Технічні науки

Savchenko Maryna

Aesthetician

COMPOSITIONAL TECHNICAL SOLUTIONS ARE THE EQUIVALENT OF INTEGRATIVE INVENTIONS

Compositional technical solutions – as an inevitable basic pushing basis for the creation of software products – equivalents of complex integrative inventions

Summary. *Psychological barriers and compositional technical solutions – as an inevitable basic pushing basis for the creation of software products – equivalent to complex integrative inventions – become the main topic of brainstorming in the context of creating smart technologies;*

The emergence of information technologies and a sharp reduction in the time cycle intended for the development and transformation of an inventive idea into a truly necessary, marketable and marketable product, the complication of the technical and technological components of new products, causing a proportional increase in the cost of manufacturing prototypes of the invented product and their testing, force us to consider in a completely new way the possibility of creating technical solutions with auxiliary innovative functions.

Now, if an inventor wants his innovative ideas to be used, he must be more versatile and must possess not only the technique of foresight, intuition and, to a certain extent, a developed imagination, but also be a practically multidisciplinary specialist, at least feeling and (better if) well understanding the commercial and consumer demands of the market, regardless of stereotypes and the psychological barriers associated with them.

Key words: *Composite technical solution, Pushing basis for creating software products, Integrative invention, Brainstorming, Smart technologies, Innovative ideas, Time cycle, Equivalent of complex integrative inventions, Auxiliary innovative functions, Foresight technology, Fundamentally new materials, Claims, Multidisciplinary specialist, Transformation of inventive idea, Technical component of new product, Technological component of new product.*

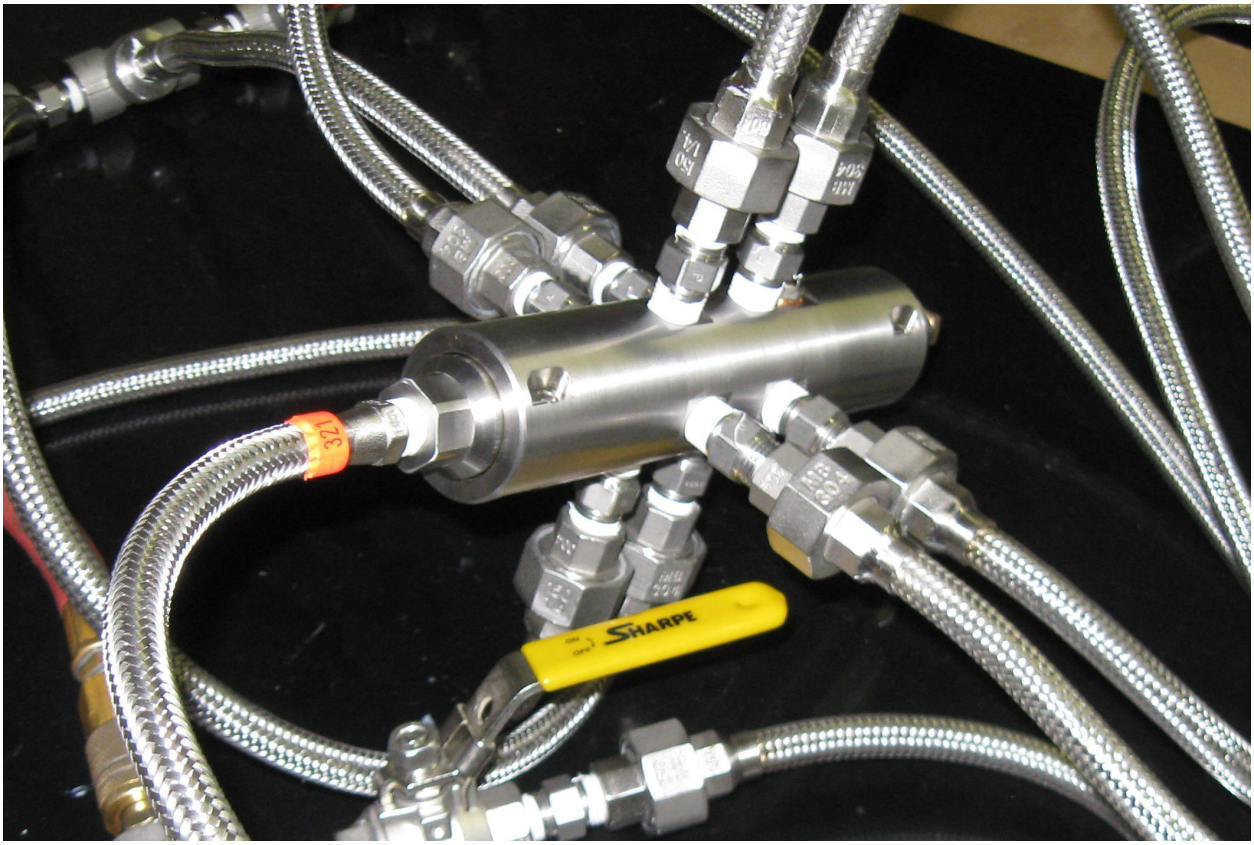

Fig. 1. An example of a compositional technical solution

All inventors know that sometimes technical solutions are created that operate, work and solve many problems in real conditions, which, when they were first posed, prompted the inventor to innovative analysis and initiated his purposeful creative activity, but there are technical solutions that are created in isolation from reality and

do not solve absolutely anything, except for the implementation of ambitious claims to at least some (usually useless) idea in the field of engineering and technology ;

In addition, technical solutions that arise in any local area necessarily directly or indirectly affect established stereotypes and the psychological barriers that arise on their basis, which prevent the overcoming of technical and technological contradictions that arise on the basis and in the development of these psychological barriers.

Even twenty years ago, the need for inventions of the second group and the no less important need to take into account the influence of psychological barriers was somehow justified by their auxiliary role as a basis for the selective selection of the most effective technical solutions.

The emergence of information technologies and a sharp reduction in the time cycle intended for the development and transformation of an inventive idea into a truly necessary, marketable and marketable product, the complication of the technical and technological components of new products, causing a proportional increase in the cost of manufacturing prototypes of the invented product and their testing, force us to consider in a completely new way the possibility of creating technical solutions with auxiliary innovative functions.

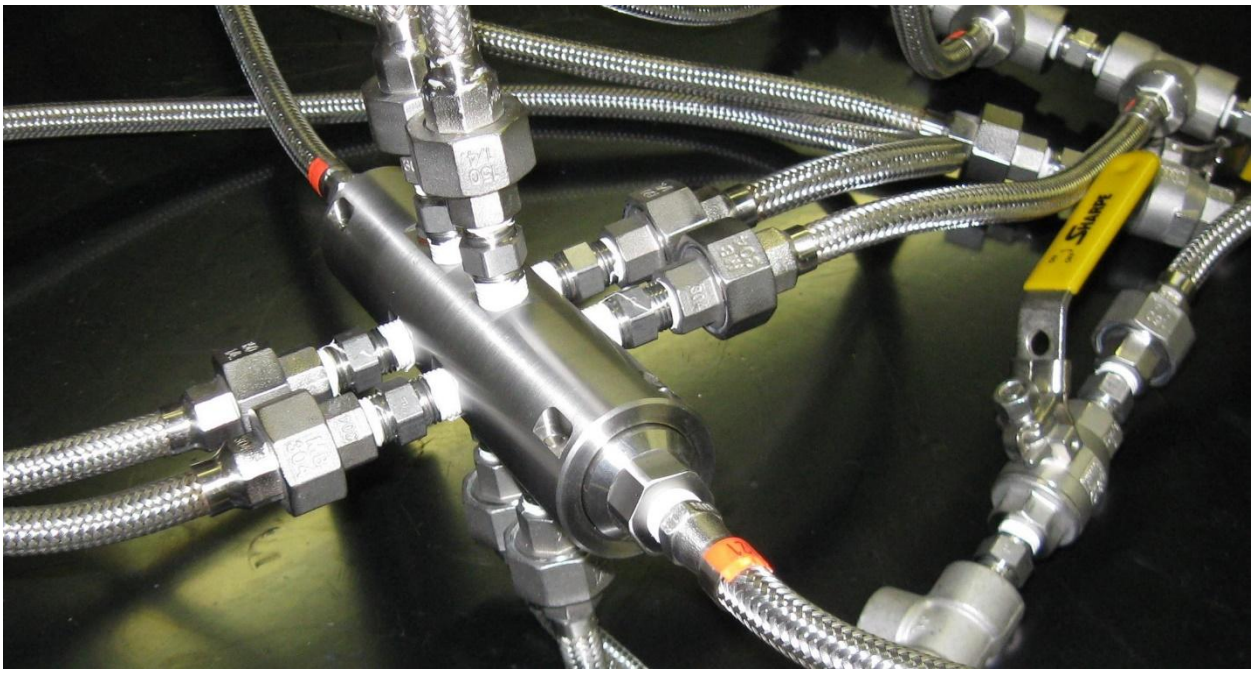

Fig. 2. Also an example of a compositional technical solution

Now, if an inventor wants his innovative ideas to be used, he must be more versatile and must possess not only the technique of foresight, intuition and, to a certain extent, a developed imagination, but also be a practically multidisciplinary specialist, at least feeling and (better if) well understanding the commercial and consumer demands of the market, regardless of stereotypes and the psychological barriers associated with them.

There are several basic directions that have a decisive influence on the fate of new ideas in the current conditions and, taking into account which, can ensure a real and high level of commercial success, or, neglecting which, will forever close the way for the idea to be implemented in any commercial form.

I propose to consider some of these basic directions (naturally, the scope of the article allows this to be done only in a thesis form):

Availability of fundamentally new materials

Let us consider, for example, two new technological directions: the creation of effective light sources based on the radiation of blue lasers (laser diodes) and the

creation of composite food products based on effective mixing systems and hydrodynamic activation.

Both of the mentioned technological directions require structural materials for development, which, due to their properties, will allow in each of the directions to obtain parameters that are impossible to obtain using conventional materials.

The possibility of using new materials is not absolute and in order to be able to use them, a primary compositional solution is necessary;

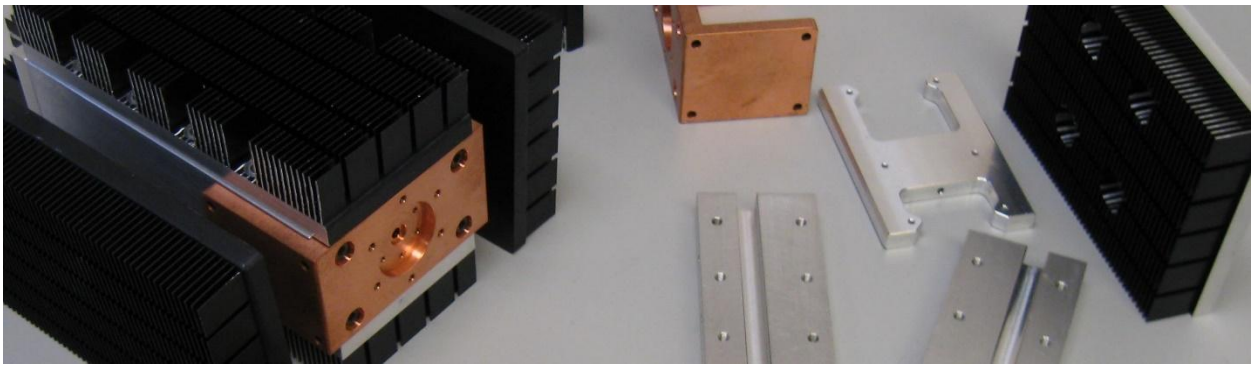

Fig. 2-1. Examples of new materials

Fig. 3. Elements of the compositional technical solution

For example, lasers require a highly efficient heat sink and a current pulse dispersion system, and to implement it, it is necessary to make changes to the design of the laser body so that it becomes possible to use a composite diamond-copper material, which, according to its parameters and properties, is capable of performing these functions.

But it turns out that replacing the material does not solve all the complex problems facing the creators of new lasers; What is the solution? - the solution may be a composite scheme, when, for example, in addition to the material, a radio frequency driver is introduced into the technical composition system, which, in combination with a new material that performs the functions of cooling and

dissipating excess heat and current pulsations, allows for a pumping mode for the laser, which in turn allows for a laser with a power of 1 watt, to introduce a pumping current of, say, 2 watts; This is already the so-called leap in effect and quality and this illustrates the fact that in modern conditions the most optimal technical solution that brings the required result is a composite technical solution

In the second example, the compositional solution looks completely different, in it the fundamentally new material is the final product of the technology, which can be imagined as a new homogeneous food composition, obtained precisely and only thanks to the compositional system of the homogenization process in the process of mixing and churning;

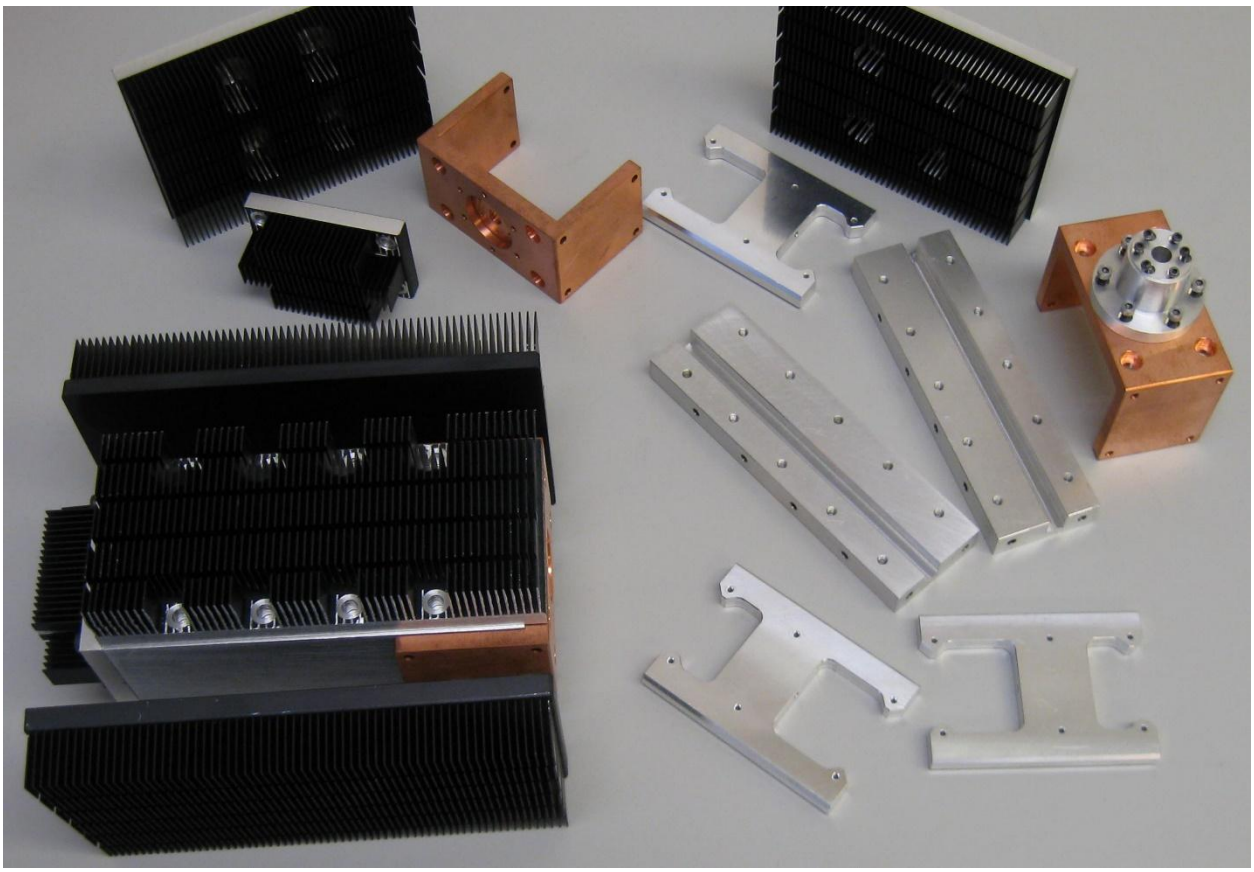

Fig. 4. Examples of fundamentally new materials in a laser diode module

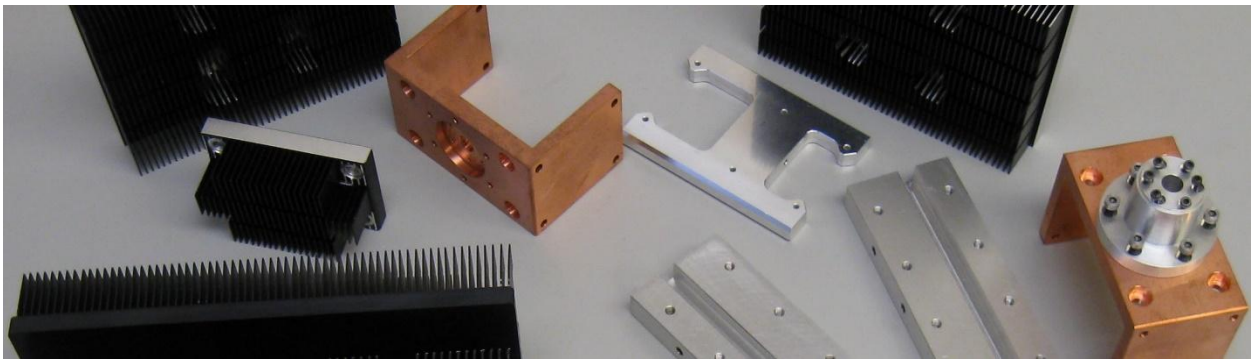

Fig. 4-1. Examples of new materials

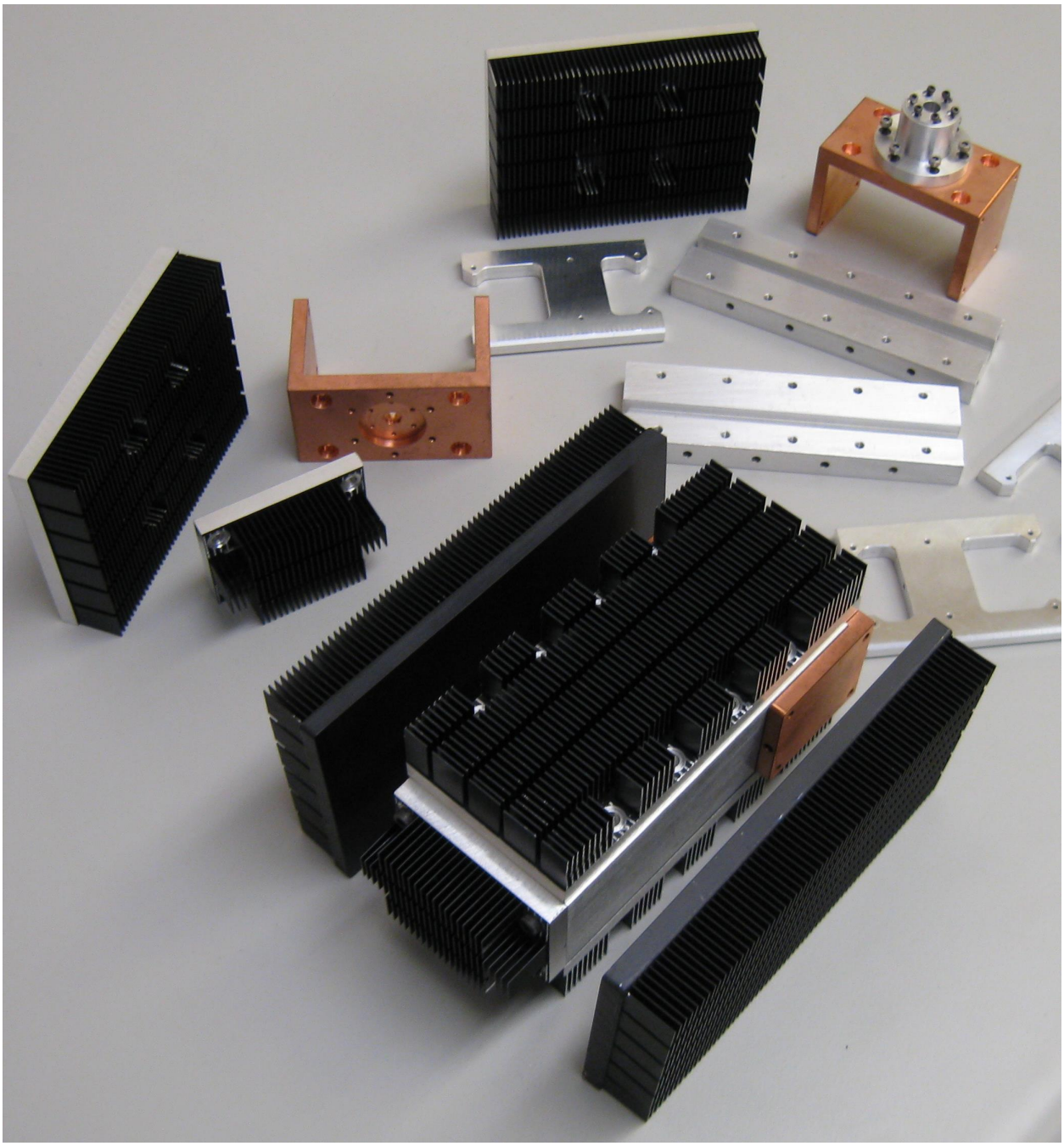

Fig. 5. Examples of composite and composite materials

Availability of composite materials

Information about scientific and technological developments in composites is eagerly awaited on the market and new composite materials are constantly appearing

and their availability makes adjustments to the design of new products and the technological process of their manufacture.

In order to link these new developments with the enormous scientific, technical and technological experience accumulated in research and development enterprises, we consider as an example the technology for creating nano-sized composites, the main component of which is nano-sized synthetic diamond powder, by the way, the production technology of which was born within the walls of the Ukrainian Institute of Superhard Materials.

A significant novelty added to the specified technology was the technique of high-speed nanosized -coatings on nanosized -diamond powders, which are made from the most plastic metals, such as copper, silver, gold, platinum, and with the subsequent introduction of these components into a complex technological composition, with the introduction of the process of the operation of initiating the properties of cold flow and subsequent plastic calibration under ultra-high pressure, obtained in this way nanosized -capsules; Thus, we see in this compositional solution a consistent horizontally oriented integration of the technique of precision nanosized -coatings and the technique of initiating the cold flow mode in the material, applied using these same coatings

Thus, the goal of this publication is to show that the existing level of research and development in the field of composite materials science allows, with the correct formulation of the task, developers of one component of the composition and, with in-depth cooperation with developers of similar technologies, the product of which is another component of the composition, to create relevant technologies and materials that are in demand on the market.

Now we can trace how the process of forming a composition from technologies and materials develops:

Since the creation of complex integrated, energy-saturated semiconductor devices, especially semiconductor lasers (laser diodes), the problem of efficient heat removal, heat dissipation, dissipation of current pulses and fluctuations has arisen.

The reason for the emergence of this problem was the absence among the construction materials, alloys and all sorts of combinations and combinations of materials, of the ability to reliably and stably perform the specified functions.

All materials and their derivatives to one degree or another did not satisfy developers and operators, and only with the advent of the possibility of creating complex composite technical solutions, problems of this level can be solved

New directions in technology of manufacturing elements

In composite technical solutions, the methods and technologies for manufacturing parts and components of a product are the most important factor determining the reality of implementing this product.

As an example, consider the nozzle or fuel injector of an internal combustion engine; This is one of the most mass-produced products. More than a billion of such injectors are produced in the world per year

For such a product, its consumer value is determined by several key factors - the diameter of the outlet holes and ensuring tightness at high fuel pressures (up to 2000 atmospheres); Making holes using conventional technology determines the limits of the minimum diameter of the holes, and since high pressures require holes whose diameter is measured in microns, the technology for making these holes should be, for example, laser; In this case, the inventor of the new injector must provide for the compositional component of the novelty of the invention, expressed in accordance with the specific requirements of laser drilling equipment

New consumer standards

Constantly changing conditions and consumer demands create, in combination with local consumption standards, with cultural and national traditions,

on the basis of which local consumption standards arise, informal but tacitly present conditional consumer standards

If the inventor's goal is to ensure commercial success for his invention, then the most important component of his commercial strategy should be a basic understanding of the currently existing consumer standard criteria, technical, operational and functional characteristics of the new product.

If technological risk is eliminated because the tests and trials of a new product have yielded positive results, the risk of commercial failure for this technologically quite successful product actually remains if the inventors and their commercialization partners have not taken into account or understood the nature of the consumer standard for their product.

New environmental standards

As is known, the restrictive requirements of environmental standards are becoming increasingly stringent; When working on the invention of a new product, the use of which somehow affects the limits of permissible parameters regulated by environmental protection standards, it is necessary to provide for full compliance with the requirements and restrictions of current standards when using the new product.

As a rule, current standards are constantly being improved and the requirements that are in effect in the current year will be planned to be tightened in a few years.

This is especially important for various power equipment and internal combustion engines.

There are known cases when an internal combustion engine with an innovative cylinder layout, with an extremely efficient fuel economy system, was invented, but the level of concentration of nitrogen oxides and soot in the exhaust gases of which

exceeded the permissible levels according to the future standard, which is due to come into force in two years.

This was enough for the newest engine to be sent for revision, during which its technical solution was changed to the level of a composite with the inclusion of an innovative fuel preparation and activation system integrated with previous technical solutions, which made it possible to reduce the concentration of harmful substances in the exhaust gases.

The influence of fashion

Even for high-tech products there is fashion, as a kind of integral complex stereotype developed over time and practice, combining both objective and subjective commercial and operational factors;

The subjectivity of this concept is not always explainable by methods of direct logic, but must be taken into account by the inventor both when developing a new product and when preparing its presentation to potential partners and consumers.

Very often, an innovative product contains elements, factors or features that future consumers are waiting for and will accept with interest, but the authors concentrate on purely technical aspects and offer them something completely different from what they want to hear and see.

Availability and continuous intensive development of software products

The significant complication of technology and especially various types of electronic and microelectronic devices has fundamentally changed the principles of their protection as objects of complex, multifaceted and multifunctional intellectual property.

For such objects, significant differences concerning purely design features, circuit solutions, combinations of these solutions do not determine all aspects of the invention, since today very often all the listed features and differences can be implemented in a working system or prototype only under certain conditions and

capabilities of manufacturing and control technology, and very often it is manufacturing that determines the main properties of the invention.

The development of processor control systems also determines the viability of the technical solution, which means that the algorithm or algorithms, programs, feedback between the elements of the design or circuit become or have already confidently become an organic part of the technical solution underlying the claimed invention.

Thus, in one description it is necessary to combine or integrate several different technologies and this combination, the identified possible channels and connections of such integration, must be presented in the invention formula in such a way as not to give the patent office expert the opportunity to doubt the unity of all integrated distinctive features of the future invention and divide it into a number of local technical solutions based on one technological direction.

The possibilities of patenting in the field of information technology affect a huge layer of activity in modern society; And if until recently it was possible to somehow very accurately characterize or limit a particular technological sector, then with the advent of high technologies and their branches, information technologies, in all spheres of human activity, such classification possibilities and protective mechanisms have changed significantly and transformed into a new system of technical, commercial and legal relationships

In almost all, even relatively simple processes, their structure becomes integrative and includes technological techniques, methods and systems never used before, and, in addition, the integration of classical technical solutions with new opportunities provided by information technologies fundamentally changes the very concept of invention.

This factor, which arose at the intersection of technologies, significantly changes the attitude towards the formulation and protection of those elements and

their combinations, which in such new conditions can be qualified as integrative technical solutions corresponding to the main features of the invention and based on composite design and technological elements.

List of references, patent and license materials:

Appendix 1

United States Patent Application **20120051174**
Kind Code **A1**
March 1, 2012

NATURAL MILK BASED FOOD COMPOSITION, PROCESS AND DEVICE FOR DYNAMIC PREPARATION

Abstract

In some aspects, an apparatus and method churning butter out of multi-component raw material are provided. The movement of the raw material develops energy that churns the raw material into butter.

Appendix 2

United States Patent Application **20120040166**
Kind Code **A1**
February 16, 2012

Composite Material, Method of Manufacturing and Device for Moldable Calibration

Abstract

Composite materials and methods and systems for their manufacture are provided. According to one aspect, a composite material includes a collection of molded together multilayer capsules, each capsule originally formed of a core and shell. The shell, after a plastic deformation process, forms a pseudo-porous structure, with pores locations containing the capsule cores. The cores are made of a material, eg, synthetic diamond, which is harder than the external shell, which can be formed of, eg, a ductile metal such as copper. The composite material has high thermal and/or electrical conductivity and/or dissipation.

Appendix 3

United States Patent Application **20120029845**
Kind Code **A1**
February 2, 2012

APPARATUS AND METHOD FOR FLUID MONITORING

Abstract

According to some illustrations, an apparatus and method are provided for detecting the composition of a fluid. An alternating electromagnetic field may be applied to the fluid and distortions in the electromagnetic field are compared with predetermined, expected distortion "signatures" for particular components at particular concentrations. The presence and concentration of the components in the fluid may be detected by detecting these distortion signatures.

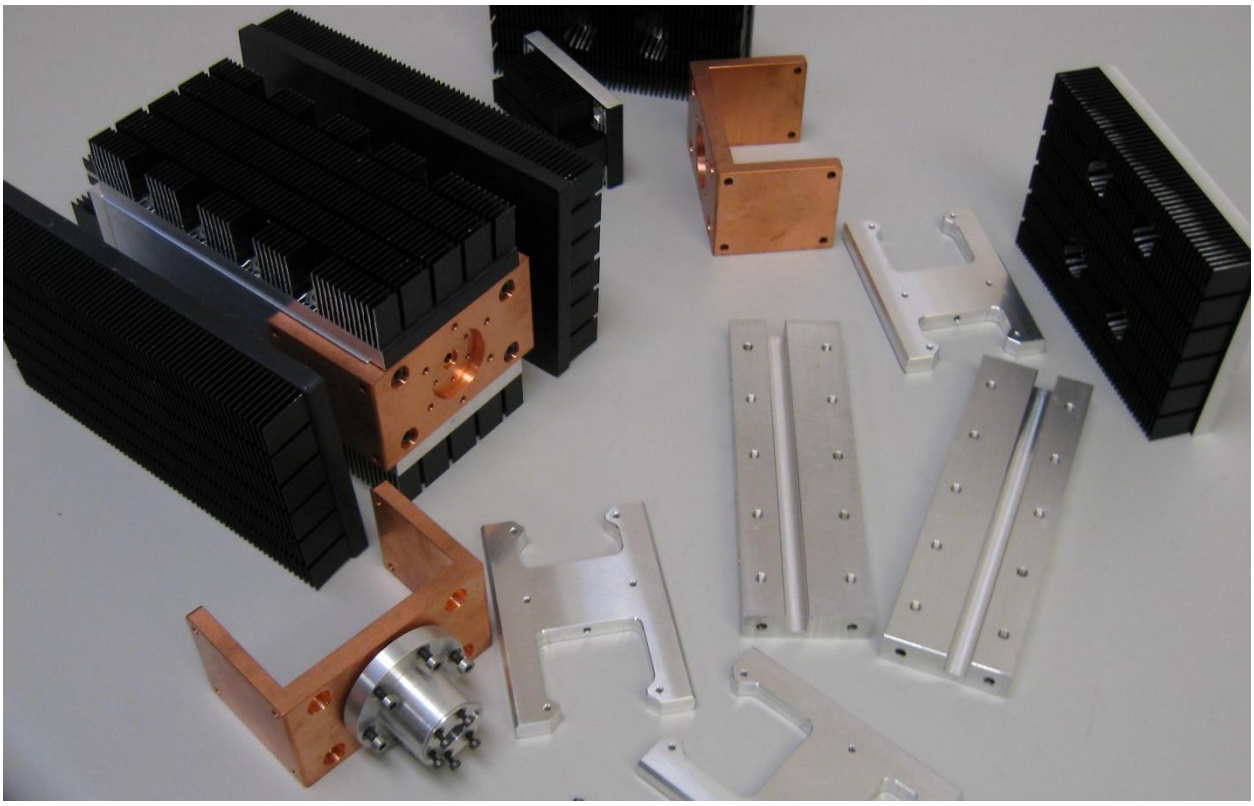

Fig. 5-1. Examples of composite materials