

TRIZ solution principles and design strategy	Design features	Solutions				
		1	2	3	4	5
#1. Segmentation i) Product the component in different sections and the sections should be asymmetric as possible to simplify and ease the design and manufacturing process ii) Joining the sections using pin-and-boss method for easy assembly and disassembly process	Cross-section profile	Double-T	Square	U-type		
	No. of sections	2	3	4		
	Sectioning type	Symmetrical	Non-symmetrical			
	Part section assembly method	Screw-boss	Circular pin-boss	Square pin-boss	Adhesive	
#3. Local quality i) Vary the thickness of the component according to the stress concentration value. Thicker component at higher stress location points. ii) Brake lever body casing designed with ribs to reinforce and strengthened the structure as well as with pin-and-boss features to provide quick and easy assembly method. Joint different functioning feature together to the same component	Body type	Solid	Shell			
	Ribbing pattern	I	V	X	I+V	I+X

Note: Example for Concept Design 1 = Square + 2-sections + symmetrical + circular pin-boss + shell + I-rib

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_4 : Distribute electricity	Cord			Electrical shock (Insulation required)
f_5 : 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

Design Concept 3

Design Concept 1

Design Concept 2

Energy	Mechanical	Fluid
Sub-function		
Capture Energy	Linear spring, Torsional spring, Pendulum, Elastic, Mass / spring.	Air: Propeller, Vanes, Cup Water: Hydraulic head, Turbine, Float
Transform Energy	Crank shaft, Gears, Belt / sprocket, Four bar, Cam, Rack & Pinion	Pneumatic / Hydraulic
Import Water	Lift, Wheel (rotary) Archimedes screw, Carousel,	Suction, Siphon,
Channel	Conveyor, Lift, Archimedes screw	Tube, Funnel, Jet, V-notch
Energize	Reciprocating, Screw or Rotary pump	Jet pump, Vaporize, Water column,
Channel	Conveyor, Lift, Archimedes screw	Tube, Funnel, Jet, V-notch
Eject	Lift,	Pressure Jet
Inhibit Back flow	Flapper, Ball, or Butterfly valve,	
Prevent Debris / Impure.	Screen, Filter, Permeable membrane	Float, Skim, Vortex