

Oct. 21, 1930.

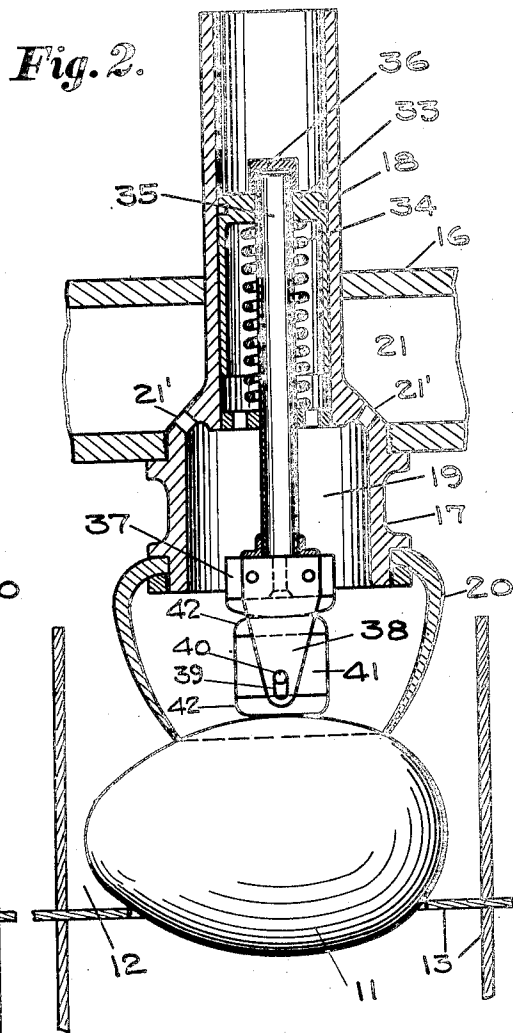
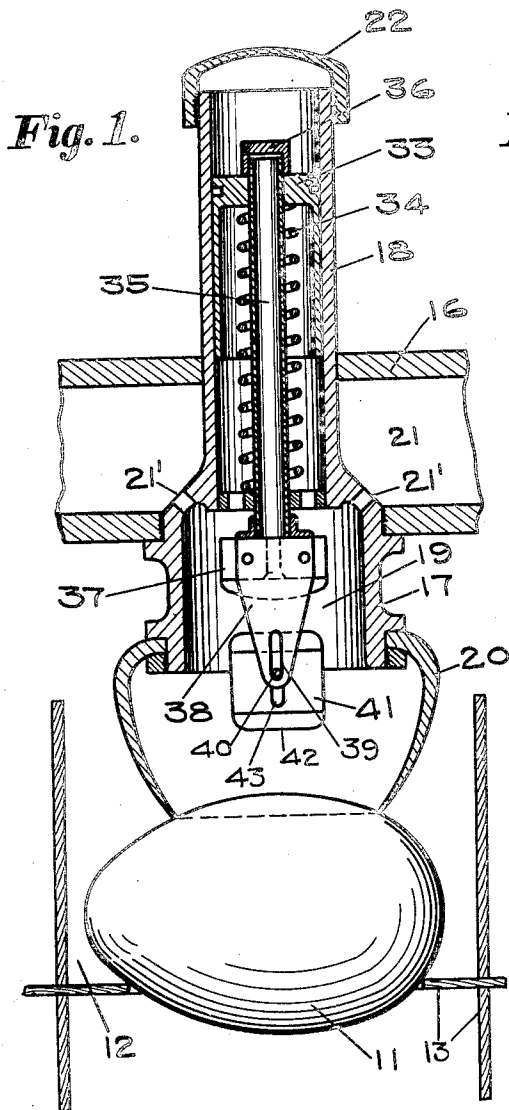
E. G. LARSEN

1,779,174

EGG HANDLING MACHINE

Filed Feb. 4, 1928

3 Sheets-Sheet 1



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Fig. 3.

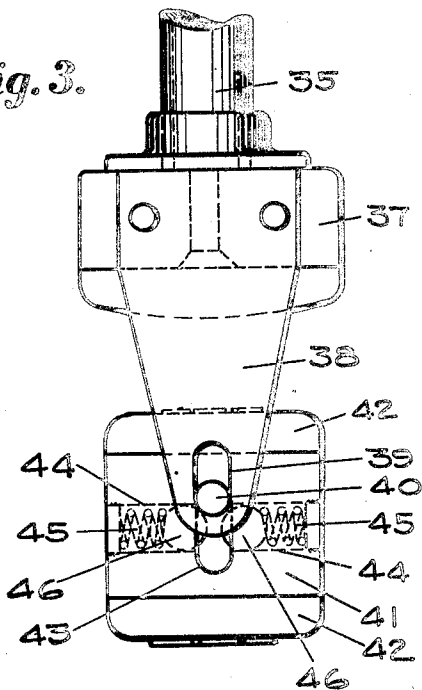


Fig. 4.

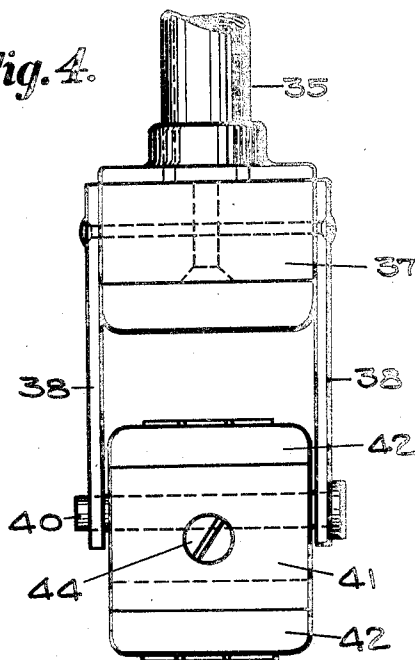


Fig. 5.

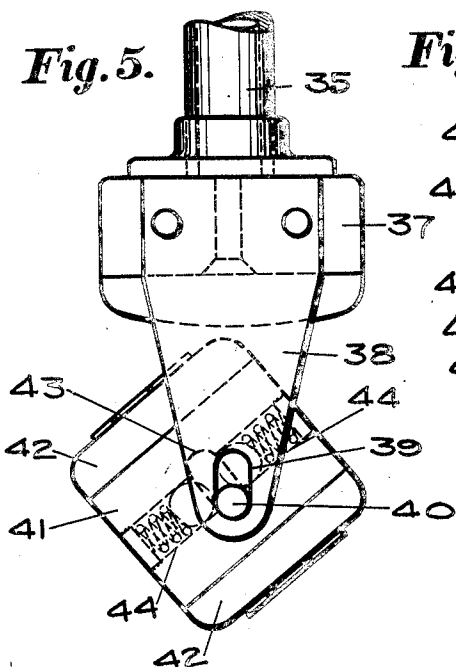
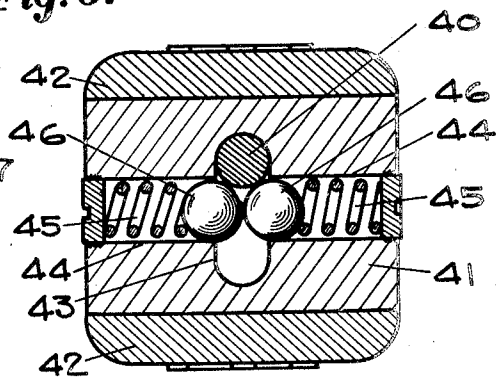


Fig. 6.



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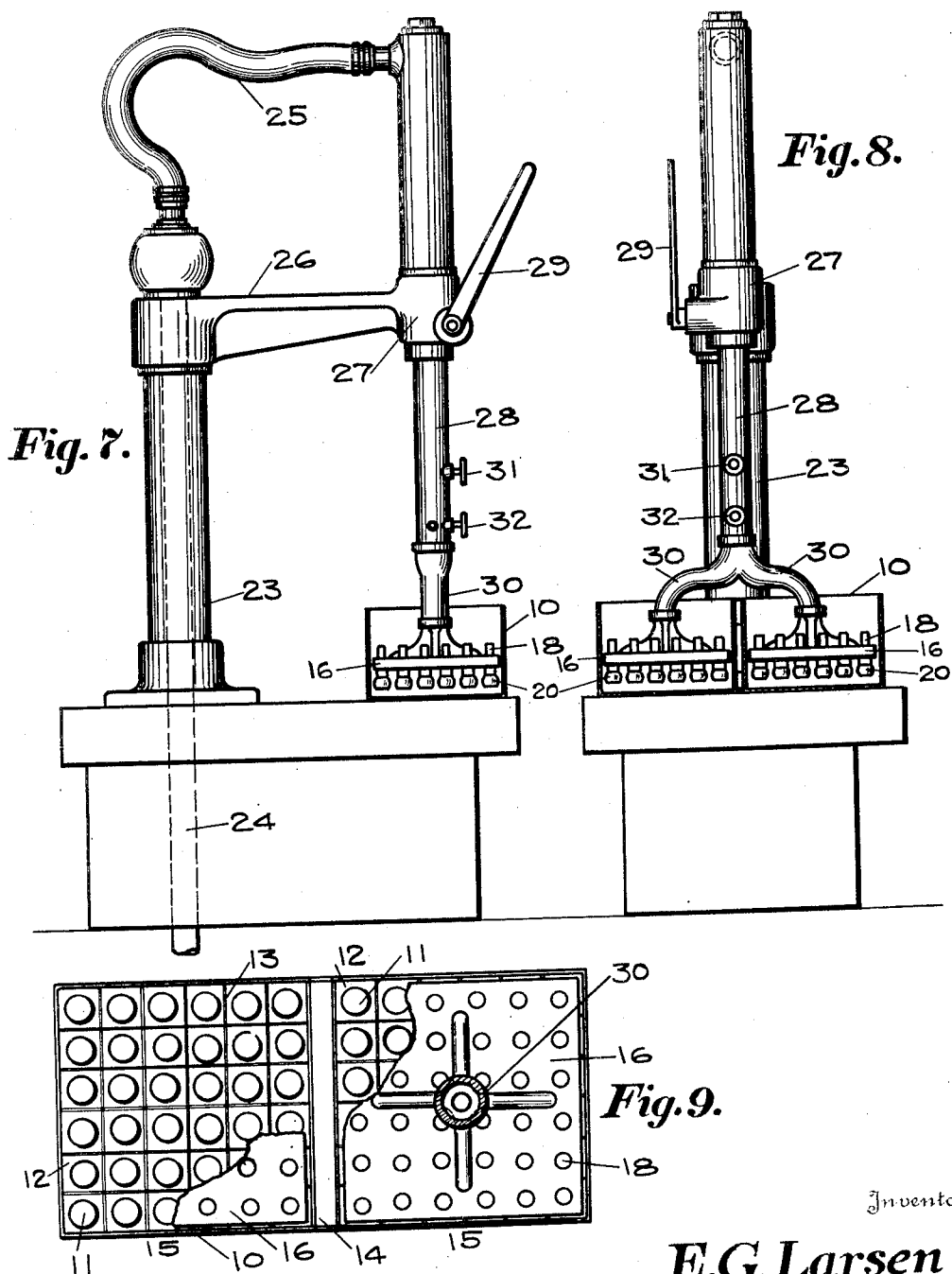
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EGG HANDLING MACHINE

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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EGG-HANDLING MACHINE

Application filed February 4, 1928. Serial No. 251,874.

This invention relates to an egg-handling machine, and has for its object, broadly, to provide such a construction that a large number of eggs may be lifted from one egg-crate and deposited in another crate or upon a candling-table without manual handling or loss of time and without causing breakage of the eggs.

In some instances and in order to comply with legal requirements it is necessary that eggs held in storage shall be separately examined or "candled" at certain intervals, and as is obvious, this work requires a considerable time if accomplished by manual handling, and often results in breakage of the eggs.

Also it is desirable in some instances to mark eggs to be shipped, stored or offered for sale by printing or stamping thereon the name of the owner, shipper or date, and this work of course requires manual handling.

The invention includes a plurality of vacuum-receptacles carried by and projecting below a support and provided with elastic suction-caps or sleeves adapted to engage and grip the convex surface of the eggs by withdrawal of air from the vacuum-receptacles, means being provided for lifting and moving the support and eggs carried thereby, and thereby avoiding manual handling. Also the invention includes means for marking each egg automatically by action of suction, the marking, printing or stamping being coincident with the action of the sleeves while gripping the eggs.

The invention is fully described herein so that its construction and operation may be readily understood and with the foregoing objects in view as well as others to be mentioned hereinafter the invention presents a new and useful construction, combination and arrangement of parts as described and claimed, and as illustrated in the accompanying drawings, it being understood that changes in form, size proportion of parts and minor details may be made as found to be of advantage, said changes being determined by the scope of the invention as claimed.

Fig. 1 is a view in longitudinal section of a vacuum-receptacle arranged for lifting

or moving eggs. Fig. 2 is a view of the same showing the parts arranged for coincidently lifting and marking the eggs.

Figs. 3, 4, 5, and 6 show enlarged details relating to marking or printing. Fig. 3 is a front or side view of a printing-block supported by the arms of an inking-pad. Fig. 4 is a view of the parts shown in Fig. 3 taken at right angles thereto. Fig. 5 is a view similar to that shown in Fig. 3, showing the printing-block swung approximately 90 degrees. Fig. 6 is a sectional view of the printing-block on an enlarged scale. Fig. 7 is a side view of an operating frame. Fig. 8 is an end view of the same. Fig. 9 is a plan view of an egg-crate, the supporting-plates for the suction-tube being broken away.

Referring now to the drawings for a more particular description, the invention is shown and described in connection with crates adapted to contain eggs in the compartments 12 formed between the strips and cross-strips 13 of cardboards. The egg crates are of conventional form, and as is well known, the eggs are disposed in horizontal layers in their compartments in the crates, said compartments generally being 72 in number for each layer. Each egg-crate is usually provided with an upright partition 14 which divides the crate equally and provides end portions 15 and therefore 36 compartments are formed for each layer at the respective sides of said partition, and it will be understood that the compartments 12 are uniformly spaced apart relative to each other.

In order that the objects may be attained as first mentioned I provide a movable support consisting of a pair of connected hollow plates or castings 16 conforming in area to the end portions 15 of said crates, means being provided as hereafter described for lowering said hollow plates into the crates or elevating them during operation as may be required.

I provide a plurality of vacuum-receptacles 17, these being disposed in uniformly spaced relation relative to each other, each being mounted in and preferably having a cylinder 18 projecting above the plate and having a chamber 19 projecting below the plate.

Numerals 20 indicate elastic caps or sleeves which are mounted on the lower open ends and project below the vacuum-receptacles, and it will be understood that if the lower edges of the sleeves 20 are disposed in engagement with the convexed shells of the eggs the latter will be securely held by action of suction if the air or a certain part thereof is withdrawn from the chambers 21 of the plates 16, apertures 21' being provided for the receptacles 17 to permit the chambers 19 to communicate with the chamber 21, closure-caps 22 being also mounted upon the open ends of the cylindrical parts 18 of the vacuum-receptacles.

Any suitable means may be provided for withdrawing air from the chambers 21 of the plates 16, and I may employ any suitable means for moving said plates. For these purposes I have shown a hollow standard 23 through which a suction-pipe 24 extends, said pipe having a flexible part or hose pipe section 25, said standard being provided with an operating arm 26 arranged to permit swinging movements therefrom.

The outer end of the arm 26 is provided with a collar 27, and slidingly and rotatably mounted in the collar is a vertical air tube or suction-pipe 28 adapted to be elevated or lowered by means of a hand-lever 29.

The lower end of the suction-tube 28 is provided with a pair of branches 30 which communicate with the chambers 21 of the plates 16. Any suitable air-pump (not shown) may be provided for pumping air from the chambers 21, the air thus pumped therefrom moving outwardly to the air-pump through the branches 30, the suction-pipe 28, the hose 25 and through the suction-pipe 24. Numeral 31 indicates a valve which is provided for the vertical suction-pipe 28, said valve being adapted to be under manual control of an operator, and when moved to open position the pump will cause removal of air from the chambers 19 and 21, and of course, when this valve is closed, suction of air from said chambers will cease. Numeral 32 indicates a relief valve which is provided for said suction-pipe 28, this last named valve being disposed between the valve 31 and branches 30, and the valve 32 may be moved to open position by an operator to permit air to pass from the atmosphere to the chambers 19 and 21 by passing through said pipe 28 and its branches 30.

As thus described it will be seen that the parts are under convenient control of an operator who may cause the arm 26 to swing horizontally on the standard 23 to dispose the hollow plates 16 above an egg-crate 10, and by use of the lever 29 the tube or pipe 28 may be moved downwardly to permit the elastic caps or sleeves 20 to engage the uppermost layer of eggs in said crate, the valves 31 and 32 at that time being closed.

The operator may then move the valve 31 to open position and by action of the air-pump (the valve 32 being closed) the eggs, by action of suction, will be securely held by the caps or sleeves 20. By use of the lever 29 the operator may elevate the suction-pipe 28 together with the eggs thus held by the elastic caps or sleeves 20, and may cause the arm 26 to swing on the standard 23 for moving the eggs to another crate or to a table for the purposes mentioned.

The eggs being released from the elastic sleeves 20 by the operator who, for that purpose, moves the relief valve 32 to open position. The operation may be repeated and by use of the parts described, eggs may be moved without danger of breakage and the work may be quickly accomplished.

For marking, stamping or printing a name, trade-mark, date or other data upon the eggs, the parts mentioned are used and are operated the same as described. However, certain other parts are employed for said marking which operate automatically, now to be described.

Numerals 33 indicate pistons which are mounted to permit sliding movements in the cylindrical parts 18 of the vacuum-receptacles 17 subject to the control of springs 34, and movable with said pistons are tubular stems 35 adapted to contain ink, one end of each stem normally being closed by a suitable cap 36, its opposite end being provided with an inking pad 37 and having a pair of arms 38 projecting beyond the pad.

The arms 38 are each provided with a slot 39, and mounted to permit sliding movements in the slots 39 are pins 40.

Numerals 41 indicate printing-blocks each being provided at two opposed sides with suitable name-plates, type or characters to represent a trade-mark or name or a date or other data as indicated at 42.

Each printing-block 41 is provided with a slot 43 opening on two opposed sides for receiving a pin 40, said slot 43 being disposed midway between the name-plates 42, said slots being disposed at right-angles to said name-plates.

Each inking-block is provided with an aperture 44 midway between and parallel with the name-plates, said aperture 44 intersecting a slot 43 at the middle of said printing-block.

Numerals 45 indicate a pair of opposed springs which are mounted in the aperture 44 of the printing-block, each spring, at its inner end being provided with a convexed contact-member or ball 46, said springs operating, normally, to maintain said members 46 in engagement.

According to the construction last described the pin 40 while disposed at one side of the balls 46 will, of course, be in non-alignment with the aperture 44, said aperture

being equi-distant from the name-plates, as mentioned, and therefore the center of gravity of the printing-block may be nearer one of the name-plates than the other, and therefore may have swinging movements in arcs of 180 degrees by action of gravity.

In operation, the suction mentioned will cause the pistons 33 to move inwardly of the chambers 19, the printing-blocks 41 being pressed against the eggs 11, one of their name-plates engaging the eggs, and their opposite name-plates engaging the inking-pads 37, said pressure causing the pins 40 in slots 39 to move upwardly in the slots 39 and 43 between the balls 46 and thereby changing the center of gravity of the inking-blocks relative to the pins 40 upon which the blocks 41 may have swinging movements.

When there is a cessation of suction in chambers 19 the pistons, by action of springs 34, together with the pads 37 and printing-blocks 41 will move upwardly, the pins 40 sliding downwardly in the slots 39 of arms 38, the printing-blocks, by action of gravity, moving a half circle, the name-plates which had previously engaged the inking-pads, by said operation, being disposed in a position to permit them to engage a layer of eggs at the next operation.

In the use of the machine for marking eggs, a crate filled with eggs is placed in such a position that the plates 16 will be disposed immediately above the end-portions 15 of the crate. The arm 26 may be swung for moving the eggs held by the suction-caps 20 to an adjacent crate to be deposited therein, the marking of the eggs, as described, being automatic, and by use of the machine as described the work may be speedily accomplished.

I claim as my invention—

An egg handling machine, comprising a standard, an arm pivotally mounted upon the standard and adapted to swing horizontally thereon, a supporting plate mounted on said arm and conforming generally to the size and configuration of a compartment of an egg crate, a plurality of vacuum receptacles mounted on said supporting plate and arranged in rows and spaced apart to correspond with the egg cells in said compartment, an elastic sleeve carried upon each receptacle and extending downwardly therefrom adapted to conform to and engage against the sides of eggs, and a flexible suction pipe connected to said receptacles for withdrawing air therefrom and from within said sleeves to bind the latter against the sides of eggs.

In testimony whereof, I have affixed my signature.

EINAR G. LARSEN.