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AUTOMATIC WEIGHING AND SORTING MACHINE

Filed Dec. 31, 1946

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My invention relates to improvements in automatic weighing and sorting machines for poultry, especially, although not necessarily.

The primary object of the invention is to provide an efficient, simply constructed machine adapted for substantially continuous operation to weigh and sort by weight chickens, turkeys, ducks, and other poultry for shipment, cold storage, or other purposes.

Another object is to provide a machine of the character and for the purposes set forth which is accurate, comparatively inexpensive to manufacture, install and operate, and which will not readily get out of order as the result of prolonged use.

Other and subordinate objects, also comprehended by my invention, together with the precise nature of my improvements, and the manifold advantages thereof will be readily understood when the succeeding description and claims are read with reference to the drawings accompanying and forming part of this specification.

In said drawings:

Figure 1 is a view in plan, partly broken away, of my improved automatic weighing and sorting machine in a preferred embodiment thereof.

Figure 2 is a view in side elevation looking at the weighing and sorting side of the machine.

Figure 3 is a view in vertical transverse section taken on the line 3—3 of Figure 1.

Figure 4 is a fragmentary view in vertical transverse section taken on the line 4—4 of Figure 2 and drawn to a larger scale.

Figure 5 is a fragmentary view in side elevation illustrating one of the carriages with the trolley wheels positioned on one of the track bridging sections.

Figure 6 is a view in vertical section taken on the line 5—5 of Figure 4.

Refraining now to the drawings by numerals, my improved automatic weighing and sorting machine, in the illustrated, preferred embodiment thereof, comprises a frame structure including a horizontal, endless top conveyor supporting rail 7 of elliptical form, generally, and which may be of any suitable length and width and is preferably of angle bar construction. Transverse angle bars 8 brace the conveyor supporting rail 7 adjacent the ends thereof, and similar transverse bars 9 intermediate said bars 8, the bars 8 and 9 being equidistantly spaced apart longitudinally of said rail 7 for a purpose presently seen. Longitudinal, central brace bars 10 extend between the ends 8 and the ends of said rail 7.

Pairs of legs, preferably angle bars, support the transverse bars 8, 9 and are spaced apart equidistantly upon opposite sides of the longitudinal center of said rail 7, with the upper ends thereof suitably connected to said bars 8, 9 in inwardly offset relation to the sides of said rail 7 so that said rail at its sides overhangs said legs 11, as well as at its ends, for a purpose presently clear.

A track supporting, endless, rail-bar 16 of the same shape as said rail 7, but relatively smaller, is suitably fixed in horizontal position to the legs 11 below said rail and in centered relation thereto. Lateral bracket arms 13 outstanding from said rail bar 12 carry on the outer ends thereof a bevelled edge, rigid track 14 of the same shape as said rail 7 and which is vertically aligned with said rail and provided on one side of the machine, hereinafter referred to as the weighing and sorting side, with gaps 15 therein intermediate the legs 11 on the designated side of the machine.

An endless, brace rail 16 of the same shape as said rail 7 and said bar 12, and of substantially the same size as said bar is suitably fixed in horizontal position to the legs 11 intermediate said rail bar 16 and the lower ends of the legs. A pair of end legs 17 at the ends of said bar 12 and said rail 16 depend from the brace bars 10 and additionally support the rails 7, 16 and said bar 12. The described brace rail 16, together with the pairs of legs 11, form transverse stalls 18 open on both sides of the machine and each centered below one of the described gaps 15 for a purpose presently explained.

Bar-like track-bridging sections 19 of bevel edge form, are fitted endwise in the gaps 15 for vertical movement in said gaps, said sections 19 forming front cross ends on transverse scale beams 20 extending from the weighing and sorting side of the machine toward the other side thereof in between pairs of the legs 11 and in the transverse centers of the gaps 15. The scale beams 20 are mounted adjacent said sections 19 to rock vertically in upstanding, bifurcated bearing brackets 21 co-planar with said beams and suitably fixed to the rail bar 12. The scale beams 20 are provided with knife-edge bearing 22, rocking on the upper ends of said bearing brackets 21. The usual graduations, as at 23, indicating pounds and fractions thereof are provided on the scale beams 20 and the usual counterweights 24. Suitably arranged channel stops 25 in which the rear ends of the scale beams 20 play, limit vertical swinging of said beams.

A plurality of trolley carriages 26 are provided to run on the track 14 and the track-bridging.
Each carriage 26 comprises, preferably, a substantially rectangular, forked, yoke 27 with depending end arms 28, and a top, relatively narrower hanger plate 29 upwardly in the vertical center of the yoke 27 and connected thereto by a lateral hanger plate 30 extending from the top of said yoke. The hanger plate 29 is formed with a top wheel housing 31 of inverted channel shape. A pair of grooved trolley wheels 32 are suitably mounted in the wheel housing 31 to rotate on the track 14 and the track-bridging sections 19. The trolley wheels 32 are spaced apart so as to both ride on said sections 19 at the same time.

As best shown in Figure 4, the trolley wheels 32 suspend the yokes 27 of the carriages 26 in vertical position to travel endwise beneath the track 14 and the track-bridging sections 19 above the stairs 18. The yoke 27 of each carriage 26 supports thereon a trough-like shelf 33 pivotally mounted, as at 34, between the lower ends of the conveyor supporting rail 7 and the conveyor supporting rail 1 and the conveyor supporting rail 21, respectively, about an axis parallel to the direction of travel of the conveyor, the arrangement being such that in the normal position of the shelf 33, the open side thereof faces forwardly of the weightin. g and sorting side of the machine, and said shelf is normally overbalanced to swing, under the influence of gravity, downwardly and forwardly into inverted dumping position, open side lowermost.

Coacting devices are provided on each carriage 26 and shelf 33 for releasably locking the shelf 33 in normal position, said devices comprising a rigid dog 35 extending laterally from the shelf 33 through the yoke 27, an upwarding trip pin 36 vertically slidably in a lug 37 on the yoke 27 into dog locking and releasing positions, respectively, and a horizontal pin raising arm 35 to which the upper end of said pin 36 is connected by a pin and slot 39, 40, said arm having a front end pivoted, as at 41, to a bifurcated post 42 upwardly from the yoke 27, and said arm having a free end 43 adapted to be raised to swing the arm upwardly. Adjustable screws 44 are extended upwardly through the bases of the bearing brackets 21, opposite the tractive centers of the track-bridging sections 19, and are adapted to be engaged by the free ends 43 of the pin raising arms 35 when the carriages 26 are lowered, in a manner to be described.

An endless conveyor chain 45 extends around the conveyor supporting rail 7 and is trained around sprocket wheels 46 rotatable on studs 47 upstanding from lateral edges 48 on said rail and which are spaced apart, around said rail and sidewise supporting the conveyor chain 45.

An endless conveyor chain 45, of any suitable type, is bolted, as at 50, to a brace 51 extending between adjacent brace bars 52, 53. The motor 49 is arranged with its armature shaft 52 vertical and operatively connected by a speed reducing belt and pulley drive 55 to a vertical shaft 54 suitably journaled in the conveyor supporting rail 7 and provided with a driving sprocket wheel 55 arranged in driving engagement with the conveyor chain 45. Any suitable and usual controls, not shown, may be provided for the motor 49 so that the motor may be connected in any usual manner to a source of electrical energy.

Vertically extensible couplings are provided between the conveyor chain 45 and the carriages 26 in the form of U-shaped links 55 straddling said conveyor chain with one end rigidly connected thereto, as at 51, and the other ends thereof journaled on and sidewise along upward- ing studs 50 provided on the wheel housings 31 of said carriages 26.

Wheeled trucks 58 with open top bodies 60 are provided for wheeling into and out of the stalls 18 on the floor or other base on which the macine is installed.

Referring now to the use and operation of the described invention, the scale beams 20 are over- balanced by counterweights 24 along the same so that said beams swing in one direction, counterclockwise as viewed in Figures 3 and 4, to elevate the track-bridging sections 19 in the gaps 15, and so that weights of different weights placed in the shelves 33 of the carriages 26 will overbalance said beams 20 to swing in the opposite direction, i.e., clockwise as viewed in Figures 3 and 4. The stops 25 limit such movement of the scale beams 20 in both directions. In the limit of movement of said scale beam 20, counterclockwise, the track-bridging sections 19 are aligned with the track 14 and levelling section 20, whereas, in the limit of movement of the scale beams 20 clockwise, said sections 19 are lowered slightly as shown for instance in Figure 6. With the trucks 58 wheeled into the stalls 18, under the path of travel of the motor 49 driving the conveyor chain 45, the shelves 33 may be loaded with fowls from the side of the machine opposite the weighing and sorting side, and such fowls carried by the carriages 26 around to the weighing and sorting side of the machine. As soon as the trolley wheels 32 of the carriages 26 ride onto the track-bridging sections 19 of the scale beams 20 adapted to be overbalanced, clockwise, by the weight of the fowl on the carriage shelf 33, such over-balancing of the scale beams 20 occurs and the carriages 26 are lowered sufficiently to engage the free ends of the pin raising arms 38 with the screws 44 so that said arms will be swung upwardly and the trip pins 36 raised to free the dogs 35. As soon as said dogs 35 are freed, the weight of the fowls will cause the shelves 33 to swing into inverted dumping position, shown in dotted lines in Figure 3, so as to deposit the fowls in the appropriate trucks 59. When the fowls are thus deposited in the trucks 58, the emptied shelves 33 may be swung manually back into normal position to engage the dogs 35, and the trip pins 36 so as to lock the shelves 33 in normal position, the carriages 26 having been raised in a manner which will be understood, when the fowls were dumped, so as to position the parts for camming engagement of the dogs 25 with said trip pins. The manner in which the emptied shelves 33 may be reloaded or refilled will be clear. Obviously, the shelves 33 may be loaded either at the side of the machine opposite the weighing and sorting side, or at the ends of the machine. Or both sides of the machine may be used, the fowls are sorted by weight in truck loads by operation of the machine in the manner described.

The foregoing, it is believed, suffices to impart a clear understanding of my invention, without further explanation.

Manifestly, the invention, as described, is susceptible of modification without departing from the inventive concept, and right is herein reserved to such modifications as fall within the scope of the appended claims.
What I claim is:

1. In a machine of the class described, an endless substantially elliptical conveyor chain power-driven and disposed in a horizontal plane, a similarly shaped and disposed supporting rail for said chain, a similarly shaped track disposed in the horizontal plane below said chain and rail and centered relative thereto, an elongated supporting frame for said rail and track having transversely arranged stalls formed therein along its length below said track and open at one side of said frame, said chain, rail and track extending outwardly beyond the frame and said stalls, load-weighing means comprising depressible track sections in said track opposite said stalls at said side of the frame, load-conveying carriages suspended from said track to travel around said stalls onto said sections for lowering thereon to depress the same under the weight of a load and thereby weigh said load at said side of the frame and opposite said stalls, operating connections between said chain and carriages extensible vertically to provide for lowering of said carriages while connected to said chain, self-dumping load supports on said carriages, means to cause dumping of said supports as said carriages are lowered opposite said stalls, and means in the stalls for receiving the contents of the dumped supports.

2. In a machine of the class described, an endless substantially elliptical conveyor chain power-driven and disposed in a horizontal plane, a similarly shaped and disposed supporting rail for said chain, a similarly shaped track disposed in the horizontal plane below said chain and rail and centered relative thereto, an elongated supporting frame for said rail and track having transversely arranged stalls formed therein along its length below said track and open at one side of the frame, said chain, rail and track extending outwardly beyond said frame and stalls, load-conveying carriages suspended from said track to travel around said stalls, load-weighing means interposed in said track and providing for lowering of said carriages to weigh the load at said side of the frame and opposite said stalls, operating connections between said carriages and chain constructed and arranged to provide for lowering of the carriages while connected to the chain, self-dumping supports on said carriages, means to cause dumping of said supports as said carriages are lowered opposite said stalls, and means in said stalls for receiving the contents of the dumped supports.

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