RECENT DEVELOPMENTS IN CARDING

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Introduction

In response to our customers changing needs, Crosrol pursues a policy of continuous product development.

Since it's introduction in 1991, the MK5 card has undergone progressive evolution. The latest model, the MK5C represents a significant advance in short staple carding performance.

Discussion

Engineering improvements now facilitate cylinder speeds in excess of 770 rpm and delivery speeds of up to 400 meters/minute, releasing the full potential of the MK5 card's unique design and construction. Production rates achieved in full scale mill operations are as much as 70% higher than were possible in the earlier MK5A.

These large increases in productivity have been achieved without detriment to yarn or fabric quality.

For example:

India, 30's combed cotton yarn		
Thin	0	
Thick	20	
Nep	28	}From the MK5C at 50 kgs/hr
Total	48	
Mill Standard		
Thin	0	
Thick	23	
Nep	45	}From existing cards at 30 kgs/hr
Total	68	
Mexico, 20's Open end yarn from a single passage of drawframe		
Thin	56	
Thick	171	
Nep	166	}From the MK5C at 85 kgs/hr
Total	393	
Mill Standard		
Thin	56	
Thick	195	
Nep	158	}From MK5B tandem cards at 65 kgs/hr
Total	409	

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Fibre losses from the MK5C are significantly lower than from other high production cards. Operating experience has shown savings of up to 2.5% in raw materials.

At today's values, over a ten year period (which is now taken as being an acceptable lifespan of a card) a saving of 164,000 GBP or 278,000 USD or DM 483,000 in raw material costs per card can be realised.

The innovative design changes incorporated into the MK5C, proved by prolonged full scale mill evaluation, make it possible to obtain production rates well in excess of 100 kgs/hr.

The chute feed now has integrated control from the card management system, giving better inter-relationship between the feed and delivery.
The proven single taker-in concept, now incorporates a new patented pinned combing segment which delivers an unmatched combination of ultra-high productivity with maximum raw material yield.

See Fig 1 - Proven Single-takerin Concept.

The pinned segment gently opens fibre tufts, without fragmenting trash particles or increasing fibre breakage. By maximising yields, loss of spinnable fibre, inherent in many systems, is minimised.

A revised feed plate and metallic wired covered feedroller give better tuft control and more effective pre-opening, permitting much higher takerin speeds without fibre damage.

Higher takerin speeds are electronically adjustable from the card management system, facilitating optimum selection of takerin tuft size, fibre transfer from the takerin to cylinder as well as maximum effectiveness of the mote knife.

This advanced takerin design reduces tuft size sufficiently to permit the release of entrapped trash whilst preserving the basic tuft structure, sustaining sufficient inter-fibre cohesion for proper fibre presentation to the cylinder.

This facilitates the optimum interaction between cylinder and flats for maximum carding efficiency. The takerin wire is now made of ceramic coated high carbon steel, giving much greater wire life (as much as 10 fold) coupled with less aggressive action at ultra high speeds.

The increased takerin wire life allows for much better synchronisation of card clothing maintenance schedules whilst sustaining consistent carding quality.

See Fig 2 - Equalisation of Carding Elements

The cylinder section has been extensively revised. Strengthened stationary card elements and improved

revolving flats now facilitate cylinder speeds of over 770 rpm.

The stationary carding elements are now spring loaded to maintain consistent close settings.

See Fig 3 - Stationary Carding Elements

Hardened steel trashknife extractor blades, give extended life and improved selectivity in the size and quantity of particles extracted.

Special metallic wire treatment to the cylinder wire also promises longer life and more consistant carding quality with reduced downtime.

The new waste extraction system is now maintenance free, giving fully effective removal of flat strip waste and trashknife waste without operator intervention. This is achieved whilst reducing the filtration requirement by 10% as well as a reduction of 20% in compressed air consumption. The undercard cleaning system now includes the doffer region. Dirty waste is separated from the spinnable waste.

The stripping roller wire with its redesigned profile and finish ensures that delivery speeds of 400 meters per minute are attainable. The revised web belt take off system carries the web forward to the tongue and groove rollers where long term autolevelling takes place.

The sensing roller zone has been redesigned to enable trouble-free running and reduced cleaning.

The unique Crosrol closed-loop mid-term autoleveller is now standard, controlling sliver irregularity at wavelengths as short as one meter. The mid-term leveller senses variation in torque at the takerin and adjusts the feedroll accordingly. By re-sensing after the correction point (at the tongue and groove roller) the system continuously monitors its own performance, providing the inherent stability of the closed loop system.

See Fig 4 - Crosrol Autolevellers

The coiler is now belt driven to give low noise levels and minimum maintenance. It is also balanced for smooth high speed running. Ease of access and ergonomics have been improved for easier piecening.

Conclusions

All of the above result in the MK5C being the biggest step forward in carding technology since the introduction of the groundbreaking MK4.

Crosrol believe it is the most cost effective card ever produced.

See Fig 5 - MK5C

Figures and Tables

Figure 1. Proven Single-takerin Concept

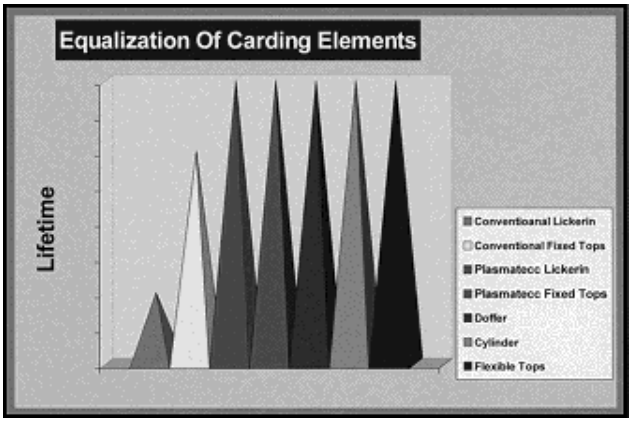

Figure 2. Equalisation of Carding Elements

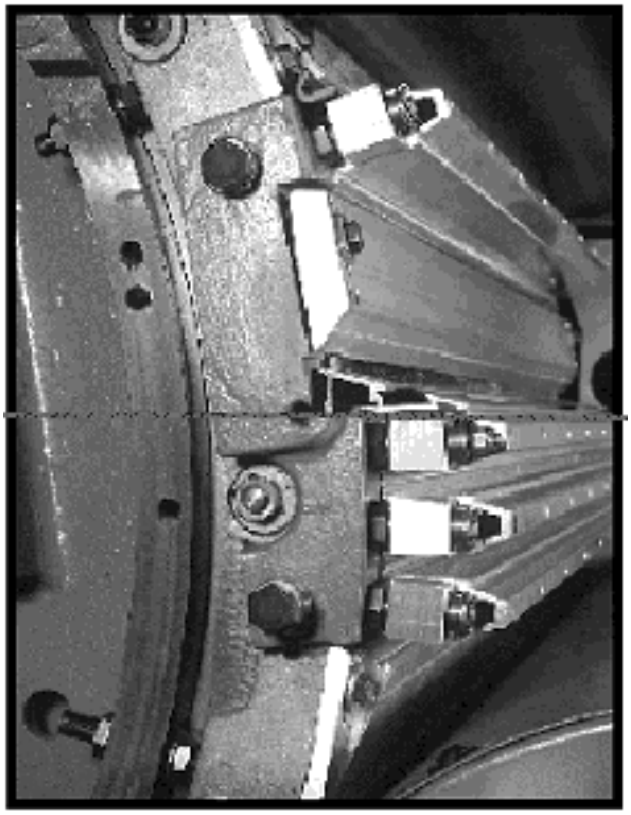

Figure 3. Stationary Carding Elements

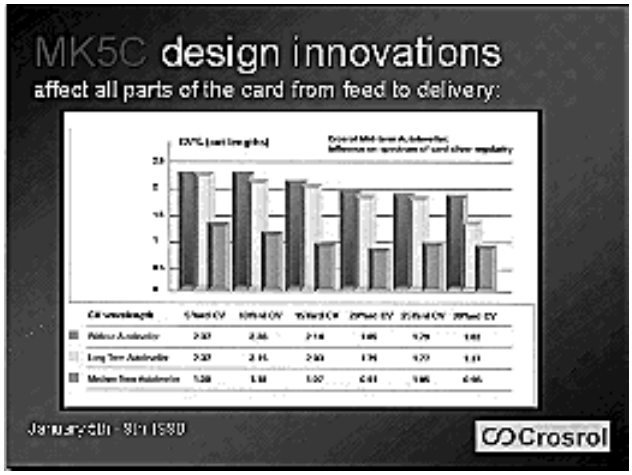

Figure 4. Crosrol Autolevellers

Figure 5. MK5C