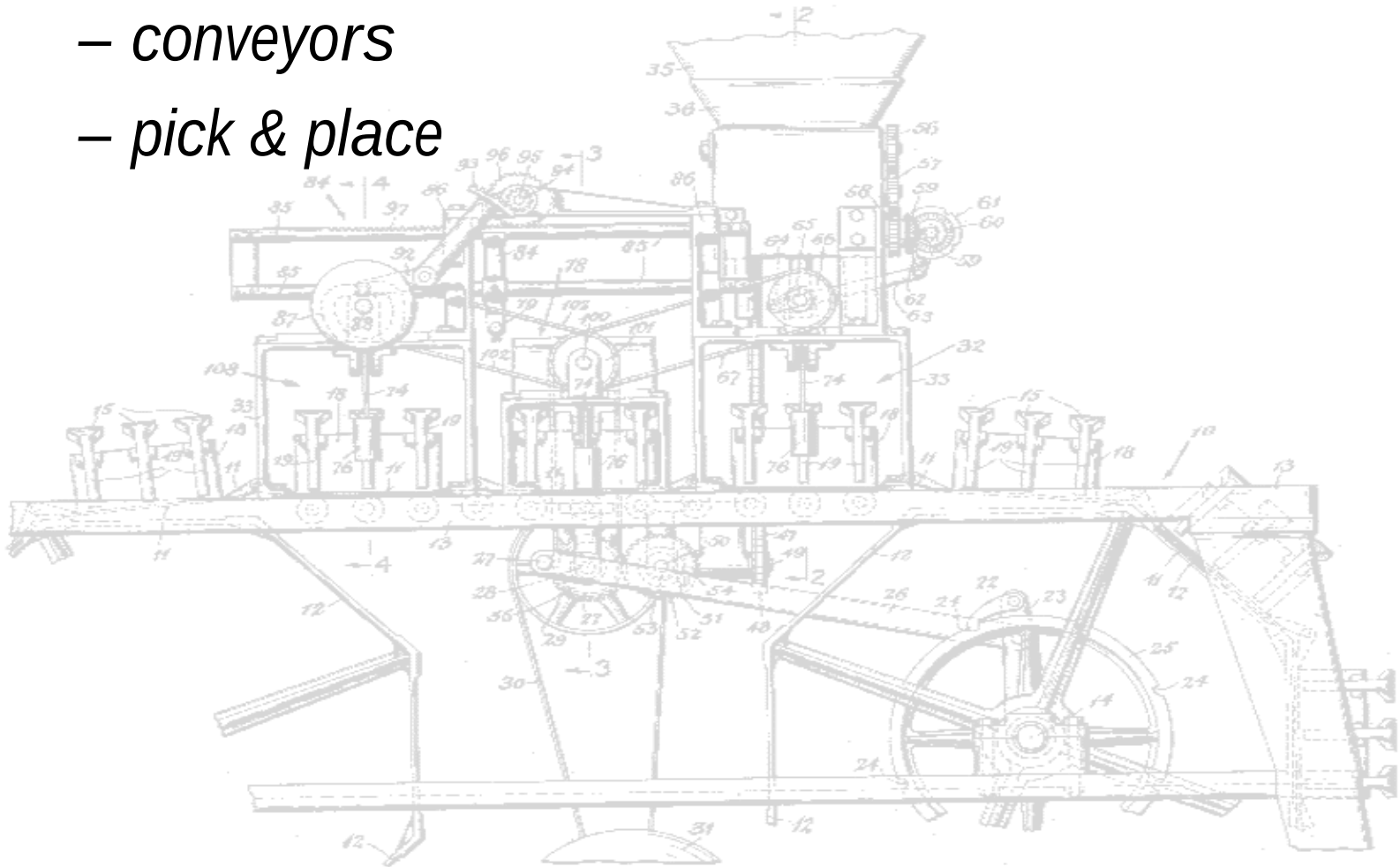
Care & Feeding of Machines

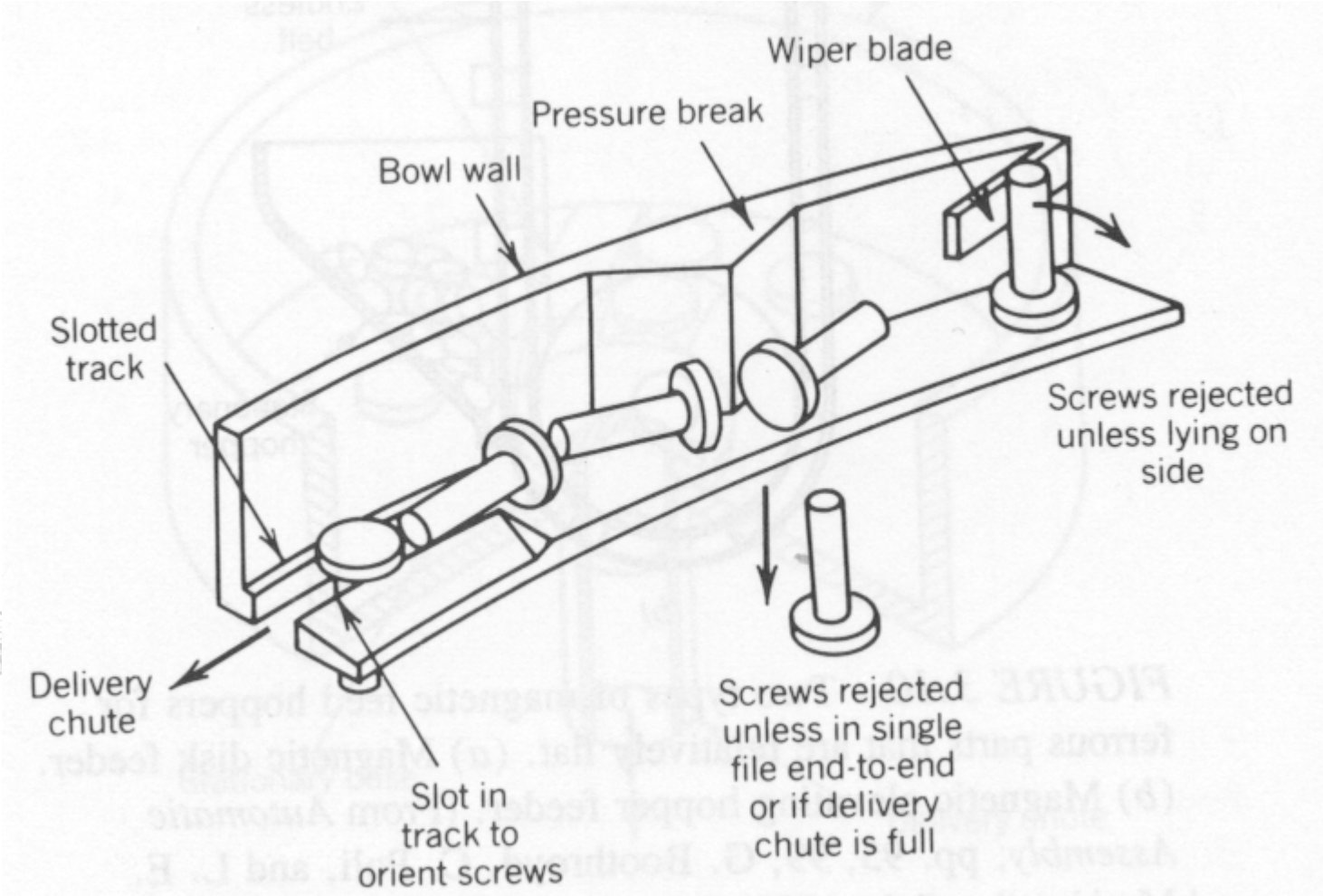
- *Feeding parts*
  - *vibratory feed bowls*
  - *conveyors*
  - *pick & place*



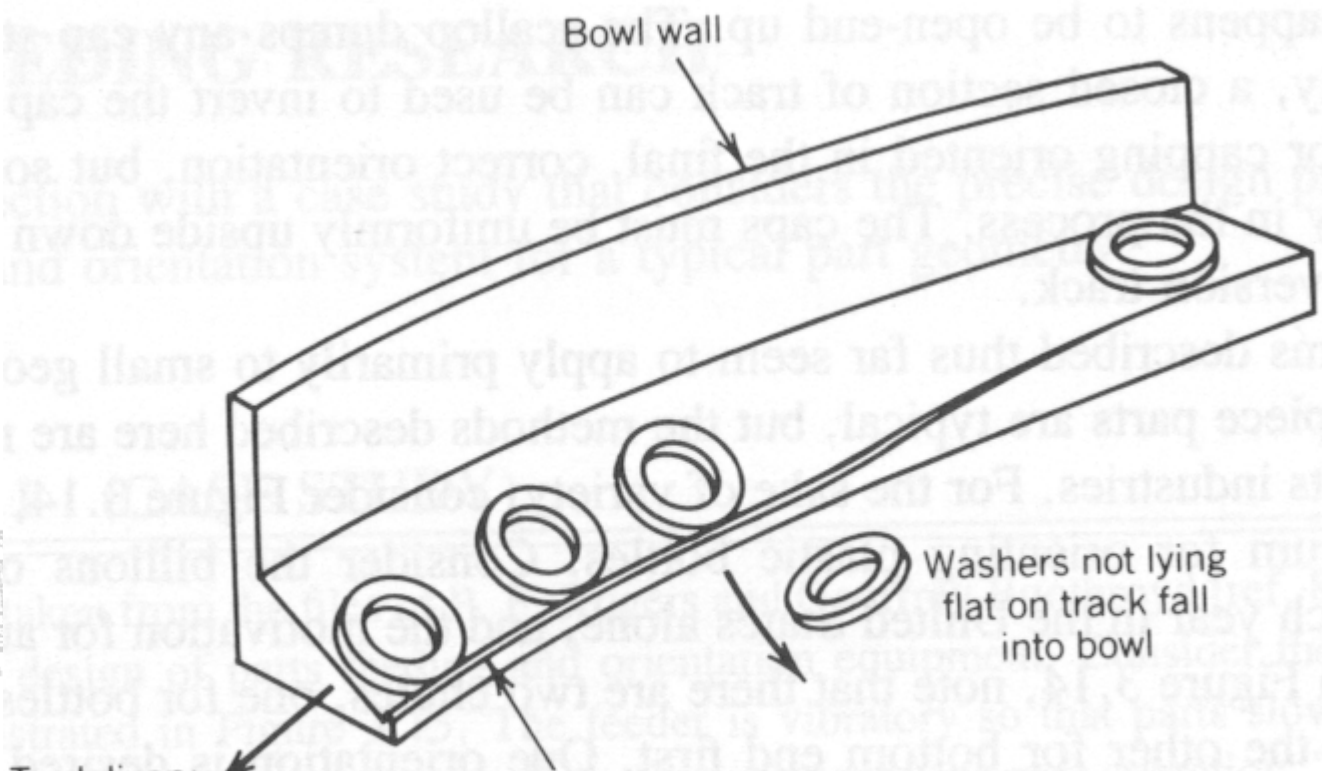
Bowl Feeders

Bowl Feeders

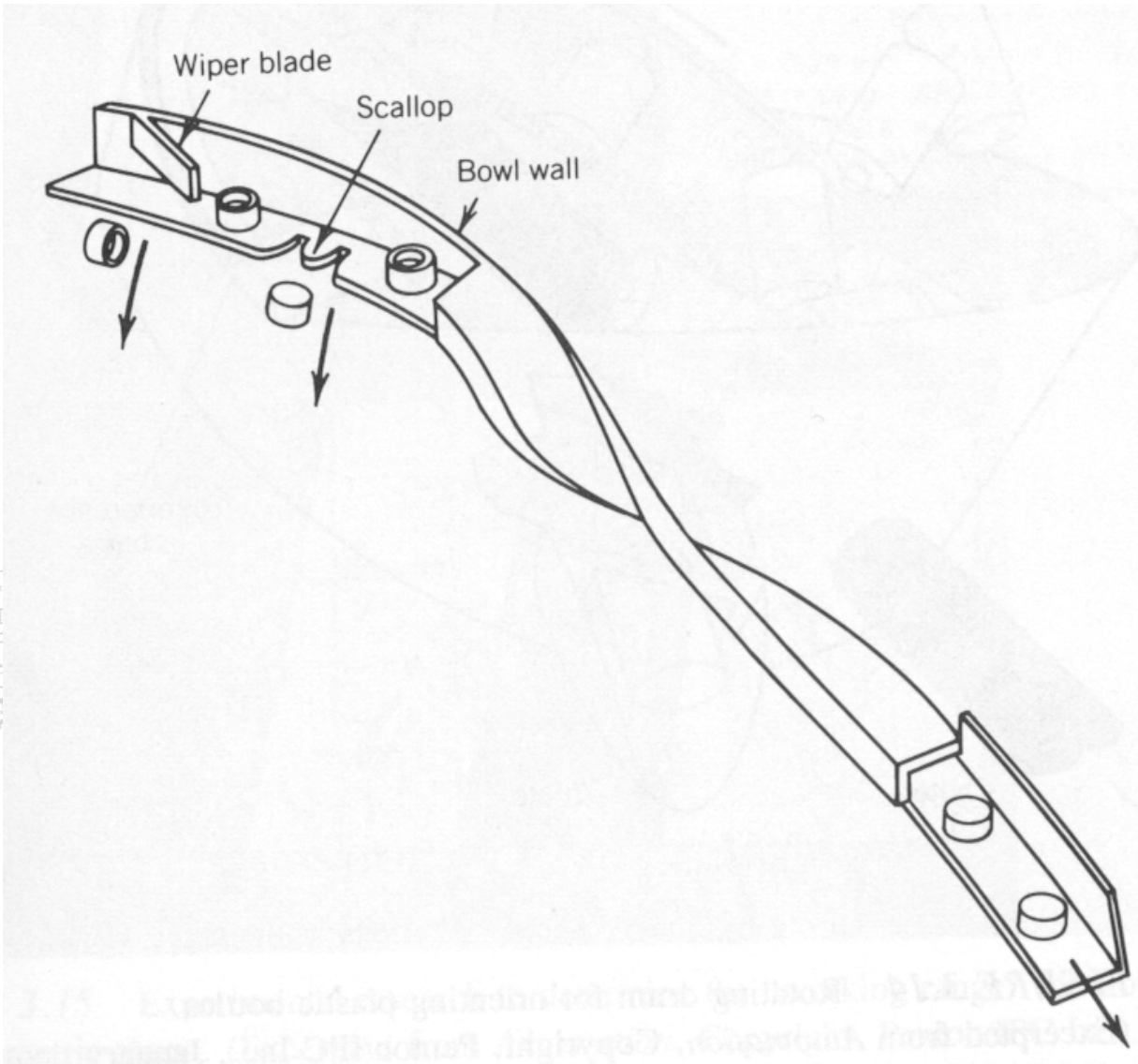
Bowl Feeders



Bowl Feeders

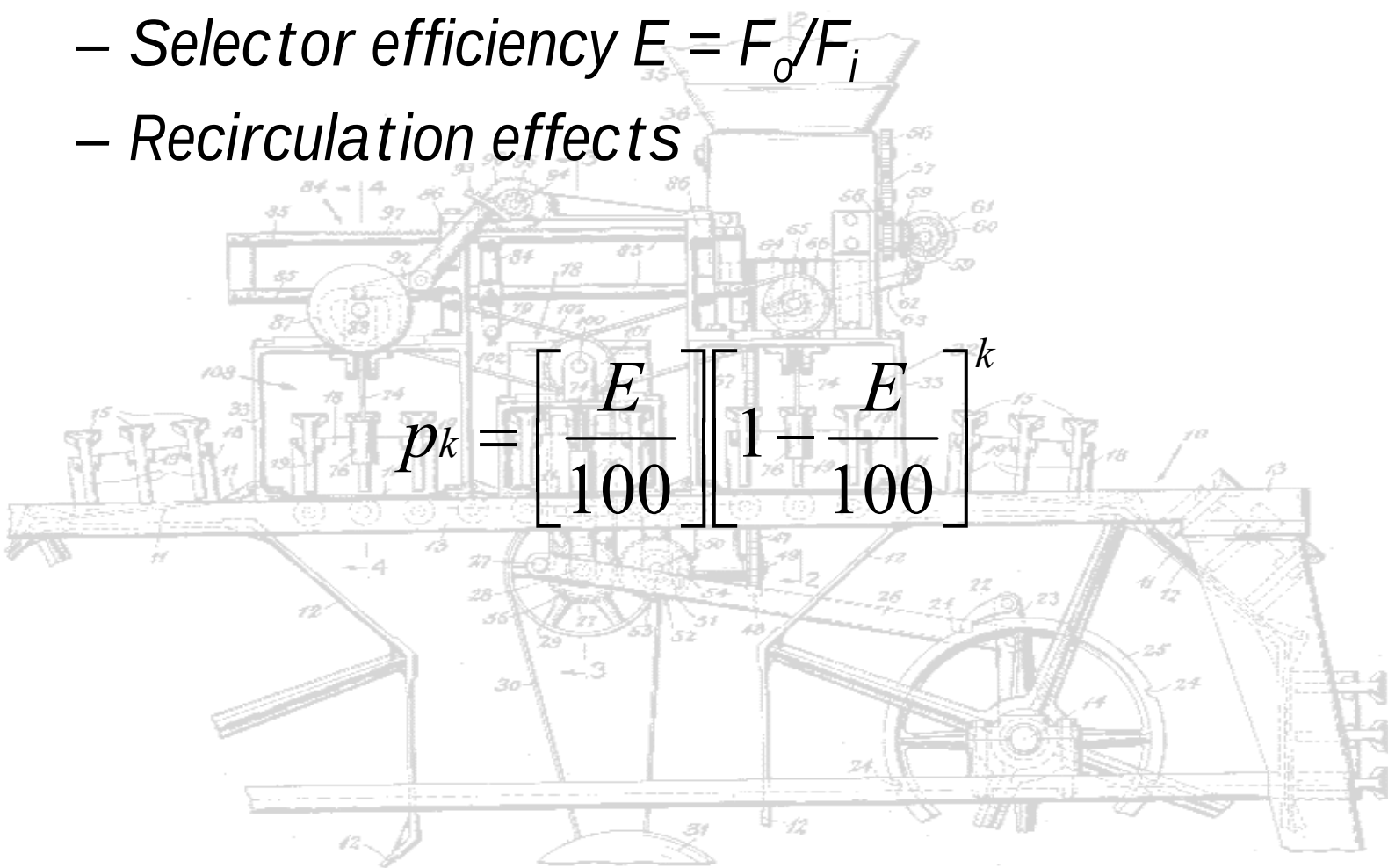


Bowl Feeders



Bowl Feeders

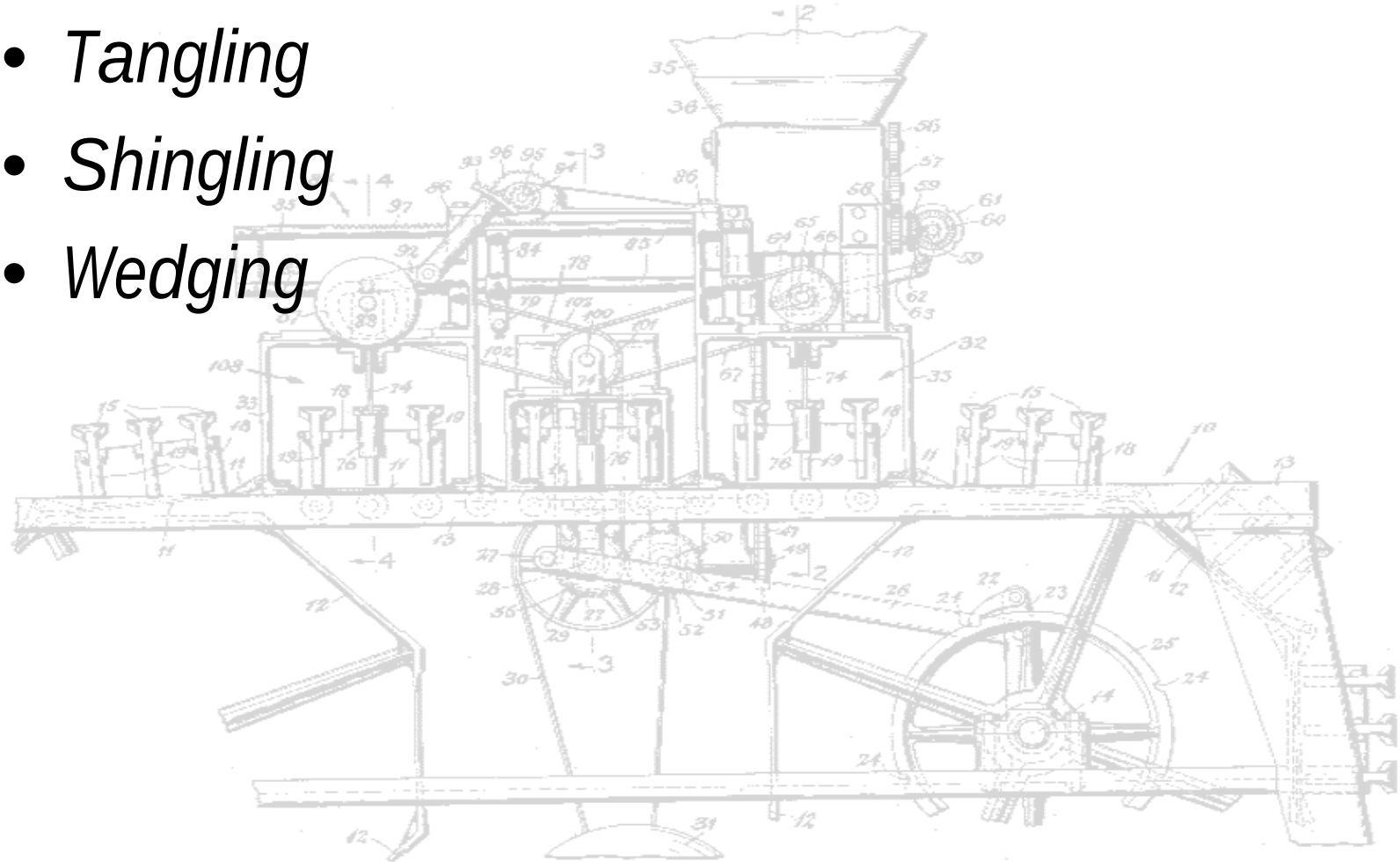
- *Design Factors*
  - *Part symmetry*
  - *Selector efficiency $E = F_o/F_i$*
  - *Recirculation effects*



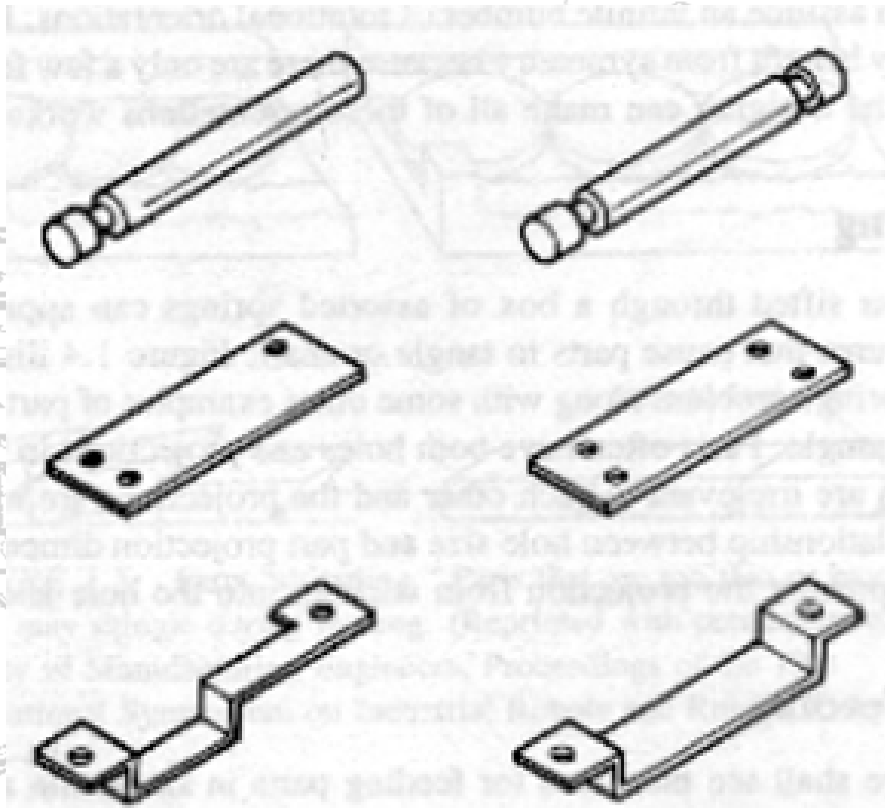
$$p_k = \left[\frac{E}{100}\right]\left[1-\frac{E}{100}\right]^k$$

Designing Parts for Feeding

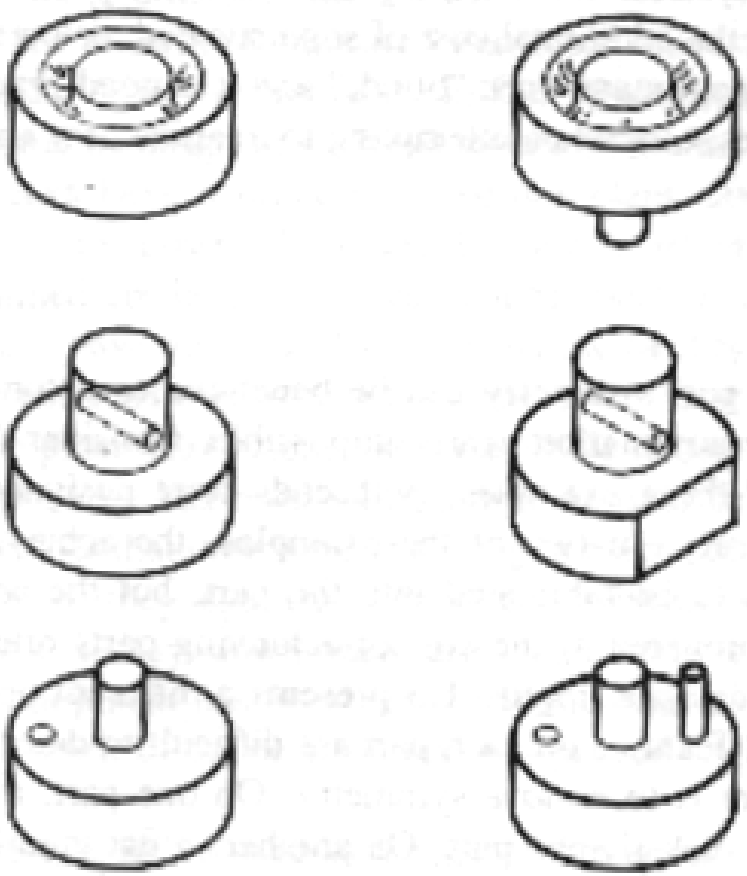
- *Symmetry*
- *Asymmetry*
- *Tangling*
- *Shingling*
- *Wedging*



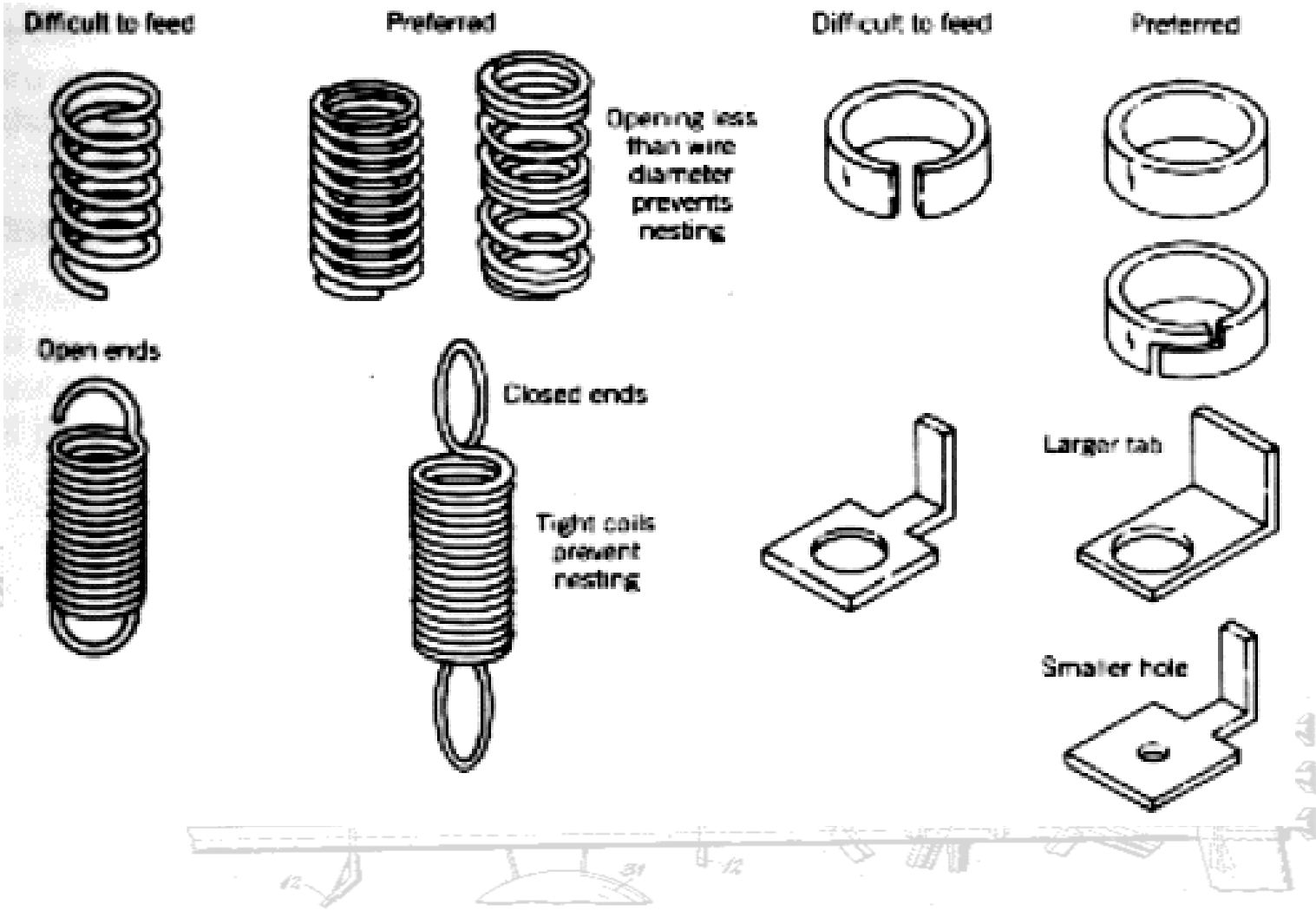
Symmetry



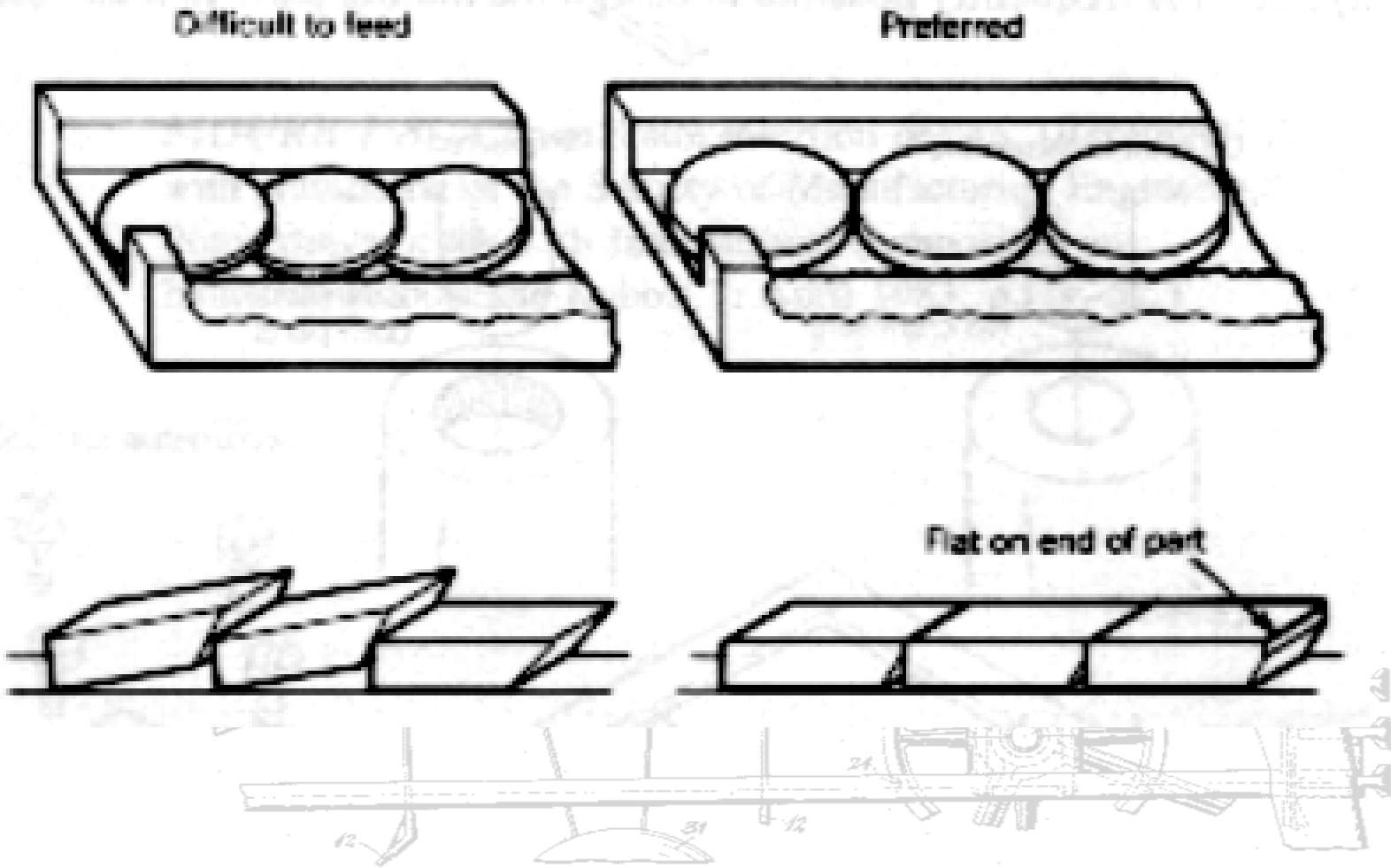
Asymmetry



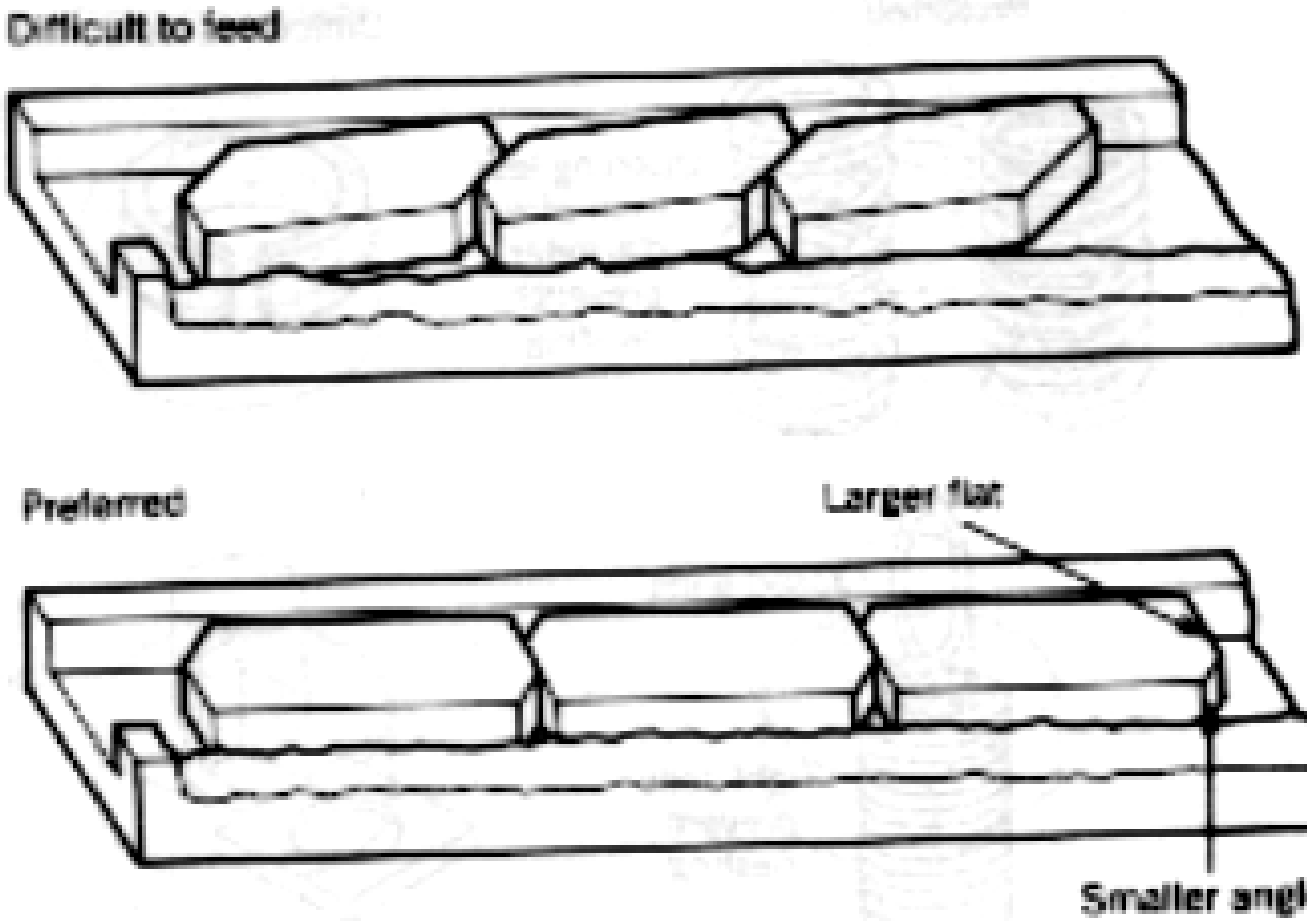
Tangling


Difficult to feed
Preferred
Opening less than wire diameter prevents nesting
Difficult to feed
Preferred
Open ends
Closed ends
Tight coils prevent nesting
Larger tab
Smaller hole

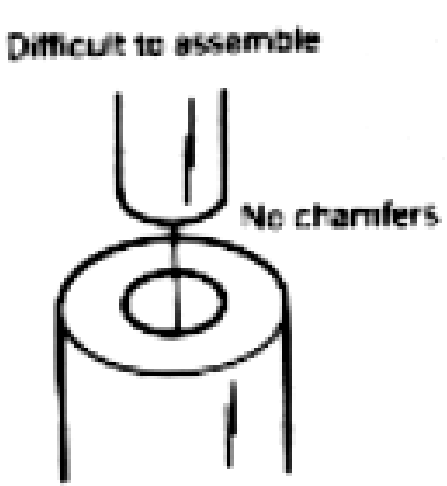
Shingling

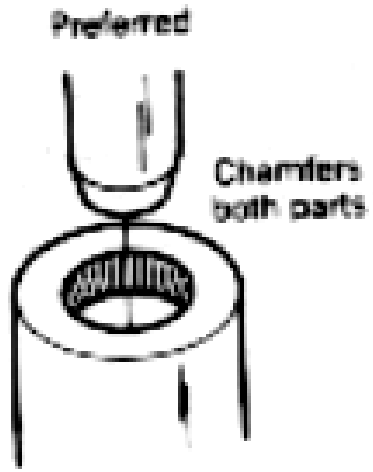


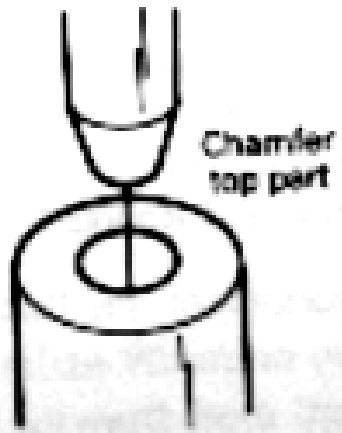
Wedging

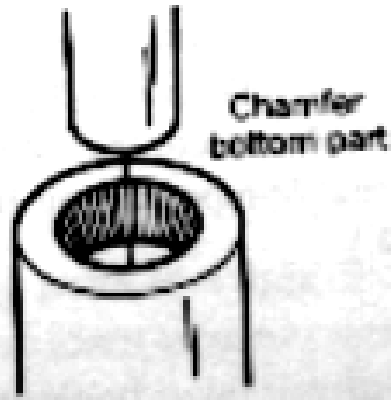


Designing for Insertion

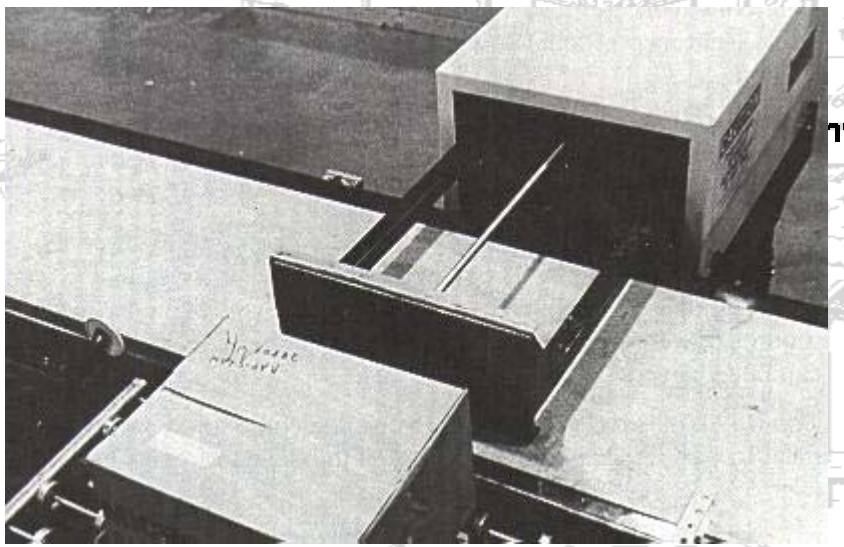


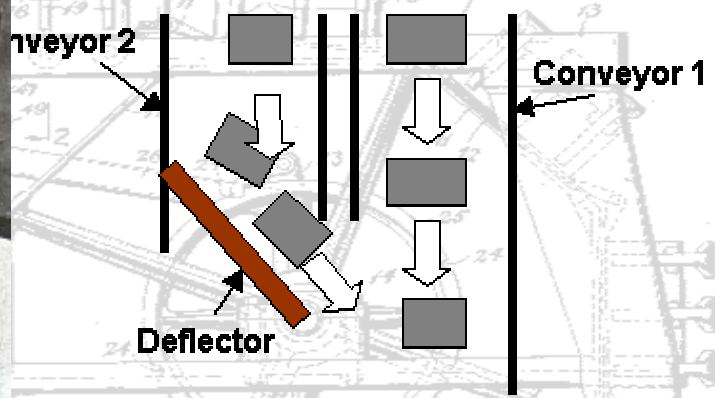




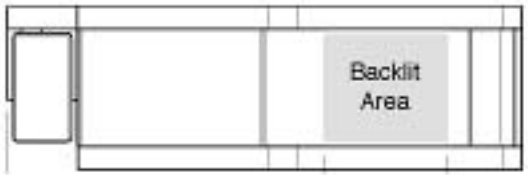


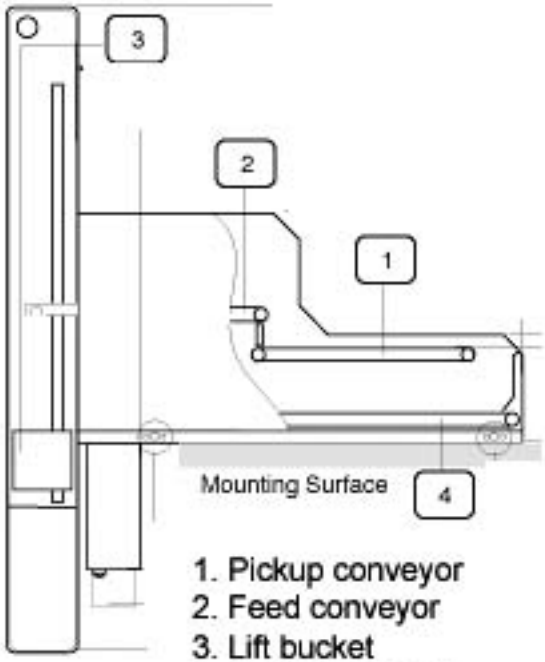
Feeding Parts - Conveyors



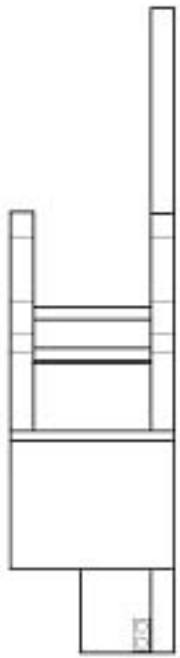


Conveyors





1. Pickup conveyor
2. Feed conveyor
3. Lift bucket
4. Return conveyor



Other Feeder Mechanisms