Hungarian Intellectual Property Office

United States Patent and Trademark Office (USPTO) and
Hungarian Intellectual Property Office (HIPO) Garibaldi utca 2 , Budapest

Intellectual Property and Innovation
USPTO-HIPO Conference Budapest, Hungary April 3- 4, 2012
Intellectual Property (IP) Management Best Practices & Challenges: Discussion Panel

Innovation, Patent Prosecution and Monetization Perspective, Motivation, Challenges, Goals and Dreams of an Engineer-Inventor : Smart Phones, Smart TV, Medical, Wireless Communications Technologies

Dr. **Kamilo FEHER**, Fellow IEEE

President, **Digcom Inc**.-Engineering, Wireless Technologies, Inventions and Patents,
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I hope to motivate the participants of this USPTO-HIPO conference and also the GLOBAL International Community, all Young and all "Young at Heart" People to Improve HUMANITY and GLOBAL Economy to Invent and Patent and to co-operate

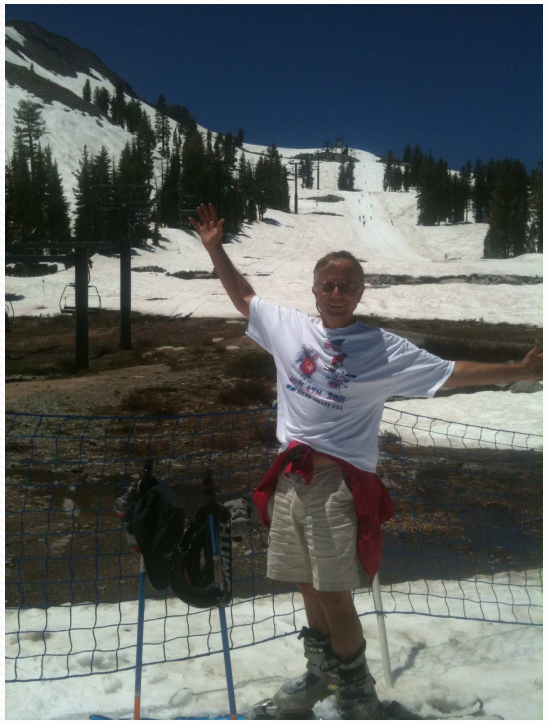
I plan to say a few words about:

- *my Passion, Love, Challenges, Frustrations and Successes with Inventions, Patents*
- *How do I invent? How do I get motivated?*
- *What frustrates me ? What scares me and many other independent Inventors?*
- *What did I invent ?*
- *Companies -products using my Licensed patents: USA, Europe, Korea, Japan, Taiwan…*
- *Sample Patents and Products: smart phones; cellular GSM phones; satellite GPS systems*
- *NASA's highest data speed Satellite system using my patented Feher QPSK ("FQPSK")*
- *How did one of my patented GSM phones with GPS Save my LIFE in a recent Auto Accident*
- *Monetization how to make money with patents ?*
- *What is my Hope for the USPTO -HIPO and Other International Cooperation?*

On the Lighter side ..... MOTIVATION and PASSION of an Inventor

Where, When and How do I get most Invention Ideas ?

In the photo below I am "working" in an even more inspiring than the "**American Dream**-Invention Laboratory".
I am in my "**Californian Dream** Laboratory"
more than 2000 meters above sea level and on
US Independence Day on July 4, 2011,
Squaw Valley, Lake Tahoe, California I am Challenging my
69 year young multiple time broken bones in
Ski-Challenge-Risks fighting the Steeps and Rocks
the stumbling blocks to a safe successful landing...



I said many times to myself:
Create, Invent, Dream –take Risks –
Just like in Extreme Skiing...
"Hit the steeps".... do not be afraid to fail or fall—if you brake your bones (or your finances or ...) and fail ----do not give up
Try it again ... and again...
Most initial attempts, discoveries inventions fail....
But do NOT give up ...

Motivation to Invent-Patent in America started more than 200 years ago

Constitution of the United States

Article 1, Section 8, Clause 8:

"***The Congress shall have power: …to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries***. "

From the Dedication page of:
Dr. Kamilo Feher: "Wireless Digital Communications ", **Book**, Published by Prentice Hall , 1995

The Constitutional basis of the US patent Law **motivated** me and provided the means to describe my inventions and patents in the text and Appendix 3 of this book, with the hope of **encouraging extraordinary engineering talents to invent and Create**

Motivation to Invent-Patent in Hungary started more than 117 years ago… the Austro-Hungarian Patents Act of 1895

"….Our Office was established by the **Patents Act of 1895 under the Austro-Hungarian Dual Monarchy** and it managed to continue its operation during different regimes, also under the communist era, which was a real achievement at the time. Finally, when Hungary could return to the path of market economy, it quickly adjusted its legal instruments in order to reflect the *acquis communautaire*. The Republic of Hungary acceded to the European Patent Convention on 1 January 2003 and to the European Union on 1 May 2004; **the Presidency of the Council of the EU is being held by the country for the first time in its history**…"

Dr. Miklós Bendzsel
President Hungarian Intellectual Property office (HIPO)

From President's Introduction:
"Global and European Initiatives for Sharing work between Intellectual Property Authorities' Budapest 17-18 May 2011

Motivations, Challenges of an Inventor

- Keen, Enthusiastic, Curious, Believe that you Can Invent and not Afraid to undertake Challenges

- **Provocations of an Inventor**
  could lead to great inventions/patents and Could be the "**Motherhood of Invention**" e.g.:
  -it's impossible
  -can not be implemented
  -**are you Crazy ?** Why would one want to do this----? (**Suggested Answer: Probably Yes and No**)
  -It already exists --- you are not discovering anything new (You did "Not Discover a New Universe..")
  you are not a GENIUS you can't discover-invent-patent such a great....

- **Wisdom of**.... (in my Case some of my patents are **contrary to the wisdom** of established telecommunications and wireless communications **theories** and established practices)

- Finding **Contrary to ... previous references, patents, publications, products...**

Frustrations, Failures, Successes and Rewards of an Inventor

FRUSTRATIONS, FAILURES , RISK.. :

-Fear of failure Caused Stress- Impact on Health, Family, Finance and even Sanity and Life)
- try and try again and do not succeed
-after significant discovery-inventions fight with employer or your own finance –whether to invest in the Patenting? How much money? How many years before getting any benefits?

-US patent(s) obtained- should I/we go International-Global ? **(Answer: Depends on progress of USPTO-HIPO- other improved cooperation**
- Return on Investment
-patent(s) if used by Other without License (without Money reward) to Inventor what next ?

- Friendly License…. Does it Exist--- or Litigate___?
- **Might have to Accept a few cents on a Dollar if no Courage –RISK of Patent Enforcement**
- Inventor is sometime called a "TROLL" … or other Derogatory names…
-Threat' s from Opponents of patent Invalidation, for Obviousness or Inequitable Conduct

- Danger of marriage Breakdowns, Family, Health; An Independent Inventor's life is very stressful

- A sad, scary historical perspective for Independent Inventors (discussed by Family Counselor-Psychology-Patient):
One of the greatest inventors:-pioneers of radio and wireless communications, about 70 years ago :

*__Dr. Armstrong Inventor of FM radio__ –**tragic story divorce, suicide and lost all his assets** during his highly stressful **FM patent litigation**. After his death the patent Appeal Court reversed decision and awarded millions of dollars to his estate-his divorced wife

- *NOTE: About 70 years ago as far as I know there were no Contingency Based Patent Litigation Law firms

Frustrations, Failures, **Successes and Rewards of an Inventor**

SUCCESS, REWARD...

-Accomplished DREAM... "What I did and I do for love and Passion.."

-HUMANITIES, HEALTH , TECHNOLGY, FINANCE, RECOGNITION ..

- Invent, Invent and Invent -In my case hopefully as long as I live..keeps me motivated..

-An engineers greatest accomplishment (in my opinion) is to invent

- Money, lots of Money Wealth for the Successful Inventor and Economic benefits Globally

-Prestige Recognition-Reward (I think of any social event the reaction of people if I say I am an Inventor vs. any other Profession/Business) is great

- **Contingency Based Attorneys Law Firms** or "Alternate Fee " law Firms, in the US (and I understand starting Internationally) can help in achieving Independent Inventors Dream..and Success and mitigate financial risks

Ultra Narrow Band (**UNB**) combined with Ultra Wide band (**UWB**)

Multimode Interoperable Mobile Technology

Is this a Contradiction …? Is it merely a thought provoking topic…? Or when will products be available__?

An Example: **Frustrations, Failures**, OR **Successes and Rewards** of an Inventor :

Is Kamilo Feher's **US patent: 7,421,004** Broadband, ultra wideband and ultra narrowband reconfigurable interoperable systems

In the Category of ----- **Frustrations, Failures ?**
or is it
In the Category of-----**Successes and Rewards?** ---

- Ultra Narrow Band (UNB) and Ultra Wide Band (UWB) are competing and "contradictory" technologies. To have them in a reconfigurable interoperable device ?
- I believe that Combinations of UNB and of UWB and/or Combinations of UNB and Super Broadband Wireless systems and products could lead to numerous advantages
- To the best of my knowledge there are no products yet on the market with reconfigurable multimode UNB and UWB technologies …..but I believe that within 2-12 years there will be on the market
- When …? Will I see the results-fruits of this invention ***while I am still alive …?***

Interoperable
Ultra Narrow Band (**UNB**)
combined with
Ultra Wide band (**UWB**)

(or Super Broadband)
and 2G and 3 G and 4G cellular and other wireless, wired and satellite systems has significant capacity and spectral efficiency advantages

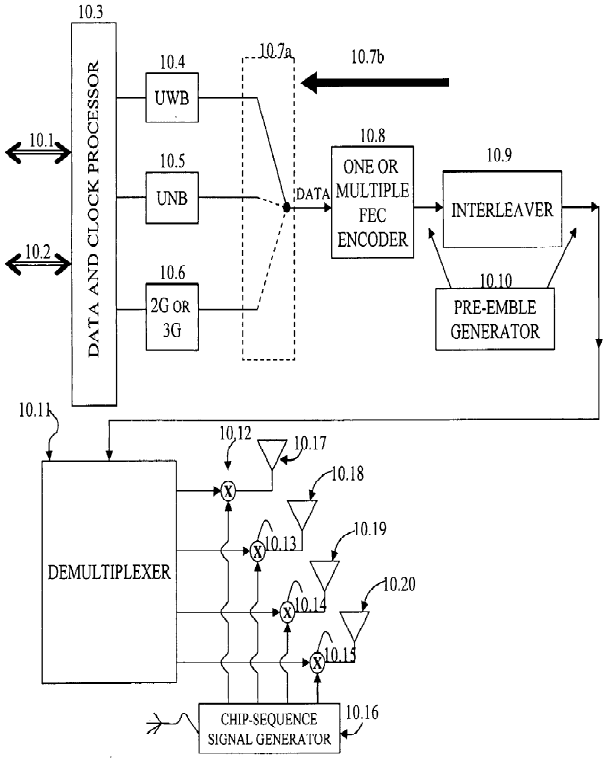


FIG. 10

An Example (continued) : **Frustrations, Failures**, OR **Successes and Rewards** of an Inventor :

Successes and Rewards

The SPIKE like spectrum and processed signal of Feher's Clock Shaped –Clock Modulated system has the potential

to increase the spectral efficiency of currently operational systems about

10 times (1000 %)

This could lead to mobile internet, video at

10 x data rate

of current mobile internet systems

If implemented in cellular and other wireless and cable systems and satellites, such

1000 % increased data rate would be a GREAT Success

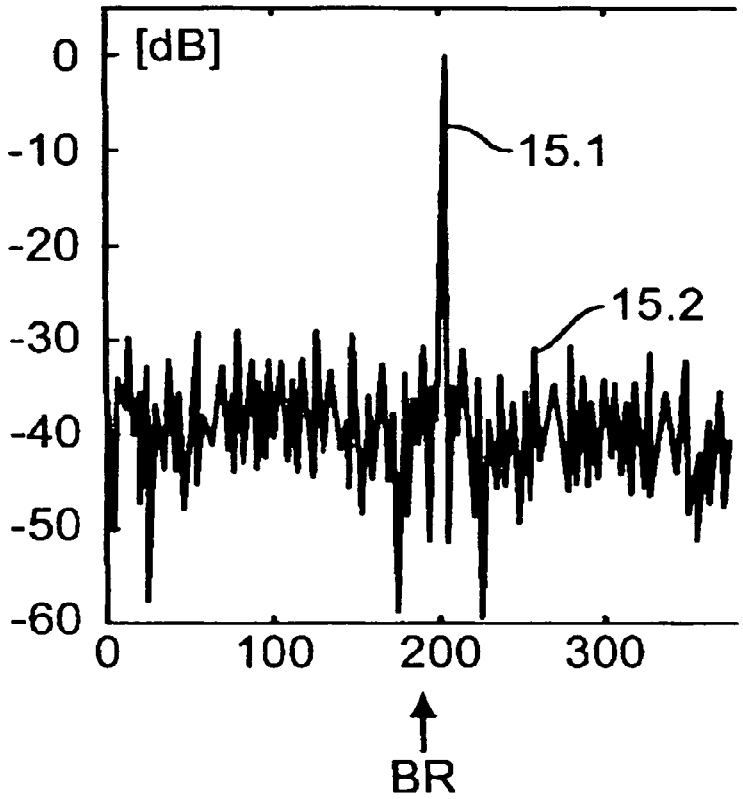


FIG. 5 PRIOR ART

Frustrations, Failures

Majority of theoretical communications researchers believe that SPIKE like spectrum is **contrary to optimum Information and Communication theory** teachings, i.e. the spike does not contain information and should be deleted.
Doubt by such researchers DISCOURAGES investors to put in many millions of dollars to get prototypes fully tested and get products into the market.

It could take 10 + years to see products ULTRA efficient technologies on the market ----- and frankly I will be **80+ years old...**

Impatience, missing capital ($ or EURO), statistical life span limitations of an inventor could be the main cause of **Frustrations and /or Failures even for the best inventions/patents**

Feher's most important patents/Inventions Include

- In GSM, CDMA, 3rd generation (3G) and 4G cellular phones and other wireless systems, implementations of enhanced performance, lower cost modulators and transmitters, is enabled by Feher's cross-correlated qudarature modulation inventions and patents. **Feher's patented GSM phone** modulation-transmitter implemenatations have been used in **many millions of licensed cellular phones, manufactured in US and globally** by some of the largest multi-national companies.

- **Feher patented QPSK** (known as " **FQPSK**") has been extensively researched by teams of **NASA-JPL** and by international **telemetry** engineers to be the most efficient combined power-spectral data transmission modulation technique. In **NASA's highest speed digital communications satellite** systems and in advanced telemetry international standards **Feher's patented FQPSK** has been used in the US and internationally.

- **ULTRA Wideband (UWB) and ULTRA Narrowband (UNB)** Systems -competing contradiction between two extreme technologies --ultra wideband exact opposite of ultra narrowband . Interoperable multimode-reconfigurable systems have the **potential to increase spectral efficiency and data speeds of mobile internet systems 1000 %**

Feher's most important patents/Inventions Include (continued)

- Mobile device implementations, disclosed in Feher's patents include previously competing technologies , such as Wi-Fi internet network, cellular and satellite system, wireless and wired communications and broadcasting in the same multi-mode reconfigurable mobile device.

•Feher's inventions include "**Smart Phones**" used in **cascade** with multifunction wireless and wired mobile devices, with "**smart TV**" in adaptive agile multi-mode **GSM, 3G, 4G cellular and Wi-Fi internet and satellite** and **mobile Video over Internet, combined with GPS** and other location finding wired and wireless mobile systems. **Medical** diagnostics, cardiology heart pace maker –telemetry control , DNA and telemetry inventions combined with remote control and security systems with multi-mode wired and wireless mobile systems

Feher's Sample Patents:

US: 4,567, 602 Cross-correlated Signal Processor
US: 7,421,004 Broadband, ultra wideband and ultra narrowband reconfigurable interoperable systems
US: 7,949,405 Cardiac stimulation control and communication system, issued on May 24, 2011
US: 8,112,110 Phone video mobile internet television (TV) and cellular system, issued on February 7, 2012

Australian Patent: 2005335219 Multiuse location finder, communication, medical control system
Russian Patent: 2008107948
German Patent 21 2005 000 081.6 (German Utility Model)

BOOK re. Feher's patents:
Dr. Kamilo Feher: Wireless Digital Communications: Modulation and Spread Spectrum Applications Prentice Hall, 1995

An Independent Inventor's path to a Reasonable Financial Reward is not easy

In our case (Feher-Digcom), we had no other choice than to:
LITIGATE US pat. 4,567,602 (the **'602 patent**) related to "**cross-correlation**"
as used in **wireless GSM cellular** systems

- **Digcom, Inc**. -- founded in 1984 by Dr. Kamilo Feher –a small US, California Based Company
  - Inventions, Patenting-Technology Developments- provides engineering consulting services, technology transfer and Licensing to numerous U.S. and international companies
  - Exclusive licensee of certain Feher patents

- From 1999 through 2004, Dr. Feher's Digcom LITIGATED U.S. Patent No. 4,567,602 (the **'602 patent** related to "**cross-correlation**") against 30-plus companies and/or their responsible third-parties

- **5 separate lawsuits in the US**

- After about5 years of Litigation Feher's cross-correlation '602 patent has been licensed to about 30 companies from the largest international (e.g. Nokia, Ericsson, Samsung, HTC, Agilent…) to some smaller/medium size entities **for wireless GSM cellular phones, base stations** and to others…

Terminology- **thought provoking** Definitions/ Inventions- patent US 4,567,602 lead to Litigations re GSM cellular phones in several US courts

thought provoking concepts:

In the following sections I will explain some important DIFFERENCES between certain terms, definitions and use of these terms – in classical communication **theory** and in Feher's books and patents re. the term

Cross- correlation

Also I will question the relevance ? of **classical communication theory's**:

"Matched Filter", "**Optimum matched filters**" , "Optimum systems with matched filters" and related theories for power efficient Non-Linearly Amplified (NLA) wireless communication systems such as the GSM system

A **Classical Communication Theory** and Signal Processing **Definition** of the term:

Cross-correlation

From: http://en.wikipedia.org/wiki/Cross-correlation#Normalized_cross-correlation

In signal processing, **cross-correlation** is a measure of similarity of two waveforms as a function of a time-lag applied to one of them.

For continuous functions, f and g, the **cross-correlation is defined** as:

where f^* denotes the cor

$$(f \star g)(t) \stackrel{\text{def}}{=} \int_{-\infty}^{\infty} f^*(\tau)\ g(t+\tau)\,d\tau,$$

Similarly, for discrete functions, the cross-correlation is defined as:

The **cross-correlation** is similar in involves reversing a signal, then shif shifting it and multiplying (no reversing).

$$(f \star g)[n] \stackrel{\text{def}}{=} \sum_{m=-\infty}^{\infty} f^*[m]\ g[n+m].$$

inctions. Whereas convolution gnal, correlation only involves

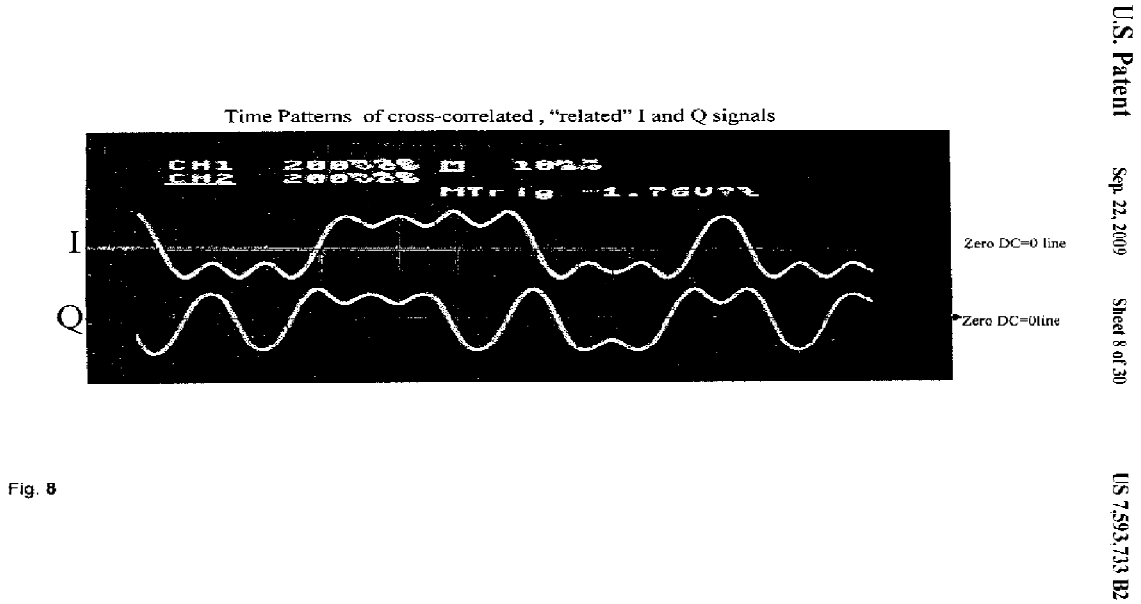
In Feher's patents:

US 4,567, 602
US 7,809,374
US 8,112,110

Australian 2005335219
Russian 2008107948

cross-correlated
in-phase and quadrature – phase time patterns, e. g. GMSK signal generation used in a GSM system is disclosed and illustrated in the photograph

* **LITIGATED** US pat. 4,567,602 (the '**602 patent**)



In Feher's patents "**cross-correlation**" or "**cross-correlating**" **means**: "***processing signals to generate related output signals in the in-phase (I) and in the quadrature-phase (Q) channels***".

"**Conventional Wisdom**" and Prior Products (**left Column)** |
Feher's patented technologies and Sample Licensed Products (**right Column**)

Conventional Wisdom:

MEDICAL Wireless Diagnostic/Treatment RISK and DANGER –e.g. Cardiologists lower Income

LINEAR-Filters… are essential for filter superposition theory and optimum systems

FQPSK Feher patented QPSK…for NASA & US Gov to use a patented ..RISK

Discrete Spike NOT good, waists power , has NO info Content –Do Not transmit it

Feher's patented technologies:

Heart Pace Maker –and other Medical diagnostics and treatment wirelessly saves Lives, Costs Saved for HUMANITY

NON-LINEAR Filters Switched - better performance in Power Efficient systems

FQPSK- Highest Speed NASA satellite and Internat Standardized Power/Spectral most Effic Feher's patented FQPSK products

Discrete Spike /Signal IS GOOD for better synchronization (e.g. pilot tone)

"**Conventional Wisdom**" and Prior Products (**left Column)** |
Feher's patented technologies and Sample Licensed Products (**right Column**)

Conventional Wisdom:

Cross-Correlation…i.e. "cross-talk" between channels degrades performance

Matched Filters Optimum Filters… matched transmit-receive filters required for optimum theoret perform

3G and Wi-Fi and GPS Compete-reduce revenues must not combine two competing systems

ULTRA Wideband (UWB) and ULTRA Narrowband (UNB) must not combine two competing systems

Feher's patented technologies:

Cross-Correlation used in Feher's patented **GSM licensed cell-phones** are better

Miss-Matched Filters in Feher patented Globally Licensed GSM products for improved efficiency

Combine 3G and Wi-Fi into same cellular mobile device and generate profits

Multimode reconfigurable UWB and UNB in same device- potential for 1000% faster data rate

From: Feher's US Patent: 7,630,717 (TOUCHSC) part of **Feher patent Portfolio (FPP)**

FPP-05 set Re.... wireless, cellular, Wi-Fi touch screen, smart-phones TV, GPS

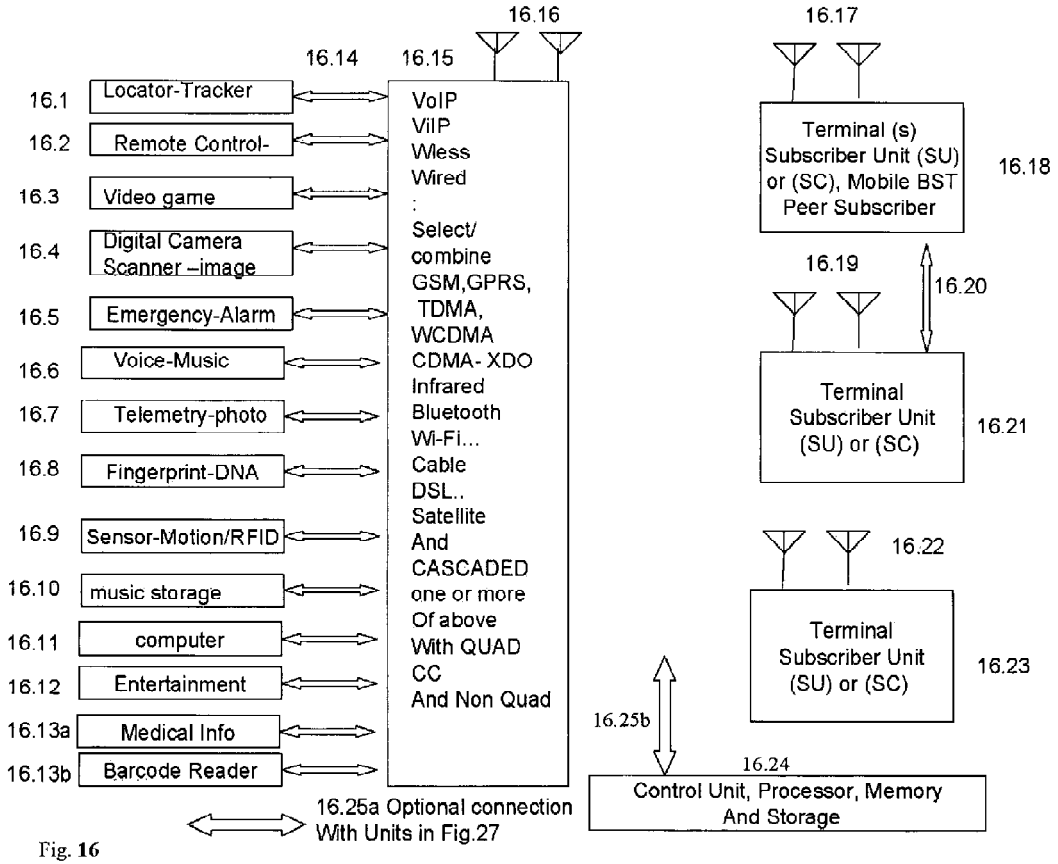


Fig. 16

U.S. Patent Dec. 8, 2009 Sheet 16 of 30 US 7,630,717 B2

In this

MEDICAL HEART

Pacemaker

Illustrative Example
of: Feher's US pat. 7,593, 733:

Feher's Invention Includes

A combination of wireless , location finder (GPS) and MEDICAL diagnostics and Treatment including
HEART PACE MAKERS for Cardiology Patients to Have Remotely Diagnosed and TREATED
Pacemaker Parameters
Also ...**DNA Tests, Blood Glucose, Urine Testing** Diagnosis and Treatment with newest Generation of SMART PHONES

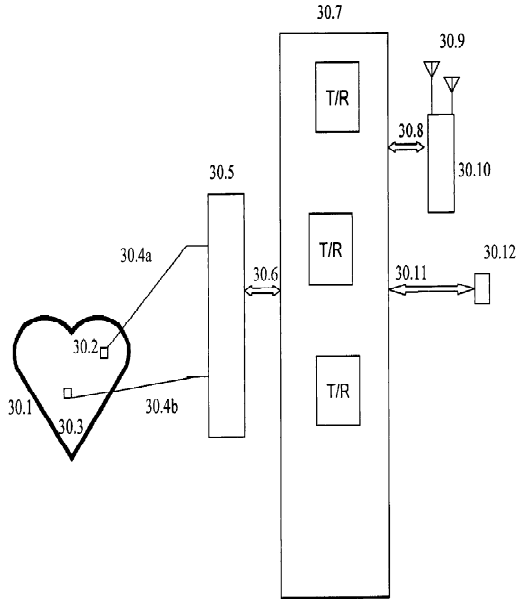


Fig.30

U.S. Patent Sep. 22, 2009 Sheet 30 of 30 US 7,593,733 B2

MEDICAL and wireless mobile and telemetry devices

- Heart-Cardiology: heart pace makers and patients health monitored, diagnosed and treated (controlled) by Doctors from wireless mobile devices, cell phones, smart phones, tablets. With future generation of such Feher patented pace maker patients will not be always required to go to Doctor's office to alter the operation of a pace maker.

- Mobile Telemetry diagnostics and patient treatment wirelessly saves lives, improves health , HUMANITY –globally has significant cost savings

- Medical Diagnostic and patient Treatment built into mobile devices, in Feher's patents include the following signals, diagnostics and treatments telemetry mobile capability in smart phones or other mobile devices:

-Magnetic Resonance Imaging (MRI) device provided signal
- **urine sensor and a blood diagnostics** device provided signal

Sample Feher's Patents:
US: 7,949,405 Cardiac stimulation control and communication system, issued on May 24, 2011
US: 7,548,787 Medical diagnostic and communication system

My life was saved by a patented device

- by a Cellular Phone ("Smart Phone") having GPS
- at about 7000 feet (2300 meters) above sea level –in forest, mountains,

snow storm –yes in my California Dream Laboratory , Lake Tahoe area

- During the first large snow storm of the 2011/12 winter season, I had a bad automobile accident, late evening, driving on a road –no other cars, not a single human close by to help, in the middle of a forest in high mountains

- I broke my large collar bone, two ribs and my head was bleeding from the injuries.

- The only way the 9-1-1 Emergency Crew could find my location and save my life, was based on the GPS coordinates transmitted during my emergency call with the center from my cellular phone

- I could not tell them my location, I had no idea.. –the "smart phone" GPS coordinates did

My touch screen operated patented phone SAVED my life
This is one of the reasons--- I keep motivated to invent new and better systems

- I believe that Geo-tagging of Voice, Video and Picture Signals will save many lives

What has been Patent Monetization Strategy for Some Independent Inventors, Small and Medium Entities (SME) and Universities

- Entrepreneur Technology Exploitation -Product Manufacturing, New Service..
- Sale of portion of or entire patent portfolio to one or more manufacturers
- Sale of portion of portfolio to Non-Practicing Entity (NPE)
- Sale to Patent Aggregators-IP Defense Group-Alliance
- Incentives for cooperative relationship US and International
- Licensing
- Litigation (U.S. and International)

USPTO-HIPO CONFERENCE
Budapest – April 3-5, 2012

The Importance of Efficient Cooperation between International Patent Offices and Inventors -- An Independent Inventor's Perspective:

I believe that a strong, efficient, inventor-friendly, improved cooperation among international patent offices is important for most inventors, and is of ***paramount*** importance to inventors with limited resources – e.g. independent inventors, inventors working in small to medium size enterprises (SME's), universities and other research and development laboratories, and medical institutions, which have limited resources for patent prosecution and monetization.

I am an independent inventor, and founder of a small California-based wireless communications technology development company, Digcom, Inc. I have more than 60 issued U.S. patents and several international patents, including patents issued in Australia, Germany, Mexico, Russia, and South Africa. While some of the largest cellular phone, Wi-Fi, smart-phone, smart-TV, and even some medical device product, developments are in China, India and other countries, like many other inventors without an unlimited budget, I do not have sufficient funding to obtain and monetize patents in most countries due to what I believe is a lack of cooperation between the various patent offices and courts of these other countries. Different criteria in prosecutions, as well as duplications and triplications of patent prosecution expenses, could be alleviated by an improved, enhanced cooperation between patent offices around the world.

But a greater degree of cooperation between patent offices, in my opinion, is only a first essential step to enable independent inventors, SME's and universities to obtain and monetize patents internationally. In my view, harmonization and cooperation in the international patent courts, would be a second, essential step to achieve most inventors' desires to have their inventions recognized around the world.

It is my hope that this USPTO-HIPO Budapest conference will significantly contribute to the cooperation among the U.S., Hungarian, European and other international patent offices, and encourage inventors around the world to proceed internationally with their love and passion of inventing.

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- Education -- Electrical-Computer Engineering and Electronics Degrees:
  Dipl. Eng. University of Zagreb; M.Sc.A. University of Montreal; Ph.D. University of Sherbrooke, Canada
- **Engineer,** Manager ,Consultant of Numerous Telecommunications, Electronics , Satellite, Wireless and High Tech Companies (1966-2003)
- President of founder of **DIGCOM Inc.** (1984-Present)
- Professor of Electrical and Computer Engineering
  - University of California, Davis (1986-2003), USA; University of Ottawa, Canada ;Concordia University, Montreal, Canada Santa Clara University, California; Stanford University, California, USA
- Fellow IEEE
- INVENTOR of more than 70 US and International Patents
- Author -- 6 books in Wireless Digital Communications Published in the USA and Translated into Russian and Chinese
- Author of more than 300 IEEE and other similar publications
- Personal -- Married (Elisabeth) ; 4 children
- Languages: English, Hungarian, Serb-Croat , French, German

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