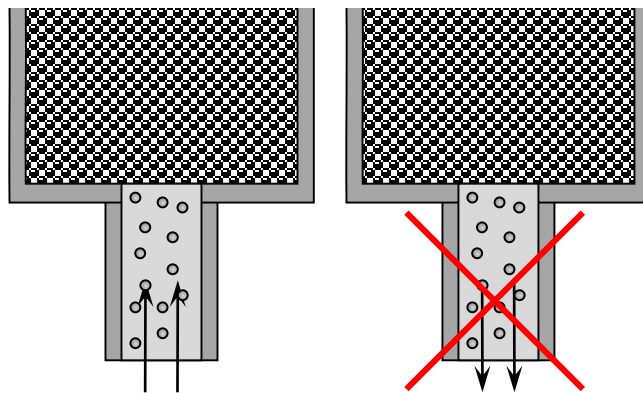


Agriculture - Fertilizer Granules Drying

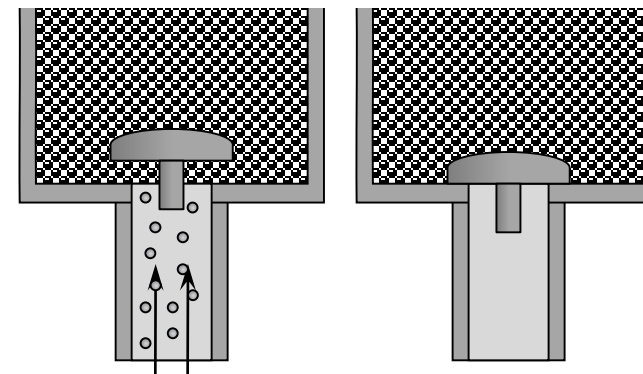
GEN TRIZ Case Study

Background

- The company uses a fluid bed dried fertilizer granules. It assumes transportation of granules with the flow of hot air from nozzles.
- However the fluid bed should stop several times per day. As a result, granules could be lost through nozzles with the absence of air flow
- The company tried to solve the problem by using self-controlled plugs. However it does not work because granules are abrasive, chemically aggressive, and sticky
- What should be done?



Initial Situation



Self-controlled plugs

Problem Solving

- Problem:
 - How to prevent losing of granules through air nozzles in the absence of air flow?
- Physical Contradictions:
 - The nozzle should conduct granules to supply the dryer, BUT it should not conduct granules to prevent granules spill
- Separation in Directions:
 - The nozzle conducts granules in straightforward direction, and it does not conduct granules in opposite direction
- Inventive Principle:
 - Curvature (make a system curved)
 - Asymmetry (make a system asymmetrical)
- Solution:
 - Conical nozzles: granules makes a dome and thus stop themselves

