Trial decision

Invalidation No. 2010-800162

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The decision on the case of the patent invalidation trial between the above parties on Japanese Patent No. 3138613, entitled "LASER MACHINING APPARATUS," dated January 24, 2012 came with a court decision of revocation of the trial decision (2012 (Gyo-Ke) 10082, rendition of decision on December 25, 2012) at the Intellectual Property High Court, the case was proceeded further, and another trial decision was handed down as follows.

Conclusion

The correction shall be approved.

The patent for the invention described in Claim 1 of Japanese patent No. 3138613 shall be invalidated.

The costs in connection with the trial shall be borne by the demandee.

Reason

No. 1 History of the procedures

The application of the invention according to the Patent No. 3138613 was filed on May 24, 1995, the establishment of the patent right relating to the invention according to Claims 1 to 7 was registered on December 8, 2000 (Japanese Patent No. 3138613), after that the opposition to grant of the patent was submitted (Opposition No. 2001-72301), a request for correction was filed on January 21, 2002, and a decision on the opposition to grant of the patent, "The correction shall be approved. The patent according to Claims 1 to 3 and 5 of Japanese Patent No. 3138613 is maintained," was made as of February 20, 2002, and the above decision has become final and binding.

The demandant requested a trail for patent invalidation on September 14, 2010 to invalidate the patent regarding the invention according to Claim 1. The demandee submitted a written reply and made a correction request (hereinafter referred to as "the First correction request") on December 7, 2010. Both parties submitted oral proceedings statement briefs on February 16, 2011. Oral proceeding was held on March 2, 2011.

In light of the above, a decision, "The correction shall be approved. The patent according to Claim 1 of Japanese Patent No. 3138613 shall be invalidated," (hereinafter referred to as "the First trial decision") was made as of April 14, 2011. The demandee brought an action for revocation of the trial decision, and filed a request for trial for correction (Correction No. 2011-390096) aiming at restriction of the scope of claims of the Patent. The case was reviewed at the Intellectual Property High Court as 2011 (Gyo-Ke) 10168. A decision was made to revoke the first trial decision as of October 7, 2011, and the case of trial regarding the invalidation of the patent was remanded to the administrative judge.

In response, the body notified about subsequent examination in writing as of October 14, 2011, and designated a period for filing a request for correction under the provisions of Article 134-3 (2) of the Patent Act. However, the demandee did not file a request for correction in accordance with Article 134-2 (1) of the Patent Act within the designated period. On October 28, 2011, which is the last day of the period, a request for correction (hereinafter referred to as "the Second correction request") in accordance with Article 134-2 (1) of the Patent Act was deemed to be made, citing the corrected description attached to the written request for trial for correction (Correction No. 2011-390096) under the provisions of Article 134-3 (5).

The First correction request is to correct the invention according to Claim 1 of the scope of claims. Since Claims 2 to 6 and Claim 12 directly or indirectly depend on Claim 1, when the invention according to Claim 1 is corrected by the First correction request, the inventions according to Claims 2 to 6 and Claim 12 are corrected, accordingly. Meanwhile, the correction for the inventions according to Claims 2 to 6 and Claim 12 by the First correct request became final and binding on April 22, 2011,

which is a date of delivery of the First trial decision.

The demandant submitted a written opinion as an opinion on the Second correction request, on December 13, 2011, and the demandee submitted a written statement on December 14, 2011.

In light of the above, the decision, "The correction shall be approved. The trial of the case was groundless." (hereinafter referred to as "the Second trial decision") was made as of January 24, 2012. The demandant brought an action for revocation of the trial decision. The case was reviewed at the Intellectual Property High Court as 2012 (Gyo-Ke) 10082. A judgment was made to revoke the Second trial decision as of December 25, 2012. The demandee petitioned for acceptance of final appeal (2013 (Gyo-hi) 133), the decision, "The case shall not be accepted as the final appellate court" was made on March 20, 2014, and the above decision has become final and binding.

In response, the demandee petitioned for a request for correction prescribed in Article 134-3 (1) of the Patent Act as of March 26, 2014. The body resumed the trial as of March 31, 2014 and designated a period for requesting correction. A request for correction was filed (hereinafter referred to as "the Correction request") as of April 14, 2014 (hereinafter the correction based on the Correction request, the written request for the Correction request, and the patent description corrected by the Correction request are referred to as "the Correction," "the Written correction request," and "the Corrected description," respectively). The demandant submitted a written refutation on May 20, 2014, and the demandee submitted a written statement on June 2, 2014.

No. 2 Suitability of Correction

1. Contents of correction

The correction request of the case is to correct the description which has been fixed in the decision on opposition and the First trial decision as described in the Corrected description attached to the Written correction request, and the points corrected are as follows with underlines.

(1) Correction A

Regarding Claim 1 in the scope of claims,

"[Claim 1] A laser machining apparatus for cutting/welding a work by collecting a laser beam output from a laser oscillator by means of a converging optical member comprising: a laser beam reflecting member which is arranged in a transmission path of the laser beam and elastically deforms with a fluid pressure; a reflecting member supporting section supporting the peripheral section of the laser beam reflecting member and, together with the laser beam reflecting member, forming a space on an opposite surface of a laser beam reflecting surface; fluid supply means for supplying a gas into the space in the reflecting member supporting section; a solenoid valve for switching fluid supply pressure in stages or an electropneumatic valve for switching fluid supply pressure successively; and fluid discharge means for discharging the gas from the space in the reflecting member supporting section, wherein the space, except for a fluid feed path and a fluid discharge path distinct from the fluid feed path, is sealed; and wherein a fluid pressure required for elastically deforming the laser beam reflecting member is applied to the opposite surface of the laser beam reflecting surface," is corrected to

"[Claim 1] A laser machining apparatus for cutting/welding a work by collecting a laser beam output from a laser oscillator by means of a converging optical member comprising: a laser beam reflecting member which is arranged in a transmission path of the laser beam and elastically deforms with a gas pressure; a reflecting member supporting section supporting the peripheral section of the laser beam reflecting member and, together with the laser beam reflecting member, forming a space on an opposite surface of a laser beam reflecting surface; fluid supply means arranged in the reflecting member supporting section and supplying a gas into the space in the reflecting member supporting section; an electropneumatic valve for switching gas supply pressure successively; and fluid discharge means arranged in the reflecting member supporting section and discharging the gas from the space in the reflecting member supporting section, wherein the space, except for a fluid feed path and a fluid discharge path distinct from the fluid feed path, is sealed; wherein the space constitutes a fluid operating circuit having an outlet together with the fluid supply means and the fluid discharge means; wherein the gas passing through the fluid discharge path is discharged to the outside by the fluid discharge means; wherein the fluid discharge path is made narrower than the fluid feed path; and wherein a gas pressure required for elastically deforming the laser beam reflecting member is applied to the opposite surface of the laser beam reflecting surface."

(2) Correction B

Regarding paragraph [0006] in the detailed description of the invention,

"[0006]

[Means for solving the problem]

The laser machining apparatus according to the present invention for cutting/welding a work by collecting a laser beam output from a laser oscillator by means of a converging optical member comprises: a laser beam reflecting member which is arranged in a transmission path of the laser beam and elastically deforms with a fluid pressure; a reflecting member supporting section supporting the peripheral section of the laser beam reflecting member and, together with the laser beam reflecting member, forming a space on an opposite surface of a laser beam reflecting surface; fluid supply means for supplying a gas into the space in the reflecting member supporting section; a solenoid valve for switching fluid supply pressure in stages or an electropneumatic valve for switching fluid supply pressure successively; and fluid discharge means for discharging the gas from the space in the reflecting member supporting section, wherein the space, except for a fluid feed path and a fluid discharge path distinct from the fluid feed path, is sealed; and wherein a fluid pressure required for elastically deforming the laser beam reflecting member is applied to the opposite surface of the laser beam reflecting surface" is corrected to

"[0006]

[Means for solving the problem]

The laser machining apparatus according to the present invention for cutting/welding a work by collecting a laser beam output from a laser oscillator by means of a converging optical member comprises: a laser beam reflecting member which is arranged in a transmission path of the laser beam and elastically deforms with a gas pressure; a reflecting member supporting section supporting the peripheral section

of the laser beam reflecting member and, together with the laser beam reflecting member, forming a space on an opposite surface of a laser beam reflecting surface; fluid supply means arranged in the reflecting member supporting section and supplying a gas into the space in the reflecting member supporting section; an electropneumatic valve for switching gas supply pressure successively; and fluid discharge means arranged in the reflecting member supporting section and discharging the gas from the space in the reflecting member supporting section, wherein the space, except for a fluid feed path and a fluid discharge path distinct from the fluid feed path, is sealed; the space constitutes a fluid operating circuit having an outlet together with the fluid supply means and the fluid discharge means; wherein the gas passing through the fluid discharge path is discharged to the outside by the fluid discharge means; wherein the fluid discharge path is made narrower than the fluid feed path; and wherein a gas pressure required for elastically deforming the laser beam reflecting member is applied to the opposite surface of the laser beam reflecting surface."

2. Allegations of the parties about the Correction request
(The line numbers specifying the descriptions below do not include blank lines.)

(1) The demandee's allegation
A. Regarding the Correction A (Written Correction request p.4 l.14 to p.7 l.3)

Correction A is, as indicated in the following Corrections a. to f., to restrict the configuration described in Claim 1 before the Correction within the scope of the matters described in the patent description, and does not enlarge or alter the scope of claims.

*Correction a.

The correction is to restrict the description, "a laser beam reflecting member which is arranged in a transmission path of the laser beam and elastically deforms with a fluid pressure," to the description, "a laser beam reflecting member which is arranged in a transmission path of the laser beam and elastically deforms with a gas pressure." The restriction is based on the descriptions in [0027] and [0043] in the patent description.

*Correction b.

The correction is to restrict the description, "fluid supply means for supplying a gas into the space in the reflecting member supporting section," to the description, "fluid supply means arranged in the reflecting member supporting section and supplying a gas into the space in the reflecting member supporting section." The restriction is based on the descriptions in [0027] and [0029] and FIGS. 1 and 2 in the patent description.

*Correction c.

The correction is to restrict the description, "a solenoid valve for switching fluid supply pressure in stages or an electropneumatic valve for switching fluid supply pressure successively," to the description, "an electropneumatic valve for switching gas supply pressure successively." The restriction is based on the descriptions in [0028], [0033], and [0043] and FIG. 2 in the patent description.

*Correction d.

The correction is to restrict the description, "fluid discharge means for discharging the gas from the space in the reflecting member supporting section," to the description, "fluid discharge means arranged in the reflecting member supporting section and discharging the gas from the space in the reflecting member supporting section." The restriction is based on the descriptions in [0031] and FIGS. 1 and 2 in the patent description.

*Correction e.

The correction is to restrict the description, "the space, except for a fluid feed path and a fluid discharge path distinct from the fluid feed path, is sealed" to the description, "the space, except for a fluid feed path and a fluid discharge path distinct from the fluid feed path, is sealed; wherein the space constitutes a fluid operating circuit having an outlet together with the fluid supply means and the fluid discharge means; and the gas passing through the fluid discharge path is discharged to the outside by the fluid discharge means."

The restriction is based on the fact that an outlet is included obviously in a fluid operating circuit, which is a series of air (gas) flow of: air (gas) is supplied into a space from the fluid supply means, to change a curvature radius of a curvature-variable mirror in the space, and the air (gas) is discharged from the fluid discharge means, on the basis of the description in [0031] of the patent description, "a fluid operating circuit is structured in which the air 15 supplied from the air inlet 14 flows into an air passage 17 formed in the peripheral part of a circular holding plate 11 through air passages 16 arranged at equal intervals in the circular holding plate 11, then is discharged through an air outlet 18 formed in one place of the air jacket 13," and descriptions in FIGS. 1 and 2.

*Correction f.

The correction is to restrict the description, "a fluid pressure required for elastically deforming the laser beam reflecting member is applied to the opposite surface of the laser beam reflecting surface," to the description, "the fluid discharge path is made narrower than the fluid feed path; and wherein a gas pressure required for elastically deforming the laser beam reflecting member is applied to the opposite surface of the laser beam reflecting surface." The restriction is based on the description in [0031] of the patent description, "the inner diameter of the air outlet 18 is formed sufficiently smaller than the inner diameter of the air inlet 14, thereby allowing a pressure to be applied to a laser-beam non-reflection surface (rear surface) 22 of the curvature-variable reflecting mirror 10 with a low flow rate."

B. Regarding the Correction B (Written correction request p.7 l.4 to l.7)

The correction is made so that inconsistent and ambiguous parts in the detailed description of the invention in the patent description, due to the restriction of the scope of claims, may correspond to the scope of claims, and falls under clarification of an ambiguous statement.

(2) The demandant's allegation

The demandant alleges in the written refutation as of May 20, 2014 that the patent for the invention according to Claim 1 of the scope of claims after correction

violates the provisions of Article 29 (2) of the Patent Act, falls under the provisions of Article 123(1)(ii) of the Patent Act , and should be invalidated, and makes no particular allegation about the propriety of the Correction.

3. Judgment on the suitability of correction

(1) Regarding the correction according to the Correction A

Correction A is formed of Corrections a. to f. alleged by the demandee. The body examines them individually and comprehensively judges the correction according to Correction A.

A. Regarding Correction a.

Correction a. is to correct the description in Claim 1 before the Correction, "a laser beam reflecting member which is arranged in a transmission path of the laser beam and elastically deforms with a fluid pressure," to the description "a laser beam reflecting member which is arranged in a transmission path of the laser beam and elastically deforms with a gas pressure." Since Claim 1 includes the descriptions, "supplying a gas into the space in the reflecting member supporting section" and "discharging the gas from the space in the reflecting member supporting section," the "fluid pressure" in Claim 1 means "gas pressure" obviously.

Thus, the correction according to Correction a., which is aimed at correction of errors and made within the scope of matters described in the patent description, does not substantially enlarge or alter the scope of claims, obviously.

B. Regarding Correction b.

Correction b. is to correct the description in Claim 1 before the Correction, "fluid supply means for supplying a gas into the space in the reflecting member supporting section," to the description "fluid supply means arranged in the reflecting member supporting section and supplying a gas into the space in the reflecting member supporting section." The location of the fluid supply means is limited in the reflecting member supporting section. The correction is aimed at restriction of the scope of claims.

The paragraph [0027] in the description includes the description "14 is an air inlet arranged in the central part of the air jacket 13." This description indicates that the air inlet 14 serving as the fluid supply means is arranged in the air jacket 13 serving as the reflecting member supporting section. The correction is made within the scope of the matters described in the patent description.

Furthermore, the correction does not substantially enlarge or alter the scope of claims, obviously.

C. Regarding Correction c.

Correction c. is to correct the description in Claim 1 before the Correction, "a solenoid valve for switching fluid supply pressure in stages or an electropneumatic valve for switching fluid supply pressure successively," to the description "an electropneumatic valve for switching gas supply pressure successively." Correcting the "fluid supply pressure" to the "gas supply pressure" is aimed at correction of errors for the same reasons as the above A.

The correction to delete "a solenoid valve for switching ... in stages" in the selective matters specifying the invention, "a solenoid valve for switching in stages or an electropneumatic valve for switching successively," to be limited to "an electropneumatic valve for switching fluid supply pressure successively," is aimed at restriction of the scope of claims.

The correction, which is made within the scope of matters described in the patent description, does not substantially enlarge or alter the scope of claims, obviously.

D. Regarding Correction d.

Correction d. is to correct the description in Claim 1 before the Correction, "fluid discharge means for discharging the gas from the space in the reflecting member supporting section," to the description "fluid discharge means arranged in the reflecting member supporting section and discharging the gas from the space in the reflecting member supporting section." The location of the fluid discharge means is limited in the reflecting member supporting section. The correction is aimed at restriction of the scope of claims.

Paragraph [0031] in the description includes the description, "air outlet 18 formed in one place of the air jacket 13," which indicates that the air outlet 18 serving as fluid discharge means is arranged in the air jacket 13 serving as the reflecting member supporting section. The correction is made within the scope of matters described in the patent description.

Furthermore, the correction does not substantially expand or alter the scope of claims, obviously.

E. Regarding Correction e.

(A) Regarding the technical matters specified by the description "discharged to the outside"

Correction e. is to correct the description in Claim 1 before the Correction, "the space, except for a fluid feed path and a fluid discharge path distinct from the fluid feed path, is sealed," to the description "the space, except for a fluid feed path and a fluid discharge path distinct from the fluid feed path, is sealed; wherein the space constitutes a fluid operating circuit having an outlet together with the fluid supply means and the fluid discharge means; and the gas passing through the fluid discharge path is discharged to the outside by the fluid discharge means."

The technical matters specified by the description "discharged to the outside" is examined below. Claim 1 of the scope of claims according to the Invention includes the description, "fluid discharge means discharging the gas from the space in the reflecting member supporting section, wherein the space, except for a fluid feed path and a fluid discharge path distinct from the fluid feed path, is sealed; wherein the gas passing through the fluid discharge path is discharged to the outside by the fluid discharge means." Consequently, the "fluid discharge means" indicates means for discharging a "gas" to the outside of "the space in the reflecting member supporting section," and it is obvious that the term "discharged to the outside" is interpreted as "being discharged to the outside of the reflecting member supporting section," on the basis of the statement in the scope of claims. The description describes the "air outlet 18" as means for discharging air, which is a fluid, from the space surrounded by the "air jacket 13," the "curvature-variable reflecting mirror 10," and the "circular holding plate

11." The above interpretation does not derive a contradiction.

(B) Regarding the purpose of correction of Correction e.

As described in the above (A), the technical matter specified by the description "discharged to the outside" in Correction e. is "being discharged to the outside of the space in the reflecting member supporting section." Correction e. specifies with limitation that the gas in the sealed space in the reflecting member supporting section is discharged by the "fluid discharge means" to the outside of the space. Furthermore, the "space" in Correction e. is limited to constituting a "fluid operating circuit" having an outlet together with the "fluid supply means" and the "fluid discharge means."

Therefore, the correction in Correction e. is aimed at restriction of the scope of claims.

(C) Regarding the presence of new matter and existence of enlargement or alteration of Correction e.

As described in the above (A), on the assumption that the technical matter, "discharged to the outside," in Correction e., is "being discharged to the outside of the space in the reflecting member supporting section," it can be recognized that the "air," which is a gas, in the "space surrounded by the air jacket 13 and the curvature-variable reflecting mirror 10" is discharged to the outside the "space," on the basis of the description in [0031] of the description, "a fluid operating circuit is structured in which the air 15 supplied from the air inlet 14 flows into an air passage 17 formed in the peripheral part of a circular holding plate 11 through air passages 16 arranged at equal intervals in the circular holding plate 11, then is discharged through an air outlet 18 formed in one place of the air jacket 13. The fluid pressure deforms a shape of the curvature-variable reflecting mirror 10 to a spherical one, which can be used as a spherical mirror (convex mirror in this case)," and FIG. 1 illustrating the air passage 16, the air passage 17, and the air passage 18, which are connected in this order to the space surrounded by the air jacket 13 and the curvature-variable reflecting mirror 10.

Regarding to the "fluid operating circuit" described in [0031], it can be said, according to FIG. 1, that the "space surrounded by the air jacket 13 and the curvature-variable reflecting mirror 10" constitutes the "fluid operating circuit" together with the "air inlet 14" serving as "fluid supply means" and the "air outlet 18" serving as "fluid discharge means," since the "air 15" flowing from the "air inlet 14" into the "space surrounded by the air jacket 13 and the curvature-variable reflecting mirror 10" deforms a shape of the "curvature-variable reflecting mirror 10" to a "spherical" one by pressure of "air 15" and is discharged from the "air outlet 18."

Thus, Correction e. is made within the scope of matters described in the patent description, and the correction does not substantially expand or alter the scope of claims, obviously.

F. Regarding Correction f.

Correction f. is to correct the description in Claim 1, "a fluid pressure required for elastically deforming the laser beam reflecting member is applied to the opposite surface of the laser beam reflecting surface," to the description "the fluid discharge path is made narrower than the fluid feed path; and wherein a gas pressure required for elastically deforming the laser beam reflecting member is applied to the opposite

surface of the laser beam reflecting surface." Correcting the "fluid pressure" to the "gas pressure" is aimed at correction of errors for the same reasons as the above A. The correction to add "the fluid discharge path is made narrower than the fluid feed path" limits the means for "applying a fluid pressure required for elastically deforming the laser beam reflecting member, to the opposite surface of the laser beam reflecting surface." Thus, the correction is aimed at restriction of the scope of claims.

The correction to add "configuration" is only addition of an obvious matter, and is aimed at correction of errors.

According to the description in [0031] of the description, "the inner diameter of the air outlet 18 is formed sufficiently smaller than the inner diameter of the air inlet 14, thereby allowing a pressure to be applied to a laser-beam non-reflection surface (rear surface) 22 of the curvature-variable reflecting mirror 10 with a low flow rate," it can be understood that a person skilled in the art can apply a pressure to the "laser-beam non-reflection surface (rear surface) 22" in forming a path for discharging from the "space surrounded by the air jacket 13 and the curvature-variable reflecting mirror 10" to be narrower than a supply path. According to FIG. 1 of the patent description, the "space surrounded by the air jacket 13 and the curvature-variable reflecting mirror 10," except for the "air inlet 14" and the "air passage 16," is sealed, and the "air passage 16" is narrower than the "air inlet 14." In considering that "the space, except for a fluid feed path and a fluid discharge path distinct from the fluid feed path, is sealed" in Claim 1, it can be said that the description describes that "the fluid discharge path is made narrower than the fluid feed path" and that a fluid pressure required for elastically deforming the "curvature-variable reflecting mirror 10" serving as a "laser-beam reflecting member" to "the laser-beam non-reflection surface (rear surface) 22" serving as "the opposite surface of the laser beam reflecting surface." Thus, the correction according to Correction f. is made within the scope of matters described in the patent description.

Furthermore, the correction does not substantially expand or alter the scope of claims, obviously.

G. Summary of the correction according to Correction A

The correction according to Correction A is, as indicated in the above A. to F., aimed at restriction of scope of claims or correction of errors.

The correction is, as indicated in the above A. to F., made within the scope of matters described in the description, and does not substantially enlarge or alter the scope of claims.

Therefore, Correction A is aimed at the matters listed in items (i) and (ii) of the proviso to Article 134-2(1) of the Patent Act before revision by the Act No. 63 of 2011, of which the provisions then in force shall remain applicable according to revision supplement Article 2(18) of the Act No. 63 of 2011, and falls under the provisions of Article 126(3) and (4) of the Patent Act which is applied mutatis mutandis pursuant to Article 134-2(5) of the Patent Act.

(2) Regarding Correction B

Correction B is made so that the description in [0006] of the detailed description of the invention, in response to Correction A to correct Claim 1 of the scope of claims, may correspond to the description in the scope of claims. The correction is aimed at

clarification of an ambiguous statement.

The correction according to Correction B is made within the scope of matters described in the patent description, and does not substantially expand or alter the scope of claims, obviously.

Therefore, Correction B is aimed at the matters listed in item (iii) of the proviso to Article 134-2(1) of the Patent Act before revision by the Act No. 63 of 2011, of which the provisions then in force shall remain applicable according to revision supplement Article 2(18) of the Act No. 63 of 2011, and falls under the provisions of Article 126(3) and (4) of the Patent Act which is applied mutatis mutandis pursuant to Article 134-2(5) of the Patent Act.

4. Closing

In light of the above, the above correction complies with the provisions of the proviso to Article 134-2 of the Patent Act before revision by the Act No. 63 of 2011, of which the provisions then in force shall remain applicable according to revision supplement Article 2(18) of the Act No. 63 of 2011, and falls under the provisions of Article 126(3) and (4) of the Patent Act which is applied mutatis mutandis pursuant to Article 134-2(5) of the Patent Act. Therefore, the corrections shall be approved as a legal correction.

No. 3 Invention according to Claim 1 of the Patent

According to the descriptions of the Corrected description and drawings, the invention (hereinafter referred to as "Corrected patent invention") according to Claim 1 of the Patent is recognized as follows, as described in Claim 1 of the scope of claims.

"[Claim 1] A laser machining apparatus for cutting/welding a work by collecting a laser beam output from a laser oscillator by means of a converging optical member comprising: a laser beam reflecting member which is arranged in a transmission path of the laser beam and elastically deforms with a gas pressure; a reflecting member supporting section supporting the peripheral section of the laser beam reflecting member and, together with the laser beam reflecting member, forming a space on an opposite surface of a laser beam reflecting surface; fluid supply means arranged in the reflecting member supporting section and supplying a gas into the space in the reflecting member supporting section; an electropneumatic valve for switching gas supply pressure successively; and fluid discharge means arranged in the reflecting member supporting section and discharging the gas from the space in the reflecting member supporting section, wherein the space, except for a fluid feed path and a fluid discharge path distinct from the fluid feed path, is sealed; wherein the space constitutes a fluid operating circuit having an outlet together with the fluid supply means and the fluid discharge means; wherein the gas passing through the fluid discharge path is discharged to the outside by the fluid discharge means; wherein the fluid discharge path is made narrower than the fluid feed path; and wherein a gas pressure required for elastically deforming the laser beam reflecting member is applied to the opposite surface of the laser beam reflecting surface."

No. 4 Allegations of the parties

1. The demandant's allegation

The demandant demanded the decision, in the written request for invalidation trial, that the patent for the invention according to Claim 1 before correction of the Patent shall be invalidated, and alleged, as reasons for invalidation, Reasons for invalidation 1 according to Article 29(1)(iii) of the Patent Act and Reasons for invalidation 2 according to Article 29(2) of the Patent Act. In the first oral proceedings as of March 2, 2011, the demandant withdrew Reasons for invalidation 1 (see the record of the first oral proceeding Demandant 3).

According to the written request for invalidation trial, the oral proceedings statement brief as of February 16, 2011, the record of the first oral proceeding, the written opinion as of December 13, 2011, and the written refutation as of May 20, 2014, the Reason for invalidation 2 alleged by the demandant is that the Corrected patent invention can be easily made by a person skilled in the art on the basis of the invention described in Evidence A No. 1 and well-known technical matters, that the demandee should not be granted a patent for the invention under the provisions of Article 29(2) of the Patent Act, and that the patent shall be invalidated under the provisions of Article 123(1)(ii) of the Patent Act. The demandant especially alleges the following (1) to (3) in the written refutation.

(1) Regarding Different features 1 and 2 between the Corrected patent invention and the invention described in Evidence A No. 1

The demandee's allegation on the Different features 1 and 2 in the written request for correction description as of April 14, 2014 is the same as the allegation in the written request for the trial, and the second trial decision made a decision that the Different features 1 and 2 can be easily conceived by a person skilled in the art. Therefore, no argument is considered to be required. However, in response to a rebuttal of the demandee against the allegation that all of the technologies described in Evidences A No. 2 to No. 4 "take it for granted that a feed path and a discharge path of a fluid are the same one" and "the configuration of supplying/discharging a pressure medium through one supply/discharge port in controlling a pressure of a sealed space has been a firm technical common sense for a person skilled in the art" (Written correction request as of April 14, 2014 p.24 l.8-l.21), an opening for supplying a gas and an opening for discharging a gas, as openings communicating with a sealed space, are provided when a gas pressure acts in the space sealed by a reflection film of a reflecting mirror to obtain a predetermined curvature radius, thereby keeping a constant curvature radius of a reflecting mirror surface, which is a well-known technical matter. (Written refutation as of May 20, 2014 p.22 l.13-p.25 l.12)

(2) Regarding Different feature 3 between the Corrected patent invention and the invention described in Evidence A No. 1

Even if the Correction adds the description, "the space constitutes a fluid operating circuit having an outlet together with the fluid supply means and the fluid discharge means" to Claim 1, it is reasonable, from [0031] and [0034] of the patent description and FIGS. 1, 2 and 3, that the description "discharged to the outside by the fluid discharge means" in Claim 1 means that a gas is discharged from an air outlet to the outside of the space in the reflecting member supporting section.

The finding held in the case for revocation 2011 (Gyo-Ke) 10168 against the second trial decision, "the description 'the gas passing through the fluid discharge path

is discharged to the outside by the fluid discharge means' means that 'the gas passing through the fluid discharge path is discharged to the outside of the space in the reflecting member supporting section,' and 'discharged to the outside' obviously means 'discharged to the outside of the space in the reflecting member supporting section' on the basis of the statements in the scope of claims. There is no other particular limitation" is not changed by the addition.
(Written refutation as of May 20, 2014 p.6 l.15-p.9 l.16)

(3) Regarding the Different feature 4 between the Corrected patent invention and the invention described in Evidence A No. 1

The "fluid feed path" and "fluid discharge path" in the Corrected patent invention correspond to the "pressure water supply path" and "pressure water discharge path" in the Invention A-1, and the "pressure water supply path" and "pressure water discharge path" in the Invention A-1 are arranged near the back space of the curvature-variable mirror. Therefore, it is not a different feature. The correct finding of the Different feature 4 is "a point that the Corrected patent invention is configured to make a fluid discharge path narrower than a fluid feed path, while Invention A-1 does not describe that the fluid discharge path is made narrower than the fluid feed path, and they have almost the same diameter according to the drawings." According to the matters described in Evidence A No. 22 and No. 23, it can be said that a person skilled in the art can determine diameters of the pressure water supply path and pressure water discharge path, as necessary. Therefore, Different feature 4 is only a design matter which is to be set by a person skilled in the art as necessary. (Written refutation as of May 20, 2014 p.9 l.17-p.12 l.15)

(4) Regarding evidences

The demandant submitted, as means of proof, with the written request for invalidation trial, the following Evidences A No. 1 to No. 9, submitted, with the written opinion as of December 13, 2011, the following Evidences A No. 16 to No. 20, and submitted Evidences A No. 21 to No. 28 with the written refutation as of May 20, 2014.

Evidence A No. 1 German Utility Model Registration No. 9407288 (published on September 15, 1994)
Evidence A No. 2 Japanese Unexamined Patent Application Publication No. H1-166894
Evidence A No. 3 Japanese Unexamined Patent Application Publication No. H1-219801
Evidence A No. 4 Japanese Unexamined Patent Application Publication No. S61-159613
Evidence A No. 5 Japanese Unexamined Patent Application Publication No. S57-6804
Evidence A No. 6 "New edition Hydraulic and Pneumatic handbook" edited by Japan Hydraulics & Pneumatics Society, Ohmsha, First edition First copy published on February 25, 1989, p.482-483 and pp.558-561
Evidence A No. 7 Japanese Unexamined Patent Application Publication No. H7-36551
Evidence A No. 8 Japanese Unexamined Patent Application Publication No.

H4-356395
Evidence A No. 9 Japanese Patent Publication No. H5-63272
Evidence A No. 16 Japanese Unexamined Patent Application Publication No. S62-241663
Evidence A No. 17 Japanese Patent Publication No. H2-18678
Evidence A No. 18 "General rules for pneumatic system JIS B8370" edited by Masaki NISHIIE, Japanese Standards Association, the first impression published on August 31, 1988, p.20-p.21
Evidence A No. 19 "Hydraulic/pneumatic circuit design handbook" written by Eiichi MORITA, Kogyo Chosakai Publishing, the fourth impression of the first edition published on July 20, 1991, pp.239-240, and p.281
Evidence A No. 20 Japanese Unexamined Patent Application Publication No. H5-212060
Evidence A No. 21 Judgment of Tokyo District Court 2010 (Wa) 20084 Attachment 1
Evidence A No. 22 "Introduction to pneumatic technology (basic edition)" supervised by Kimio SHIMADA/written by Makoto MINAMI, Ohmsha, First edition First copy published on February 25, 1976, p.16-p.19
Evidence A No. 23 Japanese Unexamined Patent Application Publication No. H5-180556
Evidence A No. 24 "Pictorial practical manual for pneumatic technology" written b Koji NAKANISHI, Ohmsha, First edition First copy published on November 30, 1986, p.7 and p.8
Evidence A No. 25 "Hydraulic and pneumatic industry list 1990 edition" edited by editorial section of The Heavy & Chemical Industries News Agency, The Heavy and Chemical Industries News Agency, published on September 10, 1989, items 3 and 4 p.328-p.330, p.446-p.467
Evidence A No. 26 Japanese Patent Publication No. H3-36401
Evidence A No. 27 Microfilm of Japanese Utility Model Application No. H55-20892 (Japanese Unexamined Patent Application Publication No. S56-122643)
Evidence A No. 28 Japanese Unexamined Patent Application Publication No. S 61-149915

The following Evidences A No. 10 to No. 15 attached to the oral proceedings statement brief of the demandant as of February 16, 2011 were used as reference materials in the oral proceeding (see the record of the first oral proceeding Demandant 2).

Evidence A No. 10 Japanese Patent Publication No. S62-2674
Evidence A No. 11 Japanese Unexamined Patent Application Publication No. S61-253194
Evidence A No. 12 Japanese Unexamined Patent Application Publication No. H5-8073
Evidence A No. 13 Japanese Utility Model Publication No. H7-19673
Evidence A No. 14 Microfilm of Japanese Utility Model Application No. S60-140785 (Japanese Unexamined Patent Application Publication No. S62-51411)
Evidence A No. 15 Japanese Unexamined Patent Application Publication No.

2. The demandee's allegation

According to the written reply as of December 7, 2010, the oral proceedings statement brief of the demandee as of February 16, 2011, the record of the first oral proceeding, the written statement as of December 14, 2011, the written correction request, and the written statement as of May 30, 2014, the demandee demanded the decision that the request for trial of the case was groundless. The allegation is as outlined below.

(1) Regarding different features between the Corrected patent invention and the invention described in Evidence A No. 1

The different features between the Corrected patent invention and the invention described in Evidence A No. 1 are as follows.

<Different feature 1>

As a pressure medium for changing a curvature radius of a curvature-variable mirror, a gas is used in the Corrected patent invention, and pressure water is used in the invention described in Evidence A No. 1.

<Different feature 2>

As a valve for changing a pressure of the pressure medium, an electropneumatic valve is used in the Corrected patent invention, and a solenoid valve is used in the invention described in Evidence A No. 1.

<Different feature 3>

The Corrected patent invention includes a fluid operating circuit having an outlet and is configured so that a gas serving as a pressure medium passes through a discharge path and is discharged to the outside from fluid discharge means. The invention described in Evidence A No. 1 does includes no fluid operating circuit having an outlet and is configured so that pressure water serving as a pressure medium passes through a discharge path then circulates to flow into the back space of the mirrors again.

<Different feature 4>

In the Corrected patent invention, the fluid discharge path made narrower than the fluid feed path to generate a gas pressure is arranged between the space and the fluid discharge means arranged in the reflecting member supporting section, or the fluid discharge path which generates a gas pressure is arranged near the back space of the curvature-variable mirror. In the invention described in Evidence A No. 1, a fixed throttle 23 which generates pressure is arranged on a return path which is located downstream the pressure water passing through the back space of the other reflecting mirror, or in a position distant from the back space of the curvature-variable mirror.

(Written correction request p.19 l.16-p.20 l.18)

(2) Regarding the Different feature 1

The invention described in Evidence A No. 1 is based on the technical spirit that the pressure water is a pressure medium as well as a cooling medium, and a person skilled in the art does not isolate a cooling function from a pressure control function in understanding the invention described in Evidence A No. 1. What a person skilled in the art conceives on the basis of the invention described in Evidence A No. 1 is one which achieves both cooling function and pressure control function. This point

eliminates motivation for the Corrected patent invention from the invention described in Evidence A No. 1, and may be an obstructive reason. According to Evidences A No. 2 to No. 4, in using a gas as a pressure medium, it is technically common for a person skilled in the art before the Corrected patent invention to use one path for both supplying and discharging a fluid. Thus, there is no motive for substituting a gas for pressure water while configuring a feed path and a discharge path for a pressure water separately in the invention described in Evidence A No. 1. The invention described in Evidence A No. 1 can be implemented only by using a cooling medium which can transfer heat at the same level as water and cannot be air or other gases. Due to compression of a gas, in the invention described in Evidence A No. 1, if a gas is substituted for pressure water, responsiveness of the throttle device 15 in the curvature-variable mirror with respect to pressure control is reduced.

Evidence A No. 1 includes the descriptions to be interpreted as "since pressure water circulates continuously in the throttle valve 16, a predetermined amount of pressure water serving as a coolant is supplied always to the adaptive mirror 7 and the deflecting mirror 6 connected downstream of the adaptive mirror" and "When a fluid flows continuously in one of throttle valves connected in parallel, the fluid being suitable as a cooling medium, satisfactory cooling of the mirror surface of the deflecting mirror can be secured." On the basis of the descriptions, the nature of the invention described in Evidence A No. 1 is to change a curvature radius of a mirror by use of cooling water. (Written correction request p.23 l.9-p.36 l.14, Written statement as of May 30, 2014 p.3 l.14-p.6 l.18)

(3) Regarding the Different feature 2

There is no motive for substituting a gas for pressure water in the invention described in Evidence A and there is a technical disincentive, such as cooling performance or responsiveness in pressure change. Therefore, it is impossible to apply an electropneumatic valve for controlling pressure of a gas to the invention described in Evidence A No. 1 which uses a liquid as a pressure medium.

For reaching the Invention from the invention described in Evidence A No. 1, a first step of employing a gas as a pressure medium and a second step of employing an electropneumatic valve as pressure control means are required. It is extremely difficult for a person skilled in the art to conceive of maintaining a configuration that a feed path of the pressure water and a discharge path of the pressure water are distinct from each other, in addition to the above two steps. (Written correction request p.36 l.15-p.37 l.10)

(4) Regarding the Different feature 3

In the invention described in Evidence A No. 1, in discharging pressure water to the outside, a method of treating the discharged water is required. When the water is discharged to the outside by a pressure of pressure water in the back of the mirror, a device is required in considering the strength of the jetting water.

In the invention described in Evidence A No. 1, there is almost no option to form a fluid operating circuit having an outlet and discharge the pressure water to the outside without circulation, substantially. (Written correction request p.21 l.1-l.14)

(5) Regarding the Different feature 4

In the invention described in Evidence A No. 1, the pressure water is incompressible, and the back of the mirror and the fixed throttle 23 may be spaced from each other.

A gas is compressible, and responsiveness is higher when the amount of gas existing between the fluid supply means and the fluid discharge means is smaller. In the Patent invention, the fluid discharge path generating air pressure by narrowing fluid discharge path than fluid supply path is arranged near the space at the back of the curvature-variable mirror.

In the invention described in Evidence A No. 1, there is no motivation to arrange the fixed throttle near the adaptive mirror 7 at all. (Written correction request p.21 l.15-p.23 l.8)

(6) Regarding the functions and effects

The Corrected patent invention is an invention based on a concept that a curvature radius of a curvature-variable mirror is changed by pressure of a gas and a discharge path to discharge a gas from the space at the back of the mirror is arranged separately from a feed path to supply a gas into the space, to change a curvature radius of a laser beam reflecting member at a high speed, which is fundamentally different from the invention described in Evidence A No. 1.

The distinct discharge path in the Corrected patent invention is arranged to change pressure of a gas in the mirror back space at a high speed, and the gas is discharged to the outside of the fluid operating circuit, or to the atmosphere outside of the device, without circulation, which is completely different from the invention described in Evidence A No. 1. (Written correction request p.34 l.16-p.36 l.14)

No. 5 Judgment by the body

1. Inventions or matters described in Evidences A

(Hereinafter, Evidence A No. x may be referred to as A-x, and the invention described in Evidence A No. x may be referred to as Invention A-x.)

(1) Described matters in A-1 and Invention A-1

A-1 includes the following description. In A-1, (a) for umlaut, (u) for umlaut, and (o) for umlaut are referred to as ae, ue, and oe, respectively, and Eszett is referred to as ss. The portions in brackets are interpretations with corrections added by the body on the basis of the attachment to Evidence A No. 1 by the demandant. Underlines are added to the corrections.

A.

「Die Erfindung betrifft eine Laserschneidmaschine mit einem Lasergenerator sowie mit einem Laserschneidkopf, welcher mittels eines durch eine numerische Steuerung gesteuerten Antriebs relativ zu dem Lasergenerator und/oder relativ zu einem zu bearbeitenden Werkstueck in einer Ebene im wesentlichen parallel zu dem Werkstueck verschiebbar ist und eine Fokussieroptik fuer den Laserstrahl sowie eine Stelleinrichtung zur Einstellung der Fokuslage des Laserstrahls durch Verlagerung des Fokus' gegenueber dem Laserschneidkopf im wesentlichen senkrecht zu dem Werkstueck

aufweist. 」(Patent description p.1 the eighth line from the bottom to p.2 l.2)
(The invention relates to a laser cutting device having a laser oscillator and a laser cutting head, the laser cutting head being movable in a plane substantially parallel to a member to be machined, with respect to the laser oscillator and/or the member to be machined, by use of a power to be controlled by a numerical control device, and comprising a converging optical system for laser beam and an adjustment device for adjusting a focusing position of a laser beam by moving a focal point for the laser cutting head substantially perpendicularly to the member to be machined.)

B.
「Der Erfindung liegt nun die Aufgabe zugrunde, eine unter Werkstattbedingungen funktionstuechtige und fuer den automatisierten Betrieb geeignete Laserschneidmaschine bereitzustellen, die eine funktionssichere optische Einstellung der Fokuslage erlaubt. 」(Patent description p.3 the fourth line from the bottom to p.3 the last line)
(The invention is based on a problem to provide a laser cutting device suitable to a functional automated operation under the condition of a work place, functionally reliable, and allowing for optical adjustment of a focusing position.)

C.
「Diese Aufgabe wird erfindungsgemaess dadurch geloest, dass bei einer Laserschneidmaschine der eingangs genannten Art die numerische Steuerung zur Einhaltung einer senkrecht zu dem Werkstueck gleichbleibenden Fokuslage zusaetzlich die Stelleinrichtung zur Einstellung der Fokuslage in Abhaengigkeit von der Position des Laserschneidkopfs in dessen Bewegungsebene parallel zu dem Werkstueck steuert. Mittels der numerischen Steuerung wird zunaechst die Position des Laserschneidkopfs stellvertretend fuer die Laenge des Laserstrahls erfasst. Jeder Position des Laserschneidkopfs und somit jeder Laserstrahllaenge ist eine bestimmte Einstellung der Stelleinrichtung zur Variierung der Fokuslage zugeordnet. Durch die numerische Steuerung gesteuert, wird die Stelleinrichtung in die jeweilige Solleinstellung gebracht. 」(Patent description p.4 l.1 to l.13)
(According to the device, the problem is solved by a numerical control device, which maintains the focusing position perpendicular to the member to be machined unchanged, in the case of a laser cutting device of the above type, controlling the adjustment device for adjusting a focusing position, in accordance with a location of the laser cutting head with a moving surface parallel to the member to be machined. By use of the numerical control device, the location of the laser cutting head is grasped first instead of a length of the laser beam. A predetermined adjustment value of the adjustment device for changing the focusing position is allocated to each of the locations of the laser cutting head, or each laser beam length. The adjustment device is controlled by the numerical control device and the locations thereof are target positions.)

D.

「Grundsaetzlich ist es moeglich, die Stelleinrichtung zur Einstellung der Fokuslage mittels der numerischen Steuerung stufenlos zu verstellen und jeder punktuellen Position des Laserschneidkopfs eine bestimmte Einstellung der Stelleinrichtung zuzuordnen. Zur Vereinfachung der Steuerung aber ist bei einer bevorzugten Ausfuehrungsform der erfindungsgemaessen Laserschneidmaschine vorgesehen, dass der Laserschneidkopf innerhalb eines in wenigstens zwei Teilbereiche unterteilten Bewegungsbereichs verschiebbar ist und dass jedem Teilbereich ein Verstellwert zur Einstellung einer gleichbleibenden Fokuslage zugeordnet ist. Die Anzahl der Teilbereiche wird zweckmaessigerweise in Abhaengigkeit von der Groesse der Flaeche gewaehlt, die mit dem Laserschneidkopf waehrend des Bearbeitungsvorgangs bestrichen wird. Auf der Grundlage des fuer jeden Teilbereich vorgegebenen Verstellwerts steuert die numerische Steuerung die Verstellung der Stelleinrichtung fuer die Fokuslage. Eine Verstellung der Stelleinrichtung wird stets dann veranlasst, wenn der Laserschneidkopf von einem Teilbereich seines Bewegungsbereichs in einen diesem benachbarten Teilbereich wechselt.」 (Patent description p.4 l.14 to p.5 l.5)

(Basically, positions of the adjustment device for adjusting the focusing position can be adjusted smoothly by use of the numerical control device, and predetermined adjustment values of the adjustment device can be allocated to the locations of the laser cutting head. However, for easy control, in a preferable embodiment of a laser cutting device of the device, the laser cutting head can move in a moving area having at least two partial areas, and the adjustment values for adjusting the focusing position unchangeably are allocated beforehand to the partial areas. The number of the partial areas is preferably selected in accordance with the size of a surface swept during machining by the laser cutting head. On the basis of the adjustment values allocated to the partial areas, the numerical control device controls the adjustment values of the adjustment device for focusing position. The location adjustment of the adjustment device is always performed when the laser cutting head moves from a partial area of the moving area to an adjacent area.)

E.

「Eine weitere Ausfuehrungsform der Erfindung, bei der die Stelleinrichtung zur Einstellung der Fokuslage wenigstens einen der Fokussieroptik in Richtung des Laserstrahls vorgeschalteten Umlenkspiegel fuer den Laserstrahl aufweist, welcher an der seiner Spiegelflaeche abgewandten Flaeche von einem unter veraenderbarem Druck stehenden Fluid beaufschlagt und dadurch adaptiv gekruemmt wird, zeichnet sich dadurch aus, dass der Umlenkspiegel ueber eine stellbare Drosselanordnung mit Fluid beaufschlagt wird, mittels derer der Druck des Fluids veraenderbar ist und dass die numerische Steuerung der erfassten Position des Laserschneidkopfs als Verstellwert zur Einstellung der Fokuslage einen Sollwert fuer den Druck des Fluids zuordnet und zur Einstellung dieses Sollwerts die stellbare Drosselanordnung steuert. Durch Regulierung des Durchflussquerschnitts der stellbaren Drosselanordnung wird der an deren Ausgangsseite anstehende Druck des Fluids reguliert. Dementsprechend kann die Spiegelflaeche des stromabwaerts der Drosselanordnung gelegenen Umlenkspiegels mit variablen Druecken beaufschlagt und in seiner Kruemmung veraendert werden. Von der Kruemmung der Spiegelflaeche abhaengig ist die Konvergenz bzw. die Divergenz des durch den Umlenkspiegel auf die Fokussieroptik reflektierten und von dieser auf das Werkstueck gebuendelten Laserstrahls. Infolgedessen Fuehrt eine Veraenderung des an der Ausgangsseite der stellbaren Drosselanordnung anstehenden und auf die Rueckseite der Spiegelflaeche des Umlenkspiegels wirkenden Fluiddrucks zu einer Aenderung der Fokussierungsverhaeltnisse an der Fokussieroptik und somit zu einer Einstellung der Fokuslage des Laserstrahls senkrecht zu dem Werkstueck. Mittels der numerischen Steuerung wird ueber den Verstellwert die Stelleinrichtung zur optischen Einstellung der Fokuslage derart gesteuert, dass sich ueber den gesamten Bewegungsbereich des Laserschneidkopfs in dessen Bewegungsebene parallel zu dem zu bearbeitenden Werkstueck bezogen auf letzteres eine einheitliche Fokuslage einstellt.」 (Patent description p.5 l.6 to p.6 l.10)

(In any further embodiment of the device, the adjustment device for adjusting the focusing position includes at least one deflecting mirror for laser beam located in a stage preceding the converging optical system in a laser beam direction. The deflecting mirror is pushed by a fluid under a variable pressure on a surface opposite a mirror surface thereof, and adaptively deformed. The fluid is applied to the deflecting mirror via an adjustable throttle device which can change fluid pressure. The numerical control device allocates a predicted fluid pressure value as an adjustment value for adjusting the focusing position to the location where the laser cutting head is grasped, and controls the adjustable throttle device for adjusting the predicted value. A flow-rate cross section of the adjustable throttle device is controlled, to control fluid pressure at an output side thereof. In response thereto, the mirror surface of the deflecting mirror arranged downstream of the throttle device is pushed by variable pressure, and a curvature radius thereof is changed. Convergence or diffusion of the laser beam reflected on the converging optical system by the deflecting mirror and converged on

the member to be machined from the converging optical system depends on the curvature radius of the mirror surface. Accordingly, when the fluid pressure at the output side of the adjustable throttle device and acting on the back face of the mirror surface of the deflecting mirror changes, convergence ratio with respect to the converging optical system is changed, and the focusing position of the laser beam perpendicular to the member to be machined is adjusted. The adjustment device for optically adjusting the focusing position is controlled via the adjustment values by use of the numerical control device so that uniform focusing position based on the member to be machined may be adjusted in the whole of the moving area of the laser cutting head with the moving surface parallel to the member to be machined.)

F.

「Wird eines der parallel geschalteten Drosselventile permanent von Fluid durchstroemt, so ist bei Verwendung eines als Kuehlmittel geeigneten Fluids stets eine hinreichende Kuehlung der Spiegelflaeche des Umlenkspiegels gewaehrleistet. Zweckmaessigerweise entspricht der Druck des Fluids, der sich an der Ausgangsseite der Drosselanordnung einstellt, wenn die uebrigen Drosselventile der Drosselanordnung in Schliessstellung geschaltet sind und lediglich das permanent geoeffnete Drosselventil von Fluid durchstroemt wird, einem einem Teilbereich der Laserschneidkopfbewegung zugeordneten Druck-Sollwert. 」 (Patent description p.7 l.6 to l.15)

(When a fluid always flows in one of throttle valves connected in parallel, the fluid being suitable as a cooling medium, satisfactory cooling of the mirror surface of the deflecting mirror can always be secured. Preferably, when other throttle valves of the throttle device are switched to a closed position and a fluid flows only in always-open throttle valves, the fluid pressure adjusted at the output side of the throttle device corresponds to the predicted pressure value allocated to the moving partial area of the laser cutting head.)

G.

「Wie Figur 1 zu entnehmen ist, wird bei Laserschneidmaschinen ein Laserstrahl 1 ausgehend von einem Lasergenerator 2 ueber Umlenkspiegel 3, 4, 5, 6, 7 zu einer als Sammellinse 8 ausgebildeten Fokussieroptik gelenkt. Die Sammellinse 8 buendelt den Laserstrahl 1 durch eine Duese 9 auf ein nicht dargestelltes Werkstueck. Die Duese 9 dient zur Aufgabe von Schneidgas in die Schneidspur des Laserstrahls 1. Bei dem Umlenkspiegel 7 handelt es sich um einen adaptiven Spiegel mit veraenderbarer Kruemmung. 」

(Patent description p.11 l.1 to l.8)

(As shown in FIG. 1, in the laser cutting device, the laser beam 1 from a laser oscillator 2 is directed to a converging optical system constituted as a converging lens 8 via deflecting mirrors 3, 4, 5, 6, and 7. The converging lens 8 converges the laser beam 1 on a member to be machined (not shown) by means of a nozzle 9. The nozzle 9 is used for charging a cutting trajectory of the laser beam 1 with cutting gas. The

deflecting mirror 7 treats an adaptive mirror with variable curvature radius.)

H.

「Die Vorrichtung nach Figur 1 bedient sich zu diesem Zweck des adaptiven Spiegels 7. Der adaptive Spiegel 7 besitzt eine polierte Spiegelflaeche 12, die von der Oberflaeche einer duennen Metallscheibe gebildet wird. Diese duenne Metallscheibe ist mit ihren Raendern in den Fassungsring eines Spiegelgehaeuses 13 eingespannt. Von der Spiegelflaeche 12 wird der einfallende Laserstrahl 1 zu einer Sammellinse 8 reflektiert, die den Laserstrahl 1 auf die Werkstueckoberflaeche buendelt. 」 (Patent description p.12 the sixth line from the bottom to p.13 l.2)

(The device in FIG. 1 is operated, for this purpose, by using an adaptive mirror 7. The adaptive mirror 7 includes a polished mirror surface 12 formed by a surface of a thin metal disk. The thin metal disk has an edge set in an attachment ring of a mirror case 13. The incident laser beam 1 is reflected by the mirror surface 12 to the converging lens 8 which converges the laser beam 1 onto a surface of the member to be machined.)

I.

「An der der Spiegelflaeche 12 abgewandten Flaeche wird die Metallscheibe des Spiegels ueber eine Fluidleitung 14 mit Druckwasser beaufschlagt. Da die Metallscheibe des dargestellten Spiegels 7 bei einem Druck von 1,25 bar plan gefertigt worden ist, ergibt sich ein planer Verlauf der Spiegelflaeche 12 dann, wenn in der Fluidleitung 14 Druckwasser mit einem Druck von 1,25 bar ansteht. Sinkt der Druck in der Fluidleitung 14 unter diesen Wert ab, so nimmt die Spiegelflaeche 12 ein konkave Form an, wie dies in der rechten Teildarstellung der Figur 2 gezeigt ist. Entsprechend fuehrt eine Erhoehung des Drucks in der Fluidleitung 14 ueber 1,25 bar zu einer konvexen Verformung der Spiegelflaeche 12. Der Grad der Konvexitaet bzw. Konkavitaet der Spiegelflaeche 12 kann durch Steuerung des Drucks in der Fluidleitung 14 eingestellt werden. Wie bei Vergleich der linken und der rechten Darstellung von Figur 2 zu erkennen ist, fuehrt eine Veraenderung der Kruemmung der Spiegelflaeche 12 zu einer Veraenderung der Konvergenz bzw. Divergenz des von der Spiegelflaeche 12 reflektierten Laserstrahls 1. In Abhaengigkeit von der sich einstellenden Geometrie des Laserstrahls 1. variiert die Lage des von der Sammellinse 8 erzeugten Fokus des Laserstrahls 1 senkrecht zu dem Werkstueck. 」 (Patent description p.13 l.3 to l.22)

(Pressure water is applied to the metal disk of the mirror on a surface opposite the mirror surface 12 via a fluid conduit 14. The metal disk of the mirror 7 shown in the figure is manufactured so as to form a plane with pressure of 1.25 bar. If pressure water with a pressure of 1.25 bar exists in the fluid conduit 14, a curved line of the mirror surface 12 is made flat. When the pressure in the fluid conduit 14 decreases below the value, the mirror surface 12 is concaved as shown in the right figure in FIG. 2. When the pressure in the fluid conduit 14 exceeds 1.25 bar, the mirror surface 12 is

deformed in a convex shape, accordingly. The concave or convex degree of the mirror surface 12 can be adjusted by controlling the pressure in the fluid conduit 14. Comparing the right and left figures in FIG. 2, when the curvature radius of the mirror surface 12 changes, convergence or diffusion of the laser beam 1 reflected from the mirror surface 12 is changed. In accordance with a geometric configuration of the adjusted laser beam 1, the focusing position of the laser beam 1, which is perpendicular to the member to be machined, generated by the converging lens 8 is changed.)

J.

「Eingestellt wird der in der Fluidleitung 14 anstehende Druck mit Hilfe der numerischen Steuerung der Laserschneidmaschine. Diese steht mit einer Drosselanordnung 15 in Verbindung, wie sie in Figur 3 dargestellt ist. Die Drosselanordnung 15 ist dem adaptiven Spiegel 7 in Stroemungsrichtung des Druckwassers vorgelagert und umfasst vier parallelgeschaltete Drosselventile 16, 17, 18, 19. Das Drosselventil 16 wird permanent von Druckwasser durchstroemt. Der Durchfluss von Druckwasser durch die Drosselventile 17, 18, 19 kann durch steuerbare Magnetventile 20, 21, 22 gesperrt bzw freigegeben werden. Eine feste Drossel 23 ist im Ruecklauf des Druckwassers vorgesehen; ein Druckregler 24 und ein Feinstfilter 25 sind der Drosselanordnung 15 vorgeschaltet. 」 (Patent description p.13 l.23 to p.14 l.8)

(The pressure in the fluid conduit 14 is adjusted by use of the numerical control device of the laser cutting device. As shown in FIG. 3, the device is connected to the throttle device 15. The throttle device 15 is disposed in a stage preceding the adaptive mirror 7 in a flow direction of the pressure water, and includes the throttle valves 16, 17, 18 19 connected in parallel. In the throttle valve 16, pressure water always flows. The flow rates of the pressure water passing through the throttle valves 17, 18, and 19 can be shut off or opened by controllable magnetic valves 20, 21, 22. A fixed valve 23 is arranged in a return path of the pressure water. A pressure adjuster 24 and a fine filter 25 are arranged in a stage preceding the throttle device 15.)

K.

「Das von einer Druckquelle bereitgestellte Druckwasser wird der Drosselanordnung 15 ueber den Feinstfilter 25 und den Druckregler 24 zugefuehrt. Mittels des Druckreglers 24 wird ein maximaler Systemdruck vorgegeben. Da die feste Drossel 23 einen unveraenderlichen Durchflussquerschnitt besitzt und infolgedessen einen konstanten Staudruck aufbaut, kann der in der Fluidleitung 14 des adaptiven Spiegels 7 anstehende Druck durch Steuerung der Drosselanordnung 15 eingestellt werden. Da das Drosselventil 16 permanent von Druckwasser durchstroemt wird, wird der adaptive Spiegel 7 sowie der diesem nachgeschaltete Umlenkspiegel 6 stets mit einer gewissen als Kuehlmittel fungierenden Druckwassermenge versorgt. Bei dem dargestellten Ausfuehrungbeispiel steht bei geschlossenen Magnetventilen 20, 21, 22 an der Ausgangsseite der Drosselanordnung 15 und somit auch an der Rueckseite der Spiegelflaeche 12 des adaptiven Spiegels 11 ein Druck

von 0,5 bar an. J (Patent description p.14 l.9 to l.23)
(The pressure water prepared by a pressure source is supplied to the throttle device 15 via the fine filter 25 and the pressure adjuster 24. By use of the pressure adjuster 24, the maximum device pressure is provided. The fixed throttle valve 23 with invariable flow-rate cross section generates constant dynamic pressure, thereby adjusting the pressure in the fluid conduit 14 of the adaptive mirror 7 by controlling the throttle device 15. Since the pressure water always flows in the throttle valve 16, a predetermined amount of pressure water functioning as coolant is supplied always to the adaptive mirror 7 and the deflecting mirror 6 located in a stage posterior to the adaptive mirror 7. In the embodiment shown in the figure, when the magnetic valves 20, 21, and 22 are closed, a pressure of 0.5 bar exists at the output side of the throttle device 15 and at the back side of mirror surface 12 of the adaptive mirror 11.)

L. FIG. 2

FIG. 2 illustrates that the "Spiegelgehaeuses 13" (mirror case 13) and the "Spiegelflaeche 12" (mirror surface 12) form a space on the side opposite the reflecting surface of the "Spiegelflaeche 12" (mirror surface 12), and that the "Fluidleitung 14" (fluid conduit 14) leading to the space and a fluid conduit distinct from the fluid conduit 14 are arranged in the mirror case 13.

M. FIG. 3

FIG. 3 illustrates that there are two paths, a path from the "Drosselventile 16, 17, 18, 19" (throttle valves 16, 17, 18, 19) to the "adativen Spiegels 7" (adaptive mirror 7), and a path from the adaptive mirror 7 to the "feste Drossel 23" (fixed throttle 23).

N. Invention A-1

The described matter G. discloses a laser cutting device that converges a laser beam 1 output from a laser oscillator 2 by use of a converging lens 8, for cutting a work, and indicates that an adaptive mirror is arranged in a transmission path of the laser beam 1.

The described matter H. discloses that, in the adaptive mirror, a peripheral part of a metal disk having a mirror surface 12 is supported by a mirror case 13, and, referring to the drawings in L., it can be said that a space is formed at the opposite side of the mirror surface 12 of the metal disk, by the mirror case 13 and the metal disk having the mirror surface 12.

The described matter I. discloses that pressure of pressure water is supplied to the opposite side of the mirror surface 12 of the metal disk, to elastically deform the metal disk having the mirror surface 12.

The described matters J. and K. disclose means for supplying pressure water, means for discharging the pressure water, or switching the pressure of the pressure water in four stagers by the magnetic valves 20, 21, 22.

Referring to the described matters J. and K. and the drawings in L. and M., it can be said that there is a path for supplying pressure water via the fluid conduit 14 arranged in the mirror case 13, that another fluid conduit separate from the fluid conduit 14 is arranged in the mirror case 13, and that a path pressure water is exhausted via the fluid conduct exists, and that the pressure water passing through the path is discharged to the outside of the space from the fluid conduit distinct from the fluid conduit 14.

Referring to the described matters I. to K. and the drawing in L. and M., it can be said that the space formed by the mirror case 13 and the metal disk having the mirror surface 12 is sealed excluding the paths. Thus, it can be said that the space forms a fluid circuit where pressure water flows together with the fluid conduit 14 arranged in the mirror case 13 and the fluid conduit arranged separately from the fluid conduit 14 in the mirror case 13, at least, to apply pressure of pressure water.

In light of the described matters A. to K. and the drawings in L. and M., it can be recognized that A-1 describes the following Invention A-1.

"A laser cutting device for cutting a work by converging a laser beam 1 output from a laser oscillator 2 by means of a converging lens 8 comprising: a metal disk having a mirror surface 12 which is arranged in a transmission path of the laser beam 1 and elastically deforms with a pressure of pressure water; a mirror case 13 supporting the peripheral section of the metal disk and forming a space at the opposite side of the mirror surface 12 of the metal disk together with the metal disk; a fluid conduit 14 arranged in the mirror case 13 and supplying pressure water into the space in the mirror case 13; magnetic valves 20, 21, 22 for switching the pressure of the supplied pressure water in four stages; and another fluid conduit arranged separately from the fluid conduit 14 to discharge the pressure water from the space in the mirror case 13, wherein the space of the mirror case 13, except for a pressure water supply path and a pressure water discharge path distinct from the pressure water supply path, is sealed; wherein the space forms a fluid circuit together with the fluid conduit 14 and the fluid conduit arranged separately from the fluid conduit 14; wherein the pressure water passing through the pressure water discharge path is discharged to the outside of the space from the fluid conduit distinct from the fluid conduit 14; and wherein a pressure of the pressure water required for elastically deforming the metal disk is applied to the opposite side of the mirror surface 12 of the metal disk."

(2) Matters described in A-2
A.
"To change a curvature radius of the mirror (16) of the collimation part (11), a control signal (20) shown in FIG. 2 is transmitted to a pressure control device (19). In the pressure control device (19), a pressure generated in a pressure pump (18) is controlled to change a pressure of a gas (or liquid) (17) to be applied to the back of the mirror (16). The curvature radius of the mirror (16) is changed, and the curvature radius of the collimation part (11) is changed, accordingly." (p.3 the upper right column l.19 to the lower left column l.7)

(3) Matters described in A-3
A.
"The variable-focus reflecting mirror (1) is formed of a shell (2), a chamber pressure adjustment device (3), and a reflecting mirror (4).

The shell (2) includes a pressure chamber (5) having an opening where a holding part (7) is formed which holds the reflecting mirror (4) airtightly with an O-ring (6). A pressure meter (8) of the chamber pressure adjustment device (3) and piping (9) are connected to the pressure chamber (5) of the shell (2). The piping (9) has a

compressor piping system (9a) and a vacuum pump piping system (9b), and is switched by electromagnetic operation valves (10a) and (10b) as necessary for a compressor (11a) and a vacuum pump (11b). The switching is performed by opening/closing the electromagnetic operation valves (10a) and (10b) by control section (12)." (p.2 the lower left column l.17 to the upper right column l.9)

(4) Matters described in A-4
A.
"In the reflecting curved mirror thus configured, when a pump 8 is operated by opening a valve 7, the air in the space 4 is discharged, and the pressure in the container 1 decreases below an outside pressure, thereby generating a pressure difference between the two sides of the film 3, and the film 3 bends inward. A reflection surface 3a, which is an outer surface of the film, forms a substantial paraboloid of revolution. Thus, when electromagnetic waves, such as beams, are made incident on the curved mirror from above, the electromagnetic waves are reflected by the reflection surface 3a, and converged in nearly one spot, which can be used as a concave mirror." (p.3 the upper left column l.13 to the lower left column l.3)

B.
"In the above embodiments, a liquid can be substituted for a gas, which is a fluid to be supplied to or discharged from the space 4 in the container 1." (p.4 the lower left column l.6 to l.9)

(5) Matters described in A-6
A.
"2. 2. 6 Electric-pneumatic pressure control valve

This section shows a structure and performance examples of a valve which successively controls pneumatic output in accordance with an electric signal. As a valve embedded in a control valve, a spool valve, poppet valve, plate valve, and nozzle flapper valve are known. In operating the valves electrically, a magnetic body, such as a solenoid, torque motor, or movable coil, or a dielectric body represented by a piezoelectric element is used.

[1] Proportional flow-rate control valve and pressure control valve ..... Meanwhile, FIG. 4. 115 introduces secondary pressure (load-side pressure) to a pressure reaction chamber of a valve, balances it with an electromagnetic force of a solenoid, to proportionally control a current of the solenoid and the secondary pressure. [9]" (p.482 the right column the fifth line from the bottom to p.483 the left column l.15)

B.
"3. 6 Electric-pneumatic pressure control system
3. 6. 1 Control method using proportional valve, servo valve

Pneumatic control using a proportional valve has been applied to various fields. The proportional valve can be easily controlled by a microcomputer, and a position, pressure, or force can be quickly changed by an external command. The proportional valve will be used increasingly as a control element of a robot driving system or a flexible automated system." (p.558 the right column l.23 to l.30)

C.
"TANAKA [6] constitutes a pressure control servo mechanism with a pressure proportional valve to improve dynamic characteristics as compared with a flow-rate control system, and confirms improvement in position control accuracy of a cylinder. A horizontal position control system of a cylinder using a pressure proportional valve is shown in FIG. 4. 279 [7]." (p.558 the right column the third line from the bottom to p.560 the left column l.2)

(6) Matters described in A-7
A.
"[0001]
[Industrial Application Field] This invention relates to a pressure control device for an electropneumatic regulator, more specifically to a pressure control device for an electropneumatic regulator that detects a pressure of a gas supplied to a pneumatic device, such as a cylinder, and controls the pressure of the gas at a set pressure.
[0002]
[Conventional art] Conventionally, for controlling a gas supplied to a pneumatic device at a desired pressure, an electropneumatic regulator including a primary valve is used. A technical idea of electrically controlling a pressure of a gas supplied to the pneumatic device is disclosed in Japanese Unexamined Patent Application Publication No. H2-284213 'Electropneumatic regulator.'"

(7) Matters described in A-8
A.
"[0001]
[Industrial Application Field] This invention relates to a laser machining device, specifically to gas pressure control of assist gas, or the like, to be supplied to a nozzle.
[0002] [Conventional Art] The laser machining device of this type is configured to emit a laser beam onto a work from a tip of a nozzle and jet a gas, such as assist gas, to cut the work. In this case, the pressure of the gas jetted from the nozzle is set and adjusted to an appropriate pressure in accordance with machining conditions, such as a material or thickness of the work.
[0003] The pressure of the gas supplied to the nozzle is adjusted by a regulator, such as an electropneumatic regulator, and the pressure of the gas discharged from the regulator is set on the basis of a gas pressure command from a controller, such as an NC device."

(8) Matters described in A-18
A.
"7. 2. 2 Volume of the piping section The piping for connecting an operating device and a device controlling it only requires an aperture enough to supply a quantity of air flow required for operation set in the operating device and a required minimum length.
The volume thereof must be minimum for preventing reduction in responsiveness of the operating device." (p.21 l.8-l.10)

(9) Matters described in A-20
A.
"[0005] This pneumatic control method exerts a rotation speed control function during

non-load or predetermined light cutting. However, air is a compressible fluid, and when a conduit between a pressure adjustment valve and a jetting nozzle is long, pressure responsiveness is low; for example, rotation control is almost disabled when a state is changed from a cutting state with a predetermined load to a non-load state by removing a tool from teeth or when a load is changed rapidly."

(10) Matters described in A-22
A.
"In the throttles A and B, internal flows are limited by Pascal's principle. The throttles serve as a speed control valve for limiting flow speed of internal air pressure, accordingly. When a pneumatic pressure of 7 $kg/cm^2$ is applied to an input side, as shown in the figure, pressure is reduced by the throttles, and a pressure of 3.5 $kg/cm^2$ is generated at an outlet, which is an available output." (p.17 l.6-l.10) (The above "A" and "B" are circled in A-22.)

(11) Matters described in A-23
A.
"[0006]
[Problem to be solved by the invention] Accordingly, in a conventional storing device, the amount of modification gas to be supplied from a modification gas supply unit to a storage is decided in advance by the capacity of the modification gas supply unit and cross-sectional area of gas supply piping connected to the storage. When the gas in the storage is replaced with the modification gas, if the amount of modification gas to be supplied is larger than the capacity of the storage, internal pressure of the storage increases with the supplied modification gas, resulting in degradation of stored materials due to the internal pressure. On the contrary, if the amount of modification gas to be supplied is small, it takes time to replace the gas in the storage.
[0007] As for an exhaust pipe for discharging a gas in the storage to the outside,
a cross-sectional area, or an inner diameter of the exhaust pipe, is decided in advance experimentally. When the pipe has a large diameter for preventing increase of internal pressure, exhaust efficiency is improved but the modification gas supplied thereinto is discharged, thereby causing leakage, and it takes a long time to reach a predetermined internal gas concentration. When an exhaust pipe is small, internal pressure is increased due to supplied modification gas."

(12) Matters described in A-24
A.
"Pneumatic pressure releases exhaust air to the atmosphere. Hydraulic pressure is used in a circulation system, and hydraulic sources are arranged for each of devices in consideration of the influence between units. Pneumatic pressure can be concentrated in one pneumatic source." (p.8 the right column l.17 to l.20)

(13) Matters described in A-25
A.
"After consuming pneumatic energy, exhaust is emitted to the atmosphere, and no return pipe is required, unlike hydraulic pressure." (p.328 the left column the third line from the bottom to the last line)

B.
"Pneumatic pressure emits an exhaust gas to the atmosphere in principle, while hydraulic pressure is used in a circulation system and long piping is undesirable. Therefore, a hydraulic source is required in each of devices." (p.330 the right column l.7-l.10)

(14) Matters described in A-26
A.
"[Technical field]
This invention relates to a focusing control device of a concave reflecting mirror using a reflection film." (The first column l.10-l.12)

B.
"This invention is
a focusing control device that forms a concave reflection mirror by attaching a reflection film on an opening of a container having the circular opening at one side and reducing pressure in the container, which is characterized in that a pressure-reducing nozzle is inserted in the container and a position of a nozzle tip opening can be adjusted in the container, the reflection film sucked into the container up to a predetermined curvature radius is brought into contact with the nozzle tip opening, to control the amount of air sucked, and a ventilation slit is formed in a part of the container to balance the amount of air flowing in from the hole and the amount of air sucked for stabilization." (the first column the last line to the second column l.10)

(15) Matters described in A-27
A.
"... A mirror plate (2) is attached in an airtight manner on a front face of a mirror frame (1) which is formed in an airtight structure. Supply and discharge pipes (7) and (8) connected to a hydraulic pump or a pneumatic pump are connected to a rear part of the mirror-body frame (1), or a mirror frame part behind the mirror plate (2), and, as described above, the hydraulic pump or the pneumatic pump is driven for a predetermined time by a left-turn direction signal or a back signal, to apply hydraulic pressure or pneumatic pressure to a back face of the mirror plate (2), for deformation into a curved shape." (p.5 l.10-p.6 l.4)

(16) Matters described in A-28
A.
"The inside part of the container 3 is not completely shielded from the outside part. Air can enter or exit to a certain degree through a small hole formed in a wall of the container 3 or a gap between an outer periphery of a suction nozzle 4 and an inner periphery of a guide 5." (p.2 the lower left column l.19 to the lower right column l.3)

B.
"Meanwhile, as for the concave reflection mirror 1, the reflection film 2 is deformed into a spherical shape due to the air discharged by the suction nozzle 4, to form a concave reflection surface with a predetermined curvature radius. When the air is

discharged by the suction nozzle 4, the amount of air discharged is larger at the beginning than the amount of air entering the container 3 through the small hole, thereby gradually deforming the reflection film 2 toward the back side due to a negative pressure on the back side of the reflection film 2 with respect to the top side, resulting in forming a reflection concave surface." (p.2 the lower right column l.18-p.3 the lower left column l.5)

2. Comparison

In comparing the Corrected patent invention with Invention A-1, the following matters are recognized.

It is obvious that the "laser oscillator 2" and "laser beam 1" in Invention A-1 correspond to the "laser oscillator" and "laser beam" in the Corrected patent invention.

The "converging lens 8" in Invention A-1, which converges the "laser beam 1", corresponds to the "converging optical member" in the Corrected patent invention. The "laser cutting device" in Invention A-1, which cuts a work, corresponds to the "laser machining apparatus for cutting/welding a work" in the Corrected patent invention.

The "pressure water" in Invention A-1, which is a flowing continuous body, corresponds to the "fluid" in the Corrected patent invention. The "pressure water" in Invention A-1 is identical with the "gas" in the Corrected patent invention, in the point of a "fluid" which is a flowing continuous body.

The "metal disk having a mirror surface 12" in Invention A-1, which is arranged in a transmission path of the "laser beam 1" to reflect the "laser beam 1" and elastically deform with a pressure of the "pressure water," corresponds to the "laser beam reflecting member" in the Corrected patent invention. The "mirror surface 12" in Invention A-1 corresponds to the "laser beam reflecting surface" in the Corrected patent invention.

The "mirror case 13" in Invention A-1, which supports a peripheral section of the "metal disk" and forms a space together with the "metal disk" on an opposite surface of the "mirror surface 12" of the "metal disk," corresponds to the "reflecting member supporting section" in the Corrected patent invention.

The "fluid conduit 14" and "fluid conduit distinct from the fluid conduit 14" in Invention A-1, which supply and discharge "pressure water" into the space formed by the "metal disk" and the "mirror case 13," are identical with the "fluid supply means" and "fluid discharge means" in the Corrected patent invention, in the point of being means for supplying or discharging a "fluid" which is a flowing continuous body. Since a pressure is generated in the space by supplying/discharging the "pressure water" and the "metal disk having the mirror surface 12" elastically deforms, the fluid circuit in Invention A-1 constituted by the space and the "fluid conduit 14" and the "fluid conduit distinct from the fluid conduit 14" corresponds to the "fluid operating circuit" in the Corrected patent invention.

The "magnetic valves 20, 21, 22" in Invention A-1, which switch supply pressure of the "pressure water" in four stages, correspond to the "electropneumatic valve" in the Corrected patent invention, in the point of "a valve for switching fluid supply pressure" as a flowing continuous body.

The "pressure water supply path" and "pressure water discharge path" in Invention A-1, which are paths for supplying and discharging pressure water, or paths

for supplying and discharging a fluid as a flowing continuous body, correspond to the "fluid feed path" and the "fluid discharge path distinct from the fluid feed path" in the Corrected patent invention.

As indicated in the above No. 2 3. (1) E., it is obvious, on the basis of the statements in the scope of claims, that the description in the Corrected patent invention, "the gas passing through the fluid discharge path is discharged to the outside by the fluid discharge means," means "the gas passing through the fluid discharge path is discharged to the outside of the space in the reflecting member supporting section," and that "discharged to the outside" means "discharged to the outside of the space in the reflecting member supporting section," and there is no other particular limitation. Accordingly, in Invention A-1, pressure water is discharged from a sealed space formed by the metal disk having the "mirror surface 12" and the "mirror case 13," by a fluid conduit distinct from the fluid conduit 14 connected in the space, it can be interpreted as "being discharged to the outside." Therefore, in light of the above comparison, the description in Invention A-1, "the pressure water passing through the pressure water discharge path is discharged to the outside of the space by a fluid conduit distinct from the fluid conduit 14," is identical with the description in the Corrected patent invention, "the gas passing through the fluid discharge path is discharged to the outside by the fluid discharge means," in the point of "a fluid passing through a fluid discharge path is discharged to the outside by fluid discharge means."

In light of the above, the Corrected patent invention and Invention A-1 are identical and different in the following points.

<Corresponding features>

A laser machining apparatus for cutting/welding a work by collecting a laser beam output from a laser oscillator by means of a converging optical member comprising: a laser beam reflecting member which is arranged in a transmission path of the laser beam and elastically deforms with a fluid pressure; a reflecting member supporting section supporting the peripheral section of the laser beam reflecting member and, together with the laser beam reflecting member, forming a space on an opposite surface of a laser beam reflecting surface; fluid supply means arranged in the reflecting member supporting section and supplying a fluid into the space in the reflecting member supporting section; a valve for switching fluid supply pressure; and fluid discharge means arranged in the reflecting member supporting section and discharging the fluid from the space in the reflecting member supporting section, wherein the space, except for a fluid feed path and a fluid discharge path distinct from the fluid feed path, is sealed; wherein the space constitutes a fluid operating circuit together with the fluid supply means and the fluid discharge means; and wherein the fluid passing through the fluid discharge path is discharged to the outside by the fluid discharge means.

<Different feature 1>

As a fluid to be supplied into the space of the reflecting member supporting section by the fluid supply means or the fluid discharged from the space of the reflecting member supporting section by the fluid discharge means, the Corrected patent invention uses a "gas," while Invention A-1 uses "pressure water."

<Different feature 2>

As a valve for switching fluid supply pressure, the Corrected patent invention uses an "electropneumatic valve for successively switching" the fluid supply pressure, while Invention A-1 uses a "magnetic valve for switching" the fluid supply pressure "in four stages."

<Different feature 3>

The "fluid operating circuit" in the Corrected patent invention has an outlet, while it is not clear whether the "fluid circuit" in Invention A-1 has an outlet or not.

<Different feature 4>

The "fluid discharge path" in the Corrected patent invention is made narrower than the "fluid feed path," while it is not clear whether the "fluid discharge path" and the "fluid feed path" in Invention A-1 have the same configuration or not.

3. Judgment by the body for the different features

(1) Regarding Different feature 1

The configuration of employing a gas as a fluid in a reflecting mirror that changes a curvature radius with fluid pressure is a well-known technical matter, as described in A-2 to A-4, and A-26 to A-28 indicated in the described matter A. in 1. (2), described matter A. in 1. (3), described matters A. and B. in 1. (4), described matters A. and B. in 1. (14), described matter A. in 1. (15), described matters A. and B. in 1. (16). Especially, in light of the descriptions in A-2 "pressure of a gas (or a liquid) (17)" and A-27 "to apply hydraulic pressure or pneumatic pressure to a back face of the mirror plate (2), for deformation into a curved shape," it can be said that the fact that a gas and a liquid are identical as a fluid that generates a pressure is also well-known technical matter.

As described in the described matter E. in 1. (1), A-1 includes the term "Fluid." The following description is found in the item "fluid" in "Dictionary of Engineering and Scientific Terms (English, Germany, Japanese) the latest edition" (the first edition published by SANSHUSHA on November 1, 1985), according to the investigation by ex officio in the body ((u) with umlaut, and (o) with umlaut are referred to as ue and oe, respectively. The symbol "-" representing prolonged sound is added on "u" of "ryutai".).

"fluid ...(omitted)... /n [Phys] Fluid n (allgemeine Bezeichnung fuer stoemende Fluessigkeit oder stroemendes Gas) Ryutai ryutai [phys.]//Ryutai ryutai [chemistry, machine, marine]"

(interpretation: general name of a flowing liquid or a flowing gas)

Referring to the above dictionary, interpreting "Fluid" in Germany as "ryutai" in the field of physics or mechanical engineering was a well-known technical matter before filing the application for the Patent. Taking into account that the configuration of employing a liquid or a gas as a fluid in a reflecting mirror that changes a curvature radius with fluid pressure is a well-known technical matter, it is natural for a person skilled in the art having contact with the description in Evidence A No. 1 indicating that a curvature radius of the "metal disk having a mirror surface 12" with pressure of "Fluid" to interpret the "Fluid" in Germany in Evidence A No. 1 as a "fluid" including a "gas" as well as a "liquid." Thus, it can be said that A-1 indicates employing a gas as a

fluid. The demandee alleges that there is no motivation to substituting a gas for pressure water while maintaining a configuration that a feed path of the pressure water and a discharge path of the pressure water are distinct from each other in Invention A-1 since it was common technique for a person skilled in the art before the Invention to use one path for supplying and discharging a fluid when a gas is used as a pressure medium, according to A-2 to A-4. However, it can be said that a reflecting mirror using a supply path and a discharge path separately and using a gas as a pressure medium is a well-known technical matter as described in the described matters A. and B. in 1. (14), described matter A. in 1. (15), and described matters A. and B. in 1. (16). Therefore, the demandee's allegation "it was common technique for a person skilled in the art before the Invention to use one path for supplying and discharging a fluid when a gas is used as a pressure medium" cannot be accepted.

Referring to the described matter B. in 1. (1) in order to examine the existence of disincentive for substituting a gas for pressure water in A-1, it can be said that the problem of Invention A-1 is to provide a laser cutting device which is suitable to a functional automated operation under the condition of a work place, functionally reliable, and allowing for optical adjustment of a focusing position. As means for solving the problem, as indicated in the described matter E. in 1. (1), a metal disk which changes a curvature radius with pressure water is employed in Invention A-1. The fact of changing a curvature radius with pressure water can be recognized independently of whether the pressure water has a cooling effect or not, and can solve the problem of Invention A-1 indicated in the described matter B. in 1. (1), independently of whether the pressure water has a cooling effect or not.

Meanwhile, the described matter F. in 1. (1) discloses that, in A-1, sufficient cooling of a mirror surface can be ensured when a fluid suitable as a coolant is used, but it only discloses a secondary effect of ensuring sufficient cooling of a mirror surface. To ensure sufficient cooling of a mirror surface is not the problem of Invention A-1, accordingly. A person skilled in the art does not recognize only a fluid suitable as a coolant, as the fluid in A-1, on the basis of the above disclosure.

In light of the above, in a reflecting mirror that changes a curvature radius with fluid pressure, it is a well-known technical matter to employ a gas as a fluid, A-1 includes an indication of employing a gas as a pressure fluid, and there is no disincentive for using a gas in place of pressure water in Invention A-1. Thus, a person skilled in the art could easily conceive of including the configuration according to Different feature 1, in Invention A-1.

(2) Regarding Different feature 2

As indicated in the described matter D. in 1. (1), A-1 includes an indication of adjusting a focusing position smoothly, and it is obvious that a focusing position can be adjusted smoothly in a reflecting mirror that changes a curvature radius with pressure water, only by changing fluid pressure smoothly.

As described in A-6 to A-8 indicated in the above 1. (5) to (7), in considering that the presence of an electropneumatic valve is a well-known technical matter as means for changing fluid pressure smoothly, it can be said that a person skilled in the art could easily conceive of employing an electropneumatic valve for adjusting a focusing position smoothly in a reflecting mirror that changes a curvature radius with fluid

pressure.

(3) Regarding Different feature 3

The Corrected patent description includes the following description about the "outlet" of the "fluid operating circuit"

"A fluid operating circuit is structured in which the air 15 supplied from the air inlet 14 flows into an air passage 17 formed in the peripheral part of a circular holding plate 11 through air passages 16 arranged at equal intervals in the circular holding plate 11, then is discharged through an air outlet 18 formed in one place of the air jacket 13. The fluid pressure deforms a shape of the curvature-variable reflecting mirror 10 to a spherical one, which can be used as a spherical mirror (convex mirror in this case). ..." ([0031])

"The air in a laser beam transmission path is often purged to prevent entry of dust or harmful gas or ensure stability of laser beams. When the air discharged from the air outlet 18 is supplied again into the laser beam's transmission path, a conventional purge-air supply source formed of a compressor, dryer, filter, or the like dedicated to purge is not required. Concretely, as shown in FIG. 3, the air 15 discharged from the air outlet 18 is kept at a constant flow rate by a flow controller (flow-rate control valve) 50, supplied continuously from a purge-air supply port 51 into the laser beam transmission path 52, thereby keeping a uniform atmosphere in the laser beam transmission path 52." ([0034])

In light of the above descriptions, the technical significance of the "air outlet 18" is discharging a fluid, as an outlet of "fluid operating circuit," at the most downstream in the "fluid operating circuit" to constitute the "fluid operating circuit" and causing a fluid pressure to act on the "curvature-variable reflecting mirror 10" for deformation, and existence of particular limitation is not recognized, such as discharging the fluid discharged from the "air outlet 18" into the space around the "fluid operating circuit" without circulation, or using the fluid as purge air. Such particular limitation does not exist also in Claim 1 of the scope of claims after the Correction. Consequently, the "outlet" specified in Claim 1 of the scope of claims after the Correction can be recognized as one that allows a fluid to be discharged from the "fluid operating circuit," thereby applying "pressure" of fluid to "elastically deform the laser beam reflecting member." The "fluid conduit distinct from the fluid conduit 14" in the invention described in Evidence A No. 1 is also configured to discharge a fluid from the "fluid circuit" corresponding to the "fluid operating circuit" in the Corrected patent invention to elastically deform the "metal disk," and it can be said that the "fluid circuit" in the invention described in Evidence A no. 1 also "has an outlet." Therefore, Different feature 3 is not a substantial different feature.

As described above, although Different feature 3 is not a substantial different feature, the demandee alleges, as described in the above No. 4 2. (4), that "there is almost no option to form a fluid operating circuit having an outlet and discharge the pressure water to the outside without circulation, substantially." In the following examination, the "outlet" in the "fluid operating circuit" in the Corrected patent invention is interpreted as an "outlet" to "discharge" a fluid "to the outside without circulation" as alleged by the demandee. As described in Evidence A No. 24 and No. 25 indicated in the described matter A in 1. (12) and described matters A. and B. in 1. (13), it can be said that it is a well-known technical matter to configure a device using

pressure of air, which is a gas, so as not to circulate the air pressure after use. Thus, it is obvious for a person skilled in the art to need equipment, such as piping, for returning a discharged fluid for circulation. In employing a gas in place of pressure water, as a fluid in Invention A-1, so as not to require the equipment, a person skilled in the art could easily conceive of discharging the fluid by arranging an "outlet" in a "fluid circuit" without circulation.

(4) Regarding Different feature 4

As indicated in A-22 and A-23 indicated in the described matter A. in 1. (10) and described matter A. 1. (11), it can be said that it is a well-known technical matter that pressure of a space is increased by forming a narrow path ("throttle" in A-22 and "exhaust pipe" in A-23) where a gas is discharged, in the space having paths where a gas is discharged and flows in, such as "internal" part upstream of the throttle in A-22 or the "internal" part in A-23. It is obvious that the pressure in the space is increased by a gas flowing into the space.

Therefore, in employing a gas as a fluid in Invention A-1, the configuration of making the "fluid conduit distinct from the fluid conduit 14" where a gas is discharged, narrower than the "fluid conduit 14" where the gas flows in, in order to generate a pressure in the "space formed by the mirror case 13 and the metal disk having the mirror surface 12," can be easily employed by a person skilled in the art as a design matter, so as to "elastically deform" the "metal disk" with the pressure generated in the space by the gas flowing in.

(5) Regarding the functions and effects

According to the descriptions in A-18 and A-20 indicated in the described matter A. in 1. (8) and described matter A. in 1. (9), the fact that responsiveness of pressure is reduced as a length of piping is longer is a matter of technical common sense in controlling pneumatic pressure as a gas. As indicated in the above (3), the "outlet" in the Corrected patent invention can be recognized as an "outlet" for "discharging" a fluid "to the outside without circulation." A resultant effect of improving pressure responsiveness can be easily predicted by a person skilled in the art, on the basis of the above technical common sense, since the length of the "fluid operating circuit" is made shorter due to limitation by the "outlet."

(6) Summary

As examined in (1) to (5), a person skilled in the art could easily conceive of employing a configuration according to Different features 1 to 4 in Invention A-1, on the basis of well-known technical matters.

The effect to be obtained by the Corrected patent invention is also within the scope that can be expected by a person skilled in the art from Invention A-1 and well-known technical matters, and cannot be remarkable.

4. Closing

In light of the above, the invention according to Claim 1 of the Patent could be easily made by a person skilled in the art on the basis of the invention described in Evidence A No. 1 and well-known technical matters. The demandee should not be granted a patent for the invention under the provisions of Article 29(2) of the Patent Act,

and the patent according to Claim 1 of the Patent shall be invalidated under the provisions of Article 123(1)(ii) of the Patent Act.

The costs in connection with the trial shall be borne by the demandee under the provisions of Article 61 of the Code of Civil Procedure which is applied mutatis mutandis in the provisions of Article 169(2) of the Patent Act.

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

May 29, 2015

Chief administrative judge: ISHIKAWA, Yoshifumi
Administrative judge: KUBO, Katsuhiko
Administrative judge: WATANABE, Makoto