Comber

1. $\frac{\text{mass/length of yarn}}{\text{mass/length of fibre}} = \text{no. of fibres in cross-section}$

2. Bending Rigidity $\propto (\text{dia of yarn})^2$

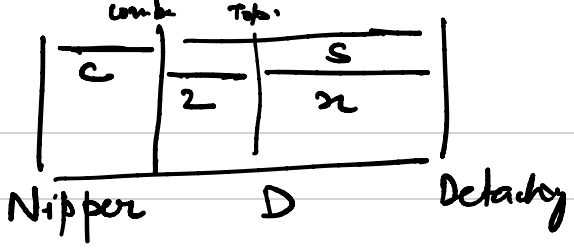
3. $\text{Noil \%} = \frac{\text{Mass of Noil}}{\text{Mass of combed Sliver} + \text{Mass of Noil}} \times 100$

$\text{tex} \propto \frac{1}{\text{Noil \%}}$

4. $DOC = \frac{S}{f}$

$2 = D - C - x$

$2 = D - (C + x)$



5- Effective take-off of Nipper $T = V - R$ (V: forward, R: backward.)

6. Nvil'.

$$\text{forward feed} = \left(\frac{E + \frac{S}{2}}{M}\right)^2$$

$$\text{Backward feed} = \left(\frac{E - \frac{S}{2}}{M}\right)^2$$

7. Production of Lumber = $\dfrac{H \times E \times S \times N \times 60 \times N' \times G \times \left(1 - \frac{k}{100}\right) \times 1000}{A \times 100 \times 1000 \times 1000 \times 1000}$

$= \dfrac{H \times E \times S \times N \times 60 \times N' \times G \times (100 - k)}{A \times 1000 \times 1000 \times 100 \times 100}$

TXL 222 Formulas

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Roving Frame

Rate of Delivery = Rate of Winding = $|n_b - n_f| \times \pi d_b$

Twist = $\frac{n_{flyer}}{V_{deliv.}}$ (turns/m)

Traverse Rate (T) = $\frac{V_{del.}}{\pi d_{bobbin}} \times d_{roving}$

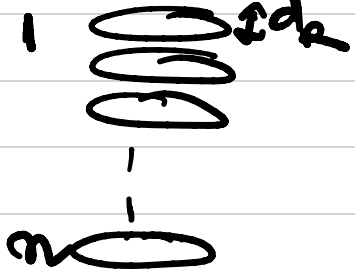
Derivation

Traverse Rate of Bobbin Rail $\propto \frac{1}{d_b}$

$V_d \rightarrow$ deliv. Rate

$\pi \times d_b$ = 1 coil length

No. of coils (n) $= \frac{V_d}{\pi d_b}$



length of bobbin $= \pi \times d_R$

$= \frac{V_d}{\pi d_b} \times d_R$

Traverse Rate (T) $= \frac{V_d}{\pi d_b} \times d_R$

Speed of top cone drum = Speed of Bottom Cone drum

$n_1 \times r_1 = n_2 \times r_2$

$$e = \frac{A}{C} \times \frac{D}{B}$$

a = arm / casing f = input l = output

$$e = \frac{l-a}{f-a} \qquad l = a + e(f-a)$$

- Speed of driven cone drum changes linearly

Length of Belt $= 2l + \pi(r_1 + r_2)$

Driven Cone drum linearly with dia ratio

Ring frame

- Twist = $\frac{\text{Traveller Speed}}{\text{Delivery Speed}}$
- $V_d = \pi d_B (n_b - n_T)$
- Twist change not significant with changing traveller speed
- Rel. b/w winding tension & spindle speed
- $f_W = \frac{f_T \, d_{Ring}}{d_{Bobbin}}$

$$f_{\text{winding Tension}} = \frac{2\pi^2 \mu m d_k n_s^2}{\sin\alpha}$$