

MINISTRY OF DIGITAL DEVELOPMENT,
COMMUNICATIONS AND MASS COMMUNICATIONS OF THE
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Federal State Budget-Financed Educational Institution of Higher
Education

The Bonch-Bruевич Saint Petersburg State University of
Telecommunications



17.09.2024

Re: for Mr. **Marat Khaitbaev** as Alien of Exceptional and Extraordinary Ability and Alien of Exceptional Ability Professional

Dear Sir or Madam!

My name is Ivan Nikitin, and I am a senior specialist of the department of inter-university relations at the Bonch-Bruевич Saint Petersburg State University of Telecommunications. I have been working in the field of inter-university exchange experience for 17 years, specializing in development of careers and professions for students after graduation.

My curriculum vitae, list of selected publications and information about my institution are enclosed herewith for your convenience.

Mr. Marat Khaitbaev has asked me to comment on the significance and national interest value of his inventions, publications and research in technical fields of non-contact Fluids monitoring, non-contact Fluids flow control and monitoring and applications of said technologies in all fields of industry and agriculture

While I have never had a pleasure to work directly with Mr. Marat Khaitbaev or even meet him personally, I am familiar with his research published in internet scientific journals of international circulation.

I also reviewed his CV before writing this opinion.

Although he and I have never worked together, I have reviewed presentations of his Light Emitting Technology and his published reports and extensively discussed his work with my colleagues.

Mr. Marat Khaitbaev sent to me following information related to his inventions in said technical fields:

1. **Provisional Patent.** Application №63/612,379 from 12/20/2023 “Apparatus, program, system and associated method for the dynamic formation of a fuel emulsion in the fuel system of an internal combustion engine, mainly based on liquid condensed from exhaust gases”, USA 2023
2. **Publication.** Book “Evolution and continuity in the automotive industry”, Germany 2023
3. **Publication.** Book “Innovative technologies in the automotive industry”, Germany 2024
4. **Publication.** Book “Modern energy supply in the automotive industry”, Germany 2024
5. **Publication.** Collective monography “Modification of liquid fuel by online dissolution of combustible gas in it before injection into combustion chamber of thermodynamic equipment”, Russia 2023
6. **Publication.** International conference “Technique, technology and design in the Smart Transportation systems creation and adaptation to the classical provisions of the Theory of Inventive Problem Solving and Algorithms for Inventive Problem Solving”, Russia 2023
7. **Publication.** “Dynamic homogenization device. Description, types, application”, Canada 2023
8. **Publication.** “Changes in the portrait of automotive market customers in 2014-2021”, Canada 2023

The most important claim in innovative projects Marat Khaitbaev in New Technical Direction of non-contact measurements and on-line real time monitoring of fluids in dynamic conditions is a

significant increase in efficiency as compared to regular measurements methods and Design and Development of methods give all needed available evidence to support this claim.

I feel that I am well-qualified to evaluate Mr. Marat Khaitbaev contributions to principal systematic inventing and development of innovative integrated Systems of non-contact fluids content and flow measurements, including innovative processing in Manufacturing process in rapid electroplating and common electrochemical treatment, invented by Marat Khaitbaev.

MY EXPERT OPINION

For the past two years I have been witnessing a unique event of emerging a versatile metrology that will change our life for good.

The Impedance Resonance technology (IRT) and its effective and innovative applications invented by Marat Khaitbaev is a novel sensor technology, I strongly believe, has a significant contribution in the field of metrology, inspection and automation control.

The instruments based on IRT, that with very original way was invented and designed by Mr. Marat Khaitbaev will open new horizons in processes control, replace or compliment majority of monitoring technologies on the market today.

This new technology represents a new non-destructive spectra-analytical methodology that allows probing of this technology will yield a family of non-expensive_devices for real-time, on-line monitoring of environment and technological processes; and in contrast to other modern spectra-analytical methods, such optical and Radio Frequency Identification (RFID) are more stable, reliable and can gather the information from the large areas and volumes as well as from relatively small medium with a harmonic electric field within RF (radio frequency in range of 0.1-500 MHz).

IRT technology has great significance and tremendous national interest value.

It is aiming to solve technological problems for many industries including: Semiconductor and thin film Photovoltaic, biotechnology and pharmaceutical, agriculture and farming, petro-chemistry, Homeland Security and National Defense (including monitoring parameters of liquids and gases and early detection of harmful chemicals and bacteria), etc.

It is a unique approach to the measuring of contaminants in various liquids and mixtures.

“Spectroscopy is the science that deals with the use of spectroscope and spectrum analysis.” (The Random House Dictionary of the English Language. Second Edition. 1987). Electromagnetic spectrum study has exceptional scientific and practical importance.

It provides important information about the properties of matter under investigation.

The importance of impedance spectroscopy, in particular, has increased tremendously in recent years. It is the most powerful of electrochemical techniques for defining corrosion processes, reaction mechanism, and exploring impedance systems.

The study combines aspects of physics, chemistry, and electronics.

Mr. Marat Khaitbaev possesses an advanced degree in Engineering and Chemical Engineering, and in addition possesses Certificates of Accomplishment in Computer Aided Drafting (CAD) and Quality assurance techniques.

All said areas of Integrated degree help Mr. Marat Khaitbaev effective focus on the technological studies and support the performance improvements for new composite products and fully integrated technologies of automotive industries development.

Mr. Marat Khaitbaev possesses complete exceptional ability which also confirm his deep, original and high-level professional publications and pioneer inventions, which implementation demonstrate significant original scientific and technologic achievements.

Mr. Marat Khaitbaev is the key participant in the all-stages development and implementation of very sophisticated technologies to drastically increasing efficiency of new composite materials in micro-electronics and laser diodes designs, light emitting devices and different on-line, non-contact, real time regime control systems.

His work in natural gas dissolving in fluidic fuels can be designated as a most important for the United States Environmental Protection Agency and USA Energy Ministry;

Provisional Patent. Application №63/612,379 from 12/20/2023 “Apparatus, program, system and associated method for the dynamic formation of a fuel emulsion in the fuel system of an internal combustion engine, mainly based on liquid condensed from exhaust gases”, USA 2023

New energetic material achieved after dissolving of natural gas in fluid fuel, in combustion reduce emissions in complete concordance with environmental standards and this development, deeply integrated work can be evaluated like substantial intrinsic merit.

Original interdisciplinary inventions of Mr. Marat Khaitbaev are sufficient cause for a national interest waiver, because the benefit which its technical decision presents in his field of endeavor greatly exceed the regular standard level of achievements and contributions from technical decision. As a result of Mr. Marat Khaitbaev innovative and patentable work, cutting edge technologies will be preserved within the USA environmental remediation industry which faces competition from other major suppliers in Europe and Japan.

The technologies developed by Mr. Marat Khaitbaev on base on his inventions are very competitive in the world market. The USA exports potential of the great number engineering composition products developed as result of Mr. Marat Khaitbaev significant innovative work, will therefore increase significantly to the benefit of the USA economy and improvement of the balance of trade. Mr. Marat Khaitbaev plays a significant role in works significantly above that of others performing in a similar capacity.

Said absolutely innovative development, novel inventions and analytical Published professional articles of Mr. Marat Khaitbaev give deep understanding of his interdisciplinary unique Exceptional Ability.

This experience can help receive for USA Industrial start-up companies best results in development process in comparison with another countries.

Unique experience of Mr. Marat Khaitbaev in original development of new products and technologies integrated with analytic instruments of Theory of Inventive Problems Solving and Algorithm of Inventive Problems Solving, with examples and professional recommendations in practical inventions and innovative development process in USA, was described in the publications mentioned above.

Use of TRIZ and ARIZ analytic instrumentations and significant technologic and common technical novelty creation integrated methods, explain why the developments and original designs of Mr. Marat Khaitbaev in very complicated field of integrated non-contact measurements and on-line monitoring is maximum effective and why this methodic is so much important for development of new products and technologies in USA industry today.

The basic innovative ideas of this publications after development and integration with present technologies can solve the current problems in implementation of novel technologies and can help save working places in USA.

Digest of Mr. Marat Khaitbaev work history showing, that all his works are in an area of substantial importance.

He has more than 7 years of experience in Interdisciplinary Design and Manufacturing of New Products and Technologies, in particular in innovative Light Emitting Devices, cleaning of gases and water, Rapid Metal Coating technologies, rapid electroplating, Precision Measurements of Liquid quality, Precision Measurements of fluids flow and Optic disks (including multilayer integrated optic disks) protection with original advanced coding-encoding principles.

He has more than 7 Inventions and more than 11 professional publications.

Most importantly, Mr. Marat Khaitbaev endeavors significantly “exceed the norms” of accomplishment of others in the field.

His unique knowledge, abilities and extensive experience in new products development, design and

manufacturing process organization in support with his deep understanding of TRIZ and ARIZ, set him apart from others in the field.

In a question on the importance Mr. Marat Khaitbaev contribution to the development of the specified area of technology, I can tell the following:

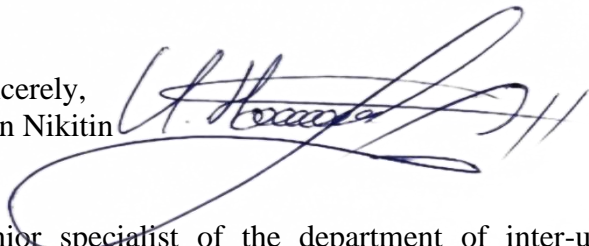
- It is especially necessary to note a high level of integrative conditions and properties of said technical decisions, and their advanced outlook on inclusion in the structure of the process and the equipment crucial for the release of the newest products;
- The structural analysis of the technological and constructive architecture of technical decisions on which the inventions Mr. Marat Khaitbaev are based, allow, thanks to their technical harmonious simplicity, reliability and advanced outlook, to draw a conclusion about his exceptional and extraordinary potential;
- Uniqueness of his opportunities which are shown in synthesis and development of the specified technical decisions, and also it enables to assume application of such level of original extraordinary opportunities for the resolutions of future tasks and challenges that might arise as well as solutions for existing problems in modern industrial production;
- The uniqueness of the extraordinary opportunities Mr. Marat Khaitbaev is shown in that:
- The technological range of areas of use of his inventions is wider, than it is usually accepted in regular technical practice.

Mr. Marat Khaitbaev is widely recognized as playing a foundational and highly innovative role and he is unquestionably in the forefront of this field of new product development organization with his unique experience in Theory of Inventive Problems Solving and Algorithm of Inventive Problems Solving, combined with effective general methodic of innovations process management.

He has a unique education and experience in the fields of Special Engineering, special advanced mechanical engineering and QA Technique in all aspects of advanced industrial new products and technologies development, design and manufacturing.

This unique combination allows Mr. Marat Khaitbaev to have a leading role in the field of Design of new products and technologies.

Sincerely,
Ivan Nikitin



Senior specialist of the department of inter-university relations at the Bonch-Bruевич Saint Petersburg State University of Telecommunications
Candidate of Technical Sciences

Saint Petersburg
17.09.2024

