### REVIEW OF SAMUEL STRAPPING SYSTEMS' AUTOMATED BALE BAGGING SYSTEM -JENGLO<sup>™</sup> MODEL 90 Norman O. Penegar Samuel Strapping Systems Cartersville, GA

# <u>Abstract</u>

Current bale packaging/bale bagging methods are labor intensive and can impact the gin's productivity thus potentially limiting overall capacity upstream of the baler. Typically, three (3) to six (6) individuals are employed seasonally per shift to perform the tasks of completing the bale packaging process once cotton bales are pressed in the gin baler. The total labor compliment employed for these positions is variable and is principally based on average hourly output of ginning capacities within the plant and experience in hiring and retaining labor. Costs for these seasonal employees continue to increase overall and turnover is often high. To address this labor situation in the final phase of preparing bales for shipment or warehousing, an automated system has been commercialized with functional features to reduce the required labor in this area from as many as six (6) employees to one (1) per shift using approved bale bags.

#### Introduction To Automating Bale Packaging

Currently, employed laborers process bales once out of the bale press, essentially using the same methods as developed in conjunction with the advent of the Universal Density Bale approximately 40 years ago.

Acquiring, training, drug testing, E-verifying and retaining labor for a gin's production period presents gin owners and managers with annual staffing concerns. Those concerns are further exacerbated by a growing universe of more complex sets of rules and regulations imposed at the State and Federal levels applicable to gin employee labor.

To address these concerns and to investigate the viability of a system to mitigate these costs, etc., a prototype system was designed and installed at a Texas gin (United Farm Industries, Plainview, TX) having a capacity of up to 55 bales per hour for production use beginning with the 2008 crop. With some design modifications, this system continued in production use for years 2009, 2010, and 2011.

Coupled with the gin's P600 Strapping System installed on the gin's bale press in 2006, labor has been reduced from six (6) to one (1) employees per shift. To date, ten (10) systems of this design, employing its unique technologies, have been sold and installed to mitigate the challenges gins face to hire seasonal labor formerly required.

Therefore, design and development objectives for the Samuel Jenglo<sup>™</sup> Model 90 Automated Bale Bagging System were focused and met its criteria of reducing the gin's annual labor compliment to one (1) person per shift and to replace 40 year old labor intensive methods.

# Methods Of And Results Of Automating Bale Packaging

In recent years, ginning capacities have continued to increase through technologies to control cost by marrying the module feeders to downstream systems aimed at reducing gin run days, energy consumption costs and responding to growers desire to monetize the harvested crop as soon as possible.

The capacity of the Jenglo<sup>™</sup> Model 90 Bale Bagging System design was targeted on high hourly throughput rates to match changes occurring to increase output and, at the same time, to fit into existing floor space occupied by conventional manual bagging methods.

The Jenglo<sup>™</sup> Model 90 Automated Bale Bagging System incorporates automated features, in this order:

- 1. Convey bales from the bale press into the system.
- 2. Automatically pull required sample or samples from the top and bottom sides of the bale.
- 3. Automatically retrieve approved bags supplied on pallets containing 400 bags each.
- 4. Automatically insert bales into bags at rates to process more than 75 bales per hour.
- 5. Automatically fold and secure each bag's open end.

- 6. Discharge bales onto an internally mounted scale to dispatch weight to the gin's existing data collection system.
- 7. Exits bales for labeling/tagging on a two (2) strand chain conveyor. An optional bale position device orients bales for operator to easily apply labels to either side.
- 8. Bales are then moved forward to be up ended and pushed into lift truck pickup position.

With labor reduced to one (1) operator per shift on this end of the plant, cost savings can provide a compelling return on investment and match current and future capacities of the gin without adding employees.

Duties for the one (1) employee would include overseeing the bale press operations, collecting lint samples from the system's locker box, replenishing bale bag supplies and apply labels to finished bales.

### <u>Summary</u>

The Jenglo<sup>TM</sup> Model 90 Bale Bagging System incorporates the current and highest levels of safety standards applicable to machinery. Plus, Ethernet communication technology is used to maximize wiring simplicity, its reliability and the system monitoring capacities to simplify diagnostics.

To date the Jenglo<sup>™</sup> Model 90 system is capable of using approved woven polypropylene bags which are the dominate type used for U.S. cotton bales. Bags for use in the bagger are available through and sold by Samuel Strapping systems.

In conclusion, four (4) years of operating the system have been proven to deliver cost of labor reductions and other associated benefits such as providing some limitation to liability exposure from accidents or personnel injury complaints.