INVESTIGATION OF SEPARATION OF USABLE FIBERS ADDED TO CONTAMINANTS DURING CLEANING COTTON

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Abstract: *Lint cleaners were developed specifically for removing leaf particles, motes, grass, and bark that remain in cotton after seed cotton cleaning, extracting, and ginning. They were developed and improved in conjunction with the transition from manual to mechanized harvesting of cotton during the 1980's. Virtually all gins in the Agriculture of Uzbekistan have lint-cleaning facilities, and over four-fifths of the gins have two or more stages of lint leaning The lint cleaners now being marketed are of two general types, flow-through air type and controlled- batt saw type.*

Objective: *Modern gin stands are equipped with both overhead and gravity mooting systems. The seals on the overhead mooting system, whether dropper wheel or roller type, should be kept in good condition. In some gins, pressure is maintained in the overhead mooting chamber, and the system will not operate properly if the seals leak excessively. Honeydew and green, wet lint sometimes cause motes to be sticky and build up on the mooting bars, wiper flights, and roller seals. Such a buildup drastically reduces mooting system effectiveness. Under extreme conditions the buildup will cause choke in the gin ribs. The gin saws should be stopped and the power locked out before cleaning the mooting system.*

Methods. *A profitable cotton crop includes two basic components: high yield and high-quality lint. Good season-long cultural practices are associated with high yields, and timely cultural practices also complement harvest preparation. A well-fruited, uniform crop begins with an early, uniform stand of vigorous plants and with early season insect control.*

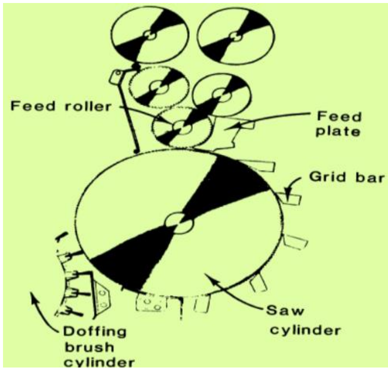
Results. *Study results provide useful guidelines on how storage variables affect quality. These results clearly show that, while it is impossible to predict precisely how storage variables will affect quality, guidelines for safe, effective storage are useful.*

Conclusion: *Studying foreign technologies will motivate us to improve our existing technologies. Studying the design of Linter device in foreign technology and applying ourselves in our technology will lead to the improvement of lint quality.*

Keywords: *Linter, controlled-batt saw, saws, quality, cleaner, ginning, rollers, feed-roller, grid bar, condenser screen drum, brush, batt, doffing brush cylinder, feed plate, vane-axial fan*

Introduction

The controlled-batt saw cleaner is now the most common lint cleaner in the ginning Industry. Lint from the gin stand or another lint cleaner is formed into a batt on a condenser screen drum. The batt is then fed through one or more sets of compression rollers, passed between a very closely fitted feed roller and feed plate or bar, and fed onto a saw cylinder (fig.1). Each set of compression rollers rotates slightly faster than the preceding set and causes some thinning of the batt. The feed roller and plate grip the batt so that a combing action takes place as the saw teeth seize the fibers; the feed plate clears the saw by about one-sixteenth inch. The teeth of the saw cylinder convey the fibers to the discharge point. While the fibers are on the saw cylinder, which may be 12-24 inches in diameter, they are cleaned by a combination of centrifugal force, scrubbing action between saw cylinder and grid bars, and gravity assisted by an air current. The fibers may be doffed from the saw teeth by a revolving brush (figs.2 and 3) or air suction. When brush doffing, the tip speed of the brush should be 1.5-2.0 times the tip speed of the saw. The principal features and settings of saw lint cleaners used in most gins are given in table 1, and their recommended installations and power requirements are given in table 2.



Methods. There have various constructions in foreign enterprises. An important factor in the operation of the cleaner is the condition of the batt as it is fed to the saws. If the batt is thicker on one side of the condenser drum or if it is too thin or broken, the lint cleaner will not operate properly.

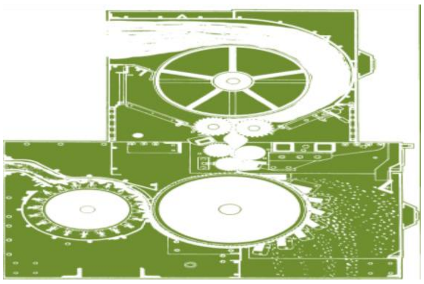


Figure 1. Feed works of a controlled-batt saw lint cleaner (Clean master lint cleaner, courtesy of Continental Eagle Corporation)

Figure 2. Unit controlled-batt saw lint cleaner with brush doffing (Lummus model 86 or 108 lint cleaner, courtesy of Lummus Corporation)

Figure 3. Unit controlled- batt saw lint cleaner (Continental model 24-D Golden Eagle lint cleaner, courtesy of Continental Eagle Corporation)

Results. The following results were seen and compared with our own technologies

Table 1. Principal features and settings of saw lint cleaners

№	Manufacturer and make	Saw diameter (inches)	Saw speed (rpm)	Grid Bars (number)	Feed-roller Diameter (inches)	Settings			
						Feed plate to saws (inch)	Feed roller to feed plate (inches)	Grid bar to saw (inches)	Doffing system
1	Consolidated HGM Corp Multisaw Super 86 inch Top saw	16	1,220	7	4-1/2	5/64	0.010-inch, floating spring load	0.030	Brush, 18-inch diameter
2	Bottom saw	24	1,040	6				0.042	
3	Super 66 inch	16	1,200	7	4-1/2	5/64	0.010-inch, floating spring load	0.030	Brush, 18-inch diameter
4	Continental Eagle Corp. Sixteen D								
5	66 inches	16	1,214	5	4-7/16	3/32	0.010-inch, spring loaded	1/16	Do
6	94 inches	16	1,214	5	4-7/16	3/32	do	1/16	Do
7	Lummus Corporation								
8	Model 66	16	800-1,200[2]	6	4	1/16	0.005 inch, floating spri	1/32	Brush, 15-inch diamet

							ng loaded		er
9	Model 86	16	800-1200[2]	6	5-3/8	1/16	….do….	….do ….	Do
0	Model 108	16	800-1200[2]	6	5-3/8	1/16	….do….	….do ….	Do

Do= ditto
1. All makes of machinery have a 1/16-inch feed roller-to-saw setting
2. a speed of 1,000 rpm is most common

Table 2. Power requirements and recommended installation of saw lint cleaners

№	Make	Condenser Diameter (inches)	Axial-flow fan		Horsepower	Recommended installation	Capacity (bales/hr)
			Horse power	Type and size[1]			
Consolidated HGM Corp.							
1	Multisaw Super 86 inch	50	15; 25	V.A., 29 V.A., 36	5., feedworks; 40, stipped cotton ., picked cotton	Single unit or battery unit or as a second stage	8-10
2	Super inch	50	10-15	C.A., 42	….25….		5-7
3	Super 86 inch	50	15; 25	V.A., 29 V.A., 36	5. feedworks; 30,no fan; 40, with fan	…..do….	8-10
Continental Eagle Crop.							
4	Sixteen D: 66 inch	24	5 per unit	V.A.,26	….15…	Unit behind each gin stand, single and tandem	8

5	94 inch	24	10 or 20	V.A., 26 single or tandem	….30….	…..do….	12
6	Constellation	50	5 -20	V.A., 42"	30	Battery unit or tandem.	12
7	Super Constel	50	Two 5-20	V.A., 42"	Two30's	Battery unit or tandem, split stream.	24
8	Lummus Corporation						
	Model 66	24	3-20 as required	V.A., 18", per machine; V.A., 24 ", per two machines.	…15…	Behind each gin stand, single and tandem or split stream.	4-6 per machine 2-3 when split
	Model 66	24	…do ….	…do….	…15-20..	Battery units, single and split stream.	4-6 per machine
	Model 86	30	10-30 as required	V.A., 24", per single or double machine.	30 per machine	Behind each gin stand, single and tandem, or split stream.	6-10 per machine

	Model	30	…do ….	…do… .	…do….	Battery units, single and split stream.	6-10 per machine 3 to 4-1/2 when split

Conclusion. Poor batt conditions can also cause chokes and may damage the equipment. A good batt can be obtained only by having the proper air balance between the gin stand, the condenser, the duct fan, and lint flue. Axial or vane-axial fans, often referred to as clean-air fans, are usually used to discharge air from lint cleaner condensers. If high-efficiency cyclones are required for air pollution control, centrifugal fans should be used to overcome

the additional static pressure.

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