PERIODICA POLYTECHNICA SER. SOC. MAN. SCI. VOL. 9, NO. 1, PP. 43–49 (2001)

PROTECTION OF INTELLECTUAL PROPERTY RIGHTS IN R&D ACTIVITIES

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Received: Dec. 10, 2000

Abstract

Functions of protecting intellectual property have been greatly reassessed in the past decade. Shortening product cycles and strengthening international character of the production have upgraded the role of market maker big companies in the field of R&D and patents. The companies spend great amounts on R&D at their own research bases, and also use the intellectual values of university research sites. Dependence of Hungarian university research sites on and their vulnerability to industrial commissions have increased. At the same time, the institutional and individual ways to protect intellectual products have weakened. The article discusses the most important Hungarian and TUB features of protecting intellectual property.

Keywords: intellectual property right, patent, innovation, R&D.

1. Introduction

Creative intellectual work is an essential element to all links of the innovation process. The protection and safety of intellectual values play the following roles in the innovation process:

- Part of the innovation chain
  One of the heights and results of the research-development process when protection is ensured.
- Medium of spreading innovation
  Utilisation and trade of works under protection promote the spread of the latest technical inventions, intellectual works. Protection, in addition to its role in the innovation process, exerts significant influence in other fields as well.
- Protection is an important commercial policy instrument
  Protection ensures exclusive utilisation right for the owner based on the exclusion of others and may guarantee significant competitive advantage.

- Protection of personal rights
  It ensures the financial-moral recognition of the inventor and gives possibility for action against imitation, reproduction and acquisition of intellectual products.
- Returns of innovation costs
  Industrial utilisation following legal protection for intellectual values ensures the returns of R&D costs.

Protection of industrial rights is not an organic, central issue of the innovation process, but it is an important instrument of knowledge-flow. The different innovation models (linear, chain-link, feedback, etc.) look at the starting and end points of innovation and the prime movers of innovation. It is, however, certain that patents are mainly related to the hard core of innovation, i.e. R&D activity.

2. Development of the Socio-Economic Background of Legal Protection

Following the changes in the 1990s, the number of Hungarian patents and innovations has fallen sharply. On the one hand, the funds earmarked for education and research have decreased and this fact affects the emergence of outstanding intellectual works, but, on the other, significant changes regarding the character of economic development cannot be ignored either.

Table 1. Changes in applications for patent

Applications	1995	1996	1997	1998	1999
From Hungary	1059	796	737	694	727
Of which: institutional	312	204	237	208	176
from inventors	747	592	500	486	551
from abroad	17.718	24.142	29.332	37.934	44.186

Source: Hungarian Patent Office, Annual report 1999.

The decreasing number of Hungarian patents in itself does not express the deterioration of economic competitiveness. The number of patents is only one indicator of the innovation process that is difficult to measure. This situation reflects rather the fact that the social-economic background for patents and the functions of patents also change. In the former – socialist – era, the inventing-innovative activity as a movement often led to spectacular results increasing the number of patent registrations. Following the change of the system, with the transformation, liquidation of the state companies the number of Hungarian patents has fallen. However, the number of applications from abroad has grown dynamically. The Patent Cooperation Treaty (PCT) simplifies and multiplies the international protection of patents. Judging the number of patents, we should not ignore that the economic era is changing. This change is characterised by strengthening economic competition shifted to international level, which urges continuous, forced pace for innovations

and technical-technological developments. Most of the time the innovation process requires the accumulation of great knowledge, concentrated teamwork and capital. The best conditions to achieve the above are provided by market maker companies and they operate in a global economy. This, however, does not mean that they are the only ones carrying on research work with substantial results. Innovation centres, however, develop at big companies; they have the best conditions. Forced competition compels the leading companies to renew their products constantly; they employ a great number of specialised researchers at their own research sites. They, however, are also ready to fund research sites where new solutions and other ways of product development also emerge. Market makers are continuously confronted with fast obsolescence of leading product and technology developments and shortening product cycles. The new products preserve their novelty for 3-4 years (in some fields 1-2 years) then other companies constituting the majority adapt, copy them or appear with similar products. Patenting the new products or follower utilisation could facilitate access for others and fast spreading of innovation. The company developing new product, procedure, however, is not interested in the fast spreading of patents. They are interested in the protection of novelty until the other companies catch up with them. Fast diffusion is also hindered by the slow patenting procedure. It is enough to mention that in Hungary it takes 18 months from the day of priority application to publish it, which ensures publicity.

An economic feature of patenting and protection procedures is the strengthening market position-protecting role of patents. A typical result is that following the Hungarian application for the dynamically growing foreign inventions, the full patenting procedure is not carried on. Following from the procedure, at the end of the 21- and 31-month international pre-examination stage, only a modest proportion of the applications, in Hungary some 15 percent, is maintained i.e. national procedure is requested.

3. Research-Development and Legal Protection

Solution to market or production problems appears as urgent demand at the research-development units of companies. Patent for the invention is a basic need for the companies; novelty offers protection against imitation or forgery.

Research work commissioned by industry at research institutes and research sites of higher education is characterised by strong result-orientation and financial compulsion that easier lead to inventions. Inventions resulting from non-corporate commissions, public tender funds and individual interest of researchers-inventors have the smallest possibility to become patents at these institutions. Research institutes cannot perform this task in great numbers since their funds are scarce and there are no persons able to manage the utilisation of inventions.

Success and efficiency of research work can be described by several indexes. Relative indexes make the comparison among institutes possible. The number of Hungarian patents by 100 researchers does not differ significantly at the three types

of research sites. The number of patents by HUF 1000, however, differs greatly. Higher patent expenditures of company research institutes also confirm this fact. University research sites are the most and the company sites the least cost-efficient, so better financial and instrument supply does not guarantee new inventions.

Table 2. Patent applications by research units, 1998

Designation	Research-development institute	Higher education research unit	Company research unit
Number of Hungarian inventions applied for	62	83	55
Number of foreign inventions applied for	4	12	305
Hungarian applications per HUF 1000 spent on R&D	3.0	4.8	2.1
Hungarian applications per 100 researchers	2.0	1.9	2.0
Foreign applications per 1000 researchers	0.1	0.3	11.2

Source: [Higher Education], own calculation

In the case of foreign inventions, the difference among the three types was outstandingly large. Applied inventions abroad by 100 researchers at company research sites are over 11, which is five times higher than at higher education sites. Foreign protection for companies is indispensable mainly to protect their markets.

Are there sectoral differences regarding the utilisation of research results? Research tasks are not concentrated on the same fields at the three types of research sites. Company R&D clearly concentrates on the leading economic branches, which rank second at research institutes and higher education research sites.

The order of importance for branches regarding the breakdown of R&D input at the different research units was the following:

Research institutes: 1. technical and scientific research, 2. safety and protection, 3. social studies, 4. chemical industry, rubber and plastic industry, 5. agriculture.

Higher education research sites: 1. technical and scientific research, 2. public health, 3. agriculture, 4. engineering industry, 5. education

Corporate research sites: 1. chemical industry, rubber, plastic industry, 2. technical and scientific research, 3. metal-working, 4. telecommunication, informatics, 5. manufacture of vehicles.

4. Diffusion of Inventions

Hungarian company case studies clearly indicate [4] that the role and frequency of buying patents, licenses was not substantial, companies more often use their own R&D capacities to boost their competitiveness. The OECD source cited by the volume shows a little more favourable situation (see the latest [OECD]). Based on the data, Hungary has an average position regarding the use of patents. The number of utilised patents is growing dynamically in Hungary, the dynamics is given by the utilisation of foreign patents. The number of Hungarian patents has decreased, in 1995 out of all the used patents 5.2 percent was of Hungarian origin (three years before this number was 13 percent) then slightly increased.

A typical feature of innovation at the Budapest University of Technology and Economics (TUB) is that it rarely comprises the full innovation process from the birth of the idea to the marketable product. R&D research work usually contains 1–2 links of innovation. In the current development stage of technical sciences, even a test of the basic idea requires a lot of money in most fields. Outstanding innovation could emerge systematically if teamwork built on reliable basic research could be funded. Based on case studies, out of the examined 42 cases 12 resulted in inventions, patents.

Table 3. Managing intellectual property (number of cases from 42 case studies)

Protection type	Basic research	Applied research	Experimental development	Technology transfer
No protection	1	4	5	1
Confidentiality agreement	2	6	4	2
Patent	3	3	6	–
Others	1	6	1	–

Source: [DÉVAI et al]

A precondition of patenting is industrial applicability, therefore the number of patents in basic research should be considered outstanding. Applied research and experimental development usually take the form of industrial commissions. The number of patents in this field is also significant, but not generally true for higher education. Transferring company research to universities is beneficial for both parties. The case studies showed that foreign companies and joint ventures (Siemens, MOL, MATÁV, Ericsson) invested great amounts in university research, and patent registrations were also the highest in this field. The company commissioning research usually has exclusive right for the utilisation of the resulting invention.

The company pays the costs of registration and maintenance if patent registration comes from industrial commission. The authors of the invention are listed, in this way they receive professional recognition. Since their financial resources are missing the inventors cannot participate in registration and utilisation and do not have share from the profits either. Following Western-European examples the

authors should be able to enforce their interests, protect their rights and share the profits. To ensure identical status and acceptance, however, financial vulnerability of researchers should be reduced.

Protection of intellectual property and recognition of values are to be ensured at higher education research sites. The significance of this problem today is highlighted only if controversial issues emerge. Teaching law pertaining to industrial rights and organisation of forums may help in this field but the general attitude should also change.

The future of inventions not funded by companies is even more uncertain at the University. The University has hardly any means to manage patenting and utilisation of patents and to fund registration. The University operates as an office, performs its duties as to registration and maintenance but does not have staff to manage utilisation which is essential for patents and its interest is only indirect, negligible.

- Number of applications for patent: from 1966, the first application for patent to August 2000 TUB (Budapest University of Technology and Economics) applied for 658 patents. The system was at its height between 1982 and 1988. At that time 40-60 applications were filed a year. The number of applications dropped sharply in the years of transition. In 1996 and 1998 there was no application at all. Recently, the University has undertaken the registrations of 1-2 inventions a year, for prestige primarily.
- Return of the costs of patent registration: out of 658 patents 160 have been utilised so far. The proceeds covered the expenses. Some patents have never been utilised but others have been utilised in several ways and the University has been paid significant royalties. Out of the existing patents, six have contract of utilisation. No user has been found yet for patents applied for in the 90s.

The University expects recovery of the expenses for sold inventions. A flexible regulation has however, been introduced instead of one-off cost deduction of costs and the University pays equitable inventor's fee from the first revenues already; providing incentive for research work in this way. The rule of accounting is the following: if no expenses are charged to the accounts when they are rendered, inventor's fee is 70 percent of the sales revenue. (If direct expenses are to be charged, the inventor's fee will proportionally decrease accordingly but cannot be below 20 percent of the sales revenue.) This regulation takes over a significant part of the initial risks and provides adequate incentive. The University, however, undertakes the registration and utilisation of fewer and fewer inventions, thus the establishment of a commonly funded centre or organisation that could mediate and take risks is indispensable in this field.

The third possible way of obtaining patents for university inventions is registration as individual patent but it has mainly unfavourable features. The costs of application and maintenance may be substantial especially if international protection is sought for. The risk of the inventor is great in the period of application if

no user is found later on, then – besides moral recognition – registration means financial loss. Case studies, however, indicated that research sites able to manage themselves, open to business life were present at the University. They are due to exceptional managerial skills but are not general in the majority of cases. What will happen to inventions whose patenting is not undertaken by the institution and the inventor does not try to organise registration? The number of inventions, which do not obtain patents because of the above reasons, is significant. In this way, important intellectual works do not gain their worthy positions and the chance of using them in the production process is decreasing.

As a result of inadequately financed R&D and underdevelopment in many fields of economic life, legal protection for intellectual works is not a central issue. Recognition and utilisation of intellectual results is handled on a large scale or their significance is ignored. Is protection needed? In spite of the negative examples, we must give an affirmative answer. Patents, know-how, trademarks and industrial patterns incorporated into the product ensure more favourable market position during sales. This is an adequate instrument to spread new technology, and protects the interests of inventors by legal means and this is to be emphasised in the motivation of patenting. The elements of counter-interests can be reduced by the general development of the economy and effective state assistance.

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