PATENT COURT OF KOREA

TWENTY-FIRST DIVISION

DECISION

Case No.	2016Na1899 Compensation for Employee Invention
Plaintiff-Appellant/Appellee	A Counsel for Plaintiff-Appellant/Appellee Attorney Shincheol KIM, Jiyeon LEE
Defendant-Appellee/Appellant	B Counsel for Defendant-Appellee/Appellant LEE & KO LLC. (Attorney in Charge Hongseon KIM, Inbeom YEO, Chungjeon OH)
District Court's Decision	Daejeon District Court Decision 2012GaHap37415, July 6, 2016
Date of Closing Argument	August 31, 2017
Decision Date	November 30, 2017

ORDER

1. The District Court's Decision including the Plaintiff's demand expanded in this court shall be amended as follows:

The Defendant shall pay KRW 257,006,469 and the following therefrom:

A. As to KRW 32,967,529, an amount calculated at an annual interest of 5% for the period from January 10, 2013 to July 6, 2016 and an amount calculated at an annual rate of 15% for the period from the following day to the date of full repayment;

B. As to KRW 17,532,471, an amount calculated at an annual interest of 5% for the period from January 10, 2013 to November 30, 2017 and an amount calculated at an annual rate of 15% for the period for the period from the following day to the date of full repayment; and

C. As to KRW 206,506,469, an amount calculated at an annual interest of 5% for the period from November 4, 2016 to November 30, 2017 and an amount calculated at an annual rate of 15% for the period for the period from the following day to the date of full repayment.

2. Among the total cost arising from this litigation between the Plaintiff and the Defendant, the appraisal cost shall be borne by the Plaintiff. Among the remaining cost except the appraisal cost, 90% shall be borne by the Plaintiff and the remaining 10% shall be borne by the Defendant.

3. In the money payment order under Order No. 1, the part for which the district court did not sentence provisional execution may be subject to provisional execution.

PLAINTIFF'S DEMAND AND APPELLANT'S DEMAND

I. Plaintiff's Demand

The Defendant shall provide the Plaintiff with KRW 5 billion and an amount calculated for KRW 5 billion at an annual rate of 15% for the period from the day following the service of a bill of complaint to the date on which KRW 5 billion is repaid in full (in the first instance, the Plaintiff demanded KRW 50.5 million and delinquency charges therefor and then expanded his/her demands as stated above in this court).

II. Appellant's Demand

1. Plaintiff

In the district court's decision, the part ordering the following obligations, which is the part the Plaintiff lost, shall be revoked. The Defendant shall pay the Plaintiff KRW 17,532,471 and an amount calculated at an annual rate of 15% for the period from the day following the service of complaint to the date

on which KRW 17,532,471 is repaid in full.

2. Defendant

In the district court's decision, the part that the Defendant lost shall be revoked. The Plaintiff's demand under such revoked part shall be dismissed.

OPINION

1. Background

A. Status of Parties

1) On October 22, 1968, B Co., Ltd. was established for manufacturing and selling copper, copper alloy, and processed goods (B Co., Ltd. is different from the current Defendant Company spun off from B Holdings Co., Ltd., as explained below).

2) On July 1, 2008, B Co., Ltd. changed its target business to a holding business, etc. that controls and develops subsidiaries by acquiring and owning stocks, etc. of subsidiaries, and changed its company name to B Holdings Co., Ltd. (hereinafter, B Co., Ltd. prior to the change of company name is also referred to as "B Holdings"). On the same day, B Holdings established the Defendant Company by spinning off its main manufacturing business part related to copper processing and special products (hereinafter, B Holdings and the Defendant Company are collectively referred to as the "Defendant, etc.").

3) On September 10, 1993, the Plaintiff joined B Holdings and performed, in the Defendant, etc., R&D, quality control, etc. together with E, who joined on October 9, 1988 (hereinafter, the Plaintiff and E are collectively referred to as the "Plaintiff, etc."). However, the Plaintiff resigned on December 1, 2012.

B. Completion and Patent Registration of Employee Invention at Issue

1) On December 1, 1994, the Plaintiff was designated as a head of the material development office at the Onsan Plant Material Technology Institute of

B Holdings, and on the same day, E was designated as a head of the Material Technology Institute.

2) While working at the Onsan Plant Material Technology Institute of B Holdings, the Plaintiff, etc. created an employee invention titled "high strength and high conductivity Cu-alloy of precipitate growth suppression type and production process" (hereinafter, the "Employee Invention at Issue"; each claim thereof shall be indicated in the form of "Claim 1 of the Employee Invention at Issue", and the same shall apply hereinafter). Also, the Plaintiff, etc. succeeded a right to obtain a patent right to B Holdings, and B Holdings filed an application therefor and obtained a patent right (hereinafter, the "Patent Right at Issue").

1) Title of invention: High strength and high conductivity Cu-alloy of precipitate growth suppression type and production process 2) Filing date of application/ date of registration/ registration number: December 8, 1995/ July 29, 1998/ No. 0157257 3) Claims Claim 1: A high strength and high electrical conductivity copper (Cu) alloy of precipitate growth suppression type comprising: nickel (Ni) of 0.5–4.0 weight%; silicon (Si) of 0.1–1.0 weight%; tin (Sn) of 0.05–0.8 weight%; copper (Cu); and inevitable impurities, wherein the size of precipitate particles is 0.5μm or less. Claim 2: The high strength and high electrical conductivity copper (Cu) alloy of precipitate growth suppression type comprising according to claim 1, comprising: nickel (Ni) of 0.5–3.0 weight%; and iron (Fe) or cobalt (Co) of less than 1 weight%. Claim 3: A method of producing a high strength and high electrical conductivity copper alloy, comprising: obtaining an ingot by melting and casting raw material comprising nickel (Ni) of 0.5–4.0 weight%; silicon (Si) of 0.1–1.0 weight%; tin (Sn) of 0.05–0.8 weight%; copper (Cu); and inevitable impurities; surface machining and cold rolling of the ingot; cold rolling[1] of the ingot by precipitation processing[2] at a

temperature of 450–502℃ for 5–12 hours; and tension annealing the ingot at a temperature of 350–550℃ for less than 90 seconds, wherein the size of precipitate particles is 0.5μm or less.

3) On October 22, 2008, the Defendant completed the registration of full transfer of the Patent Right at Issue based on the division of the corporate body.

C. Exploitation of Employee Invention at Issue

Since 1998, the Defendant, etc. has produced PMC26, which is a copper alloy product comprising copper, nickel, silicon, and tin, by exploiting Claim 1 of the Employee Invention at Issue. A brochure for PMC26 published in July 1999 by B Holdings states that PMC26 is composed of nickel (Ni) of 2.0%, silicon (Si) of 0.4%, tin (Sn) of 0.4%, and the rest is copper (Cu).

【Factual basis】 Undisputed facts, statements in Plaintiff's Exhibits 1, 2, 35, and 47 and Defendant's Exhibits 2, 8, 9, and 35 (including hyphenated numbers, if any), purport of the overall argument

2. Arising of Obligation of Compensation

A. Obligation of Compensation

In light of the factual basis stated above, the Employee Invention at Issue was invented by the Plaintiff, etc. in relation to their duties in a field that falls under the business of B Holdings while the Plaintiff, etc. worked as employees of B Holdings, the employer. Also, the Plaintiff, etc. succeeded to B Holdings a right to register a patent for the Employee Invention at Issue. Thus, B Holdings shall pay compensation to the Plaintiff under Article 40(1)[3] of the old Patent Act (prior to being amended by Act No. 6411, February 3, 2001; hereinafter, the same shall apply).

Furthermore, the Defendant, having been spun off from B Holdings, shall be jointly liable for the debts incurred by the company before the spin-off (Article 530-9(1) of the Commercial Act). Thus, the Defendant is jointly liable for the compensation for the employee invention in relation to the Subject Invention with B Holdings.

B. Defendant's Arguments and Discussion

1) Defendant's arguments

Since the Subject Invention is substantially identical to the prior art (Defendant's Exhibit 10), its novelty is denied. Alternatively, since a person having ordinary skill in the art to which the present invention pertains (hereinafter, the "PHOSITA") could easily invent the Subject Invention from the prior art, its inventive step is denied. Thus, the patent registration of the Subject Invention shall be invalidated. Since the Defendant, etc. earned no exclusive profit through the Employee Invention at Issue due to the grounds of invalidation stated above, the Defendant is not liable for the compensation to the Plaintiff for the employee invention.

2) Relevant laws

Article 40(2) of the old Patent Act provides that where an employer succeeds an employee invention from an employee, the amount of compensation shall be calculated in accordance with the profits to be realized by the employer from the employee invention and the extent of contributions made by the employer and the employee to the creation of the employee invention. Under Article 39(1) of the same Act, since an employer shall have a free non-exclusive license to a patent right even if the employer does not succeed the employee invention, the term "profits to be earned by an employer" means the profits to be earned by acquiring the status to practice the employee invention exclusively

1) A process to press and spread copper alloy coils thinly through rollers at room temperature.

2) The term "precipitation" refers to a phenomenon of separating a component from a solid solution (solid mixture in which alloy elements are evenly mixed). Further, the term "precipitation processing" indicates a manufacturing process to induce precipitation.

3) Where employees or officers of a corporate body or government employees establish an exclusive license over an employee invention or have an employer, etc. succeed a right to obtain a patent for an employee invention or a patent right for an employee invention by an agreement or work provisions, the employees or officers of the corporate body or government employees are entitled to reasonable compensation.

exceeding the non-exclusive license. Unless it may be deemed that an employer earns no exclusive profit from an employee invention which is succeeded from the employer and whose patent is registered due to grounds of patent invalidation, such as the fact that the employee invention is a part of publicly known technology or could be easily invented from the publicly known technology by the PHOSITA, etc., and a third party competing with the employer could easily know such facts, the exclusive profits from such patent right shall not be denied on an indiscriminate basis due to the fact that there are grounds to invalidate a patent on the employee invention. Also, the payment of compensation for the employee invention shall not be exempted. The grounds for invalidation could only be considered when calculating the exclusive profits from the patent right (see Supreme Court Decision 2014Da220347, January 25, 2017).

3) Whether novelty and inventive step of Claim 1 of Employee Invention at Issue are denied

a) Comparison of Claim 1 of Employee Invention at Issue and Prior Art

	Claim 1 of Employee Invention at Issue	Prior Art (Defendant's Exhibit 10)
1	Nickel (Ni) of 0.5–4.0 weight %, silicon (Si) of 0.1–1.0 weight %, and tin (Sn) of 0.05–0.8 weight %	Nickel (Ni) of 1.0 – more than 3%, silicon (Si) of 0.08 – less than 0.8%, tin (Sn) of 0.1–0.8%
2	Copper and inevitable impurities	Copper alloy, comprising: zinc (Zn) of 0.1–3%; iron (Fe) 0.007 –0.25%; phosphorous (P) 0.001 –0.2%; copper (Cu); and inevitable impurities
3	A size of precipitate particles is 0.5 μ	

	m or less.	

b) Commonalities and differences between inventions

As shown in the comparison table in 1) above, Element 1 has a composition component identical to the Prior Art. The two inventions have a common numeric range in their composition ratio in each composition component.

However, the Prior Art has zinc (Zn) of 0.1–3%, iron (Fe) of 0.007–0.25%, and phosphorous (P) of 0.001–0.2%, which are not explicitly included in Element 2 (hereinafter "**Difference 1**"). Also, the Prior Art does not restrict a size of precipitation particles as in Element 3 (hereinafter "**Difference 2**").

c) Whether Employee Invention at Issue is easily invented

Unless it is determined *ex post facto* on the premise that the content of the specification of the Employee Invention at Issue is already known, it is difficult to deem that the PHOSITA could easily create Claim 1 of the Employee Invention at Issue from the Prior Art, in light of the following circumstances:

(1) Disclosure, implication, etc. in Prior Art

The technical significance of Claim 1 of the Employee Invention at Issue is to provide a conductive copper alloy with excellent mechanical and physical properties, such as flame retardancy, high strength, high conductivity, etc., even omitting the solution heat treatment[4] by adding tin (Sn) of 0.05–0.8 weight % to a Cu-Ni-Si series alloy,[5] suppressing the generation and growth of

4) The term "solution heat" refers to a phenomenon in which a metal becomes a solid solution. Originally, the solution heat progresses naturally in part in a process to practice hot rolling in manufacturing copper alloys. However, better properties can be obtained in a precipitation processing process performed after the additional solution heat through a heat treatment process at a high temperature. In particular, materials with improved machinability can be obtained. This is referred to as "solution heat treatment."

5) This is a copper alloy created by Corson and composed of Cu, Ni, and Si. Although this is also called the Corson alloy, it is referred to here as the Cu-Ni-Si alloy.

precipitate, and finely dispersing the precipitate (Element 3 restricts the size of precipitate particles).

In the Prior Art, an object of adding tin (Sn) to a Cu-Ni-Si alloy is to improve the spring properties and bending processability of the Cu-Ni-Si alloy. Thus, it is difficult to deem that the Prior Art discloses or implies a technical idea of Claim 1 of the Employee Invention at Issue to the effect that the mechanical and physical properties, such as flame retardancy, etc., are due to suppressing the generation and growth of precipitate in the Cu-Ni-Si alloy. Also, it is difficult to view that the PHOSITA would be able to easily perceive the technical idea stated above from the Prior Art.

(2) Predictability of effect

Furthermore, as stated in the table shown below, Claim 1 of the Employee Invention at Issue has an effect of improving mechanical properties for "tensile strength," "spring strength," etc. compared to the Prior Art (a numeric value in parentheses is a median value). Also, the employee invention has the flame retardancy to keep 80% or more of the initial tensile strength up to about 500℃. Thus, Claim 1 of the Employee Invention at Issue shall be deemed to have newly discovered specific properties of an alloy by adding tin (Sn) and restricting the size of precipitate particles in Element 3, which the Prior Art never perceived. However, Claim 1 of the Employee Invention shall not be evaluated only to experimentally confirm an effect of the Prior Art or to have an effect not anticipated by the Prior Art.

	Tensile strength (TS)	Elongation (EL)	Hardness (HV)	Electricity conductivity (EC)	Spring strength (Kb)
Claim 1 of Employee Invention at Issue	60–77 (68.5)	7–10	175–250	40–57 (48.5)	40–62 (51)
Prior Art	56.1–61.5 (58.8)	7–9	X	37–53 (45)	38–46 (42)

Thus Claim 1 of the Employee Invention at Issue has an effect that could not be predicted from the Prior Art.

(3) Easiness of change in composition

The Prior Art contains zinc (Zn), phosphorous (P), and iron (Fe) in addition to tin (Sn). Thus, in light of the statements in the specification of the Prior Art shown below, these components indicate the essential means to solve a problem of the Prior Art or to obtain the properties of the alloy that the Prior Art intends to achieve. Thus, it would be difficult for the PHOSITA to easily conceive an idea that omits these components without damaging the original technical meaning of the Prior Art.

(c) Zn

Zn improves properties, such as solder thermal resistance, fissility, and movement resistance. However, such effects could not be obtained with a content thereof of less than 0.1%. Also, its solder thermal resistance would be degraded with a content thereof of more than 3%. Thus, its content is set to 0.1–3%.

(d) Fe

Fe improves the reliability of a coupler through an effect of improving hot rolling, an effect of improving plating heating, and adhesion by refining Ni-Si compound precipitates. However, such effects could not be obtained with a

content thereof of less than 0.007%. With a content thereof of more than 0.25%, the hot rolling is saturated and actually declines, and at the same time, the conductivity is also adversely affected. Thus, it content is set to 0.007–0.25%.

(e) P

P suppresses the deterioration of a spring property arising from the bending processing, improves the insertion/extraction properties of a coupler obtained by forming processing, and improves the movement resistance properties. However, such effects could not be obtained with a content thereof of less than 0.001%. Also, its solder thermal resistance and fissility would be substantially degraded with a content thereof of more than 0.2%. Thus, its content is set to 0.001–0.2%.

On the other hand, the specification of the Employee Invention at Issue states that "During this refining process, Zn below 1.0 weight %, and P, Mg, Zr, respectively up to 0.1 weight % could be added as deoxidizers ... Also, of the composition, Ni may be replaced with Fe or Co up to 1 weight %." Zinc (Zn), phosphorous (P), and iron (Fe), which are components in the Prior Art, can be added to the Employee Invention at Issue. However, it is difficult to deem that the zinc (Zn) and phosphorous (P) in Claim 1 of the Employee Invention at Issue have the same technical significance as the corresponding components in the Prior Art, in light of the following facts: Element 2 discloses components except nickel (Ni), silicon (Si), tin (Sn), or copper (Cu) as "inevitable impurities"; it is the technical idea that when melting and casting to prevent defect bubbles by removing oxygen in a molten metal, a deoxidizer is added in a small amount, forms an oxide by binding to oxygen, and is almost completely absent in the metal.

Ultimately, it is difficult to deem that the composition related to zinc

(Zn) and phosphorous (P) in the Prior Art is substantially identical to the composition of Claim 1 of the Employee Invention at Issue. Also, it could not be viewed that the PHOSITA would easily be able to arrive Element 2 by removing zinc (Zn), phosphorous (P), and iron (Fe) from the Prior Art without a particular motivation.

d) Summary

Thus, the inventive step of Claim 1 of the Employee Invention at Issue is not denied by the Prior Art.

Also, in light of each circumstance in paragraph c) stated above, it is difficult to deem that since Differences 1 and 2 only add, delete, or change a well-known practice in the art to, from, or in the solutions to a problem, a new effect would not occur. Thus, it may not be viewed that the two inventions are substantively identical. Ultimately, the novelty of Claim 1 of the Employee Invention at Issue is not denied by the Prior Art.

4) Whether novelty and inventive step of Claim 3 of Employee Invention at Issue are denied

Since Claim 3 of the Employee Invention at Issue contains the technical characteristics of Claim 1 of the Employee Invention at Issue without changing them, the novelty and inventive step of Claim 3 of the Employee Invention at Issue are not denied, provided that the novelty and inventive step of Claim 1 of the Employee Invention at Issue are not denied by the Prior Art as examined in paragraph 3) above.

5) Summary

Therefore, it may not be deemed that there are grounds for invalidation of the Employee Invention at Issue, such as the fact that the Employee Invention at Issue is already publicly known, or the fact that the PHOSITA would be able to easily create the Employee Invention at Issue from the publicly known

technology. Even if the inventive step of the Employee Invention at Issue is denied by the Prior Art, it is difficult to find any evidence that a third party competitor could easily know such facts, and thus the employer earned no exclusive profits at all from the patent right.

Thus, since the Defendant, etc. earned no exclusive profit from the Employee Invention at Issue, it is difficult to accept the Defendant's argument that the Defendant is not liable for the compensation to the Plaintiff for the employee invention.

3. Calculation of Just Compensation

A. Summary of Plaintiff's Arguments

The Defendant shall pay, to the Plaintiff, KRW 8,616,882,316 (KRW 689,350,585,341 as turnover × 50% as contribution to exclusive right × 10% as royalty rate × 50% as contribution as inventor × 50% as the Plaintiff's contribution) as just compensation for the Employee Invention at Issue. Thus, the Plaintiff seeks to be paid KRW 5 billion and delinquency charges therefor.

B. Calculation Criteria

1) Article 40(2) of the old Patent Act provides that "the amount of compensation shall be calculated in accordance with the profits to be realized by the employer from the invention and the extent of the employer and the employee's contributions to the creation of the invention. Where employees, etc. present reasonable determination methods, such methods shall be taken into account." According to the provision stated above, when calculating the compensation for an employee invention, various factors such as ① profits to be realized by the employer, ② the employer's contribution, ③ the inventor's contribution rate, etc. shall be considered.

Here, ① the phrase "profits to be realized by the employer" means any profit to be distributed between the employer and the employees. The profits

arising from the relevant patent to be realized by the employer are restricted to the profits whose causal relationship with the relevant patent is recognized. ② The phrase "the employer's contribution" means a degree of contribution to the completion of an invention by the employer's provision of R&D cost, research facilities, material cost, wages, etc. ③ The phrase "the inventor's contribution rate" means the degree of contribution made by the Plaintiff as a degree of creative endeavors that the employee invests to complete the relevant invention.

2) Even if an employer does not succeed an employee invention, the employer has a free non-exclusive license on a patent right. Thus, the phrase "the profits to be realized by the employer" means the profits to be realized by acquiring the status to exclusive practice of the employee invention exceeding a non-exclusive license. Meanwhile, the profits to be realized by the employer refers not to the accounting profits, such as business profits, etc. after settling profits and costs, but to the profits to be realized by the employee invention itself. If the profits arise from the employee invention itself, they are the profits to be realized by the employer irrespective of the results of settlement of profits and costs. Also, even if the products that the employer manufactures and sells are not included within the scope of rights in the employee invention, the profits arising from the employee invention can be evaluated as the profits of the employer due to the employee invention, provided that the sales of products that could replace the demand of products practicing the employee invention are increased by preventing competing companies from practicing the employee invention by means of the patent right for the employee invention (see, e.g., Supreme Court Decision 2009Da75178, July 28, 2011).

3) On the other hand, where only the employer practices the employee invention and a third party is not allowed to practice the same, the "profits to be realized by an employer" can be calculated as follows: (i) the profits are

calculated based on an amount corresponding to the royalties to be earned on the premise that the employer allows a third party to use the employee invention; or (ii) the profits are calculated based on the turnover exceeding a sales amount predictable when the employer permits a third party to practice the employee invention (the amount oversold).

The profits to be realized by the Defendant, etc., who are employers, for the period from when the Employee Invention at Issue is practiced to the day on which the relevant patent expires could be calculated by multiplying an exclusive right contribution rate, i.e. a manner to exclude the profits arising from a free non-exclusive license from an amount calculated by multiplying a hypothetical royalty rate by the sales amount of the employer calculated according to the following calculation formula:

> Compensation = ① Profits of Defendant, etc. arising from Employee Invention at Issue (sales amount of products of Defendant, etc. × hypothetical royalty rate × exclusive right contribution rate) × ② Contribution of employees (inventors) (1 - contribution of employer) × ③ Plaintiff's contribution rate in inventors

4) However, since it is very difficult to recognize various factors stated above through strict confirmation, a reasonable value shall be determined based on the purport of the overall argument and the results of evidence examination.

C. Concrete Calculation of Compensation

1) Profits of Defendant, etc. arising from Employee Invention at Issue

a) Sales of products of Defendant, etc. in which Employee Invention at Issue is practiced

In light of the purport of the overall argument and statements in Plaintiff's Exhibit 47 and Defendant's Exhibits 35 and 53, the sales amount of PMC26 sold from 1998 to 2015 by the Defendant, etc. is KRW 689,350,585,341

(the Parties did not argue on this point).

Type		Sales volume (ton)	Sales amount (KRW)	Type		Sales volume (ton)	Sales amount (KRW)
1998	Bare	18	91,000,000	1999	Bare	60	273,000,000
	Plating	69	403,000,000		Plating	261	1,238,000,000
	Total	87	494,000,000		Total	321	1,511,000,000
2000	Bare	64	301,000,000	2001	Bare	63	297,000,000
	Plating	518	2,647,000,000		Plating	849	4,360,000,000
	Total	582	2,948,000,000		Total	912	4,657,000,000
2002	Bare	126	562,000,000	2003	Bare	222	1,060,000,000
	Plating	1,248	6,352,000,000		Plating	1,359	7,139,000,000
	Total	1,374	6,914,000,000		Total	1,581	8,199,000,000
2004	Bare	232	1,391,000,000	2005	Bare	274	1,777,000,000
	Plating	1,848	12,423,000,000		Plating	2,644	18,872,000,000
	Total	2,080	13,814,000,000		Total	2,918	20,649,000,000
2006	Bare	312	2,820,000,000	2007	Bare	387	3,729,000,000
	Plating	2,999	29,342,000,000		Plating	3,646	36,995,000,000
	Total	3,311	32,162,000,000		Total	4,033	40,724,000,000
2008	Bare	340	3,560,000,000	2009	Bare	314	3,006,000,000
	Plating	3,229	33,896,000,000		Plating	3,129	28,615,000,000
	Total	3,569	37,456,000,000		Total	3,443	31,621,000,000
2010	Bare	728	7,837,000,000	2011	Bare	837	9,908,000,000
	Plating	5,201	48,601,000,000		Plating	6,614	69,985,000,000
	Total	5,929	56,438,000,000		Total	7,451	79,893,000,000
2012	Bare	752	7,543,000,000	2013	Bare	963	8,469,000,000
	Plating	7,168	71,915,000,000		Plating	8,652	81,124,000,000
	Total	7,920	79,458,000,000		Total	9,615	89,593,000,000
2014	Bare	1,080	9,282,000,000	2015	Bare	1,000	8,226,051,095
	Plating	8,932	76,358,000,000		Plating	10,355	88,953,534,246
	Total	10,012	85,640,000,000		Total	11,355	97,179,585,341
Total	Bare	7,772	70,132,051,095				
	Plating	68,721	619,218,534,246				
	Total	76,493	689,350,585,341				

b) Hypothetical royalty rate

(1) Concrete calculation

As examined in 2. B above, the technical significance of the Employee Invention at Issue is to provide conductive copper alloys with excellent mechanical and physical properties even without solution heat treatment

by suppressing the generation and growth of precipitate and finely dispersing the same. The Defendant, etc. came to produce PMC26, which is a vehicle connector using the employee invention with the technical significance stated above, and increased its sales sharply so that PMC26 could replace competing products from foreign competitors (see paragraph a) above). In light of these facts, it may be evaluated that the Employee Invention at Issue contributed substantially to technological innovation.

However, other competitors manufactured and sold products whose composition components and composition ratio are similar to those in Claim 1 of the Employee Invention at Issue (Defendant's Exhibits 11, 12, 45, etc.). Even where the manufacturing method in Claim 3 of the Employee Invention at Issue is used, it is obvious that it is required to optimize the detailed process and know-how to manufacture products that are competitive in terms of yield, quality, etc. (it seems that even the Defendant, etc. achieved their competitiveness by optimizing their detailed process over a long period of time).

As examined above, it would be reasonable to set a hypothetical royalty rate of the Employee Invention at Issue at about 2%, in light of all relevant circumstances the Employee Invention at Issue brings, such as the degree of technical innovation, improved effect, objective technical value, easiness and profitability of practice, etc.

(2) Defendant's arguments and discussion

(a) Defendant's arguments

On June 9, 2002, "C Industries, Inc.", which is the Defendant's U.S. corporation (hereinafter, "C"), entered into a license agreement with D to permit practicing of patents related to the manufacture and sale of products, such as MAX251C, etc. in the Americas and to transfer the relevant manufacturing technologies, and agreed to pay royalties (JPY 20 million + Output in kg × JPY

8) (Plaintiff's Exhibit 45). About 76,000 tons (KRW 689 billion) of PMC26 were manufactured and sold from 1998 to 2015. Thus, the royalties calculated for the period stated above according to the formula shown above are about 0.91%. Since the royalties stated above include even the transfer of manufacturing technology, the hypothetical royalty rate shall be lower than 0.91%.

(b) Discussion

It seems that the products have not actually been produced under the agreement above as the Defendant argues, and thus the royalties have not been provided at all. Thus, it would not be reasonable to apply the formula for royalties to an amount of sales in Korea up to about KRW 689 billion based on the practice outside of Korea for which the royalties have not been provided due to the non-existence of sales volume. This is so even in light of the circumstances stated in paragraph (1) above.

Thus, it is insufficient to overturn the recognition of hypothetical royalties as stated in paragraph (1) above only with statements in Plaintiff's Exhibit 45.

c) Exclusive right contribution rate

(1) Practice of Employee Invention at Issue

The Parties do not argue regarding the fact that the Defendant, etc. manufactured and sold PMC26 by practicing Claim 1 of the Employee Invention at Issue. Meanwhile, the Defendant, etc. changed their manufacturing process several times while producing PMC26 (Plaintiff's Exhibits 6, 9, 28, and 35; Defendant's Exhibit 38-1; etc.) Also, the Defendant, etc. changed the order of the processes in Claim 3 of the Employee Invention at Issue or included the solution heat treatment, which was not included in the claims. Even if the production method of PM26 is not included in the scope of rights of Claim 3

of the Employee Invention at Issue, it may be deemed that at least PMC26 could replace the demand for products manufactured according to Claim 3 of the Employee Invention at Issue, and that the employer increased its sales by preventing competitors from practicing the employee invention with the patent right of Claim 3 of the Employee Invention at Issue. Thus, the profits arising therefrom may be evaluated as the profits of the employer due to the employee invention.

However, the profits from Claim 1 and Claim 3 of the Employee Invention at Issue arise from the manufacturing and selling of the same products, and thus it is difficult to divide and evaluate them accordingly. Thus, a uniform exclusive right contribution rate is calculated in light of the following circumstances:

(2) Concrete calculation of exclusive right contribution rate

(a) The exclusive right contribution rate may be evaluated highly in light of the following circumstances:

i) As stated in paragraph b) above, it may be evaluated that the Employee Invention at Issue substantially contributes to technological innovation.

ii) The Defendant sold products up to about KRW 689 billion by practicing the Employee Invention at Issue.

(b) The exclusive right contribution rate may be restricted in light of the following circumstances:

i) Other competitors manufactured and sold products whose composition components and composition ratio are similar to those of Claim 1 of the Employee Invention at Issue (Defendant's Exhibits 11, 12, 45, etc.).

ii) Even where the products are manufactured under Claim 3 of the Employee Invention at Issue, it is obvious that it is required to optimize the detailed process and know-how thereof to produce products which are

competitive in terms of yield, quality, etc. It seems that the Defendant, etc. have secured competitiveness in terms of yield, quality, etc. by utilizing their know-how, optimizing their detailed process over a long period of time, and expanding their manufacturing facilities (Defendant's Exhibits 17 through 24, 44, etc.).

iii) The Defendant, etc. changed their manufacturing process several times while producing PMC26 (Plaintiff's Exhibits 6, 9, 28, and 35; Defendant's Exhibit 38-1; etc.). Also, the Defendant, etc. changed the order of processes in Claim 3 of the Employee Invention at Issue or included the solution heat treatment, which was not included in the claims.

iv) It is evaluated that the Defendant, etc. were able to achieve great success in the sales of their products not only due to the technical characteristics of the Employee Invention at Issue but also due to their status, prestige, sales network, brand recognition, attractiveness to customers, promotion and marketing activity, etc. In particular, in light of the fact that the exclusive right contribution rate shall be calculated based on an amount oversold compared with a case in which the employer practices the Employee Invention at Issue with a free non-exclusive license, it would be experientially obvious that the monopolistic status of the Defendant, etc. in the relevant market would contribute thereto substantially (however, specific circumstances, such as the fact that the Defendant's market share in the copper rolling market in 2016 was 48% (Defendant's Exhibit 45) shall also be considered).

(c) Summary

In light of the circumstances stated above, the exclusive right contribution rate of the Employee Invention at Issue shall be set to about 15%.

d) Summary: Calculation of profits to be realized by Defendant, etc.

Thus, the profits to be realized with the Employee Invention at Issue by

the Defendant, etc. shall be about KRW 2,068,051,756 (KRW 689,350,585,341 as product sales of the Defendant, etc. × 2% as hypothetical royalties × 15% as exclusive right contribution rate; the number is rounded to the ones place).

2) Contribution of employees (inventors)

a) The contribution of employees may be evaluated highly in light of the following circumstances:

i) The Plaintiff joined B Holdings after obtaining his/her doctorate in metal engineering and created the Employee Invention at Issue while he/she performed the development works as a head of the Material Development Office. The Employee Invention at Issue was created through continuous experiments, research, etc. based on professional knowledge, experience, etc. of the Plaintiff, etc. in copper alloys (Defendant's Exhibits 8 and 9).

ii) It seems that the Plaintiff, etc. led the selection of research projects related to the Employee Invention at Issue.

b) The contribution of employees may be restricted in light of the following circumstances:

i) It seems that the long-accumulated technology of the Defendant, etc. had a substantial effect on the completion of the Employee Invention at Issue, in light of the following facts: the Defendant, etc. had developed technology for Cu-Ni-Si copper alloys, such as PMC102, 102M, etc., before completing the Employee Invention at Issue; and the manufacturing process of PMC26 is substantially identical to that of PMC102 (Plaintiff's Exhibit 8-2), etc.

ii) It seems that it is essential to repeat experiments and evaluation to complete the Employee Invention at Issue. Thus, it is empirically obvious that the Defendant, etc. have spent human resources and material resources. In particular, it seems that expensive equipment would be required to repeat the experiments and evaluation.

c) Summary

In light of the circumstances stated above, the contribution of the employees shall be set to 25%.

3) Contribution rate of Plaintiff

Since the Plaintiff, etc. jointly completed the Employee Invention at Issue, it would be reasonable to deem that the contribution rate of the Plaintiff shall be 50%.

4) Summary: Calculation of compensation for employee invention

Thus, the Plaintiff's reasonable compensation for the employee invention shall be KRW 258,506,469 (KRW 2,068,051,756 as profits of the Defendant, etc. × 25% as the contribution of the employees (inventors) × 50% as the contribution rate of the Plaintiff; rounded down to the nearest won).

Therefore, the Defendant shall pay KRW 257,006,469 (KRW 258,506,469 as the compensation for the employee invention – KRW 1,500,500 as the compensation for the employee invention paid to the Plaintiff from B Holdings) and delinquency charges therefor to the Plaintiff, unless there are special circumstances.

4. Discussion of Defendant's Plea for Statute of Limitations

The opinion of this court is the same as the statements in paragraph 5 of the decision in the first instance. Thus, the same is cited under the body of Article 420 of the Civil Procedure Act.

5. Conclusion

A. Therefore, the Defendant shall pay the Plaintiff **KRW 257,006,469** and delinquency charges calculated, as sought by the Plaintiff, of **KRW 32,967,529**, which is an amount admitted by the first instance, at an annual rate of 5%, under the Civil Act, from January 10, 2013, the day following service of the complaint, to July 6, 2016, which is the decision date of the first instance wherein it was

admitted that it was reasonable for the Defendant to plead against the existence or scope of an obligation to perform and at an annual rate of 15%, under the Act on Special Cases Concerning Expedition, etc. of Legal Proceedings, from July 7, 2016, the day following the decision of the first instance, to the day on which the Defendant pays the same in full. Further, the Defendant shall pay the Plaintiff the delinquency charges for **KRW 17,532,471** (KRW 50,500,000 as an amount claimed in the first instance – KRW 32,967,529 as an amount admitted in the first instance), as sought by the Plaintiff, at an annual rate of 5%, under the Civil Act, from January 10, 2013, the day following service of the complaint, to November 30, 2017, which is the decision date of this court wherein it was admitted that it was reasonable for the Defendant to plead against the existence or scope of an obligation to perform and at an annual rate of 15%, under the Act on Special Cases Concerning Expedition, etc. of Legal Proceedings, from December 1, 2017, the day following the decision of this court, to the day on which the Defendant pays the same in full. Also, the Defendant shall pay the Plaintiff the delinquency charges for **KRW 206,506,469** (257,006,469 - KRW 32,967,529 as an amount admitted by the first instance – KRW 17,532,471), which is the remaining amount in the amount that is additionally admitted by this court, as sought by the Plaintiff, at an annual rate of 5%, under the Civil Act, from November 4, 2016, the day following service of the application for amendment to the Plaintiff's Demand and Ground for Demand, to November 30, 2017, which is the decision date of this court wherein it was admitted that it was reasonable for the Defendant to plead against the existence or scope of an obligation to perform and at an annual rate of 15%, under the Act on Special Cases Concerning Expedition, etc. of Legal Proceedings, from December 1, 2017, the day following the decision of this court, to the day on which the Defendant pays the same in full.

B. The Plaintiff's claim at issue is reasonable within the scope of admission

above and is accordingly granted. However, since the remaining claims are without merit, they shall be dismissed. The first instance decision is inconsistent with the above conclusion in part and therefore the Plaintiff's claim as expanded in this court is accepted in part, and the first-instance decision shall be amended as in paragraph 1 in the Order. It is decided as ordered.

Presiding Judge Hwansoo KIM

Judge Jootag YOON

Judge Hyunjin CHANG