

United States Patent

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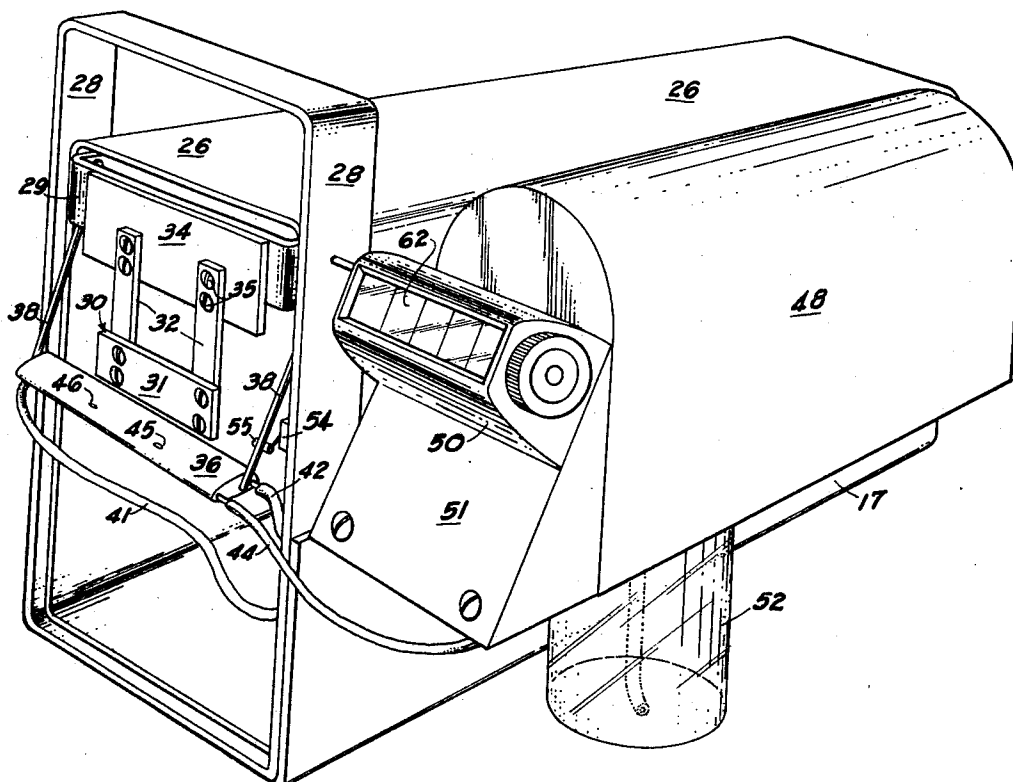
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[54] **CHICK DEBEAKING AND VACCINATING APPARATUS**
2 Claims, 4 Drawing Figs.

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A61d 17/38
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ABSTRACT: Chick treatment method and apparatus comprising a heated cauterizing element, a hollow beak receiving and support member pivotal into juxtaposition with the cauterizing element, a vaccine source, a pump connected between the vaccine source and the support member for pumping vaccine through the support member into the oral cavity of a chick, support member cooling means, a counter, and switch means responsive to the pivoting of the support member for energizing the pump and counter.



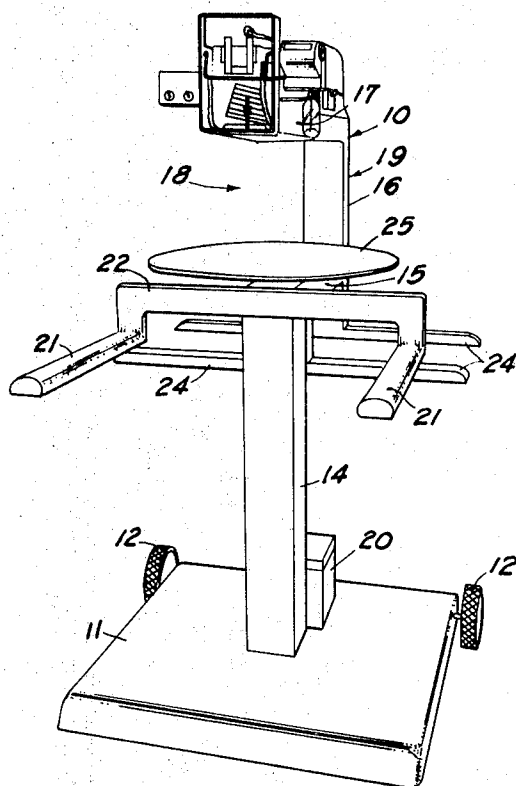


Fig. 1

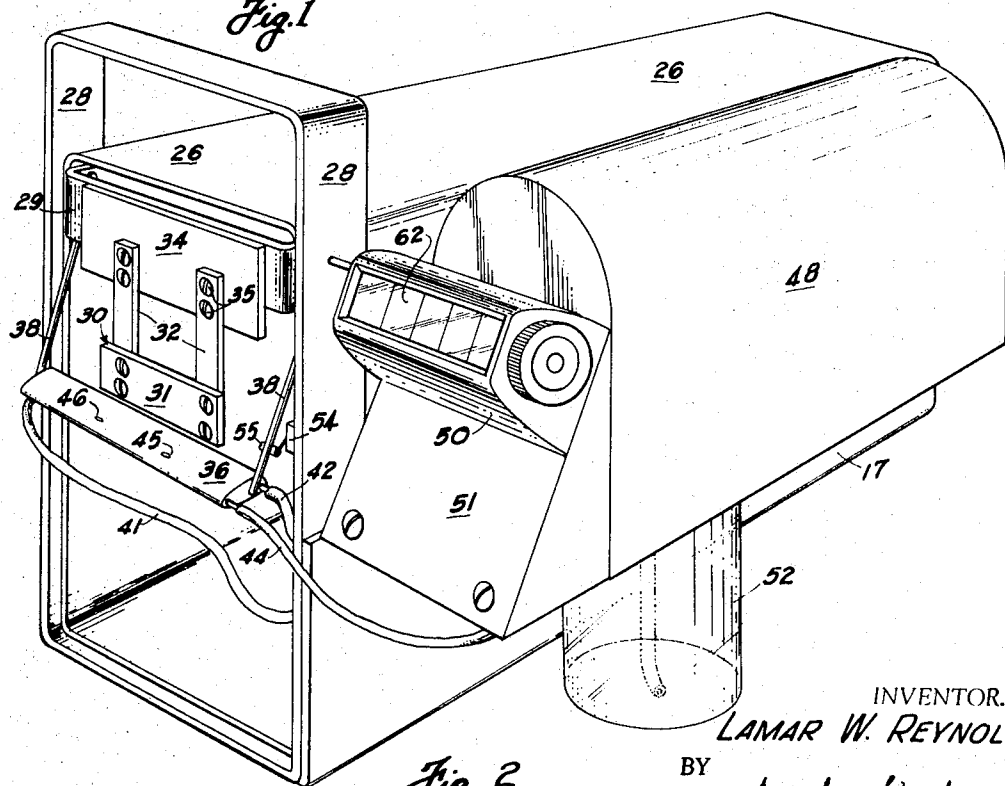
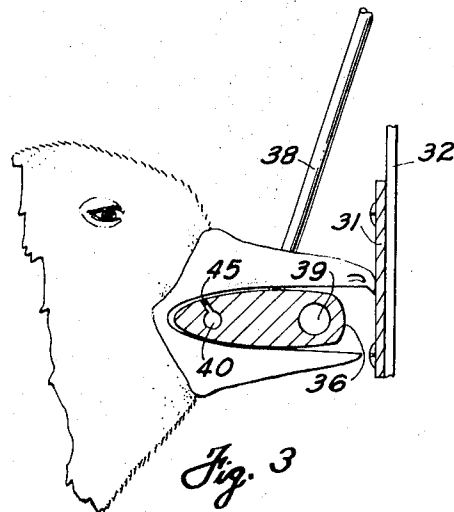


Fig. 2

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CHICK DEBEAKING AND VACCINATING APPARATUS

BACKGROUND OF THE INVENTION

In the processing of baby chicks in a hatchery, it is desirable to vaccinate each chick for the control of disease, debeak or trim the upper half of the chick's beak and count the chicks treated in this manner. The vaccination of the chicks helps to control diseases of the chicks during shipment from the hatchery and after the chicks are received by the growers so that the chicks mature into large, healthy birds. Trimming of the chicks' beak is effective to enable the chicks to feed themselves and to reduce feather removal and other injuries caused by the chicks' pecking at one another, during processing and shipment from the hatchery.

SUMMARY OF THE INVENTION

This invention comprises a chick treatment method and apparatus wherein the chicks are vaccinated, debeaked and counted in a single operation. An operator grasps a chick in each hand, places a thumb at the base of the skull of each chick and a forefinger around the base of the lower beak of each chick and gently squeezes to open their beaks. The two halves of the beak of each chick are simultaneously placed about a pivotal beak support member, over apertures defined in the beak support member. The operator then thrusts the chicks forward, to pivot the beak support member toward a heated cauterizing element. Movement of the beak support member in this manner energizes a pump which is effective to squirt vaccine through the apertures of the beak support member, into the oral cavity of each chick. The upper protruding half of the chick's beak engages the heated cauterizing element which is effective to sear and blunt the protruding beak. The beak support member is continuously cooled by circulating water so that the chick's tongue will not be burned during the operation. A counter is energized upon each depression of the beak support member so that the hatcheryman is able to determine the number of chicks treated and the effectiveness of the operator.

Accordingly, it is an object of this invention to provide a method of simultaneously vaccinating chicks and reforming the upper halves of their beaks.

Another object of this invention is to provide a method of simultaneously cauterizing the upper half of a chick's beak, vaccinating the chick, and counting the chicks so treated.

Another object of this invention is to provide apparatus for simultaneously vaccinating chicks and blunting the upper half of chicks' beaks.

Another object of this invention is to provide apparatus for the treatment of chicks which is capable of blunting the upper half of a chick's beak, vaccinating the chick, and counting the chicks so treated which is expedient and economically operated, adaptable to existing hatcheries, and is not harmful to the chicks which are treated thereby.

Other objects, features and advantages of the present invention will become apparent upon reading the following specification when taken in conjunction with the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of the chick treatment apparatus.

FIG. 2 is a partial perspective view of the apparatus housing and its associated components.

FIG. 3 is a schematic showing of the manner in which a chick is treated, showing the beak support member and cauterizing element in cross section.

FIG. 4 is a schematic diagram of the electrical circuit and the operating elements of the chick treatment apparatus.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now more particularly to the drawing, in which like numerals indicate like parts throughout the several views,

FIG. 1 shows a chick treatment apparatus 10 comprising a horizontally disposed base 11. Wheels 12 are rotatably connected to each side of base 11 adjacent one edge thereof. A support column 14 extends upwardly from the center portion of base 11, and a rearwardly extending support beam 15 is connected to the upper end of support column 14. An upwardly extending support leg 16 is connected to the rear end of rearwardly extending support beam 15, and a forwardly extending support leg 17 is connected to the upper end of upwardly extending support leg 16. Rearwardly extending support beam 15, upwardly extending support leg 16 and forwardly extending support leg 17 are joined together to form a forwardly facing C-shaped frame 19, which defines working space 18.

A liquid storage tank 20 is connected to the upper surface of base 11, to the rear of support column 14. Various support arms are attached to support column 14 and the rearwardly extending support beam 15 for the purpose of supporting boxes of chicks at a convenient working level. For instance, support arms 21 are connected together by means of base 22, and base 22 is supported from the upper end of support column 14. Support arms 21 extend forwardly of the chick treatment apparatus at approximately the level of the operator's lap. Boxes filled with chicks may be conveniently placed on support arms 21 during the operation of the chick treatment apparatus. Support arms 24 are positioned below rearwardly extending support beam 15 and extend on either side thereof. Support arms 24 can be utilized to support extra boxes of chicks.

Rearwardly extending support beam 15 supports, at its midpoint, a rotatable disc 25. Disc 25 is arranged so that it conveniently supports a box of baby chicks in working space 18. Since boxes of baby chicks are usually divided into compartments, the operator may retrieve or deposit baby chicks from the compartment of the box most closely adjacent her position while treating the chicks, and then rotate the box on disc 25 so that another compartment may be conveniently reached.

Referring now to FIGS. 2 and 4, forwardly extending support leg 17 of the chick treatment apparatus supports housing 26 which encloses the electrically activated components of the system. Housing 26 has connected thereto at its forward edge a support frame 28. A U-shaped support member 29 is connected at each of its ends to support frame 28 and cauterizing element 30 is connected to the base of U-shaped support member 29. Cauterizing element 30 comprises heater bar 31 and support bars 32 extending upwardly from heater bar 31 at each of its ends. A sheet of insulation 34 is positioned between the upper ends of support bars 32 and the base of U-shaped support member 29, and screws 35 extend through mated apertures (not shown) of support bars 32, insulation material 34 and the base of U-shaped support member 29 so that cauterizing element 30 is rigidly attached to support member 29.

Beak support member 36 is generally elliptical in cross section (FIG. 3) and extends substantially the entire width of housing 26. Beak support member 36 is connected at each of its ends to levers 38 which are pivotally received in support frame 28. Beak support member 36 is rigidly connected to levers 38 so that the longer of the elliptical axes of the beak support member is maintained so that it extends in a substantially horizontal plane, and the smaller thickness of the beak support member is disposed outwardly of housing 26.

As is best shown in FIG. 3, beak support member 36 defines a cooling conduit 39 and a vaccine conduit 40. Cooling conduit 39 extends through a major portion of the length of beak support member 36 and opens through the bottom surface of beak support member and is joined to flexible conduits 41 and 42. Conduit 42 transmits cooling fluid to cooling conduit 39 while conduit 41 allows the cooling fluid to be channeled back to the source of supply.

Vaccine conduit 40 extends through one end of beak support member 36 and is connected to flexible conduit 44. Vaccine conduit 40 opens through the surface of beak support member 36 at spaced apart apertures 45 and 46. Thus, vac-

cine can be transmitted from conduit 44 through vaccine conduit 40 of beak support member 36 and injected through apertures 45 and 46.

Pump housing 48 is connected to one side of housing 26 and encloses pump 49 (FIG. 4) of the apparatus. Counter housing 50 is connected to pump housing 48 by means of angled support member 51. Vaccine container 52 is connected to the bottom of pump housing 48 and supplies vaccine to pump 49.

Microswitch 54 is connected to support frame 28 and comprises a pivotal lever 55 positioned to be engaged and depressed by one of the pivotal levers 38 of beak support member 36. Thus, when beak support member 36 is depressed so that its levers 38 pivot about their upper ends, lever 55 of microswitch 54 will be depressed to close microswitch 54.

As is best shown in FIG. 4, a source of electricity 56 is connected to conductor 58, conductor 59, on-off switch 60, conductor 61 to microswitch 54. Microswitch 54 is connected to counter 62 through conductors 64 and 65. Counter 62 is connected to the other side of the source of electricity through conductors 66, 68 and 69. Switch 54 is also connected to solenoid 70 through conductor 71, and solenoid 70 is connected to the other side of electrical source 56 through conductors 72, 68 and 69. Thus, when switch 54 is closed, counter 62 and solenoid 70 will be energized. Heater bar 31 of cauterizing element 30 is connected to source 56 through conductors 58, 74, on-off switch 75, conductor 76, conductors 78, 79 and 69. Motor 80 is connected to source 56 through conductors 58, 74, switch 75, conductor 81, conductors 82, 79 and 69. Thus, when on-off switch 75 is closed, heater bar 31 will be heated by the flow of electricity therethrough, and motor 80 will be energized.

Motor 80 is in driving connection with pump 84, and both motor 80 and pump 84 are positioned on the lower side of base 11 (FIG. 1). Pump 84 has its inlet connected to sump 20 and its outlet connected to flexible conduit 42. Flexible conduit 42 is connected to cooling conduit 39 of beak support member 36, while flexible conduit 41 is connected between cooling conduit 39 of beak support member 36 and sump 20. Thus, pump 84 is effective to pump liquid from sump 20 through cooling conduit 39 of beak support member 36.

Vaccine container 52 is connected to the lower wall (not shown) of pump housing 48, and flexible tube 85 extends from pump 49 to the bottom surface of container 52.

Operating arm 86 of solenoid 70 is connected to piston 88 of pump 49. Thus, when solenoid 70 is energized, operating arm 86 will thrust piston 88 into pump 49 (to the left of FIG. 4). Check valve 89 is positioned in the outlet conduit of pump 49, between pump 49 and its flexible conduit 44 to permit one-way flow of liquid from pump 49.

OPERATION

When it is desired to vaccinate and shorten the upper half of the beaks of chicks, the hatcheryman places the chick treatment apparatus 10 at a convenient location in the hatchery by tilting the apparatus so that it rests only on its wheels 12 and moving the apparatus through the hatchery. The chick treatment apparatus 10 may be placed adjacent a conveyor so that support arms 21 extend over the upper flight of the conveyor belt and boxes filled with chicks may be moved down with the conveyor belt toward the apparatus 10 so that the boxes come to rest against one of the arms 21. The operator may lift the box from the conveyor and place it on disc 25, or on top of the support arms 21, as is most convenient. In the event no conveyor belt is utilized, the boxes of chicks may be transported to the vicinity of the chick treatment apparatus and the operator may handle the boxes as desired. Support arms 21 provide a convenient horizontal surface upon which boxes may be rested, immediately below the working space 18. Disc 25, which forms the lower surface of working space 18, provides a rotatable platform upon which boxes of chicks may be placed, at the convenience of the operator. Extra storage space is provided by the laterally extending support arms 24. Extra boxes

of chicks may be positioned on these support arms by the operator's coworkers so that a new supply of chicks is readily available to the operator.

Switches 60 and 75 (FIG. 4) are closed to activate the system. The closing of switch 75 causes heater bar 31 to become hot and activates motor 80 so that a continuous circulation of cooling water is maintained through cooling conduit 39 of beak support member 36. When switch 60 is closed, the subsequent closing of switch 54 will actuate counter 62 and solenoid 70.

The operator grasps a chick in each hand, places her thumbs at the base of the skull of each chick, and gently presses the lower portion or base of the jaw bone of the chick with her forefinger to force the beak of the chick open. The operator then thrusts the open beak over the beak support member 36, so that the lower and upper portions of the beak extend on the lower and upper surfaces, respectively, of the beak support member 36. The upper beaks of the chicks are positioned over apertures 45 and 46 of beak support member 36, and the chicks are thrust toward heater bar 31 of cauterizing element 30. As the chicks are thrust toward cauterizing element 30, beak support member 36 pivots about the upper ends of levers 38. This pivotal movement guides the upper half of the chicks' beaks toward heater bar 31. When the upper half of the chicks' beaks engage the heater bar, the heat from the heater bar sears and deforms the pointed portion of the upper half of the beak so that it is blunted and shortened.

As beak support member 36 is pivoted, one of its levers 38 engages lever 55 of microswitch 54 so that a circuit is made to counter 62 and solenoid 70. Flexible conduit 85 of vaccine container 52 is connected to the inlet of pump 49 and check valve 89 permits one-way flow of liquid through pump 49. Thus, when solenoid 70 is energized, piston 88 of pump 49 will be thrust into its pumping chamber, thus exerting a pressure through check valve 89, flexible conduit 44, through vaccine conduit 40 of beak support member 36, and out through apertures 45 and 46 defined in beak support member 36. When beak support member 36 is allowed to pivot in the opposite direction by removing the chicks therefrom, switch 54 will be opened and solenoid 70 deenergized. The deenergizing of solenoid 70 allows piston 88 to be withdrawn from its pumping chamber. Since check valve 89 permits flow of liquid only in the direction toward beak support member 36 from pump 49, the space vacated in pump 49 by its piston 88 is occupied by a new source of vaccine flowing up through tube 85 into pump 49. Thus, pump 49 becomes primed and ready for another cycle.

When switch 54 is closed by the pivotal movement of beak support member 36, counter 62 is energized to record the movement. Since two apertures, apertures 45 and 46, are present in beak support member 36 for the simultaneous vaccination of two chicks, counter 62 is adjustable so that it can be adapted to count by twos.

During the above described operation, heater bar 31 is maintained at a predetermined temperature as calibrated by its resistance and the voltage applied thereto so that the chicks' beak is heated to a temperature sufficient for reforming or blunting the beak but not heated so high as to injure the chick. Moreover, the continuous operation of motor 80 causes pump 84 to continuously circulate cooling water through cooling conduit 39 of beak support member 36 and beak support member 36 is maintained at a temperature well below that of heater bar 31. This permits the chick to be treated by the heater bar 31 without burning of the chick's tongue or the remaining portions of the chick's beak.

At this point, it should be apparent that means are provided for simultaneously vaccinating a pair of chicks and blunting the upper halves of each of the chick's beaks. Also, the number of chicks treated by the apparatus is recorded by counter 62 so that the hatcheryman can maintain accurate records of the operation. Rotatable disc 25 and support arms 21 and 24 provide convenient means by which the boxes filled with chicks may be manipulated. Furthermore, the portability

of the apparatus is such that it is easily utilized on conjunction with a conveyor line for various other loading and stacking apparatus. The characteristics of pump 49 are such that a measured amount of vaccine is injected into the oral cavity of each chick on each operation, and the simultaneous blunting of the upper half of each chick's beak with the insertion of vaccine into the oral cavity is such that each chick is only handled one time to minimize shock to the chick and to expedite the necessary treatments usually made by the hatcheryman.

I claim:

1. Apparatus for treating chicks comprising a horizontally extending base, a support member extending upwardly from said base, a rotatable platform mounted on said support member, a heated member positioned above said platform, guide means movable toward and away from said heated member, liquid injecting means connected to said guide means, cooling means for cooling said guide means, and recording means for recording the movement of said guide means.

2. In an apparatus for treating chicks comprising, in combination:

a. a vertically extending support means having guide means

movably mounted thereon and detailed for separating the upper and lower halves of the chick's beak and for moving the beak through a prescribed path in a to and fro generally horizontal direction;

- b. a heated beak forming member rigidly supported on said supporting means and intersecting said prescribed path for contacting and forming by searing said upper half of said chick's beak in response to movement through said prescribed path;
- c. liquid injecting means connecting to said guide means for injecting a vaccine liquid into the oral cavity of the chick's mouth in response to movement of said guide means through said prescribed path;
- d. cooling means operatively associated with said movable guide means for passing a cooling media through said movable guide means during the beak forming operation; and
- e. recording means operatively associated with said movable guide means for effecting a recording of each movement of said movable guide means through said prescribed half.

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