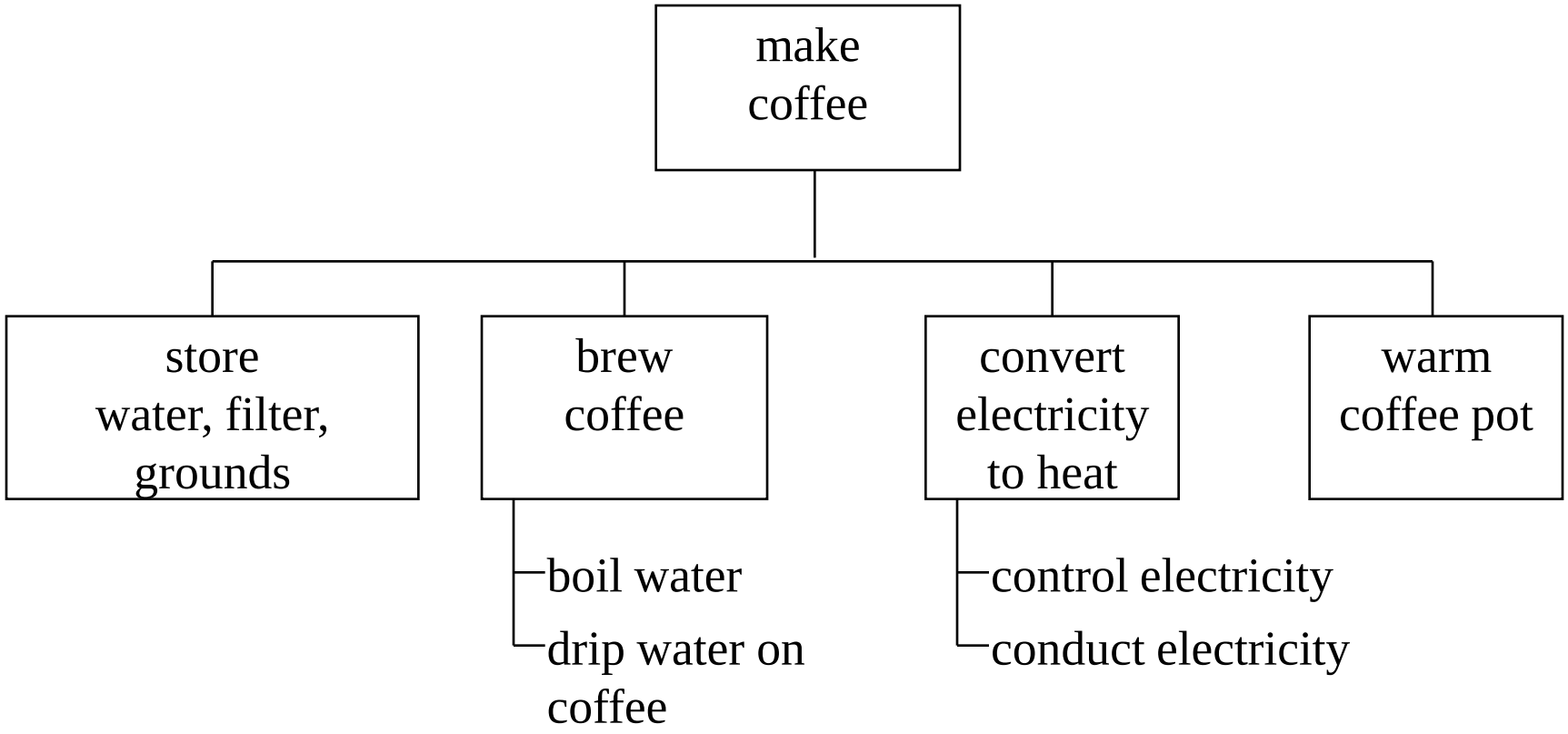
Morphological Chart

.

Functional requirements - Function decomposition diagram method

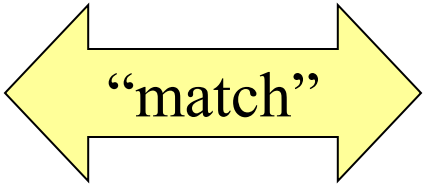
What functions are performed?



Remove? Combine? Reorganize?

Generating alternative concepts

e.g. fasten papers

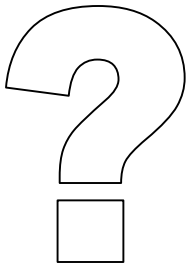


a) flexible clamp, paperclip
b) bent clamp, staple
c) adhesion, glue

(Sub)Functional requirements

SF_1

SF_2



Concept

$\{C_{11}, C_{12}\}$

$\{C_{21}, C_{22}, C_{23}\}$

Generating = finding or creating “matches”

“Developing” generated concepts

E.g. mini bike

		Alternative Concepts		
		1	2	3
Sub functions	Transmit	Chain	Belt	Gearbox
	Brake	Disc	Drum	
	Steer	Handlebar	Control stick	Fly-by- wire

Morphological matrices

Developing combinations of concepts into alternative product concept designs

		Alternative Concepts					
		1	2	3	…		n
Subfunctions	SF_1	C_{11}	C_{12}	C_{13}			C_{1n}
	SF_2	C_{21}	C_{22}	C_{23}			C_{2n}
	SF_3	C_{31}	C_{32}	C_{33}			C_{3n}
	…						
	SF_m	C_{m1}	C_{m2}	C_{m3}			C_{mn}

Alternative	Concept design
1	$\{C_{11}, C_{22}, C_{31} \ldots C_{m2}\}$
2	$\{C_{12}, C_{23}, C_{33} \ldots C_{m3}\}$

Functions	Possible conceptual solutions			Impact consequence (positive/negative)
f_1: Receive coffee material	Automatic receive	Manual Receive		More energy needed
f_2: Mix hot water and powder	Filter	Osmosis		Time increases then energy increases
f_3: Filter out coffee powder	Paper filter	Steel mesh filter	Plastic filter	High impact/less impact
f_5: Distribute electricity	Cord			Electrical shock (Insulation required)
f_6: Heat water	Submersible element	Large heating plate		More energy consumption
f_7: Warm brewed coffee	Hot plate	Insulated cup		Energy consumption/kept
f_8: Dissipate heat	Temp insulation	Seal covers		Energy kept
f_9: Distribute weight	Minimize heavy material	Disassemble parts (carafe)		Solid waste impact
Insulate energy flow	Rubber O-ring	Screws	Grommet sealing	Less energy leakage