Casi Studio

Gaetano Cascini
Esempi applicativi

- 1 - Company: Archiglaze s.r.l. (<20 employees)  
  Study case: Innovative spiders for architectural glazing  
  Resources:  
  - 5th year student (duration: 2 months)  
  - Archiglaze designer

- 2 - Company: Whirlpool Europe (Siena)  
  Study case: Chest Freezer Illumination Device  
  Resources:  
  - 5th year student (duration: 3 months)  
  - Whirlpool design “mini”team

- 3 - Company: Whirlpool Europe (Siena)  
  Study case: Chest freezer hinge  
  Resources:  
  - 5th year student (duration: 4 months)  
  - Whirlpool designer
Innovative spiders for architectural glazing

Company: Archiglaze s.r.l. (<20 employees)

Study case: Innovative spiders for architectural glazing
Innovative spiders for architectural glazing

**Advantages**
- No bending moment on glass sheets
- Low support/glazing size ratio (High wall transparency)

**Limits**
- Assembly time
- Costs related to drilling holes
- Special parts are needed for not-planar walls

**Spider**

**Advantages**
- Easy to assemble
- Glazing without holes

**Limits**
- Bending moment acting at glass sheets vertices
- High support/glazing size ratio (Low wall transparency)
- Special parts are needed for not-planar walls

**Bracket**
Innovative spiders for architectural glazing
Innovative spiders for architectural glazing

Functional and Value Analysis

The system component with the lowest value (more harms) is the glass with holes.

Evolution Trends Analysis

Increase the system “dynamization”: a support that allows variable orientation of glass sheets.
Innovative spiders for architectural glazing

Contradictions
identification and overcome

- Where an object or system is uniform or homogenous, make it non-uniform
- Enable each part of a system to function in locally optimized conditions
Innovative spiders for architectural glazing

First embodiment

PATENT PENDING
Innovative spiders for architectural glazing

Second embodiment

PATENT PENDING
Chest Freezer Illumination Device

- Improve the existent system, providing a better illumination, without increasing the costs of manufacturing and preserving a good appeal for the customers.
Chest Freezer Illumination Device

System constraints:

- The light cannot be placed inside the cabinet walls, because it would negatively impact the manufacturing process.
- The solution should fit with all the models of the catalogue, apart from the size of the cabinet and the shape of the hinges.
- As a direct consequence a device applied on the back of the freezer on the condenser supports must be avoided since it can be applied only on the models with a large gap between cabinet and door when the latter is open.
- The illumination device should not interfere with the external geometry of the cabinet in order to not impact packing and transporting systems.
Chest Freezer Illumination Device

System functional modeling:

- Main Useful Function poorly accomplished
- High system complexity
Chest Freezer Illumination Device

Problem solving through patterns of evolution:

- **Space segmentation**
- **Controllability**
- **Reducing system complexity**
- **Geometric evolution**

**Trimming**
- Complex System
  - Elimination of non-key components
  - Elimination of non-key sub-systems
  - Trimmed System

**Dynamization**
- Immobile System
  - Jointed System
  - Fully Flexible System
  - Fluid or Pneumatic System
  - Field Based System
Chest Freezer Illumination Device

Three main concepts generated:

- **TRIMMING**: Number of parts reduction by means of a simpler assembly system
- **DYNAMIZATION**: “Pendulum”: dynamized illumination device
- **ELIMINATE HARMFUL FACTOR + K SEARCH**: Change of the energy source to L.E.D. (distributed light sources or flat emitting panel)
Cerniera per congelatore orizzontale

Caratteristiche sistema attuale:

- Unico fornitore (Apparatebau) con dispositivo brevettato
- Forza nulla con porta chiusa
- Spinta crescente all’aumentare dell’angolo di apertura (equilibrio oltre 40°)
Cerniera per congelatore orizzontale

Ricerca brevettuale:
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Analisi sistema attuale:
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Analisi sistema Samsung:
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Analisi trend evolutivi: Dinamizzazione
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Cerniera magnetica