“DZ” High Speed Comber of Howa's Pattern No.3

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Introduction

“DZ” high speed comber of Howa's Pattern No. 3 is acknowledgedly an improvement on the Nasmith type comber in these respects, among others:

- (1) Increase of speed to as high as 140 nips.
- (2) Ability to feed heavier laps.
- (3) Production of high quality combed slivers.
- (4) Simplicity of mechanism and accuracy of movement.
- (5) Being easy to erect and handle.

Fig. 1. The general view of “DZ” High Speed Comber of How's Pattern No.3.

Features:

The special features of this machine and salient aspects of its make-up, classified according to purposes, may be set forth as follows:

1. For Increase of Speed to 140 Nips.

(a) The number of gear teeth for gearing and the curvature of the cam have been drastically changed. Hitherto, there has been a big impact force on the cam at the turning point between the back-and-forth movements of the detaching roller, thus wearing out the cam heavily at the turning point.

This defect is eliminated because a smooth curvature is given to the cam and also because the cam is made of high quality cast iron containing nickel, chrome and low carbon. In the gearing assembly, too, special steel is used to reduce the weight of the gear and the force on the cam to a minimum.

(b) The movement of the detaching roller is adjustable by the change wheel used in the detaching roller gearing. This adjustment considerably improves the piecing of wave laps and obviates the need to increase the movement of the detaching

roller more than is necessary.

(c) The brush shaft of the conventional machine is driven directly from the end of the driving shaft through the carrier wheel. Consequently, the meshing of the brush encroaches upon the cylinder and imposes a heavy load upon the cylinder shaft, which load receives a shock by the back-rush of the gears of the head stock and the shock extends to the detaching cam.

The new machine is equipped with a counter shaft between the brush and the cylinder shaft. From the counter shaft the brush shaft is driven by a silent chain, so that the machine runs smoothly and noiselessly.

(d) The back top detaching roller is equipped with a spring weight, instead of a dead weight as in the conventional machine. This reduces the vibration-induced irregularity of weighting considerably, as shown by Figure 2.

(e) The air stripping apparatus—a new device—installed between the cylinder and the brush keeps the brush-generated air from disturbing fiber fleece which issues from the detaching roller.

Fig. 2. Spring weighting for back top detaching roller.

2. For High Quality Combed Sliver

(f) The nipper has been modified by shortening the projection of the nipper knife from the cushion plate to 1/64 inch. This brings the nip-point of the nipper and the needles closer to each other. This simple alteration improves combing action measurably. The feed roller is placed closer to the nip point of the detaching roller, thus reducing the

amount of floating fibers which enter the detaching roller. The cushion plate is reinforced to prevent the strain and to enable the feeding of heavier laps.

(g) The nipper brush fixed to the nipper knife prevents the rolling-up of nipped tufts during combing.

(h) The back-and-forth movements of the nipper have been modified by slowing down the forward movement somewhat for smooth piecing. The backward movement is so designed that, when it reaches its end, it practically stops and, therefore, comes closest to the cylinder. This means that almost all rows of needles pass through the nipper tuft, thereby giving complete combing and smooth piecing.

(i) The draw box has 4 over 5 drafting rollers, each equipped with Ermen's clearer at top and bottom.

Fig. 3. Table assembly and combing part.

3. For Simplicity of Mechanism and Accuracy of Movement:

(j) The stop motion is electrical. Low-voltage electricity is used to avoid all danger of fire and personal hazards to the operative.

The stop motion as well as the alarm signal is given by the closing of the circuit in cases where:

(1) Fed laps on the corrugated feed roller are exhausted.

(2) Slivers on the table calender roller are broken because cotton has wrapped round the feed roller or the detaching roller.

(3) Slivers jam the table trumpet.

(4) Cotton has wrapped round the rollers of the draw box.

(5) Slivers are broken before going to the coiler.

(6) Cans have been filled with slivers.

(k) The main parts of this machine are divided into three units: (1) the head stock, (2) the coiler head with the draw box and (3) the total assembly. The head and draw box are wholly covered with sheet iron covers to reduce dust accumulation inside the heads to a very small amount. The covers can be opened wide for easy adjustment of the cam. The head end and the coiler head can be delivered complete. This facilitates erection in the mill.

(l) The machine is low enough in height to

Fig. 4. 4-over-5 drafting rollers.

make a large lap-package 18 inches in diameter without the necessity of increasing the height of the creel. The frame, roller beam, etc. are rigid enough for the machine to be driven vibration-free even at a high speed.

(m) The fan is placed in the center of the machine and driven separately by an independent motor. The air from the fan is discharged into a duct, or collector box, from which filtered air can return to the room.

As the fan is far removed from the head end, the accumulation of waste cotton in the head end is reduced to a minimum.

The dust collector is always kept clean by the revolving rubber clearer. Collected waste can be easily removed from the dust collector. The entire dust-collecting apparatus is placed under the roller beam, and the air flows in the same direction as the longitudinal direction of the machine. This precludes any ill effect on spinning.

(n) Each bearing is centrally lubricated. Needle bearings are used on the roller brushes. Ball-bearings or oil-sintered metals are used in all places where smooth running is required, or where loads are imposed, and in all otherwise important places. This reduces power consumption and facilitates maintenance and operation.

Fig. 5. Motor drive in the head end.