Appeal decision

Appeal No. 2015-15661

Tokyo, Japan

AppellantNATIONAL INSTITUTE OF ADVANCED INDUSTRIALSCIENCE AND TECHNOLOGY

Tokyo, Japan

Patent Attorney HASEGAWA, Yoshiki

Tokyo, Japan

Patent Attorney KUROKI, Yoshiki

Tokyo, Japan

Patent Attorney SHIBAYAMA, Kenichi

Tokyo, Japan

Patent Attorney KIDO, Hiroji

Tokyo, Japan

Patent Attorney	IKEDA, Masato
Shizuoka, Japan	
Appellant	HAMAMATSU PHOTONICS K.K.
Tokyo, Japan	
Patent Attorney	HASEGAWA, Yoshiki
Tokyo, Japan	
Patent Attorney	KUROKI, Yoshiki
Tokyo, Japan	
Patent Attorney	SHIBAYAMA, Kenichi
Tokyo, Japan	
Patent Attorney	KIDO, Hiroji
Tokyo, Japan	
Patent Attorney	IKEDA, Masato

The case of appeal against the examiner's decision of refusal for Japanese patent Application No. 2011-83920, entitled "Laser Ignition Device" (the application published on November 12, 2012, Japanese Unexamined Patent Application Publication No. 2012-219661) has resulted in the following appeal decision:

Conclusion

The appeal of the case was groundless.

Reason

No. 1 History of the procedures

The application was filed on April 5, 2011 and reasons for refusal were notified on December 2, 2014. In response to this, a written opinion was submitted on February 9, 2015; however, a decision of refusal was made on May 20, 2015. Against this, an appeal against the examiner's decision of refusal was requested on August 24, 2015 and a written amendment to amend the description and scope of claims was submitted at the same time; and a written statement was submitted on December 8, 2015 and February 2, 2016.

No. 2 Decision to dismiss amendment for the amendment dated August 24, 2015

[Conclusion of Decision to Dismiss Amendment]

The amendment dated August 24, 2015 shall be dismissed.

[Reason]

1. The Amendment

(1) Details of the Amendment

The amendment according to the written amendment submitted on August 24, 2015

(hereinafter, referred to as "the Amendment") is to amend, regarding the scope of claims, from the following description (A) of Claim 1 of the scope of claims before the Amendment (that is, Claim 1 of the scope of claims originally attached to the application) to the following description (B) of Claim 1 of the scope of claims after the Amendment.

(A) Claim 1 of the scope of the claims before the Amendment

" [Claim 1]

A laser ignition device for igniting an air-fuel mixture within a combustion chamber comprising:

a target unit arranged within the combustion chamber; and

a laser light source arranged outside the combustion chamber and emitting laser light for irradiating the target unit;

wherein the laser light source is a microchip laser."

(B) Claim 1 of the scope of the claims after the Amendment

" [Claim 1]

A laser ignition device for igniting an air-fuel mixture within a combustion chamber comprising:

a target unit arranged within the combustion chamber; and

a laser light source arranged outside the combustion chamber and emitting laser light for irradiating the target unit;

wherein the laser light source is a microchip laser <u>including an exciting light source</u> of a semiconductor laser, a laser resonator, and pulsing means." (Note that the underlines were added by the Appellant to indicate the amended portions.)

(2) Purpose of Amendment

The Amendment is for the purpose of limiting the "microchip laser" that is a matter specifying the invention in Claim 1 of the scope of claims before the Amendment to one "including an exciting light source of a semiconductor laser, a laser resonator, and pulsing means," and the field of industrial application and the problems to be solved are identical between the invention described in Claim 1 before the Amendment and the invention described in Claim 1 after the Amendment.

Thus, the Amendment is, regarding the scope of claims, to aim at the restriction of the scope of claims stipulated in Article 17-2(5) (ii) of the Patent Act.

2. Judgment on independent requirements for patentability

As described above, the amendment regarding the scope of claims in the Amendment is to aim at the restriction of the scope of claims and thus, whether or not the invention specified by the matters described in Claim 1 of the scope of claims after the Amendment (hereinafter, referred to as "the Amended Invention") is independently patentable at the time of filing of the patent application is examined below.

2.-1 Cited Document

(1) Description in Cited Document

Japanese Unexamined Patent Application Publication No. 2010-101266 (hereinafter, referred to as "the Cited Document") that was distributed prior to the filing of the application and cited in the reasons for refusal of the examiner's decision includes, for example, the following description with drawings regarding "Laser Spark Plug, Laser Igniter, and Engine."

(A) "[0001]

The present invention relates to a laser spark plug, a laser igniter, and an engine using them.

... (remainder omitted)..." (Paragraph [0001])

(B) "[0006]

The problem of the present invention is to provide a laser spark plug, a laser igniter, and an engine exhibiting stable ignition performance by low electric power consumption.

... (remainder omitted)..." (Paragraph [0006])

(C) "[0012]

Further, the engine according to the present invention includes a laser ignition device, and a cylinder head. The laser ignition device is a laser ignition device described above and the lens device is provided in the cylinder head, wherein the target is arranged in the combustion chamber of the cylinder head. The laser device outputs the laser light in synchronization with the rotation of the engine.

... (remainder omitted)...

[0015]

FIG. 1 shows a laser spark plug and a laser ignition device according to the present invention. The laser ignition device includes a laser device 1, an optical fiber 2 which is a transmission path, and a laser spark plug G; this laser spark plug G includes a lens device 3 and a target T.

[0016]

The laser device 1, which is a typical semiconductor laser device driven by a pulse signal, outputs laser light and makes it incident on the optical fiber. As the laser light, in order to facilitate the ignition, an infrared (IR) laser having large thermal energy, for example, can be employed. Further, although an optical fiber is mentioned as a transmission line of the present embodiment, other optical components such as mirrors, prisms, etc. can be used to constitute the transmission line, so long as they can transmit laser light with low loss.

[0017]

The lens device 3 is connected to the optical fiber 2 and focuses the incident laser light on the target T. This lens device 3 includes an objective lens 31, a SELFOC lens 32, a distal end cover 33, a body cover 34, a stopper 35, and a rear end cover 36." (Paragraphs [0012] to [0017])

(D) "[0030]

Next described are the other embodiments of the laser ignition device according to the present invention and an engine using the same. FIG. 2 shows the engine using the laser ignition device according to the present invention.

[0031]

The engine includes the laser ignition device described above, a fuel injection control unit 10, and a cylinder C; the cylinder C includes a cylinder head 5, a piston 71, a piston rod 72, an intake valve 61, and an exhaust valve 62.

[0032]

As is publicly known, the operation of the engine is such that the air-fuel mixture is introduced into the combustion chamber R by the intake valve 61, the piston 71 and piston rod 72 are driven by the explosive force generated by ignition of the air-fuel mixture, and a remaining exhaust gas is discharged through the exhaust valve 62. Here, symbols D1 to D3 indicate the driving directions of the intake valve 61, exhaust valve 62, piston 71, respectively.

[0033]

The laser spark plug and laser ignition device according to the present invention are applied as a substitute for conventional spark plugs in such an engine as described above." (Paragraphs [0030] to [0033])

(2) Described matters in the Cited Document

From the descriptions in the above (1) (A) to (C) and FIGS. 1 and 2, it can be seen that the following matters are described in the Cited Document:

(F) From the descriptions in the above (1)(A) to (C) and FIGS. 1 and 2, it can be seen that the laser ignition device for igniting the air-fuel mixture introduced into the combustion chamber R is described in the Cited Document.

(G) According to the descriptions in the above (1) (C) and FIG. 2, the target T is arranged within the combustion chamber R; and therefore, when considering this in combination with the descriptions in the above (1) (C) and (D) and FIGS. 1 and 2, it can be seen that the laser ignition device described in the Cited Document includes the target T arranged within the combustion chamber R.

(H) In FIG. 2, it can be seen that the laser device 1 is located outside the combustion chamber R; and when considering this in combination with the descriptions in the above (1)(C) and (D) and FIGS. 1 and 2, it can be seen that the laser ignition device described in the Cited Document is located outside the combustion chamber R and includes the laser device 1 that outputs laser light for irradiating the target T.

(I) From the descriptions in the above (1) (C), it can be seen that the laser ignition device described in the Cited Document is a typical semiconductor device driven by a pulse signal.

(3) Cited Invention

From the descriptions in the above (1) and (2) and FIGS. 1 and 2, it can be said that the following invention (hereinafter, referred to as "the Cited Invention") is described in the Cited Document:

" A laser ignition device for igniting an air-fuel mixture introduced into a combustion chamber R comprising:

a target T arranged within the combustion chamber R; and

a laser device 1 arranged outside the combustion chamber R and emitting laser light for irradiating the target T;

wherein the laser device 1 is a typical semiconductor laser device driven by a pulse signal."

2.-2 Comparison

Comparison between the Amended Invention and the Cited Invention results in the following: The "combustion chamber R" in the Cited Invention corresponds to the "combustion chamber" in the Amended Invention in the light of its function, configuration, or technical significance; and in a similar fashion, the "air-fuel mixture" to the "air-fuel mixture," the "laser ignition device" to the "laser ignition device," the "target T" to the "target unit," the "laser light" to the "laser light," "output" to "emit," the "laser device 1" to the "laser light source."

In addition, the "laser ignition device for igniting an air-fuel mixture introduced into a combustion chamber R" in the Cited Invention corresponds to the "laser ignition device for igniting an air-fuel mixture within a combustion chamber" in the light of its technical significance.

From the above, the Amended Invention and the Cited Invention are identical in terms of:

" A laser ignition device for igniting an air-fuel mixture within a combustion chamber comprising:

a target unit arranged within the combustion chamber; and

a laser light source arranged outside the combustion chamber and emitting laser light for irradiating the target unit."

On the other hand, they are different in the following point:

<The different feature>

In the Amended Invention, the laser light source is "a microchip laser including an

exciting light source of a semiconductor laser, a laser resonator, and pulsing means;" whereas, in the Cited Invention, the laser device 1 is "a typical semiconductor laser device driven by a pulse signal" (hereinafter, referred to as "the different feature.").

2.-3 Judgment

The above different feature is examined.

A "microchip laser including an exciting light source of a semiconductor laser, a laser resonator, and pulsing means" was a well-known art prior to the filing of the present application (hereinafter, referred to as "the Well-Known Art"; refer to, for example, paragraphs [0007], [0020], and [0021] of Japanese Unexamined Patent Application Publication No. 2006-73962, and also, Takunori Taira, "High Brightness Microchip Laser and Engine Ignition," The review of laser engineering, Japan, The Laser Society , 2010-8, Vol. 38, No. 8, pp. 576-584, especially "2.2 Passively Q-Switched Microchip Lasers," etc.).

In addition, that the "microchip laser can be miniaturized and has a high energy efficiency" was also a well-known matter prior to the filing of the present application (hereinafter, referred to as "Well-Known Matter 1"; refer to, for example, paragraph [0017] of the above Japanese Unexamined Patent Application Publication No. 2006-73962, and also, Shinji Motokoshi, "Research and Development of Microchip Solid-State Laser," "LASER CROSS, Japan, Institute for Laser Technology, 2001-7, No. 160, pp. 1-2, etc.)

Further, in the Cited Invention for solving the problem of providing a laser igniter that exhibits stable ignition performance by low electric power consumption (refer to the above 2.1-1 (1) (B).), a person skilled in the art could have easily conceived of using a "microchip laser including an exciting light source of a semiconductor laser, a laser resonator, and pulsing means" of the above Well-Known Art instead of "a typical semiconductor laser device driven by a pulse signal," while taking the above Well-Known Matter 1 into account, so as to specify it as the matter specifying the invention of the Amended Invention relating to the above different feature.

In addition, generally, it can be said that problems such as miniaturization of devices and improvement in efficiency in mechanical devices are universal and continuous technical problems to be solved; and it can also be said that adopting the above Well-Known Art instead of "a typical semiconductor laser device driven by a pulse signal" for the purpose of miniaturization of devices and improvement in efficiency in the Cited Invention is within the ordinary creativity of a person skilled in the art.

In addition, using the microchip laser for a laser ignition device of a gas engine which is used for automobile engines and cogeneration systems was a well-known matter prior to the filing of the present application (hereinafter, referred to as "Well-Known Matter 2) as indicated in, for example, paragraphs [0007] and [0037] of Japanese Unexamined Patent Application Publication No. 2006-329186 which is provided as a prior art document in the Description of the present application, and also, Takunori Taira, "High Brightness Microchip Laser and Engine Ignition," which is the same as described above, especially "4. Summary," etc. and it can be said that there was a cause or motivation to adopt the above Well-Known Art instead of "a typical semiconductor laser device driven by a pulse signal" by taking Well-Known Matter 2 into account in the Cited Invention.

Further, it cannot be acknowledged, even if being examined as a whole, that the Amended Invention provides specific effect beyond effect predicted based on the Cited Invention, Well-Known Art, and Well-Known Matters 1 and 2; and the Amended Invention could have easily been invented by a person skilled in the art based on the Cited Invention, Well-Known Art, and Well-Known Matters 1 and 2.

Accordingly, the appellant should not be granted a patent for the Amended Invention independently at the time of patent application in accordance with the provisions of Article 29(2) of the Patent Act.

3. Closing

As described above, since the Amendment violates the provisions of Article 126(7) of the Patent Act which is applied mutatis mutandis pursuant to the provisions of Article 17-2(6) of the Patent Act, the Amendment should be dismissed under the provisions of Article 53(1) of the Patent Act applied mutatis mutandis by replacing certain terms pursuant to the provisions of Article 159(1) of the Patent Act.

Accordingly, the decision shall be made as described in [Conclusion of Decision to 11/13

Dismiss Amendment] above.

No. 3 Regarding the invention

1. The Invention

Since the amendment dated August 24, 2015 was dismissed as described above, the inventions relating to Claims 1 to 3 of the present application are specified by matters described in Claims 1 to 3 of the scope of claims as viewed from the description, scope of claims, and drawings originally attached to the application; wherein the invention relating to Claim 1 (hereinafter referred to as "the Invention") is as described in No. 2. [Reason] 1. (1) (A) [Claim 1] above.

2. The Cited Invention

The invention (the Cited Invention) which is described in the Cited Document (Japanese Unexamined Patent Application Publication No. 2010-101266) that was distributed prior to the filing of the application and cited in the reasons for refusal of the examiner's decision is as described in No. 2 [Reason] 2.-1 (3) above.

3. Comparison / Judgment

As examined in No. 2 [Reason] 1. (2) above, the Amendment further limits the invention relating to Claim 1 of the scope of claims before the amendment; that is, the matters specifying the invention of the Invention and therefore, the Invention substantially corresponds to one that is obtained by deleting part of the matters specifying the invention in the Amended Invention.

Then, the Amended Invention including all the matters specifying the invention of the Invention could have been easily made by a person skilled in the art based on the Cited Invention, Well-Known Art, and Well-Known Matters 1 and 2, as described in No. 2 [Reason] 2.-2 and 2.-3; and therefore, for a similar reason, the Invention could also have been easily made by a person skilled in the art based on the Cited Invention, Well-Known

Art, and Well-Known Matters 1 and 2.

4. Summary

As described above, the Invention could have been easily made by a person skilled in the art based on the Cited Invention, Well-Known Art, and Well-Known Matters 1 and 2; thus, the appellant should not be granted a patent for it in accordance with the provisions of Article 29(2) of the Patent Act.

No. 4. Closing

As described in No. 3 above, the appellant should not be granted a patent for the invention in accordance with the provisions of Article 29(2) of the Patent Act and therefore, the present application should be rejected.

Therefore, the appeal decision shall be made as described in the conclusion.

March 28, 2016

Chief administrative judge: ITO, Asahito

Administrative judge: NAKAMURA, Tatsuyuki

Administrative judge: KAJIMOTO, Naoki