BINF6399 - Principles of Team Science



UNC CHARLOTTE

Richard Allen White III, PhD RAW Lab Lecture 10 - Tuesday March 30th, 2021

Learning Objectives

- Intellectual Property

- IP protection

- Patents 101

- Patents 201

- Patents Advanced



So you got an idea....?

Without protection, your idea...

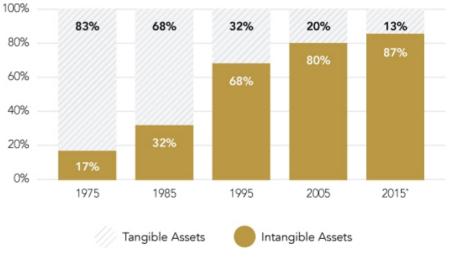
Is their idea.



Intellectual property – stuff ideas are made of...



COMPONENTS of S&P 500 MARKET VALUE







Social media giants

GE

Chevron





Amazon

Facebook

How to protect IP?



Cost/Benefit analysis

- Revenue generation
- competitive advantage
- Asset value



Develop an IP strategy

"An IP strategy should. not exist in a vacuum, it has really got to be designed to help the business to achieve its technology, and business strategies. Otherwise, it does not really serve a useful purpose."

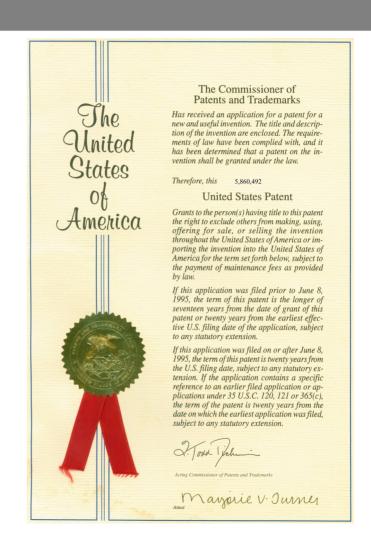
Cost/Benefit analysis

- Business goals
- Protection fit
- Budget/timeline
- Which protection?
- Identifying competitor products/services



What is a patent?

- A legal property interest
- A *document* containing a set of *claims* that distinctly point out the protected invention
- Confers to patent holder the *right to exclude others* from making, using,
 selling, importing invention for ~20 years
- Inventor must disclose to the public in exact terms how to make and use the invention
- It *DOES NOT* give you the right to practice your invention
- Claims define the invention
- *Each country has it's own patent system and associated rules
- **Patent protection only applies in the jurisdiction in which it's filed.





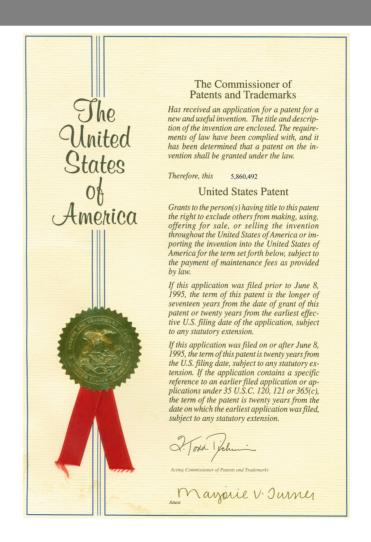
What can be patented?

Any new and useful <u>process</u>, <u>machine</u>, <u>manufacture</u>, <u>or composition of matter</u>, <u>or</u> <u>any new and useful improvement thereof</u>"

Process has been defined as any process, act, or method. Primarily industrial or technical processes

(e.g., Amazon's 1-Click process)
Manufacture means articles that are made
E.g., Trolley for the Automation of Sleep
Deprivation

Composition of matter relates to chemical compositions and may include mixtures of ingredients as well as new chemical compounds (e.g., think pharmaceutical drugs)





Examination criteria

Utility (35 USC §101)

Does it have some type of use An invention should have a practical application

Novelty (35 USC §102)

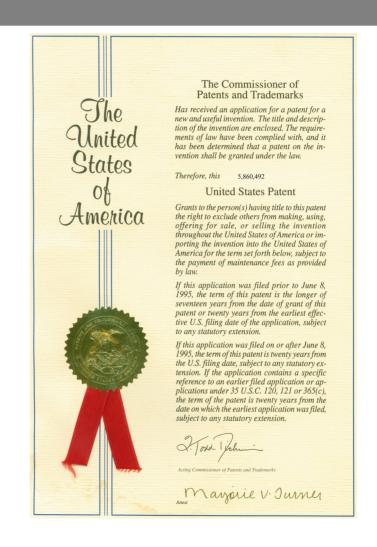
Is the invention new and original

Obviousness (35 USC §103)

At the time of filing is the technology obvious to a person of "ordinary skill" in the art

Enablement (35 USC §112)

Do we have a working example





Examination criteria - Utility

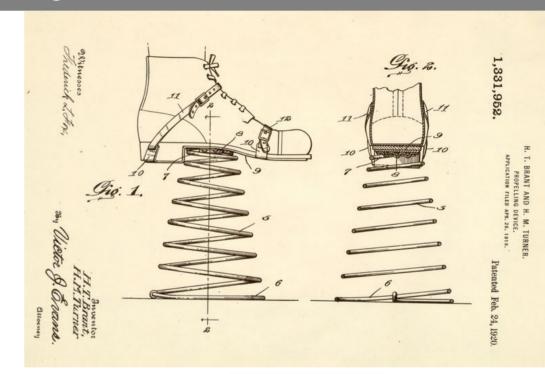
Utility (35 USC §101)

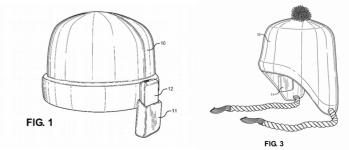
Does it have some type of use An invention should have a practical application

The invention must satisfy the "useful" requirement in patent law

The patent system is designed to reward inventive contribution

It doesn't recognize merely creative or ornamental elements







Examination criteria - novelty

Novelty (35 USC §102)

Is the invention new and original

An invention is not new and therefore not patentable if it was known to the public before the filing date of the **patent** application, or before its date of priority if the applicant claims priority of an earlier **patent** application.

First to File - Not first to invent

Public Disclosures or Publications can affect your patent rights

1-year "grace period" for U.S. Fillings, but lose international rights
In Researchers/Academia, always communicate with the Office of Commercialization if you think something is novel.





Examination criteria - Obviousness

Obviousness (35 USC §103)

At the time of filing is the technology obvious to a person of "ordinary skill" in the art

The non-obviousness principle asks whether the invention is an adequate distance beyond or above the state of the art

Prevents the patenting of relatively insignificant differences between the invention and the prior art

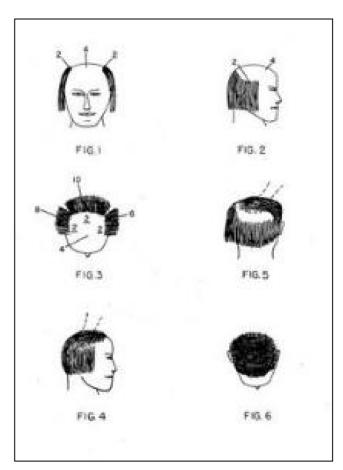
Conventional transformation and operations on objects such as:

Changing the size Substituting materials Making a device portable Moving parts around

Determination of "non-obviousness" are questions of law (e.g.,):

Combining prior art elements according to known methods to yield predictable results;

"Obvious to try" – choosing from a finite number of number of identified, predictable, solutions, with a reasonable expectation of success;



Method of concealing partial baldness US Patent # 4,022,227

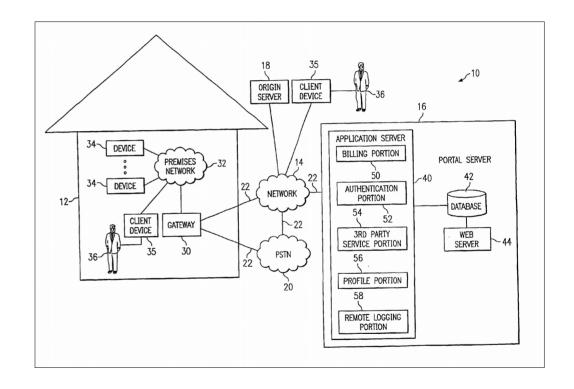


Examination criteria - Enablement

Enablement (35 USC §112)

Do we have a working example

- Have you provided sufficient information
- Depends heavily on the field of invention
- Predictable vs. Unpredictable arts
- Can impact claim scope





Parts of a Patent: Cover Page

Cover page

Patent # / Publication # Priority/Filing Date This is a key part when considering what is and is not prior art Related/Referenced **Publications** Might be worth looking at



	United States Zhong	Patent	(10) Patent No.: US 8,263,103 (45) Date of Patent: Sep. 11, 2					
(54)	MEDICAL ARTICLES CO BIODEGRADABLE POLY ACID-NEUTRALIZING C	MERS AND	2003/0129158 A1 7/2003 Matthews et al. 42478. 2003/0134810 A1* 7/2003 Springate et al. 514/ 2003/0180259 A1 9/2003 Chauban et al. 42478. 2003/0190364 A1* 10/2003 Panisch et al. 424/4 2003/0236514 A1 12/2003 Schwarz 604/890					
(75)	Inventor: Sheng-Ping Zho (US)	ng, Shrewsbury, MA	2004/0076661 A1* 4/2004 Chu et a 2004/0120979 A1 6/2004 Roessler 2005/0027064 A1 2/2005 Lynn et	et al				
(73)	Assignce: Boston Scientific Grove, MN (US)		2005/0187146 A1 8/2005 Helmus et al. 2005/0278015 A1* 12/2005 Dave et al. 623/1.3 OTHER PUBLICATIONS					
(*)		sclaimer, the term of this ed or adjusted under 35 391 days.	Anaa U. Biclinska et al., "Application of membrase-base dendrimer/DNA complexes for solid phase transfection in vitro an in vivo," Biomaterials, vol. 21 (2000), pp. 877-887. Dusko Cakara et al., "Microscopic Protonation Equilibria o Polytamidoamino) Dendrimers from Macroscopic Titrations," Mac- romofecules, vol. 36 (2033), pp. 4201-4207.					
(21)	Appl. No.: 11/343,628							
(22)	Filed: Jan. 31, 2006		Wei Lin et al., "Charging and Aggregation of Latex Particles b Oppositely Charged Dendrimers," <i>Langmuir</i> , vol. 20 (2004), pp 7465-7473. Ulrik Bons et al., "Dendrimers in drug research," <i>Chem. Soc. Rev</i> vol. 33 (2004), pp. 43-63.					
(65)	Prior Publica US 2007/0178135 A1 A	tion Data ug. 2, 2007						
(51) (52) (58)	Int. Cl. 46IF 2/00 (2000) U.S. Cl. Field of Classification Sear See application file for comp	ch None	Barbara Klajnert et al., "Deadrimers: pro Acta Biochimica Polonica, vol. 48, No. 1 (Ragheb Abu-Rmaileh et al., "Dendrimers Delivery Systems and Sciences, vol. 3, No F. Aulenta et al., "Dendrimers: a new class and delivery devices," European Polymer 1771.	2001), pp. 199-208. in cancer research," Drug 3 (2003), pp. 65-70. of nanoscopic container				
(56)	References C	ited	* cited by examiner					
	5,714,166 A * 2/1998 Tornal	lia et al	Primary Examiner — Paul Dickinson (74) Attorney, Agent, or Firm — Mayer & Williams PC David B. Bonham; Keum J. Park					
	5,830,730 A 11/1998 Germ	et al	(57) ABSTRACT					
	6,127,448 A 10/2000 Demb 6,262,162 B1 7/2001 Lan et 6,440,405 B1 8/2002 Coep 6,699,504 B2* 3/2004 Rowe 6,743,521 B2 6/2004 Hubbs 7,135,038 B1* 11/2006 Limot	523/105 1 al. 524/445 1 et al. 424/78.17 1 et al. 424/486 2 ell et al. 428/500 2 al. 623/1.15 2 et et al. 424/78.27	According to an aspect of the pres- articles are provided, which are at lea able. The medical articles comprise (mers that produce acidic molecules up acid neutralizing cationic species.	st partially biodegrad a) biodegradable poly-				
		et al 428/483	23 Claims, No Dray	vings				



Parts of a Patent: Specification

Specification

Clarifies/Defines language for use in claims Describes "best mode" of operation or use of the invention Enables one who is "skilled in the art" to practice the invention This is the part that supports the claims

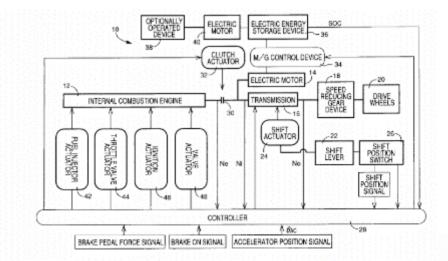
gazev drive control means operated in the event of a failure of one of the engine and the electric motor as the first and second drive power sources, for operating the other of the first and second drive power sources to drive the motor vehicle, and range changing means for changing one of the medetermined low-lend and high-lend mases which corresponds to the other of the first and second drive power sources, when the other of the first and second drive power

sources is operated by the emergency drive control means.

the invention is of the parallel type adapted such that in the event of a failure of one of the engine and the electric motor, the emergency drive control means activates the other of the engine and the electric motor to drive the vehicle, and the or high-load range in which the normally functioning ongine or electric motor is operated in the low-load or high-load drive mode. Accordingly, the present hybrid drive systempermits the vehicle to be run even in a condition in which the prenated in the prior art labrid drive system. The present hybrid drive system is therefore effective to increase the

high-load drive mode, which may consist of an engine drive mode in which only the engine is operated to drive the vehicle, or an engine motor drive mode in which both of the engine and the electric motor are operated to drive the vehicle. The electric energy storage device is charged as needed by an electric generator, which may be the electric motor or a dynamo separate from the electric motor. The electric generator is driven by the engine or regenerative braking. When the vehicle running condition is in the The hybrid drive system according to the first aspect of '10 kiw-load range, the vehicle is driven by only the electric motor in the low-load drive made. In this law-load drive mode, the electric motor is operated by only the electric energy which has been stored in the electric energy storage device, or by not only the stored electric energy, but also the range changing means changes the corresponding low-lead "is electric energy generated by the electric generated operated by the engine. The electric motor may be provided for each of two or more drive wheels of the vehicle, or may be used commonly for the two or more drive wheels. Where the engine and the electric motor are disposed in parallel connormally functioning motor or electric motor could not be ... rection with a transmission whose speed ratio is variable. the two or more drive wheels are desirably driven by the

wingle electric motor.



Parts of a Patent: Claims

Claims

The legally enforceable definition of "the invention"

Series of single sentence statements at the end of the patent that define scope of the patent

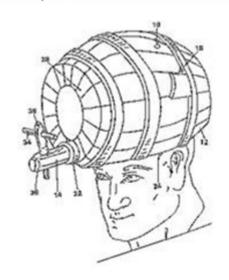
It takes a bit to get adjusted to how these are written

A headgear apparatus (comprising

a headband member having **a** frontal portion;

a visor member removably secured to said frontal portion of said headband; and

an eye shield member removably secured to said frontal portion of said headband.





Parts of a Patent: Claims

Claims

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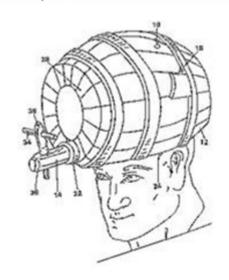
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A headgear apparatus (comprising

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IP landscape

Top 10 Companies Top 15 tech. Sub-domains	IBM	TSMS	Intel	Global Foundries	Micron Tech	AMD	Samsung Electronic	Toshiba	Infineon Tech	Hynix
Etching +Structural features	616	475	263	224	145	126	91	54	41	27
Device Formation + Structural Features	341	342	258	147	113	122	74	55	51	21
BEOL + Structural Features	318	377	172	63	38	47	45	51	44	13
Lithography +Structural Features	435	262	89	133	106	66	73	43	47	14
Wafer Development + Structural Features	440	234	152	98	57	75	58	28	55	8
Stacking + Structural Features	295	220	137	31	24	14	36	44	19	3
BEOL + Model Parameters	72	42	28	12	11	3	6	27	9	12
BEOL + Power Consumption	23	41	22	7	2	6	11	17	5	3
Etching + Model Parameters	66	33	39	21	3	10	19	23	3	27
Oxide Growth + Structural Feature	120	46	50	38	31	17	12	11	10	2
BEOL + Operating Voltage	44	47	20	8	0	6	8	21	5	6
Device Formation + Model Parameters	42	32	75	15	7	10	20	15	7	21
Device Formation + Operating Voltage	44	35	19	12	5	7	13	16	10	14
Device Formation + Feature Size	14	33	26	8	42	14	12	11	8	9
Wafer Development + Model Parameters	67	16	16	10	2	14	4	11	4	7



Defend your pen patent!

