

# Smartphones - Flexible Battery

GEN TRIZ Case Study

## Background

- The next generation smartphones are going to become flexible. A flexible case is not an issue. Flexible screens were recently developed. The bottleneck now is a secondary battery. Electrode materials that provide high capacity have insufficient flexibility, and flexible materials have insufficient capacity.
- The Problem: how to make a flexible secondary battery with a high capacity?



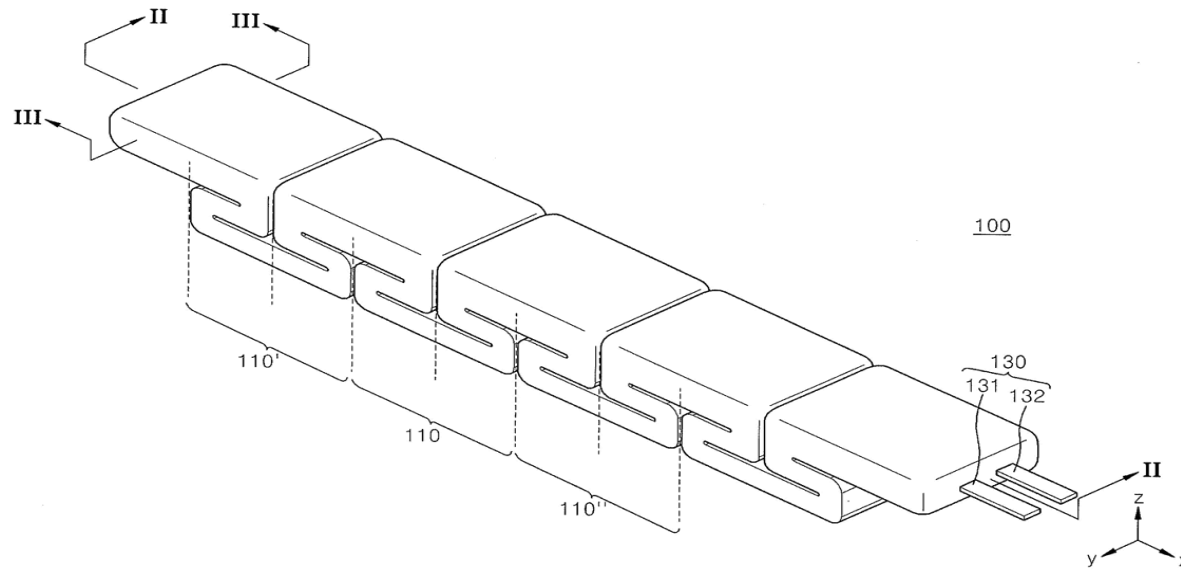
## TRIZ Problem Solving

- The Problem:
  - How to make flexible secondary battery with high capacity?
- Physical Contradiction:
  - Electrode material should be flexible to provide battery flexibility, however it should be rigid to provide high capacity
- Inventive Principles:
  - Separation - divide an object into independent parts
  - Transition to another dimension (multi-level design)
- Solution:
  - Zigzagging electrodes
  - US Patent 2015/200417 (Samsung)

# Solution

- High flexibility
- High capacity

FIG. 1



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