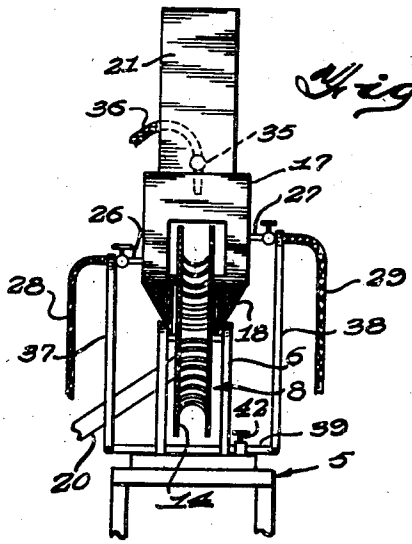


Fig. 5

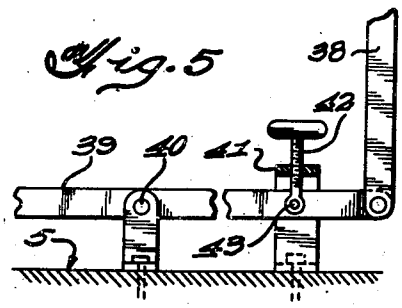
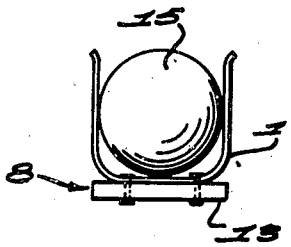


Fig. 4



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Patented May 6, 1947

2,419,933

UNITED STATES PATENT OFFICE

2,419,933

EGG CLEANING MACHINE

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Application April 15, 1946, Serial No. 662,390

7 Claims. (Cl. 51—14)

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This invention relates to a machine for cleaning the outer surfaces of eggs by means of a sand blasting operation.

The primary object of the present invention is to provide a machine of the above kind by means of which the eggs may be expeditiously and effectively cleaned, and which may be readily used without the exercise of special skill or the expenditure of a great amount of manual labor.

Another object of the invention is to provide a machine of the above kind which is comparatively simple and compact in construction, highly efficient in operation, and otherwise adapted to meet the requirements for successful commercial use.

A more specific object of the invention is to provide a machine of the above kind including a sand blast chamber, an endless conveyor for moving the eggs through said chamber, and means for directing a blast of sand and air against the successive eggs as they pass through the chamber, respectively near the top and near the bottom of the eggs and in opposite directions, whereby to turn the eggs and subject substantially all portions of their surfaces to the cleansing action of the sand.

The exact nature of the present invention, as well as other objects and features thereof, will become apparent from the following description when considered in connection with the accompanying drawings, in which:

Figure 1 is a view, partly in side elevation and partly broken away and in section, of an egg cleaning machine constructed in accordance with the present invention;

Figure 2 is a view partly in elevation and partly in vertical transverse section on line 2—2 of Figure 1;

Figure 3 is a fragmentary end elevation looking toward the right of Figure 1;

Figure 4 is an enlarged transverse sectional view through the endless conveying elements, taken on line 4—4 of Figure 1;

Figure 5 is a fragmentary detail view, partly in section, showing details of the adjusting means for the air nozzles at opposite sides of the sand blast chamber.

Referring in detail to the drawings, the illustrated embodiment of the invention includes a base 5 which is shown in the form of a bench or table of elongated form having bearing brackets 6 and 7 mounted on the top thereof adjacent the respective ends of the same. The bearing brackets 6 and 7 form part of an endless conveyor including an endless conveying element 8 which

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passes around pulleys 9 and 10 carried by shafts 11 and 12 respectively journaled in the brackets 6 and 7. The conveying element 8 includes an endless belt 13 having a continuous series of closely related uniformly spaced clasps 14 secured thereto transversely thereof and projecting outwardly therefrom. The clasps 14 are preferably of substantially U-shape as shown more clearly in Figure 4 and are adapted to receive the eggs 15 to be cleaned and to lightly grasp the latter. The bearing bracket 6 is adjustable longitudinally of the base relative to the bracket 7 so as to maintain the conveying element 8 in a taut condition, suitable adjusting means for the bracket 6 being provided as generally indicated at 16.

Mounted upon the base 5 between the pulleys 9 and 10 is a sand blast chamber 17 having a lower portion 18 of hopper form and provided with a central bottom outlet 19 adapted to be connected by a conduit 20 to a suction fan located remote to the machine and adapted to withdraw the used sand and excess air from the sand blast chamber and discharge it at a desired point of disposal. The upper portion of chamber 17 is provided with openings in its ends through which the upper flight of the conveying element 8 passes. Mounted on the chamber 17 is a sand reservoir or hopper 21 provided with bottom outlets 22 and 23 respectively provided with valve controlled discharge nozzles 24 and 25 that depend at opposite sides of the conveying element 8 and respectively terminate adjacent the belt 13 and adjacent the outer portions of the clasps 14 at opposite sides of the conveying element.

Air discharge nozzles 26 and 27 respectively project into the chamber 17 at opposite sides of the latter and terminate respectively adjacent the outlet ends of the nozzles 24 and 25. The nozzles 26 and 27 are valve controlled as shown and are connected by flexible pipes 28 and 29 to the outlet of a compressed air storage tank 30. An air pump or compressor 31 is provided for supplying the tank 30 with air under pressure, and this pump or compressor is operatively connected at 32 with a motor 33. The motor 33 is also utilized to drive the conveying element 8, as by means of a belt gearing 34 connecting the motor with the shaft 12. Another air discharge nozzle 35 may extend through the top of chamber 17 in front of the hopper 21 and nozzles 26 and 27, said nozzle 35 being connected by a flexible pipe 36 with the outlet of tank 30.

The nozzles 26 and 27 are vertically movable and respectively carried by the upper ends of vertical rods 37 and 38 pivoted to the opposite

ends of a lever 39 which extends transversely of the base 5 beneath the conveyor and is pivotally mounted on said base intermediate its ends as at 40. The lever 39 extends through a bracket 41, and an adjusting screw 42 is threaded through this bracket and pivoted at 43 to the lever 39. By this means, the lever 39 may be tiltably adjusted so as to raise nozzle 26 and simultaneously lower nozzle 27, or vice versa. In this way, the nozzles 26 and 27 may be properly positioned so as to cause the blast of sand and air to be directed most efficiently against the eggs respectively at the bottoms and tops thereof as they pass between said nozzles. By supplying the blasts of sand and air at these points and in opposite directions, in this way, the eggs are rotated while being subjected to the blasts, thereby insuring effective cleansing of the outer surfaces of the eggs substantially through the areas thereof. It will of course be understood that the streams of sand which are allowed to discharge from the hopper 21 through the nozzles 24 and 25 are in the paths of the jets of air discharged from the nozzles 26 and 27 and the sand will thus accordingly be forcibly blown against the surfaces of the eggs. The nozzle 35 additionally acts to blow sand against the eggs because a certain amount of the sand will be suspended in the sand blast chamber during the operation of the machine. A window 44 is preferably provided in one side of the chamber 17 so that the cleansing action may be viewed and any needed adjustments of the nozzles 26 and 27 readily ascertained. A deflector 45 is preferably provided between the nozzles 24 and 25 above the plane of the jet of air issuing from the nozzle 27, so as to direct said jet and the sand blown thereby downwardly into contact with the eggs.

In operation, the motor 33 is placed in operation so as to drive the compressor 31 and the endless conveying element 8. The valves of the several nozzles are properly opened, and the eggs are successively subjected to the sand blasting operation as described above as they pass through the chamber 17 between the nozzles 26 and 27. The eggs may be conveniently deposited in the clasps 14 at the right hand end of the machine as viewed in Figure 1, and may also be conveniently removed or received from said clasps at the left hand end of the machine as viewed in the same figure.

From the foregoing description, it is believed that the construction, operation, and advantages of the present invention will be readily understood and appreciated by those skilled in the art. Minor changes may be made in details of construction illustrated and described, such as fairly fall within the spirit and scope of the invention as claimed.

What I claim is:

1. In an egg cleaning machine, traveling egg supporting and conveying means, and sand blasting means to direct oppositely moving blasts of sand in different planes against the successive eggs as they are carried along by said supporting and conveying means, whereby to turn the eggs while being sand blasted.

2. In an egg cleaning machine, an endless conveyor belt having a substantially horizontal flight, a chamber disposed along and about a portion of said horizontal flight of the conveyor, substantially opposed sand blasting means in said chamber, said sand blasting means having zones of action in different horizontal planes above the conveyor belt, and means carried by the conveyor belt for retaining the eggs thereon within said zones.

3. In an egg cleaning machine, the combination of a traveling conveyor, a lower sand blasting means disposed at one side of the conveyor, upper sand blasting means disposed at the opposite side of the conveyor, said sand blasting means being disposed and directed above and across the conveyor to zones of action at different distances above the conveyor so that said sand blasting means may act to turn the eggs while being sand blasted, and means carried by the conveyor for supporting the eggs in said zones.

4. In an egg cleaning machine, the combination of a sand blasting chamber, an endless conveyor having a substantially horizontal flight movable through said chamber, sand blasting means disposed at opposite sides of said flight within said chamber and disposed to direct blasts of sand across the conveyor in different horizontal planes above the latter, and means carried by the conveyor for supporting the eggs in said zones.

5. The construction defined in claim 4, wherein said sand blasting means comprises vertically adjustable air blast nozzles mounted at opposite sides of the chamber and projecting into the latter, means for discharging streams of sand downwardly into the path of the jets of air issuing from said nozzles, and means to simultaneously adjust said air blast nozzles vertically into different planes toward or from each other to vary the spacing of the zones in which the blasts of air are directed.

6. The construction defined in claim 4, wherein said egg supporting means comprises a series of transverse uniformly spaced clasps carried by and projecting outwardly from the conveyor, said clasps acting to lightly grasp the eggs to permit turning thereof by the blasts of sand from said sand blasting means.

7. The construction defined in claim 4, in combination with a suction line connected to the bottom of the sand blasting chamber, and a further air blast nozzle discharging downwardly into the sand blast chamber above the horizontal flight of the conveyor and in advance of said sand blasting means.

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