Sept. 4, 1951 F. B. WRIGHT 2,566,475

MECHANICAL EGG WASHER WITH ROTATING DISKS

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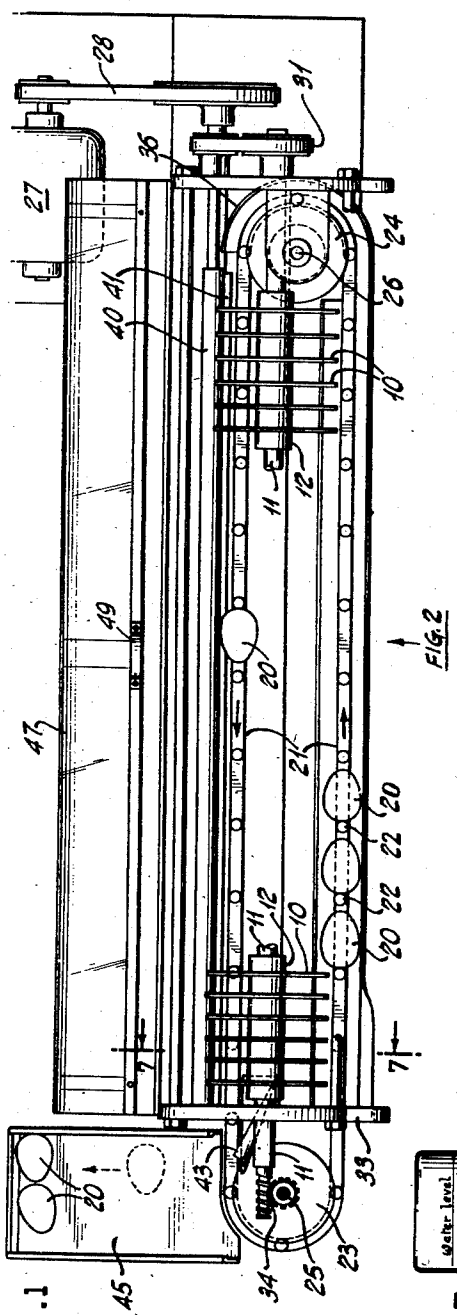


FIG. 1

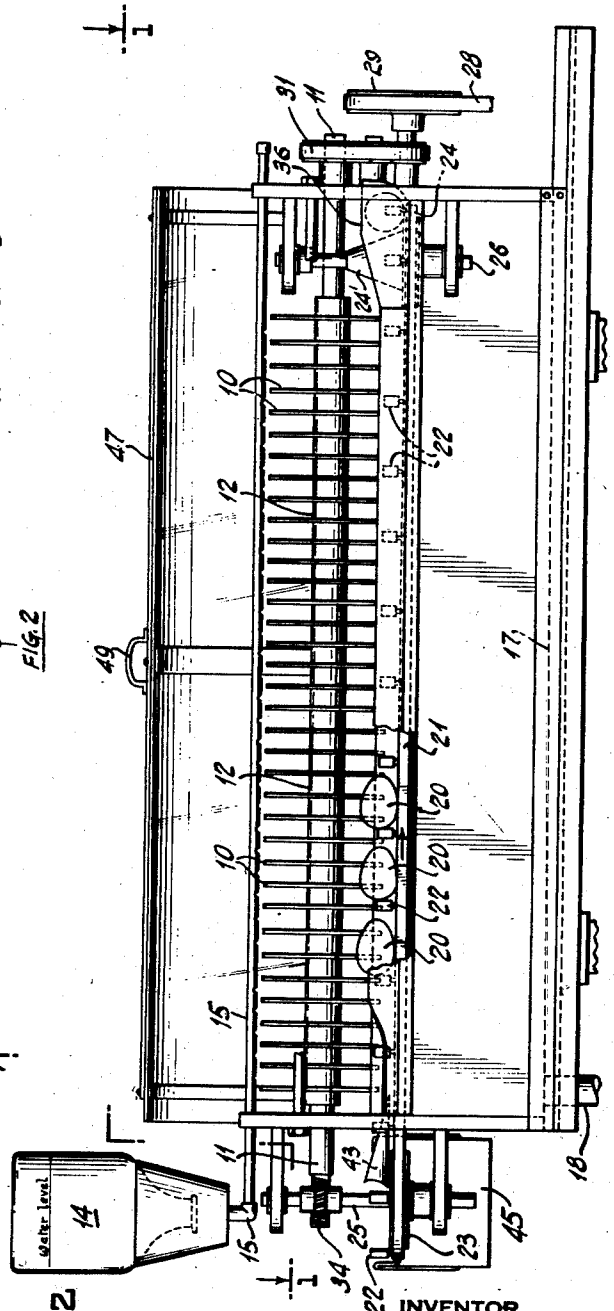


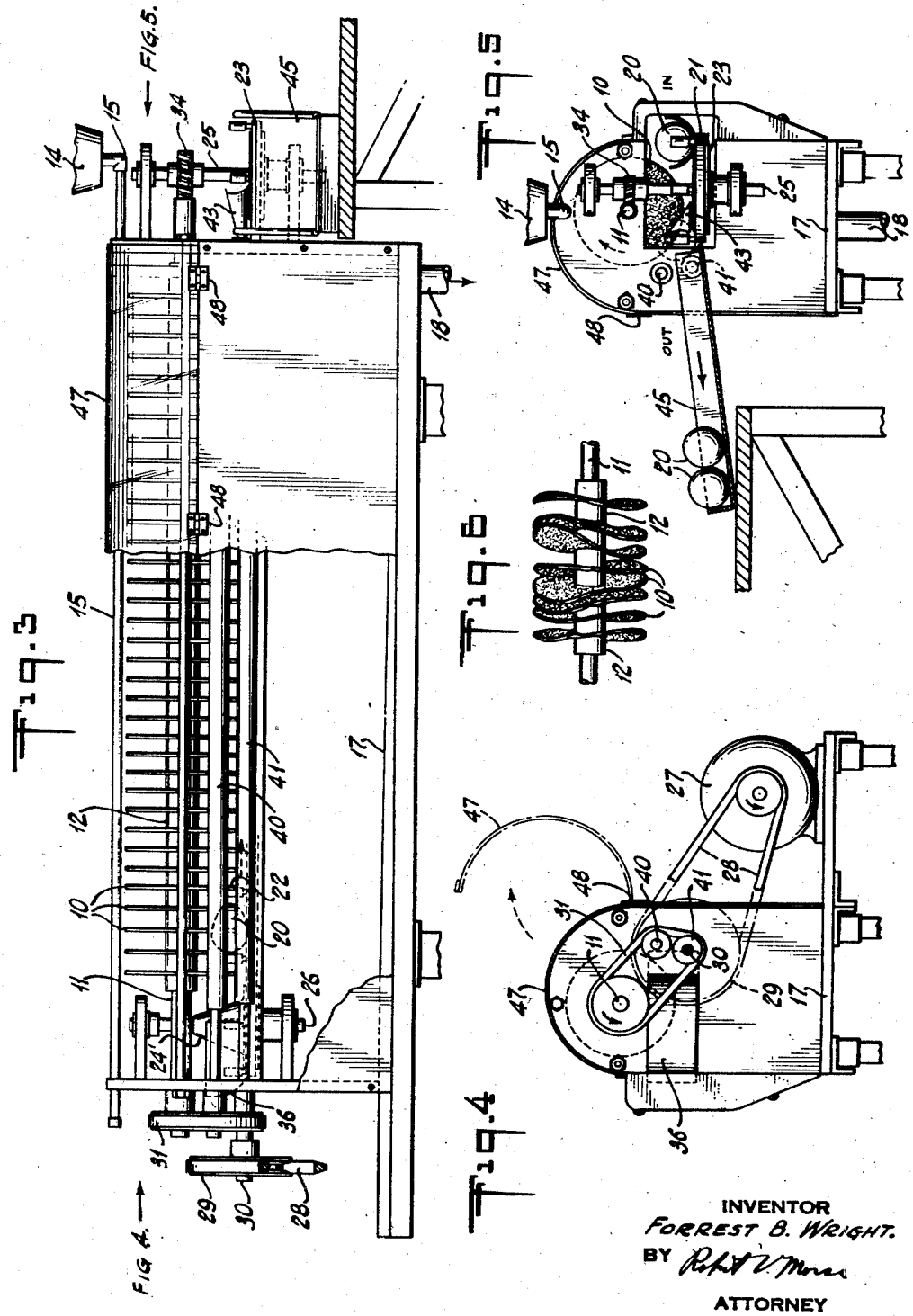
FIG. 2

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MECHANICAL EGG WASHER WITH ROTATING DISKS

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MECHANICAL EGG WASHER WITH ROTATING DISKS

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Fig. 7

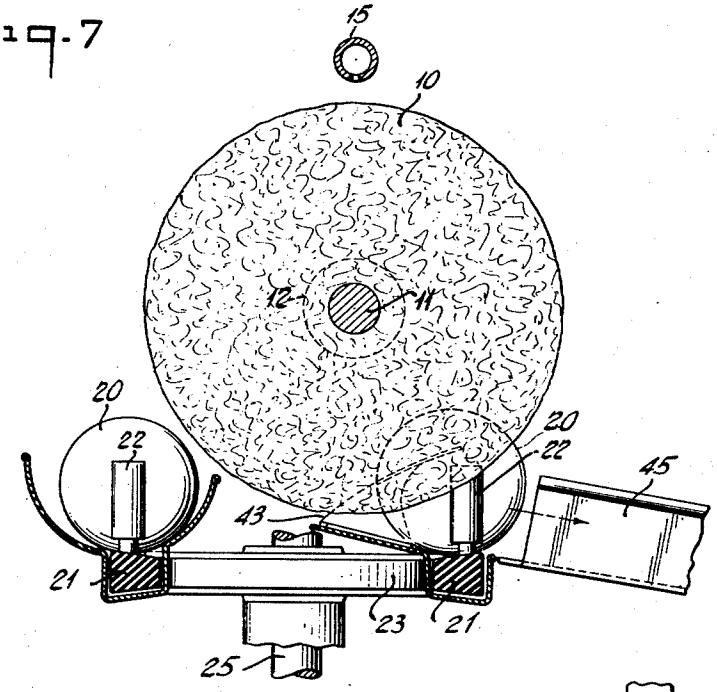
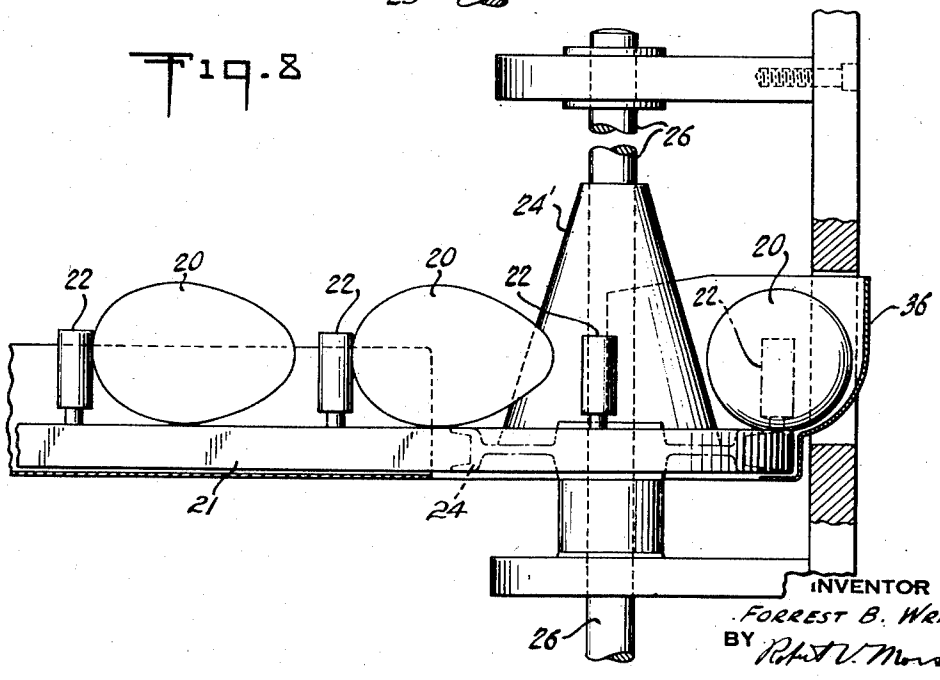


Fig. 8



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MECHANICAL EGG WASHER WITH ROTATING DISKS

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Application February 3, 1947, Serial No. 726,188

2 Claims. (Cl. 51—22)

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Eggs as collected from the nests are often dirty and require some form of cleaning before they are suitable for grading and marketing. The common method of cleaning is by hand, using some form of brush or cloth and a pail of water. This procedure is both arduous and unsanitary; the water frequently becomes dirty, and in such cases the washing may be detrimental rather than beneficial to the keeping qualities of the egg. The principal object of the present invention is to relieve the farmer of this tiresome chore, and at the same time assure an efficient cleaning under more sanitary conditions, with fresh water and continuously cleaned scrubbers. Tests have shown that proper washing does not impair the keeping qualities of eggs, and of course removes dirt and definitely unsanitary matter which otherwise might adhere.

Further objects of the present invention are to produce an automatic machine for feeding, turning and scrubbing the eggs; for protecting them from breakage; for preventing accumulations of dirt in any part of the machine or process; for guiding the eggs in and out of the mechanism; and for protecting the operator, and allowing him to serve more than one machine if desired. Additional purposes are to reduce the cost and complexity of scrubbing machines, whether used for eggs or other objects of a rotatable nature. More detailed features will become apparent as the description proceeds.

Referring now to the drawings forming part of this specification,

Fig. 1 is a top plan view of the machine with the hood open and some of the parts broken away to better show the conveyor mechanism.

Fig. 2 is a front view of the machine shown in Fig. 1 looking in the direction of the arrow marked Fig. 2 in Fig. 1, some of the parts being broken away.

Fig. 3 is a rear view of the machine with parts broken away.

Fig. 4 is an end view looking from the left as viewed in Fig. 3.

Fig. 5 is an end view looking from the right as viewed in Fig. 3.

Fig. 6 is a fragmentary view of the cleaning disks, shaft and spacers as they appear in their stationary or non-operating condition; when operating, the cleaning disks assume a more straight radial form as in Fig. 1, Fig. 2 and Fig. 3.

Fig. 7 is a detail view taken approximately on the line 7—7 of Fig. 1 showing the delivery mechanism.

Fig. 8 is a detail view of the right hand side of Fig. 2 showing the cone structure.

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Similar reference numerals refer to similar parts thruout the various views.

Referring now to Fig. 1 and Fig. 2, the principal cleaning elements of the machine consist in a series of rotatable flexible disks 10 mounted on a shaft 11 between spacing collars 12. These disks 10 are sufficiently flexible to permit an egg to pass thru their peripheral portion without breaking, and may be made of fabric, plastic, rubber or other suitable material impregnated with abrasive particles so as to form a good scrubbing surface. When the machine is at rest the disks 10 fall into various positions as shown in Fig. 6, but straighten out approximately as shown in the other views due to centrifugal force when the shaft 11 is rotating. The disks 10 are kept wet and clean while running by water from the reservoir 14 passing thru the pipe 15 and emerging thru numerous orifices to fall upon the whirling disks. The water and dirt thrown off by the disks 10 falls into a pan 17 under the machine and drains out thru the pipe 18 as shown in Fig. 2 and Fig. 3.

The eggs 20 to be cleaned are conveyed thru the yielding disks 10 by means of a belt 21 having fingers or nipples 22 attached thereto, these being of rubber or similar soft material which will not crack the eggs as they roll quite vigorously against them. The eggs 20 may be fed on to the belt 21 by an intermittent gate as is common in egg graders, or from another belt if it is a large handling plant; but where the return run of the belt is not used for any other purpose it affords a convenient place for laying in the eggs by hand to start them thru the process. This is shown at the bottom of the plan view of Fig. 1 where the belt 21 is travelling to the right. Some of the spray thrown off by the whirling disks 10 here wets the eggs and prepares them for the cleaning operation. The travel of the belt 21 is sufficiently slow so that an operator can fill one belt and then turn and fill another belt on an adjacent machine while the first is going thru. One operator can thus serve more than one machine if desired.

The belt 21 is preferably of the V type and runs between the pulleys 23 and 24 mounted on the shafts 25 and 26 respectively. Power to drive the machine may be supplied from any suitable source such as the motor 27 thru the belt 28 and wheel 29 which turns the shaft 30, from which another belt 31 turns the shaft 11 on which the cleaning disks 10 are mounted. The other end of the shaft 11 projects beyond the frame 33 and thru the spiral gearing 34 serves to turn the vertical shaft 25 on which the pulley 23 is

mounted to drive the belt 21. The belt 21 drives the other pulley 24 mounted on the shaft 26 at the other end of the frame 33.

The eggs 20 placed on the belt 21 between the fingers 22 are first carried to the right as shown in Fig. 1 and then around the pulley 24 which is provided with a conical hub 24' and a curved trough extending around the outside to guide them. This curved trough 36 is at the right in Fig. 1 and Fig. 2 and is shown on a larger scale in Fig. 8. After passing around this trough the eggs start back thru the disks 10 for the cleaning process, moving from right to left in Fig. 1. The eggs here come into direct contact with the cleaning disks 10, which must bend and yield to allow the eggs to pass thru; and as the disks are wet and whirling they toss the eggs about in various positions and scrub them thoroughly. The rotation of the disks 10 is such that the eggs tend to be thrown to the back, that is, to the upper side in the plan view of Fig. 1, and it was found that with an ordinary wall they tended to jump out of the machine, or to roll so high that they would crack. To prevent this, and also to assist in turning the eggs around in various positions to be cleaned, there are provided two rotating walls or rollers 40 and 41, both turning in the same direction, that is, downward on the side towards the eggs. These rollers 40 and 41 extend all across the back of the machine, and are seen best in Fig. 1 and in the rear view Fig. 3, as well as the end views Fig. 4 and Fig. 5. They are covered with rubber or other cushioning material and are driven by the same belt 31 that drives the disk shaft 11, as will be evident from Fig. 4. Whatever the means used to drive the rollers 40 and 41, it is important that they turn in the same direction, that is, both downward on the sides in contact with the eggs. To watch the eggs turning and tossing as they progress thru the series of cleaning disks one would expect them to crack; but extensive tests have shown such fears to be unfounded—in fact originally cracked eggs have passed thru the machine without being broken.

After the eggs have passed thru all the cleaning disks 10 and have arrived at the left hand bend of the belt in Fig. 1, they are nudged off by a deflector 43 and roll down the trough 45 for the succeeding operations, such as drying, grading or packing. They may of course feed directly into another machine where a machine process is involved. The deflector 43 is a bent piece of metal shown at the left in Fig. 1 and Fig. 2, at the right in Fig. 3, also in Fig. 5 and on a larger scale in Fig. 7. To shield the operator from the spray thrown off by the rotating disks 10 a cover 47 is provided, hinged at the back 48 and provided with a handle 49. This cover 47 is preferably of a transparent material such as glass or plastic, so that the operation can at all times be observed, and it terminates at the front above the level where the eggs are placed on the belt by the operator, so as not to interfere with the operation of the machine.

In the drawings only a few eggs have been shown so as not to obscure the elements of the mechanism, but it will be understood that in actual operation the belt is usually full of eggs so that a large number can be undergoing the scrubbing operation at the same time. This permits delivery of the washed eggs at a rapid rate.

While I have in the foregoing described certain specific forms by way of example, it will be understood that they are merely for purposes of illustration to make clear the principles of the invention, which is not limited to the particular forms shown, but is susceptible to various modifications and adaptations in different installations as will be apparent to those skilled in the art without departing from the scope of the invention as stated in the following claims:

I claim:

1. In an egg washer, the combination of a rotating shaft, a series of flexible scrubbing disks widely spaced along said shaft, the spacing being many times more than the thickness of the disk so that their outer zones are loose and free to yield radially and laterally so that an egg can move along thru the entire series of scrubbing disks without breaking, a water supply system for pouring water on the scrubbing disks and eggs to keep the disks clean and wash the eggs, a conveyor for forcing the eggs thru said series of disks from one end to the other, a rotatable backing rail whose axis of rotation is above the center of gravity of the egg, said conveyor and rail being sufficiently close to the scrubbing disks to force the bulk of the egg up in between adjacent loose disks so that its sides may be scrubbed with water as it passes thru the series of disks and the egg scrubbed by first one side and then the other side of the loose disks.

2. In an egg washer, the combination of a rotating shaft, a series of flexible scrubbing disks widely spaced along said shaft, the spacing being many times more than the thickness of the disk so that their outer zones are loose and free to yield radially and laterally so that an egg can move along thru the entire series of scrubbing disks without breaking, a water supply system for pouring water on the scrubbing disks and eggs to keep the disks clean and wash the eggs, a conveyor for forcing the eggs thru said series of disks from one end to the other, a roller shaft in normal contact with the egg and below its center of gravity, a rotatable backing rail above the roller shaft, the axis of rotation of said backing rail being above the center of gravity of the egg, said conveyor, roller shaft and backing rail being sufficiently close to the scrubbing disks to force the bulk of the egg up in between adjacent loose disks so that its sides may be scrubbed with water as it passes thru the series of disks and the egg scrubbed by first one side and then the other side of the loose disks.

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