BINF6399 – Principles of Team Science

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

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So you got an idea….?

Without protection,
your idea…

Is their idea.

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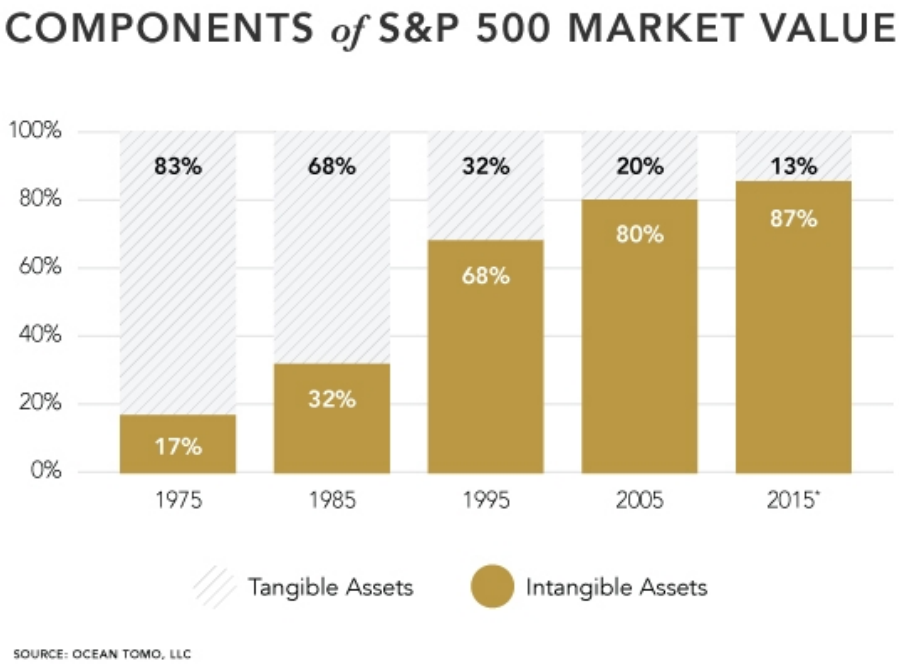
Intellectual property – stuff ideas are made of..



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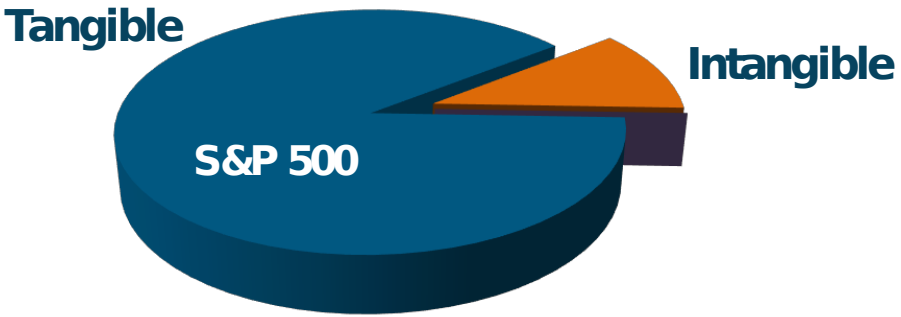
Social media giants



1970 — **Today**

IBM
GM
Exxon
GE
Chevron

1986
Microsoft IPO

1997
Apple Near
Bankruptcy

2004
Google IPO

Apple
Google
Microsoft
Amazon
Facebook

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How to protect IP?

Cost/Benefit analysis

- Revenue generation
- competitive advantage
- Asset value

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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

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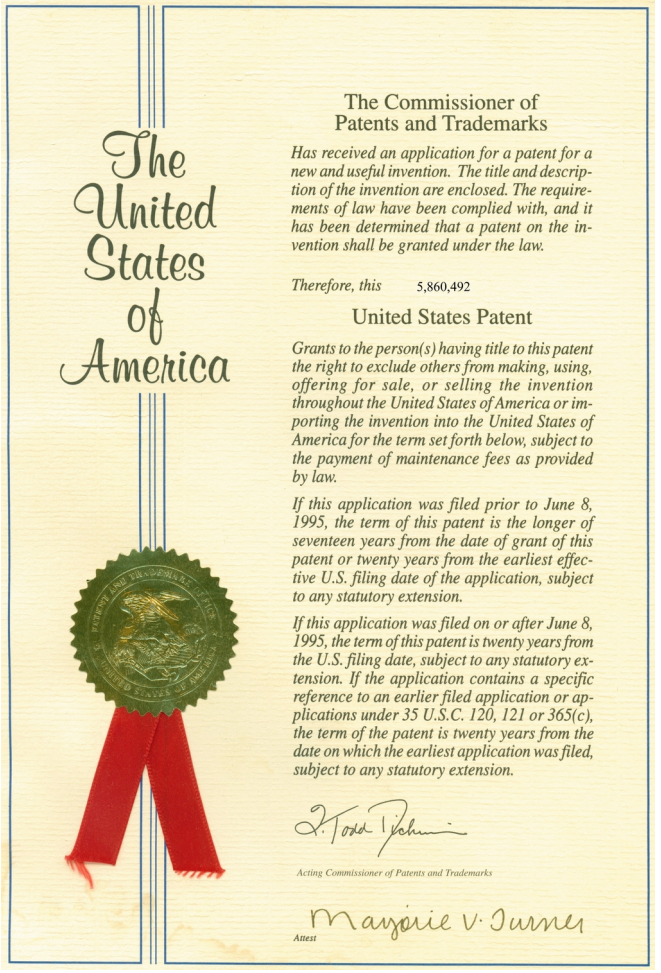
What is a patent?

- 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.


The United States of America

The Commissioner of Patents and Trademarks

Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this 5,860,492

United States Patent

Grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America for the term set forth below, subject to the payment of maintenance fees as provided by law.

If this application was filed prior to June 8, 1995, the term of this patent is the longer of seventeen years from the date of grant of this patent or twenty years from the earliest effective U.S. filing date of the application, subject to any statutory extension.

If this application was filed on or after June 8, 1995, the term of this patent is twenty years from the U.S. filing date, subject to any statutory extension. If the application contains a specific reference to an earlier filed application or applications under 35 U.S.C. 120, 121 or 365(c), the term of the patent is twenty years from the date on which the earliest application was filed, subject to any statutory extension.

Acting Commissioner of Patents and Trademarks

Attest

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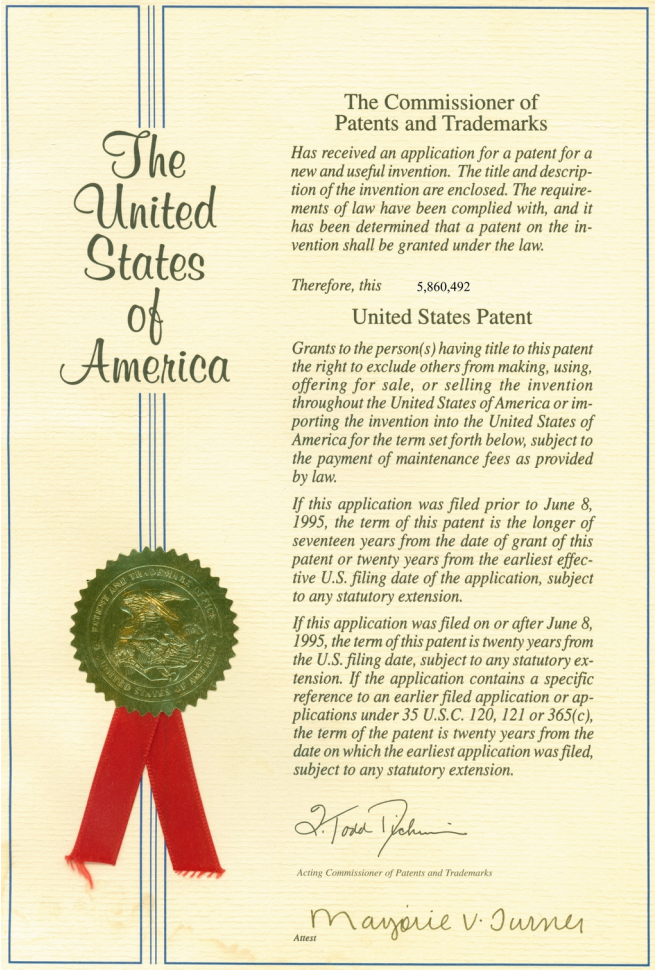
What can be patented?

Any new and useful **process, machine, manufacture, or composition of matter, or any new and useful improvement thereof**”

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)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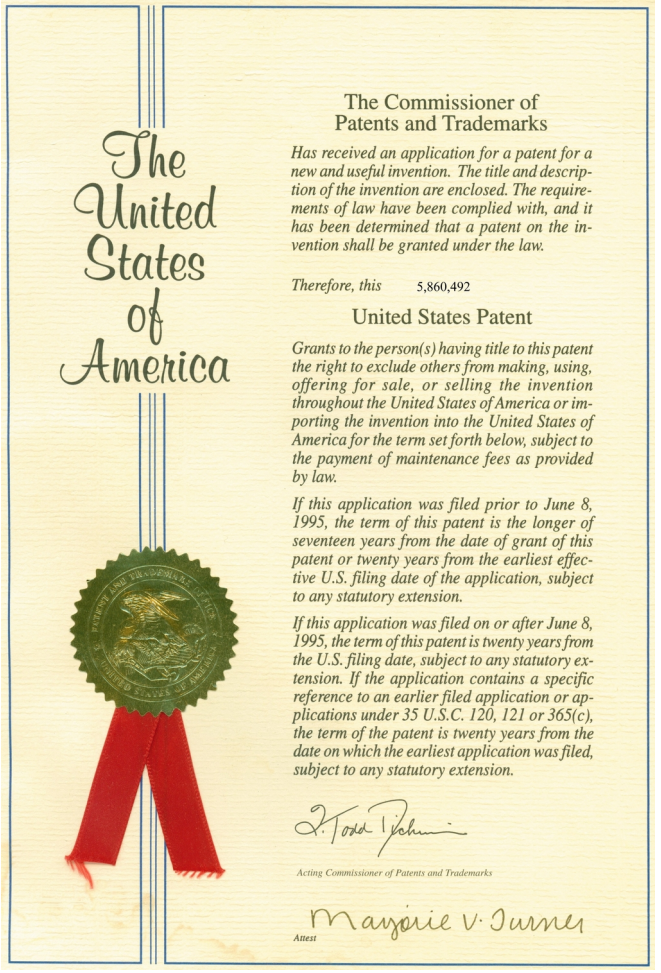
Examination criteria

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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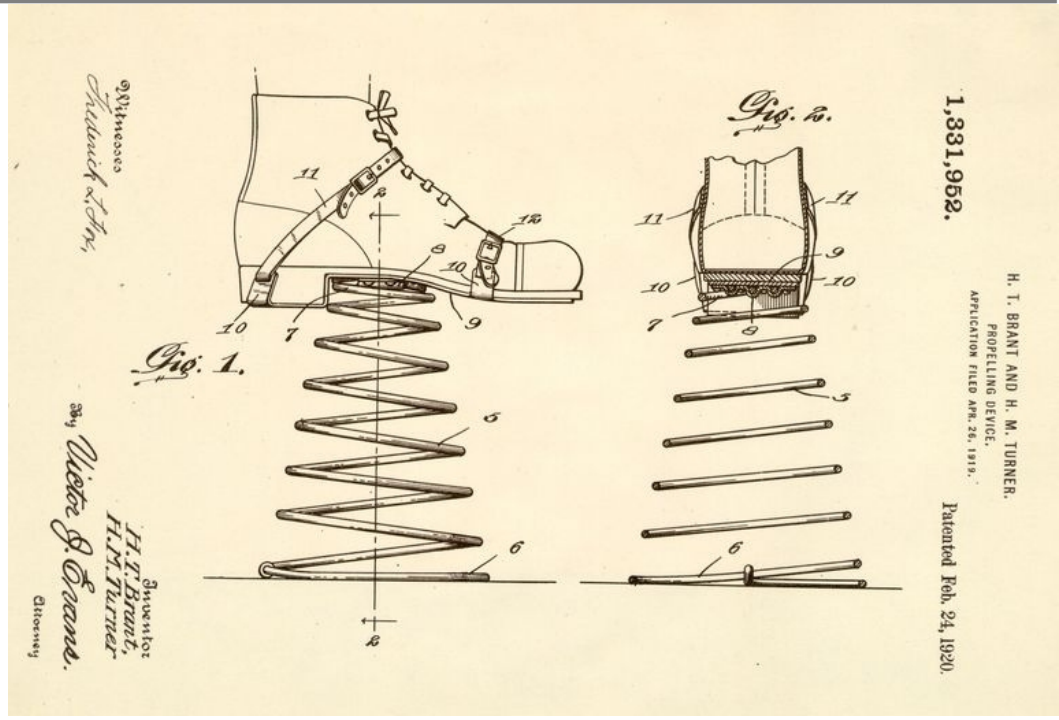
Examination criteria - Utility

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



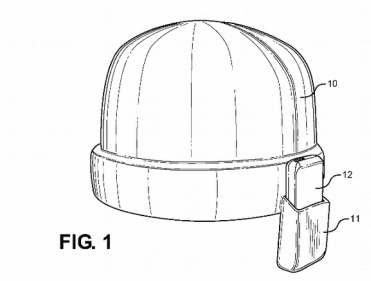


FIG. 1

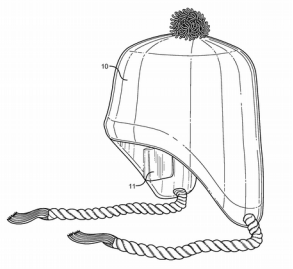


FIG. 3

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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.

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Examination criteria - Obviousness

Obviousness (35 USC §103)

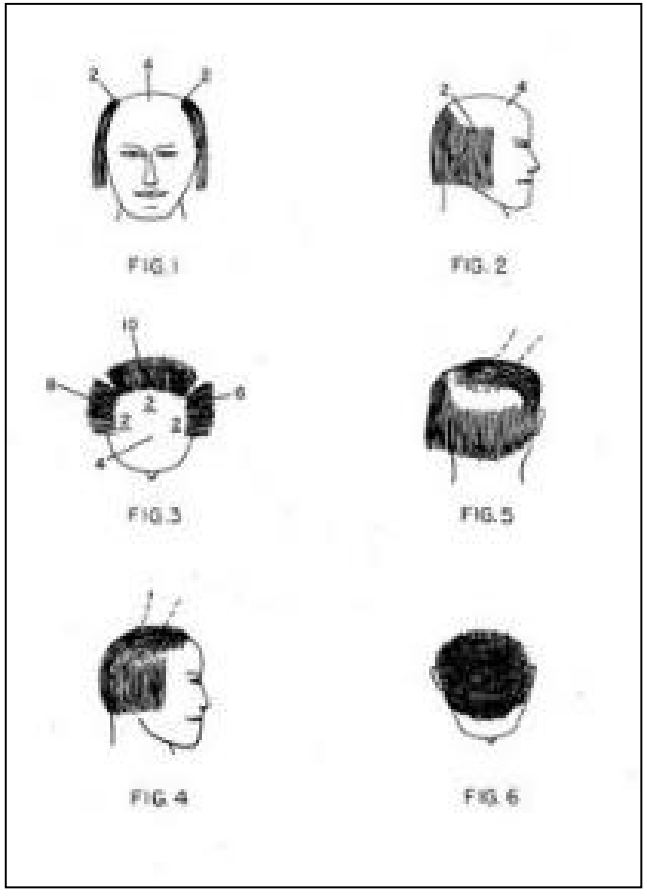
At the time of filing is the technology obvious to a person of “ordinary skill” in the art

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

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Examination criteria - Enablement

Enablement (35 USC §112)

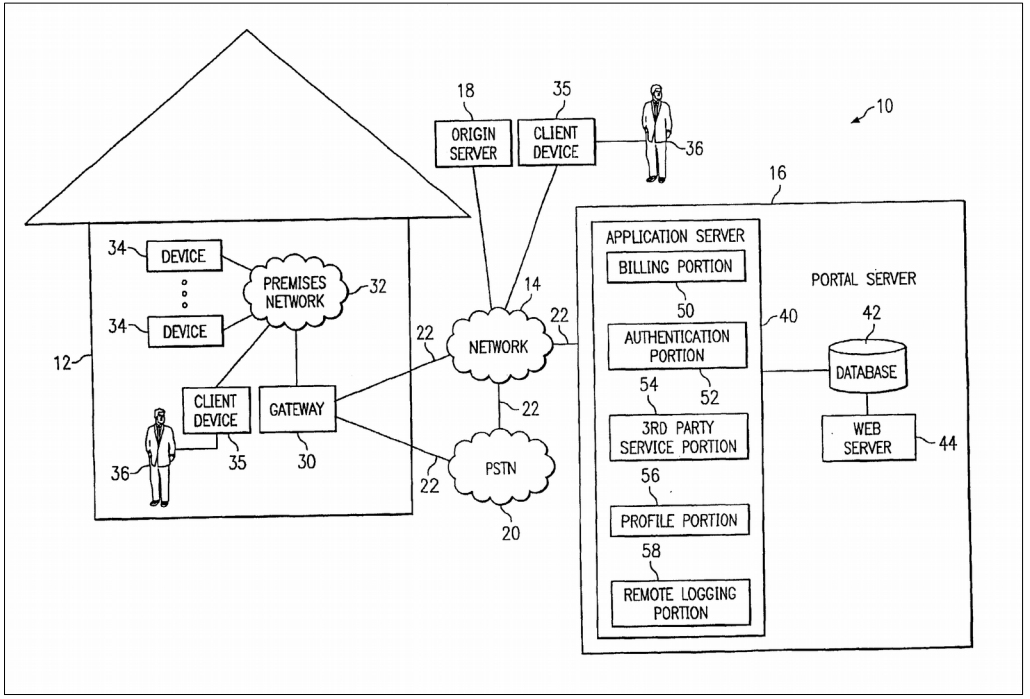
Do we have a working example

- Have you provided sufficient information

- Depends heavily on the field of invention

- Predictable vs. Unpredictable arts

- Can impact claim scope



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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

US008263103B2

(12) **United States Patent**
Zhong

(10) **Patent No.: US 8,263,103 B2**
(45) **Date of Patent: Sep. 11, 2012**

(54) **MEDICAL ARTICLES CONTAINING BIODEGRADABLE POLYMERS AND ACID-NEUTRALIZING CATIONIC SPECIES**

(75) Inventor: **Sheng-Ping Zhong**, Shrewsbury, MA (US)

(73) Assignee: **Boston Scientific Scimed, Inc.**, Maple Grove, MN (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 391 days.

(21) Appl. No.: **11/343,628**

(22) Filed: **Jan. 31, 2006**

(65) **Prior Publication Data**

US 2007/0178135 A1 Aug. 2, 2007

(51) **Int. Cl.**
A61F 2/00 (2006.01)

(52) **U.S. Cl.** **424/423**

(58) **Field of Classification Search** ..... None
See application file for complete search history.

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Primary Examiner — Paul Dickinson

(74) *Attorney, Agent, or Firm* — Mayer & Williams PC; David B. Bonham; Keum J. Park

(57) **ABSTRACT**

According to an aspect of the present invention, medical articles are provided, which are at least partially biodegradable. The medical articles comprise (a) biodegradable polymers that produce acidic molecules upon degradation; and (b) acid neutralizing cationic species.

23 Claims, No Drawings

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Parts of a Patent: Specification

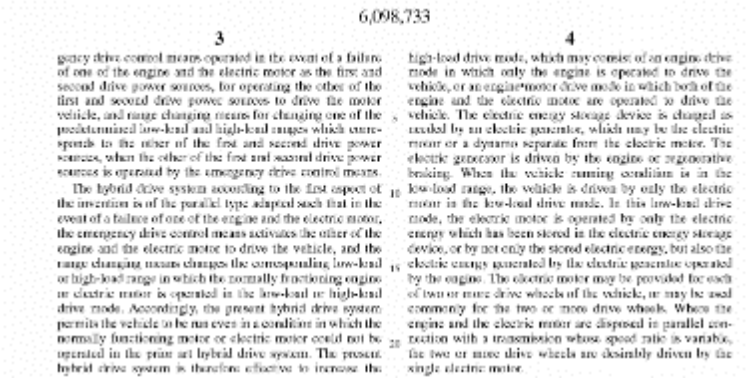
Specification

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



6,098,733

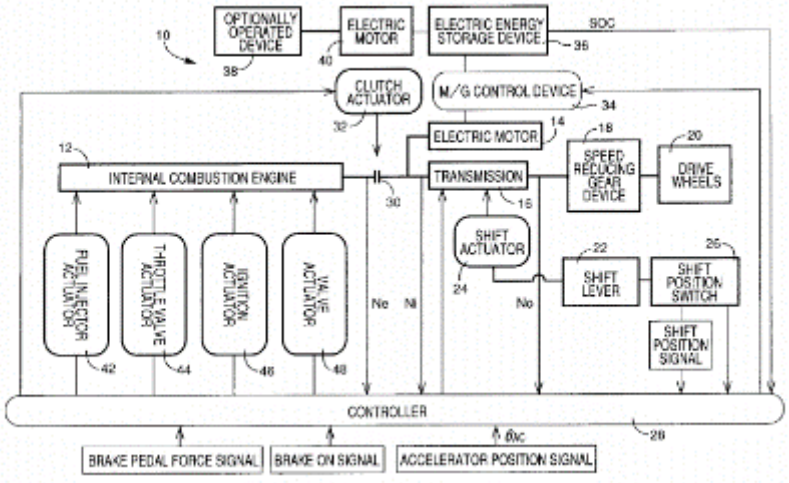
3

gency 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 predetermined low-load and high-load ranges 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 hybrid drive system according to the first aspect of 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 range changing means changes the corresponding low-load or high-load range in which the normally functioning engine or electric motor is operated in the low-load or high-load drive mode. Accordingly, the present hybrid drive system permits the vehicle to be run even in a condition in which the normally functioning motor or electric motor could not be operated in the prior art hybrid drive system. The present hybrid drive system is therefore effective to increase the

4

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 low-load range, the vehicle is driven by only the electric motor in the low-load drive mode. In this low-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 electric energy generated by the electric generator 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 connection with a transmission whose speed ratio is variable, the two or more drive wheels are desirably driven by the single electric motor.



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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

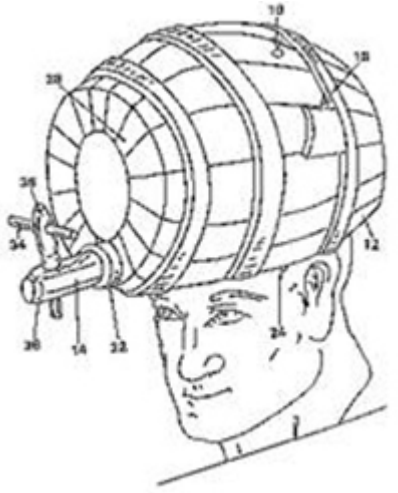
It takes a bit to get adjusted to how these are written

1. 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.



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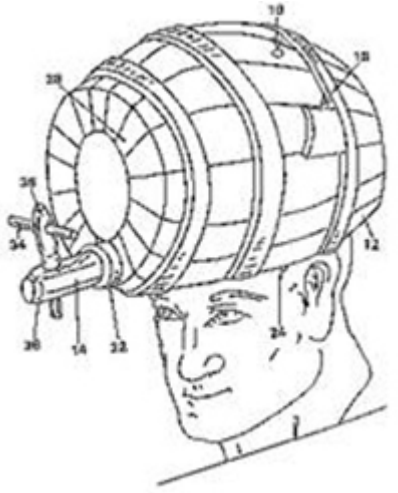

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IP landscape

Top 15 tech. Sub-domains \ Top 10 Companies	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

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Defend your pen patent!