

Study on Supreme Court's Decision for Case No. 2019Hu12094

1. The subject case

Case No.: 2019Hu12094

The subject patent: Korean Patent Application No. 10-2015-7021990, "METHOD OF TREATMENT OF A FERROUS ALLOY SHEET"

Date of decision: January 13, 2022

2. Gist of the Decision

(1) How to determine inventive step of an invention

For determination on inventiveness of an invention, it should be examined first by grasping the scope and content of prior art and differences between the invention the inventiveness of which is to be determined and the prior art based on evidences regarding the technical level of a person skilled in the art to which the invention pertains (hereinafter, referred to as 'a skilled person in the art') and then reviewing whether, despite a difference between the invention the inventiveness of which is to be determined and prior art, the invention can be very easily invented by making up the difference, in light of the technical level at the time of filing. In this case, **the determination on whether a skilled person in the art can easily invent the invention should not be made based on hindsight analysis on the assumption that he/she is in the knowledge of the art disclosed in the specification of the invention the inventiveness of which is to be determined.**

(2) How to examine whether inventiveness of the invention is denied based on the cited prior art

In order to determine whether the inventive step of an invention is denied based on a cited prior art reference, **the invention must be compared and determined based not only on some disclosures that could deny the inventive step but on what can be reasonably recognized by a skilled person in the art based on the entire prior art reference.**

3. Details of the Case

(1) Facts

A. The petitioner filed a patent application for a method of treatment of a running ferrous alloy sheet. However, the examiner at the KIPO finally rejected the application on the ground of lack of inventiveness over D1.

B. The petitioner filed an appeal against the final rejection with Trial No. 2017WON3154, but the IPTAB denied the appeal, holding that the invention could be

easily invented by a skilled person in the art from D1. In response, the petitioner filed a Petition for Cancellation of Trial Decision.

(2) Original judgment (Patent Court)

A. There is a difference in that while the molten oxides bath has a viscosity between $0.3 \cdot 10^{-3} \text{ Pa.s} \sim 3 \cdot 10^{-1} \text{ Pa.s}$ in the present invention, D1's molten salt bath has a viscosity of no more than 100 poise.

In addition, there is a difference in that while the molten oxides bath of the present invention comprises $10\%w \leq \text{Li}_2\text{O} \leq 45\%w$, D1's molten salt bath comprises 0 to 6.0 wt% of Li_2O .

B. D1 improves the adhesion of coating by removing oxidation scale in ferrous alloy sheet surface; thus, its technical task overlaps with that of the present invention.

In addition, D1 limits the viscosity preferably to no more than 100 poise (10Pa.s) to decrease the adhesion amount of coagulation film, which is also why the present invention limits the viscosity.

Further, it can be fully expected that the lower the viscosity the smaller the adhesion amount of molten oxides. There is no objective material supporting how much the adhesion amount of molten oxides is on the ferrous sheet surface when the viscosity of the bath is limited as in the present invention.

Moreover, the numerical range of the viscosity of bath overlaps between D1 and the present invention. Accordingly, the limitation of the numerical range of the viscosity of bath in the present invention has no critical significance, and it is reasonable to say that it is a simple numerical limitation that can be appropriately selected and carried out by a skilled person in the art after general and repetitive experiments.

C. In general, viscosity of bath can be properly adjusted by a skilled person in the art in consideration of working conditions such as composition, temperature, etc. of bath. The present invention and D1 both decrease the viscosity of bath by controlling the composition and temperature of bath so that there is rarely no oxides or a small amount of oxides remains on the sheet surface when ferrous sheet is taken out from the molten oxides bath; thus, there is no difference, and the range of the viscosity of bath overlaps.

In addition, there is no material confirming that there is a remarkable difference in effect inside and outside the numerical limitation of the amount of Li_2O .

Meanwhile, D1 discloses, 'Addition of Li_2O in an amount greater than 6.0% should be avoided because peelability of the coagulation film deteriorates due to excessively good adhesion between the coagulation film and the band steel surface.' However, it can only be understood that addition of Li_2O exceeding 6.0%

in D1 deteriorates 'peelability' of the coagulation film in the working environment of composition and temperature selected by D1, but it does not teach away from decreasing 'viscosity' of bath, which is a completely different property than 'peelability.'

(3) The Supreme Court's judgment

A. The present invention limits the viscosity of the molten oxides bath to $0.3 \cdot 10^{-3} \text{ Pa.s} \sim 3 \cdot 10^{-1} \text{ Pa.s}$, the surface of said bath being in contact with a non-oxidizing atmosphere, and specifies that the amount of Li_2O in the composition of the molten oxides bath is $10\%w \leq \text{Li}_2\text{O} \leq 45\%w$. D1 is different from the present invention in the range of viscosity of the molten salt bath and the amount of Li_2O in the composition of the molten salt bath.

B. D1 discloses that the preferably viscosity of the molten salt bath is 'no more than 100 poise' and it does not disclose the lower limit of the viscosity; however, D1 is an invention based on the range of viscosity having enough adhesion to form a coagulation film on band steel surface immersed in the molten salt bath. Therefore, a skilled person in the art can reasonably understand from overall disclosures of D1 that the lowest viscosity that allows formation of the coagulation film would be the lower limit of the viscosity. Meanwhile, if the viscosity is ' $0.3 \cdot 10^{-3} \text{ Pa.s} \sim 3 \cdot 10^{-1} \text{ Pa.s}$ ', i.e., 0.003 poise $\sim$ 3 poise, as in the invention, which is excessively lower than 100 poise, the molten salt does not adhere to the surface of the band steel even when the band steel is immersed in the salt bath and then taken out, but only a few droplets remain on the surface of the salt band steel and the coagulation film is not formed. Accordingly, it seems that modifying the viscosity of D1 to the range of ' $0.3 \cdot 10^{-3} \text{ Pa.s} \sim 3 \cdot 10^{-1} \text{ Pa.s}$,' at which the coagulation film cannot be formed, could not be easily conceived by a skilled person in the art because it would then lose its technical significance.

C. D1 discloses that "Up to 6.0% of Li_2O can be added for the purpose of lowering the melting temperature of the bath without increasing the coefficient of thermal expansion of the coagulation film. Addition of Li_2O in an amount greater than 6.0% should be avoided because peelability of the coagulation film deteriorates due to excessively good adhesion between the coagulation film and the band steel surface." This can be deemed to **teach away from the addition of Li_2O in an amount greater than 6.0%** in regard to the composition of the molten salt bath. Accordingly, without hindsight analysis in the knowledge of the invention, it is difficult for a skilled person in the art to ignore the teaching away and modify the content of Li_2O of D1 to $10\%w \leq \text{Li}_2\text{O} \leq 45\%w$.

D. Accordingly, it cannot be deemed that a skilled person in the art can easily invent the present invention from D1, and thus, the inventive step of the present invention is not denied over D1.

4. Our Comments

As to determination of inventive step of an invention with numerical limitation, previous Decision No. 2003HU1000 held 'When a patented invention quantitatively expresses elements constituting a known invention by limiting their numerical values, unless it is a simple numerical limitation that can be appropriately selected and carried out by a skilled person in the art, creating no qualitative difference or significant difference in effect inside and outside the numerical limitation, the patented invention shall be invalidated because it does not meet the requirements for inventive step.'

Patent Examination Guidelines provide that 'critical significance of the numerical limitation is required if the task of the claimed invention is the same as that of prior art and the effect is equivalent qualitatively; if the task of the claimed invention is not the same as that of prior art and the effect is different qualitatively, critical significance of the numerical limitation is not required even if both inventions have the same features except for the numerical limitation'

In Korean practice, when it comes to determination of inventive step of an invention including a numerical limitation, the examiners often determine inventive step of the invention based on the technical significance of the numerical limitation and whether the effect of the numerical limitation is remarkable.

More specifically, in Korean practice, the examiners often require proof of critical significance or qualitatively different effect from the numerical limitation, and they do not recognize inventive step of the numerical limitation if they are not proven.

Also, in Korean practice, in the case where the upper limit or lower limit of the numerical range is not disclosed in a prior art reference, it is often considered that the numerical value disclosed in that prior art reference is a very wide range without an upper or lower limit.

Further, in Korean practice, even if the numerical range of Li_2O content does not overlap with the prior invention as in this case, if the boundary values are close to each other, it is often deemed that the difference in the numerical range can be optimized by a skilled person in the art.

As such, regarding the 'range of viscosity of the molten salt bath,' the original decision 2019HEO3847 decided that even if D1 does not disclose the upper and lower limits, it discloses a very wide range without a lower limit, making the numerical range overlap. Regarding the 'range of composition ratio of Li_2O ,' it decided that although the range limited by the present invention does not overlap with D1, it is a simple numerical limitation that can be appropriately selected through repeated experiments, and denied the inventive step of the present invention.

However, as opposed to the above Korean practice, the present decision 2019HU12094 limited the numerical range disclosed in D1 to the scope that can be

reasonably understood by a skilled person in the art so as to accomplish the task and object of D1.

Also, prior to examining the critical significance of the numerical range of the present invention, it acknowledged the difference in technical significance of the numerical range in D1. It is also significant in that it reveals the relations between negative teachings and hindsight analysis concerning D1.

Under the influence of this decision, it is expected that more decisions acknowledging inventive step of an invention including a numerical limitation will be made.