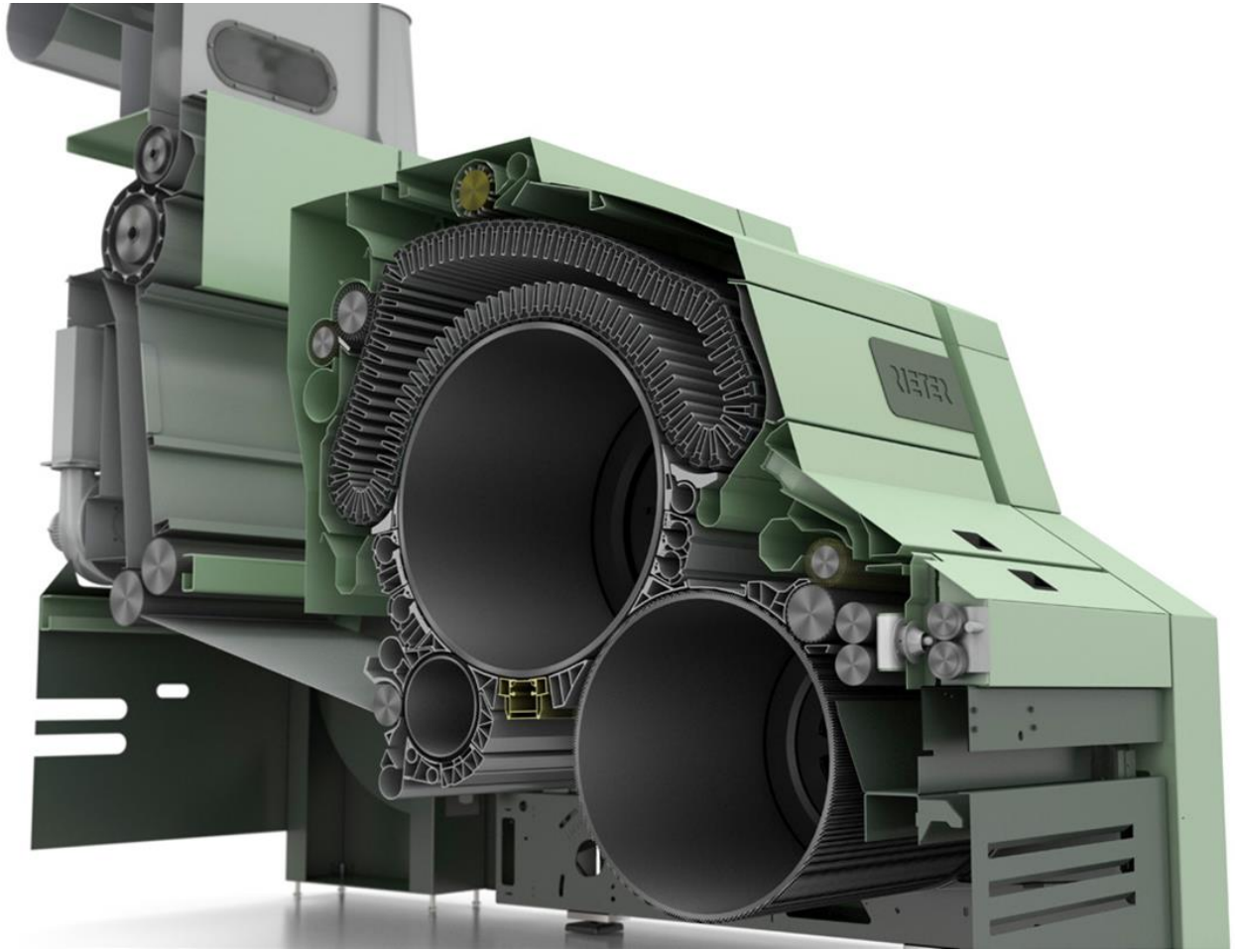
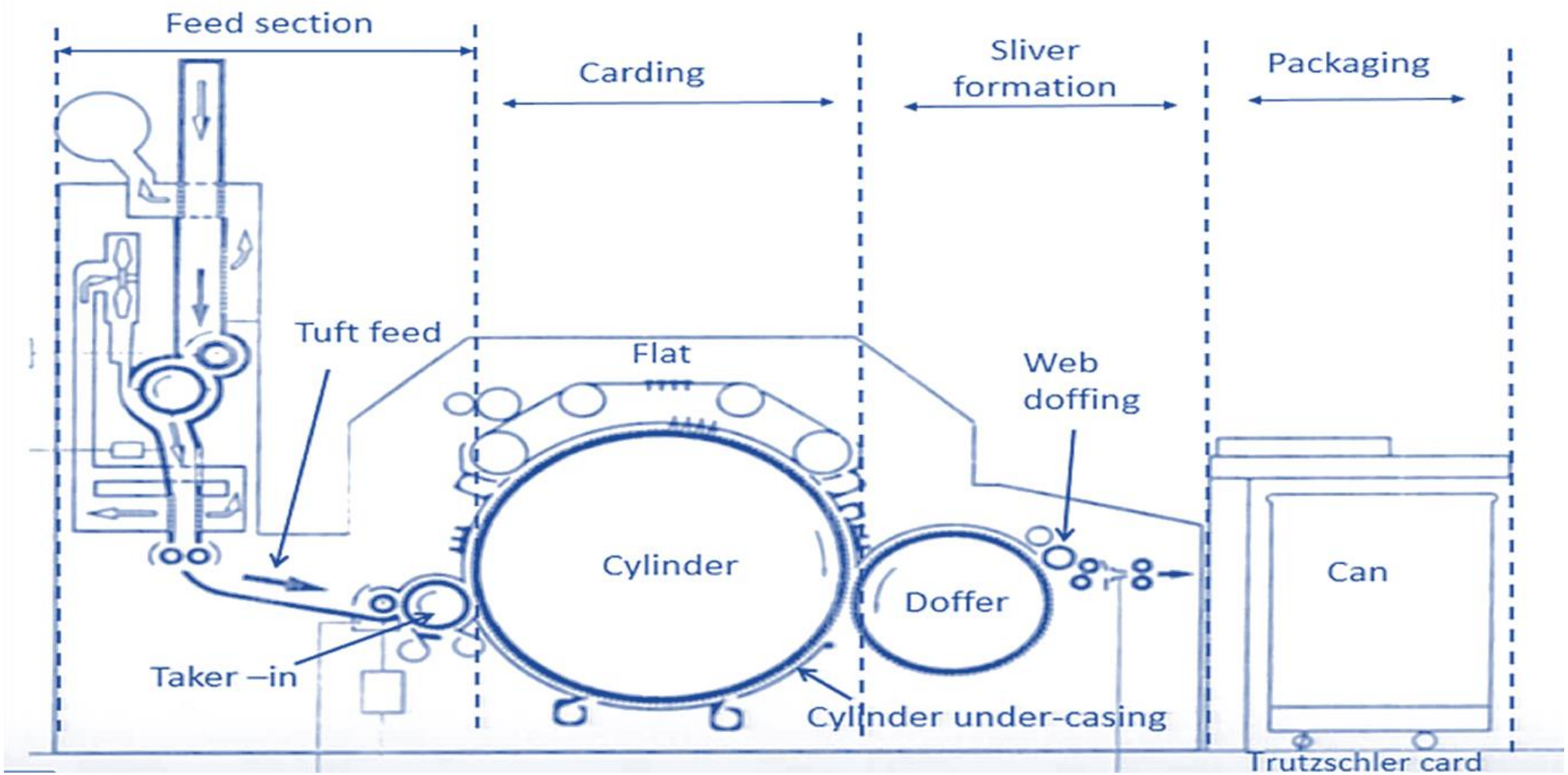
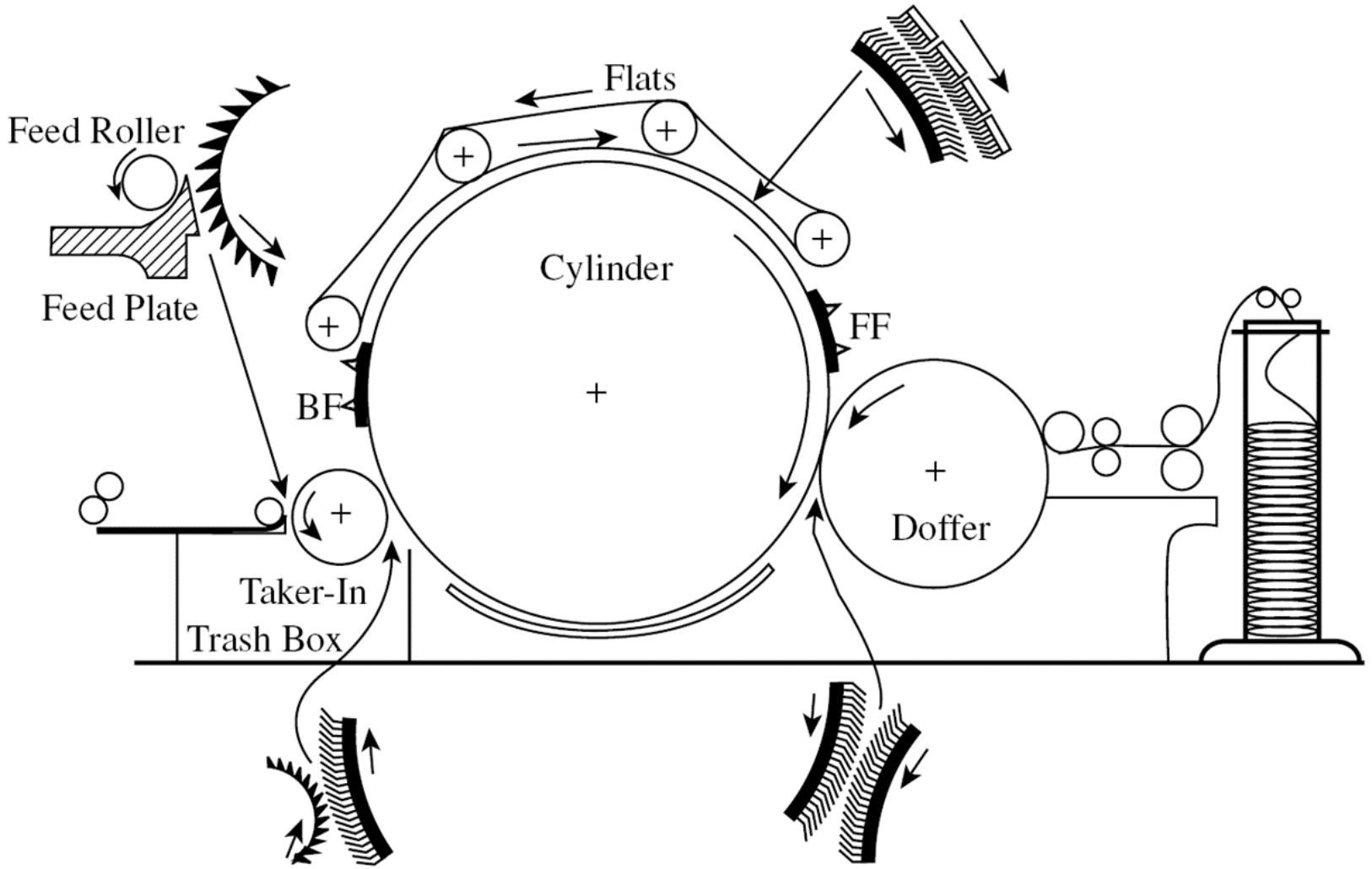
Carding Process



Carding Machine Zones



Carding Machine Zones



Carding Machine Functioning

RIETER

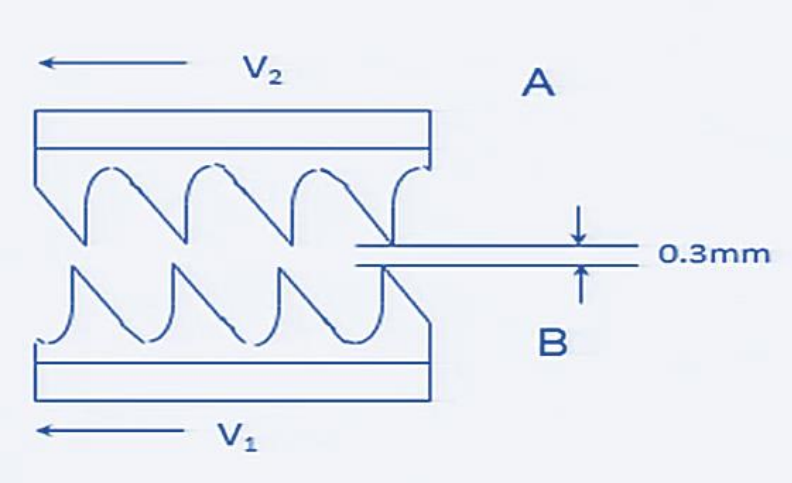
C 70 High-performance card

The card with the maximum active carding area

Purpose of Carding Process

- Individualization of fibre tufts
- Cleaning of fibres
- Removal of fibre clusters/neps
- Mixing of fibres
- Production of assembly of random array of fibres

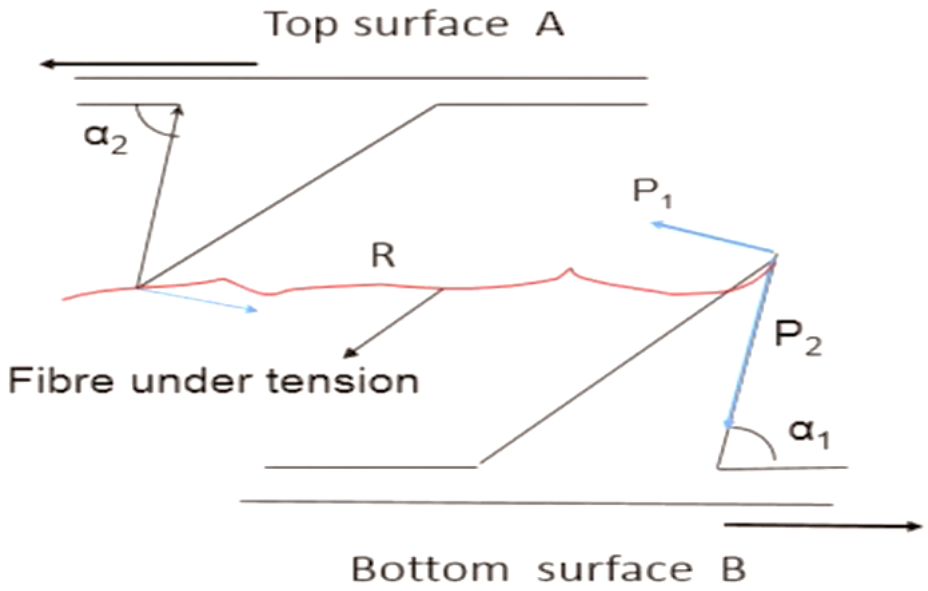
Carding Action



Conditions for carding action:

- ✓ **Wire points of interacting surfaces should be inclined with inclination direction opposite to each other: point against point configuration.**
- ✓ **The surfaces can move in the same or opposite directions**
- ✓ **If they move in same direction, the material carrying surface should move at a faster speed**

Carding Action



R: Tension in the fibre
μ: Frictional co-efficient

$$P_1 = RSin\alpha_1$$

$$P_2 = RCos\alpha_1$$

For carding action,

Fibre should move towards the base of the wire point by overcoming fibre-metal frictional force

So, $P_2 > \mu P_1$

$$RCos\alpha_1 > \mu RSin\alpha_1$$

$$Cot\alpha_1 > \mu \ldots\ldots\ldots\ldots\ldots(1)$$

Similarly,

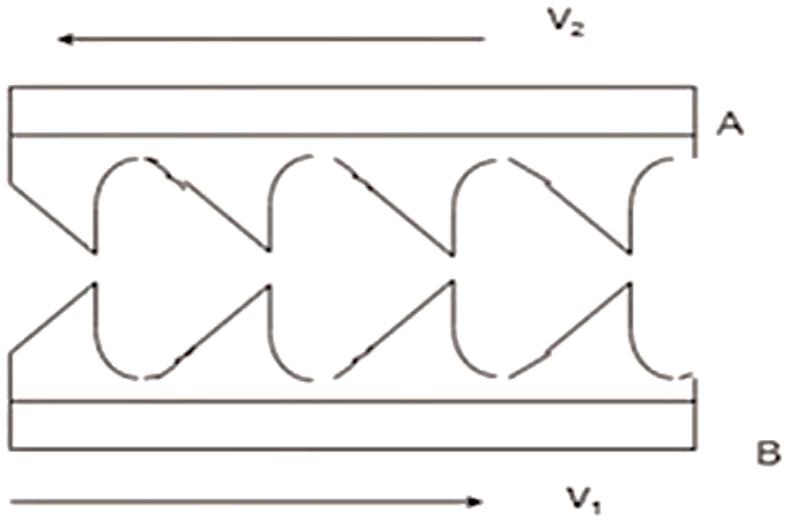
$$Cot\alpha_2 > \mu \ldots\ldots\ldots\ldots\ldots(2)$$

Carding Action

Values of α		
Fibre	Values of μ between steel & fibre	Value of α_1
Cotton	0.27	$\leq 75^\circ$
Wool	0.23	$\leq 77^\circ$
Polyester	0.40	≤ 68

Wire point inclination angle depends on the frictional co-efficient between fibre and wire point.

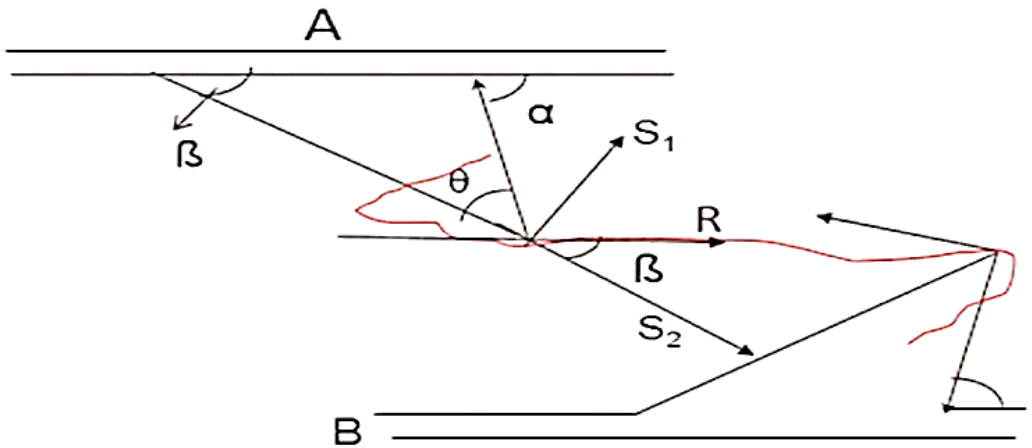
Stripping Action



Conditions for stripping action:

- ✓ **Wire points of interacting surfaces should be inclined in the same direction: point against back configuration.**
- ✓ **The surfaces can move in the same or opposite directions**
- ✓ **If they move in same direction, the material receiving the material surface should move at a faster speed**

Stripping Action



$$S_1 = RSin\beta$$
$$S_2 = RCoc\beta$$

For stripping action,

Fibre should move away from the wire point by overcoming fibre-metal frictional force

So,

$$S_2 > \mu S_1$$
$$RCos\ \beta > \mu RSin\ \beta \ldots\ldots\ldots \ldots(3)$$
$$\therefore Cot\ \beta > \mu \ldots\ldots\ldots \ldots\ldots\ldots (4)$$

R: Tension in the fibre
μ: Frictional co-efficient