

CIRCOT Leaflet No. 65

CIRCOT AUTO-GROOVER – AN ESSENTIAL TOOL FOR GINNING INDUSTRY



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Introduction

Roller gins are the most popular ginning machines used in India. During continuous operation of the rollers the surface of the grooved leather gets smoothen due to friction between the roller and the knife. The grooving of the rollers after every 16 to 20 working hours is necessary to increase the surface roughness so that the lint adheres to the roller at a faster rate. Since grooving is done manually with a hacksaw in the industry, the grooves are not uniform. The depth and breadth of the grooves also vary from roller to roller and from operator to operator. Besides, manual grooving requires an hour to groove a roller spirally. This job is laborious and many a times, the grooving is not done at the right time. This not only affects the productivity of ginning machine but also damages the roller and reduces its longevity.

CIRCOT Development

An auto-grooving machine has been developed to cut helical grooves on the roller. The machine consists of main frame, head stock, tail stock and a cutter assembly mounted on a movable trolley. The rotary motion of the roller, forward motion of the trolley and the rotary motion of the saw blade cutter was synchronized with a suitable drive. With this mechanism as the roller completes 270° rotation, the cutter assembly moves forward by the length of the roller. A mechanism consisting of a screw shaft and a handle arrangement for adjusting the depth of groove on the roller has been provided. A chuck on a spindle with an indexing arrangement is provided for making consecutive helical grooves at a set distance parallel to one another.

Performance

The CIRCOT Auto-groover can groove the ginning roller in ten minutes with 18 grooves on it. The equally spaced grooves of uniform depth and breadth of 2 mm can be cut with precision and accuracy. The salient advantages of the machine are given below :

- ◆ It is a fully automatic grooving machine
- ◆ The rotary motion of the roller, forward motion of the trolley and the rotary motion of the saw blade cutter were perfectly synchronized

Specifications

| | |
|---|---------------|
| Cutter blade diameter (mm) | 100 |
| Cutter blade thickness (mm) | 1.5 |
| Cutter blade speed (rpm) | 1400 |
| Trolley size (m x m) | 0.66 x 0.35 |
| Power required to drive cutter blade (HP) | 1 |
| Power required to drive the roller and trolley (HP) | 1 |
| Capacity of machine (rollers/hr) | 6 |
| Number of groves per roller | 18 |
| Number of operators | 1 |
| Weight of the machine (kg) | 500 |
| Overall size of the machine (m) | 2 x 0.6 x 0.7 |

- ◆ It makes helical grooves on the roller
- ◆ Equally spaced grooves of uniform depth and breadth can be cut with precision and accuracy
- ◆ Re-grooving on the same impression even at reduced roller diameter can be carried out
- ◆ It avoids the drudgery involved in manual grooving operation
- ◆ Ten minutes are required to groove a single roller
- ◆ Timely, accurate and precise grooving increase the gin productivity
- ◆ It reduces gin machine downtime resulting in increased production
- ◆ Preserves the fibre and seed quality
- ◆ Increases the durability of the roller
- ◆ Easy to operate and ensures operator safety
- ◆ Reduce manpower requirement

Utility

CIRCOT Auto-groover machine can successfully replace the existing manual method of grooving and will avoid the drudgery involved in this operation. This machine is an useful tool for the cotton ginning industry.

Licencee

The licence to manufacture the auto-groover machine is awarded to M/s Raji Electricals & Engineering, P/22 /7 Hingna MIDC, Nagpur-440028.



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