

New Machine Automates Broiler Coop Handling

SCENES: Receiving dock of a commercial poultry processing plant. Contaminated dust. Off odors. Heat, rain, or freezing winds, whatever the climate may offer.

SCENARIO: Eight to ten men are unloading trucks, tossing coops of live poultry onto conveyors which move the coops into the processing plant. Every hour workers manually move 1,000 75-pound coops - 12,000 chickens - to meet a quota.

What makes this a bad scene? Unhealthy human environment and bruised birds.

Improvement is on the way. A new chicken coop unstacking machine, the first component of a mechanized coop handling system, has been developed by agricultural engineer Albert D. Shackelford and engineering technician John Holladay at the Richard B. Russell Agricultural Research Center in Athens,

Ga. Unlike some proposed semi-mechanical systems, the unit is expected to be adaptable to most processing semi-mechanical systems, the unit is expected to be adaptable to most processing operations. The Center is part of USDA's Agricultural Research Service.

In 1973, per capita consumption of chicken totaled 41.4 pounds including 37.7 pounds of broilers. Retail broiler sales totaled \$5 billion. But before the country-fried chicken meets the mashed potatoes on the consumer's table, the live bird must be transported from broiler house to processing plant in coops stacked on live haul trucks.

Individual coops must be safely unstacked from coops stacked up to 11 high on the truck and then set on a conveyor. At an average of 12 birds per coop (10 per coop during hot summer months, up to 16 during cold winter months), a 6,000-bird-per-hour processing plant requires 500 coops of chicken per hour. Two workers may handle this load. The distances between the coop stacks on the truck and the conveyor are not great - 2 to 8 feet, depending on the location of the crates on the truck. The distance tempts workers to toss the coops onto the conveyor, bruising the chickens, perhaps causing them to be condemned, or at best, downgrading the dressed product. Coops dropped or thrown off the truck onto the conveyor are also damaged. Because of an inherently poor working environment and the heavy labor involved, workers are increasingly difficult to find and to keep. Both conditions

constitute a serious major problem to the poultry processing industry; it must turn to mechanization and automation, researchers say.

The new unstacking machine works like this: A squeeze lift removes a stack of full crates from the haul truck and places it on a conveyor. The conveyor moves the load of crates to an elevator which raises the stack to the top of a tower. Then the top crate is picked up by a series of pneumatic tires and chains and transferred to a second conveyor which takes it to the area where the birds are to be removed and hung on the kill line.

A prototype of engineer Shackelford's design has been installed at a processing plant near Gainesville, Ga., for testing under commercial operating conditions. Based on test results, the unit is capable of handling 12,000 coops per hour with a labor saving potential of 3 to 4 workers. Bruising of live birds and damaging of coops are greatly reduced. Im-

portantly, the equipment relieves employees of manual handling of coops.

A powered feed conveyor supplies stacks of standard 10-inch coops to the unstacking tower on demand. Controls on the unit supply one stack of coops into the tower and at the same time position another stack at the entrance for quick transfer to the tower. The coops are moved toward the tower by powered drag chains which travel the length of the conveyor.

An integral part of the unstacker is the tower conveyor; it positions a stack of coops on the lift platform. The lift platform, which supports and elevates a stack of coops, is raised and lowered by a powered ball bearing screw; it is driven by a 2-horsepower motor equipped with a fail-safe brake to stop the lift platform at control points. Total cycle time from bottom to top and return is less than 20 seconds.

"The unit is simple to construct, it's rugged and reliable even in a dusty atmosphere, and it is not

costly or difficult to operate," said Mr. Shackelford. "It handles damaged crates and stacks that get out of alignment, plastic and wooden coops, and mixed stacks."

Are there any limitations? Mr. Shackelford finds no major ones. "The conveyor stores six stacks of six crates at present, if that is a limitation. But there's no reason to believe a longer conveyor or a higher tower couldn't be constructed to increase coop storage and production rates."

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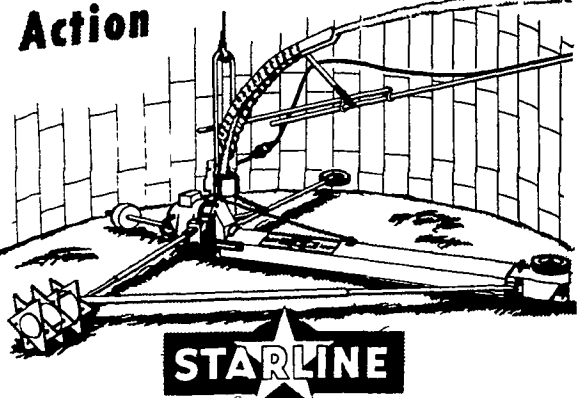
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