SHORT FIBERS CARDING

This operation is performed on the cards.
Carding objectives are:

- Separate and break up the fibers.
- Mix the fibers.
- Remove impurities from the fibers.
- Delete neps formed in the opening and cleaning.
- Formation of a ribbon to feed to following machines.
The carding machine consists of several parts, whose specific functions are independent of each other, but strongly related to form a joint, where all the parts are required to perform efficient operation of carding.

The carding machine is divided into the following work areas:

1 – Fiber supply:

The introduction of the fibers in the carding machine, is made using a fiber feeder (1).

From there, the fibers are sent to another element called charging silo (2), which forms the first agglomeration on fibers.

From the air separator, the fibers are sent uniformly and continuously around the roller (5) to another silo, where they form a second set of finer fibers.

The feeder system is divided into several stages, allowing the fibers are fed uniformly and continuously to the following parts of the carding machine.
2 – Feed the fiber opening unit:

Regular and uniform feeding, carrying the fibers formed in the air outlet combs self-cleaning. The fiber opening unit is performed by a system comprising:

- **Feed roller (1);**
- **Feeder table (2);**
- **Measuring arm (3).**

The fibers are sent to the feed roller, and are compressed continuously with the feeding table. Springs are in contact with the feeding table, and attached to the measuring arm that ensures a supply regular and uniform fibers, at time that the first opening roller (5) is stopped.
The feed system drive opening, performs the additional function of controlling feeding to the main machine part, which is where the operation takes place carding.

This feed system, is equipped with an electronic device usually metal detection or large particles in the fiber tufts. The machine stops when detecting this type of elements.

3 – Fiber opening unit:

The opening unit, is formed by three opening rollers, which are positioned behind one another.

The fibers are treated carefully, in order to achieve a high degree of separation.

Opening rollers are coated with a layer of theet, whose size gradually increases from the first roller (1) to the third (3). The speed of the rollers also increases from the first to third roller.

The function of the first opening roller, is drawn the fibers forward between the spring elements and the feed roller of the feed unit.

The second and third opening rollers, performs the separation of the fibers, and form a uniform thin veil, that will pass to the master cylinder.
The type of coverage to the third opening roller and the master cylinder, are symmetrical, and the speed of the master cylinder, is greater than the opening roller. This allows the fibers to be transferred from the opening unit to the carding unit.

4 – The carding unit:

Fibers taken from the third opening roller by the master cylinder or large cylinder, are transported to the part where they are in contact with the flats, which because they move slower and have fittings in the opposite direction to the main cylinder, performs carding operation.
5 – Liberation veil and ribbon formation:

The veil is removed by the carding doffer (1) by the roller (2), which has a special fitting on small barbs, which causes the fibers to be passed to it.
A guide plate (3), sends the veil to the crushing rollers (4), where the fibers are compacted. Guiding bridge veil (5) serves to support the same, especially when running at high speed.

The veil is then directed to the formation area of the ribbon (6), which is reduced by a funnel (7) to form the ribbon. It then passes between two calender rolls (8), which is compress, so that containers can be stored, and easily removed.

At the output of the card the ribbon is stored in a boat, that can be cylindrical or rectangular as shown in the following figure.
The cards can have automatic control systems of ribbon linear mass produced. These regulators can be of two types: **long and short**.

1. **Long term adjustment.**

The mechanism works on the feeding card, from mass variations detected in the output ribbon. Corrects variations from 25 m length of sliver analyzed.

2. **Short term adjustment**

This type of regulation acts on the drawing mechanism, which is located at the exit of the sliver. Can be corrected mass irregularities exceeding 10 cm.
CARDING MACHINE CONTROLS

Should be monitored regularly **mass of sliver**, both short and long term. Should be monitored as well:

A bad set of card, can cause excessive nepes in the card veil. Can also be formed by having worn fittings, or inappropriate speeds.

You have to be extremely careful, when working fine fibers, as they have high propensity to form nepes.

The card must be removed 80% of these nepes.
In the cotton case, control seed fragments and impurities, is particularly important, especially in open-end spinning, as they cause a large number of yarn breaks, when they are deposited in the rotor groove.

A veil of cards with holes, may be indicative that the cards fitting needs grinded.

It is important to control the cards wasteful, and can distinguish the following:

- Opener cilynder.
- From the flats.
- Low card waste.
- Delinting waste.

An increase above, may indicate that there is a mismatch of the card.

The card can break fibers, so it is essential to control the fiber length diagram into and out of it.

Other controls are:

- Title of the ribbon, and its coefficient of variation (<1%).
- Mass regularity, (CV <3.5%), diagram and spectrogram.

It is important to control these values, from the use of control charts, such as a range of media.

The COMMON DEFECTS on the card are:

Eccentric doffer::
Filled fibers large drum:

Diagram large drum car loaded fiber, and diagram after large drum cleaned:

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