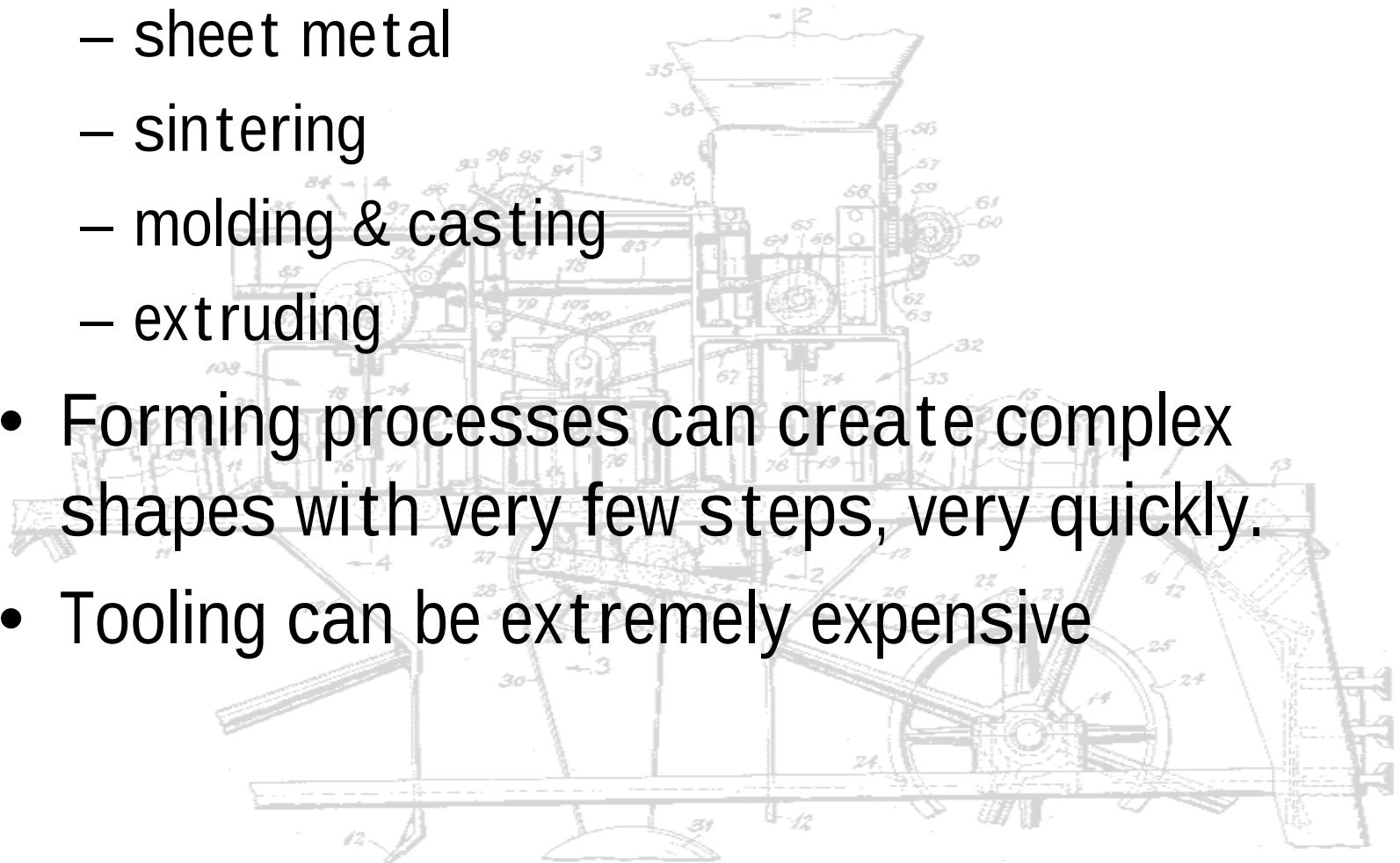
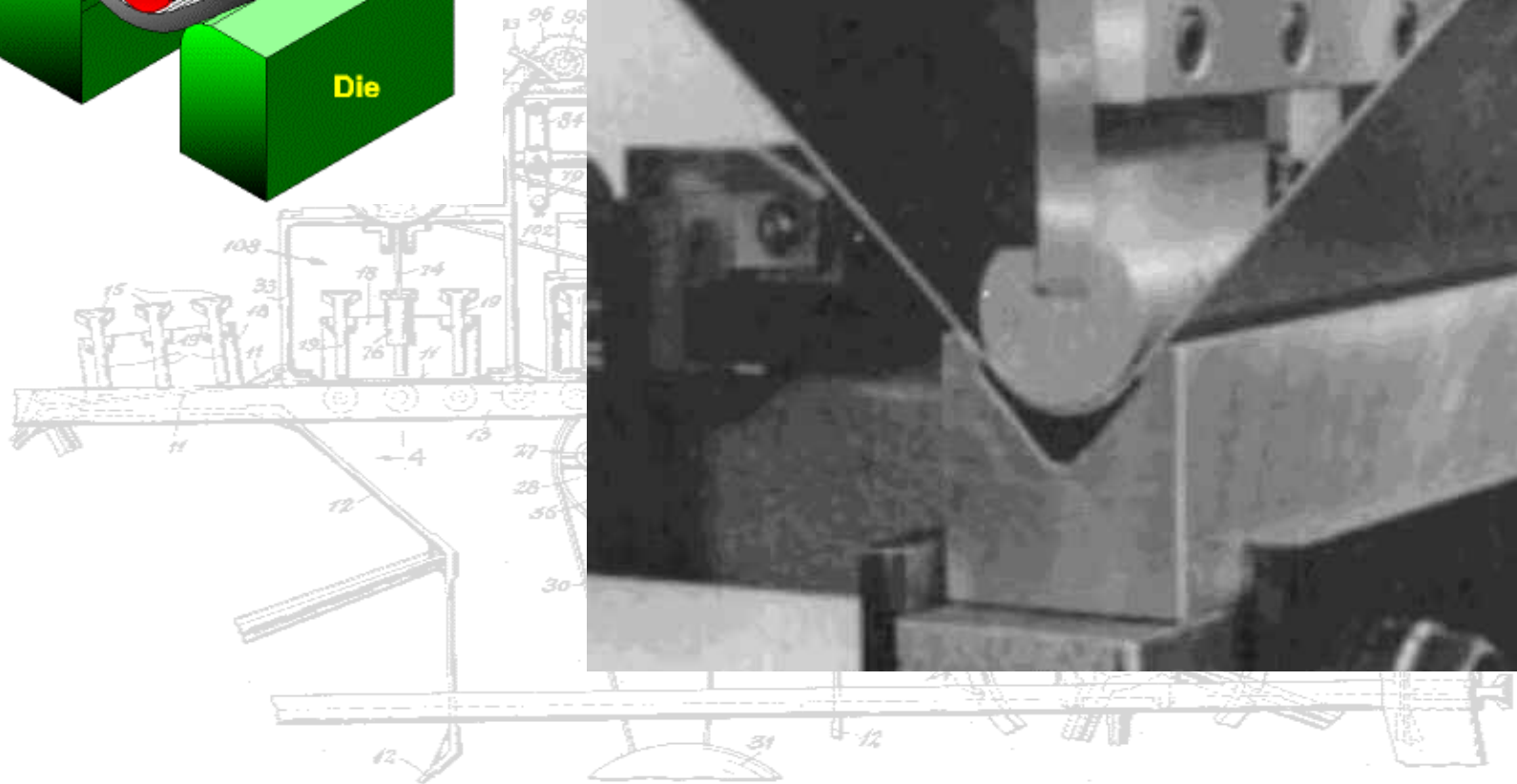
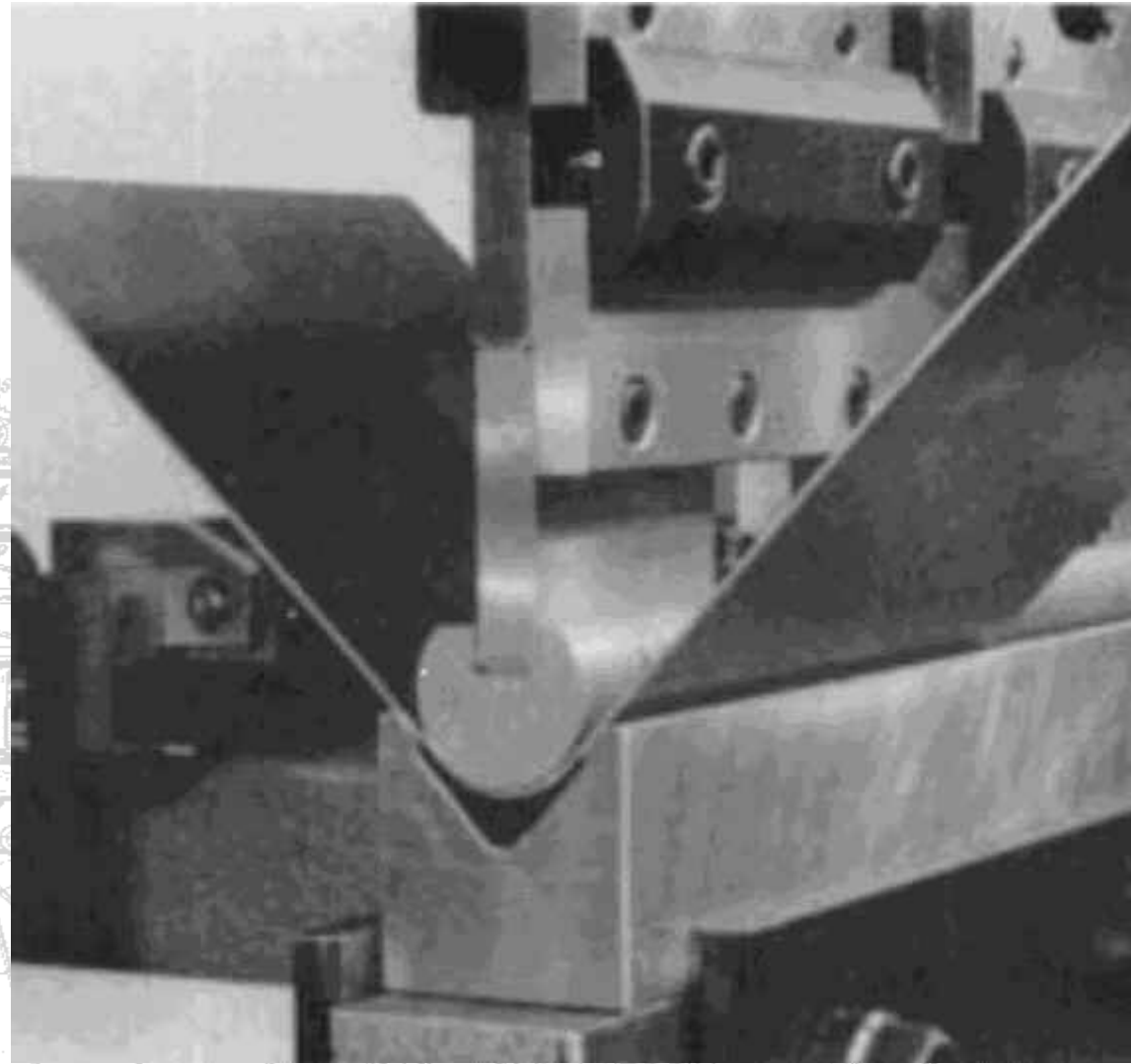
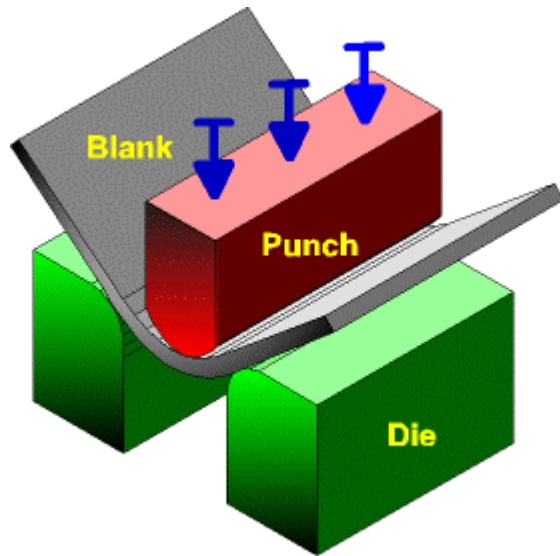


FORMING AND JOINING PROCESSES

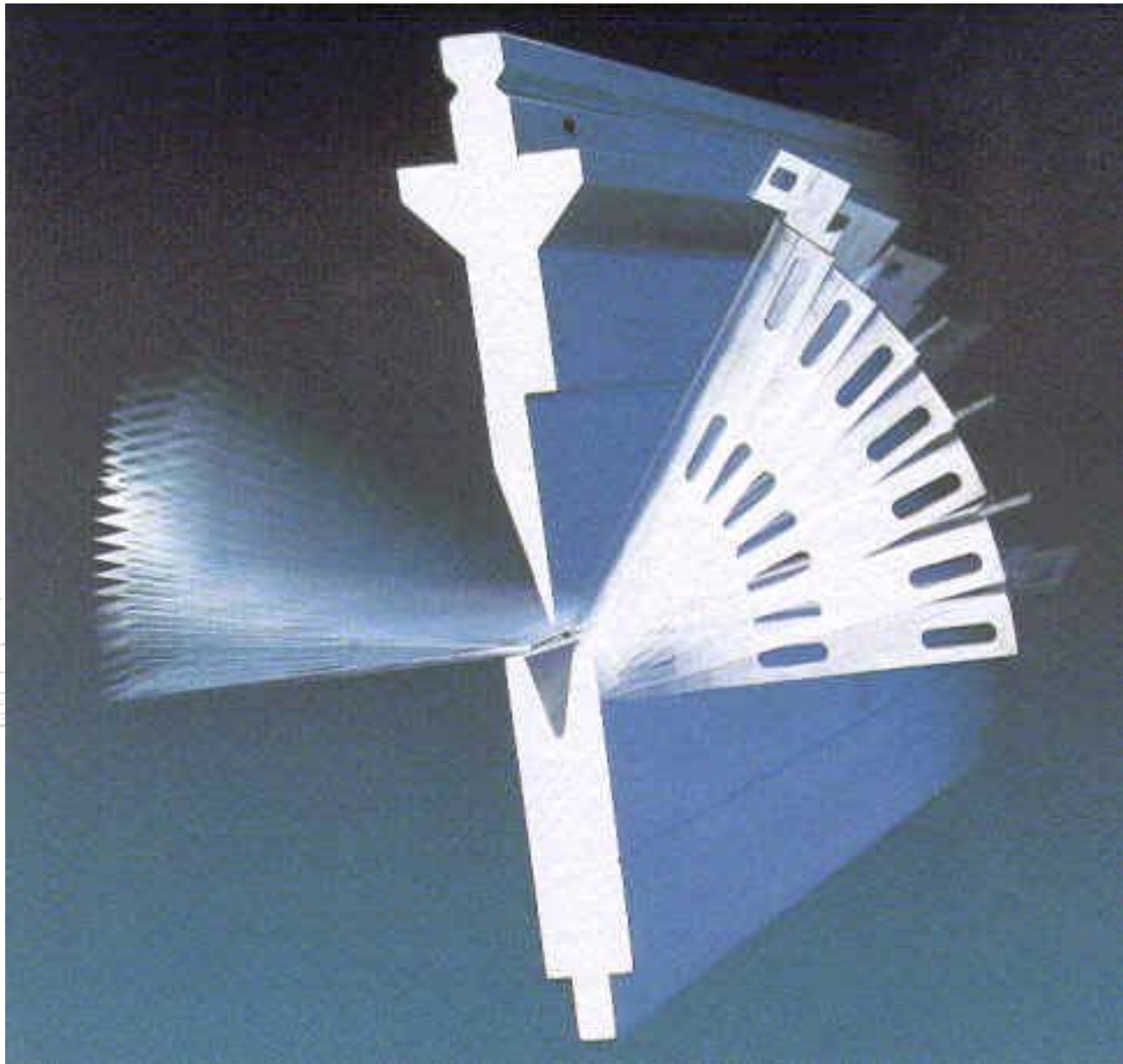
- Forming processes are “additive” rather than subtractive
 - sheet metal
 - sintering
 - molding & casting
 - extruding
- Forming processes can create complex shapes with very few steps, very quickly.
- Tooling can be extremely expensive



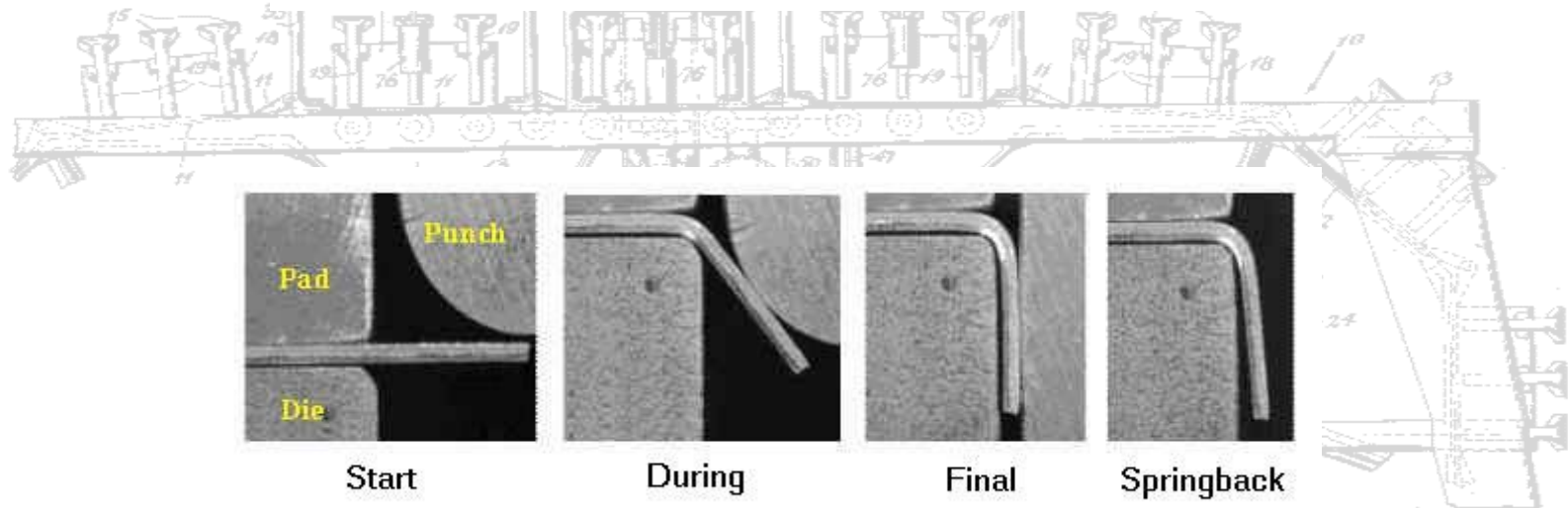
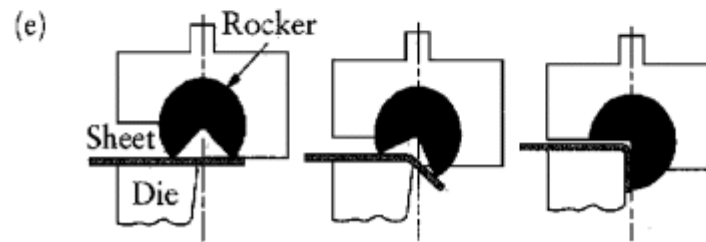
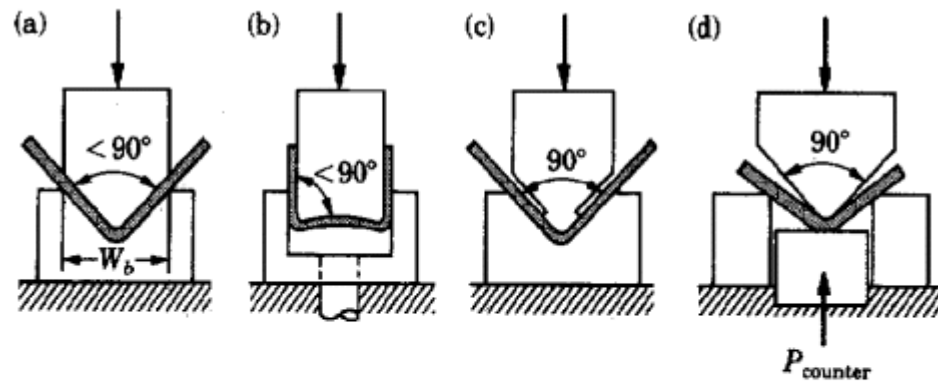
SHEET METAL BENDING



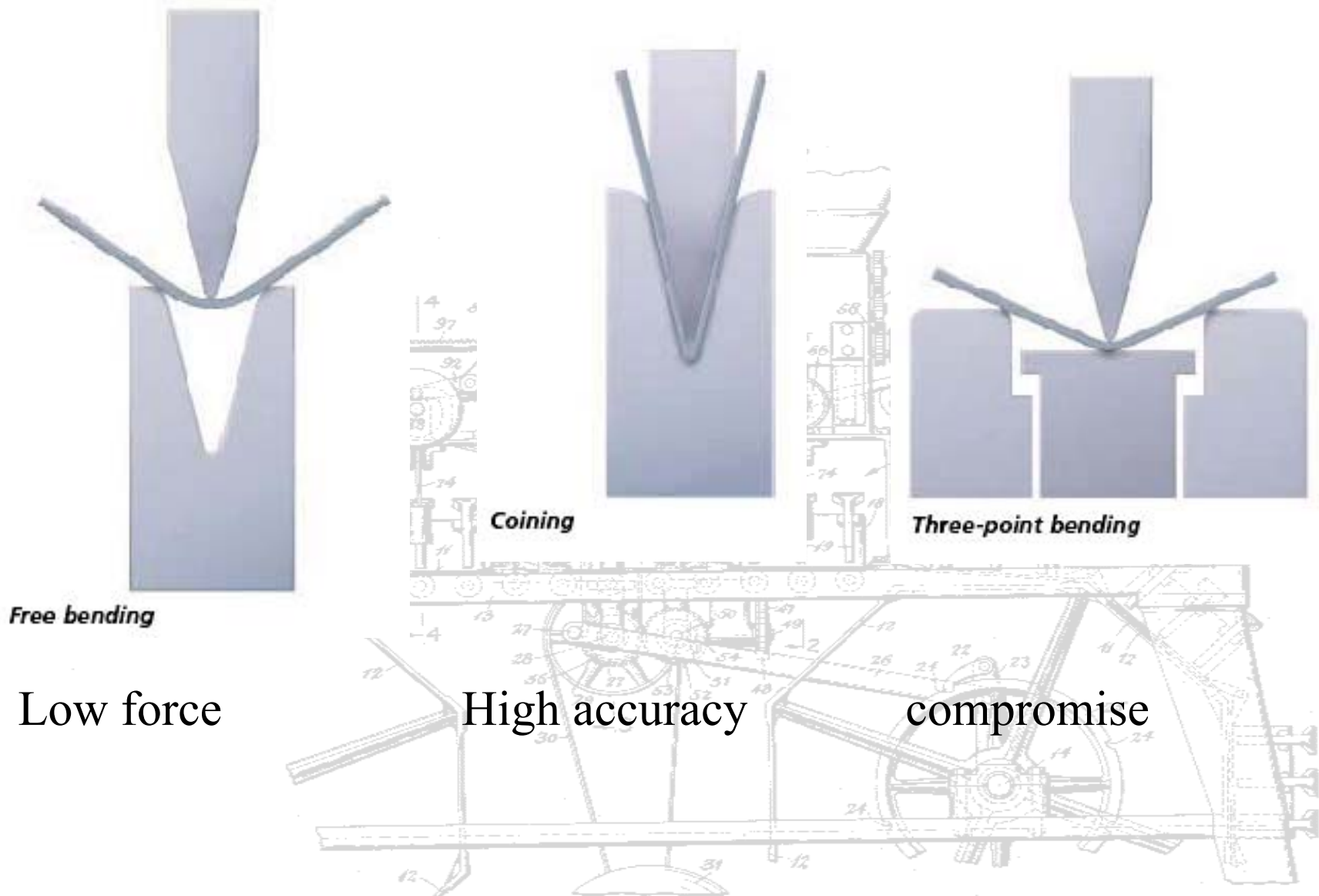
SHEET METAL BENDING



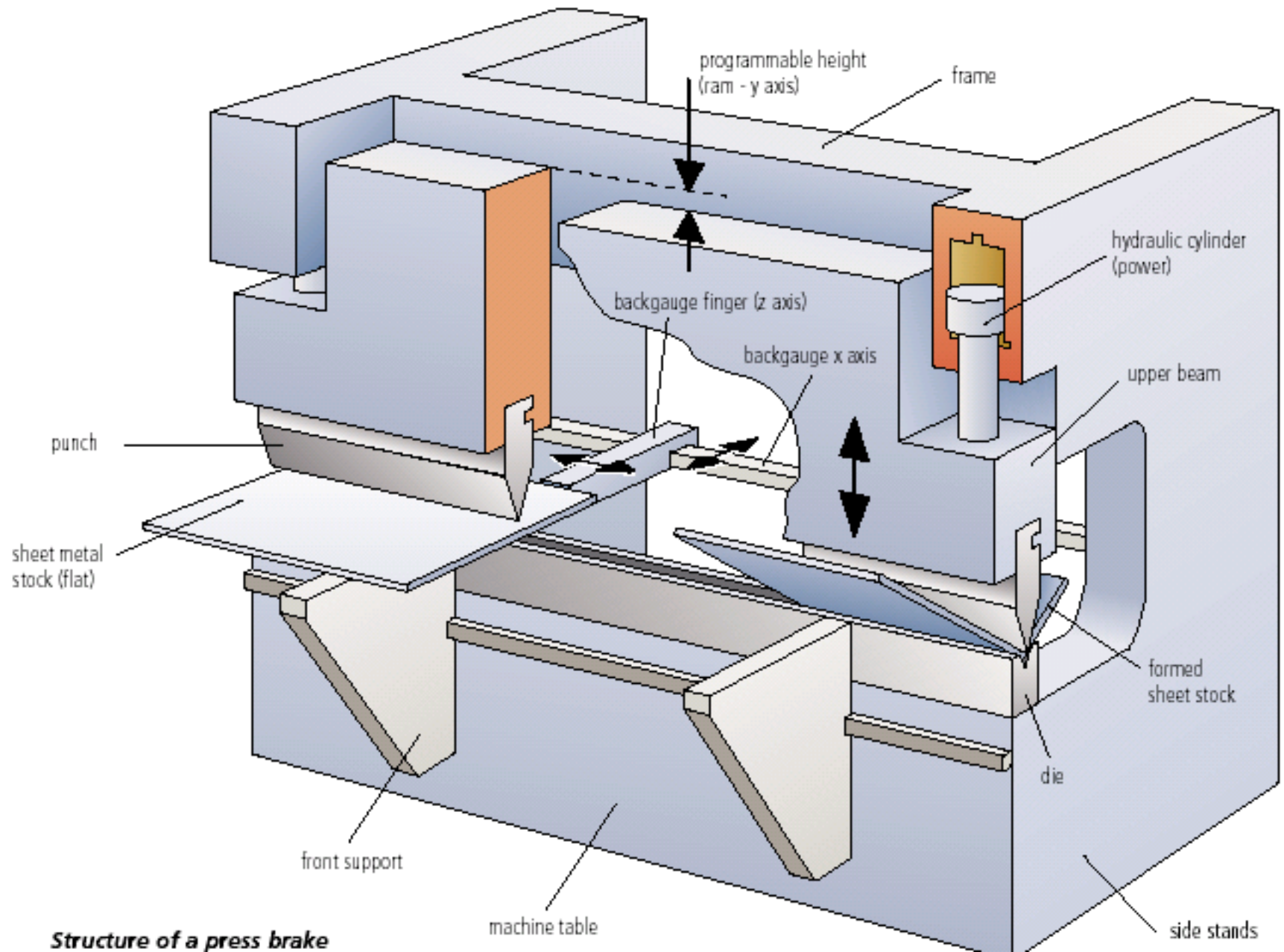
SHEET METAL BENDING



SHEET METAL BENDING

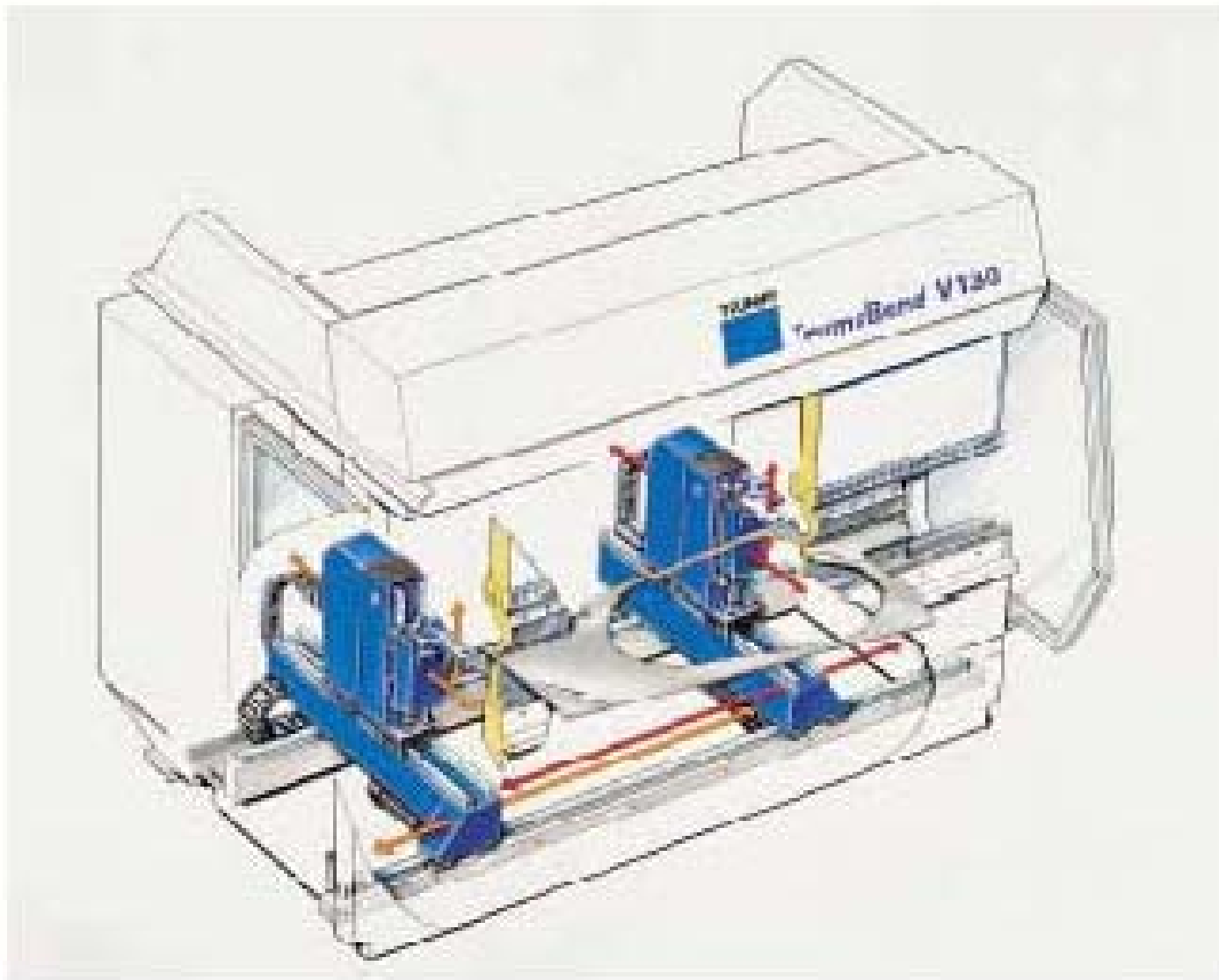


SHEET METAL BENDING



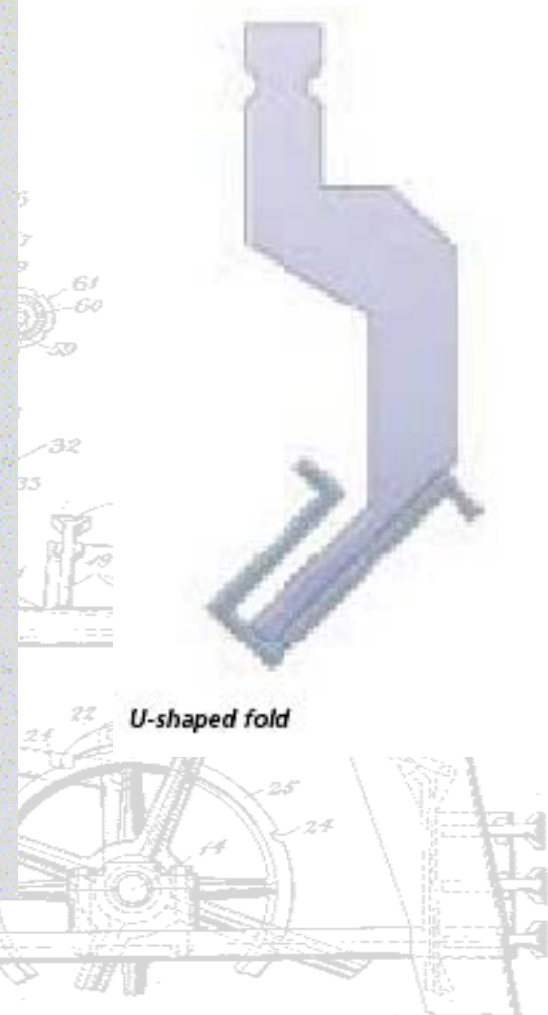
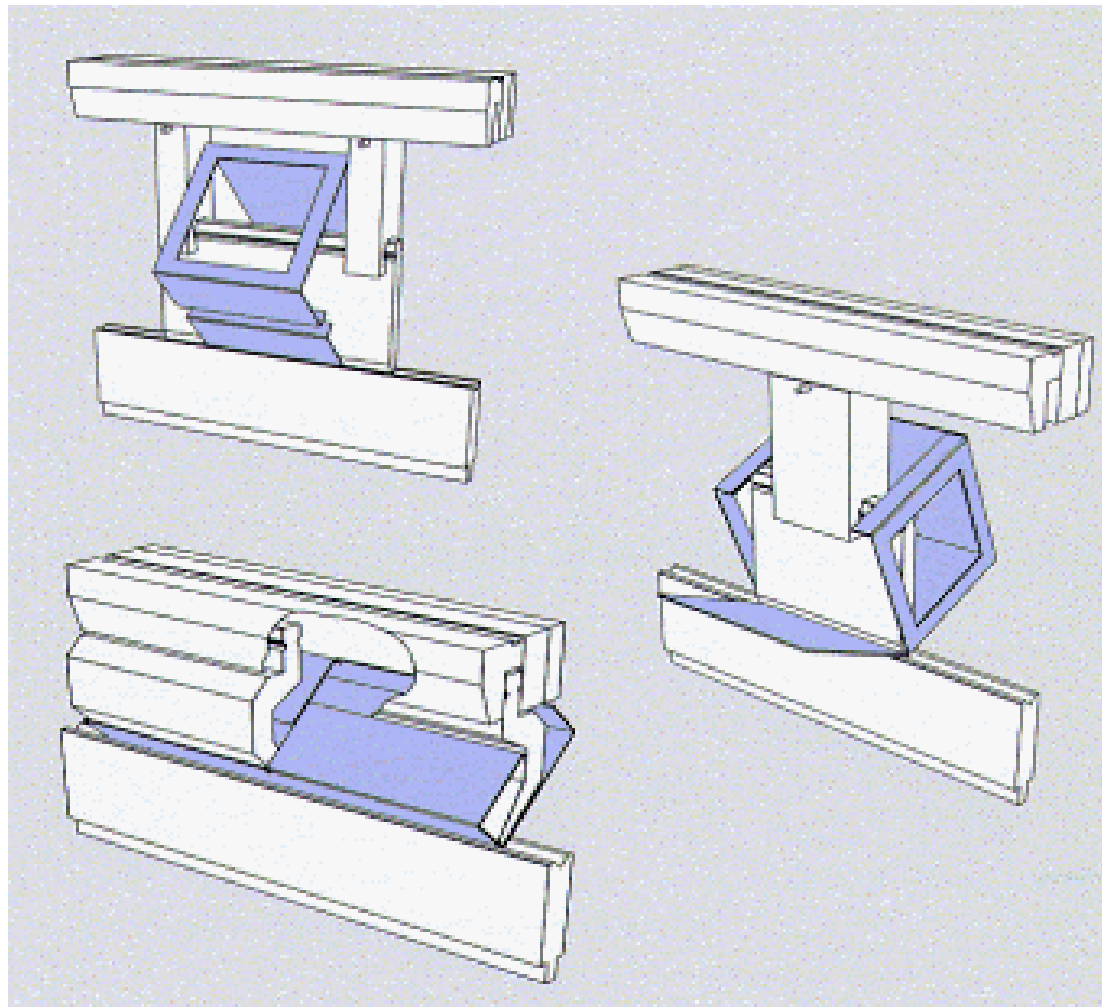
Structure of a press brake

SHEET METAL BENDING



A workpiece can be aligned on two different edges in a backgauge system with six NC axes which are totally independent of each other.

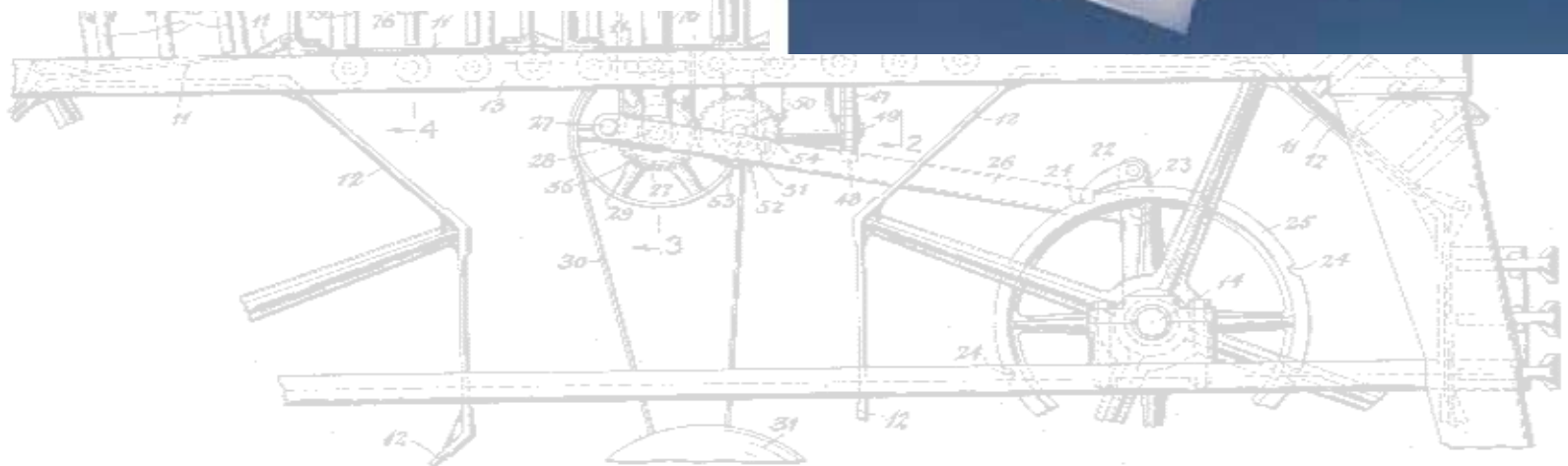
SHEET METAL BENDING



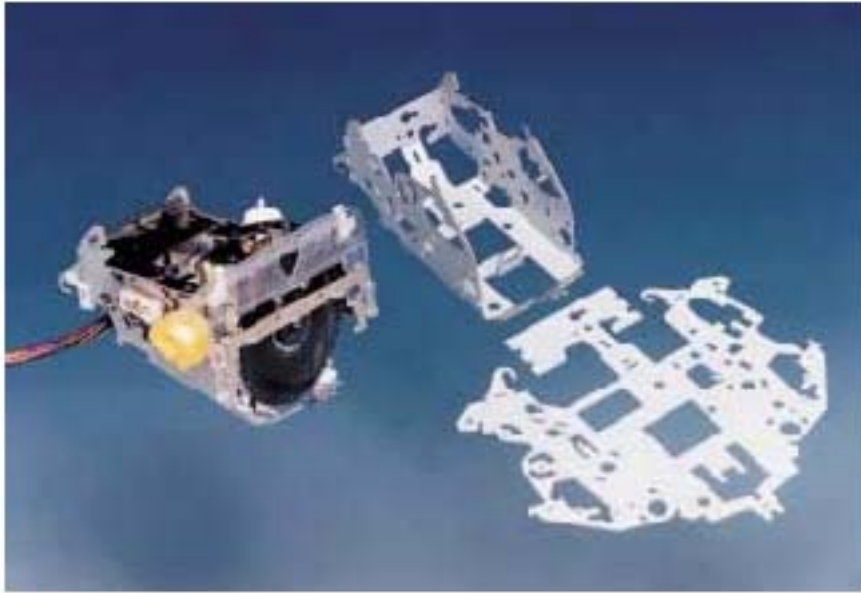
SHEET METAL BENDING



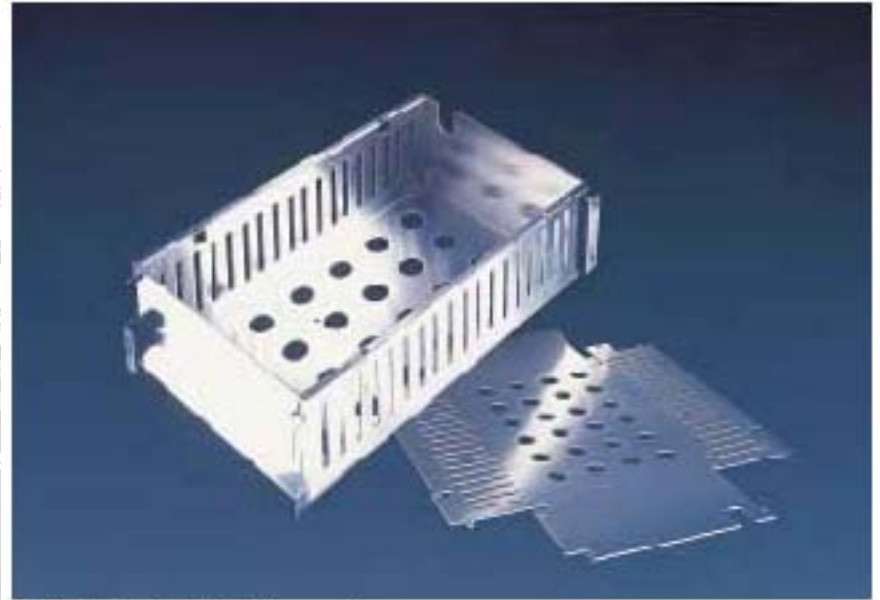
Press brake bending with several tool stations



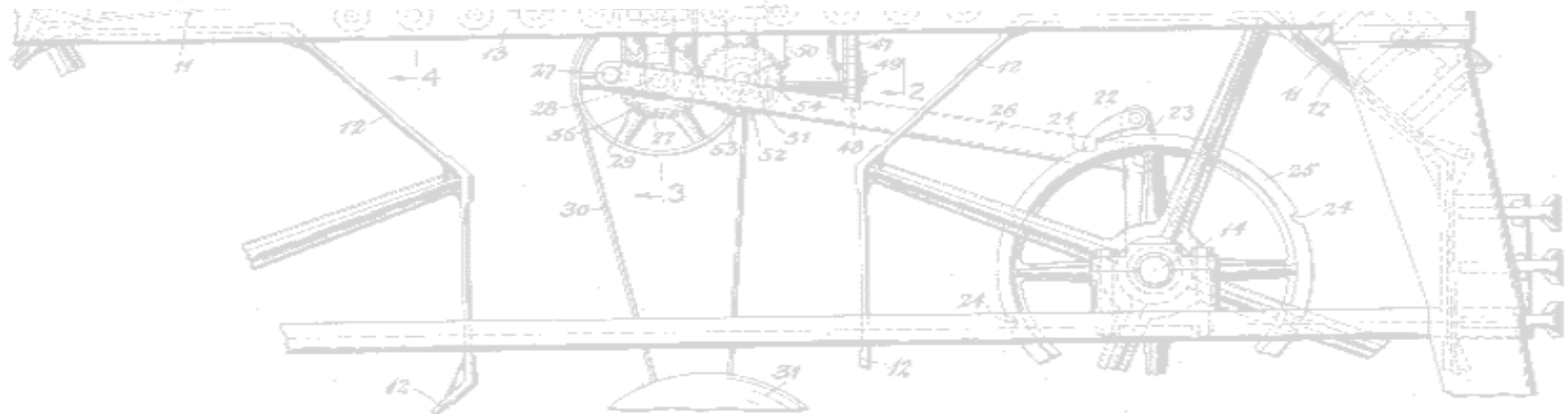
SHEET METAL BENDING



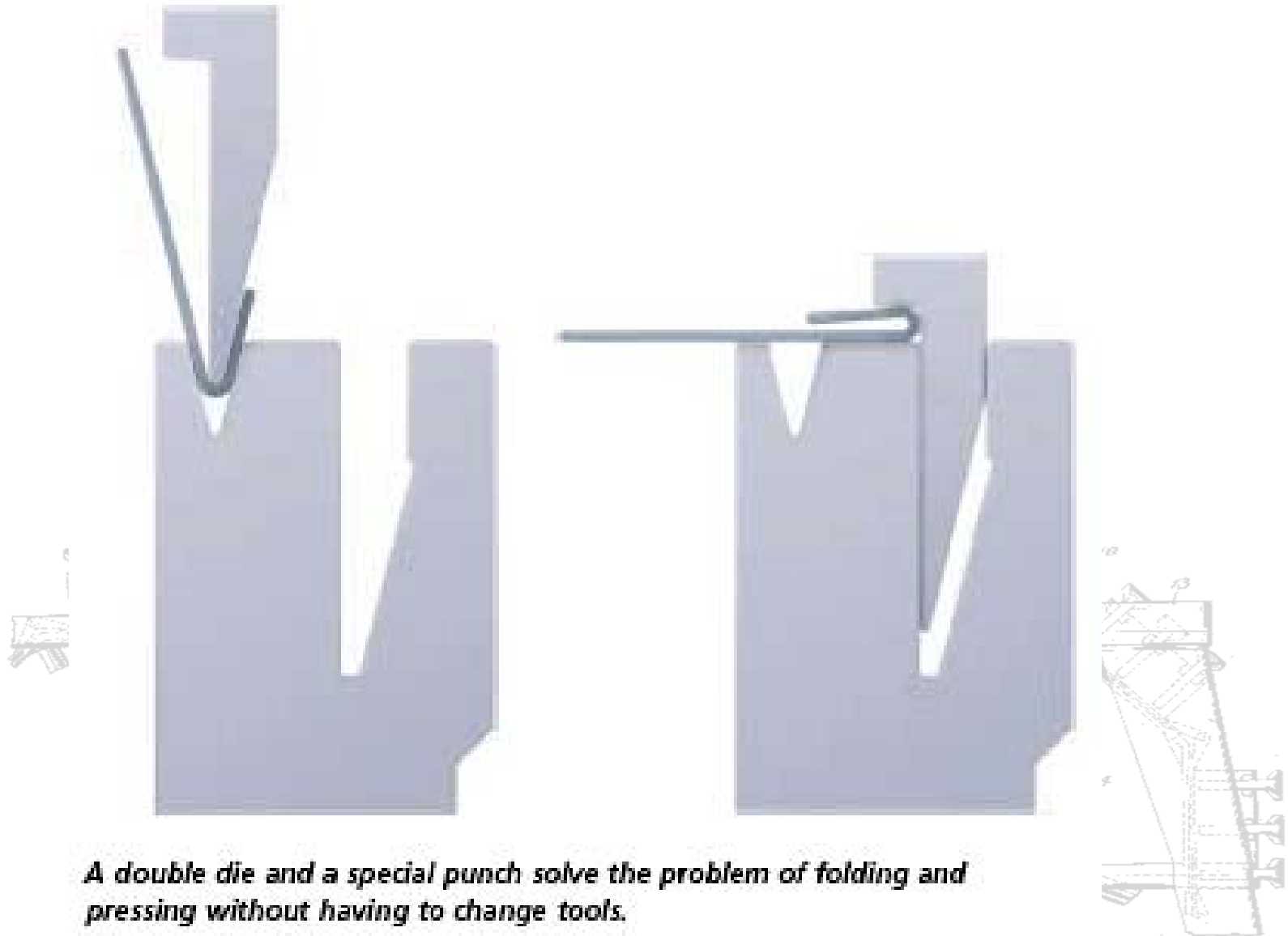
Printing unit chassis of a typewriter



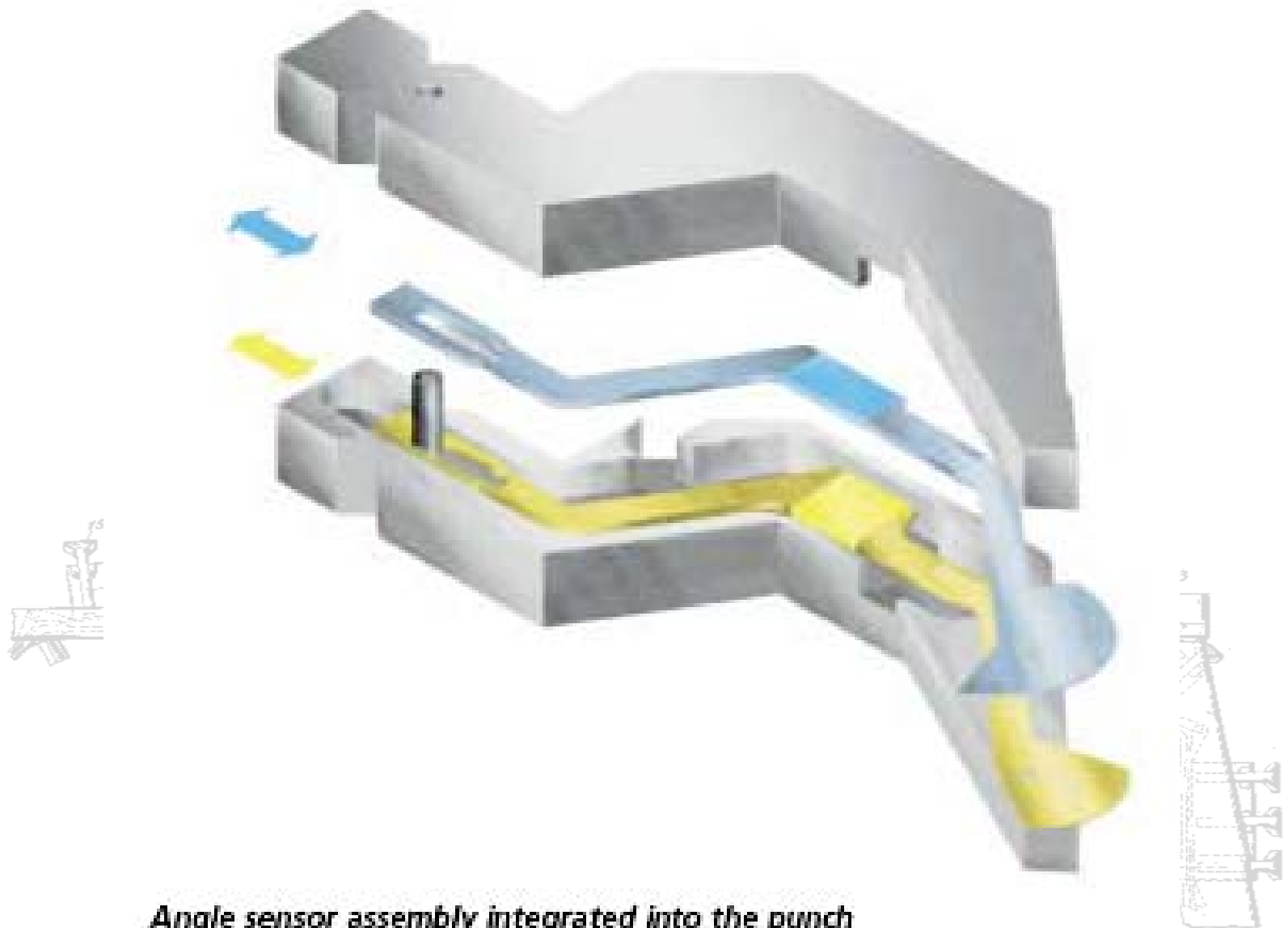
Cabinet for electrolytic capacitors



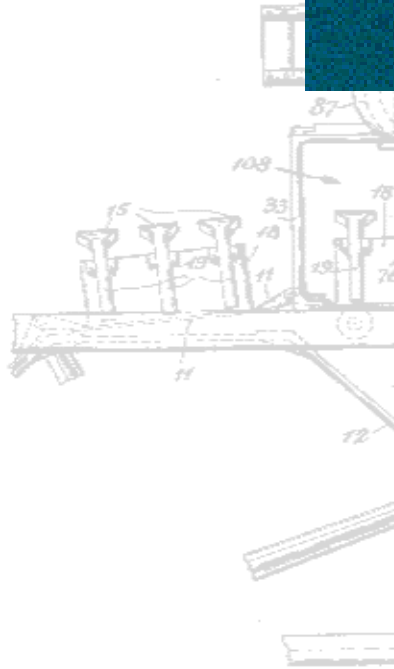
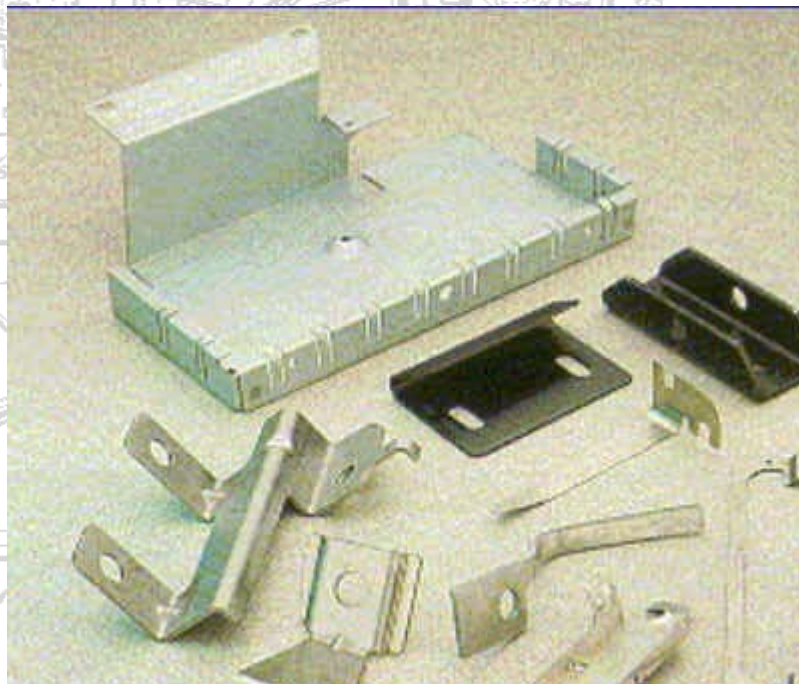
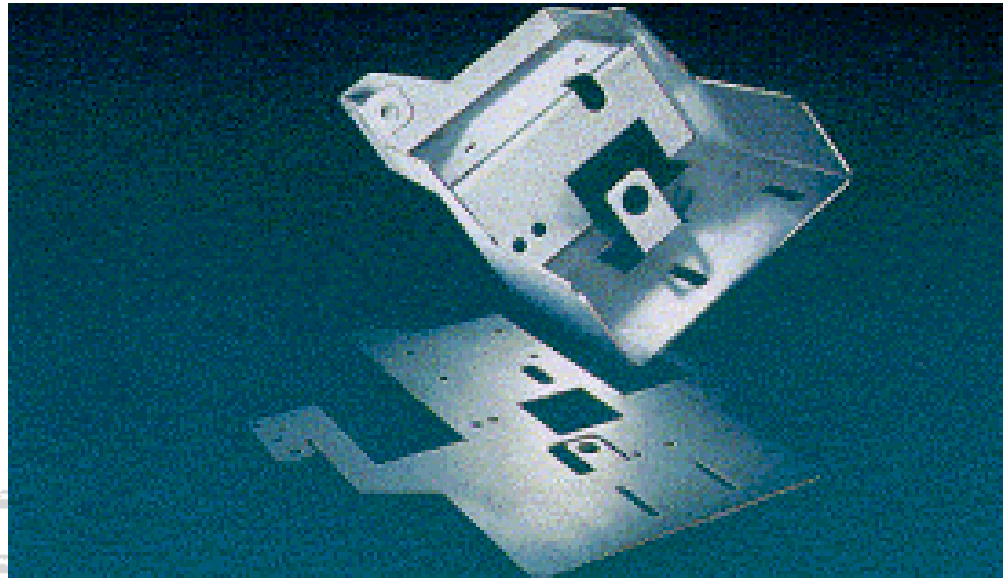
SHEET METAL BENDING



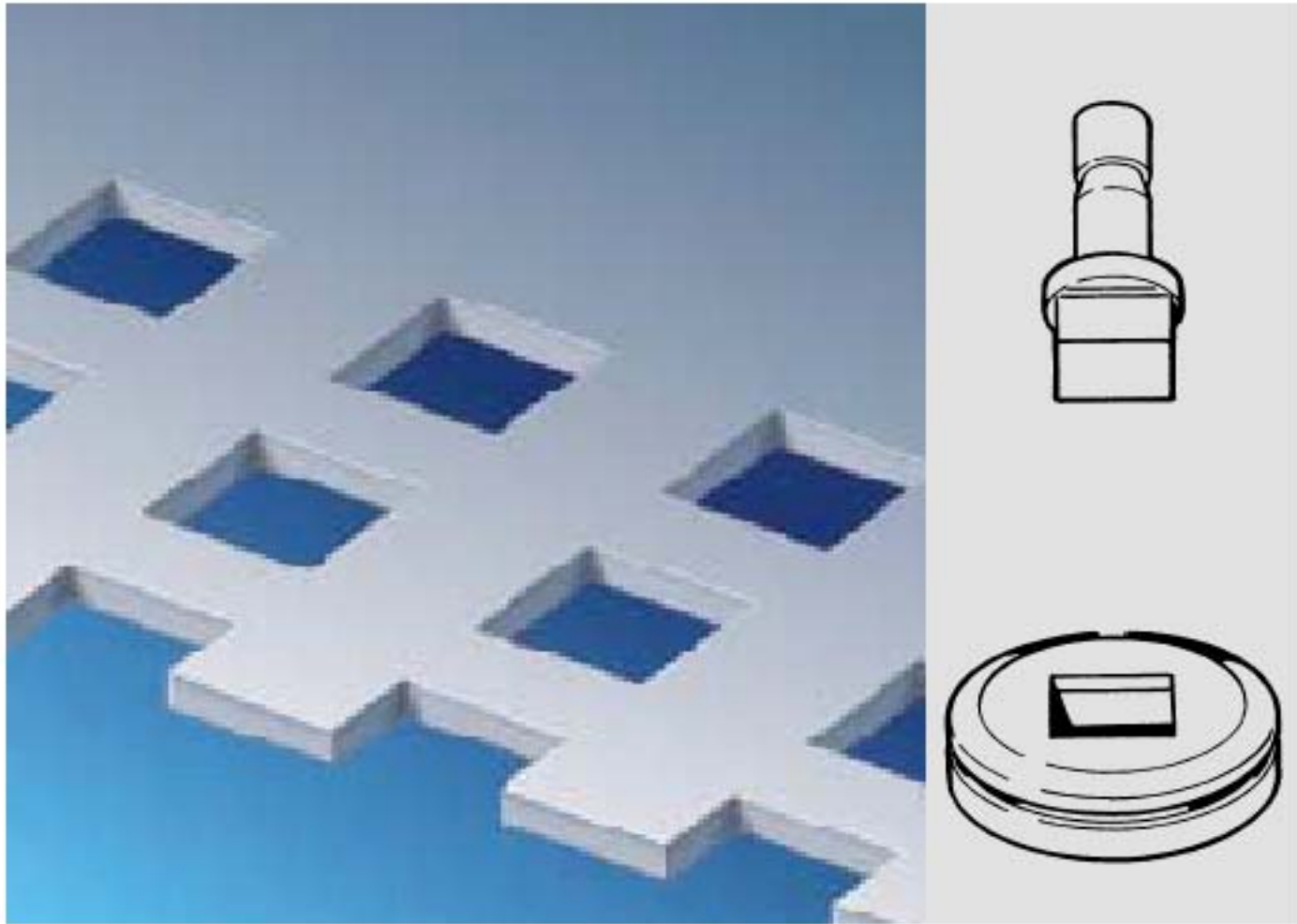
SHEET METAL BENDING



SHEET METAL BENDING

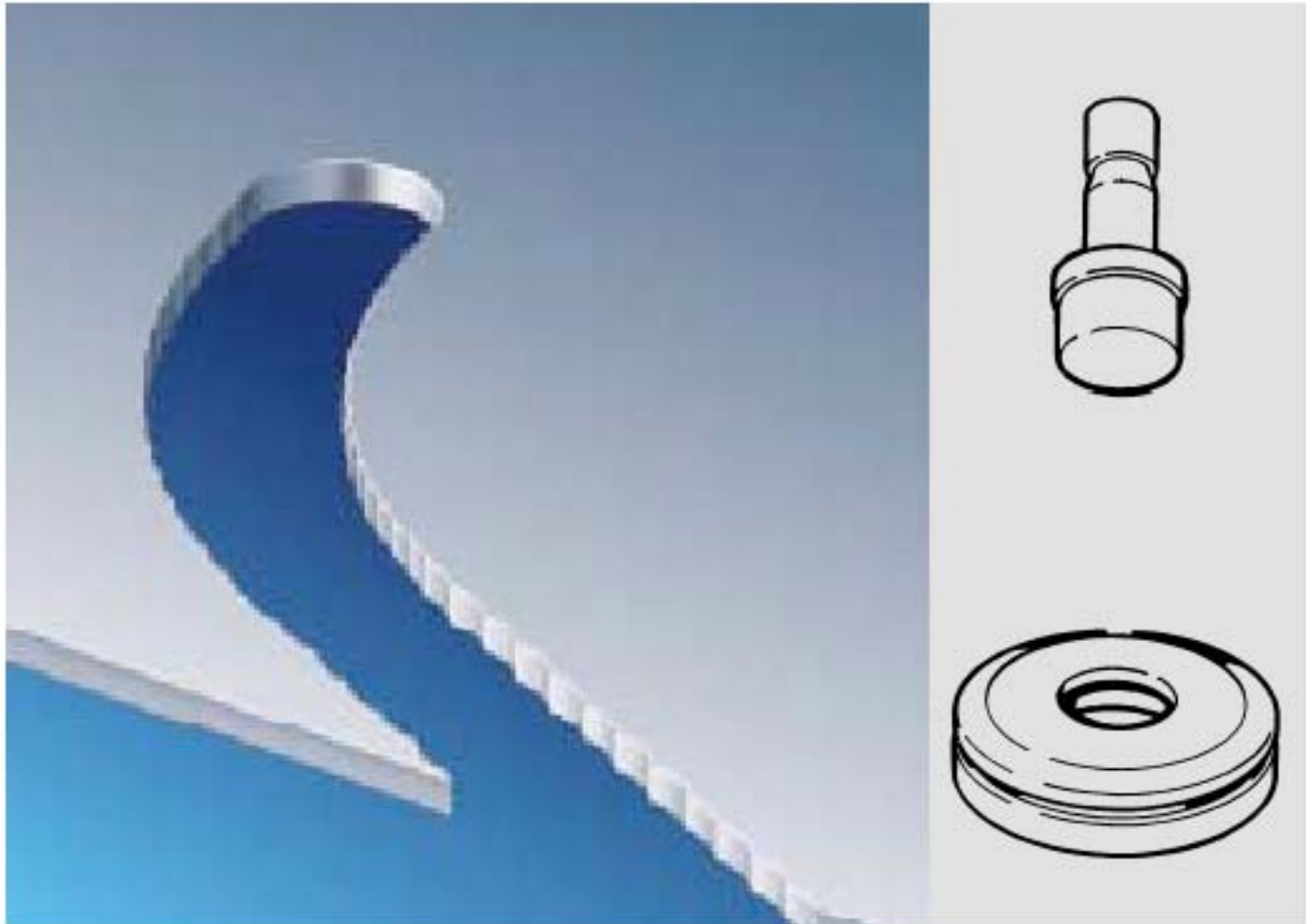


SHEET METAL PUNCHING



Punching

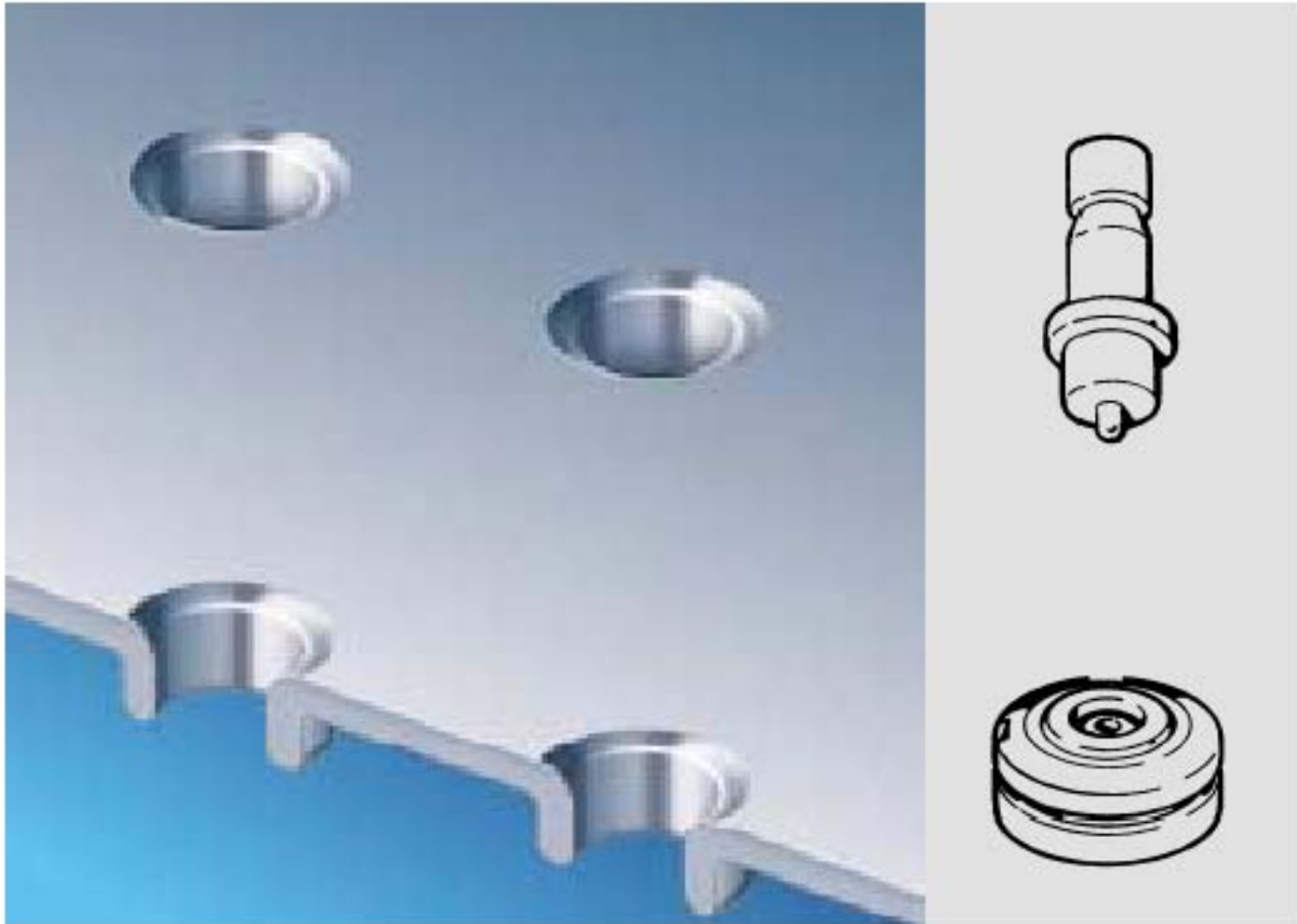
SHEET METAL PUNCHING



Nibbling



SHEET METAL PUNCHING

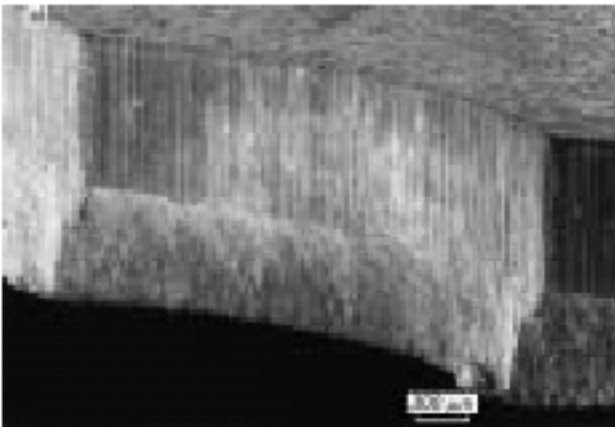
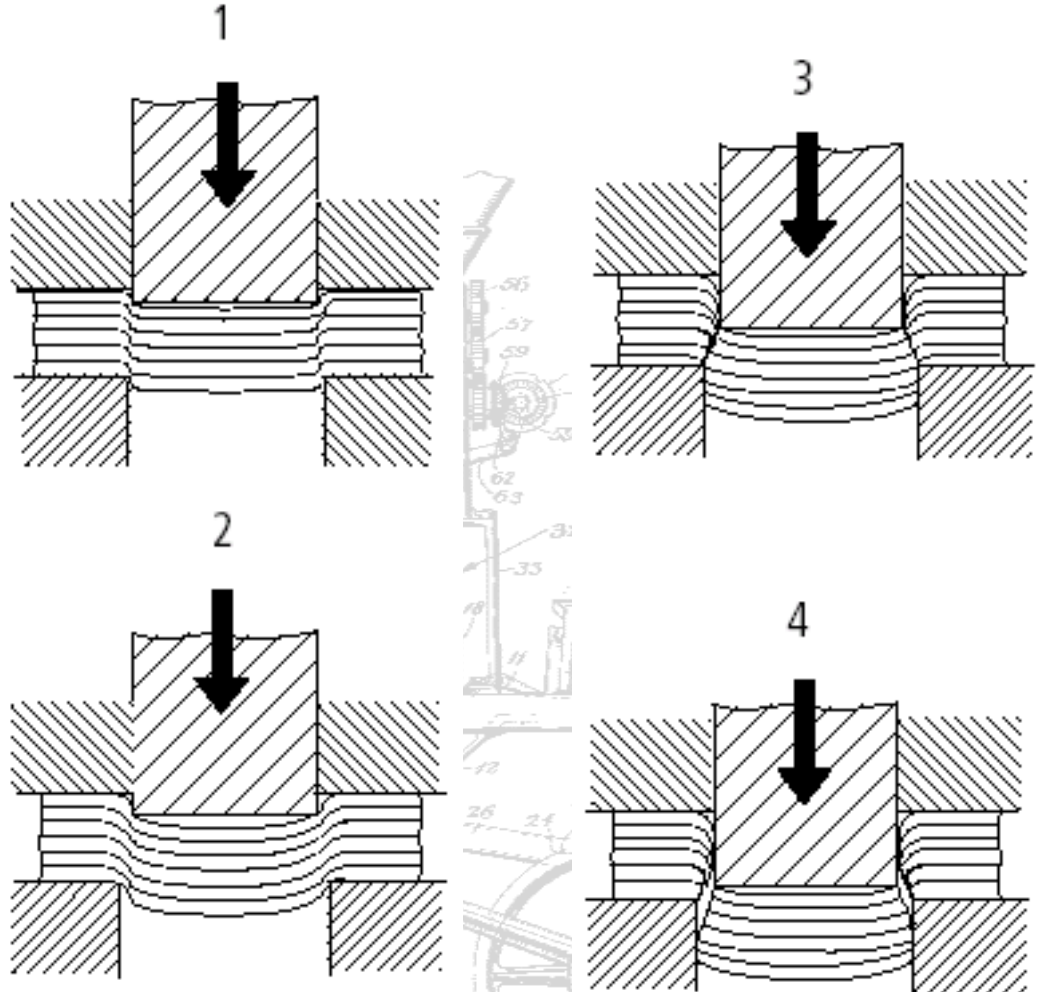


Forming



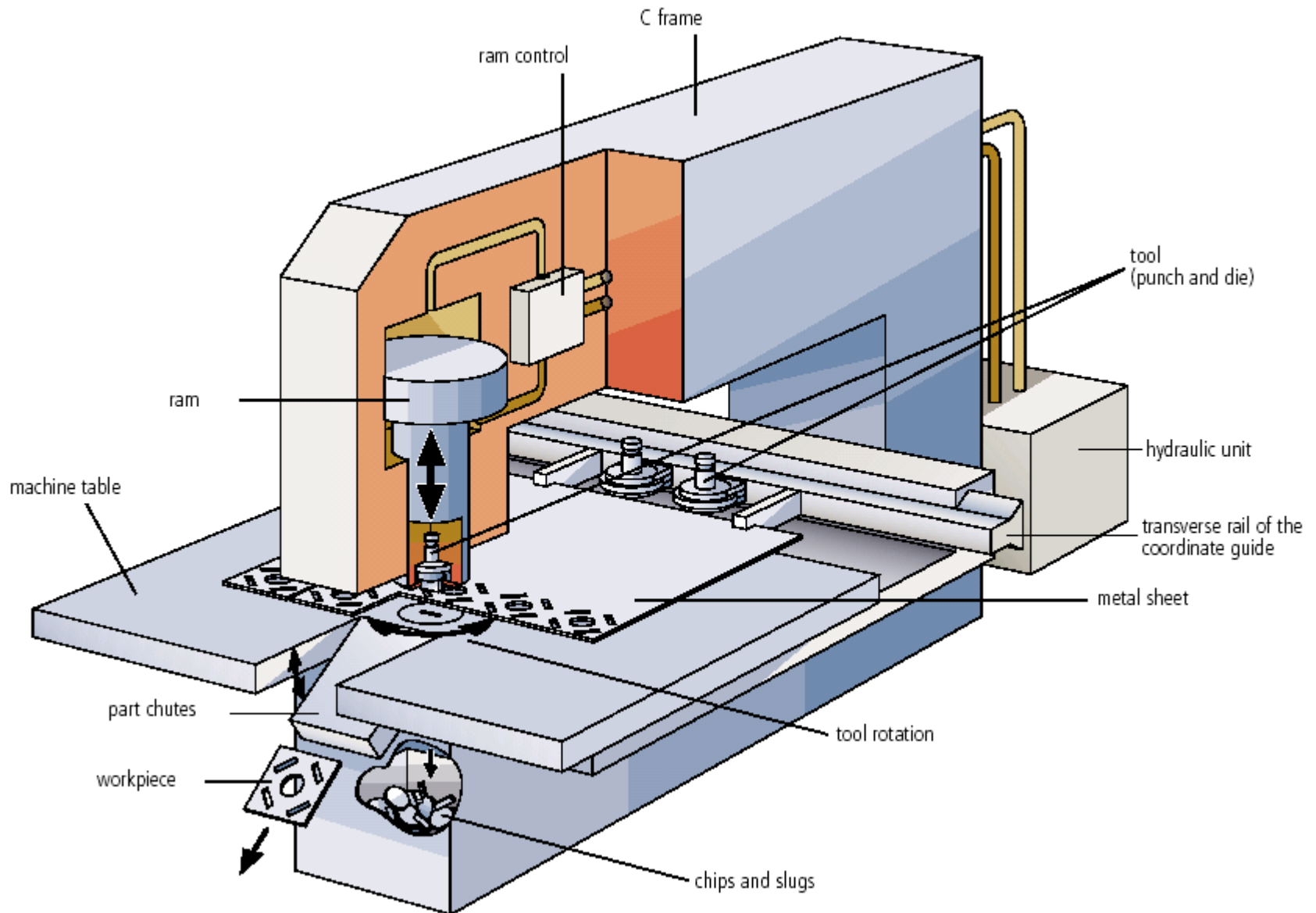
SHEET METAL PUNCHING

1. Indenting
2. Cutting
3. Fracturing
4. Ejecting slug

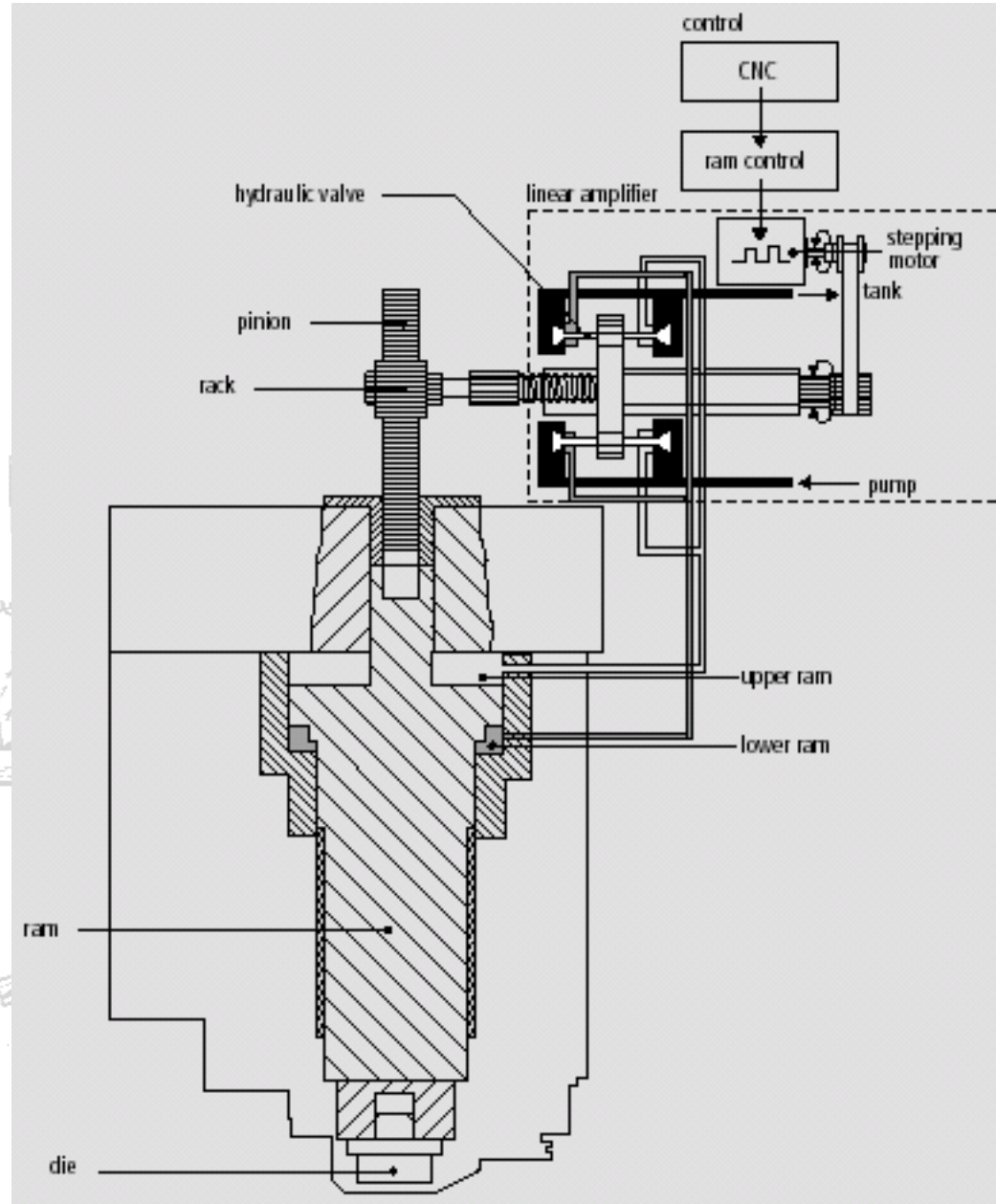


punching with a 2/3 cut ratio

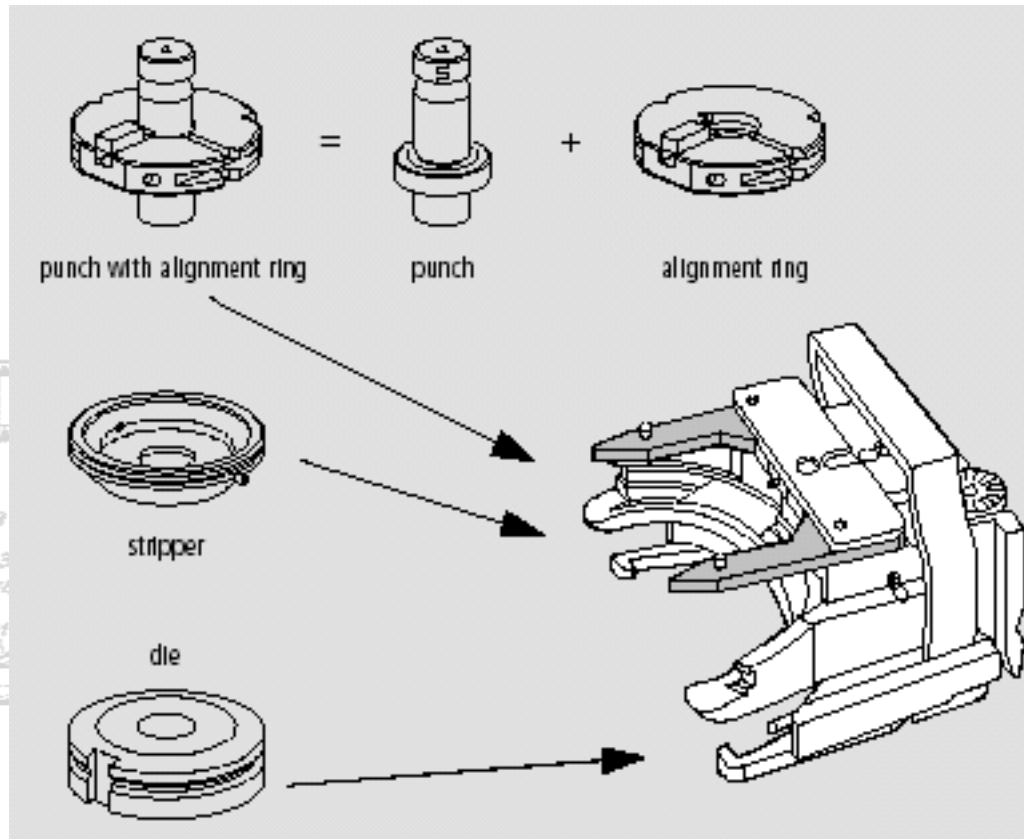
SHEET METAL PUNCHING



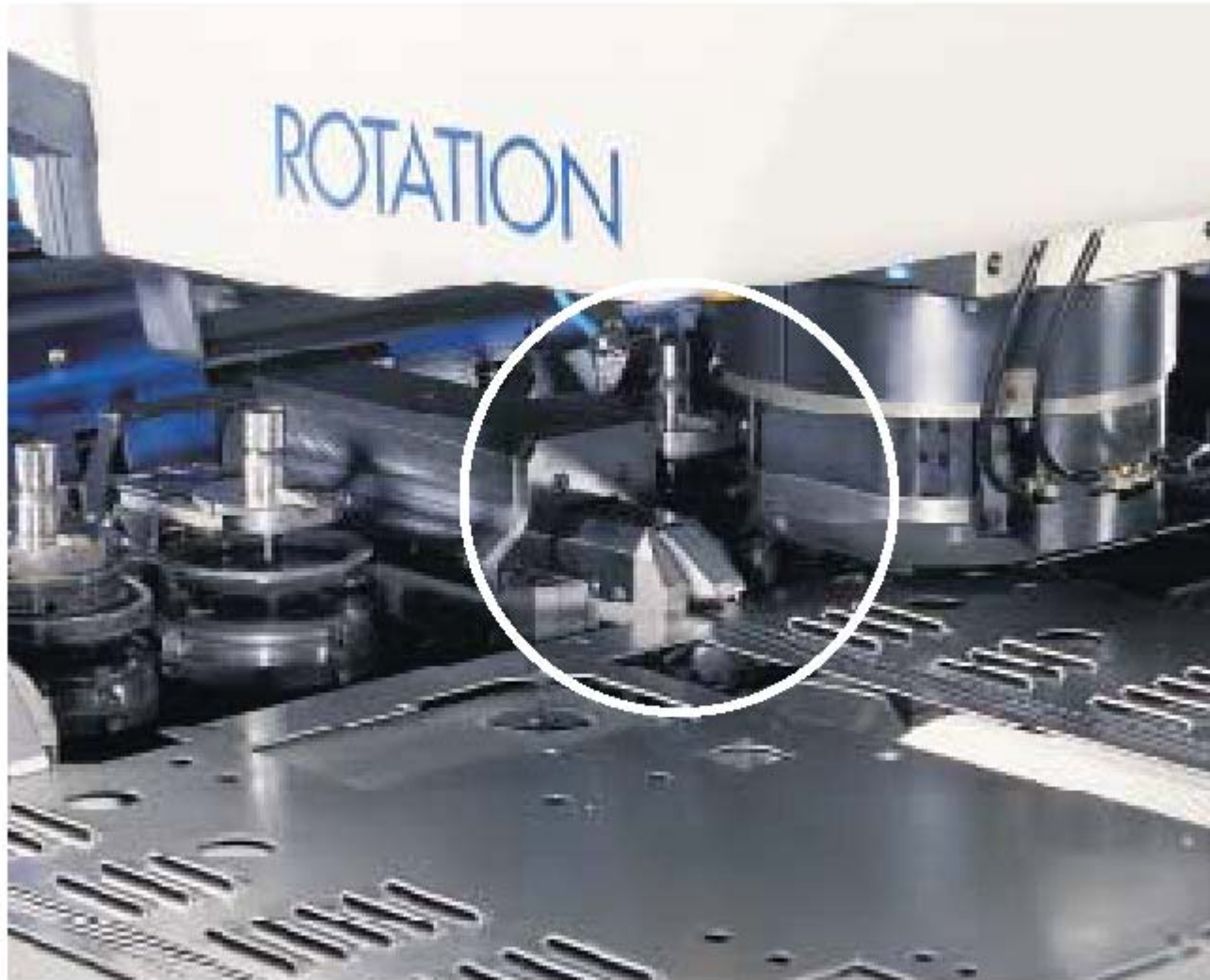
SHEET METAL PUNCHING



SHEET METAL PUNCHING

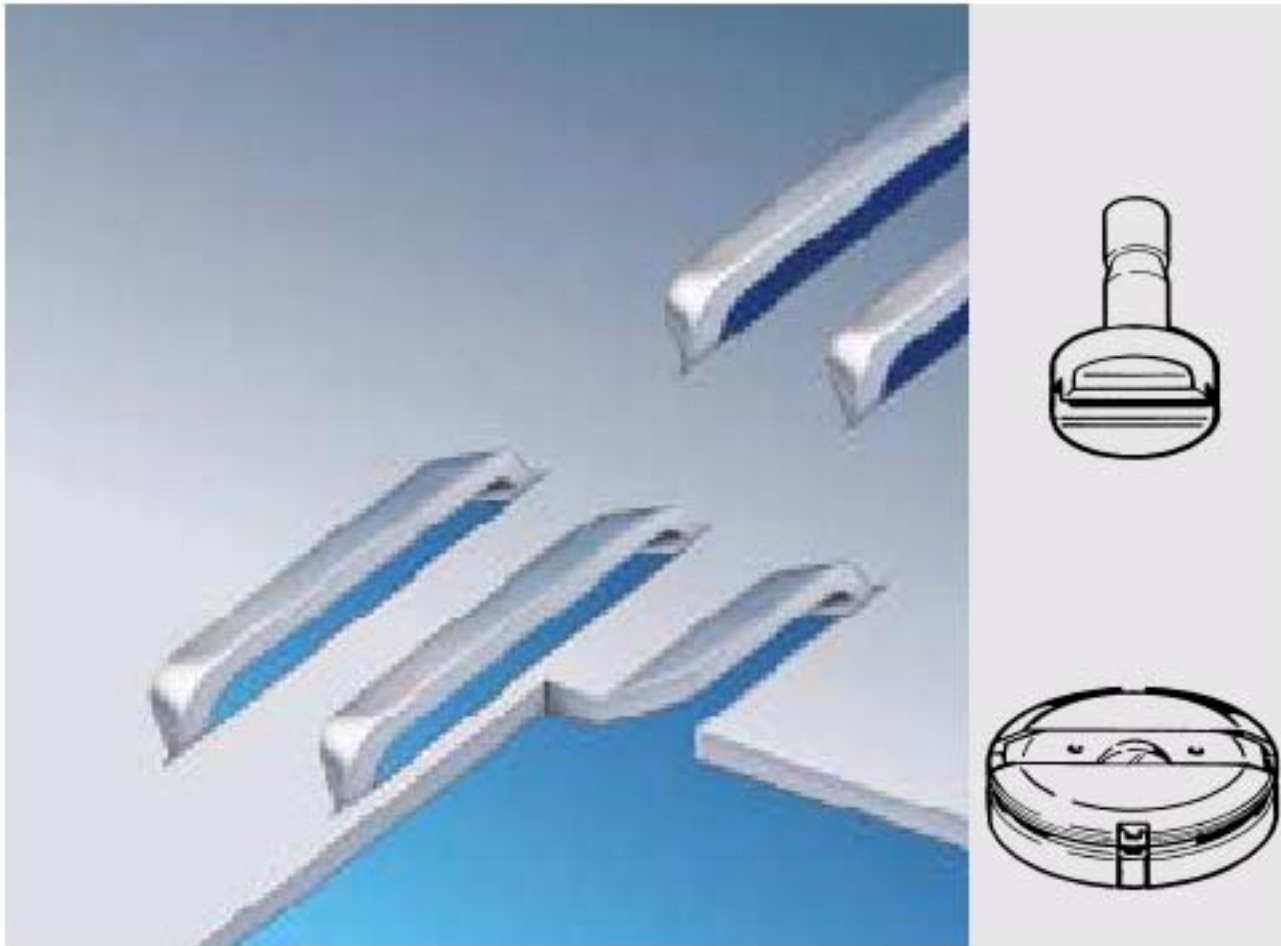


SHEET METAL PUNCHING



Retractable clamps

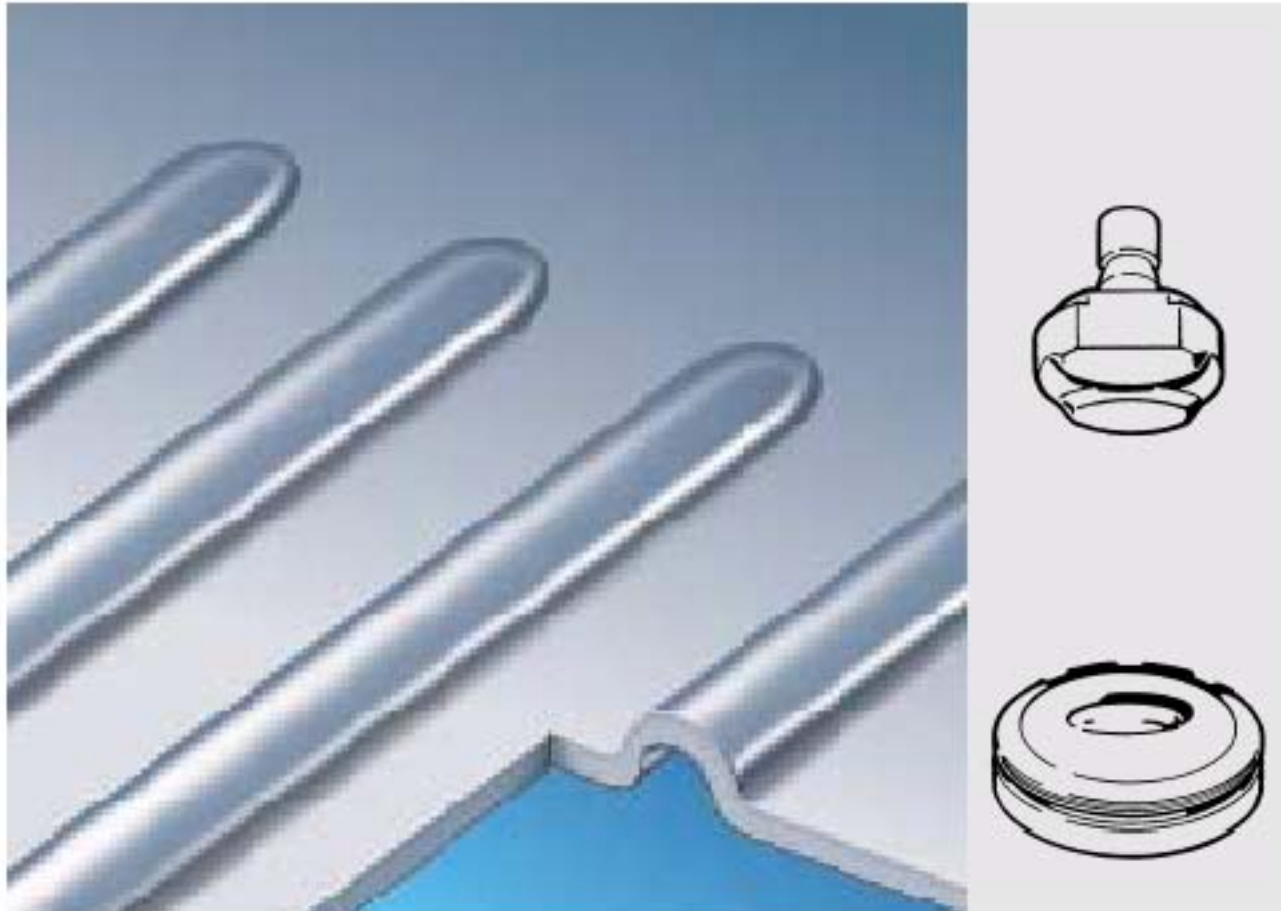
SHEET METAL PUNCHING



Louvers



SHEET METAL PUNCHING



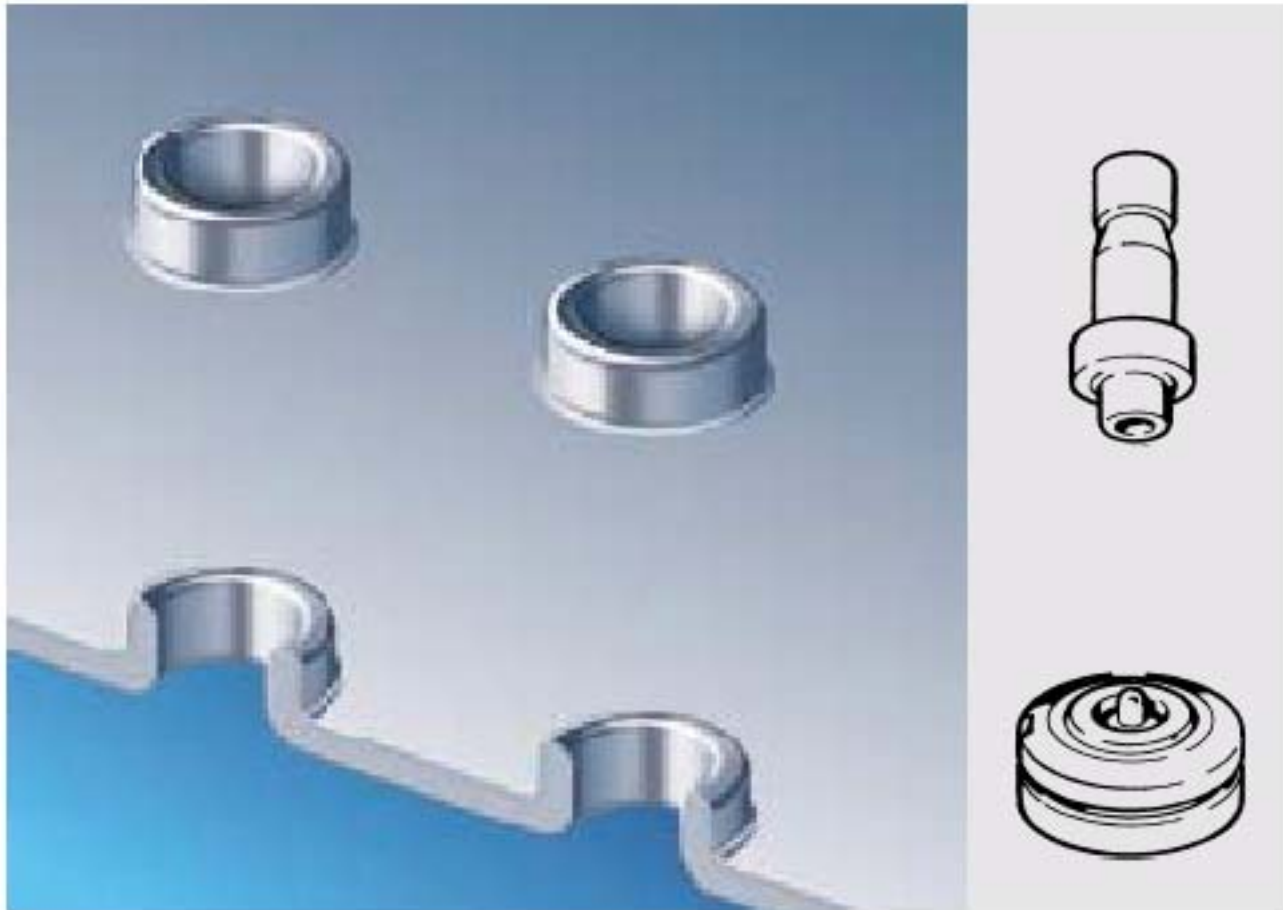
Beads (stiffeners)

SHEET METAL PUNCHING

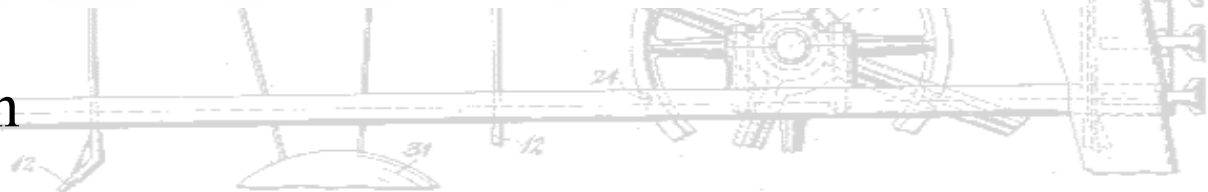


Chipless threading!

SHEET METAL PUNCHING



Extrusion



SHEET METAL PUNCHING

