Review of the Results of Scientific Activities: Protecting Intellectual Property in Russian and American Legal Practice

Alexander G. Barabashev¹, Daria V. Ponomareva¹ and Jeffrey A. Burt²,³

¹Kutafin Moscow State Law University (MSAL), Moscow, 125993, Russian Federation
²Burt Consulting, 1855 Plymouth str., NW, Washington, D.C. 20012 USA
³Jeffrey Burt is now retired and was formerly at Arnold & Porter Kaye Scholer LLP

alexander.barabashev@gmail.com, ponomad@yandex.ru, jburtconsulting@gmail.com

Abstract. In this article, the authors analyze the legal regulation of the protection of the results of scientific and technical activities in Russia and the United States. As part of the study, considerable attention is paid to the review of key regulatory acts of both states operating in the designated area, as well as international treaties affecting aspects of the protection of intellectual rights in the field of science and technology. The authors consider the main ways of protecting the results of scientific and technical activities, the system of competent authorities in the field of intellectual rights, including the judiciary. Special attention is focused on the analysis of the judicial practice of both states, which plays a significant role in shaping approaches to the legal regulation of the results of scientific and technical activities. The authors attempt to answer the question: what the similarity and difference between the Russian and American systems of protection of the results of scientific and technical activities is, in particular, the role of the judiciary in the functioning of such systems. In the end the conclusion is made about the prospects for harmonization of the Russian and American approaches to the legal regulation of the results of scientific and technical activities. The article will be relevant to practicing lawyers, researchers, students and everyone who is interested in IP law.

1. Introduction

In the modern world, ensuring comprehensive and effective protection of intellectual property information, especially in the areas of scientific activity, is becoming crucial. In an era of unprecedented development of the interconnected network society and the rapid spread of such phenomenon as cybercrime, the ability to protect intellectual property information from unauthorized intrusions by third parties is paramount. Any important information, whether private or commercially oriented and of substantial value, requires some degree of protection. Scientific information and the useful results of scientific activities, in particular, are very vulnerable to modern “digital” threats. This article provides a brief overview of the current Russian and American legal practice in place to protect various forms of intellectual property and discusses recent court decisions of relevance. Although the rules are not the same in these two countries, they do fit a common pattern designed to encourage innovation, while at the same time safeguarding the public’s right to know and to utilize certain
information that should be in the public realm. The “balancing” necessary to achieve the proper outcomes are challenging and difficult for both jurisdictions and reflect the rapid changes in technology which these leading nations are now experiencing.

1.1. The Russian Legal Regime

What is scientific information? According to the State Standard (GOST) 7.0-99 of Russian Federation (SIBID) “Information and library activities, bibliography. Terms and definitions” “scientific information is regarded as logically organized data obtained in the process of scientific perception and reflecting the phenomena and laws of nature, society and thinking” [1]. In the above definition, the following features of scientific information are disclosed: structuredness; consistency; objectivity. In addition, an important aspect is the consideration of scientific information as a result of scientific perception.

As for the definition of the concept of “the result of a scientific activity”, the following should be noted here. The Russian legislation does not give a definition of the designated concept, but in one of the normative acts lists the categories of the results of scientific activities. In the Regulation on the inventory of rights to the results of scientific activities, approved by the Decree of the Government of the Russian Federation dated January 14, 2002 No. 7 “On the procedure for inventory and valuation of rights to the results of scientific activity”, the following categories are designated: objects of exclusive rights, including inventions, industrial designs, utility models, topologies of integrated circuits, programs for electronic computers, databases; potentially protectable results of scientific activity; the results of scientific activity that cannot be subject to exclusive rights [2].

An attempt to formulate a definition of the result of a scientific activity was evidenced in adopting the “Model Law on the Status of a Scientist” during the Plenary Session of the Inter-Parliamentary Assembly of the Member States of the Commonwealth of Independent States: “the result of scientific and / or scientific and technical activity is objective information recorded on any media and containing new scientific knowledge (discoveries), new solutions of problems in the field of science and technology, which has novelty, practical feasibility and value ”[3]. Thus, the result of scientific activity is, first of all, the scientific information, which has a number of the above-mentioned characteristics, including novelty, practical feasibility and value. Scientific information is a broader concept, and the result of scientific activity can be viewed as a subcategory of scientific information. In this review we will proceed from this thesis.

1.2. International Treaties

Protection of the results of scientific activity is implemented throughout the world. There are a number of international treaties, the purpose of which was to protect against encroachment by third parties regarding the unauthorized use of scientific information. These are the primary international treaties covering the issues of IP:

- Paris Convention for the Protection of Industrial Property of 1883;
- Patent Cooperation Treaty 1970;
- WIPO Convention 1970;
- Strasbourg Agreement on the International Patent Classification 1971;
- European Patent Convention 1977;
- The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) 1994;
- The Geneva Act of the Hague Agreement Concerning the International Registration of Industrial Designs 1999;
- Patent Law Treaty 2000.

These international treaties are designed to provide protection, including such results of scientific and technical activity as inventions, industrial designs, utility models, topologies of integrated circuits, etc. States parties to designated international treaties not only comply with their provisions, but also implement international legal norms into national legislation so that it meets the advanced
international standards for protecting the results of scientific and technical activity. In addition, multilateral treaties serve to encourage individual states to conclude bilateral international treaties aimed at developing deeper cooperation in the field of science and technology, including the protection of scientific information.

The relationship between the United States and Russia in the field of science and technology is not an exception in this case. For both the Russian Federation and the United States of America, even in the present conditions of foreign policy relations, scientific and technical cooperation remains an important area of interaction. Today, the legal basis for cooperation between Russia and the United States is one interstate and three intergovernmental agreements in the field of science and technology. In addition, at the interdepartmental level (between the Ministry of Education and Science of the Russian Federation and between the United States Department of Commerce) a Memorandum of Understanding has been concluded [4].

Also, states have created a number of joint working bodies that assist partners in making decisions in the designated area [5]. It is worth noting that Russian-US international treaties often contain provisions affecting the legal regulation of intellectual property, including the distribution of rights in connection with the results of scientific and technical activity. Since such agreements provide for a national regime on the key aspects of ensuring the rights and obligations of the parties by treaties, the development of national legislation in the field of protection of the results of scientific and technical activity for both Russia and the United States remain of paramount importance. With the foundational support of legislation and relevant judicial practice, states were able to develop their own approaches to the protection of scientific information.

2. Russian legislation and judicial practice

2.1. Forms of protection of the results of scientific (scientific and technical) activity

The basic document in the Russian Federation providing for various forms of protection of the results of scientific and technical activity is the Civil Code of the Russian Federation (Part IV). It should be noted that, according to the Russian legislation, the results of scientific activity belong to such a category of intellectual property as industrial property, which predetermines the choice of appropriate forms of protection of inventions, utility models, industrial designs, integrated circuit topologies and other similar objects.

For the results of scientific and technical activity the following forms of protection are provided:

- patent;
- trade secret;
- copyright.

2.1.1. Patents. A patent as a form of protection of intellectual property is used as often as the need arises to “secure” the result of the implementation of research and experimental design (R & D). It is a document confirming the right of the applicant to the invention, utility model or industrial design. In accordance with Article 1295 of the Civil Code of the Russian Federation, the right to determine the expediency of granting patent protection to an invention, utility model or industrial design made for official purposes is granted to an employer who makes decisions based on the potential economic benefits of patenting. It is important to note that there is no legislative definition of the term “patent” in Russia.

A patent as a form of protection of intellectual property is used as often as the need arises to “secure” the result of the implementation of research and experimental design (R & D). It is a document confirming the right of the applicant to the invention, utility model or industrial design. In accordance with Article 1295 of the Civil Code of the Russian Federation, the right to determine the expediency of granting patent protection to an invention, utility model or industrial design made for official purposes is granted to an employer who makes decisions based on the potential economic
benefits of patenting. It is important to note that there is no legislative definition of the term “patent” in Russia.

In the Russian Federation, there is a federal executive body that is responsible for accepting applications, granting patents, registering agreements on the granting of rights to industrial property objects, etc. - The Federal Service for Intellectual Property (Rospatent). Rospatent examines applications and implements a multi-stage procedure for protecting the result of scientific activity. Decisions made during the examination may be challenged administratively in the Chamber for Patent Disputes (a structural unit of the federal state budgetary institution “Federal Institute of Industrial Property” (FIPS)) that carries out the whole range of actions related to the registration of intellectual property). Decisions of the Chamber may be challenged in court.

According to the Russian legislation, inventions, utility models and industrial designs can be patented. At the same time, the Civil Code of the Russian Federation provides for an open list of objects that cannot be protected by a patent under any circumstances: methods of human cloning, methods of modifying the genetic integrity of human germ-line cells; the use of human embryos for industrial and commercial purposes; other solutions that are contrary to the public, the principles of humanity and morality. It should be noted that the Russian legislation places moral and ethical requirements in priority, despite the change in the position of public authorities (in particular, judicial authorities) in a number of countries on the issue of patenting the genome or how to use human embryos.

Violation of patent laws entails civil liability. In this case, the applicant has the possibility of recovering a loss, as well as compensation. In addition, the offender may be held administratively liable for a fine, as well as criminally liable, including imprisonment for up to five years.

2.1.2. Trade secret. The result of scientific and technical activity may be protected by a trade secret regime. What is a trade secret in accordance with Russian law? A trade secret is understood as “a mode of confidentiality of information that allows its owner to increase incomes under existing or possible circumstances, avoid unnecessary costs, maintain a position in the market for goods, works, services or obtain other commercial benefits” [6]. Russian law identifies a trade secret with the secret of production (know - how), which is "information of any nature, industrial, technical, economic, organizational and others about the results of intellectual activity in the scientific and technical sphere and about the ways of carrying out professional activities that have long-term or potential value due to uncertainty to third parties ”[7]. Please note that the secret of production is a special case of a trade secret, which is used not only to protect the results of intellectual activity in the scientific and technical sphere, but also in other areas of commercial circulation.

Russian legislation has provided for a list of requirements for the protection of information constituting a trade secret. At the same time, in the Russian realities, undertaking sufficient and effective measures that allow real trade secret protection for the results of scientific activity of organizations and individual entrepreneurs are challenging. Difficulties are caused by the significant amount and specific content of the necessary documentation, which establishes the regime of trade secrets in enterprises that develop and produce high technology products. In addition, it is very difficult to ensure technically the protection of such information, including restricting access to it, to ensure the maintenance of appropriate logbooks of information constituting a trade secret, and assign responsible employees. Violation of the trade secret regime entails criminal, administrative, disciplinary, material and civil liability, depending on the severity of the offense and the legal status of the subject.

Protection of the results of scientific and technical activity is possible using copyright. Certain types of objects, such as computer programs or databases, which in accordance with Russian law cannot be protected by a patent, are protected by copyright. In the sphere of science and technology, computer programs and databases are equated, by legal status, to literary and artistic works. In accordance with Article 1259 of the Civil Code “for the emergence, exercise and protection of copyright does not require registration of the work or compliance with any other formalities. With
respect to computer programs and databases, registration is possible, if desired by the right holder "[8]. 
Violation of non-property copyright is called plagiarism, which, unfortunately, is not uncommon in the 
scientific field. Russian legislation provides for civil, administrative and criminal liability. The most 
commonly used civil-law toolkit for the protection of infringed copyrights is compensation for 
material losses of the copyright holder, as well as compensation for moral harm. Administrative and 
criminal liability implies the possibility of imposing a fine, depending on the severity of the offense. 
The most severe punishment is up to six years of imprisonment with a penalty of up to 500,000 rubles 
or a convicted person's salary for 3 years, or without penalty (fine) [9] provided by the Criminal Code 
of the Russian Federation for using copyright objects contrary to law and carried out by organized 
group of people, either on a large scale, or with the application of official status.

2.1.3. Trademark. It is also worth noting that Russian legislation provides for the possibility of 
protecting the results of scientific and technical activity using a trademark. A trademark is a 
designation used to individualize products, legal entities or individual entrepreneurs. Since, one way or 
another, inventions, utility models and industrial designs frequently become objects of commercial 
circulation, the use of a trademark to protect them is becoming increasingly relevant. The right to a 
trademark is certified by a special document (certificate) issued by Rospatent. The right holder of a 
trademark has the entire arsenal of powers: the right of use, disposal, and the right to prohibit the use 
of the trademark by third parties. For illegal use of a trademark civil, administrative and criminal 
liability is provided.

2.2. The Court for Intellectual Property Rights
The powers to deal with disputes related to the protection of intellectual rights, including the results of 
scientific and technical activity, are stipulated by Russian law for a specialized arbitration court that is 
part of the system of state courts of the Russian Federation - the Court for Intellectual Property Rights. 
It is noteworthy that the Court for Intellectual Property Rights is the first specialized court in Russia, 
the creation of which has been discussed for a long time.

For the first time, the idea of creating such a court was voiced at a meeting of the Presidium of the 
now disbanded Supreme Arbitration Court of the Russian Federation in 2010. The discussion about the 
emergence of a specialized court was also held at the meeting of the chairmen of the arbitration courts 
in Samara in the same year. There were also proposals to create a Patent Court of the Russian 
Federation, providing for a narrower competence, focused only on patent disputes. However, from 
July 3, 2013, in accordance with the decision of the Plenum of the Supreme Arbitration Court of the 
Russian Federation, the Court for Intellectual Property Rights began its work.

The Arbitration Procedure Code of the Russian Federation, which establishes the competence of the 
court, became the legal basis for the operation of the Court for Intellectual Property Rights. This Court 
acts as a court of first and appellate instances. As a court of first instance, it considers cases involving 
challenges to the regulatory acts of federal executive bodies affecting the applicant's rights and legal 
interests in the patent field and the field of breeding achievements, rights to topologies of integrated 
circuits, secrets of production, rights to use the results of intellectual activity as part of a single 
technology; case of establishing the patent holder; cases of invalidation of a patent for an invention, 
utility model, industrial design or selection achievement; cases of disputes on the provision or 
termination of legal protection of the results of intellectual activity and equivalent means of 
individualization. As an appellate court, it considers cases tried by it in the first instance, as well as 
cases on protection of intellectual rights, considered by arbitration courts of the subjects of the Russian 
Federation in the first instance, and arbitration appeals [10].

It is worth noting that at the level of the subjects of the Russian Federation, arbitration courts 
consider cases on disputes over the protection of intellectual rights with the participation of 
organizations exercising collective management of copyright and related rights. In this case, patent 
disputes lie exclusively within the authority of the Court for Intellectual Property Rights. A significant 
number of cases at the same time constitute cases of challenging the decisions of Rospatent.
Statistics on dispute resolution is as follows: in the first instance, 56% of cases are disputes about the early termination of the legal protection of a trademark, 37% are disputes about appealing decisions, and actions of Rospatent, and 7% are remaining disputes. As part of the cassation instance, patent disputes amount to approximately 28%, and trademark disputes - 72%. As one can see, most of the disputes addressed by the specialized court involve trademarks. Patent matters are a minority, although their number is steadily increasing.

The creation of a specialized court for the consideration of cases in the field of protection of intellectual rights, including in the field of scientific and technical activity, according to experts, has its advantages and disadvantages [11]. Among the merits of the Court is the high quality of the handling of cases. While dealing with complex cases the Court involves as experts prominent members of the scientific community; for example, assessing the novelty of the patented design. In addition, the structure of the Court and the procedure for adjudicating cases prohibiting the consideration of appeals by a panel that adopted a ruling on the initial appeal testifies to the existence of guarantees for the independence of judges.

Among the shortcomings of such a court cited by the experts is the lack of sufficient experience in the analysis of such cases, and the lack of relevant knowledge of the judges as to the technologies under review. In addition, the situation is complicated by the imperfection of the regulatory framework. The fact is that the Civil Code of the Russian Federation does not include a number of necessary norms and provisions, which requires judges to bring questions to the Judicial Board on Economic Disputes of the Supreme Court of the Russian Federation in order to clarify the situation by common efforts. The use of the experience of the WIPO (World Intellectual Property Organization), in which Russia has its representation, helps to address some of these shortcomings. However, in view of the differences in the powers of the judiciary and the international organization, the implementation of the legal experience of WIPO is not an easy task.

2.3. Russian judicial practice in cases related to the protection of the results of scientific and technical activity

Disputes in the field of protection of the results of scientific and technical activity constitute a considerable share in the practice of Russian courts, whose competence includes the consideration of intellectual property cases. Here, in the first place, it is worthwhile to designate the practice of arbitration courts of subjects of RF, arbitration appeal courts and the Court for Intellectual Property Rights. Although the Russian legal doctrine does not recognize a court decision as a source of law, its enforcement value cannot be underestimated. The positions of the judges, set out in the decision, not only interpret the regulatory legal acts, but also help to fill the existing legislative gaps by systematically interpreting the existing law. Below are a few cases examined by Russian courts, the subject of which was the protection of the results of scientific and technical activity. The common issue in these cases is that all of them, in one way or another, challenged the decisions of Rospatent on patents for inventions, utility models and industrial designs.

2.3.1. Case A No. 631/2017. FORES Limited Liability Company objected to the issuance of a patent of the Russian Federation for the group of inventions “Method for producing a ceramic proppant agent (variants)”, motivated by the inconsistency of the patented invention with the conditions of patentability “industrial applicability” and “inventive step”. In addition, it was noted that the documents of the application for which the named patent was issued did not meet the requirement of disclosure of the invention with sufficient details to be carried out by a person skilled in the art [12].

Based on the results of the review, Rospatent decided that the application documents for which the patent was issued did not meet the requirements of disclosure of the invention with sufficient completeness.

These circumstances served as the basis for the adoption by Rospatent of a decision on invalidation of a patent. In this regard, the right holder appealed to the Court for Intellectual Property Rights demanding that the decision of Rospatent be overturned.
In support of its claims, the applicant noted that the contested decision of Rospatent did not contain a conclusion on the recognition of the patent as invalid. In addition, in the opinion of the holder, Rospatent, in violation of internal rules, did not suggest that he amend the claims.

When reviewing this dispute, the Court for Intellectual Property Rights established that during the consideration of the objection by Rospatent, the possibility of making changes to the application materials was not investigated. The Court also pointed out that Rospatent was unable to identify the existence of circumstances in which changes to the claims would not serve to eliminate the reasons that gave rise to the recognition of the patent as completely invalid.

In connection with the above, the Court declared the decision of Rospatent null and void and imposed on Rospatent the obligation to reconsider the said objection. Subsequently, the Presidium of the Court for Intellectual Property Rights overturned that decision of the Court for Intellectual Property Rights.

The Presidium of the Court noted that, in accordance with the Civil Code of the Russian Federation, invalidation of a patent, in part due to non-compliance of the invention with the conditions of patentability, is possible only by amending the claims as a document expressing the essence of this technical solution, so that the invention meets the conditions of patent effectiveness. The internal rules of Rospatent stipulate that the proposal to amend the claims is aimed at eliminating the reasons that served as the only basis for concluding that the object under consideration did not meet the conditions of patentability, as well as the basis for concluding that the declared object is classified as a list of solutions that are not recognized as patentable inventions, useful models, industrial designs. Also, the proposal to amend the claims may be aimed at preserving the validity of the patent as completely invalid and avoiding the recognition of the patent as completely invalid.

«In this regard, those changes in the claims that are not aimed at expanding the scope of protection will be permissible, for example, by changing the purpose of the invention, but based on the use of features previously included in this formula, which leads to a narrowing of the scope of protection.

As a conclusion, the Court also found that the introduction of features from the description not previously provided by the claim would lead to the emergence of a new object for which the patent was not issued, violators of rights to which will be third parties who conscientiously used the object that was not previously considered patented».

In the framework of this case, the Court for Intellectual Property Rights helped to clarify certain provisions of the Russian legislation on intellectual property rights, primarily the Civil Code of the Russian Federation and internal acts (orders) of Rospatent. Thus, the Court indicated that when Rospatent considered objections to granting a patent, it is necessary to take into account that Article 1378 of the Civil Code of the Russian Federation regulates the issues of introducing changes to application documents before making a decision on granting a patent (at the stage prior to registration of the invention, examination of the application in essence) and not to be applied when Rospatent considers objections to invalidation of a patent. In addition, no changes can be made to the description of an already valid patent at the stage of consideration of an objection by internal acts of Rospatent. In turn, at the stage of consideration of the objection, admissible changes will be those changes in the claims that are not aimed at expanding the scope of protection, for example, by changing the purpose of the invention, but are based on the use of features previously included in this formula, which leads to a narrowing of the scope of protection [13].

2.3.2. Case B number SIP-308/2015. Pharmasintez OJSC appealed to the Court for Intellectual Rights with a statement asserting that the actions of Rospatent to extend the term of the exclusive right to the invention “Triazole derivatives, pharmaceutical composition and intermediate products” as illegal [14].

The applicant substantiated his claims by the fact that in the Vfend (Vorikonazol) medicinal product according to the registration certificate No. P-015539/01 of April 12, 2004, the active substance was obtained in a different way than in the invention of patent No. 2114838, and, moreover, patent No. 2114838 extended on the basis of the registration certificate for the drug Vfend.
(Vorikonazol), on the basis of which the validity of another patent No. 2095358 was also extended. In this connection, the applicant believed that the procedure for extending the term of the patent was not subject in relation to patent No. 2114838.

The Court disagreed with the applicant's argument about the need to evaluate the method of obtaining both the active substance specified in the registration certificate and the product protected by the invention, stating that there is no such requirement in the provisions of paragraph 3 of Article 3 of the Patent Law (normative act in effect before Part IV of the Civil Code) and paragraphs 7 and 10 of the Procedure for extending the term of a patent, according to which the extension of the term of a patent for an invention should meet two conditions: 1) a petition to extend the term of a patent for an invention relating to a medicinal product for which it requires to obtain permission in accordance with the law, must be filed by the patent owner with the federal executive body on intellectual property during six months from the date of receipt of such permission; 2) the invention described in the formula of the disputed patent should relate to the product for which the first permission has been obtained.

Having established that both conditions were met, the court of first instance concluded that the extension of the validity period of the disputed patent was carried out by Rospatent in accordance with the procedure of such extension. At the same time, the arguments of Pharmasintez OJSC on the differences in the methods of production of a substance under a patent and registration certificate, on the one hand, are presumptive, and on the other hand, have no legal significance for the consideration of this case.

The Presidium of the Court for Intellectual Rights did not find grounds for satisfying the cassation appeal and revoking or changing the decision of the court of first instance, noting that the argument that the patent owner could not extend the validity period of patent No. 2114838, since he had already exercised this right when extending patent No. 2095358, is also unreasonable, since the circumstances of the extension of the patent No. 2095358 are not related to the extension of the patent No. 2114838.

The main conclusion of the Court was very important in determining the conditions for extending the term of a patent. So, to extend the validity of a patent for an invention at the request of the patent owner, it is necessary and sufficient to establish that the corresponding petition was filed within the prescribed period, and also that the invention described in the formula of the patent in question relates to the product for which the first permission is obtained.

Moreover, to resolve the issue of the possibility of extending the term of a patent, the circumstances connected with obtaining the active substance in one or different ways according to the description of the patent and the description of the registration certificate for the medicinal product, as well as the extension on the basis of one registration certificate for the medicinal product means of validity of one or more patents, has no legal significance.

In this case, the Court also played the role of an “interpreter” of the provisions of national legislation, which, of course, plays a decisive role in explaining the complex, sometimes ambiguous norms regulating the legal relations in the field of protection of intellectual rights [15].

### 2.3.3. Case C No. SIP-482/201.

An application for the grant of a patent was submitted to Rospatent in the group of inventions “N.V. Ismailova’s method learning to read and training manual for its implementation” According to the results of the substantive examination, Rospatent declined to grant a patent for the specified group of inventions, because the patent level US patent No. 5788503 was identified in the prior art, from which a textbook is known that implements the method of teaching reading, while the features distinguishing the claimed method from the well-known patent, are characteristic of decisions that, in accordance with the Civil Code of the Russian Federation, are not inventions [16].

Disagreeing with the decision, the applicant appealed to Rospatent, but Rospatent refused to satisfy the application. Then the applicant appealed to the Court for Intellectual Rights.

The Court for Intellectual Property Rights agreed with the conclusions of Rospatent, having established that the proposed teaching methodology is aimed at assessing the results of the individual
being trained, which allows for the choice of further actions, depending on the student’s ability, and, therefore, the stated proposal is a method of following the instructions establishing the procedure for the implementation of human mental activity. At the same time, a person carries out the process of analyzing and processing information obtained as a result of training, which results in obtaining knowledge about the conduct of his further tactics.

Thus, the scheme developed by the applicant is a training program that allows everyone to acquire the skill and experience to memorize the alphabet, that is, it is a method of intellectual activity, which, in turn, in accordance with paragraphs 1 and 5 of Article 1350 of the Civil Code does not apply to decisions protected as an invention.

At the same time, the Court for Intellectual Property Rights also noted that it is impossible to establish a direct causal relationship between the individual intellectual activity of a teacher and the intellectual abilities of various groups of trainees, their physiological state and factors affecting the learning process as well as the achieved results which, in turn, should be consistently repeated, that is impossible in this case.

Based on the foregoing, the court of first instance concluded that there were no legal grounds for declaring the contested Rospatent decision not in accordance with the law.

The Presidium of the Court for Intellectual Rights left the decision of the court of first instance unchanged.

At the same time, the Presidium recognized as reasonable the conclusions of the court of first instance and Rospatent, indicating that the sequence of actions (method) is rightfully recognized by the training program, which allows one to acquire the skill and experience to memorize the alphabet, that is a method of intellectual activity, which, in turn, does not apply to protected objects as an invention.

The Presidium also noted that the patentability of the invention implies an unconventional, non-obvious way to solve the problem, the disclosure of this way in the description of the invention with a demonstration of the technical result at a more specific, functional level, allowing a more accurate assessment of creative, inventive contribution.

The conclusion of the Court in this case was to interpret and clarify the provisions of the Civil Code of the Russian Federation. In particular, it is noted that the claimed decision is not recognized as related to inventions in the sense of the provisions of paragraph 5 of Article 1350 of the Civil Code, in particular, if all the signs distinguishing the stated solution from its prototype are characteristic of decisions that are not inventions in accordance with this clause.

3. American Legal Regime
The basic legal structure for regulating intellectual property in the United States has its origins in the eighteenth century, as reflected in the United States Constitution and English common law precedents. This is enshrined in the Patent and Copyright Clause of the Constitution which empowers Congress “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.”

The fact that this essential framework has endured through the beginning of the twenty first century is truly remarkable, considering that it now applies to computers, software, artificial intelligence, nanotechnology, genetic and biomedical engineering, robotics, and other mindboggling technologies that were inconceivable to the founders of the United States. The survival of this intellectual property regime testifies to its durability and flexibility, as molded and expanded by successive generations of lawmakers. The underlying premise of the entire system remains unchanged - there is a “quid pro quo”: the inventor receive rewards in exchange for public disclosure. Inventors and creators, and companies employing such persons, require substantial financial incentives to promote industry, science and the arts, and should be rewarded for their efforts (in some instances, quite handsomely). At the same time, the public is entitled to the results of such innovation and creativity on terms and at times that are appropriate, balancing the competing public and private interests at stake.
3.1. Forms of protection of the results of scientific (scientific and technical) activity

There are four general types of legal protection for intellectual property in the United States, which have counterparts in most nations of the world: patents, trademarks, copyrights, and trade secrets.

3.1.1. Trade Secrets. Trade secrets consist of information and can include a formula, pattern, compilation, program, device, method, technique or process. To meet the most common definition of trade secret, it must be used in business, and provides an opportunity to obtain an economic advantage over competitors. It should be noted that all countries that are members of the World Trade Organization and are a party to the Agreement on Trade Related Aspects of Intellectual Property Rights (known as TRIPS) are obligated to provide trade secret protection. Article 39, paragraph 2, requires member nations to provide a means for protecting information that is secret, commercially valuable because it is secret, and subject to reasonable steps to keep it secret.

In the United States, trade secret protection, and the threat that computers can be hacked by increasingly sophisticated means, has become increasingly important. Until recently, state laws governed most litigation over these matters - with state judges and juries the forum for companies to seek remedies when their trade secrets had been compromised. In 2016, the Congress of the United States enacted The Defend Trade Secrets Act which created a federal cause of action, designed to enhance trade secret protection, with a choice for the parties to seek redress in the state courts or the federal courts, the latter preferred by many as being more efficient and effective in the scope of remedial action.

Courts can protect trade secrets by enjoining misappropriation, that is, theft, as well as by ordering damages. Criminal penalties are also possible, including jail time and high monetary fines for stealing trade secrets. It should be highlighted that if the trade secret holder fails to maintain secrecy or if the information is independently discovered, becomes released or otherwise becomes generally known, the protection as a trade secret is forfeited. Reverse engineering may also be an issue, which can jeopardize the sought after status of the invention.

Importantly, recovering from a person or entity who is guilty of stealing trade secrets can be a challenging task - requiring solid proof of the theft. Moreover, one has to secure jurisdiction over the malefactor - as well as its assets. If located in a foreign country, the challenge can be formidable. And if the malefactor is a foreign government entity, or one controlled by the foreign government, the remedies effectively available may be limited, and entail substantial expenses.

Whether an entrepreneur seeking to protect an invention should pursue the trade secrets path or apply for patents is a question that arises frequently. Filing a patent application means that the invention will generally be disclosed to the public in a relatively short period of time. Such publication will inform competitors of the invention, who may be able to design around it to try to avoid infringement, or may even attempt to commercially practice it in secret, in the hopes that the inventor will not discover the infringement, or finance the cost of litigation for patent infringement. Competitor’s plants may well be kept under tight security, and if the patent relates to manufacturing processes, it may be exceedingly difficult to discover an infringement.

Trade secrets protection may not run the same risk associated with publication, and do not expire like patents (which generally have a 20-year term). The most frequently cited example in classrooms is the formula for Coca Cola which has been successfully kept secret for well over a hundred years, with methods that are themselves secrets. On the other hand, trade secrets run the risk that a competitor could independently discover or reverse engineer the invention. Moreover, if a competitor subsequently achieves the same invention by independent means, and files for, and receives, a patent, the second inventor can not only exclude the general public, but also prevent the true, first inventor, from using his/her own invention. The calculations and assessments in resolving the above question require considerable legal and engineering expertise.

3.1.2. Patent Protection. Patents require the inventor to provide a detailed and enabling disclosure about the invention so that a third party has sufficient knowledge to build upon the invention. In
return, the inventor has the right to exclude others from practicing the invention for a limited period of time, generally 20 years from the filing date although there are some variations. Patents grant the inventor a legal monopoly to exclude others from making, using, offering for sale, selling, or importing the invention. The fundamental prerequisites include “novelty,” “non-obviousness,” and “usefulness” - terms of art that have been defined and explicated in judicial case law and administrative decisions of the United States Office of Patent and Trademark (USPTO) over many decades.

Importantly, it should be noted that there are certain circumstances that may require the patent holder to license his/her patent to third parties. Such a compulsory license generally provides that the owner of a patent must license the patent against payment either established by law or determined through some form of adjudication. In essence, the person seeking to use another's intellectual property can do so without seeking the rights holder's consent, and pays the rights holder a fee for the license.

This is a complicated subject matter which may arise in a variety of contexts, including the pharmaceutical industry where life-saving drugs are involved, as well as “national standard setting”. In the latter case, antitrust agencies in the United States have been concerned about the abuse patent holders may exercise by excluding competitors through standard setting organizations, which have proliferated in this high technology environment. Holders of what are termed “standard setting essential patents (SEPs)” that are selected for inclusion in a widely adopted standard may acquire additional market power. The concern is that the SEP holder may enjoy a special “premium” above and beyond that legitimately traceable to the individual patent.

To counter that enhanced power, requirements that the patents be licensed on terms that are “fair, reasonable, and non-discriminatory” have been imposed. This is a subject beyond the scope of this summary, but very important for understanding the modern debate in the United States over new technology developments [17].

3.1.3. Copyrights. Copyrights grants the creator of an original work exclusive rights to determine whether, and under what conditions, original work may be used by others. The is the form of protection commonly sought by novelists, academics, journalists, musicians, and since the advent of computers, software creators. The exclusive rights are not absolute, with exceptions which include “fair use.”

Typically, the duration of the right varies from country to country, expiring 50 to 100 years after the creator dies, depending on the jurisdiction. In the United States, the period is 70 years. Some countries require certain copyright formalities to establishing copyright, others (like the United States) recognize copyright in any completed work, without formal registration. However, registration does enhance the rights, and eases enforcement procedures. Generally, copyright is enforced as a civil matter, though some jurisdictions (again like the United States) include criminal sanctions.

In the 1970s and 1980s, there were extensive discussions on whether the patent system, the copyright system, or a sui generis system, should provide protection for computer software. The outcome of such discussions can be summarized, inadequately, to the effect is that computer programs can be protected by copyright, whereas apparatus using computer software or software-related inventions can be protected by patent. The ambiguities created by these distinctions are referenced later in this article.

3.1.4. Trademarks. A trademark is a recognizable sign, design, or expression which distinguishes products or services of a particular source from those of others, although trademarks used to identify services are formally termed service marks. A trademark may be located on a package, a label, a voucher, the product itself, or on company buildings.

The owner of a trademark may pursue legal action against trademark infringement. Most countries require formal registration of a trademark as a precondition for pursuing this type of action. The United States also recognize common law trademark rights, which means action can be taken to
protect an unregistered trademark if it is in use. Common law trademarks offer the holder, in general, less legal protection than registered trademarks.

Unlike other forms of intellectual property (e.g., patents and copyrights) a registered trademark can last conceivably forever. So long as a trademark's use is continuous, a trademark holder may keep the mark registered with the USPTO by filings certain documentations for renewal, as required.

3.2. Recent Supreme Court Cases and the Challenges of Modern Technology

The Supreme Court plays a very important role in the intellectual property regime of the U.S. economy, both domestic and as it affects the international arena. The nine Justices, appointed for life, are called upon to interpret, expand, and adapt the many concepts and competing interests of the patent, copyright, trademark, and trade secret laws as they confront new technology changes, the size, speed, and scope of which are rapidly expanding and accelerating. The resulting complexity and difficulty of the legal issues presented are truly formidable. The Court must now operate in a marketplace which a leading European economist describes as “The Fourth Industrial Revolution.” He explains:

“The fourth industrial revolution, however, is not only about smart and connected machines and systems. Its scope is much wider. Occurring simultaneously are waves of further breakthroughs in areas ranging from gene sequencing to nanotechnology, from renewables to quantum computing. It is the fusion of these technologies and their interaction across the physical, digital and biological domains that makes the fourth industrial revolution fundamentally different from previous revolutions” [18].

This interaction between the Supreme Court and the challenges presented by this new era can be illustrated by examining the recent decisions of the Court.

3.2.1. Patent trolling. We begin this survey with a case that highlight the unintended, and quite costly, consequences of combining a complex regulatory system with judges and lay panels (that is, juries) where aggressive litigants exploit the system to their financial advantage.

It has been widely perceived that, in recent decades, the kinds of inventions for which patents can be granted has been expanded substantially, and that companies of all sizes may be handicapped in introducing new products by patent holders who claim infringement of even inconsequential features [19]. This situation created what was politely called “patent trolls,” referring to the proliferation of companies who aggregate patents in a portfolio (which they do not practice themselves) and then search for targets to bring lawsuits, or to threaten lawsuits. Such litigants search for jurisdictions viewed as very favorable to plaintiffs. The situation was clearly spinning out of control when statistics showed that 35% to 40% of all patent infringement cases in the United States were brought in the courts of East Texas. There, the alleged infringer was reportedly the loser in 75% to 80% of the cases brought to trial. This provided a strong incentive for defendant companies to settle cases early in the process, increasing incentives for further litigation against other innovators.

Indeed, it was reported that one major international company was finding itself in court in East Texas so frequently that it donated funds for local civic projects in an effort improve its public image, anticipating that local citizens would be empaneled in upcoming jury trials involving the company [20]. The estimated costs of patent trolling ran into tens of billions of dollars, paid by small and large companies alike to avoid trip-wiring this litigation minefield [21].

Congress was the logical forum for addressing this matter, but it took the Supreme Court’s intervention in TC Heartland LLC v. Kraft Foods Group Brands, LLC [22] to rein in such abuses. It did so in a unanimous decision where it reinstated a restrictive reading of the venue statute (28 U.S.C. §1400) which governs where cases can be brought. That interpretation was first set forth in a 1957 decision (Fourco Glass Co. v. Transmirra Products Corp., 353 U.S. 222 (1957). Lower court readings of the venue statute in subsequent years expanded venue jurisdiction to include any district where the defendant conducted business, including sales of the patented product. That reading opened the courts
in East Texas, as well as many of courts in the United States, to patent infringement cases involving products sold nationwide, and was an underlying and unintended, causative factor in patent trolling.

In the TC Heartland case, the Supreme Court held that recent readings of 28 U.S.C. § 1400 were in error. Infringement cases were only authorized in the state where the defendant domestic company had incorporated or had a regular and established place of business. The 13 page decision avoided any reference to patent trolling, and merely explicited the legislative history of the venue statute to reached the intended result. The fact that patent pooling was not specifically discussed, however, does not mean that patent trolling was not an important predicate for the unanimous decision.

3.2.2. Improving the Patent System’s Review Process. In recent years, efforts have been made to improve the patent process to ensure that “bad patent” applications that “slip through” the USPTO and are initially issued can be revoked through administrative challenges. In Oil State Energy Services, LLC v. Greene’s Energy Group [23] the Court was called upon to address whether a new administrative procedure, called “inter parties review”, implemented by the America Invents Act of 2012, violated the Constitution. (The America Invents Act was designed to bring features of the U.S. patent system in line with international practice, as well as to authorize this new procedure). The Act provided that any party other than the patent holder could file a petition with the USPTO to cancel the patent on the grounds that the claim fails the novelty or non-obviousness standards for patentability. The Patent Trial and Appeal Board, an adjudicatory body within the USPTO, had relevant jurisdiction. The issue in the case was whether revoking a patent must be exclusively limited to a federal court through a jury trial.

The Court held that giving a “second administrative look” at a patent did not require judicial intervention, and that the 2012 legislation was constitutional in this regard. The majority found support by exploring the history of patent issuance and challenges going back to the Privy Council in England. That was an “administrative body” which had authority to revoke patents throughout the 18th century. Since the “Patent Clause in our Constitution was written against the backdrop of the English system, including the Privy Council,” the majority believed there was clear precedent for inter parties review.

Chief Justice Roberts and Justice Gorsuch entered a vigorous dissent to the majority’s holding, lamenting this “retreat from the promise of judicial independence.” They asserted that a patent constituted a personal right “no less than a home or a farm” - and that only independent judges could revoke a patent. They also read the historical record differently, concluding that at the time of the founding of the United States, only courts could hear patent challenges in England.

In SAS Institute, Inc. v. Iancu [24] the Supreme Court again had occasion to review the America Invents Act, focusing on whether the administrative review process must resolve all of the claims of a challenged patent, or whether the Director of USPTO could choose to limit review to only some of the claims. The Director argued for the latter. A majority of the Court disagreed, basing its holding on the express language of the statute.

Again, there was a dissent, this time joined by four Justices. They objected to the majority’s “wooden reading” of the statutory language, and believed the USPTO should have a way to weed out “insubstantial challenges” to patent claims. They endorsed the doctrine that administrative agencies should have “considerable authority to fill in, through interpretation, matters of detail related to it administration, citing Barnhart v. Walton, 535 U.S. 212, 225 (2002).”

3.2.3. The Availability of Copyright Protection to Interface Software - “the copyright lawsuit of the decade.” In late January 2019, Google filed a Petition for Writ of Certiorari (that is, a request that the Supreme Court exercise its discretion) to review two rulings that were made by the Court of Appeals for Federal Circuit (CAFC), a special court created in 1982 to hear appeals in patent, copyright, and trademark cases [25]. As set forth in their Petition, the case was “aptly described as the ‘copyright lawsuit of the decade’”. This petition will be closely watched case by the tech industry [26].
As Mr. Lee explained in his article: “An application programming interface [API] is the glue that holds complex software systems together. Until 2014, it was widely assumed that no one could use copyright law to restrict APIs’ use—a view that promoted software interoperability. Then, in 2014, a court known as the Federal Circuit Appeals Court issued a bombshell ruling taking the opposite view. Oracle had sued Google, arguing that Google had violated Oracle’s copyright by re-implementing APIs from the Java programming language. The case has been working its way through the courts ever since, with the Federal Circuit issuing a second controversial ruling in 2018. On Thursday [1/25/2019], Google asked the Supreme Court to overturn the Federal Circuit’s controversial ruling.”

“The Federal Circuit’s approach will upend the longstanding expectation of software developers that they are free to use existing software interfaces to build new computer programs,” Google wrote in its petition to the Supreme Court. James Grimmelmann, a copyright scholar at Cornell University and former software developer, agreed. "The Federal Circuit's decision threatens the continued vitality of software innovation," he told Ars Technica.

3.2.4. Defining the boundaries of patent subject matter eligibility with respect to inventions involving “abstract ideas”, “laws of nature” and “natural phenomena” [27]. 35 USC §101 addresses patent subject matter eligibility, i.e., what subject matter is eligible to be patented. This may be understood as a preliminary gatekeeping test assessed prior to evaluating the issue of patentability itself (which depends most significantly on 35 USC §102 (novelty) and 35 USC §103 (non-obviousness).

The Supreme Court in recent years has been called upon to delineate the meanings of “abstract ideas”, “laws of nature”, and “natural phenomena” in increasingly complex scientific and engineering contexts. The starting point is the proposition that laws of nature, natural phenomena and abstract ideas (for example, mathematical formula, mental processes, etc.) are “basic tools of scientific and technological work.”[28], and that granting patents for such discoveries would impermissibly burden the “building blocks” of progress, preempting their use by subsequent researchers. 132 S.Ct. at 1294. Such a result would undermine innovation instead of promoting it, the very purpose of the patent law regime [29].

The four cases - Mayo, Alice, Myriad Genetics, and Bilski, provided an opportunity for the Supreme Court to explicate the subtle contours of the “gatekeeping” tests for eligibility set forth in 35 U.S.C. §101. Collectively, these cases heightened, that is made more restrictive, the threshold determination of patent eligibility. This followed a period when the CAFC had lowered the threshold. Such efforts to open the gates somewhat wider had been subject to criticism.

The Myriad Genetics case is instructive, evidencing the complexity and difficulty of achieving a proper balance to create an optimal environment for innovation. Myriad Genetics was a pioneer in identifying the BRCA genes which are carried by a small percentage women and men, and which increases substantially the risk of breast cancer and other potentially fatal diseases. If identified, the human carrier can pursue remedial medical procedures. The discovery of the BRCA genes by Myriad Genetics was acclaimed as a monumental achievement - having isolated the genes among the approximately 8 million nucleotide pairs contained in a subpart of chromosome 17. “There is no more exciting story in medical science” [30].

Myriad Genetic applied for, and was granted, a patent by the USPTO on the BRCA genes, whose validity was upheld by the CAFC. A coalitions of twenty scientific associations, genetic counselors, women patients, cancer survivors and breast cancer and women’s health groups protested, represented by the American Civil Liberties Union (ACLU). The concern was that granting such a patent would unfairly, and expensively, impede the delivery of effective health care, and that a human gene was a natural phenomenon, ineligible for patent protection.

The Supreme Court agreed, and reversed the CAFC decision below. It held that two BRCA gene patents were invalid as “product of nature” and were not patent eligible merely because the patent holder had isolated them. In finding for the petitioners, however, the Court found that that manipulation of a gene to create something NOT found in nature, such as a strand of synthetically-
produced complementary DNA for which Myriad Genetics had received patent coverage, was patent eligible.

The Supreme Court also entered the fray as to the meaning of “laws of nature” in several recent cases. In Mayo Collaborative Services v. Prometheus Laboratories [31] two patents set forth processes identifying correlations between metabolic levels and the likely harm or ineffectiveness associated with the use of theophylline drugs to treat autoimmune diseases. The Court prefaced its opinion by noting that “Einstein could not patent E=mc$^2$” nor could Newton have patented the law of gravity” to illustrate the principle at stake. The Court found that the patents at issue were not valid, and that “the steps in the claimed processes (apart from the natural laws themselves) involve well-understood, routine, conventional activity previously engaged in by researchers in the field. At the same time, upholding the patents would risk disproportionately tying up the use of the underlying natural laws, inhibiting their use in the making of further discoveries.” See also Alice Corporation v. CLS Bank International [32], which invalidated a patent directed to facilitating the exchange of financial obligations between two parties by using a computer system as a third-party intermediary. The underlying “abstract ideas” was not patent eligible.

The complexity and challenges associated with this area - for attorneys practicing patent law, for the USPTO examining patent applications, and for the courts in resolving disputes - can be seen by reviewing the guidance provided by the USPTO as to what is and is not eligible as to inventions relating to abstract ideas, natural law, and natural phenomena. The USPTO has issued frequent guidance on this issue over recent years (see the official Internet website: https://www.uspto.gov/patent/laws-and-regulations/examination-policy/subject-matter-eligibility). The USPTO’s general manual of patent examiner guidance, called the MPEP (Manual of Patent Examining Procedure) can also be referenced, to obtain a succinct overview of these and other issues. The online version of the MPEP is searchable and well-bookmarked for easy navigation.

### 3.2.5. Overruling Precedent in View of New Economic Circumstances. South Dakota v. Wayfair, Inc. [33] wrestled with the question of overruling precedent in light of new economic circumstances. At issue was whether an out-of-state seller could be held responsible for payment of a state-imposed sales tax. In light of new technological developments, like Amazon and the respondent in that case, Wayfair, billions of dollars of transactions were now taking place every day through the Internet. Many of such sellers had no physical presence as such in most of the states, and were therefore exempt from responsibility for collecting state sales taxes pursuant to a Supreme Court decision in 1992 - Quill Corp. v. North Dakota [34].

At the time of the Quill decision, the Court found that requiring out-of-state sellers to collect the sales tax would unduly burden interstate commerce. The Constitution enacted a Commerce Clause “to avoid the tendencies towards economic Balkanization that had plagued relations among the Colonies and later among the States under the Article of Confederation.” The courts had responsibility to preserve “the free flow of interstate commerce,” and that imposing collection obligations arising from thousands of different taxing jurisdictions (state, municipal, and towns) would be unjustified.

In the Wayfair majority opinion, the Court found that the U.S. economy had dramatically changed since 1982, and that Quill must be overturned. Adhering to this precedent would create substantial market distortions. The majority cited the example of a business that sells some of its furniture from a small warehouse in North Sioux City, South Dakota versus a furniture business located in South Sioux City, Nebraska just across the border, which maintains a virtual showroom accessible in every State. The first business must collect taxes on all sales to customers in South Dakota under the Quill precedent. The second business, however, pays no taxes through its Internet presence if Quill applies. “This distinction makes no sense”, the majority found, and jurisprudence must be grounded on “functional, marketplace dynamics.” “The ‘dramatic technology and social changes’ of our increasingly interconnected economy’ mean that buyers are ‘closer to most major retailers’ than ever before - ‘regardless of how close or far the nearest storefront’ [35].
The majority opinion highlighted that in 1982 less than 2 percent of Americans had Internet access. In 2018, by contrast, the figure was about 89 percent. The Quill court could “not have envisioned a world in which the world’s largest retailer would be a remote seller.”

Notwithstanding the compelling arguments in support of these points, four of the nine Justices dissented. Chief Justice Roberts, speaking for the dissent, believed the decision to change the Quill precedent was Congress’ alone. “The Court should not act on this important question of current economic policy, solely to expiate a mistake it made over 50 years ago.”

“The [majority of the] Court is of course correct that the Nation’s economy has changed dramatically since the time that Bellas Hess and Quill roamed the earth. I fear the Court today is compounding its past error by trying to fix it in a totally different era. The Constitution gives Congress the power ‘[to] regulate Commerce l among the several States.’ Art. I. Section 8. I would let Congress decide whether to depart from the physical-presence rule that has governed this area for half a century.”

Although the Wayfair decision did not address intellectual property rights as such, it has important implications across the board.: Should Congress, or the Supreme Court, overturn precedent when new economic and/or technology conditions suggest, indeed possibly mandate, a reassessment of previous, and now flawed, analyses? We are likely to witness a recurrence of this debate as the case law develops in intellectual property law where technological advances inevitably alter prior, and what may be long held, assumptions at odds with current reality.

These Supreme Court cases evidence considerable intellectual prowess by the Justices and their law clerks as they evaluate exceptionally complex technologies and balance the need to provide incentives for inventors while creating an open environment for future scientific and industrial inquiry. In the short term, we can anticipate modest changes in the patent and copyright field. Over the much longer term, the consequences of The Fourth Industrial Revolution will necessarily require this entire intellectual property framework to be re-assessed in its entirety.

4. Conclusion
This brief survey of the Russian and American framework for regulating and protecting Intellectual Property highlights the many challenges confronting both countries. To be sure there are differences in their regulatory regimes, but they proceed from a common framework.

For example, until relatively recently, the United States was somewhat of an “outlier” in the international system by adhering to a “first-to-invent system” for establishing patent priority. When two people claim the same invention, the USPTO would conduct an interference proceeding between them to review evidence of conception, reduction to practice and diligence. Such proceedings could be an expensive and time-consuming process. In 2011, the United States shifted, however, to a “first-inventor to file” system which moved it much closer to the international norm which had long adopted a “first-to-file” system.

The difference between “first-inventor-to-file” and “first to file”, of course, is that ONLY inventors were qualified as applicants. This followed from the provisions of Article I, Section 8, Clause 8 of the US Constitution which gives Congress the power to "promote the Progress of ... useful Arts, by securing for limited Times to ... Inventors the exclusive Right to their respective ... Discoveries."

In Russia, as well as the rest of the world, the “first to file” rule allows a broad category of entities to file for patent protection, including state enterprises, organizations performing state or municipal contracts, and employers (unless the labor or civil contract with the employee provides otherwise). The United States rules also differ from Russia in allowing for a “grace period” under specified and very limited conditions which can affect the priority determination.

Notwithstanding these and a variety of other technical difference, the legal regimes to protect the results of scientific activity in Russia and the United States have many common features. First, the protection systems of both States are designed to create conditions to attract investment in the rapidly developing sector of science and technology, and to maximize incentives for technological innovation. Secondly, both the United States and Russia seek to harmonize their national intellectual property laws
in accordance with generally accepted international standards and best practices of foreign countries, which is facilitated by the participation of the two countries in the relevant multilateral international treaties. This is because today's economy and technology are truly international in scope. Finally, both States share a common approach in many critical areas, including the existence of a requirement for the filing of a patent application prior to the publication of information about the product or sales, refraining from marketing and sales, and signing non-disclosure agreements with all interested parties. The underlying criteria and predicates of patentability are quite similar. Such an approach gives hope for further convergence and unification of the legislation of both States in the field of protection of the results of scientific activity, which can create favorable conditions for the development of international technology transfer.

Acknowledgments
This research was supported by the Russian Foundation for Basic Research (grant 18-29-15022 mk "Ways, models and problems of regulation and protection of subjective rights in the field of obtaining, using, disseminating and protecting the results of scientific activity and scientific information").

References
[1] GOST 7.0-99. «Interstate standard. System of standards on information, librarianship and publishing. Information and library activities, bibliography. Terms and definitions». 1999.
[2] Resolution of the Government of the Russian Federation of January 14, 2002 № 7 «On the procedure for inventory and valuation of rights to the results of scientific and technical activities». 2002; 3:218.
[3] «Model Law on the Status of a Scientist and Scientific Researcher» adopted in St. Petersburg November 25, 2008 by Decree 31-14 at the 31st plenary meeting of the Inter-Parliamentary Assembly of the CIS Member States. 2009; 43:337.
[4] Order of the Government of the Russian Federation of April 14, 2004 № 467-p «On the negotiation of the signing of a Memorandum of Understanding between the Ministry of Education and Science of the Russian Federation and the United States Department of Commerce on cooperation in the field of technology and innovation». 2004; 16:1578.
[5] Partnerships for International Research and Education. Available from https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505038.
[6] Civil Code of the Russian Federation (Part Four) dated December 18, 2006 № 230-FZ. 2006; 52 (1):5496.
[7] Civil Code of the Russian Federation (Part Four) dated December 18, 2006 № 230-FZ. 2006; 52 (1):5496.
[8] Civil Code of the Russian Federation (Part Four) dated December 18, 2006 № 230-FZ. 2006; 52 (1):5496.
[9] Criminal Code of the Russian Federation dated June 13, 1996 № 63-FZ, 1996; 25: 2954.
[10] The Arbitration Procedure Code of the Russian Federation" dated July 24, 2002 № 95-FZ. 2002; 30:3012.
[11] Bliznets IA, Novoselova LA. The Court on Intellectual Property Rights in the System of State Authorities of the Russian Federation. Prospect Publishing. 2014; 17-28.
[12] Determination of the Judicial Board on Economic Disputes of the Supreme Court of the Russian Federation dated January 22, 2019 № 300-KG18-19429 in Case № CIP-631/2017. Not officially published.
[13] Civil Code of the Russian Federation (Part Four) dated December 18, 2006 № 230-FZ. 2006; 52 (1):5496.
[14] Decision of the Court of Intellectual Property Rights of September 24, 2015 on Case № CIP-308/2015. Not officially published.
[15] Morgunova E, Pogulyaev V, Korchagina N. Rights to the results of intellectual activity and means of individualization: a commentary on part four of the Civil Code of the Russian
Federation. Litres. 2018; 534-538.
[16] Decision of the Court of Intellectual Property Rights of December 18, 2017 on Case № CIP-482/2017. Not officially published.
[17] Abbott AF. US Government Antitrust Intervention in Standard-Setting Activities and the Competitive Process. Vanderbilt Journal of Entertainment & Technology Law. 2016; 18(2):1-22.
[18] Schwab K. The Fourth Industrial Revolution. Currency. 2016. p. 8.
[19] Downes L. The U.S. Supreme Court Is Reining in Patent Trolls, Which Is a Win for Innovation. Harvard Business Review [Internet] 2017 Jun [cited 2019 Jul 5]; [about 1 p.]. Available from: https://hbr.org/2017/06/the-u-s-supreme-court-is-reining-in-patent-trolls-which-is-a-win-for-innovation.
[20] Joe Nocera: the town that trolls built. Bloomberg Opinion. [Internet] 2017 May [cited 2019 Jul 2]; [about 1 p.]. Available from: https://www.bloomberg.com/opinion/articles/2017-05-25/the-texas-town-that-patent-trolls-built-j34rlmjc.
[21] Doing the Math on Patent Trolls: The U.S. patent system is a most efficient government program. Ipwatchdog. [Internet] 2016 Dec [cited 2019 Jul 7]; [about 1 p.]. Available from: https://www.ipwatchdog.com/2016/12/14/math-patent-trolls-u-s-patent-system/id=75683/.
[22] TC Heartland LLC v. Kraft Foods Group Brands LLC, No. 16-341, 581 U.S. (2017).
[23] Oil States Energy Services, LLC v. Greene's Energy Group, LLC, No. 16-712, 584 U.S. (2018).
[24] SAS Institute Inc. v. Iancu, 584 U.S. (2018).
[25] Google, Inc. v. Oracle America, Inc., No. 14-410, 584 U.S. (2019).
[26] Timothy Lee: Google asks Supreme Court to overrule disastrous ruling on API copyright. Ars Technica. [Internet] 2019 Jan [cited 2019 Jul 9]; [about 2 p.]. Available from: https://arstechnica.com/tech-policy/2019/01/google-asks-supreme-court-to-overrule-disastrous-ruling-on-api-copyrights/.
[27] The authors express their thanks to Douglas W. Pinsky, J.D., for his contributions to this section.
[28] Mayo v. Prometheus, 566 U.S. 66 (2012).
[29] Alice Corp. v. CLS Bank International, 573 U.S. 208, 134 S. Ct. 2347 (2014); Association for Molecular Pathologists v. Myriad Genetics, 569 U.S. 576, 133 S. Ct. 2107 (2013); Bilski v. Kappos, 561 U.S. 593 (2010).
[30] Batt S. Patient No More: The Politics of Breast Cancer. Gynergy Books/Ragweed Pr. 1994. p. 176.
[31] Mayo v. Prometheus, 566 U.S. 66 (2012).
[32] Alice Corp. v. CLS Bank International, 573 U.S. 208, 134 S. Ct. 2347 (2014).
[33] South Dakota v. Wayfair, Inc., 585 U.S. (2018).
[34] Quill Corp. v. North Dakota, 504 U.S. 298 (1992).
[35] Direct Marketing Assn. v. Brohl, 575 U.S. (2015).