

Instructors: Albert Liu, Nicholas
A. Kotov

Particles and Particle Systems: Patents



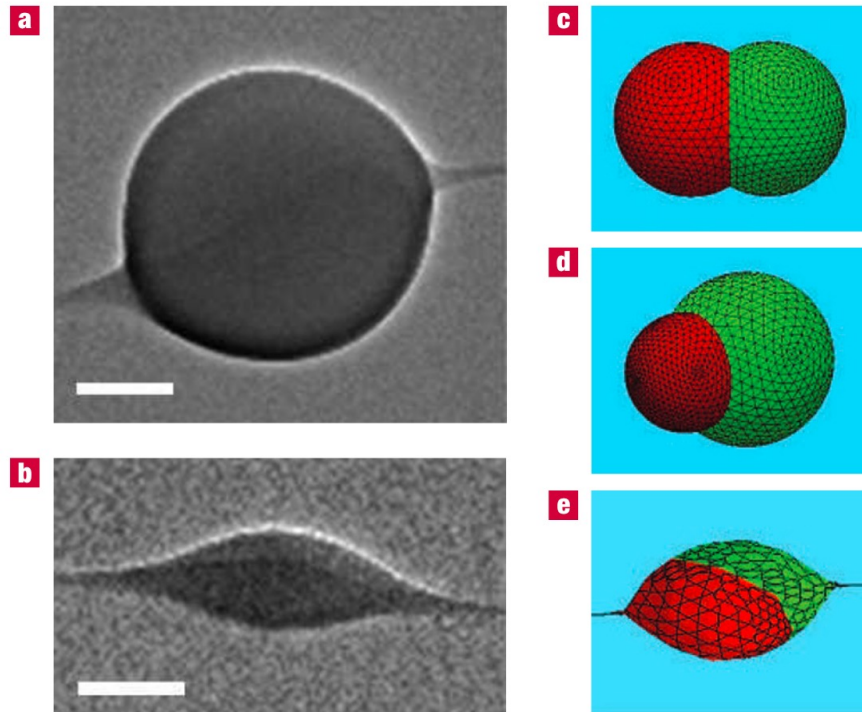
Journal club assignments for L11

Lecture 11 (4/2)	
Group	Paper Title
A	P2_doshi-et-al-2009-red-blood-cell-mimicking-synthetic-biomaterial-particles
B	P1_nmat1486
C	P3_Advanced Materials - 2012 - Maeda - Controlled Synthesis of 3D Multi-Compartmental Particles with Centrifuge-Based
D	P4_s41598-019-49244-4

You need to log in using your umich.edu account in order to access this poll

Lecture 11 Poll (a): biphasic electrified jetting

- For **equal volumes** of the two phases (A and B), and a relatively **large** surface free energy γ_{AB} , which of the following structures would you expect to obtain?



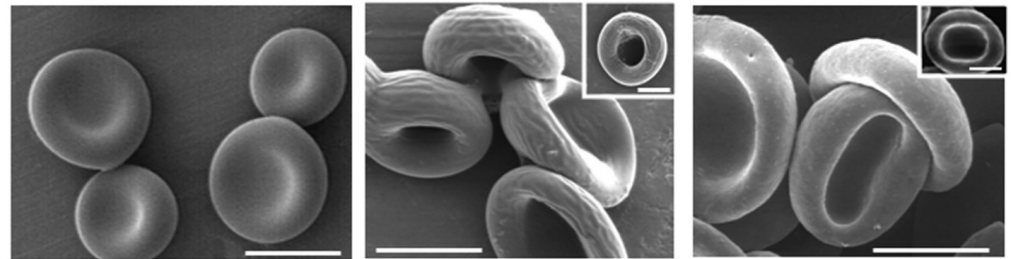
Long URL <https://forms.gle/EiRHTK8mTash3UMH9>

Short URL <https://shorturl.at/GHWY8>

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Lecture 11 Poll (b): Red blood cell-mimicking synthetic biomaterial particles

- Of the following choices, which is NOT a reason the authors decided to use Polystyrene hollow spheres as the precursor for their RBC like particles?
 - A. hollow polystyrene particles, upon solvent or heat induced fluidization, can collapse into an RBC shape
 - B. polystyrene is biocompatible
 - C. hollow polystyrene spheres are readily available commercially
 - D. starting with polystyrene microspheres with high elastic modulus mimics the genesis of RBCs in nature



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Short URL <https://shorturl.at/hxGHM>

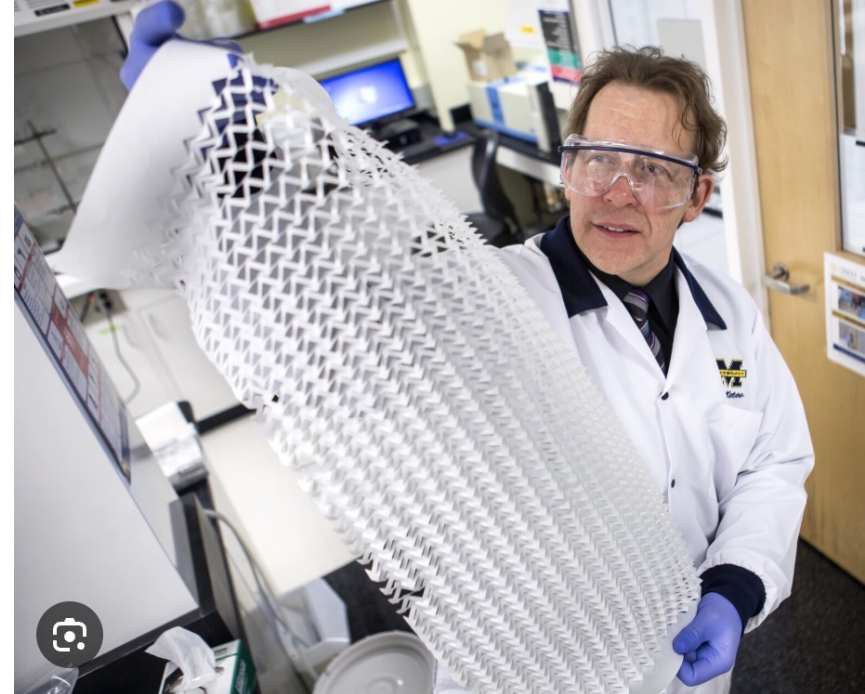




Technology Transfer

KOTOV LAB / TECHNOLOGY TRANSFER

- 2022-present Founder, Chief Technology Officer, Tuebor Energy, Ypsilanti, MI
- 2018-present Chief Technology Officer, Photon Semantics, Detroit, MI
- 2017-present Founder, Photon Semantics, Ypsilanti, MI, USA
- 2015-2020 Board of Directors, Elegus Technologies, Ann Arbor, MI, USA
- 2013-2020 Founder, Elegus Technologies, Ann Arbor, MI
- 2010-2012 Board of Directors, 3D Biomatrix, Ann Arbor, MI
- 2009-2010 Chief Executive Officer, 3D Biomatrix, Ann Arbor, MI
- 2008-2016 Founder, 3D Biomatrix, Ann Arbor, MI
- 2003-2016 Chief Technology Officer, Founder, Nico Technologies, Ypsilanti, MI
- 2000-2004 Consultant, Nomadics Inc., Stillwater, OK
- 2003-2005 Consultant, Boston Scientific, Maple Grove, MN
- 2000-2004 Consultant, Nomadics Inc., Stillwater, OK
- 2002 Consultant, Avery Dennison, Glendale, CA
- 1999-2001 Consultant, Ciba Vision, Atlanta, GA



Nick Kotov Elected to National Academy of Inventors / Biointerfaces Institute / University of Michigan

TUEBOR
ENERGY



PHOTON SEMANTICS™

Particles and Particle Systems: Patents

Instructors:

Albert Liu,

Nicholas A. Kotov

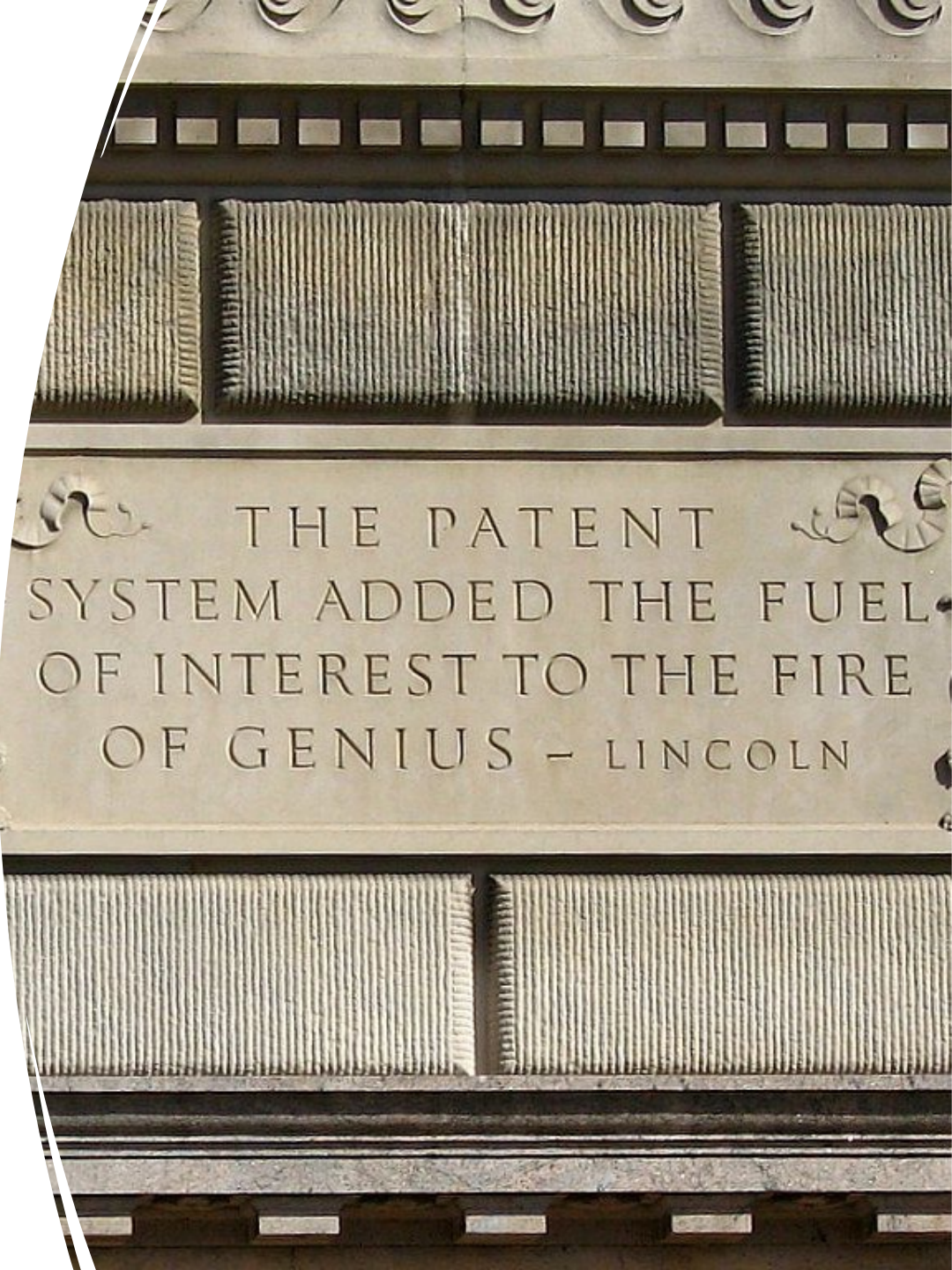


Particles and Particle Systems: Patents

Instructors:

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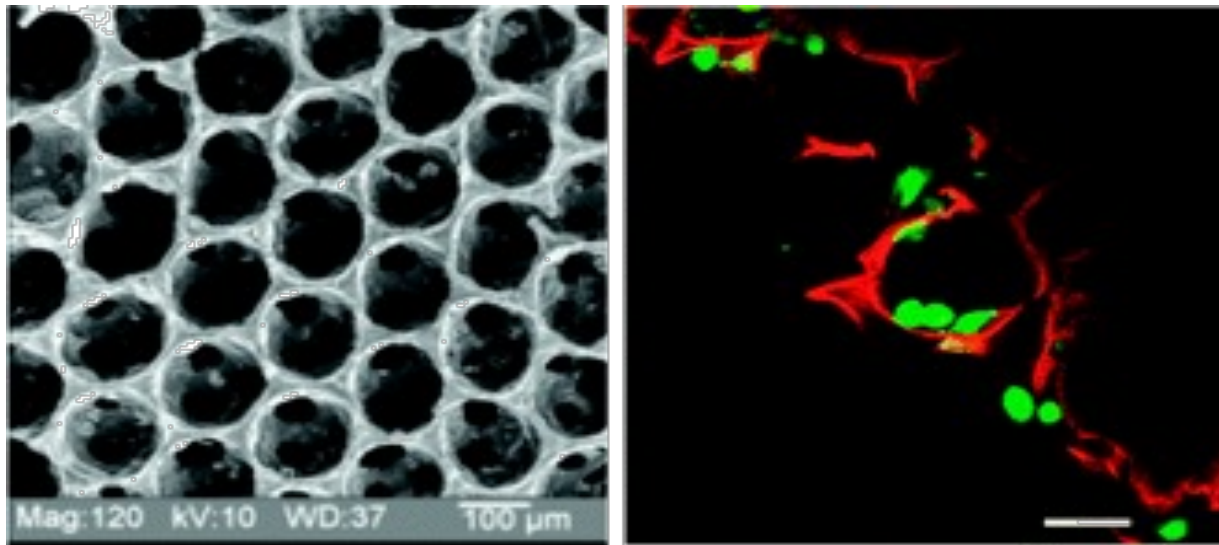


Invention: Paper

Inverted Colloidal Crystals as Three-Dimensional Cell Scaffolds

Nicholas A. Kotov, Yuanfang Liu, Shaopeng Wang, Colin Cumming, Mohammad Eghtedari, Gracie Vargas, Massoud Motamedi, Joan Nichols, and Joaquin Cortiella

Langmuir **2004**, 20, 19, 7887–7892



Invention: Patent

Cell culture well-plates having inverted colloidal crystal scaffolds USPTO 20090041825

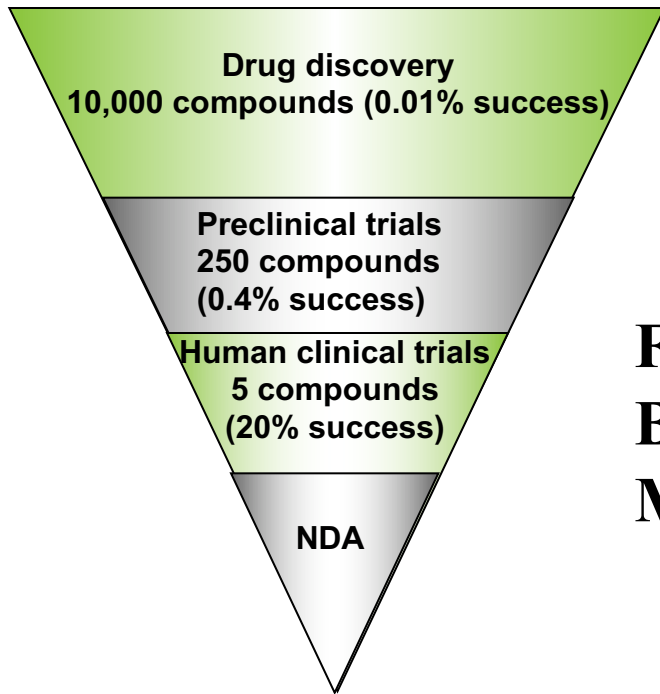
Abstract: An artificial bone marrow construct comprising a substrate having at least one well; a three dimensional biocompatible polymer matrix comprising a transparent polymer network containing microspherical voids, wherein the microspherical voids are each connected to at least one other void through inter-connecting pores; at least one Layer-by-Layer (LBL) coating on a surface of at least one of the polymer network, voids and pores, a population of bone marrow cells comprising stem cells and stromal cells; and at least one bioactive agent. An artificial immune network comprising a polymer matrix with a population of immune cells comprising B-cells and T-cells is disclosed. Methods for testing the toxicity of drugs and other agents against bone marrow cells and methods for making universal blood using the artificial bone marrow constructs are also disclosed.

Filed: August 12, 2008

Publication date: February 12, 2009

Inventors: Nicholas A. Kotov, Joaquin Cortiella, Joan E. Nichols

Challenge of Drug Discovery



\$1 B and 12 to 15 years

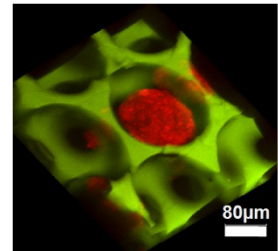


Inadequacy of the
traditional 2D cell
cultures

Difficulties, long duration,
and cost of animal and
human tests

Failures of Vioxx, Tysabri, hexamethonium,
Byetta, Torcetrapib, Semagacestat,
Marimastat, (all FDA approved), Erbitux

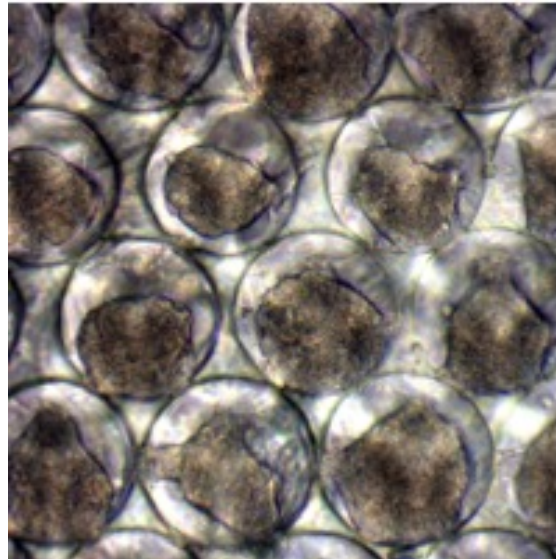
3D Biomatrix provides early stage
3D cell culture tools
more predictive than 2D,
less expensive/complicated than animals
less liability than humans



Value Proposition

Inserts in the well-plates,
first artificial bone marrow.

Liver toxicity model: 3D more accurate
response than 2D



Competitive Advantages:

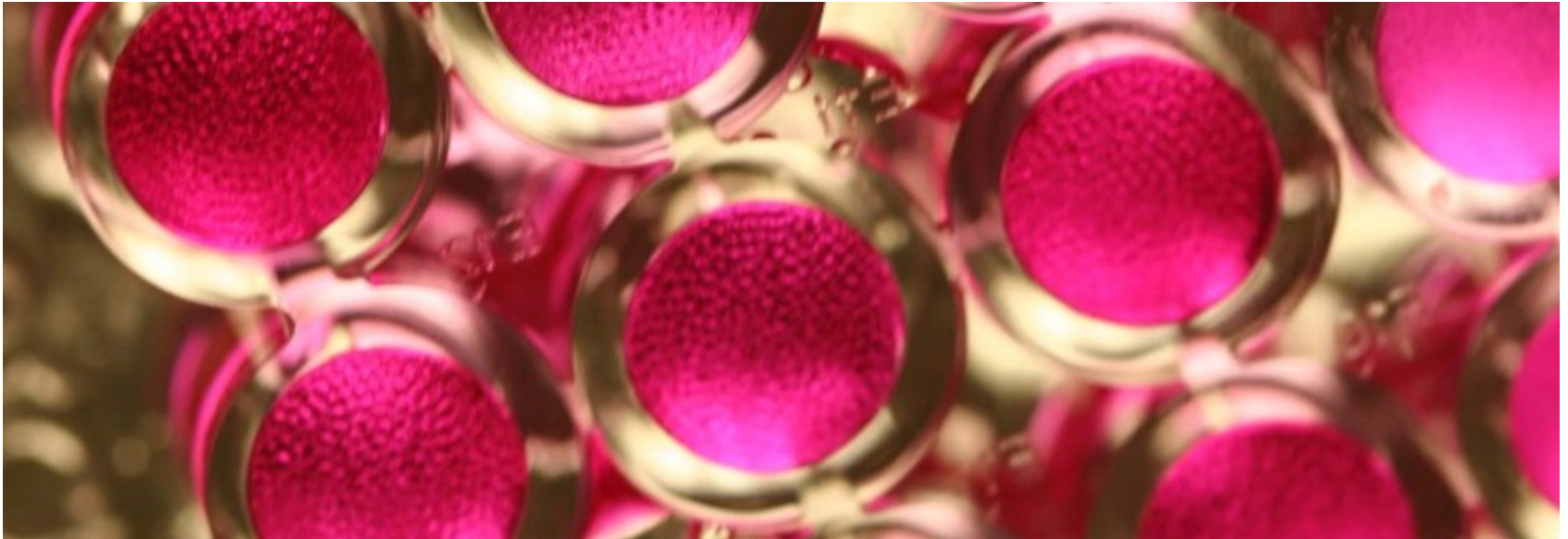
designed specifically for drug
discovery

standard multi-well format
tissue-like geometry,

transparent materials for
imaging

all mainstream drug discovery
instruments

3D Biomatrix



Accelerated drug discovery in tissue mimics

Perfecta 3D™ Scaffolds

3D Biomatrix

Law Suit

Law Suit



and drug discovery in

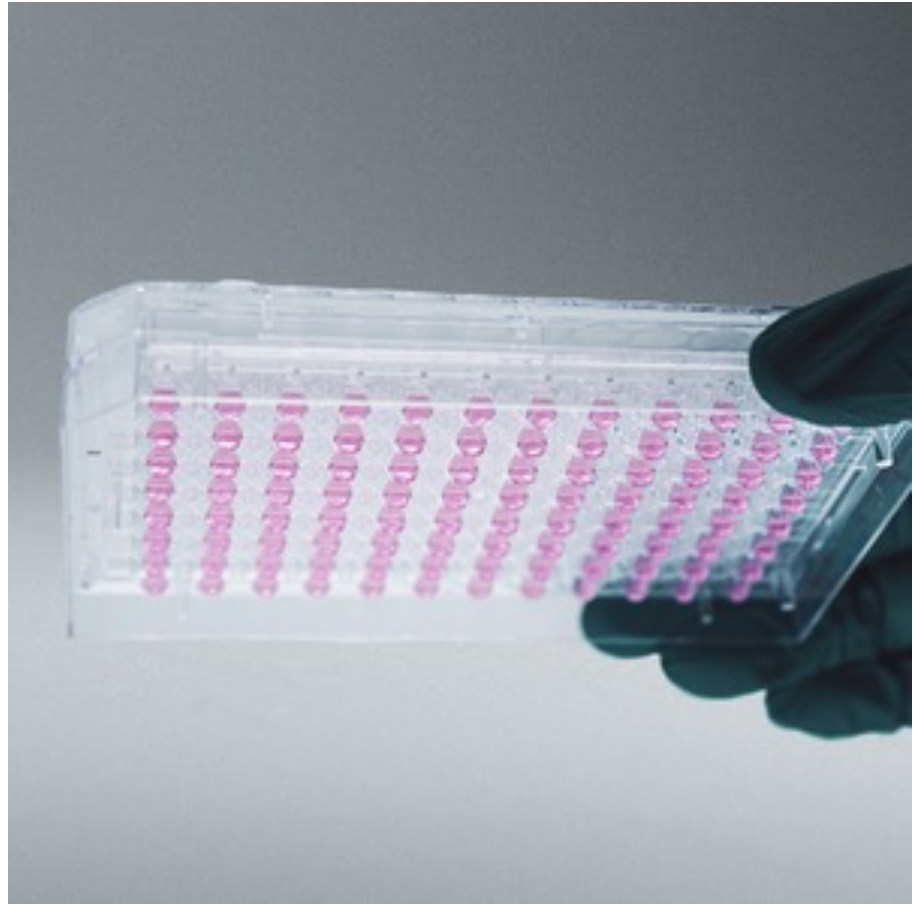
Perfecta 3D™ Scaffolds

Competitor

insphero

Wagistrasse 27A, 8952, Schlieren, Switzerland

We won the lawsuit!



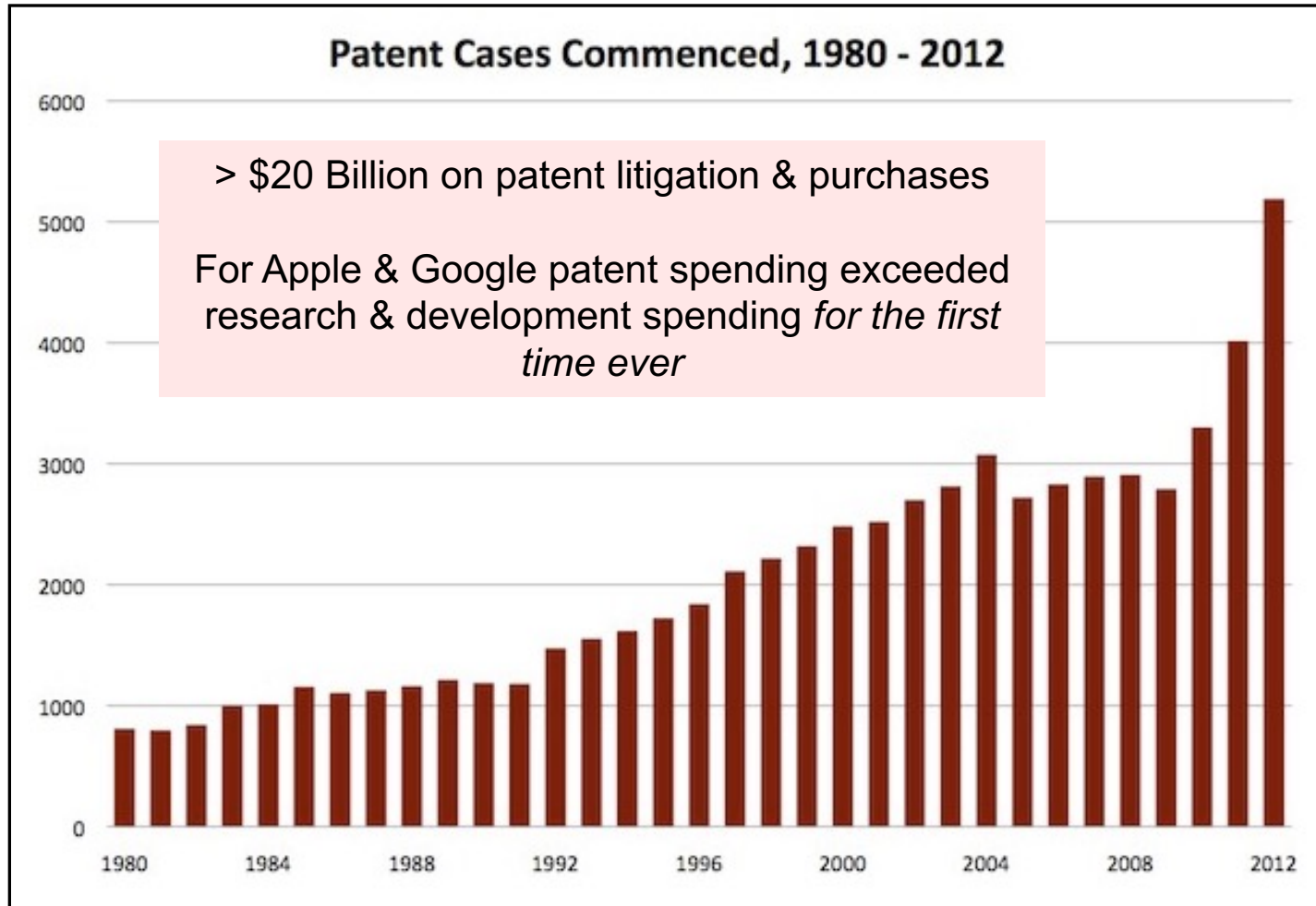
<https://shop.insphero.com>

Billions spent on patents

- 2010 – 2012
- Smartphone industry
- > \$20 Billion on patent litigation
- For Apple & Google patent spending exceeded research & development spending *for the first time ever*
- Patent litigation destroys over \$60 billion in firm wealth each year



Patent Litigation



Dave Schmitt, Engineering Librarian, UC San Diego Library

What is a Patent?

An official document, issued by the U.S. Patent & Trademark Office (USPTO), granting property rights to the inventor or assignee (owner of the patent).

Protection is 14-20 years from the date of application in the U.S. (if maintenance fees are pai).

US Patents are effective only in the U.S., territories and possessions.

Patents from other countries protect IR rights there

Rights Granted by Patents

NOT the right to make, use, offer for sale, sell or import, but

the right to EXCLUDE OTHERS from making, using, offering for sale, selling or importing the invention.

Patents may be licensed by the assignee to another party.

Except undergraduate students, inventions from UM assigned typically to UM



Minimum Fees Over Patent Life

	Regular	Small entity	Micro entity
Filing	\$ 280	\$ 140	\$ 70
Search	\$ 600	\$ 300	\$ 150
Examination	\$ 720	\$ 360	\$ 180
Issue	\$ 960	\$ 480	\$ 240
Maintenance			
3.5 yrs	\$ 1,600	\$ 800	\$ 400
7.5 yrs	\$ 3,600	\$ 1,800	\$ 900
11.5 yrs	\$ 7,400	\$ 3,700	\$ 1,850
Total	\$15,160	\$ 7,850	\$ 3,790

Attorney costs to prepare and prosecute the patent: ~ \$20,000-100,000

First to Invent vs. First to File

Leahy-Smith America Invents Act was signed in 2011

First to file became
law March 16, 2013

Smaller fees



Market incumbents become further entrenched

A startup that relies on patents for protection from competitive risk lose capital, strategic partners, and time for R&D and testing.

Patents vs Papers

Scientific publication

Patent publication

Content	Mainly basic research findings	Technical solutions to a problem
Access	Paid access or open access or depending on the journal	Open access via public patent databases
Quality filter	Peer review	Patent examination process
Indexing	Scientific papers can have inconsistent bibliographical details, meaning that they can be hard to index.	Patent publications have a (more or less) standardised numbering system, meaning that it is possible to fully index them.
Subject categorization	Core journals by subject field	Patent classifications by technology field
Reason to publish	Scientific recognition	Economic (gain commercial monopoly, licensing, etc.)
Who publishes	Research entities (mainly universities)	Companies and to a lesser degree research entities and private persons (inventors)
Cost	Sometimes fee based and others for free (depending on journal prestige)	Fee based (depending on patent office and coverage)
Content duplicity	No (the article can only be published in one single journal)	Yes (as patents are territorial, the same invention can generate several different patent documents for each country)
Timeliness	Article publishing depends on the efficiency of the peer review process of the journal	Patent is not published before 18 month after filing

Patents vs Papers

Scientific publication

Authorship is negotiable

Must have done the work

**Disclosure of ideas interferes
with patentability**

**Prior results and analogous systems
are acceptable**

Patent publication

Inventorship is a matter of law

Reduction to practice is possible

**Disclosure of ideas enhances
applicability**

**Prior results and analogous systems
result in rejection**

Types of Patents

Utility Patents - 20 years from filing

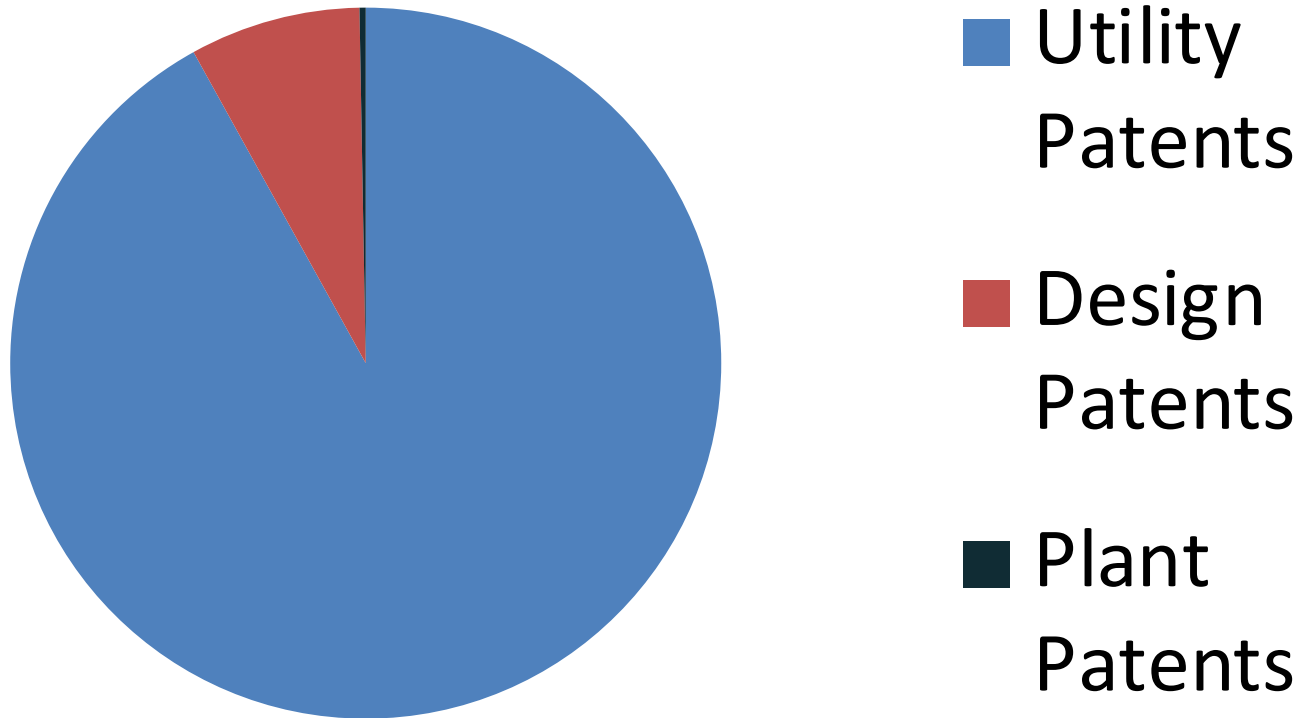
- Chemical
- Mechanical
- Electrical
- Biological

Design Patents – 14 years from issue (no maintenance fees)

Plant Patents – 20 years from filing (no maintenance fees)

For Complex Particle Systems, Utility Patents are more likely.

U.S. Patents Granted in 2013 by Type



Source: U.S. Patent Statistics Chart

http://www.uspto.gov/web/offices/ac/ido/oeip/taf/us_stat.htm

Utility Patent Example



US 20090041825A1

(19) **United States**

(12) **Patent Application Publication** (10) Pub. No.: **US 2009/0041825 A1**
(43) Pub. Date: **Feb. 12, 2009**

(54) **CELL CULTURE WELL-PLATES HAVING INVERTED COLLOIDAL CRYSTAL SCAFFOLDS**

(76) Inventors: **Nicholas A. Kotov**, Ypsilanti, MI (US); **Joaquin Corfiella**, Galveston, TX (US); **Joan E. Nichols**, Galveston, TX (US)

Correspondence Address:
HARNESS, DICKEY & PIERCE, P.L.C.
P.O. BOX 828
BLOOMFIELD HILLS, MI 48303 (US)

(21) Appl. No.: **12/228,419**

(22) Filed: **Aug. 12, 2008**

Related U.S. Application Data

(63) Continuation-in-part of application No. 11/656,362, filed on Jan. 22, 2007.

(60) Provisional application No. 60/772,283, filed on Feb. 10, 2006.

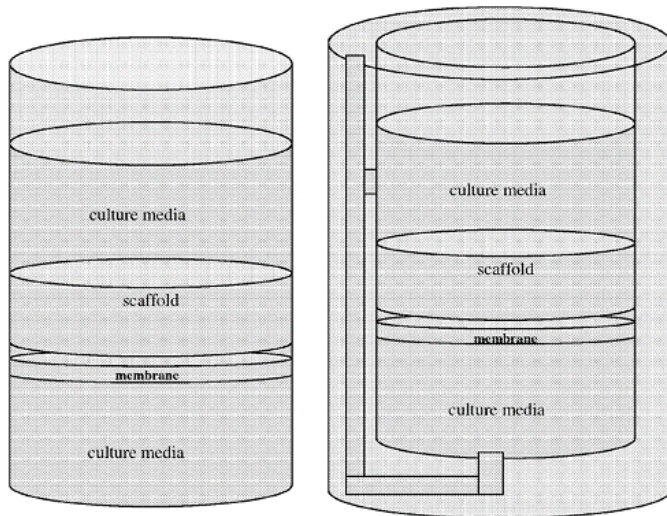
Publication Classification

(51) **Int. Cl.**
A61K 35/28 (2006.01)
A61F 2/02 (2006.01)
C12N 5/02 (2006.01)
A61P 43/00 (2006.01)
C12Q 1/02 (2006.01)
(52) **U.S. Cl.** **424/423**; 435/29; 424/93.71; 435/374

(57) **ABSTRACT**

An artificial bone marrow construct comprising a substrate having at least one well; a three dimensional biocompatible polymer matrix comprising a transparent polymer network containing microspherical voids, wherein the microspherical voids are each connected to at least one other void through inter-connecting pores; at least one LBL coating on a surface of at least one of the polymer network, voids and pores, a population of bone marrow cells comprising stem cells and stromal cells; and at least one bioactive agent. An artificial immune network comprising a polymer matrix with a population of immune cells comprising B-cells and T-cells is disclosed. Methods for testing the toxicity of drugs and other agents against bone marrow cells and methods for making universal blood using the artificial bone marrow constructs are also disclosed.

Covers inventions that function in a unique manner to produce a utilitarian result



Cell culture well-plates having inverted colloidal crystal scaffolds

Publication number: 20090041825

Filed: August 12, 2008

Publication date: February 12, 2009

Inventors: Nicholas A. Kotov, et al

Design Patent Example



US00D648333S

(12) **United States Design Patent** (10) **Patent No.:** **US D648,333 S**
Andre et al. (45) **Date of Patent:** ** *Nov. 8, 2011

(54) **PORTABLE COMPUTER**

(75) Inventors: **Bartley K. Andre**, Menlo Park, CA (US); **Daniel J. Coster**, San Francisco, CA (US); **Daniele De Iullis**, San Francisco, CA (US); **Evans Hanley**, San Francisco, CA (US); **Richard P. Howarth**, San Francisco, CA (US); **Jonathan P. Iye**, San Francisco, CA (US); **Steve Jobs**, Palo Alto, CA (US); **Duncan Robert Kerr**, San Francisco, CA (US); **Shin Nishihori**, Portola Valley, CA (US); **Matthew Dean Rohrbach**, San Francisco, CA (US); **Peter Russell-Clarke**, San Francisco, CA (US); **Douglas B. Satzger**, Menlo Park, CA (US); **Christopher J. Stringer**, Woodside, CA (US); **Eugene Anthony Whang**, San Francisco, CA (US); **Rico Zorkendorfer**, San Francisco, CA (US)

(73) Assignee: **Apple Inc.**, Cupertino, CA (US)

(**) Term: **14 Years**

(21) Appl. No.: **29/384,006**

(22) Filed: **Jan. 25, 2011**

Related U.S. Application Data

(60) Continuation of application No. 29/366,369, filed on Jul. 23, 2010, now Pat. No. Des. 633,087, which is a continuation of application No. 29/351,847, filed on Dec. 11, 2009, now Pat. No. Des. 623,645, which is a continuation of application No. 29/337,518, filed on May 22, 2009, now Pat. No. Des. 606,988, which is a division of application No. 10/152,008, filed on Oct. 15, 2008, now Pat. No. Des. 604,292, which is a continuation of application No. 29/326,082, filed on Oct. 10, 2008, now Pat. No. Des. 604,290.

(51) **LOC (9) CL** **14-02**

(52) **U.S. CL** **D14/315**

(58) **Field of Classification Search** **D14/315-327; D18/1, 2, 7, 11; 235/145 A, 145 R; 341/22, 341/23; 345/104, 156, 168, 169, 173; 361/679.08, 361/679.09, 679.11, 679.26, 679.27**
 See application file for complete search history.

(56) **References Cited**

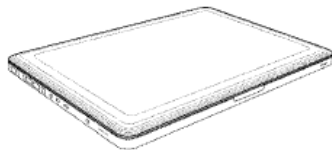
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D611,045 S *	3/2010	Andre et al.	D14/327
D616,880 S	6/2010	Andre et al.	D14/318
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D625,717 S	10/2010	Andre et al.	
D635,566 S	4/2011	Andre et al.	
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OTHER PUBLICATIONS

Apple PowerBook G4 Titanium, available at least as early as Jan. 1, 2001.
 Apple PowerBook G4 Aluminium, available at least as early as Jan. 1, 2003.
 Apple MacBook Pro, available at least as early as Jan. 10, 2006.
 Appendix in U.S. Appl. No. 29/201,636 entitled "Electronic Device" filed Mar. 17, 2004, now USPN D504,889.
 Photographs of Sony VAIO PCG-4G1L, available at least as early as May 8, 2006.
 Apple MacBook Air, available Jan. 15, 2008, http://images.apple.com/macbookair/images/design_gal01_20080115.jpg.
 Apple MacBook Air, available Jan. 15, 2008, http://images.apple.com/macbookair/images/design_gal02_20080115.jpg.
 Apple MacBook Air, available Jan. 15, 2008, http://images.apple.com/macbookair/images/design_gal03_20080115.jpg.

Unique, ornamental, or visible shape or surface ornamentation of an article or object, even if only on a computer screen



Plant Patent Example



(12) **United States Plant Patent** (10) **Patent No.:** US PP15,726 P2
Dümmen (45) **Date of Patent:** Apr. 19, 2005

(54) **GERANIUM PLANT NAMED 'DUEIMGABRI'** (58) **Field of Search** P1L/327

(50) Latin Name: *Pelargoniumhortorum* (56) **References Cited**
Varietal Denomination: **Dueimgabri** PUBLICATIONS

(75) Inventor: **Marga Dümmen**, Rheinberg (DE) UPOV-ROM GTTM Computer Database 2004/04, GTI
Jouve Retrieval Software, Citation for 'Dueimgabri'. *

(73) Assignee: **Dümmen Jungpflanzen GbR**, Rheinberg (DE) * cited by examiner

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **10/859,497**

(22) Filed: **Jun. 1, 2004**

(30) **Foreign Application Priority Data**

Apr. 23, 2001 (02) PBR 20019999

(51) Int. Cl.⁷ **A01H 5/00**

(52) U.S. Cl. **P1L/327**

(57) **ABSTRACT**

A new and distinct cultivar of *Zonal Geranium* plant, named 'Dueimgabri', characterized by its upright, somewhat outwardly spreading and rounded plant habit; freely branching habit; foliage with distinct zonation pattern; freely and early flowering habit; and dark pink-colored semi-double flowers.

1 Drawing Sheet

1

2

Botanical classification/cultivar denomination: *Pelargoniumhortorum* cultivar *Dueimgabri*.

BACKGROUND OF THE INVENTION

The present invention relates to a new and distinct cultivar of *Zonal Geranium* plant, botanically known as *Pelargoniumhortorum*, and hereinafter referred to by the name 'Dueimgabri'.

The new *Zonal Geranium* is a product of a planned breeding program conducted by the Inventor in Rheinberg, Germany. The objective of the breeding program was to develop new freely and early flowering *Zonal Geraniums* with attractive flower and foliage colors.

The new *Zonal Geranium* originated from a cross-pollination made by the Inventor in May, 1998, of a proprietary selection of *Pelargonium peltatum* identified as code number N-02-05, not patented, as the female, or seed, parent with a proprietary selection of *Pelargonium peltatum* identified as code number E-12-250, not patented, as the male, or pollen, parent. The cultivar *Dueimgabri* was discovered and selected by the Inventor as a flowering plant within the progeny from this cross-pollination in a controlled environment in Rheinberg, Germany in April, 2001.

Asexual reproduction of the new cultivar by terminal vegetative cuttings at Rheinberg, Germany since July, 2001, has shown that the unique features of this new *Zonal Geranium* are stable and reproduced true to type in successive generations of asexual reproduction.

SUMMARY OF THE INVENTION

The following traits have been repeatedly observed and are determined to be the unique characteristics of 'Dueimgabri'. These characteristics, in combination distinguish 'Dueimgabri' as a new cultivar and distinguish it from other known *Zonal Geranium* cultivars:

1. Upright, somewhat outwardly spreading and rounded plant habit.

2. Freely branching habit.
3. Foliage with distinct zonation pattern.
4. Freely and early flowering habit.
5. Dark pink-colored semi-double flowers.

Compared to plants of the parent selections, plants of the new *Zonal Geranium* differ in flower coloration. The new *Zonal Geranium* can be compared to plants of the cultivar HWD Gabrieli, disclosed in U.S. Plant Pat. No. 9,745. In side-by-side comparisons conducted in Rheinberg, Germany, plants of the new *Zonal Geranium* differed from plants of the cultivar HWD Gabrieli in the following characteristics:

1. Plants of the new *Zonal Geranium* had slightly smaller flowers than plants of the cultivar HWD Gabrieli.
2. Flowers of plants of the new *Zonal Geranium* were darker in color than flowers of plants of the cultivar HWD Gabrieli.

BRIEF DESCRIPTION OF THE PHOTOGRAPH

The accompanying colored photograph illustrates the overall appearance of the new cultivar, showing the colors as true as it is reasonably possible to obtain in colored reproductions of this type. Flower and foliage colors in the photograph may differ slightly from the color values cited in the detailed botanical description which accurately describe the colors of the new *Zonal Geranium*. The photograph comprises a side perspective view of a typical flowering plant of 'Dueimgabri' grown in a container.

DETAILED BOTANICAL DESCRIPTION

The cultivar *Dueimgabri* has not been observed under all possible environmental conditions. The phenotype may vary somewhat with variations in environment, such as temperature and light intensity, without, however, any variance in genotype.

Asexually reproducible plants

Most often flowers

Requirements to Patents

Under U.S. patent law, an invention is patentable only if it meets the following four requirements:

The invention must be subject matter eligible

Processes, machines, articles of manufacture, and compositions of matter; cannot patent songs, characters in literature, names... Those are subject to Copyright Law.

The invention must be new.

Cannot patent things again. Cannot patent known items.

The invention must be useful.

Has to address technological needs.

The invention must be non-obvious.

The invention is compared to the prior art and a determination is made whether the differences in the new invention would have been obvious to a person having ordinary skill in the type of technology used in the invention

What Inventions Can Be Patented?

Articles of manufacture

- The structure of a complex particle

Process

- A process for making complex particles

Machine

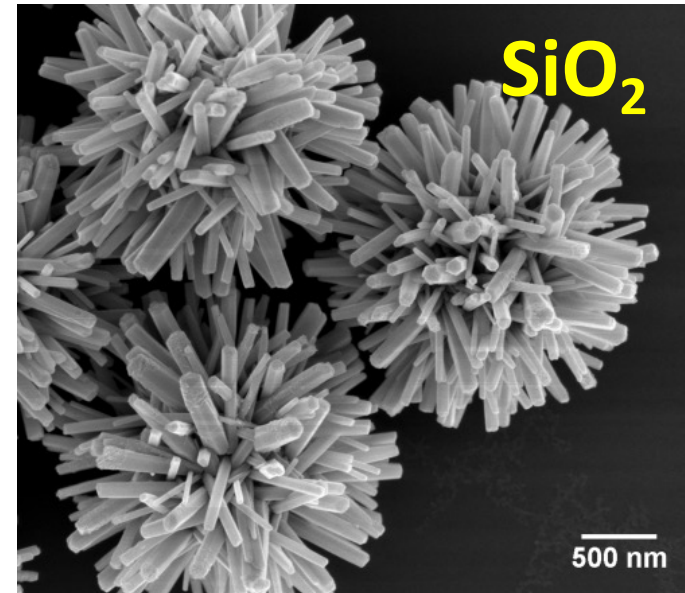
- A machine for making complex particles

Composition of matter

- A new material for complex particles

Improvements to the above

- Improvements



What Inventions Can Be Patented?

Articles of manufacture

- The structure of a complex particle

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What Inventions Can Be Patented?

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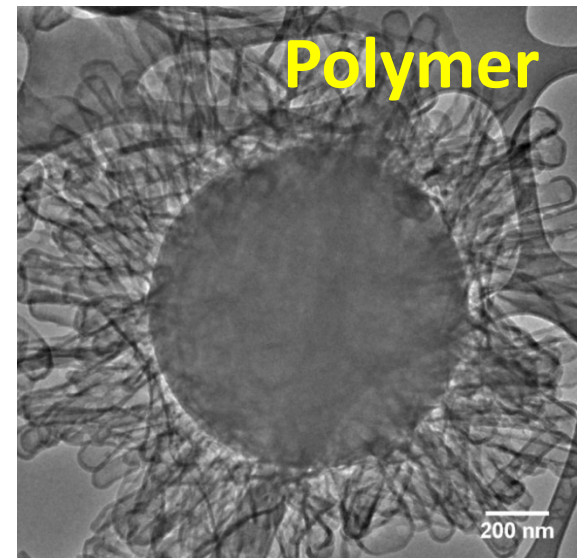
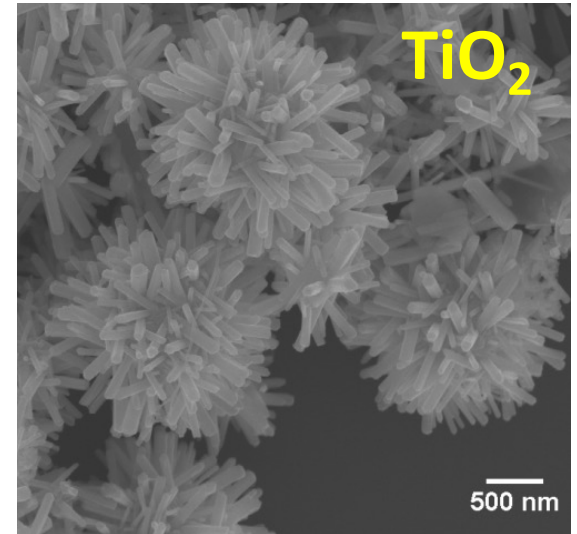
- A machine for making complex particles

Composition of matter

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Improvements to the above

- Improvements



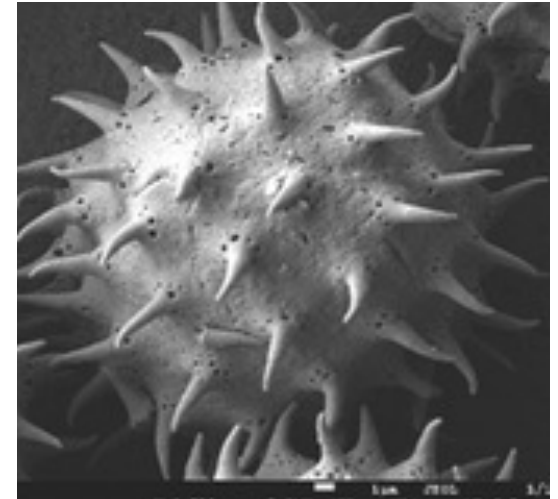
What Inventions Can Be Patented?

Laws of nature (e.g. thermodynamics)

Abstract ideas (a formula or algorithm)

Physical phenomena (e.g. lightning)

Literary, dramatic, or artistic work (which are copyrightable)



Requirement of “Useful”



US006637447B2

(12) **United States Patent**
McMullin et al.

(10) **Patent No.:** **US 6,637,447 B2**
(45) **Date of Patent:** **Oct. 28, 2003**

(54) **BEERBRELLA**
(76) Inventors: **Mason Schott McMullin**, #7 Ridgetop St., St. Louis, MO (US) 63117; **Robert Platt Bell**, 8033 Washington Rd., Alexandria, VA (US) 22308; **Mark Andrew See**, 8033 Washington Rd., Alexandria, VA (US) 22308

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 33 days.

(21) Appl. No.: **09/981,966**

(22) Filed: **Oct. 19, 2001**

(65) **Prior Publication Data**

US 2003/0075208 A1 Apr. 24, 2003

(51) **Int. Cl.**⁷ **A45B 11/00**; A45B 13/00; A45B 23/00

(52) **U.S. Cl.** **135/16**; 220/694; 206/217

(58) **Field of Search** 135/16; 220/694, 220/703; 215/386, 400; D3/5; 248/519, 534, 231.81, 230.7; 206/217

(56) **References Cited**

U.S. PATENT DOCUMENTS

973,731 A * 10/1910 Watkins

5,058,757 A * 10/1991 Proa 220/739
5,086,712 A * 2/1992 Clark 108/50.12
5,115,939 A * 5/1992 Porter 220/705
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5,365,966 A * 11/1994 McLaren 135/16
5,396,915 A * 3/1995 Bomar 135/16
D361,018 S * 8/1995 Drape et al. D7/619
5,544,783 A * 8/1996 Conigliaro 220/735
D394,589 S * 5/1998 King D7/707
5,823,496 A 10/1998 Foley et al. 248/314

* cited by examiner

Primary Examiner—Robert Canfield

(74) *Attorney, Agent, or Firm*—Robert Platt Bell

(57) **ABSTRACT**

The present invention provides a small umbrella (“Beerbrella”) which may be removably attached to a beverage container in order to shade the beverage container from the direct rays of the sun. The apparatus comprises a small umbrella approximately five to seven inches in diameter, although other appropriate sizes may be used within the spirit and scope of the present invention. Suitable advertising and/or logos may be applied to the umbrella surface for promotional purposes. The umbrella may be attached to the beverage container by any one of a number of means, including clip, strap, cup, foam insulator, or as a coaster or the like. The umbrella shaft may be provided with a pivot to allow the umbrella to be suitably angled to shield the sun or for aesthetic purposes. In one embodiment, a pivot joint and counterweight may be provided to allow the

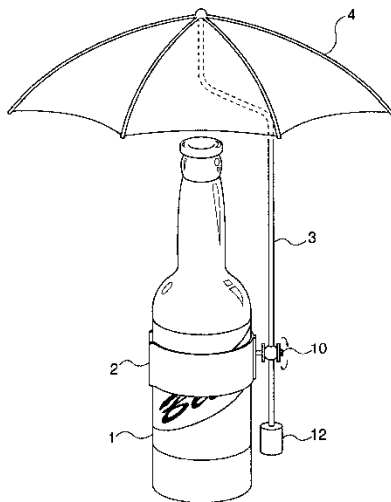
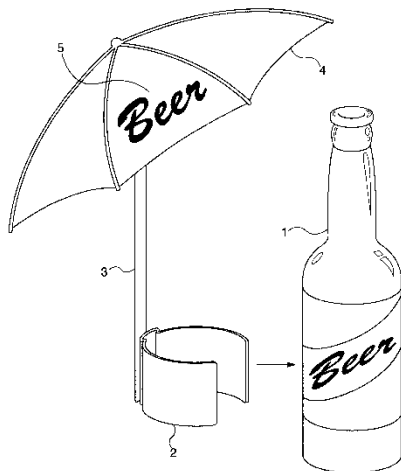
The invention has a useful purpose

The invention will operate to perform the useful purpose

Requirement of “Useful”



US006637447B2



(12) **United States Patent**
McMullin et al.

(10) **Patent No.:** **US 6,637,447 B2**
(45) **Date of Patent:** **Oct. 28, 2003**

(54) **BEERBRELLA**

(76) **Inventors:** **Mason Schott McMullin**, #7 Ridgetop St., St. Louis, MO (US) 63117; **Robert Platt Bell**, 8033 Washington Rd., Alexandria, VA (US) 22308; **Mark Andrew See**, 8033 Washington Rd., Alexandria, VA (US) 22308

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(58) **Field of Search** 135/16; 220/694,
220/703; 215/386, 400; D3/5; 248/519,
534, 231.81, 230.7; 206/217

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5,086,712 A	*	2/1992	Clark	108/50.12
5,115,939 A	*	5/1992	Porter	220/705
5,186,196 A	*	2/1993	Gorka et al.	135/16
5,365,966 A	*	11/1994	McLaren	.....	135/16
5,396,915 A	*	3/1995	Bomar	.....	135/16
D361,018 S	*	8/1995	Drape et al.	.....	D7/619
5,544,783 A	*	8/1996	Conigliaro	.....	220/735
D394,589 S	*	5/1998	King	.....	D7/707
5,823,496 A		10/1998	Foley et al.	.....	248/314

* cited by examiner

Primary Examiner—Robert Canfield

(74) *Attorney, Agent, or Firm*—Robert Platt Bell

(57) **ABSTRACT**

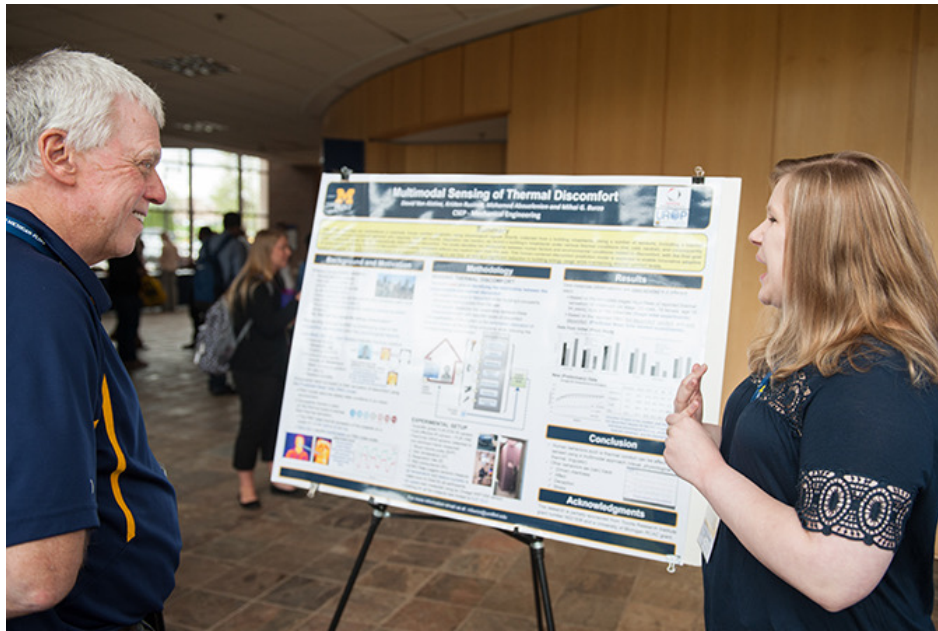
The present invention provides a small umbrella (“Beerbrella”) which may be removably attached to a beverage container in order to shade the beverage container from the direct rays of the sun. The apparatus comprises a small umbrella approximately five to seven inches in diameter, although other appropriate sizes may be used within the spirit and scope of the present invention. Suitable advertising and/or logos may be applied to the umbrella surface for promotional purposes. The umbrella may be attached to the beverage container by any one of a number of means, including clip, strap, cup, foam insulator, or as a coaster or the like. The umbrella shaft may be provided with a pivot to allow the umbrella to be suitably angled to shield the sun or for aesthetic purposes. In one embodiment, a pivot joint and counterweight may be provided to allow the

Requirement of “New”

The invention has not been disclosed before

Public disclosure includes written (articles), verbal (conference presentation), sale, or offer for sale (marketing), or previous patent.

In the US, there is a one-year grace period after public disclosure if the disclosure came from you or was derived from you.



Requirement of “New”

Three types of novelty generally recognized:

Physical differences (Different shape, value, size, color, composition)

New Combinations (New combination of old features, new arrangement of elements)

New Use (For an old item of hardware, process, etc.)

The invention is non-obvious to a person having ordinary skill in the art.

Non-obvious = producing new and unforeseeable results

Factor in previous failure of others, solves an unsolved problem, commercial success

Requirement of "New"

P. PLANT.
CORK SWIMMING SUIT.
Patented Nov. 21, 1882.
No. 267,799.

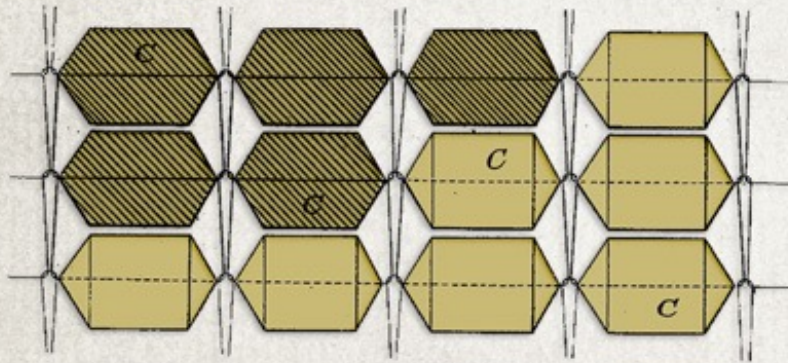


Fig. 2.

INVENTOR
Paschal Plant



Fig. 1.

Structure of the Patents

Title (long and detailed; often convoluted, essential for patent searches)

Inventors: (strictly regulated; tough contribution threshold requirement)

Abstract (brief description of problem, solution, and realizations)

Background Art (describe the what is the state-of the art preceding your invention)

Summary of Invention (Here you describe the concept of the patent)

Problem

Solution

Advantages

Description of drawings

Description of Embodiments (Give an example how your invention will be used)

Claims (2-3 bullet points describing what would look like claims in the patent)

Structure of the Patents: Example

United States Patent [19]
Kwoleck

CERT OF CORRECTION
ON LAST PAGE

[11] 3,819,587
[45] June 25, 1974

[54] WHOLLY AROMATIC CARBOCYCLIC
POLYCARBONAMIDE FIBER HAVING
ORIENTATION ANGLE OF LESS THAN
ABOUT 45°

[75] Inventor: **Stephanie Louise Kwoleck**,
Wilmington, Del.

[73] Assignee: **E. I. du Pont de Nemours and
Company**, Wilmington, Del.

[22] Filed: **Sept. 7, 1971**

[21] Appl. No.: **178,184**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 827,345, May 23, 1969, Pat. No. 3,671,542, which is a continuation-in-part of Ser. No. 736,410, June 12, 1968, abandoned, which is a continuation-in-part of Ser. No. 644,851, June 9, 1967, abandoned, which is a continuation-in-part of Ser. No. 556,934, June 13, 1966, abandoned.

[52] U.S. Cl. 260/78 R, 57/140 R, 161/227, 260/30.2, 250/30.6 R, 260/30.8 R, 260/32.6 N, 260/37 N, 260/78 A, 260/78 S, 264/210

[51] Int. Cl. F, 264/235
C08g 20/20, C08g 20/38
[58] Field of Search ... 260/78 R, 78 A, 78 S, 47 CZ

[56] References Cited UNITED STATES PATENTS

3,079,219	2/1963	King	260/78 S
3,094,511	6/1963	Hill et al.	260/78 R
3,228,902	1/1966	Beste	260/78 S
3,287,324	11/1966	Sweeny	260/78 R
3,354,127	11/1967	Hill et al.	260/78 R
3,554,971	1/1971	Jones et al.	260/78 R

Primary Examiner—Harold D. Anderson

[57] ABSTRACT

Fibers of unique internal structure (evidenced by low orientation angle and/or high sonic velocity) and exceptionally high tensile properties (e.g., initial modulus) are prepared from spinning dopes of selected carbocyclic aromatic polyamides in suitable liquid media.

16 Claims, 9 Drawing Figures



Stephanie L. Kwolek

In a polymer research lab at DuPont, Kwolek discovered the super fiber known as Kevlar.

Kevlar, Nomex, and Tyvek

Semi-Break - 3 min

Invention Disclosures

Preceding Patents

Facilitated at UM

List of companies

Evaluated for patentability

Manuscript or segments of a manuscript

To be rewritten by an IP attorney

umich.edu/faculty/

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LEARN MORE ABOUT VENTURES

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Prior Art Search

The patent examiner does a thorough **prior art search to rule out these reasons for rejection of the application**

The invention was already patented or described in another publicly available document prior to US application date.

The subject matter as a whole would be obvious to a person having ordinary skill in the art.

Data in any format that pre-dates the priority date of the application and was/is publicly available or published

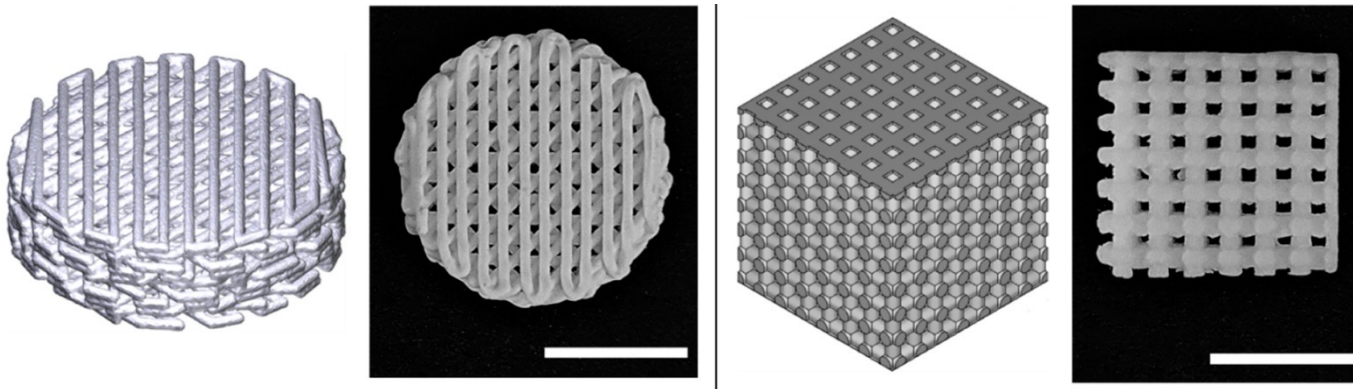
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Data in any format that pre-dates the priority date of the application and was/is publicly available or published



Prior Art Search

The patent examiner does a thorough **prior art** search to rule out these reasons for rejection of the application

United States Patent [19]
Sweeny

[11] **Patent Number:** **4,959,453**
[45] **Date of Patent:** **Sep. 25, 1990**

[54] **PROCESS FOR THE PREPARATION OF A POLY(PARAPHENYLENE TEREPHTHALAMIDE)FIBROUS GEL COMPOSITION AND A PROCESS TO PRODUCE POLY(PARAPHENYLENE TEREPHTHALAMIDE) PAPER FROM THE COMPOSITION**

4,072,664 2/1978 Konomi et al. 260/78
4,511,623 4/1985 Yoon et al. 428/359
4,579,895 4/1986 Cuidard et al. 524/104

OTHER PUBLICATIONS

U.S. Ser. No. 7,213,741, filed June 30, 1988.
Japanese Patent Application No. 52-124099, published Oct. 18, 1977.

Primary Examiner—Harold D. Anderson

[75] **Inventor:** **Wilfred Sweeny**, Wilmington, Del.

[73] **Assignee:** **E. I. du Pont de Nemours and Company**, Wilmington, Del.

[21] **Appl. No.:** **332,792**

[22] **Filed:** **Apr. 3, 1989**

[51] **Int. Cl.⁵** **C08G 69/28**

[52] **U.S. Cl.** **528/336; 162/157.3; 264/232; 524/104; 524/606; 524/718; 528/348**

[58] **Field of Search** **528/336, 348; 524/104, 524/718, 606**

[57] ABSTRACT

A process for producing a fibrous gel composition of poly(paraphenylene terephthalamide) comprising the steps of placing terephthaloyl chloride in reactive contact with paraphenylene diamine in a solution of at least one amide-type polar solvent (e.g. N-methylpyrrolidone), an alkaline earth metal salt and the aliphatic tertiary amine, N-methylpyrrolidine or its hydrochloride. Poly(paraphenylene terephthalamide) papers are prepared by diluting the composition in an amide diluent, blending in a slurry of poly(paraphenylene terephthalamide) fibers in a precipitating medium, filtering, washing, pressing and drying the mixture.

[56] References Cited

U.S. PATENT DOCUMENTS

3,063,966 11/1962 Kwolek et al. 528/204
3,869,429 3/1975 Blades 260/78
4,011,203 3/1977 Konomi et al. 260/78 R

7 Claims, No Drawings

Provisional Application

Claims not required

Less expensive to file

Is not examined by patent office

Establishes early filing date

Automatically abandoned after 1 year, unless “regular” application filed

Utility Application

Description of the invention

One or more claims

Drawing(s) if necessary

Oath or declaration signed by inventor

Payment of fee

International Patents

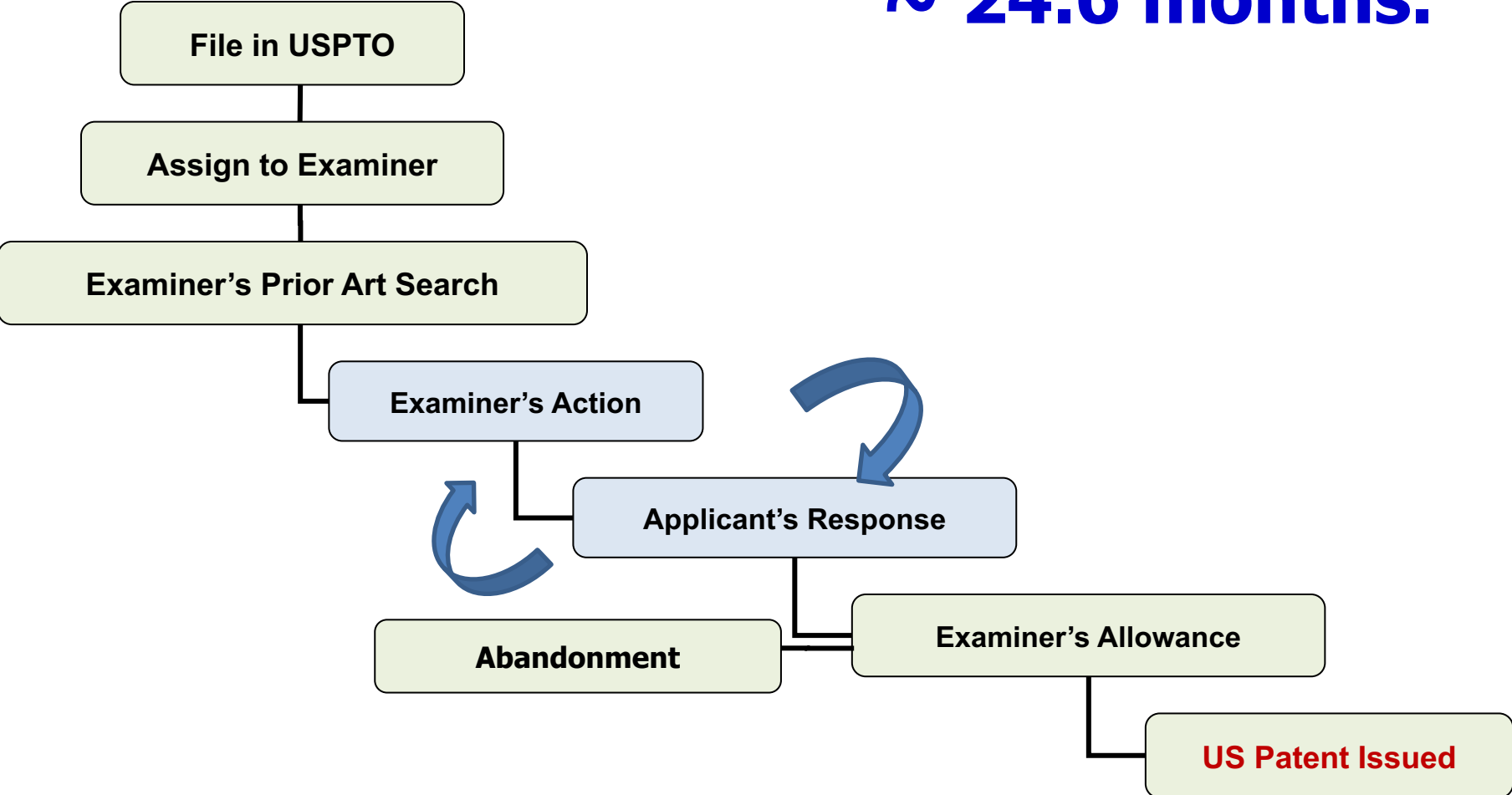
Application must be filed in
each country

Patenting cooperation treaties have
simplified the process

51	BUNDESREPUBLIK DEUTSCHLAND	Int. Cl.:	D 01 f C 08 g
			
	DEUTSCHES PATENTAMT		
52		Deutsche Kl.:	29 b, 3/60 39 b5, 41/02
10			
11			
21			
22			
43			
		Offenlegungsschrift	1 810 426
		Aktenzeichen:	P 18 10 426.2
		Anmeldetag:	22. November 1968
		Offenlegungstag:	12. Februar 1970
		Ausstellungspriorität:	—
30		Unionspriorität	
32		Datum:	12. Juni 1968
33		Land:	V. St. v. Amerika
31		Aktenzeichen:	736410
54		Bezeichnung:	Masse und aus ihr hergestellte Fasern oder Fäden
61		Zusatz zu:	—
62		Ausscheidung aus:	—
71		Anmelder:	E. I. du Pont de Nemours and Company, Wilmington, Del. (V. St. A.)
		Vertreter:	Abitz, Dr.-Ing. Walter; Morf, Dr. Dieter; Patentanwälte, 8000 München
72		Als Erfinder benannt:	Kwolek, Stephanie, Wilmington, Del. (V. St. A.)
		Benachrichtigung gemäß Art. 7 § 1 Abs. 2 Nr. 1 d. Ges. v. 4. 9. 1967 (BGBl. I S. 960):	—

From Application Filing to Granted Patent or Abandonment

~ 24.6 months.



Start-Up vs Patent

Patent

Foundation of the start-up

Multiple patents

Covers as much as possible

Comparable technologies

Must keep trade secrets

Technical details with ranges

Start-Up

Technological story

Value proposition

As focused as possible

Competitive products

Freedom to operate

Execution of the business plan