Spis treści

Artykuły

Glosa

Contents

Gloss

Bartłomiej Biga

The Economic Analysis of Patent in Three Dimensions

Ekonomiczna analiza patentu w trzech wymiarach

Introduction

In the context of conducting an economic and social analysis of a patent as a leading instrument of an invention protection, one should think about deliberations concerning constructive features of this legal institution as they have got a fundamental meaning. The effectiveness of a patent is mostly determined by its width, length and height. Each of these dimensions is a subject of analysis in this paper. However, it will not be a separated analysis, because these features are strongly intermingled and we can observe a strong trade-off between them.

Deliberations of this text are a part of the research, which purpose is to answer the question: how strong should the legal protection of inventions be in order to get the biggest net benefits for a society? To put it simply, it is allowed to assume that – as a rule – social costs grow with the power of monopoly, which is created by granting a patent. At the same time, it has to be remembered that if potential innovators do not have a high enough level of economic incentives guaranteed, which is to a large extent dependent on the strength of a patent, then the supply of inventions will be smaller than it is expected by a society and as a result a social deadweight loss would appear. Therefore, the aspect how strong the legal protection of inventions should be is one of the key questions, which arise in the context of the economic analysis of intellectual property law.

According to the assumptions of law and economics, it is desired to seek such an invention protection system, which would be able to guarantee an appropriate speed of research. It would be achieved with the lowest possible level of incentives for creators. Looking at his issue from another perspective, it could

be observed that there is a need for choosing such a level of creators' protection, where marginal social costs and marginal social benefits are equalized[1].

If the initial marginal cost is lower than the marginal benefit, then the level of protection should be increased by a single unit, because this action generates more benefits than costs. This increase should be abandoned at the point, where the cost of increasing the level of protection is higher than benefits caused by such a change. The reverse mechanism should be used in the situation where the initial marginal cost is higher. W. Załuski proposed a graphical illustration of this deliberation for just one of the variables, which constitute the level of protection – for the duration time. However, for other variables, like the scope of protection, this graphic would be analogical[2].

Figure 1. Illustration of marginal costs and benefits of intellectual property law
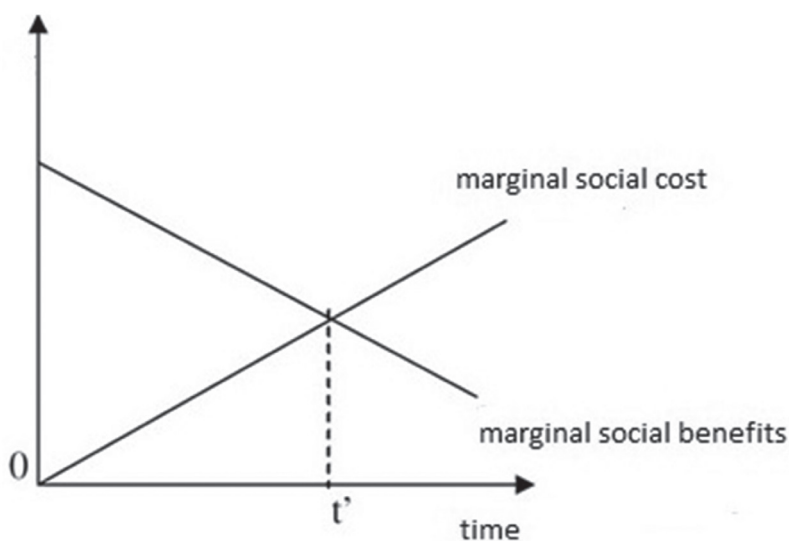
Source: Załuski, *Schemat…*,p. 110.

Moreover, the reason to establish and keep monopoly-based invention protection system can be noticed only in dynamic approach. Thus, in static research, limiting the spread of innovation warrants strongly negative assessment from

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[1]   W. Załuski, Schemat ekonomicznego ujęcia prawa własności intelektualnej, (in:) J. Stelmach (ed.), M. Soniewicka (ed.), *Ekonomiczna analiza w zastosowaniach prawniczych*, Warszawa 2008, p. 110; W. M Landes, R. Posner, 1989, *An Economic Analysis of Copyright Law*, "Journal of Legal Studies" 1989, vol. 18, no. 2, pp. 341-343.
[2]   W. Załuski, *Schemat…*, pp. 110 and following.

a social point of view. However, the promise of exclusivity (monopoly) generated by intellectual property is made to increase the level of incentives to innovation activity. The societies accept this limitation, because they want to keep relatively high level of invention supply in long term. Without such promise, as the result of prisoner's dilemma, potential inventions would prefer the "copy" over "create" strategy. One of the methods clarifying the discussion about patents is a glance at this issues from a reward / contribution perspective[3].

Without deeper understanding of the structural features of a patent, it is impossible to give an accurate answer to the question of how strong patent protection of inventions should be. The resultant of three patent constructional features will be the so called "strength of a patent". It seems that to illustrate this issue one should imagine the patent as a cuboid (figure 2). Then each of the patent's structural features would be seen as one of three cuboid's dimensions – width, length and height of a patent.

However, the strength of the patent is also determined by other – external – factors. In this paper, this factors are only mentioned. They are not described in detail, because the aim of this text is to explore relations between patent structural features, which which influence the strength of the patent much more. If we demonstrate patent as a cuboid, we can assume as hypothesis, that a given patent strength can be achieved as a result of many different combinations of those three structural features. The key question in this paper is which combination of patent structural features is the most effective to create the given (present) strength of a patent. Thus, it is worth to manipulate the relation between structural features because in some cases, the rule that strength of a patent corresponds directly to the amount of social costs does not work. Therefore, it is possible to reduce social inconveniences while maintaining the same amount of economic incentives for inventors.

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[3] C. Saphio, *Patent Reform: Aligning Reward and Contribution*, "Innovation Policy and the Economy" 2007, Vol. 8, pp. 141-142.

Figure 2., Patent structural features in three-dimension-model
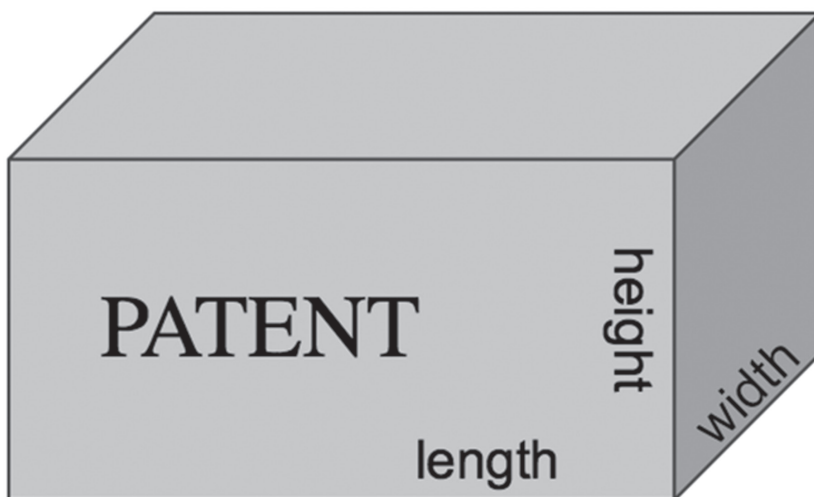
Source: Author's graph.

Such actions, which are one of the fundamental goals of law and economics, lead us to increase the efficiency of the described tool. These actions are the subject of research interest in this paper. Deliberations on how high the total strength of a patent should be or a problem in an access for databases and their quantification[4] will be treated as a background of the research issue, which was drawn above. The essence of this scientific description will be to answer the question – which combination of width, height and length of a patent will allow to maximize the efficiency of this institution as a tool for the protection of inventions.

Width of a patent

Width, which means the scope of the patent, defines a level of similarity of other inventions to the patented one whose violation means infringement of the patent. Therefore, it is the size of an invention range beyond which the activity

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[4]   B. Allered, W. G. Park, *Patent Rights and Innovative Activity: Evidence from National and Firm-Level Data*, "Journal of Intellectual Business Studies", Vol. 38, no. 6 (November 2007), pp. 878-900.

of competitors is legally allowed. In the literature The Rubic's Cube is given as an example. It has got six walls, each divided for criss-cross of 9 squares. According to the decision of the US court this invention does not violate earlier Moleculon's patent for a similar game where a cubic had walls divided into 4 squares[5]. It is a relatively rare statement for a very narrow scope of a patent. Analysing the case law one can rather finds arguments, which talk about a much broader scope of interest.

Assuming even a moderately wide scope of the patent, a monopoly obtained by a Moleculon would also include a variant with a wall spliced in a 3x3 way. Therefore, this corporation would get the exclusive right for profits gained from both variations of this game. Undoubtedly, wide patents are incentives for conducting fast research, because of far-reaching consequences of "the winner takes it all" rule. On the other hand, this situation reflects on the economic efficiency in a negative way, because it inevitably leads to the duplication of research. The expenditure incurred by all participants in the race for a patent, except from the winner, constitute a loss from the perspective of the inventor. In a social perspective, it seems to be better to describe it as a cost. With a narrow scope of a patent, creators are encouraged to conduct complementary research, which in turn are proceeded significantly slower.

Klemperer[6] mentioned that the width of a patent affects two categories of social costs - those of consumers not purchasing any member of the product class and those of consumers inefficiently substituting a less-preferred member of the class. A wider patent reduces the distortion of consumers' choices between the patented brand of the product and unpatented, lower-priced varieties of the product sold by competitors. However, a wider patent also permits higher prices and so increases (relative to profits) the deadweight losses from consumers switching consumption out of the product class. Thus, if demand is relatively more elastic in reservation price than in substitution cost, society should generally be more concerned with non-consumption and hence should narrow the patent scope to ensure low prices, while if the converse is true, society should generally be more concerned with substitution within the product class and hence should broaden patents' scope. More generally, a narrow patent is desirable when it causes relatively few consumers to substitute, that is, when demand is relatively inelastic in substitution cost. When demand is relatively inelastic in reservation

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[5] Moleculon Research Corp. vs CBS Inc., 872 F2d 407, 409 (Fed. Cir. 1989).
[6] P. Klemperer, *How Broad Should the Scope of Patent Protection Be*, "The Rand Journal of Economics" 1990, vol. 1, no. 1, pp. 126-127.

price, on the other hand, controlling price is relatively less important, and so broader patents are optimal[7].

The aspect of width of a patent is often analysed in a context of a horizontal spread of a product. In this approach technological innovations are seen as processes, which generate additional opportunities for consuming goods. As a result of different tastes of consumers – each variant of consumption has got its own demand and does not absorb the whole market. A wide patent covers a large part of the horizontal spread of a product, but it would be difficult to imagine that it could get it all[8].

Mazzoleni and Nelson[9] warn against a common wisdom, which is widespread among economists, lawyers and officials that strong and wide patents lead to economic growth. They mentioned that keeping a wide patent by a single company causes other companies to try to act beside this monopoly. These are imitations, which do not enhance economic efficiency – the more, the wider patent is. Then a further shift away from the optimal shape of the invention is required.

Length of a patent

On this basis of this, it is possible to put the next variable into deliberations – time. In this approach, a shorter duration reduces the amount of inventor's revenue, but it also increases social welfare, because it is limited by monopoly powers for a shorter time. The above-discussed width of a patent has got direct gear on a price, which could be demanded by a patent's owner. In this approach, the sum of benefits obtained from the invention is a ratio of time and price. This model differs significantly from the proposal of Klemperer, which was described before, because it notices the possibility of wider regulation of prices, as a substitute of a model, where making a wider patent means that consumers' tendency to buy the product is automatically reduced and it increases a social deadweight loss[10].

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[7] T. Van Dijk, *The Limit of Patent Protection*, "Essays on the Economics of Intellectual Property Rights", Maastricht 1994, p. 34.

[8] B. Verspagen, *Intellectual Property Rights in the World Economy*, essay from WIPO Arab Regional Sumposium on the Economic Importance of Intellectual Property Rights, Muscat, Oman 1999, pp. 8-9.

[9] R. Mazzoleni, R. Nelson, *The Benefits and Costs of Strong Patent Protection: a Contribution to the Current Debate*, "Research Policy" 1998, no. 27, pp. 273, 275.

[10] P. Klemperer, *How broad….*, pp. 126-127.

Length as a constructional feature of a patent is the time for which it is granted. In this moment it is necessary to emphasise that the method of economic analysis, which refers to comparison the balance states in the context of a constant technology – a static balance analysis – is not suitable for the intellectual property law. The immanent aspect of this branch of law is innovation and changing of technology[11].

The longer the duration of patents is, the more benefits related to acceleration in innovation activities society gets but the growth rate of these benefits probably decreases. Therefore, the marginal benefit from the increase of innovation decreases with the extension of the duration time of a patent. When the duration of a patent is exceeded, society bears higher costs due to a reduced distribution. In response to long-term patents society seeks substitutes of patented goods. And the longer it seeks, the more it finds. Therefore, as in the case of benefits, the growth rate of social costs of a patent, probably decreases with the extension of a patent length[12].

Due to the enormous diversity in inventions which could be patented, it is worth to consider the possibility of diversification of protection length in relation to specific industries. However, final conclusions in this area could be made only after a detailed analysis of at least two significantly different markets, such as the pharmaceutical and the IT market. The choice of these two areas is justified by the fact that the evaluation of patent in these two industries is extremely different. This issue will be explained below. It gives a chance to show how difficult it is to make a general assessment of a patent. Additionally, it is an opportunity to reveal the strongest points and the most serious weaknesses of the described institution.

People who are interested in keeping the patent protection system often cite the pharmaceutical industry. Ethical dilemmas are clearly visible in this area. Additionally, it is particularly vulnerable to easy unauthorized copying of inventions, which in combination with the extremely high cost of manufacturing justifies the introduction of a special protective regime. On the contrary, the possibility of granting software patents is highly controversial. Software is protected in copyrights way. And it seems that this kind of protection – modelled on literacy protection, is more appropriate and sufficient. It provides an automatic protection of a code, which is a result of intellectual programmer activity. Granting a software patent gives a much wider protection, because in

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[11]   R. Cooter, T. Ulen, *Ekonomiczna analiza prawa*, Warszawa 2009, p. 150.
[12]   R. Cooter, T. Ulen, *Ekonomiczna…*, p. 155-156.

this case a creation of a new implementation does not violate copyrights but it can be a violation of law.

In other words, software patents create patent thickets, which make entering a very difficult. Software patents are the source of large danger especially for independent innovators who do not have enough resources to do research in patent databases. If they gain a certain effect with a different code then it is not a plagiarism but it could be treated as a violation of patent. Therefore this phenomenon significantly reduces the overall level of innovation[13]. It is particularly dangerous because it happens in the industry, which gives a unique possibility for the independent creators – talented developers – to appear even without a financial backing.

Coming back to the considerations of constructional features, it is worth mentioning that one of first researches on economic efficiency of duration of patent protection was conducted by Nordhaus[14]. However, this research proved to be seriously flawed. His model was based on an assumption of a lack of pressure from other innovators. Yet it is hard to undermine that even if the extension of patent duration initially stimulates innovations in the next stage, when the innovation is patented, the welfare decreases as a result of a too long monopoly. The social deadweight loss of lack of competition increases with time. However, the competitiveness could lower the optimal length of patent significantly. Dore[15] took it into account, and noted that according to W. Nordhaus assumptions it is hard to find a reason to justify economic utility of a patent for more than two or three years.

Research from the 1980s showed that the critical limit for the optimal patent life is 8 years, with 50% efficiency of a patent in thirteenth year of protection. Moreover, 70% of patented inventions where imitated in the first year, and 60% in next four years. The result of this data is that, even if the legislator provides a very long time of patent protection, it could still play its role properly only in the first few years. Inventors also recognize the declining efficiency of a patent and therefore many of them resign from the payment of patent fees during the next years. It is illustrated in the following chart. The pace of decline is different in each patent office, but everywhere it is clearly visible. Hence, the maximum

[13]   J. Bessen, *A Generation of Software Patents*, Boston University of Law Working Paper no 11-31 (21 July 2011), p. 9.

[14]   W. Nordhaus, *Invention, Growth and Welfare : A Theoretical Treatment of Technological Change*, MIT Press. 1969.

[15]   M. H. I.Dore, J. Kushner, L. Masse, *The Optimal Length of a Patent with Variable Output Elasticity and Returns to Scale in R&D*, "Atlantic Economic Journal" 1993, vol. 21, no 1.

legal period of patent duration is significantly longer than its real lifetime. This discrepancy is beneficial mostly for patent trolls, because real inventors resign from patent protection earlier. This circumstance creates the possibility to make patent shorter

Figure 3. Percentage of patents maintaned in following years of patental protection
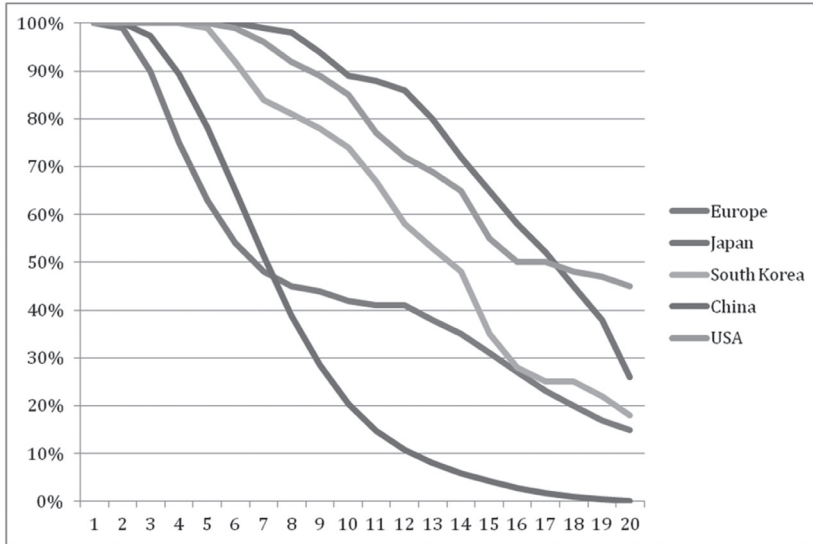
Source: IP5 Statistics Report (2011).

In this context, the proposal of Klemperer[16] seems to be very controversial. He suggested, that in many cases a narrow timeless patent would be the most effective. Additionally, he hints that this model could be used in situations when narrow patent causes that only a small part of consumers would choose the substitutes. It corresponds with the results obtained by Nordhaus[17] , who mentioned that optimal patent length depends on flexibility of a demand and flexibility in the range of a technical advancement in relations with expenditures on R+D. Therefore, with higher flexibility of demand for a new product, the optimal patent length is shorter, because of the fact that a high level of monopoly implicates significant deadweight loss. Additionally, in the situation when research is cheap, the optimal duration of patent protection is shorter too, because then it is not necessary to provide especially big incentives to maintain research.

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[16] P. Klemperer, *How broad…*, p. 127.
[17] B. Verspagen, *Intellectual…*, p. 8.

The main argument of the followers of narrow but timeless patents is the assumption that generally extending the patent generates additional costs by the means of extending deadweight loss related to the power of a patent holder in a certain market. In their opinion, in the case of extending the duration of protection the growth of inventor's benefits is higher than the growth of social costs. Therefore, they suggest that granting timeless patents with the minimal width is economically more effective because they could provide sufficient level of market power to guarantee the prize for an inventor on the demanded scale[18]. Additionally, the concept of timeless patent is supported in such philosophical ideas, which accent the fact that the right for innovation is an immanent right with its roots in a natural law. This aspect will not be described in this paper because it does not belong to Law and Economics.

A serious threat in making a patent a timeless institution is noticed even by the supporters of this concept[19]. It is related to the unpredictability of the economic reality even in a mid-term. Therefore, making petrification of a certain branch for a longer perspective is too risky. In this place it is impossible to avoid the question, how communication market would look today if the first inventors had been given an infinite monopoly. The growing dynamic of changes in the social and economic reality inclines to opt for a short patent. It is worth to consider situation when a longer patent protection would be possible but with a dynamic increase of patent fees for each year after 20-year period. However, it seems not to be a good solution for the most significant inventions. What needs to be emphasised is that most inventors abandon patent protection much earlier (Figure 3). But the owners of the most valuable patents would be still interested in keeping their patents even if the fee is being doubled each year. Therefore, some certain markets could be monopolized for a very long period time.

A bit different understanding of a relation between patent length and width was proposed by Gallini[20] . She defined it as a determinant of entrance to market protected by a patent. The scope of a patent is a cost, which must be taken by potential competitors to let them make imitation without violation of law. The income of inventors does not increase through the whole patent duration, because when the patent length exceeds the threshold of imitation, then some imitators would appear. Consequently they could change the monopoly pricelist

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[18] R. Gilbert, Shapiro, *Optimal Patent Length and Breadth*, "Rand Journal of Economics" 2012, vol. 21, p. 107.

[19] R. Gilbert, Shapiro, *Optimal…*, p. 108.

[20] N. Gallini, *Patent Policy and Costly Imitation*, "Rand Journal of Economics" 1992, Vol. 23, No. 1, p. 60.

into the oligopoly pricelist. Thus a too long patent protection encourages to spendthrift imitations instead of creating real innovations expected by a society. Therefore, according to Gallini's model, a patent should be long enough to generate the expected income for a patent owner and wide enough to prevent a harmful imitation.

The alternative of creating a patent policy based purely on a combination of width and time was revealed by Maurer and Scotchmer[21]. They proposed a wide implementation of licensing. It could dismiss the threat of such an imitator's activity, which would decrease the price resulting from monopoly. To make it happen, two conditions must be fulfilled – the cost of R+D of potentially entering entities must be at the same level as R+D cost of the first innovator and the license must keep such a high level of market price that it would be high enough to cover the costs of a patent owner. Then the width of a patent would give a possibility to regulate the price of a certain product, and licenses would prevent imitations.

Patent height

Beside a problem of patent infringement through its imitation, which was described while analysing a patent width, there is the second type of infringement, which is about improving a patented invention – especially in the context of low expenditures in relation to utility increase. The scope of legality of such actions is described as height of a patent. The higher it is, the further the improvements are located in granted patent for a primary invention.

Patent height is positively correlated with an incentive for conducting basic research. Thus, it could be used as a tool of intervention in a situation, when from the social perspective the number and the scope of basic research is not sufficient in relation to the number and the scope of work connected with improvements[22]. If social value of investments in basic research is higher than social value of investments in application development, then a patent should be higher. On the other hand, if social value of investments in application developing is higher than a social value of investments in basic research, then a patent height should be lower[23].

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[21] S.M. Maurer, S. Scotchmer, *The independent invention defence in intellectual property*, "Economica" 2002, 69(276), p. 535-547.
[22] T. Van Dijk, *The Limit…*, p. 67.
[23] R. Cooter, T. Ulen, *Ekonomiczna…*, p. 153.

Granting a high patent brings the risk that an inventor, who also gets a monopoly for further improvements, applications and next level inventions, would act inefficiently, because if the market mechanisms work properly, they prevent from waste. Additionally, the social cost of such solution is higher, because it blocks a possibility to work for many other innovators, who would improve and develop a certain base more efficiency. Moreover, the bargaining position of other inventors in relation to a person who has a strong patent, is too weak To negotiate a fair contract[24].

Without doubt the technical progress is continuous, in which artificially highlighting of phases could be hard to explain. It happens, when a patent is granted for a solution, which is in fact just a part of this process - often with arbitrarily drawn boundaries. This assumption puts the lower boundary in search of the optimal patent height on the relatively high level. In consequence of fuzzy patent boundaries it is rational to extract as few phases as possible, because the fewer boundaries have to be drawn, the smaller is the area of unpredictability. On the other, hand if the number of phases is too small, a certain branch is monopolized for too long.

A width of a patent could be described as a model of horizontal distinction. A height of a patent is in this context a model of vertical distinction. It is shaped mostly through the novelty requirement, which is executed when a patent is granted. Van Dijk[25] noticed that a social goal of setting an incentive for innovation is best realized with the restrictive understanding of this requirement. However, if early disclosure is a goal, then novelty requirement should be weaker.

This play a significant role in for the attempt to describe an optimal shape of a patent, because it could greatly play a role of limiting the number of granting patents. It seems to be very useful to improve the global economy efficiency of legal invention protection. It is a phenomenal criterion, which could be objectively used. Furthermore, its restriction is not contradictory to the immanent patent features. Thus a patent should be granted only if the invention is a real, remarkable step in development of a certain science or a technical branch.

Thinking about the usage of a novelty criterion in setting a patent's constructional features. It must be mentioned that in many legal systems there is a requirement that an invention has to be non-obvious and posses an adequate innovation level. These criteria are not sharp, and therefore their utility is relatively low. In fact, a subjective scope of a patent is set according to the doctrine

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24 R. Mazzoleni, R. Nelson, *The Benefits…*, p. 280.
25 T. Van Dijk, *The Limit…*, p. 40.

of equivalents. It refers to many court sentences, which explain, how close the equivalent between two inventions must be in order to conclude that a patent infringement has appeared. However, this doctrine is vague and unpredictable. What can be noticed is that courts have sometimes indicated that improvement of enormous commercial value should not be treated as violating a pioneer invention of low individually value[26]. Yet consumers assign a real value for improvement not for a basic invention. The consequences of using this interpretation could lead us to a shortage of basic research, and therefore it would be negatively assessed in law and economics[27].

The solution of this dilemma could provide a wider protection for the first-level inventions in the circumstances, when they have got low individual value, and as a result they could not generate sufficient income for their creator in the first stage of spreading. In the case of inventions of higher autonomous value, it is possible to think about narrower protection, because additional income for initial inventor does not have to be so high[28]. This approach is typical for law and economics, which sets the requirement of economy efficiency. It could be achieved only in the balance proximity between numbers of first- and second-level research.

It is interesting that solving this problem in an economic way is closer – in the context of justice – to the righteousness category than the above-mentioned doctrine of equivalents. It does not include the need to compensate expenditures for basic invention. It is a clear example that law and economics used without ignoring an ethical context do not lead to a moral monstrosity. Moreover, it could be a basis to argue for more justice solutions.

What is of crucial importance while comparing the difference between the width and the height of a patent is the cost benefits analysis. Thinking about the protection against improvements means taking the height into consideration. On the other hand, the width determines the level of protection against imitations. In fact only improvement generates new information - a new value instead of focusing on only copying created solution in a non-infringement way[29].

The fundamental difference is seen when customers' behaviour will be analysed. In the case of imitation, only a part of potential buyers would resign from buying a patented product. The number depends on both price flexibility of demand in a certain group and on substitution cost. In a situation of choosing

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[26]   Westingohouse vs Boyden Power Brake Co., 170 US 537, 572 (1898).

[27]   R. Cooter, T. Ulen, *Ekonomiczna…*, p. 153.

[28]   R. Cooter, T. Ulen, *Ekonomiczna…*, p. 154.

[29]   T. Van Dijk, *The Limit…*, p. 50.

between an invention and its improved version, the only factor, which could dissuade a consumer from buying a better version, is a much higher price, that vividly conveys the potential buyer. This distinction clearly shows what kind of economic consequences happen for a patent owner in the context of imitation and improvement made by another player on a market. Undoubtedly, improvements bear the higher threats for gaining profits from a patent. They can evoke a stronger price pressure.

Conclusion and recommendations

The main target of the presented conclusions and recommendations is to indicate the direction of changes, which would minimalize social welfare. It has to be analysed taking into account a complicated political context – both national and international. It makes building deep reforms very difficult. As a result, the recommended changes are as close to status quo, as it possible or they rely on such mechanisms, which are close to the existing ones. It is not a goal at this text to present a revolutionary patent protection system, which would be deprived of opportunities of even a partial realization. Additionally, the social reality changes so fast that implementing deeper reforms – which require much time – is very difficult because of a big delay between the decision stage, and the factual implementation.

Referring these deliberations to the current social and economics context, it is possible to express that it would be socially beneficial to form a patent as a short-duration and relatively wide institution. A fewer number of years for which a patent is granted, could reflect a permanent acceleration of technical development, which makes effective patent life shorter and shorter. Therefore, it would not be a significant change from the inventors' perspective. It would rather be an adoption to reality, and it would let us avoid disputes about alleged violations of over ten years in fact dead patents.

Furthermore, it could make easier to make extension of a vertical range of this institution and it would be even more effective to discourage for imitation. If a width of protection is big enough, then the phenomenon of action around the patent by a competitor would be economically feasible, which would reduce a social loss as well. In a link with shorter time of bearing costs for society, it would significantly reduce a sum of costs. However, a patent would be wider to provide similar incentives for innovators activity. It generates increased social costs – in the former the first years of patent, which in this proposal would be

the only years of patent protection – do not consume a whole generated and above described savings.

Moreover, if a patent is short, the problem of a patent height would disappear to a large extend. Because, if time for making improvements from the monopolist position is short, then blocking competitors in this area brings much lower social costs. Therefore, with a care of balance of an incentive system for the creators, with far-reaching shortening of the patent, it would be possible to design it as a very high institution.

Naturally, it is hard to indicate how many years a patent should be shortened. In this context it would be a very desirable would be to carry out the analysis about a diversification of a period for which a patent is granted in certain branches. Selecting criteria, which written into normative language would extend this institution making it higher and wider, would cause many problems. Additionally, the new approach to sentencing such court cases is required. However, the direction of reforms seems to be inevitable.

In conclusion, it is impossible not to share the concerns of Mazzoleni and Nelson[30] who claimed that change in intellectual property law in the direction of making patent institution stronger, could bring many troubles in the future. The world economy will not gain benefits from making patent stronger. Except from some branches – such as chemistry ones – a stronger patent would be characterized by a worse relation of generating benefits in relation to social costs.

The emphasis is also required due to the fact that social reality related to inventions changes very dynamically. It is an additional impediment for seeking the optimal solutions. Since, even if we have got very accurate diagnosis, as a result of a delay in its implementation into public policies, it could finally be classified as pointless. Additionally, there is a problem in an access for databases and their quantification. Moreover, we have to take into account some differences, which appear in global, regional, and local contexts.

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Summary

The effectiveness of patent is mostly determined by its width, length and height. Each of these dimensions is a subject of analysis in this paper. These three dimensions, together determine "the strength of a patent". Such perspective allows us to form a fundamental assumption that a given strength of a patent could be achieved as a result of many different combinations of those three factors, differing in terms of efficiency from the social perspective. This is the main hypothesis of this text. On this ground a key question is formulated – i.e. which combination of patent structural features is the most efficient to create the given (present) strength of a patent.

KEYWORDS: patent, intellectual property, structural features

Streszczenie

Efektywność patentu jest zdeterminowana głównie przez jego szerokość, długość i wysokość. Każdy z tych trzech wymiarów jest przedmiotem analizy w niniejszym tekście. Łącznie te trzy wymiary determinują całkowitą „siłę patentu". W tej perspektywie określona siła patentu może być osiągnięta w rezultacie różnych kombinacji wspomnianych wyżej trzech zmiennych i charakteryzować się różnym poziomem efektywności ze społecznego punktu widzenia. Jest to główna hipoteza niniejszego tekstu. Na jej bazie formułowane jest pytanie o to, jakie kombinacje cech konstrukcyjnych patentu pozwalają najbardziej efektywnie uzyskać założoną siłę patentu.

SŁOWA KLUCZOWE: patent, własność intelektualna, cechy strukturalne

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