INNOVARE CON METODO:
dalle nuove tecniche per il trasferimento tecnologico ai metodi di innovazione sistematica (TRIZ)

Prof. DAVIDE RUSSO

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14/05/2019

Sommario

- *introduzione sui metodi per fare innovazione di prodotto in modo sistematico; il metodo TRIZ (basi)*
- *L'evoluzione del metodo TRIZ come strumento per innovare nella piccola e media impresa*

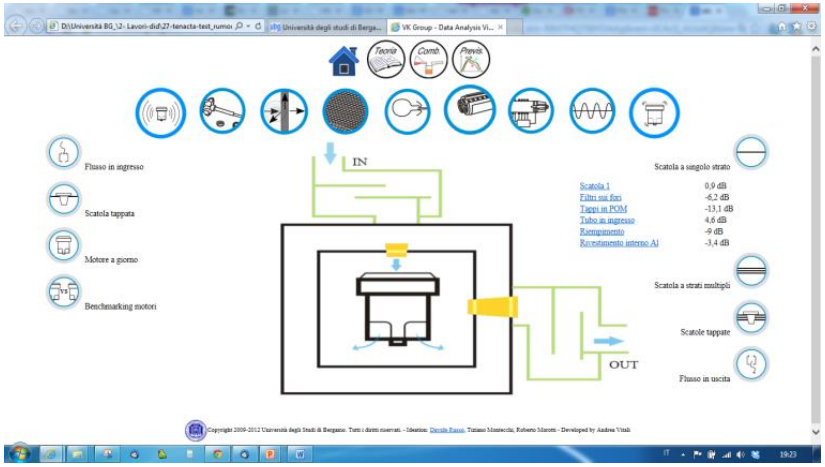
(ore 17:00 – 17:20: Coffee Break)

- *Il ruolo della brevettazione nel processo inventivo*
- *Casi di studio*

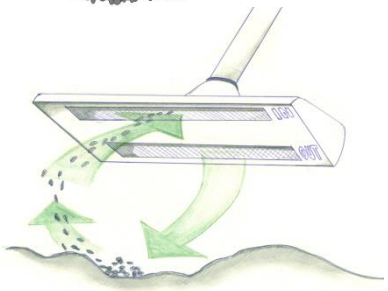
Davide Russo

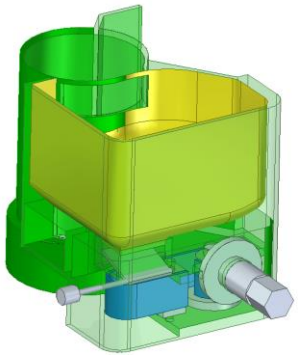
- 2003_ Mechanical Engineer
- 2007- PhD in machine design at University of Florence
- Associate Professor at **University of Bergamo** where he teaches TRIz in the course of "Product and process Innovation" (80 hours).
- over than 80 publications in scientific journals, international conferences about TRIz and intellectual property.
- inventor of **13 international patents and 2 Italian (Bracco3, Coesia 2, GDM1, Imetec1, Alfa servizi1, University of BG2, Bigflo2, Synecom2,Quicklypro1, Warrant…)**.
- founder and ex CEO of **BiGFLO srl**, spin off of the University of Bergamo
- member of **COGES**, Center for Innovation and knowledge management at University of Bergamo
- founder of APEIRON, the italian Triz association
- TRIZ expert, with over than 15 years experience in consulting and training in more than 200 companies, Universities and public institutions.
- Trainer certification in Intellectual Property from DINTEC (UnionCamere)
- Member of U4I Foundation

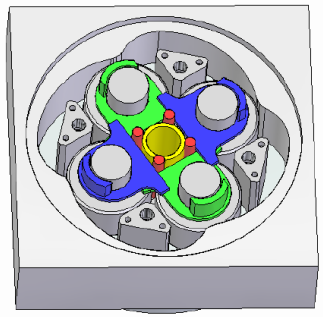
TENACTA

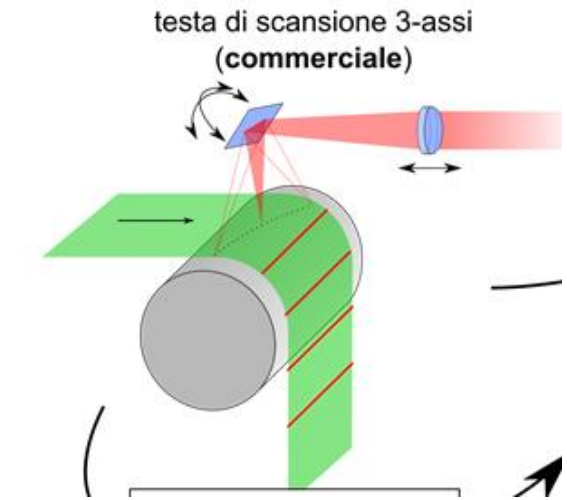


TENACTA (IMETEC) patented

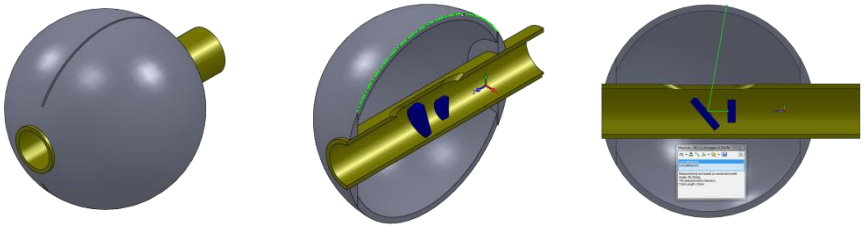


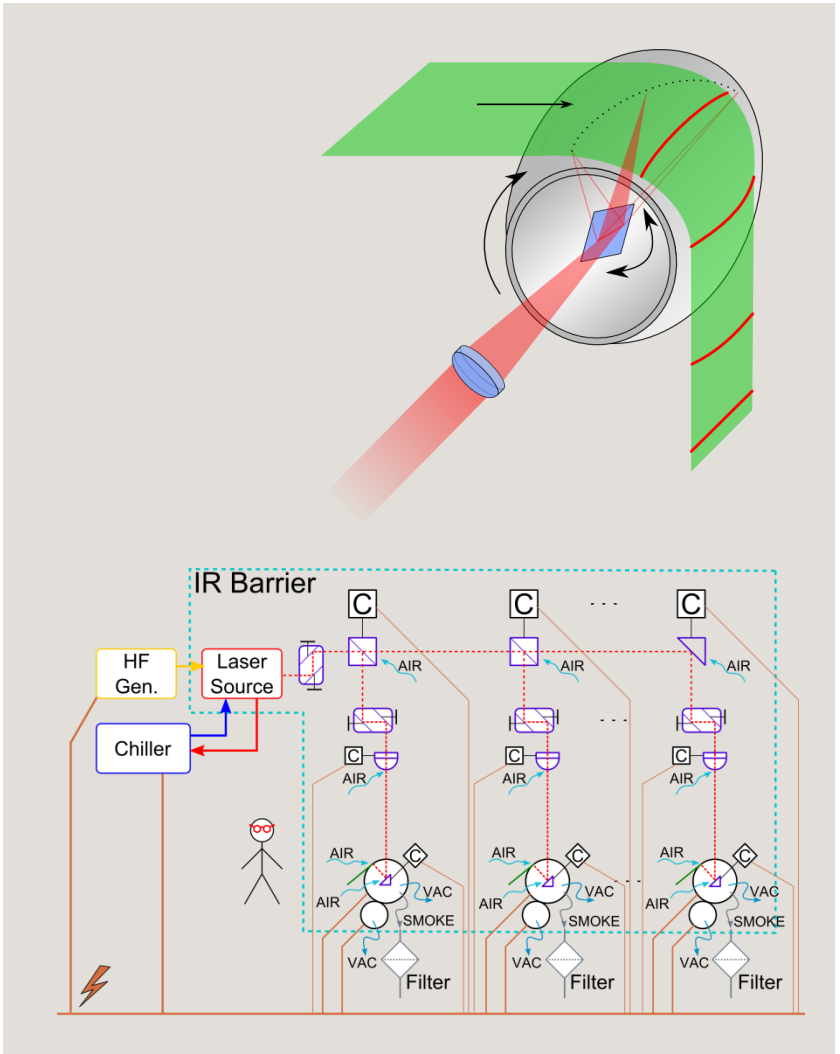


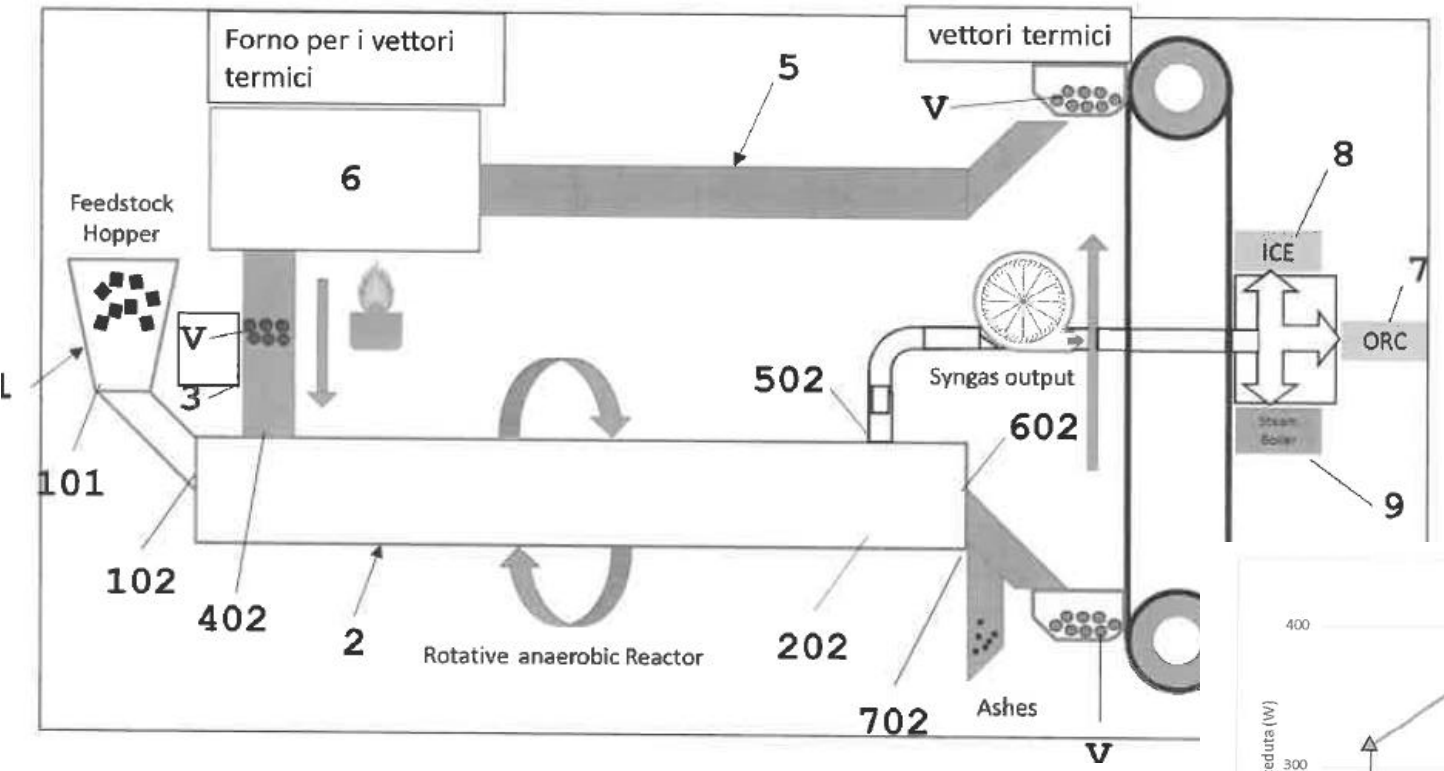




GDM- Diapers cutting
4 patents







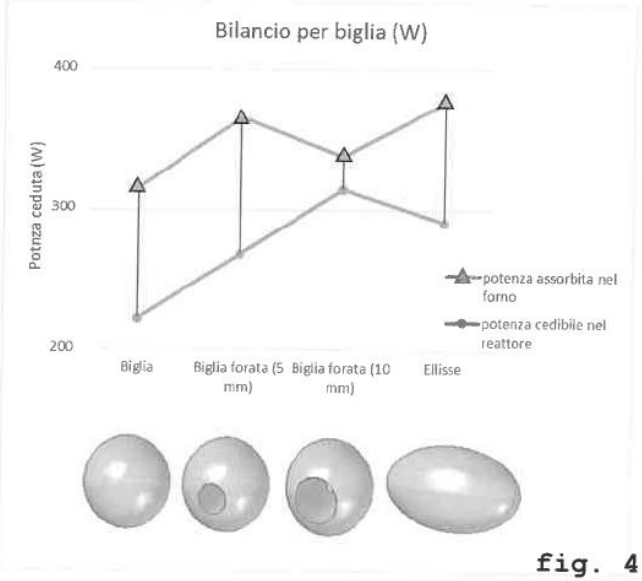
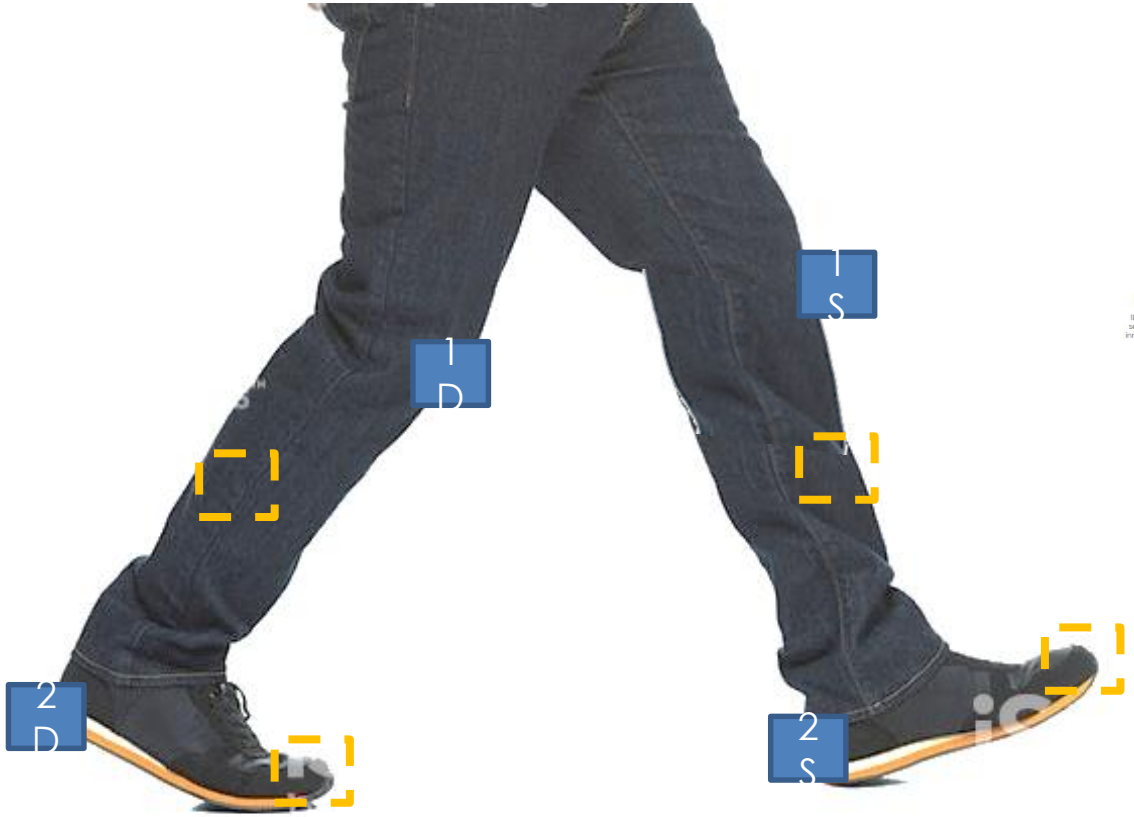


fig. 4



Premi e riconoscimenti

BIOUPPER Startup Accelerator

Vincitore Bioupper

startcup Bergamo

Progetto 2° classificato

Il progetto Q-Walk si è classificato secondo alla competizione tra idee innovative organizzato dall'Università degli Studi di Bergamo.

GSVC

Semifinale italiana

Il progetto Q-Walk ha raggiunto le semifinali italiane del concorso internazionale ideato e promosso dalla HAAS School of Business di Berkeley, che intende favorire la nascita e lo sviluppo di nuove imprese a forte rilevanza sociale e/o ambientale.

Progetto 2° classificato

Il progetto Q-Walk si è classificato secondo alla competizione tra progetti innovativi organizzato dalla Fondazione Gian Maria Mazzola Onlus e da Hidrogest.

innov-aging

21 - 23 JUNE 2018 - Ancona, Italy

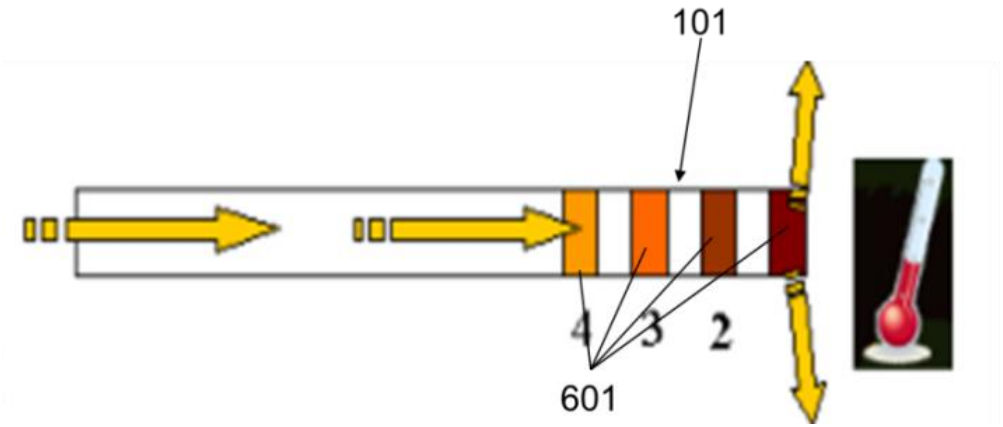
Progetto selezionato evento Innovaging

Il progetto Q-Walk è stato scelto da Fondazione Marche tra oltre 300 start-up di tutto il mondo nel campo della "silver age", per partecipare all'evento Innov-aging, il primo Expo Meeting in Italia totalmente dedicato alle innovazioni del mondo del Silver Market.

Progetto finalista con premi

Il progetto Q-Walk è stato selezionato tra le 20 start-up finaliste alla competition del Web Marketing Festival di Rimini ed ha ottenuto due riconoscimenti:
1° premio da Healthware International
1° premio da studio legale Perani|Pozzi|Associati

Others



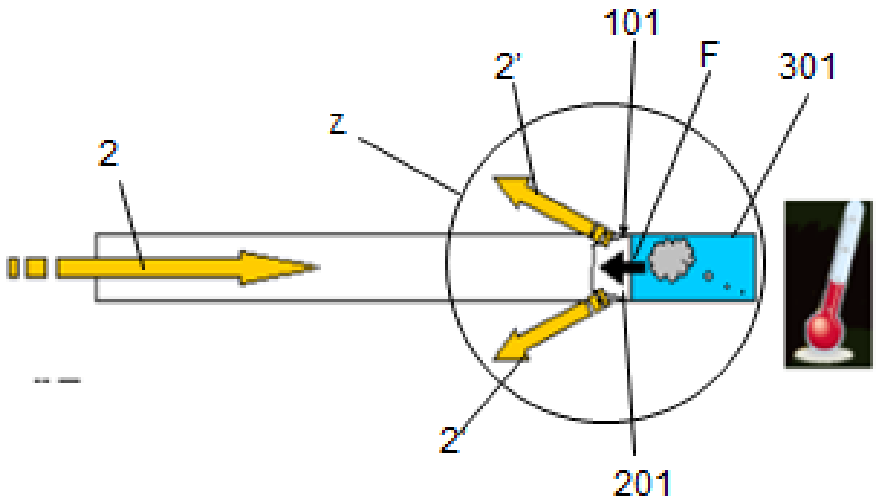


Fig. 3

BRACCO laser tip
for tumour
ablation
3 patents

I metodi per fare innovazione di prodotto

BiGFLO
From information to innovation!

Problema tecnico e problema inventivo

Problema:
Voglio una stampante compatta !

PROBLEMA TECNICO:
----> «ottimizzazione»

PROBLEMA INVENTIVO:
----> «invenzione»

circular printer

What are the existing strategies for product Innovation?

- Benchmarking, copying from competitors
- Serendipity or fortuity
- “Out of the box” method
- Design Innovation
- Technology transfer from research world
- Bio Inspiration
- Trial and error

- Systematic innovation

Benchmarking

Benchmarking: it is really innovation?

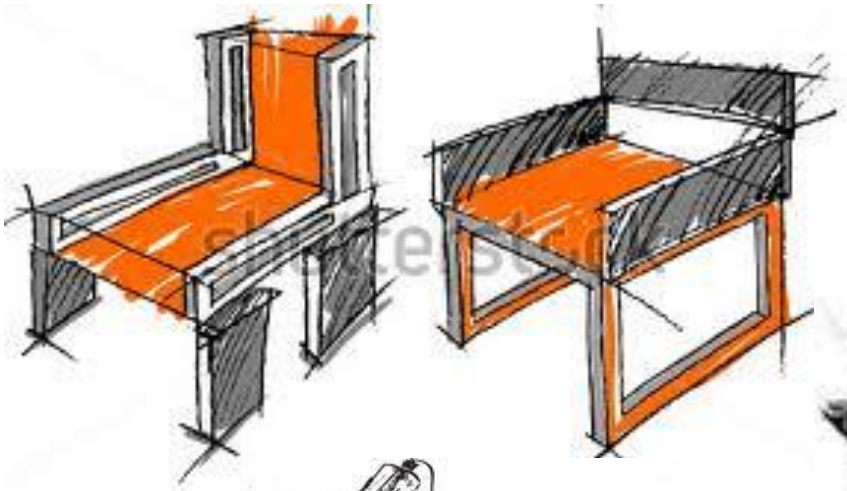
Study the competitors to copy the choices of the best on the market

Serendipity

1. The Microwave - Percy L. Spencer
2. Saccharin - Ira Remsen, Constantin Fahlberg
3. Super Glue - Harry Coover
4. Teflon - Roy Plunkett
5. Bakelite - Leo Baekeland
6. Pacemaker - Wilson Greatbatch
7. Velcro - George de Mestral
8. X-Rays - Wilhelm Roentgen
9. …….

During the second world war, the English people invented the microwave radar (MWs were generated by a device called magnetron). The idea of a microwave oven was due to a chocolate bar. Spencer was working close to a magnetron, when he noticed that the bar was melt.

DESIGN Innovation



Technology transfer

- Continuous improuvement

PROBLEM SOLVING
WITH PHYSICS

- Keep closer research and industry
  (new technologies and materials)

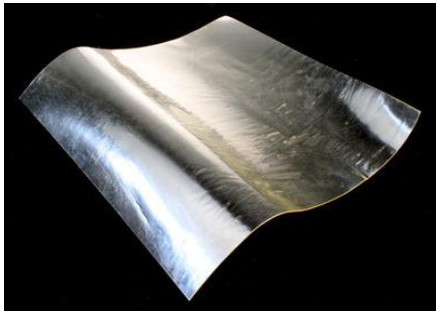
New materials

Super-Elastic Plastic

Super stretchy material stretches to eight times its size without ripping

Aluminum Foam

Decorate with a strong and light weight material



Shape Memory Plastic Sheet

Can be deformed and set, but always remembers its shape

New materials for new products and functions

http://en.wikipedia.org/wiki/Superabsorbent_polymer

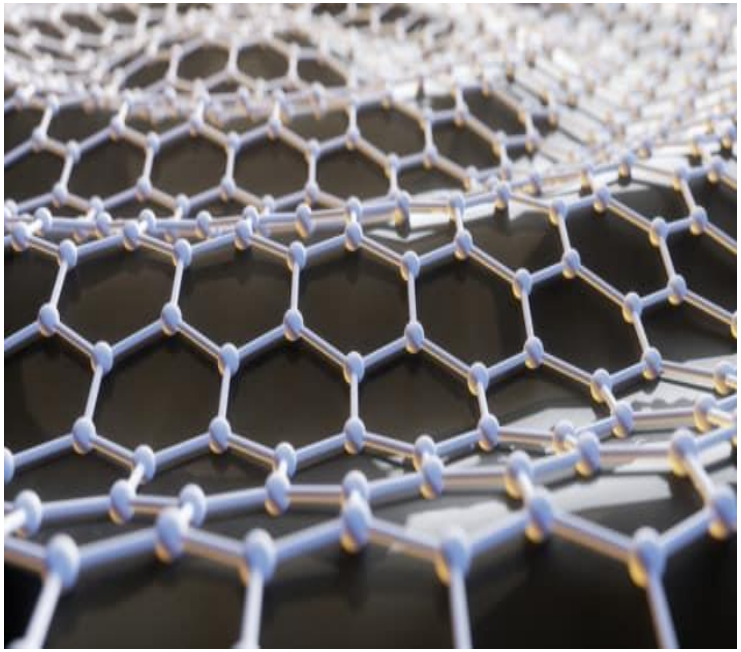
SAP- Super absorbent powder

- Candles
- Composites and laminates
- Controlled release of insecticides and herbicides
- Diapers and incontinence garments
- Drown-free water source for feeder insects
- Filtration applications
- Fire-retardant gel
- Fragrance carrier
- Frog tape
- Grow-in-water toys
- Hot & cold therapy packs
- Medical waste solidification[
- YinCheng's pads
- Motionless water beds
- Spill control
- Surgical pads
- Potting soil
- Waste stabilization and environmental remediation
- Water retention for supplying water to plants
- Wire and cable water blocking
- Wound dressings
- Fuel monitor systems in aviation
- Fuel monitor systems in vehicles
- Artificial snow
- ……..

Grafene: cos'è e come cambierà il futuro

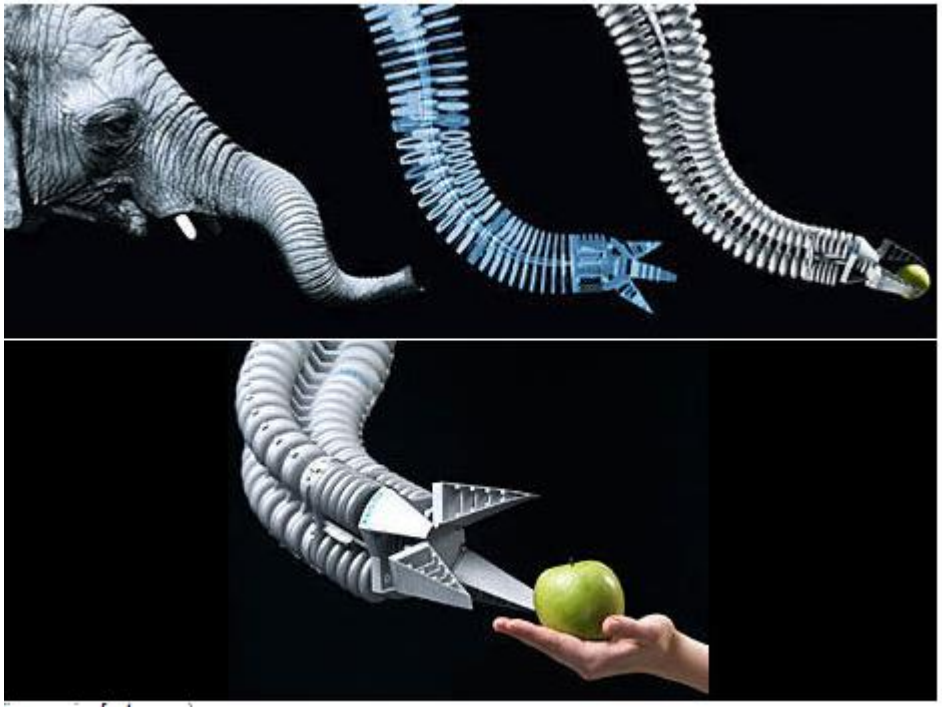
Il grafene è un materiale a 2D: un foglio di carbonio dello spessore di un atomo. La sua scoperta è valsa il premio Nobel del 2010 e sta invadendo tutti i campi della tecnologia, dall'elettronica all'aeronautica, dalla medicina all'esplorazione spaziale.

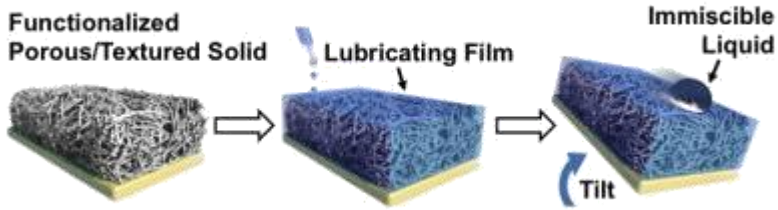
Può diventare un depuratore d'acqua o un filtro per l'aria.
una parete molecolare che imita la membrana delle cellule
minuscola lampadina o una retina bionica,
stravolgerà il mondo dell'informatica con circuiti stampati. Inoltre, applicato ai microfoni dinamici, ne amplifica di 32 volte la sensibilità. Costruzioni spugnose in 3D, 10 volte più dure dell'acciaio e decisamente più leggere.
vele solari per futuribili navi spaziali.....



https://www.focus.it/tecnologia/innovazione/tra-scienza-e-tecnologia-grafene-e-futuro

Bio inspired innovation





Limits of non-systematic methods

- Benchmarking

  how to invent anything new by copying?

- Serendipity or fortuity

  how to be in the suitable situation and be bright?

- Design Innovation

  the appearance is important, and the rest?

- Technology transfer from research world

  which technologies to transfer and where?

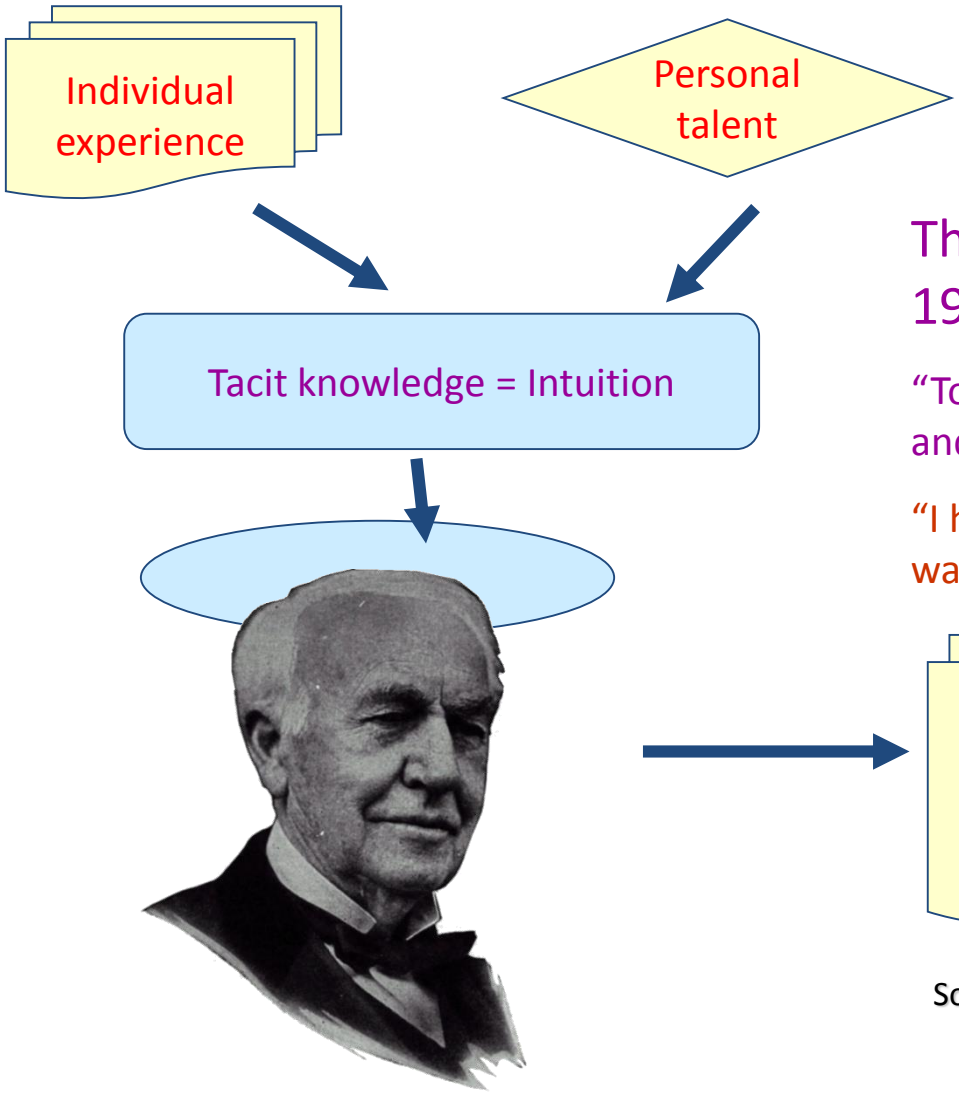
- Bio Inspiration

  which organism to copy, in which scope?

- Trial and error

  how many times I have to fail before of the right idea?

Trial and Error: the classic model



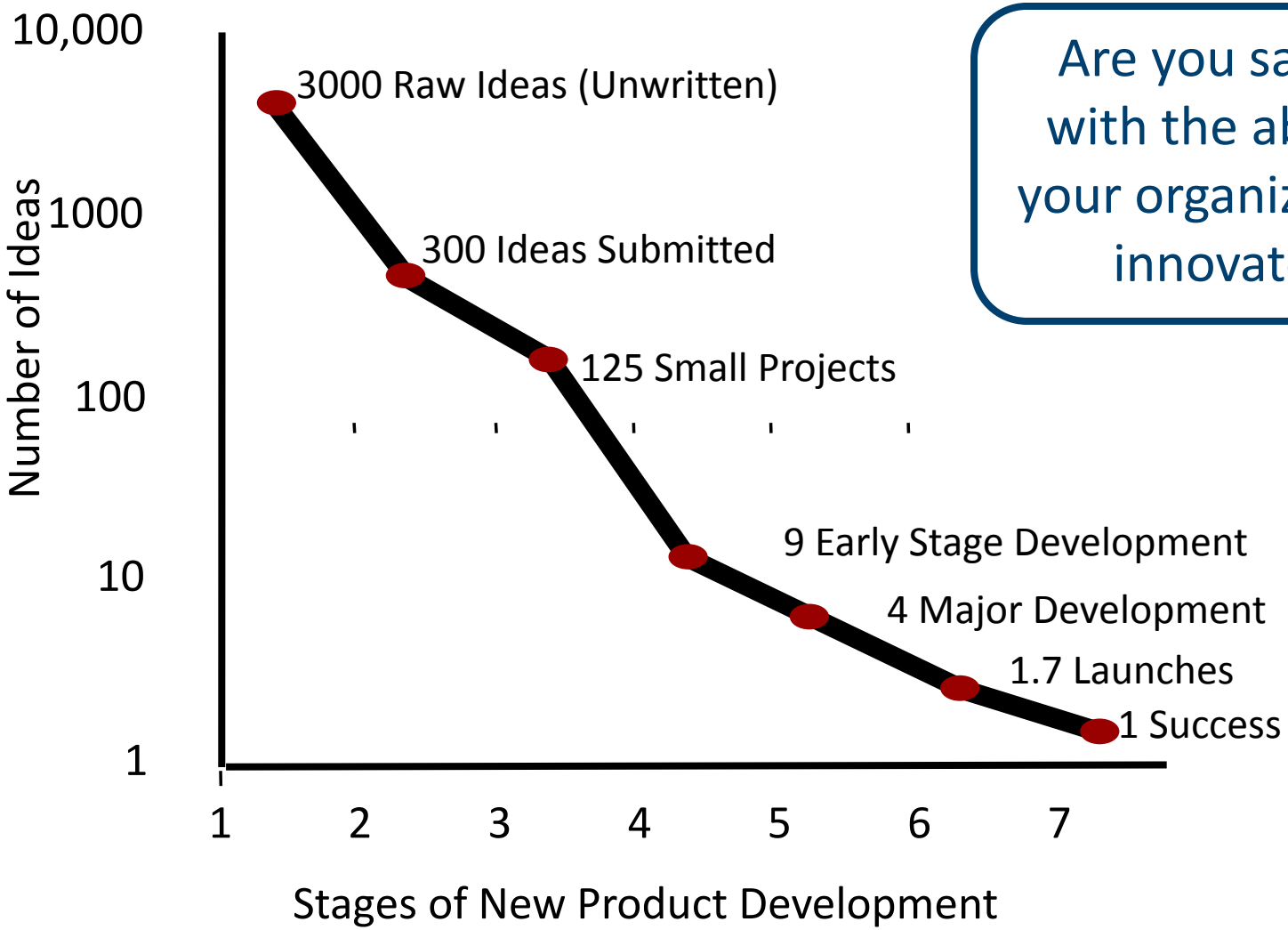
Thomas Alva Edison (1847–1931):

"To invent, you need a good imagination and a pile of junk"

"I have not failed. I've just found 10,000 ways that won't work."

Source: Boris Zlotin

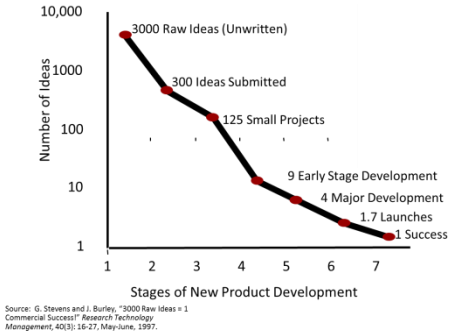
3000 raw Ideas = 1 Commercial Success



Are you satisfied with the ability of your organization to innovate?!?

Source: G. Stevens and J. Burley, "3000 Raw Ideas = 1 Commercial Success!" *Research Technology Management,* 40(3): 16-27, May-June, 1997.

To have ideas is the problem? NO!



Source: G. Stevens and J. Burley, "3000 Raw Ideas = 1 Commercial Success!" *Research Technology Management*, 40(3): 16-27, May-June, 1997.

- Benchmarking
- Serendipity or fortuity
- Design Innovation
- Technology transfer from research world
- Bio Inspiration

Among the many ideas:

- Only 1/3000 ideas has success
- Only 1/100 patents are high profitable
- Only 10/100 cover the patent fees

The truth is:

- We do not need only methods to have ideas
- We need a method to drive ourselves in the solving path of a problem

If we do not need many ideas…

But, if the problem is not to have many ideas, then what is systematic innovation?

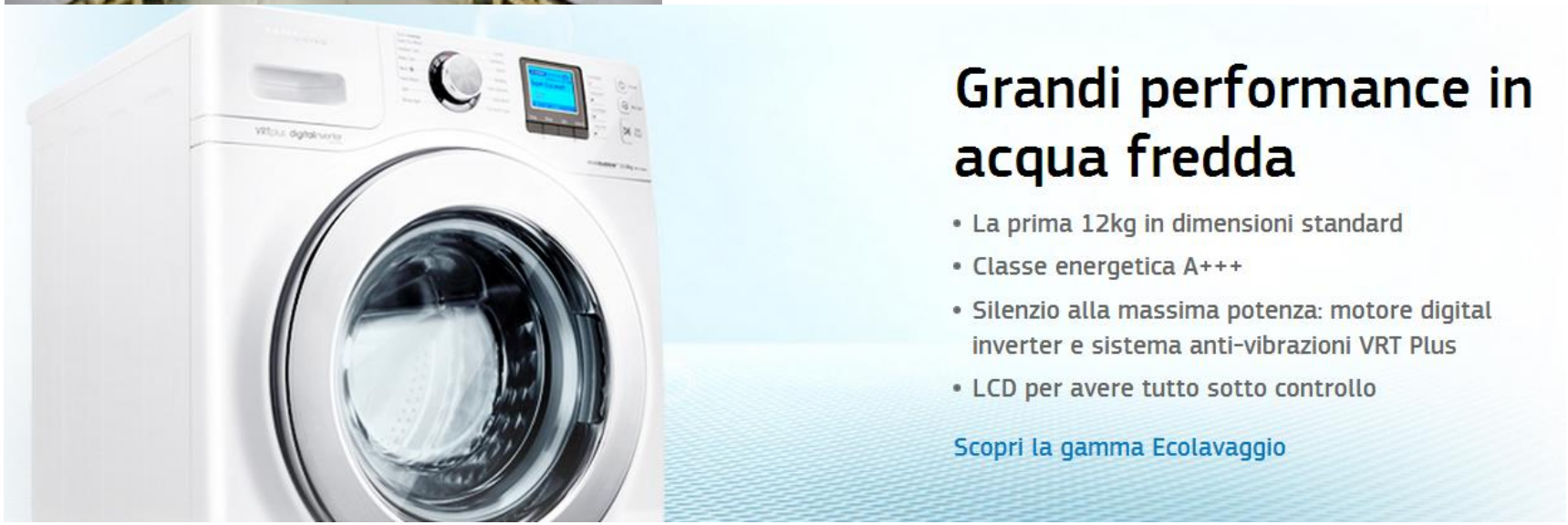
TRIZ born as a method to generation of ideas, but changed itself in method to manage and reformulate the problem to have the right idea

TRIZ

BiGFLO
From information to innovation!

La lavatrice A+++++++

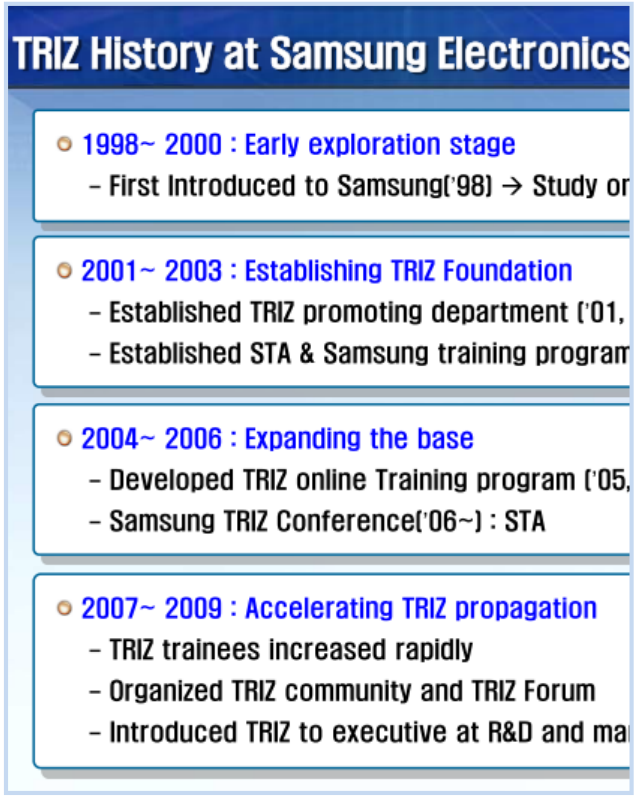
Scopriamo
il segreto di
Samsung

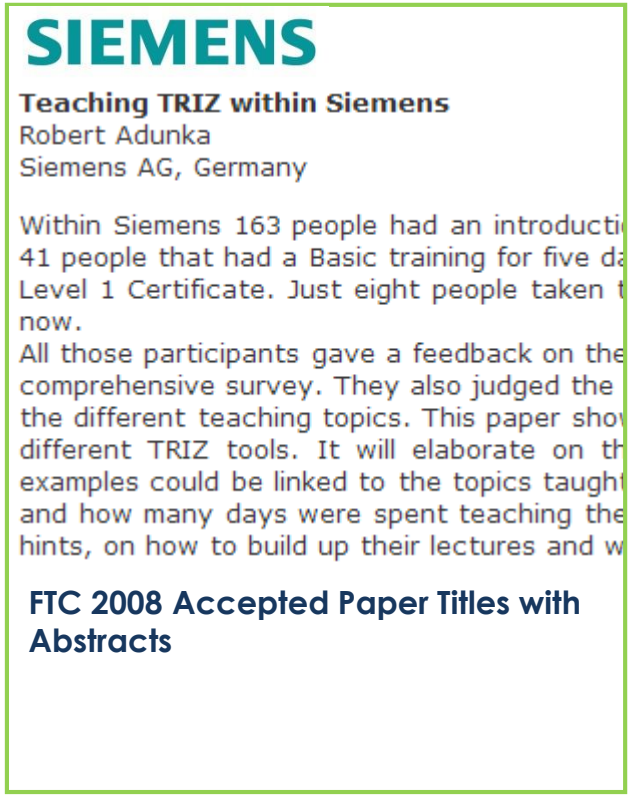


Samsung entra sul mercato con un nuovo prodotto e in pochi anni compete con i leader del mercato

Samsung usa TRIZ per accelerare lo sviluppo di prodotti innovativi

TRIZ at Intel, Samsung and Siemens



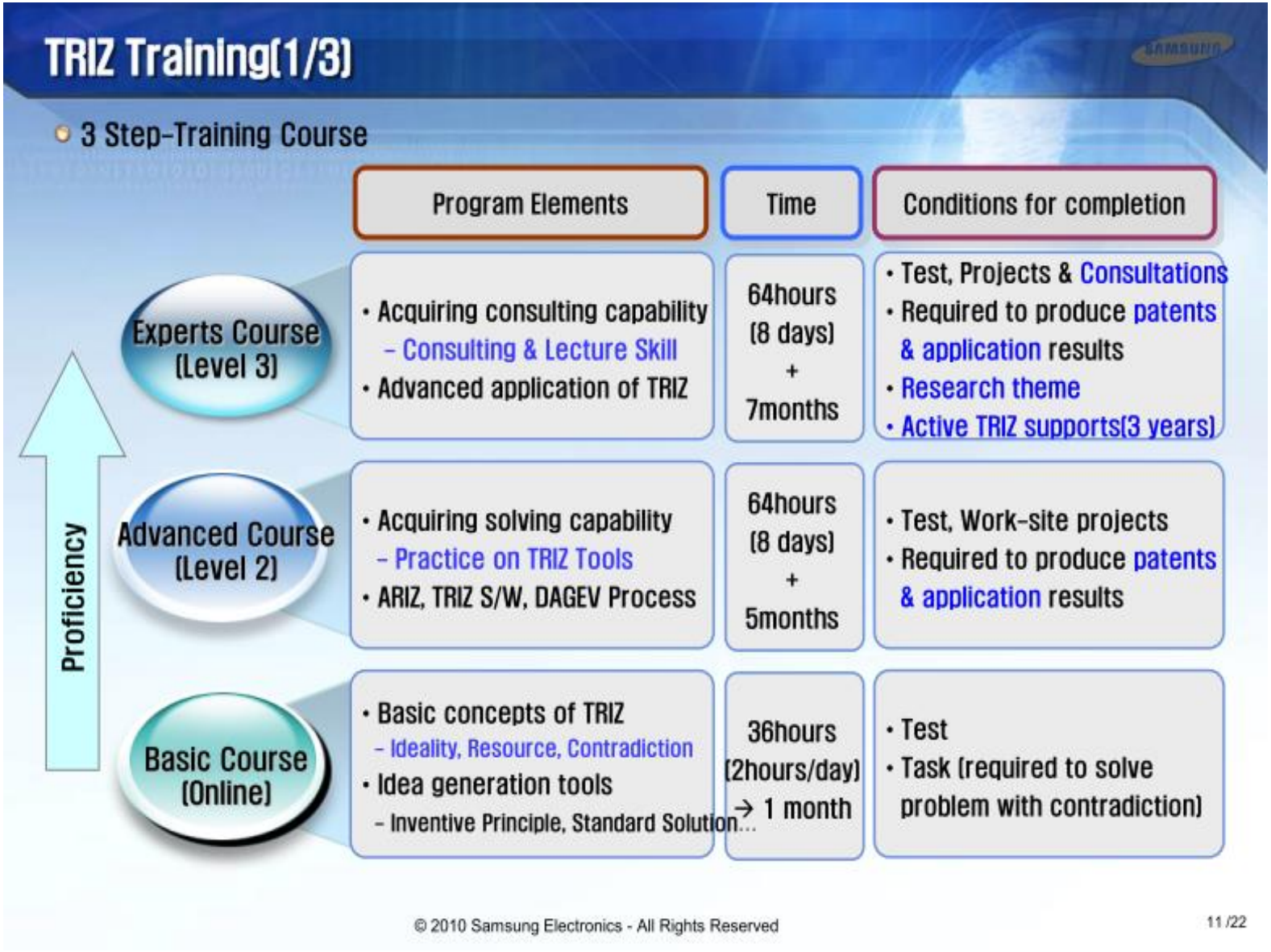


Main Limitations:

- Necessity of constant tutoring with TRIZ experts (more than 10 years of experience)
- Long period of training to apply TRIZ properly
- Technical oriented, lacking in marketing and industrial design aspects
- More oriented towards troubleshoot problem solving than new concepts generation
- Not integrated knowledge search inside the methodology

TRIZ History at Samsung Electronics

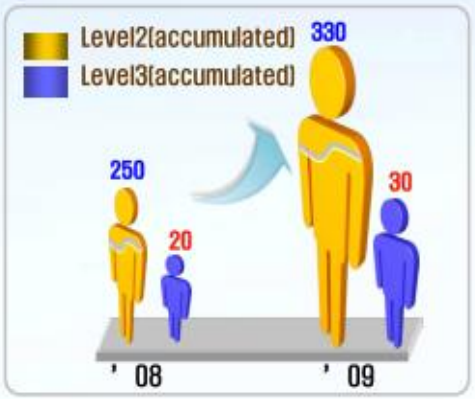
- 1998~ 2000 : Early exploration stage
  - First Introduced to Samsung('98) → Study on TRIZ effectiveness
- 2001~ 2003 : Establishing TRIZ Foundation
  - Established TRIZ promoting department ('01, Russian TRIZ Experts)
  - Established STA & Samsung training program : Started to certify Level 2 ('03)
- 2004~ 2006 : Expanding the base
  - Developed TRIZ online Training program ('05, basic course)
  - Samsung TRIZ Conference('06~) : STA
- 2007~ 2009 : Accelerating TRIZ propagation
  - TRIZ trainees increased rapidly
  - Organized TRIZ community and TRIZ Forum
  - Introduced TRIZ to executive at R&D and manufacturing Field (2HR)

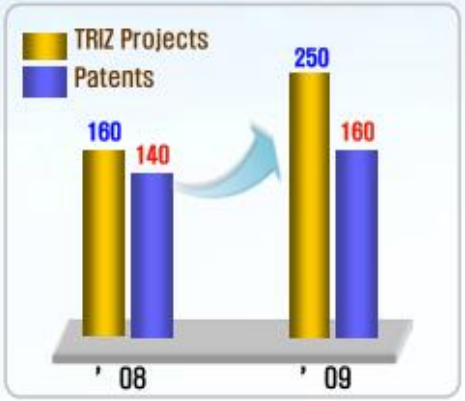


Project Support

- Results of applying TRIZ in 2009
  - 250 TRIZ projects were performed. (Supporting consultation)
  - 160 patents for core technology were applied.
  - Supporting strategic projects : 10 (Russian TRIZ experts, Solving)

- Main goals of applying TRIZ
  - Securing core technology in advance : (Pre) Research, Pre-Development
  - Cost reduction : Development
  - Improving quality & productivity : Manufacturing (Semiconductor & LCD)





Intel usa TRIz

TRIZ at Intel

- **1996-2001 Early exploration stage** — Curious early adopters
  - 1996, Santa Clara Technology Development - Began TRIZ software pilot/training. Two very successful projects – "Sputnik" and "Bubbles"
  - 1998 Introduced to Assembly Technology Development and Flash Business
- **2002-2004 Early deployment and seeding in Mfg.** — Champion - Evangelist
  - 2002 First TRIZ class in Assembly/Test Mfg. – Cavite, Philippines
  - 2003 First class in Fab/Sort Mfg. – Kiryat Gat, Israel
  - 2004 Classes in more sites (Fab/Sort and Assembly/Test)
- **2005-2006 Adoption – Manufacturing world-wide** — Leader - Proliferators
  - 2005 First classes to Level-2 and Level-3
  - 2006 All Level-1, Level-2 classes delivered internally
- **2007-2008**
  - Manufacturing expansion
  - R&D Introduction
  - Connectivity with other methods
- **2009 -> into the future**
  - Expanding existing use
  - New fields of application
  - Synergy with other methods:
    - Lean, Six-sigma, TOC…

Courtesy Amir Roggel, Intel Principal Engineer

Key Learning

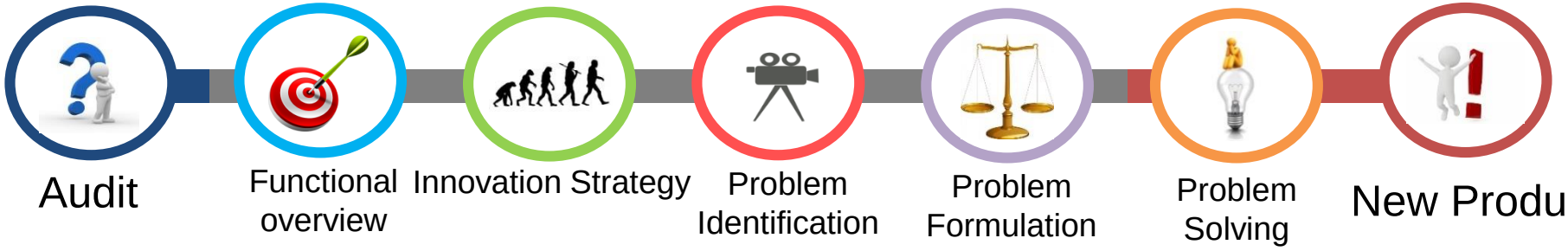
- If it's a new program with no track record, start with small wins. Need to show that program adds tangible value
- Constant & regular 1/1 with key stake holders is essential
- Networking is essential. It has to start now, not later
- Trust comes with networking and interactions based on proven track record. Programs can move relatively quicker
- Understand factory/customer issues, gear towards needs
- Disciplined follow-up/through: key to ensure sustainability
- Risk taking is a norm as success is not guaranteed
- Persistence is necessary
- Passion is key

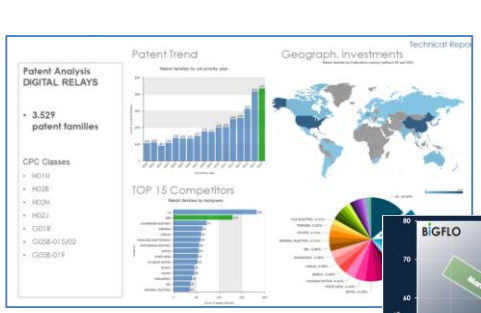
Networking, Persistence, Risk taking, Passion

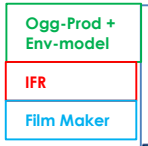
22

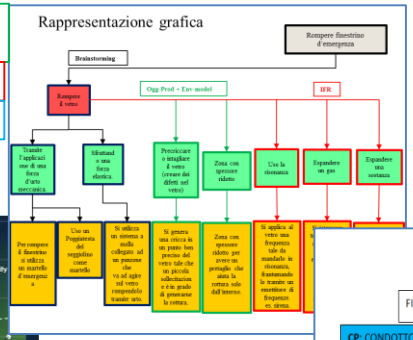
TRIZ
in pillole

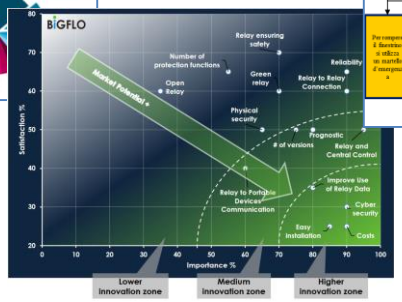
Outputs

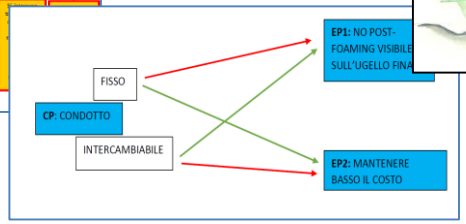


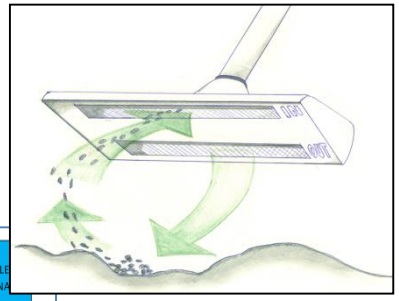




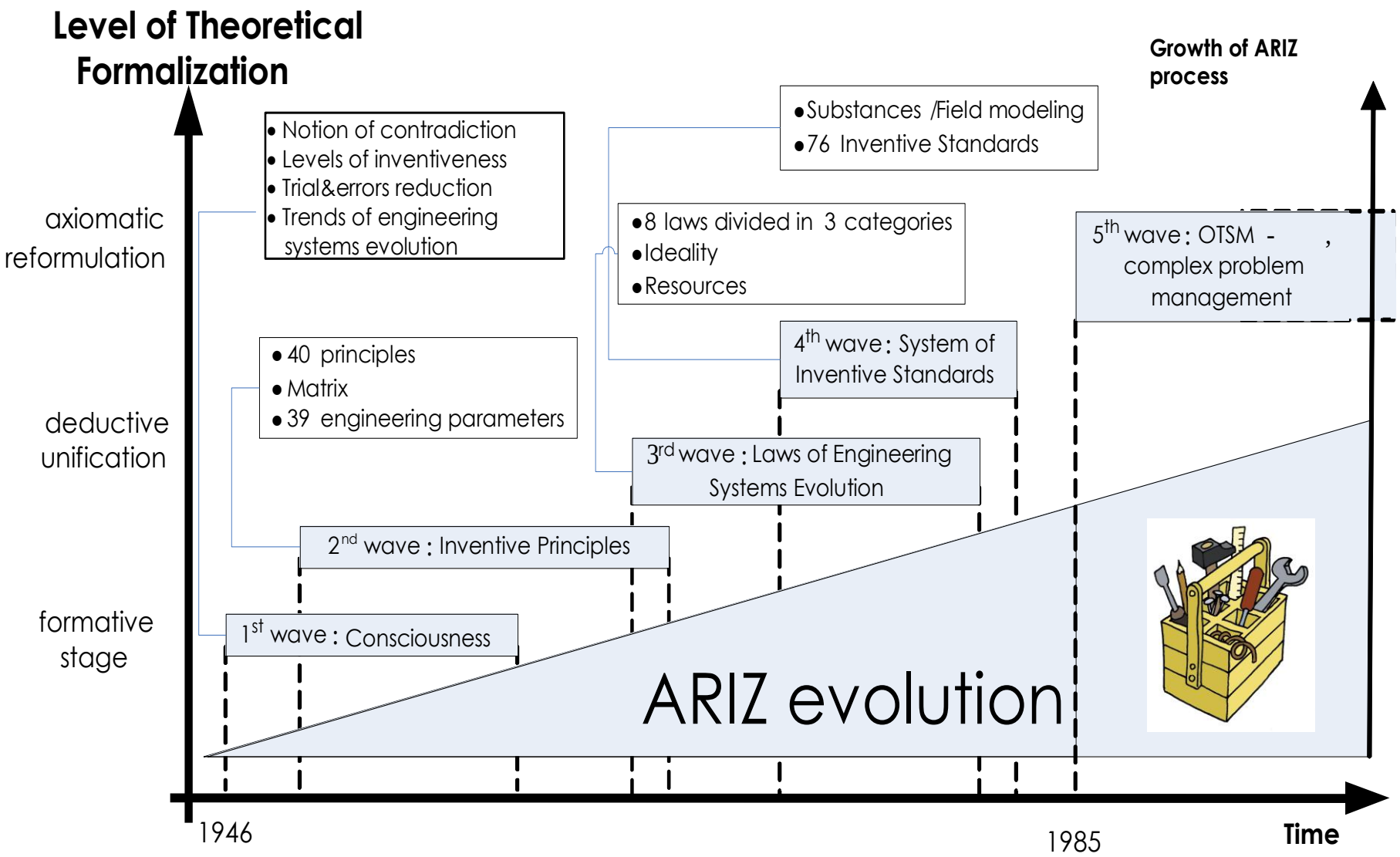








Esercizi Esercizi



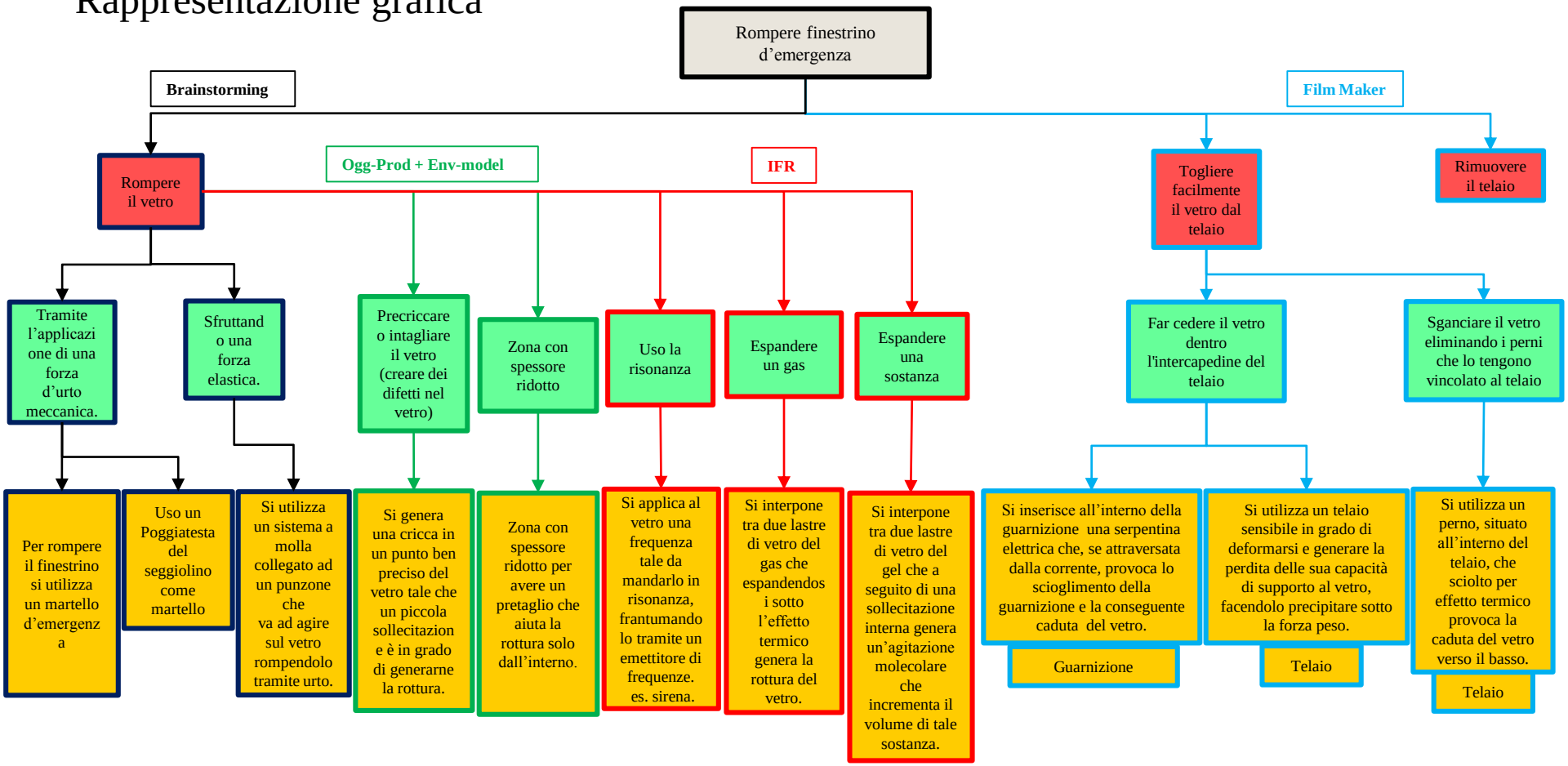
TRIZ as a toolbox

- Contradiction matrix
- 40 Inventive principles
- 76 Inventive standards
- Multiscreen
- IFR
- Laws of evolution
- Ariz

TRIZ as a Prob. Solv. process

- for thinking out of the box
- abstracting
- decomposing in functional way
- partitioning the problem
- choose parameters
- find contradiction
- stimulate creativity
- generating ideas

Rappresentazione grafica

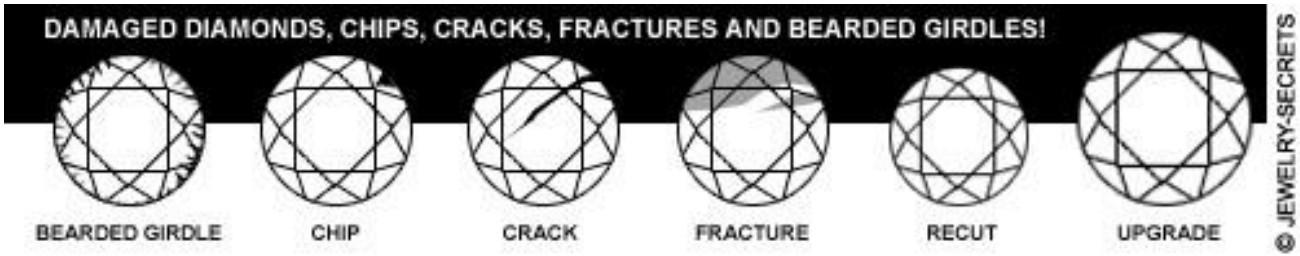


Counteracting Psychological Inertia

Psychological Inertia (PI) represents the many barriers to personal creativity and problem-solving ability, barriers that have as their roots "the way that I am used to doing it." In solving a problem, it is the inner, automatic voice of PI whispering "You are not allowed to do that!" Or, "Tradition demands that it be done this way!" Or even, "You have been given the information, and the information is true."

- **How long does an electron take to flow through a 1cm of copper ? And through the arc between movable and fixed contact ?**

How would you break Artificial Diamonds?



1972: Patent for breaking artificial diamonds

- Diamonds are placed into a pressure chamber
- High pressure forces air into micro fractures
- Releasing the pressure suddenly breaks the diamonds into crystals

Patterns of evolution

How would you remove Cores From A Million Green Peppers ?

1945: Patent for processing peppers

Force air inside of the peppers, Suddenly reduce the pressure: Seeds and stems separate from pepper body.

"Slowly raise pressure and suddenly reduce it"

Patterns of evolution

How would you remove shell of cedar nuts ?

1950: Patent for removing the shell of cedar nuts

Under high pressure, water is forced inside of the shells. When the pressure is suddenly reduced, the shells break away

"Slowly raise pressure and suddenly reduce it"

Slow raise pressure and suddenly reduce it

1945: Patent for processing peppers

Force air inside of the peppers, Suddenly reduce the pressure: Seeds and stems separate from pepper body.

1950: Patent for removing the shell of cedar nuts

Under high pressure, water is forced inside of the shells. When the pressure is suddenly reduced, the shells break away

1972: Patent for breaking artificial diamonds

- Diamonds are placed into a pressure chamber
- High pressure forces air into micro fractures
- Releasing the pressure suddenly breaks the diamonds into crystals

Pattern of evolution

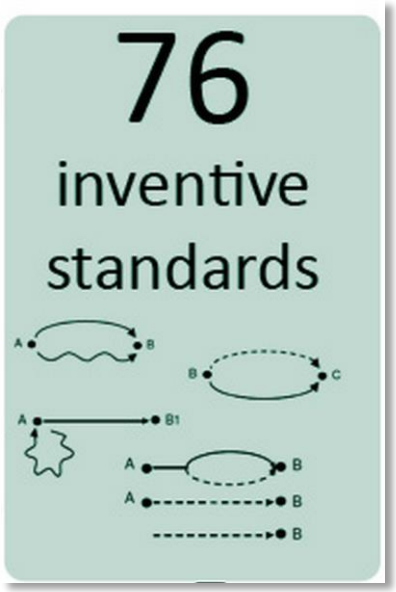
"Slowly raise pressure and suddenly reduce it"

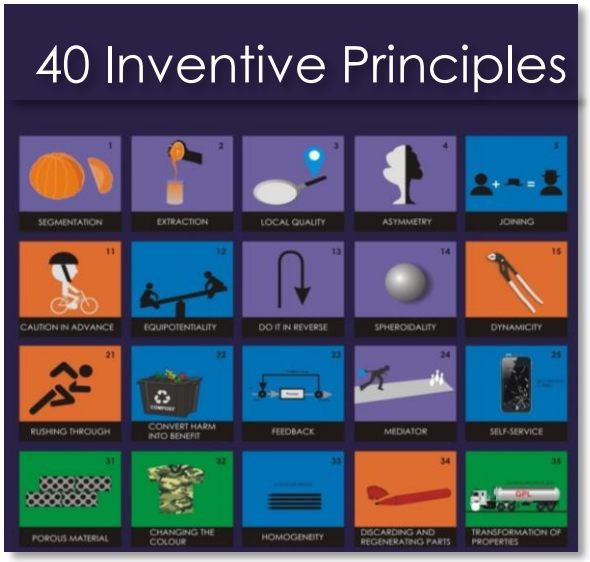
Pattern: Raise Pressure Slowly Then Suddenly Release It

- Removing stems from bell peppers (1945)
- Removing shells form sunflower seeds
- Shelling cedar nuts
- Cleaning filters
- Unpacking parts wrapped in protective paper
- Splitting diamonds along micro-cracks (1972)
- Producing sugar powder from sugar crystals
- Explosive paper depulping

How to recognize a pattern of evolution?

	Laws of Technical System Evolution	
1	Law of System Completeness	Corollary: Controllability
		Trend of elimination of human involvement from systems
		Trend of increasing dynamicity
2	Law of "energy conductivity" of a system	
3	Law of harmonizing the rhythms of parts of the system	
4	Law of increasing ideality	
5	Law of uneven development of the parts of a system	
6	Law of transition to a super-system	Trend Mono-Bi-Poly
7	Law of Transition from macro to micro level	
8	Law of increasing Su-Field inyteractions	





8 LAWS of evolution

	Laws of Technical System Evolution	
1	Law of System Completeness	Corollary: Controllability Trend of elimination of human involvement from systems Trend of increasing dynamicity
2	Law of "energy conductivity" of a system	
3	Law of harmonizing the rhythms of parts of the system	
4	Law of increasing ideality	
5	Law of uneven development of the parts of a system	
6	Law of transition to a super-system	Trend Mono-Bi-Poly
7	Law of Transition from macro to micro level	
8	Law of increasing Su-Field inyteractions	

40 Inventive principles

Inventive principle #13. DO IT IN REVERSE

B. Make the moveable part of an object, or outside environment, stationary and the stationary part moveable

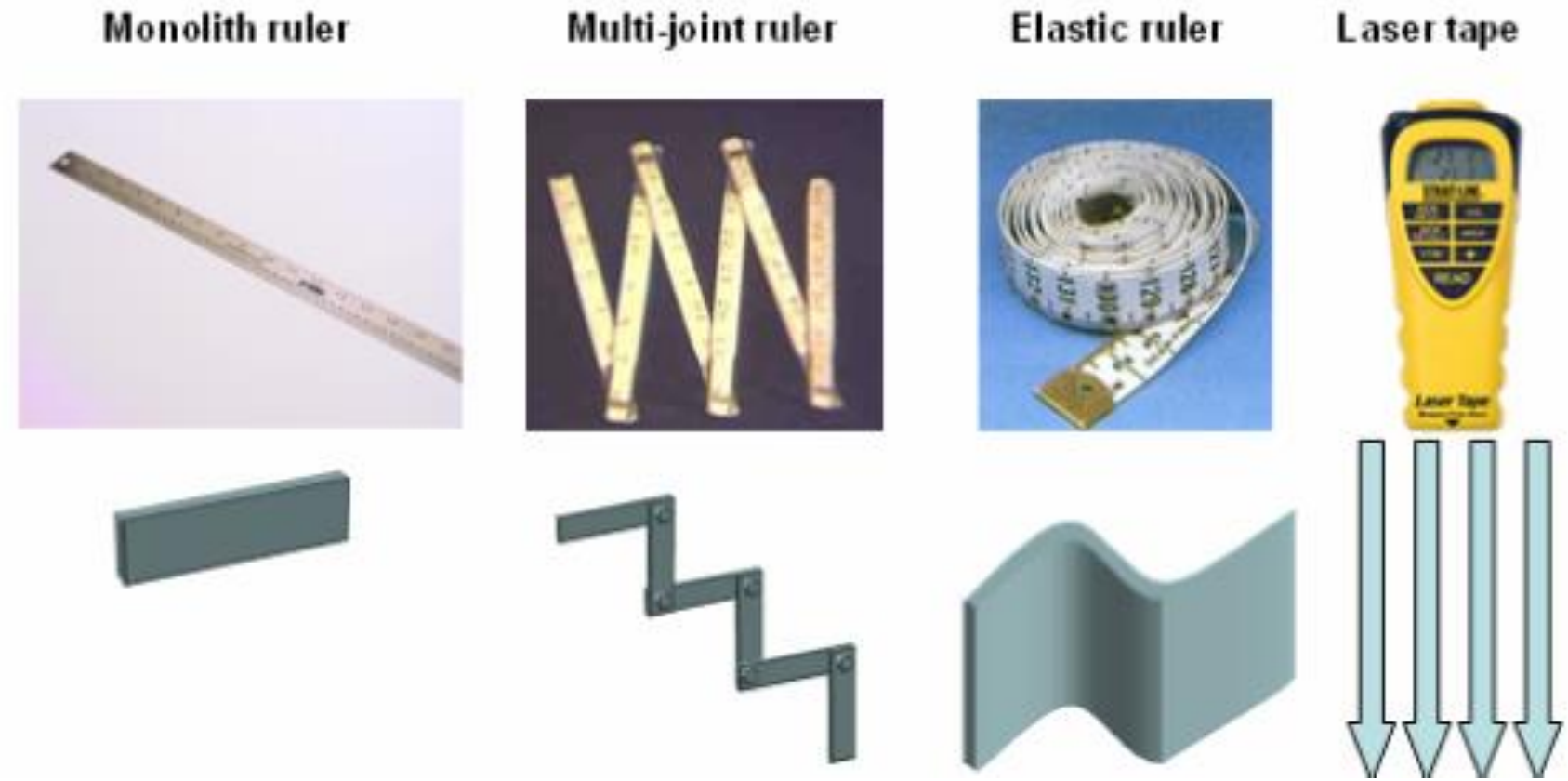
Treadmill

Other examples:

Jetted surf

Jetted swim

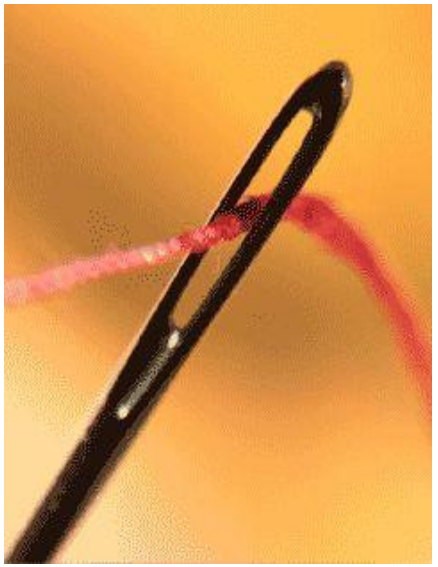
Inventive principle #15. Dynamization



Contradictions

A needle's eye …….

Must be Small in order to avoid damaging the fabric	VS	**Must be Big in order to thread easily the eye**



Can you imagine 2 different time when ….. the eye must be big and small?

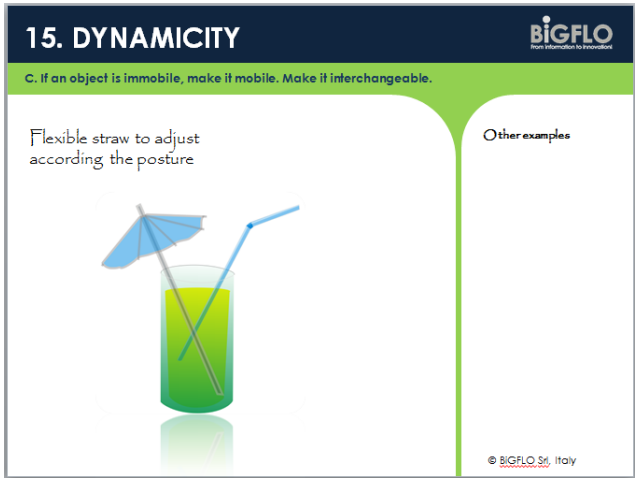
IDEA!:

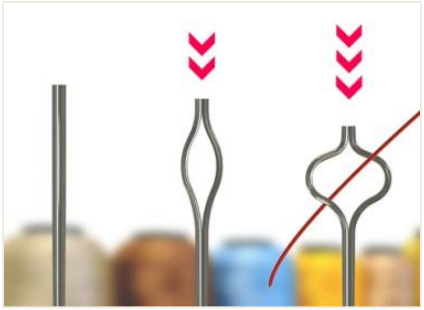
A needle must be ……

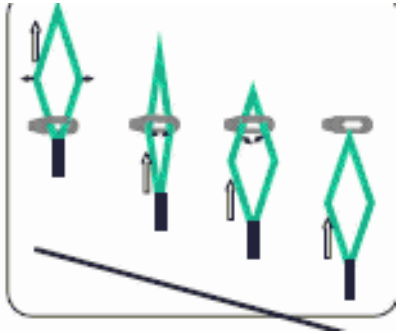
small during sewing and big only during threading

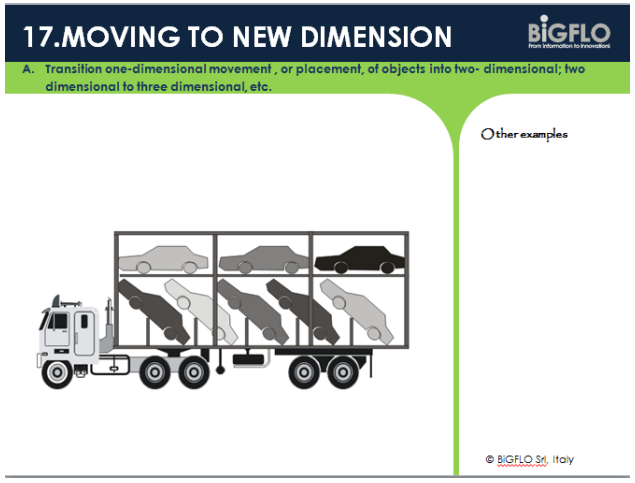
Example

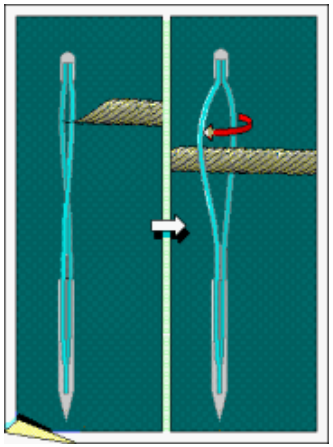
IDENTIKIT of the solution:
I want a small needle's eye during sewing that becomes bigger during threading





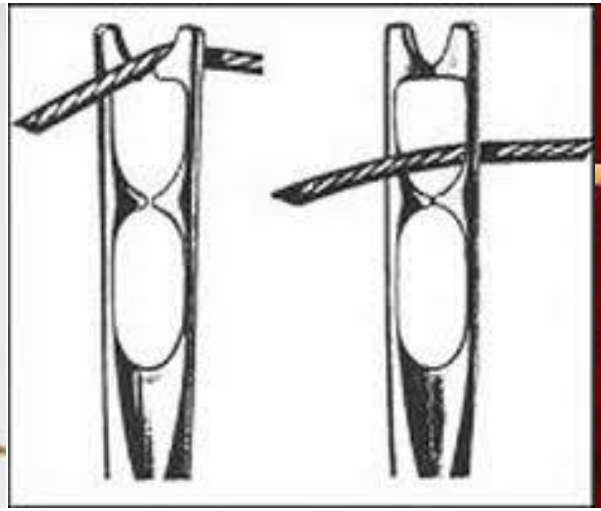


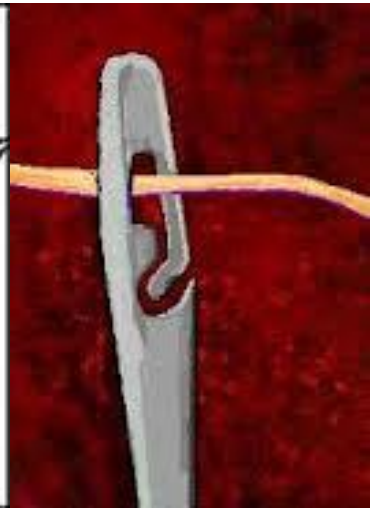




Invece di infilare il filo: bloccalo !

Cerca nei brevetti aghi che bloccano il filo





Inventare con TRIZ nell'era dell'Intelligenza artificiale

La fonte brevettuale – introduzione

BIGFLO
From information to innovation!

Cercare nei brevetti

Dove cercare brevetti - GRATIS

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Deutsches Patent- und Markenamt	https://depatisnet.dpma.de/DepatisNet/depatisnet?action=experte&switchToLang=en
United States Patent and Trademark Office — An Agency of the United States Department of Commerce	http://appft.uspto.gov/netahtml/PTO/search-adv.html
Ministero dello Sviluppo Economico — DGLC- UIBM	http://www.uibm.gov.it/uibm/dati/Avanzata.aspx

Espacenet

Come scaricare un brevetto completo

Bibliographic data: AU2016219631 (A1) — 2016-09-08

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WATER JET POOL CLEANER WITH OPPOSING DUAL PROELLERS

Page bookmark	AU2016219631 (A1) - WATER JET POOL CLEANER WITH OPPOSING DUAL PROELLERS
Inventor(s):	ERLICH GIORA +
Applicant(s):	AQUA PRODUCTS INC +
Classification:	- international: *B08B5/00; E04H4/16*
	- cooperative: E04H4/1654
Application number:	AU20160219631 20160822
Priority number(s):	AU20110358547 20110811 ; AU20160219631 20160822 ; WO2011US00261 20110211
Also published as:	WO2012108903 (A1) WO2012108903 (A8) EP2673429 (A1) → EP2673429 (A4) AU2011358547 (A

Abstract of AU2016219631 (A1)

Translate this text into

Select language | patenttranslate powered by EPO and Google

Abstract A robotic pool or tank cleaner is propelled by water jets, the direction of which is controlled by the direction of rotation of a reversible pump motor that is horizontally mounted in the pool cleaner housing that has a propeller attached to either end of the motor drive shaft which projects from opposing ends of the motor body, each of the propellers being positioned in, or near a water jet discharge conduit that terminates in discharge ports at opposite ends of the housing. Each discharge conduit has a pressure-sensitive flap valve downstream of the respective propellers. When the propellers rotate in one direction, the water is drawn through one or more openings in the base plate, passes through one or more filter assemblies associated with the pool cleaner and is discharged through one of the discharge ports as a water jet of sufficient force to propel the pool cleaner. fn 4114 zC 8w

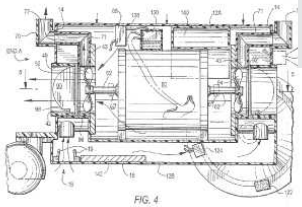

FIG. 4

WO2011100067 (A1)

- Bibliographic data
- Description
- Claims
- Mosaics
- **Original document**
- Cited documents
- Citing documents
- INPADOC legal status
- INPADOC patent family

Original document: WO2011100067 (A1) — 2011-08-18

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WATER JET POOL CLEANER WITH OPPOSING DUAL PROELLERS

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(71) Applicant *(for all designated States except US)*: **AQUA PRODUCTS, INC.** [US/US]; 25 Rutgers Avenue, Cedar Grove, NJ 07009 (US).

(72) Inventor; and
(75) Inventor/Applicant *(for US only)*: **ERLICH, Giora** [US/US]; 1 Vale Place, North Caldwell, NJ 07006 (US).

(74) Agent: **HERTZBERG, Steven, M.**; Abelman, Frayne & Schwab, 666 Third Avenue, New York, NY 10017-5621 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report (Art. 21(3))*

STRUTTURA DI UN BREVETTO

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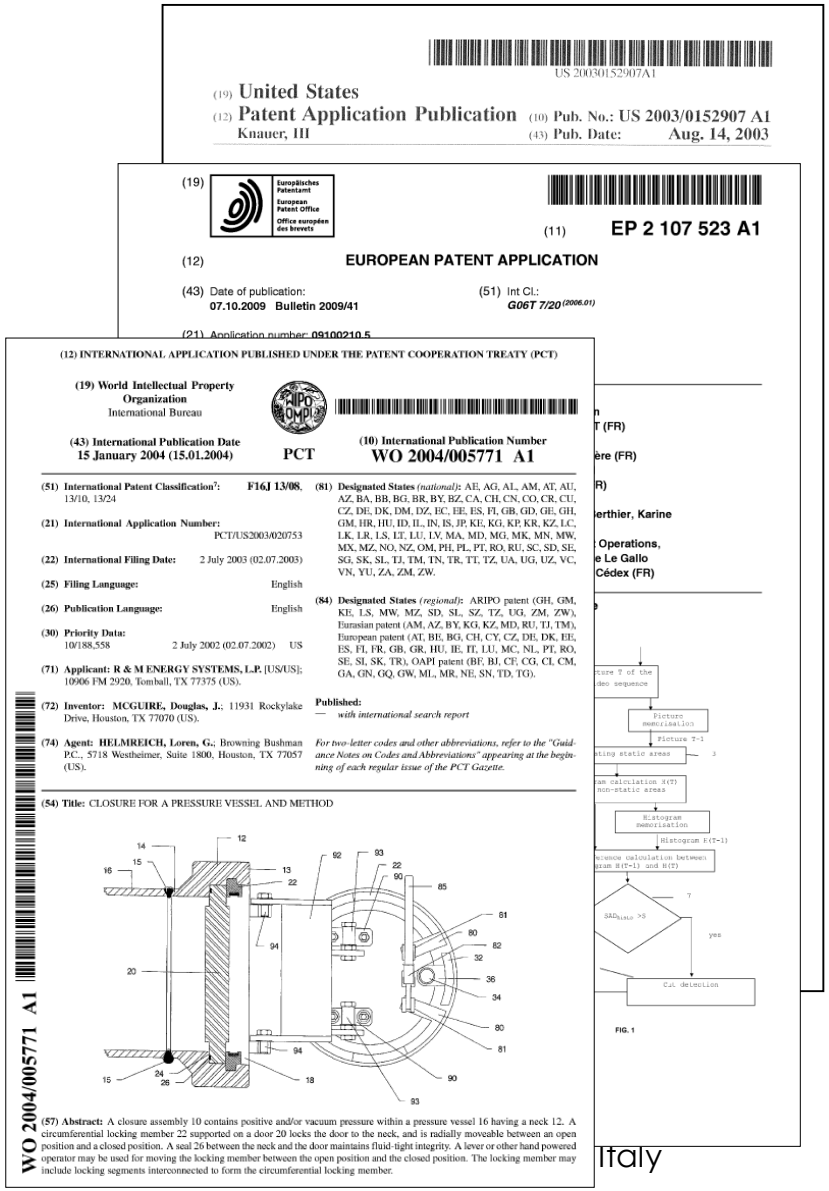
- ABSTRACT
- DESCRIPTION
- CLAIMS
- DRAWINGS
- INTERNATIONAL SEARCH REPORT



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(71) Applicant: R & M ENERGY SYSTEMS, L.P. [US/US]; 10906 FM 2920, Tomball, TX 77375 (US).

(72) Inventor: MCGUIRE, Douglas, J.; 11931 Rockylake Drive, Houston, TX 77070 (US).

(74) Agent: HELMREICH, Loren, G.; Browning Bushman P.C., 5718 Westheimer, Suite 1800, Houston, TX 77057 (US).

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(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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(54) Title: CLOSURE FOR A PRESSURE VESSEL AND METHOD

WO 2004/005771 A1

(57) Abstract: A closure assembly 10 contains positive and/or vacuum pressure within a pressure vessel 16 having a neck 12. A circumferential locking member 22 supported on a door 20 locks the door to the neck, and is radially moveable between an open position and a closed position. A seal 26 between the neck and the door maintains fluid-tight integrity. A lever or other hand powered operator may be used for moving the locking member between the open position and the closed position. The locking member may include locking segments interconnected to form the circumferential locking member.

Italy

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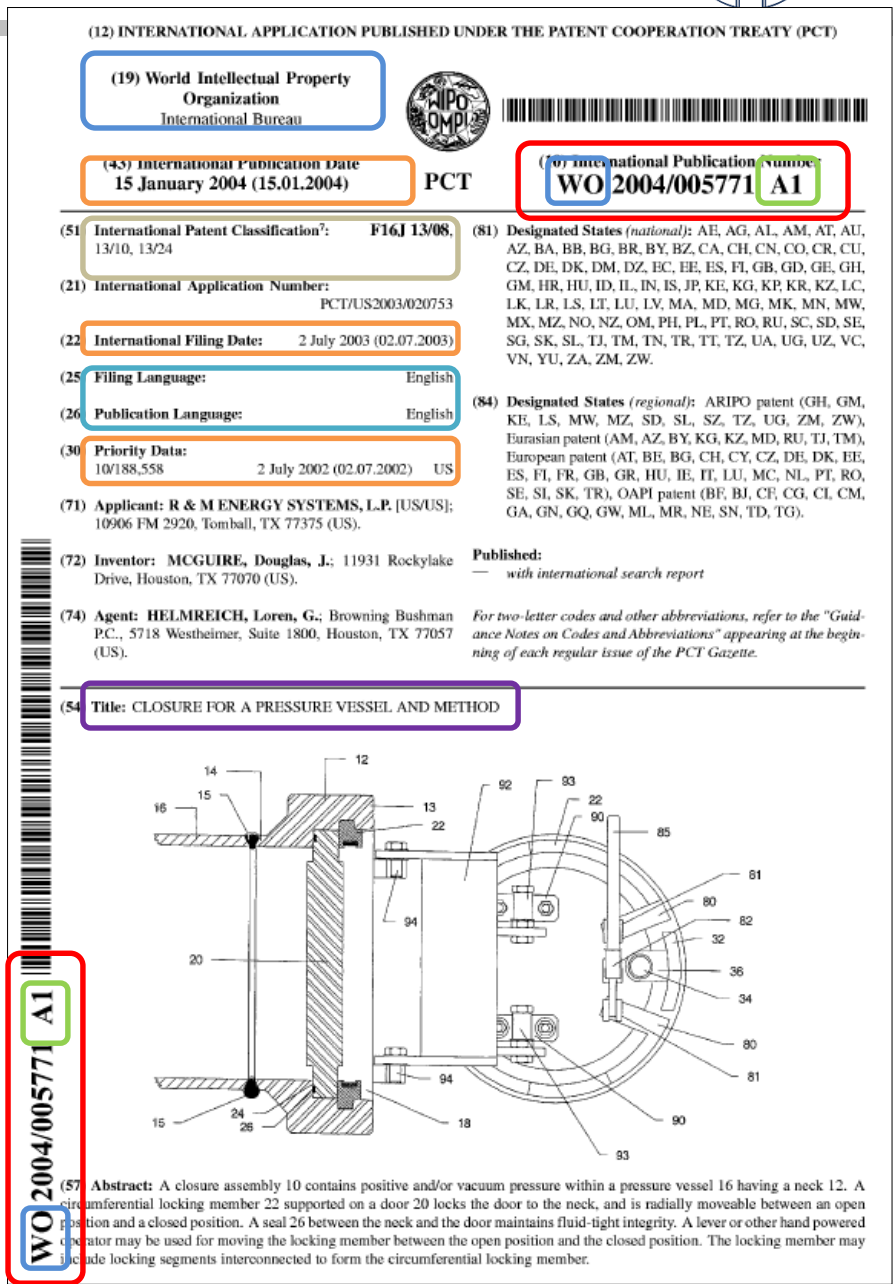

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BIBLIOGRAFIC DATA (2)

Applicant

Inventor

Stati in cui ha validità il brevetto

(81) **Designated States** *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW.

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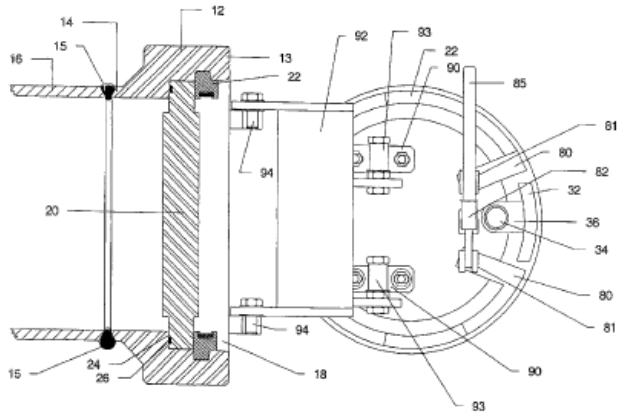

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WO 2004/005771 A1

CLAIMS

Definiscono legalmente l'invenzione

CLAIMS INDIPENDENTI E DIPENDENTI

1) **CLAIM 1:** A television receiver of the type having at least 2 loudspeakers radiating... (**prior art portion**) characterized in that a single differential amplifier instead of 2 is driving....(esposizione dell' elemento tecnico o della caratteristica supposta originale rispetto allo stato della tecnica conosciuto).

2) a television receiver **AS CLAIMED IN CLAIM 1** (rivendicazi principale) where two loudspeakers Fig. 3(1) and Fig. 3(2) are arr

di una caratteristica **interna** che si riferisce ad un **particolare p**

altoparlanti citati nel CLAIM 1. Si definisce interna perché spe

si fa riferimento in un rivendicazione (claim) di gerarchia super

CONTENUTO TECNICO

- INDIPENDENTI: indicazioni tecnologiche generali, idea
- DIPENDENTI: settori, applicazioni, tecnologie alternative

1. A signal processing device for performing filter processing operations on an input signal using a plurality of filters to generate an output signal, comprising:

   filter processing means for performing a filter processing operation on said input signal using a filter; and generating means for generating said output signal by adding a correction value determined on the basis of each sign and each absolute value of each difference between each of filtered output signals obtained by filter processing operations performed using a plurality of said filter processing means and said input signal, to said input signal.

2. The device according to Claim 1, wherein in the case that, among differences between each of the filtered output signals and the input signal, the product of a difference of a maximum value and difference of a minimum value is zero or more, said generating means defines one of the difference of the maximum value and the difference of the minimum value which has a larger absolute value as said correction value.

3. The device according to Claim 1, wherein in the case that, among differences between each of the filtered output signals and the input signal, the product of a difference of a maximum value and a difference of a minimum value is less than zero, said generating means defines the sum of the difference of the maximum value and the difference of the minimum value as said correction value.

4. The device according to Claim 1, wherein first filter processing means of said plurality of filter processing means performs said filter processing operation using a filter for performing smoothing processing and second filter processing means of said plurality of filter processing means performs said filter processing operation using a filter having an edge saving property.

5. A signal processing method for performing filter processing operations on an input signal using a plurality of filters to generate an output signal, comprising the steps of:

   performing a filter processing operation on said input signal by means of filter processing means using a filter; and generating said output signal by adding a correction value determined on the basis of each sign and each absolute value of each difference between each of filtered output signals obtained by the filter processing operations performed using a plurality of said filter processing means and said input signal, to said input signal.

CLAIMS INDIPENDENTI - DIPENDENTI

CLAIMS INDIPENDENTI

CIASCUNA RIVENDICAZIONE INDIPENDENTE DEVE CONTENERE:
- tutte le caratteristiche indispensabili alla soluzione del problema
- nessuna caratteristica non indispensabile alla soluzione del problema

LE CARATTERISTICHE SONO COSI' DISTRIBUITE:
- nella parte introduttiva quelle già presenti nel documento di tecnica nota più vicino
- nella parte caratterizzante quelle non presenti nel documento di tecnica nota più vicino

CLAIMS DIPENDENTI

DEVONO ESSERE RIVOLTE ALLE CARATTERISTICHE CHE:
- non sono indispensabili alla soluzione del problema
- portano comunque dei vantaggi
- sono tali da permettere un ripiegamento in caso di non validità delle rivendicazioni da cui dipendono.

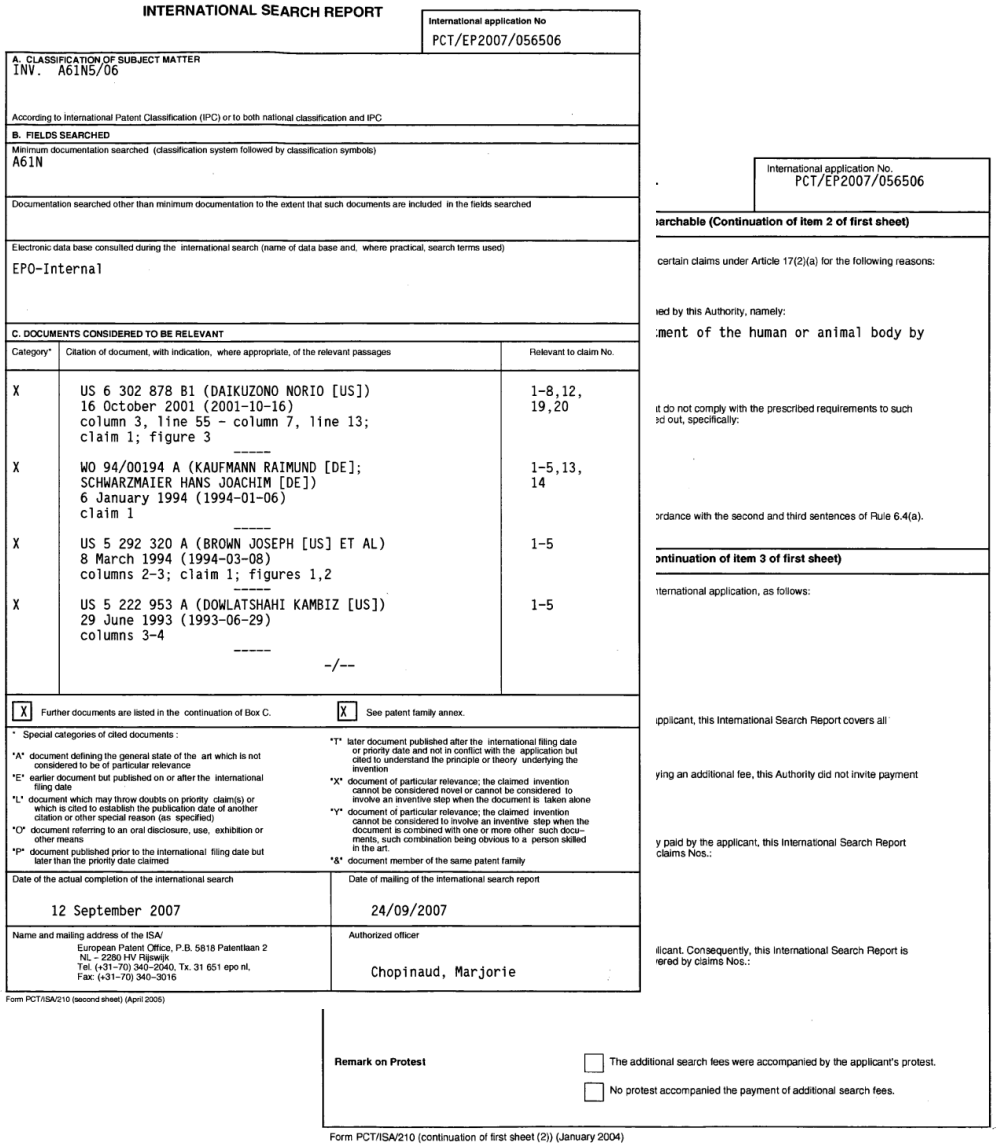
INTERNATIONAL SEARCH REPORT

Esempio

L'International Search Report contiene:

1. una ricerca internazionale effettuata dall'International Searching Authority per trovare i documenti della prior art più rilevanti rispetto a quanto rivendicato nelle claims
2. resoconto scritto relativo alla brevettabilità

L'International Search Report è dato dall'ISA all'applicant nei mesi successivi al deposito del brevetto. L'ISR può aiutare l'applicant a decidere se provvedere alla protezione nazionale del brevetto, ovvero ad entrare nella fase nazionale.



INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2007/056506

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61N5/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 302 878 B1 (DAIKUZONO NORIO [US]) 16 October 2001 (2001-10-16) column 3, line 55 - column 7, line 13; claim 1; figure 3	1-8,12, 19,20
X	WO 94/00194 A (KAUFMANN RAIMUND [DE]; SCHWARZMAIER HANS JOACHIM [DE]) 6 January 1994 (1994-01-06) claim 1	1-5,13, 14
X	US 5 292 320 A (BROWN JOSEPH [US] ET AL) 8 March 1994 (1994-03-08) columns 2-3; claim 1; figures 1,2	1-5
X	US 5 222 953 A (DOWLATSHAHI KAMBIZ [US]) 29 June 1993 (1993-06-29) columns 3-4	1-5

-/--

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
12 September 2007	24/09/2007

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Chopinaud, Marjorie

Form PCT/ISA/210 (second sheet) (April 2005)

International application No.
PCT/EP2007/056506

...archable (Continuation of item 2 of first sheet)

...certain claims under Article 17(2)(a) for the following reasons:

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...it do not comply with the prescribed requirements to such ...ed out, specifically:

...ordance with the second and third sentences of Rule 6.4(a).

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Remark on Protest

[ ] The additional search fees were accompanied by the applicant's protest.

[ ] No protest accompanied the payment of additional search fees.

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 302 878 B1 (DAIKUZONO NORIO [US]) 16 October 2001 (2001-10-16) column 3, line 55 - column 7, line 13; claim 1; figure 3	1-8,12, 19,20
X	WO 94/00194 A (KAUFMANN RAIMUND [DE]; SCHWARZMAIER HANS JOACHIM [DE]) 6 January 1994 (1994-01-06) claim 1	1-5,13, 14
X	US 5 292 320 A (BROWN JOSEPH [US] ET AL) 8 March 1994 (1994-03-08) columns 2-3; claim 1; figures 1,2	1-5
X	US 5 222 953 A (DOWLATSHAHI KAMBIZ [US]) 29 June 1993 (1993-06-29) columns 3-4	1-5
	-/--	

X	US 2002/151778 A1 (DOWLATSHAHI KAMBIZ [US]) 17 October 2002 (2002-10-17) paragraphs [0035] - [0039]	1-5
X	EP 0 980 695 A (TOKAI UNIVERSITY EDUCATIONAL S [JP]; NIPPON INFRARED IND [JP]) 23 February 2000 (2000-02-23) paragraphs [0012] - [0017]	1-5
X	EP 0 604 931 A2 (MATSUSHITA ELECTRIC IND CO LTD [JP]) 6 July 1994 (1994-07-06)	1-5
A	the whole document	6-25

Special category

Document citation (relevant passage)

Relevant claim

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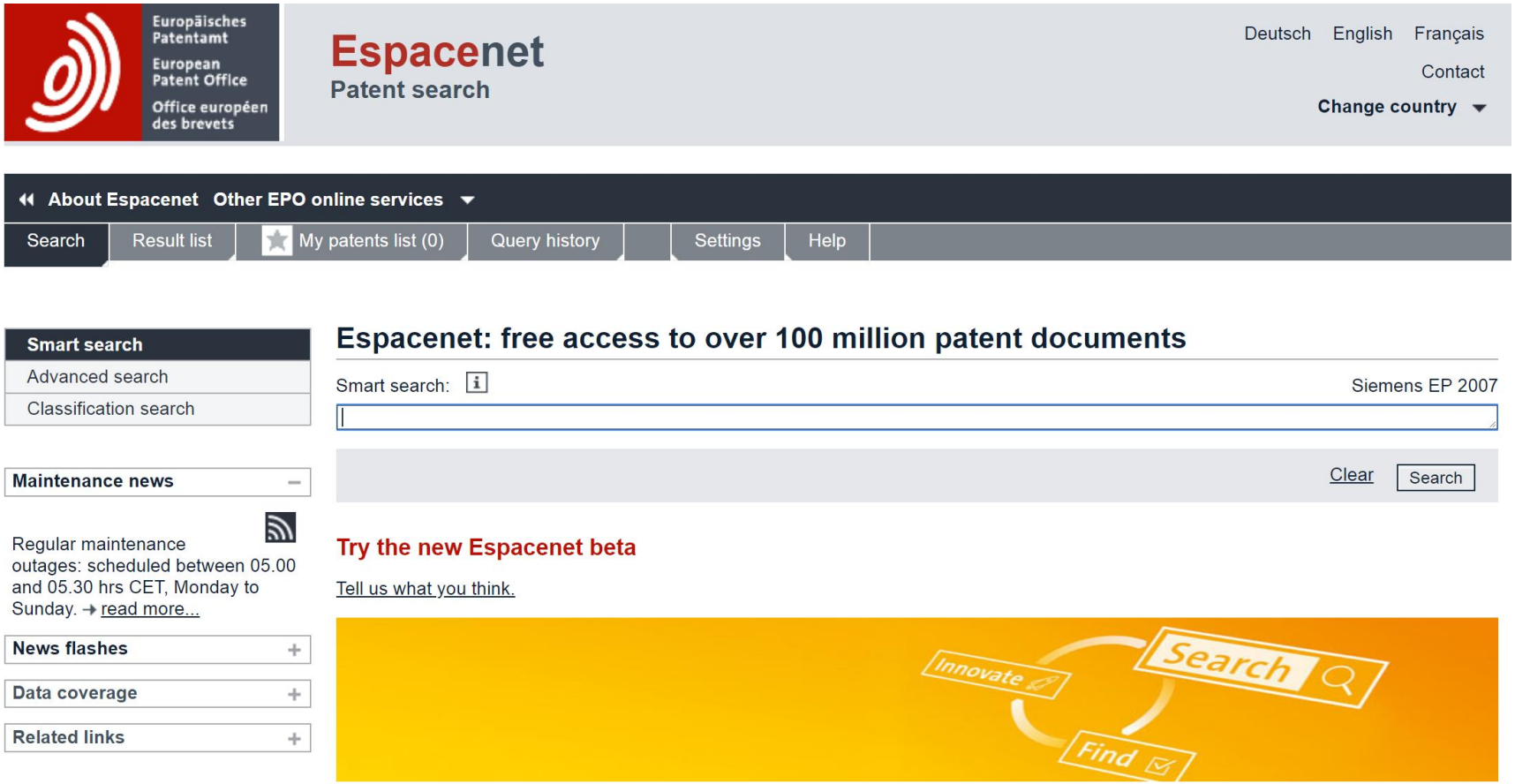

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Application number: DE201310112935

Priority number: WO1995US15925

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Publication date: 2014-12-31 or 20141231

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Applicant(s): Institut Pasteur

Inventor(s): Smith

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	Inventor:	Applicant:	CPC:	IPC:	Publication info:	Priority date:
1. HEAT CARRIER FOR HEATING RAW MATERIAL IN A REACTOR, PLANT FOR THE PYROLYSIS OF RAW MATERIAL USING SAID HEAT CARRIER AND METHOD FOR THE PYROLYSIS OF RAW MATERIAL	PERI PAOLO [IT] PIROLA MICHELE [IT] (+2)	SYNECOM S R L [IT]	C10B49/16 F28D11/02 F28D13/00 (+1)	C10B49/16 F28C3/18	WO2018163015 (A1) 2018-09-13	2017-03-06
2. DEVICE AND METHOD FOR LASER CUTTING A WEB OF FIBROUS MATERIAL	PIANTONI MATTEO [IT] SOLI VALERIO [IT] (+2)	GDM SPA [IT] UNIVERSITA' DEGLI STUDI DI BERGAMO [IT]	A61F13/15723 A61F13/15764 B23K2101/22 (+5)	A61F13/15 B23K26/03 B23K26/08 (+2)	US2017189242 (A1) 2017-07-06	2014-04-18
3. DEVICE FOR CUTTING A WEB OF MATERIAL	PIANTONI MATTEO SOLI VALERIO (+2)	GDM SPA [IT] UNIVERSITA' DEGLI STUDI DI BERGAMO [IT]	A61F13/15723 A61F13/15764 (+12)	A61F13/15 B23K26/03 B23K26/08	KR20170029411 (A) 2017-03-15	2014-04-18
4. METHOD AND TOOL FOR THE AUTOMATIC REFORMULATION OF SEARCH KEYWORD STRINGS IN DOCUMENT SEARCH SYSTEMS	RUSSO DAVIDE [IT] MONTECCHI TIZIANO [IT] (+2)	BIGFLO S R L [IT]	G06F16/3338	G06F17/30	EP3163467 (A1) 2017-05-03	2015-10-30
5. INFLATABLE TUBULAR ELEMENT FOR LAYING PROTECTIVE TARPAULINS	Inventor:	Applicant:	CPC:	IPC:	Publication info:	Priority date:

Bibliograpich data and abstract

Bibliographic data | Description | Claims | Mosaics | Original document | INPADOC legal status

Publication number: US6876896 (B1)
Publication date: 2005-04-05
Inventor(s): ORTIZ MARK S [US]; BOGDANOV EMIL D [US]; NAJI MOHAMMAD R [US]; JACOBS KEITH G [US]; BOLOGNA GREGORY A [US]; ARMS DONALD A [US]
Applicant(s): TETRAPAK AB [SE]
Classification:
- international: ***B29C65/00; B29C65/02;*** *B65B9/20; B65B51/30;* **B29C65/00; B29C65/02;** B65B9/10; B65B51/26; (IPC1-7): G06F19/00
- European: B29C65/00P; B29C65/00M12B; B29C65/00P22; B29C65/02; B29C65/78M6; B65G54/02
Application number: US20000558233 20000426
Priority number(s): US20000558233 20000426; US20000185019P 20000225; US20000185020P 20000225; US20000185065P 20000225; US19990131027P 19990426; US19990137346P 19990603; US19990144483P 19990717

Cited documents:
US4005349 (A)
US4633148 (A)

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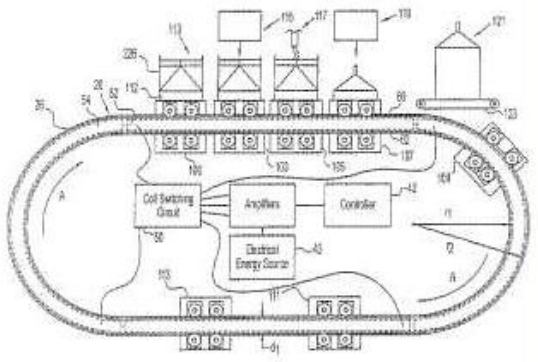
Abstract of **US 6876896 (B1)**

The invention relates to a system and a method for performing a manufacturing operation at a predetermined position relative to a first path. The system includes a plurality of first elements mounted for movement relative to the first path. The first elements have a plurality of motion parameters which are independently controllable. Active elements are operatively associated with reactive elements to produce relative movement between the first elements and the first path, with the active elements controlling the relative movement. A controller controls the activation of the active elements and a first tool is associated with each first element for performing at least part of the manufacturing operation. The system may also include at least one second element and a second path. The method includes the steps of mounting a plurality of first carriages for movement relative to a first path, operatively associating a plurality of active elements with at least one reactive element to produce relative movement between the first carriages and the path, associating a first tool with each first carriage for performing at least part of the manufacturing process, and controlling the activation of the active elements.



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B	PERFORMING OPERATIONS; TRANSPORTING
C	CHEMISTRY; METALLURGY
D	TEXTILES; PAPER
E	FIXED CONSTRUCTIONS
F	MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING
G	PHYSICS
H	ELECTRICITY
Y	GENERAL TAGGING OF NEW TECHNOLOGICAL DEVELOPMENTS; GENERAL TAGGING OF

View Section: Index A B C D E F G H Y

Find classification(s) for keywords: packaging — Go

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- **Packages comprising articles or materials partially or wholly enclosed in strips, sheets, blanks, tubes, or webs of flexible sheet material, e.g. in folded wrappers** (.... — B65D75
- **Closures not otherwise provided for** (covers or similar closures as engineering elements for pressure vessels in general F16J13/00) — B65D51
- **Foods or foodstuffs; Their preparation or treatment** (preservation thereof in general A23L3/00 ; [N: mechanical aspects .... — A23L1
- **Containers, packaging elements or packages specially adapted for particular articles or materials** (B65D71/00 , ... — B65D85
- **Containers of polygonal cross-section, e.g. boxes, cartons, trays, formed by folding or erecting one or more blanks made of paper** (pallets B.... — B65D5
- **Layered products essentially comprising synthetic resin** — B32B27
- **Packages formed by enclosing articles or materials in preformed containers, e.g. boxes, cartons, sacks, bags** — B65D77
- **Enclosing successive articles, or quantities of material, e.g. liquids or semi-liquids, in flat, folded, or tubular webs of flexible sheet material; Subdividing filled flexible tubes to form pa....** — B65B9
- **Cosmetic or similar toilet preparations** (casings or accessories for storing or handling of solid or pasty toilet or cosmetic substances A45D.... — A61K8

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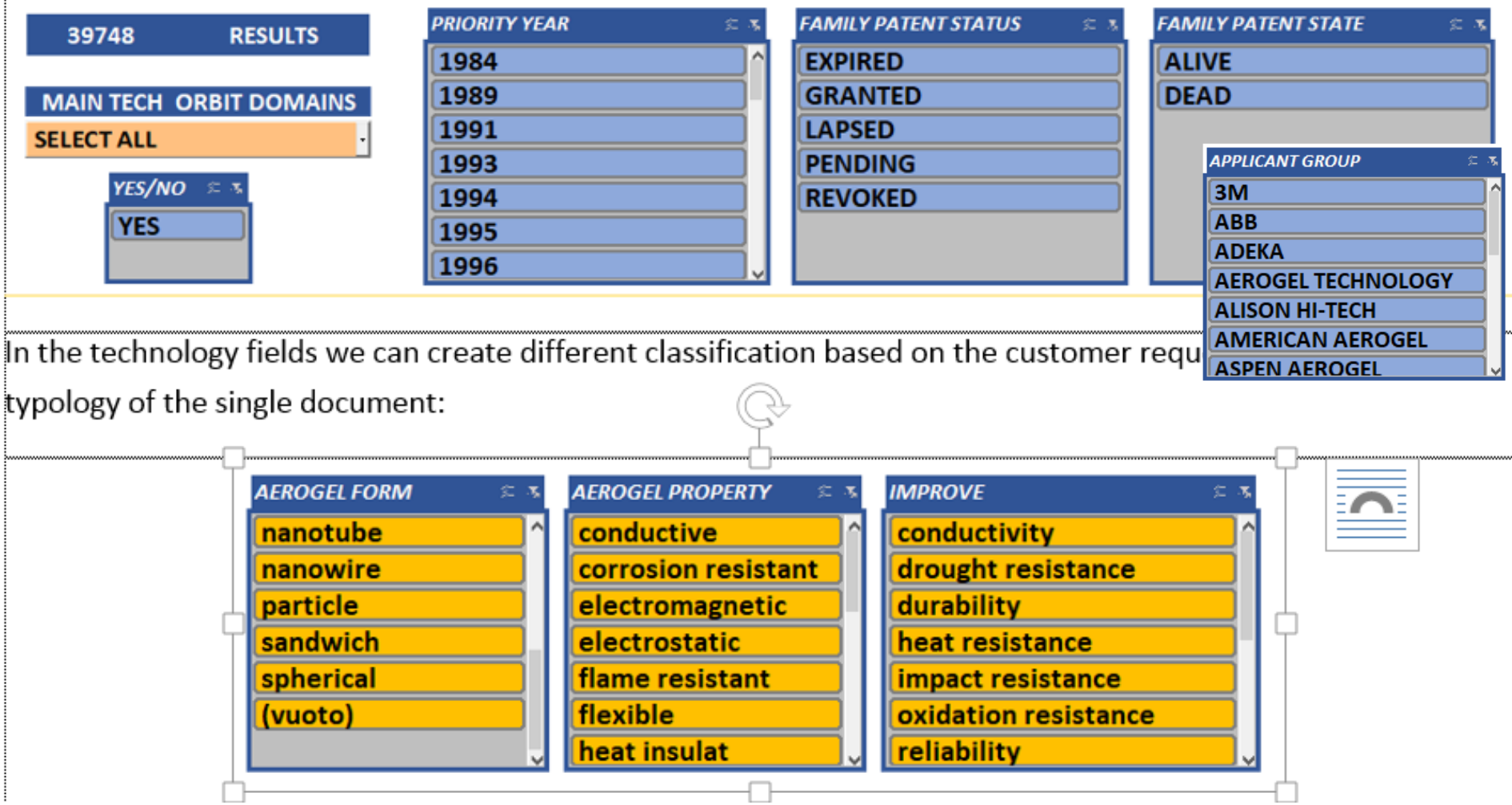

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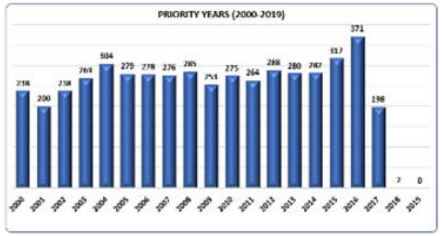

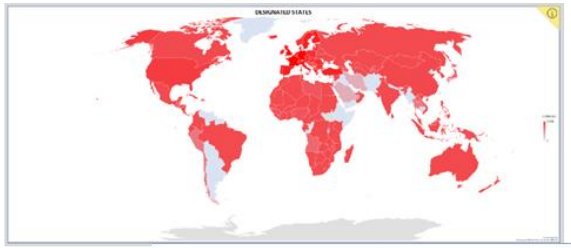

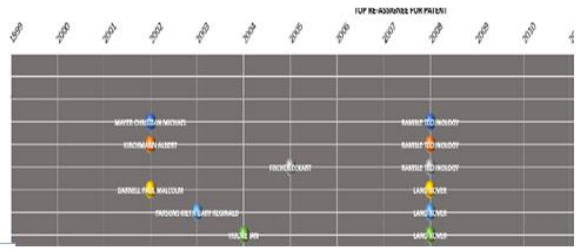

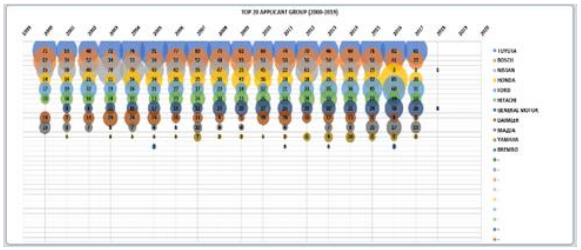

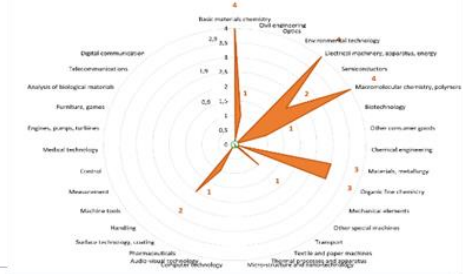

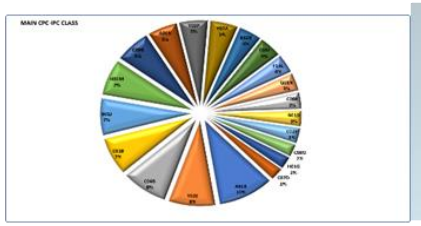

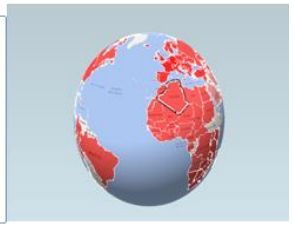

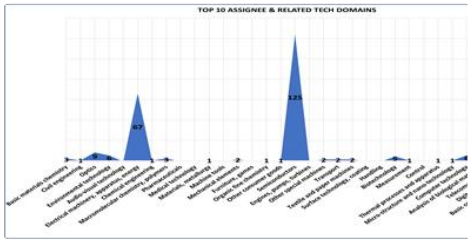

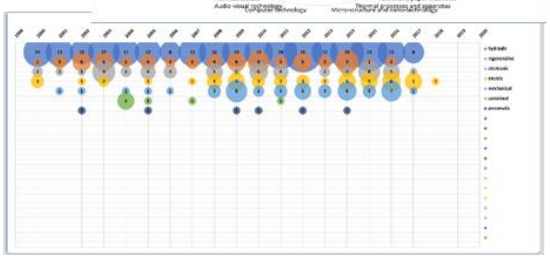

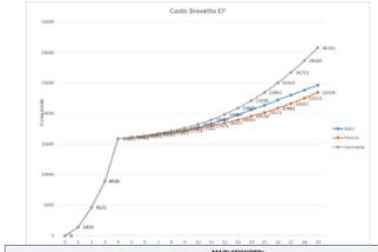

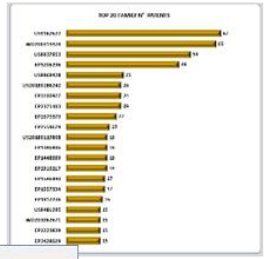

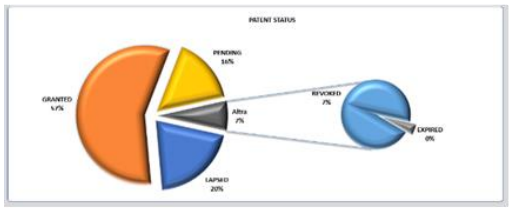

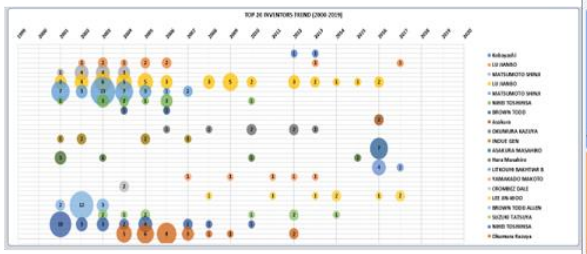

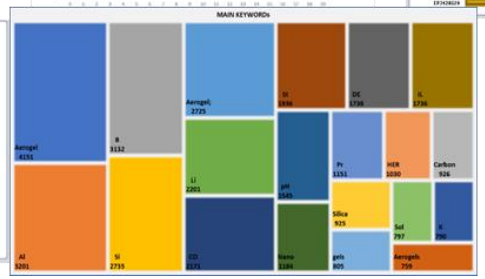

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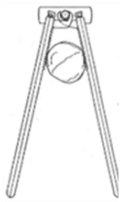

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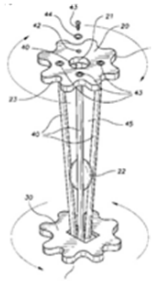

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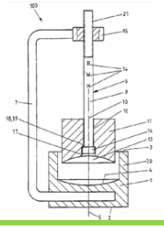

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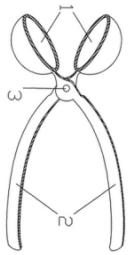

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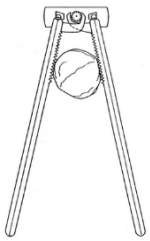

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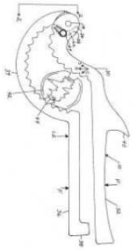

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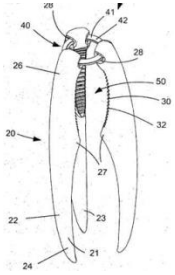

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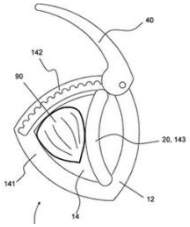

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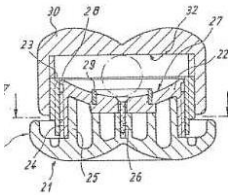

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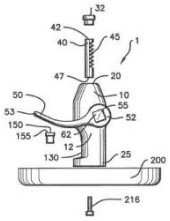

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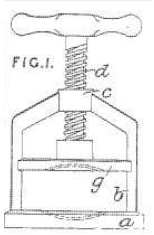

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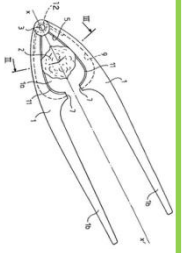

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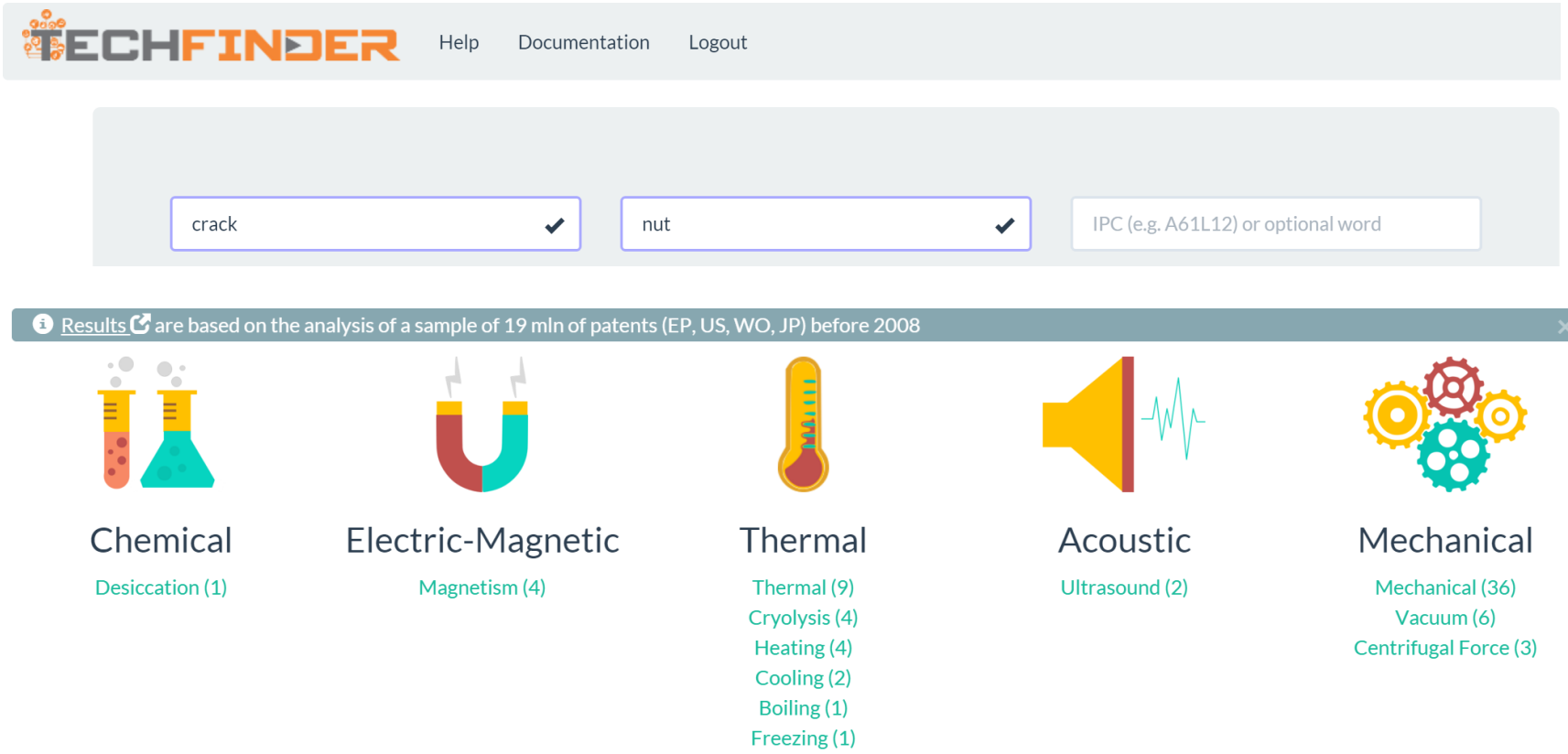

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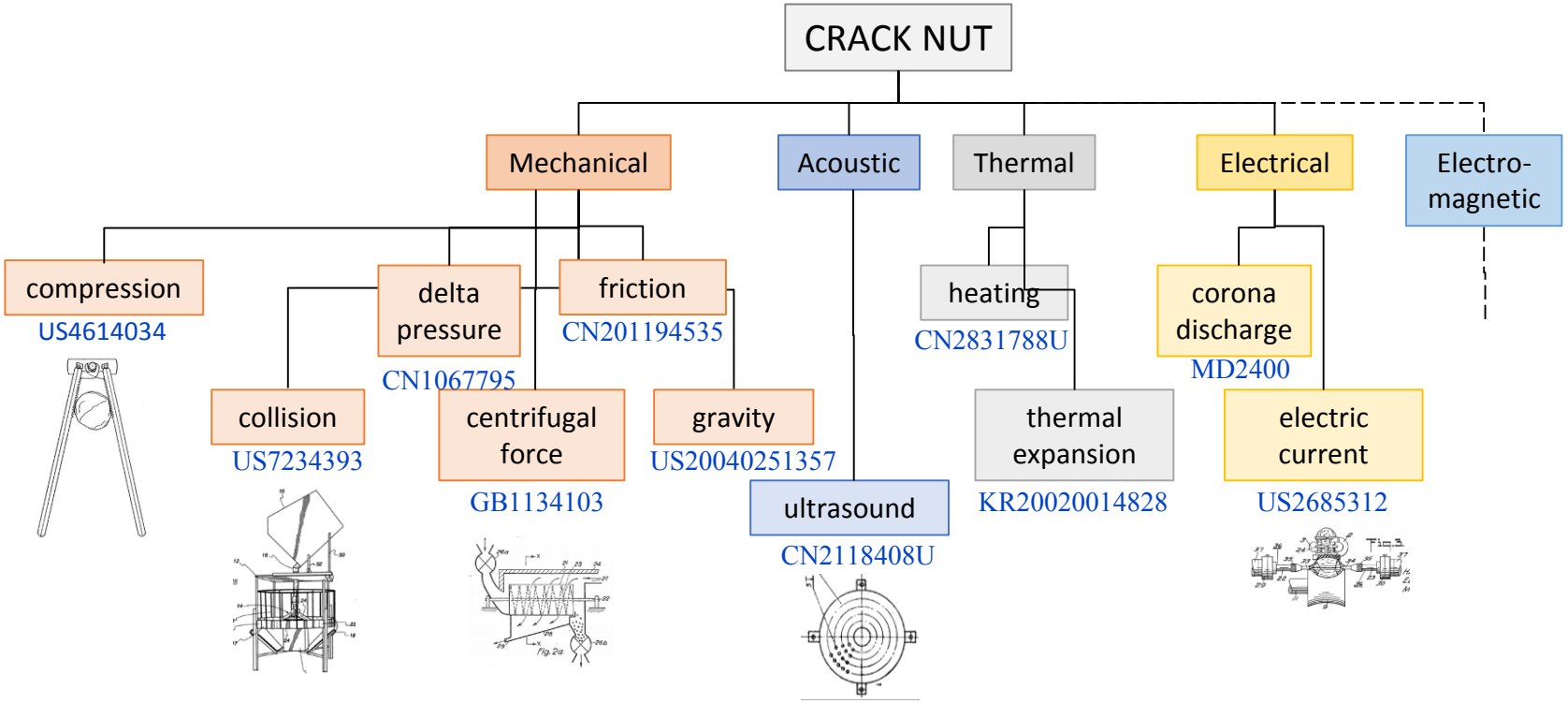
Innovating a …. Nutcracker



Innovating a …. Nutcracker

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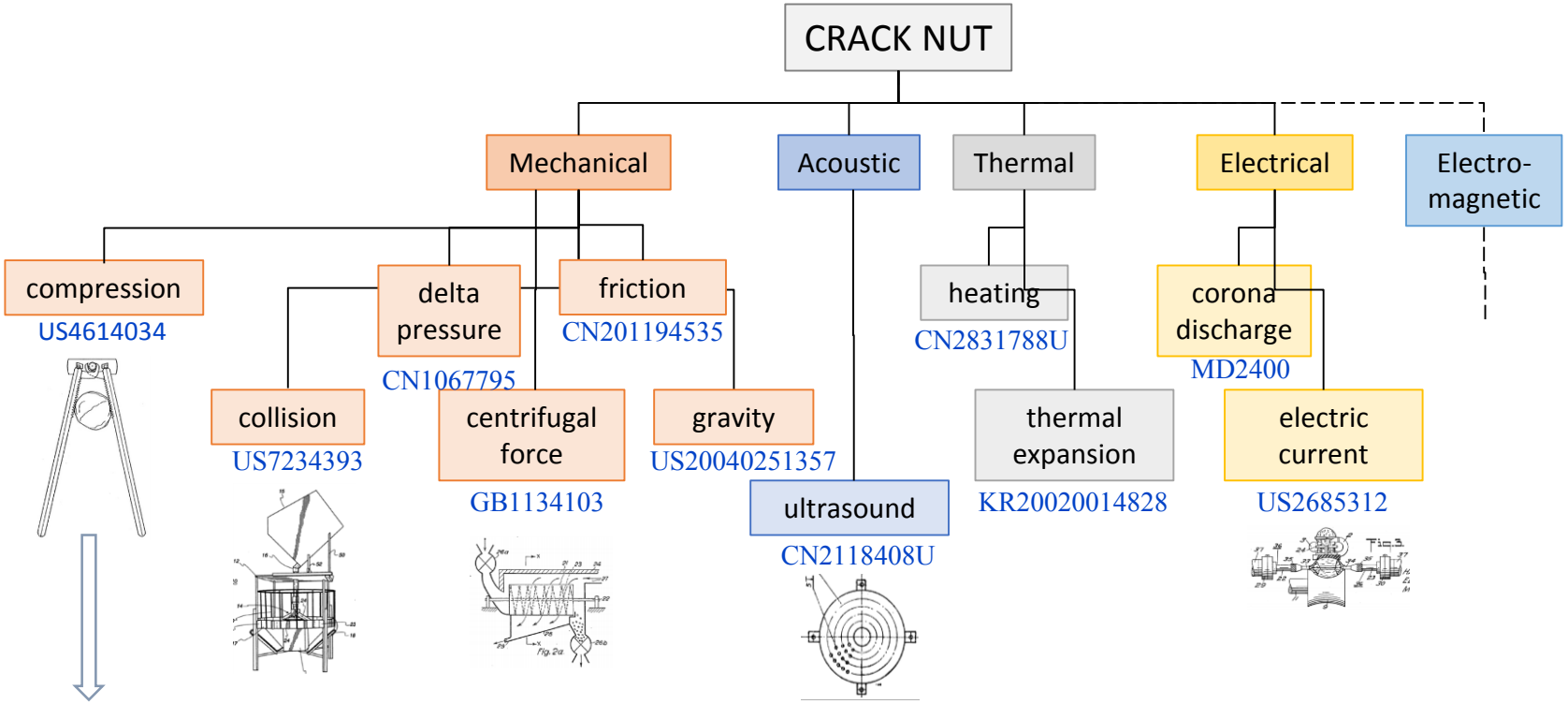
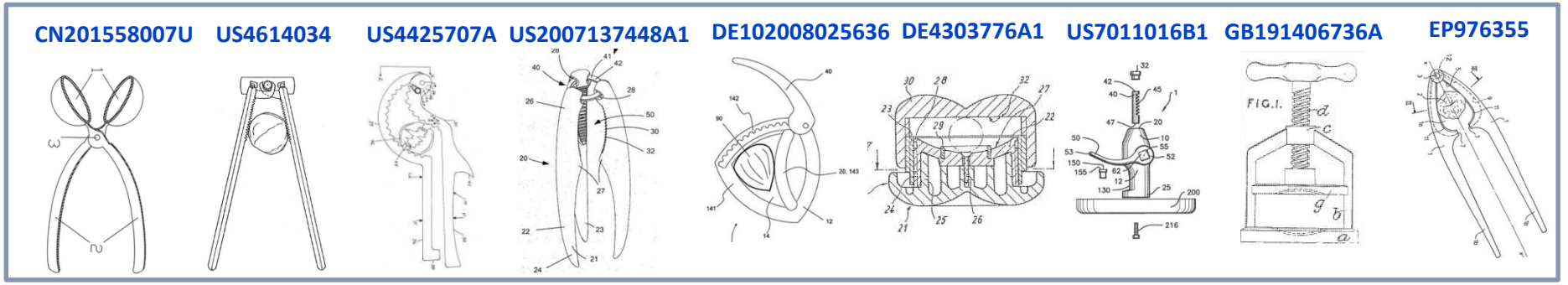
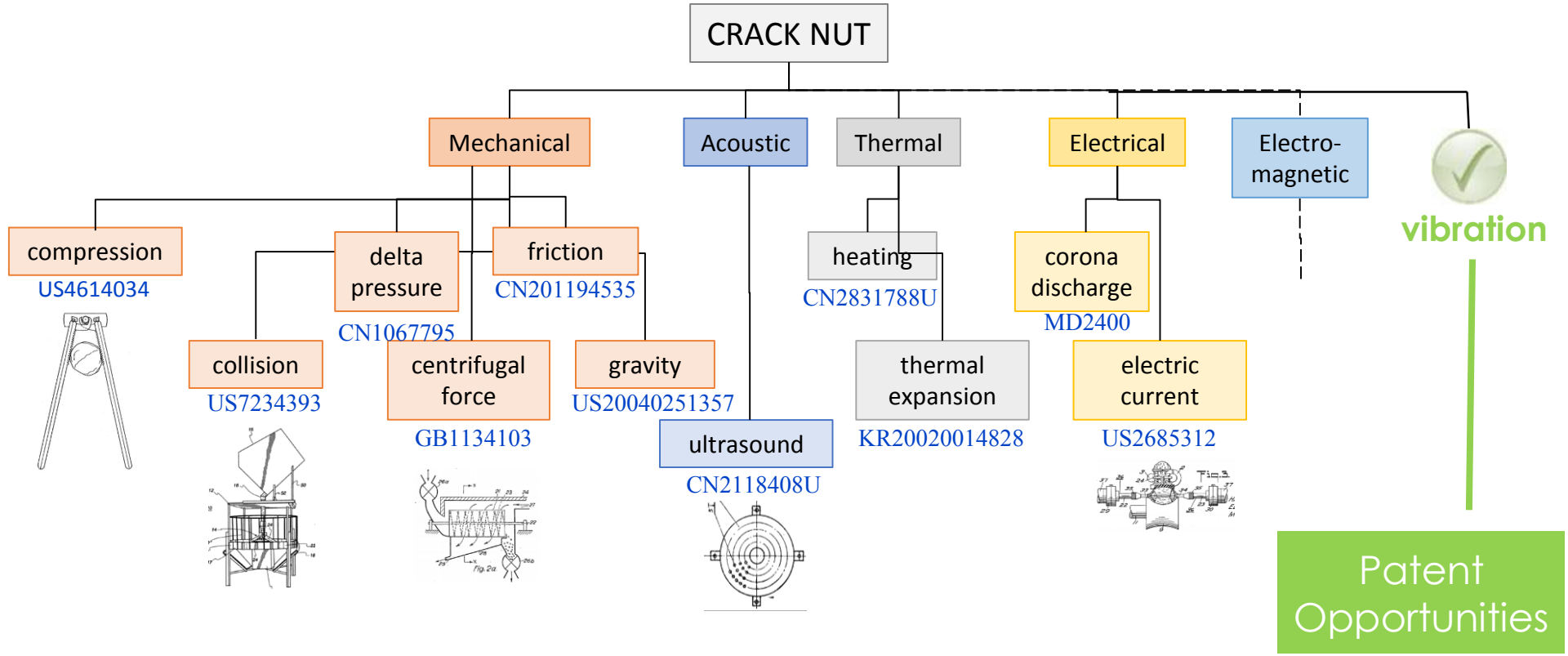




Innovating a …. Nutcracker



Investigation of other domains

vibration

In which other domains, vibrations are already used for cracking?

- Drilling machines for building galleries and tunnels (e.g. CN102287137),
- Cutting machine for the treatment of fruits (e.g. US20080166468)
- Cracking eggs for preparation of food (e.g. JP2013128443)
- Breaking ice in ice-breaker vessels (e.g. DE19717202)
- Working soil for building foundations (e.g. CN101899827),
- Calculus smashing apparatus for medical surgery (e.g. WO9826705),
- Cracking shells for processing shellfishes (e.g. CN102389130).

Technological Landscaping

PRODUCT

WATER PURIFIER

NEW PATENTABLE OPPORTUNITIES

FUNCTION

PURIFY | TRANSFER | STORE | .....

FIELD

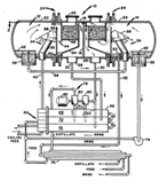
THERMAL | MECHANICAL | CHEMICAL | ELETTRIC | ELETTRO-MAGNETIC | .....

EFFECT

THERMAL HYDROLYSIS | EVAPORATION | FREEZING | ELECTROLYSIS | UV LIGHT | LASER

PATENT

HIGH TEMPERATURE | LOW PRESSURE | LAMP PLACEMENT | WAVE LENGHT | MATERIAL TRASMISSIVITY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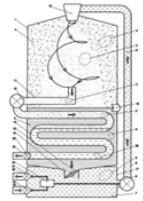
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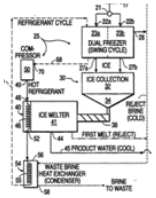
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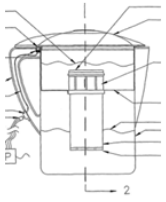
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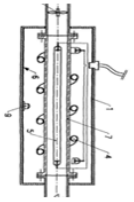
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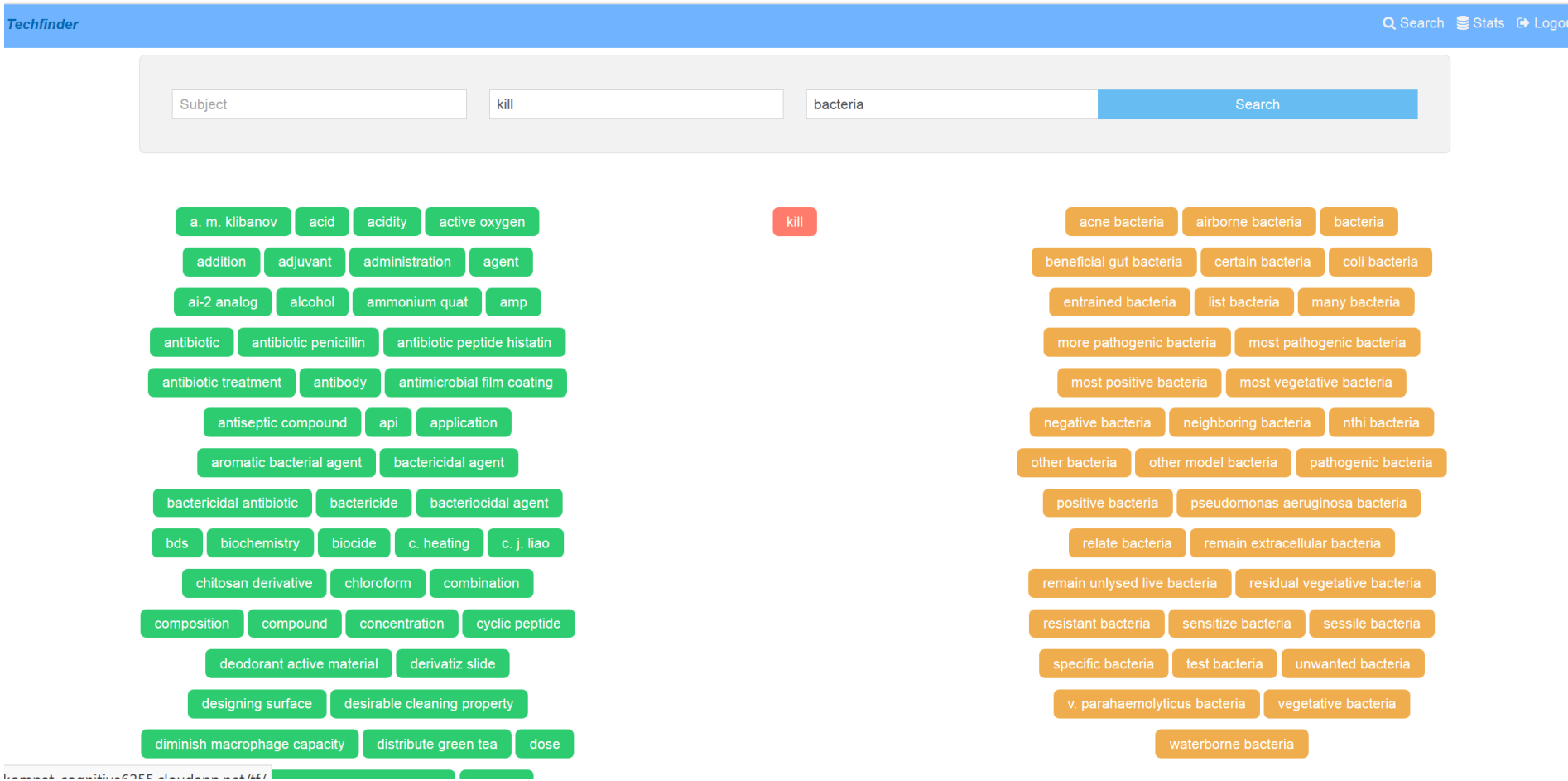

kill bacteria
prevent heating
improve absorption
remove water

Requirement Matrix- strumenti per prendere decisioni

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Market potential

How to capture the measures of customer value?

Our analysis deliver two statements for each requirements:

1. **The IMPORTANCE degree for customer**
2. **The SATISFACTION degree to which a requirement is fulfilled through existing product -existent VSC contactor (valued by marketing)**

- Importance and satisfaction help to calculate the **market potential** of the benefit as a decisive factor of customer value

Benefits of notebook users:

- Increase damage resistance in case of a fall
- Increase picture quality

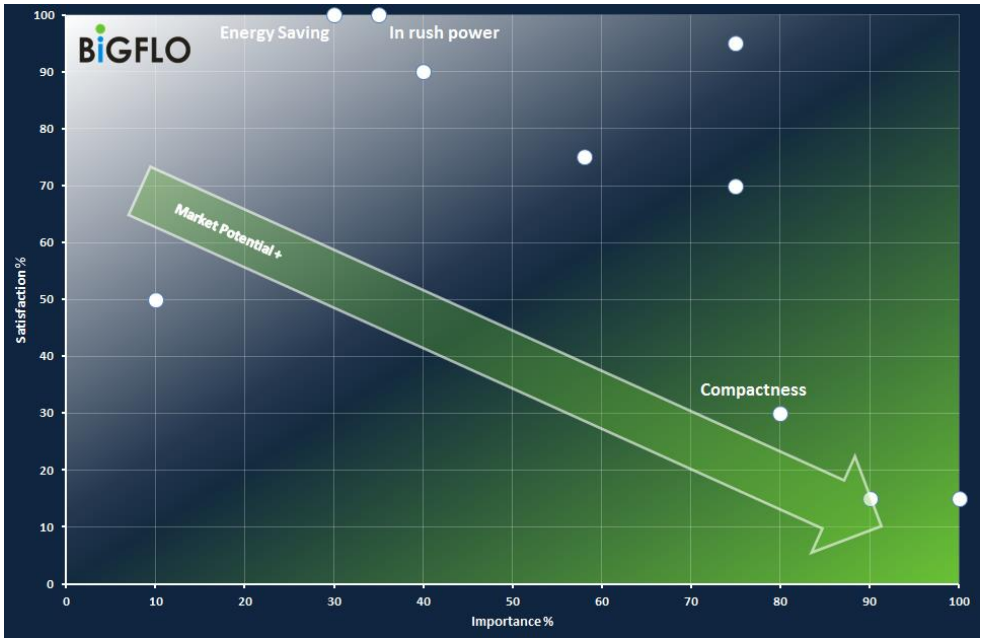
Imp.	Satisf.	Market potential
76%	22%	high
76%	74%	low

Market potential = F (Importance, Satisfaction)

Market potential Matrix

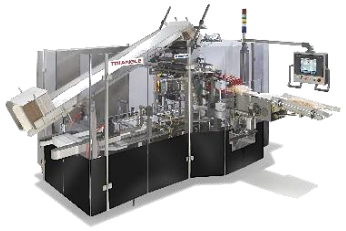
Market potential matrix is a decision making tool based on the Importance-Satisfaction Analysis that allows managers to plan product innovation strategies. This analysis is based on the concept that for maximizing sales is better to emphasize improvements in areas where the level of satisfaction is relatively low and the perceived importance of the item is relatively high.

	Overall Importance %	Overall Satisfaction %	Market Potential Ulwick
Energy Saving	30	100	6.0
In rush power	35	100	7.0
Compactness	58	75	14.1
Versions	80	30	23.0
...	40	90	9.0



Innovation Strategy Formulation

- A package of chosen benefits with the highest market potential shapes the innovation strategy



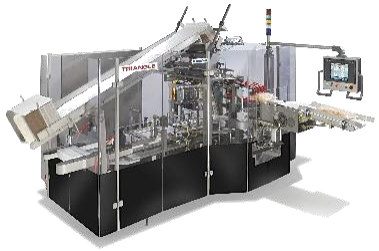
	Benefits of bureau telephone users	Market potential %	Satisfaction, existing product %	Satisfaction, future new product %
☑	Tolerate higher size deviation of products	8,4	24	100
☑	Reduce maintenance and cleaning time	5,8	43	100
☑	Tolerate density deviation of product	5,0	32	100
☑	Avoid contamination of primary packaging	4,8	64	100
☐	Reduce noise and vibration level	3,2	79	unchanged
☐	…	…	…	unchanged
☐	Increase number of run product formats	1,6	78	unchanged
☐	Increase line productivity	1,5	81	unchanged
☐	…	…	…	unchanged
☐	Reduce compressed air consumption	0,8	89	unchanged
☐	Reduce energy consumption	0,6	91	unchanged
☐	Reduce production losses by material change	0,6	88	unchanged
	Total product value: (customer's measure of total product value)		**65%**	**89%**

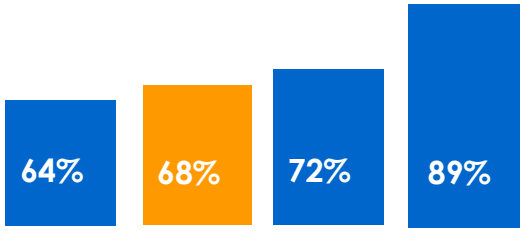
Added value: 89 – 65 = 24%

Comments: • total product value of existing and future products are compared
• product value of 100% means that all benefits are satisfied to 100%
• market potential is the contribution of a benefit into product value growth if this benefit will be satisfied to 100%

Innovation Strategy Formulation

How to create more added value for customers

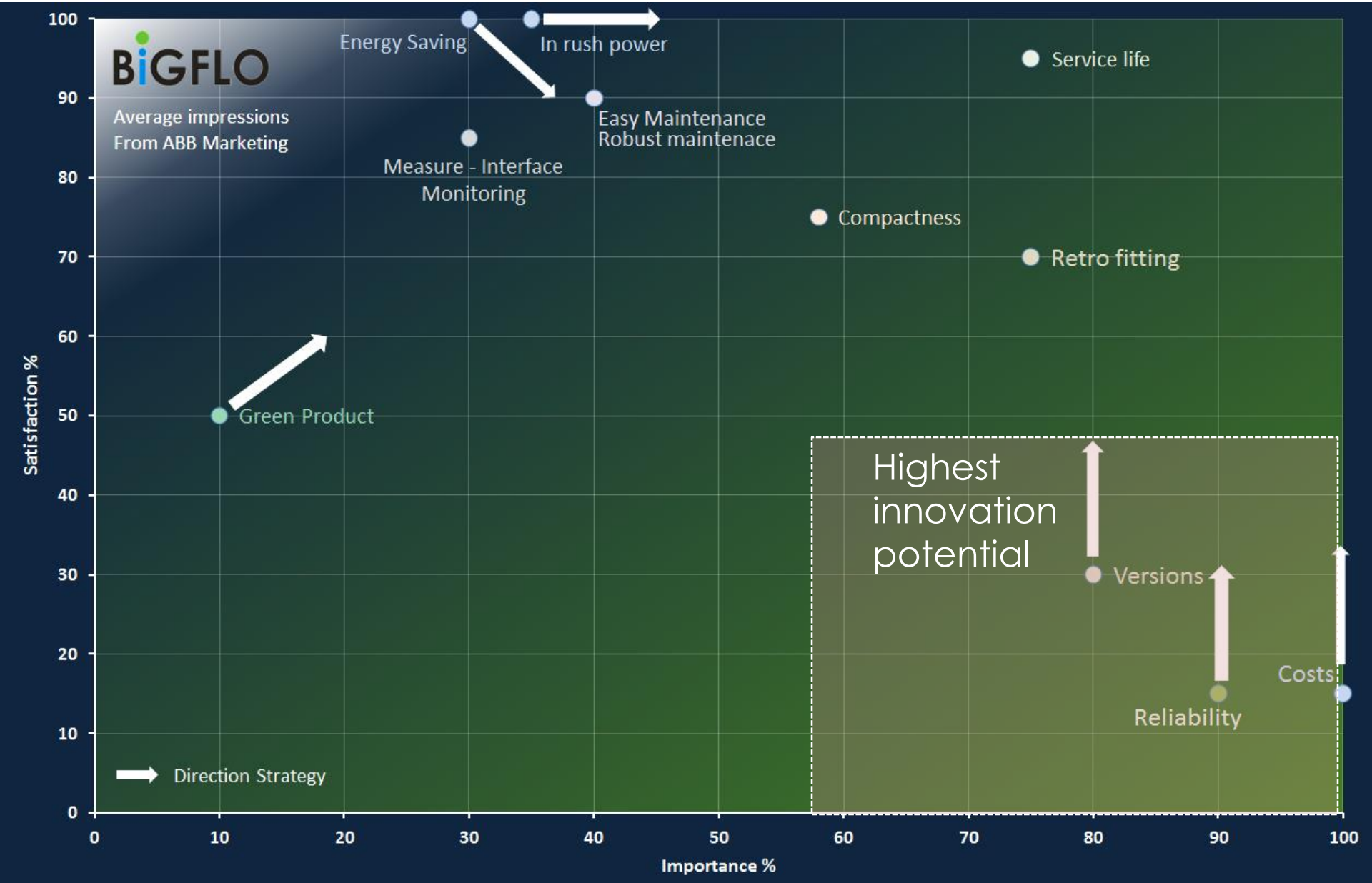




Packing machine: Benefits & Innovation strategies	Market-potential %	Satisfaction in %			
		actual Product	Compe-titor	Strategy N1	Strategy N2
Tolerate higher size deviation of products	8,4	24	26	24	100
Reduce maintenance and cleaning time	5,8	43	45	43	100
Tolerate density deviation of product	5,0	32	30	32	100
Avoid contamination of primary packaging	4,8	64	65	64	100
Reduce noise and vibration level	3,2	79	85	100	79
…	3,1	72	70	72	72
Increase number of run product formats	1,6	78	86	100	78
Increase line productivity	1,5	81	89	100	81
…	…	…	…	…	…
Reduce compressed air consumption	0,8	89	95	100	89
Reduce energy consumption	0,6	91	94	100	91
Reduce production losses by material change	0,6	88	98	100	88
Product value: (customer's measure of total product value)		**65%**	**68%**	**72%**	**89%**

- Existing strategy N.1 «Get ahead of competitors» underlies the benefits-based strategy N.2

Innovation strategy



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http://www.matriz.ru (International TRIZ Association)
http://www.aitriz.org/ (Altshuller Institute for TRIZ)
http://www.triz-journal.com/ (TRIZ journal)
http://www3.sympatico.ca/karasik/ (anti-Triz Journal)

Siti Utili:

http://www.triz.co.kr/TRIZ/intro.html

TOOL:

http://kompatvm.cloudapp.net/
http://dbeffectvm.cloudapp.net/

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http://www.uibm.gov.it/uibm/dati/Default.aspx
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