Appeal Decision

Appeal No. 2020-4036

Appellant The Boeing Company

Patent Attorney SONODA & KOBAYASHI INTELLECTUAL PROPERTY LAW

The case of appeal against examiner's decision of refusal of Japanese Patent Application No. 2018-32991, entitled "FLUID TRANSPORT SYSTEM FOR PREVENTING ELECTRICAL DISCHARGE", [the application published on July 26, 2018: Japanese Unexamined Patent Application Publication No. 2018-115766], has resulted in the following appeal decision:

Conclusion

The appeal of the case was groundless.

Reason

No. 1 History of the procedures

The present application is a divisional application filed on February 27, 2018 from Japanese Patent Application No. 2013-119456 filed on Jun. 6, 2013 (Heisei 25) (priority claim under the Paris Convention on Jun. 8, 2012 (US) the United States, July 9, 2012 (US) the United States, October 12, 2012 (US) the United States, January 23, 2013 (US) the United States, January 23, 2013 (US) the United States, and January 23, 2013 (US) the United States), and the History of the procedures is shown as follows.

March 20, 2018 : A written amendment

As of March 22, 2019 : A written notice of reasons for refusal

July 1, 2019 : A written opinion and a written amendment

As of November 19, 2019 : A decision of refusal (hereinafter, referred to as "Examiner's decision")

March 25, 2020 : A written request for appeal and a written amendment

September 2, 2020 : A written statement

No. 2 Decision to dismiss amendment for the amendment according to the written

amendment submitted on March 25, 2020

[Conclusion of Decision to Dismiss Amendment]

The amendment according to the written amendment submitted on March 25, 2020 shall be dismissed.

[Reason]

1 Details of the Amendment

The amendment according to the written amendment submitted on March 25, 2020 (hereinafter, referred to as "the Amendment") is one that includes a matter to amend, relating the scope of claims, Claim 1 shown in the following (1) before amended by the Amendment (that is, Claim 1 amended by the written amendment submitted on July 1, 2019) to Claim 1 shown in the following (2) (the underlines indicate amended portions).

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

"A fluid transport system, comprising:

a plurality of transport members (302, 304); and

an optional number of connections (112) interconnecting transport members (302, 304) of the plurality of transport members (302, 304), wherein

the plurality of transport members (302, 304) and the optional number of connections (112) comprise a material selected such that the intensity of the discharge occurring in the fluid transport system falls within a selected tolerance, wherein

one connection of the optional number of connections (112) is configured to connect a first transport member (302) of the plurality of transport members (302, 304) and a second transport member (304) of the plurality of transport members (302, 304), and the connection is configured so as to make an electrical resistance of the entire connection be smaller than an electrical resistance through a specific length of at least one of the first transport member (302) and the second transport member (304), wherein

a material of the transport members (302, 304) is selected so as to make the transport members (302, 304) have an electric resistance within a selection range, and the selection range includes an electric resistance level per unit length of at least one of a value exceeding 100 kiloohm/m such that voltage and current to be caused are limited to or below a level over which undesirable discharge is formed, and a value less than 100 megaohm/m under which electrostatic dissipation is allowed."

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

"A fluid transport system, comprising:

a plurality of transport members (302, 304); and

an optional number of connections (112) interconnecting transport members (302, 304) of the plurality of transport members (302, 304), wherein

the plurality of transport members (302, 304) and the optional number of connections (112) comprise a material selected such that the intensity of the discharge occurring in the fluid transport system falls within a selected tolerance, wherein

one connection of the optional number of connections (112) is configured to connect a first transport member (302) of the plurality of transport members (302, 304) and a second transport member (304) of the plurality of transport members (302, 304), and the connection is configured so as to make an electrical resistance of the entire connection be smaller than an electrical resistance through a specific length of at least one of the first transport member (302) and the second transport member (304), wherein

a material of the transport members (302, 304) is selected so as to make the transport members (302, 304) have an electric resistance within a selection range, and the selection range includes an electric resistance level per unit length of at least one of a value exceeding 100 kiloohm/m such that voltage and current to be caused are limited to or below a level over which undesirable discharge is formed, and a value less than 100 megaohm/m under which electrostatic dissipation is allowed, and the material of the transport members (302, 304) includes a carbon reinforced plastic material or a non-homogeneous metal material."

2 Purpose of the Amendment

The Amendment is one that adds, regarding "a material of the transport members" that is described in Claim 1 before the Amendment and is a matter necessary for specifying the invention, the limitation of "includes a carbon reinforced plastic material or a non-homogeneous metal material", and the invention recited in Claim 1 before the Amendment and the invention recited in Claim 1 after the Amendment have an identical field of industrial application and a problem to be solved, and therefore the Amendment corresponds to one for the purpose restriction of the scope of claims stipulated in Article 17-2(5)(ii) of the Patent Act. In addition, the Amendment is not one that adds a new matter.

Therefore, whether the invention according to Claim 1 amended by the Amendment (hereinafter, referred to as "the Amended Invention") is one that can be granted a patent independently at the time of filing of the patent application (whether it complies with the requirement of Article 126(7) of the Patent Act applied mutatis mutandis pursuant to the provisions of Article 17-2(6) of the same act) will be examined

hereinafter.

3 Judgment on independent requirements for patentability

(1) Described matters in Cited Documents

In the description of U.S. Patent Publication No. 2012/0056416 which is a publication cited in the reasons in the Examiner's decision and distributed in advance of the priority date of the present application (hereinafter, referred to as "Cited Document 1"), there are the following descriptions relating to "SYSTEMS AND METHODS FOR ESTABLISHING ELECTRICAL CONTINUITY ABOUT PIPES AND OTHER CONDUITS" together with drawings (the underlines were added by the body for the purpose of helping understanding).

"[0002]

This invention relates to establishing electrical paths capable of dissipating electrostatic charges and more particularly, although not necessarily exclusively, to conductive seals for pipes intended to carry flammable fluids, particularly in an aerospace environment."

"[0007]

The present invention provides such means to dissipate electrical charges at junctions between fuel lines using conductive seals. Especially suitable for use in aeronautics, the present seals may be formed of polymeric materials, as are standard aeronautical seals. Suitable polymeric materials include, but are not limited to, rubber, silicon, fluorosilicon, and thermoplastics. Additionally, forming the seals may be conductive materials such as metallic charges (from silver or other metals, for example), carbon, carbon fibers or nanotubes, or intrinsically conducting polymers. Preferably the conductive materials are added to the polymeric materials when the seals are formulated, although they conceivably could be applied or added later."

"[0016]

Illustrated in the FIGURE are exemplary seals 10A and 10B of the present invention. Also depicted are pipes 14A and 14B, which are shown as separate and distinct elements each defining a respective channel 18A or 18B through which fluid may flow. To ensure continuity of fluid flow through pipes 14A and 14B, they beneficially may be connected at a junction or joint. Element 22 illustrates an example of an assembly useful for connecting pipes 14A and 14B.

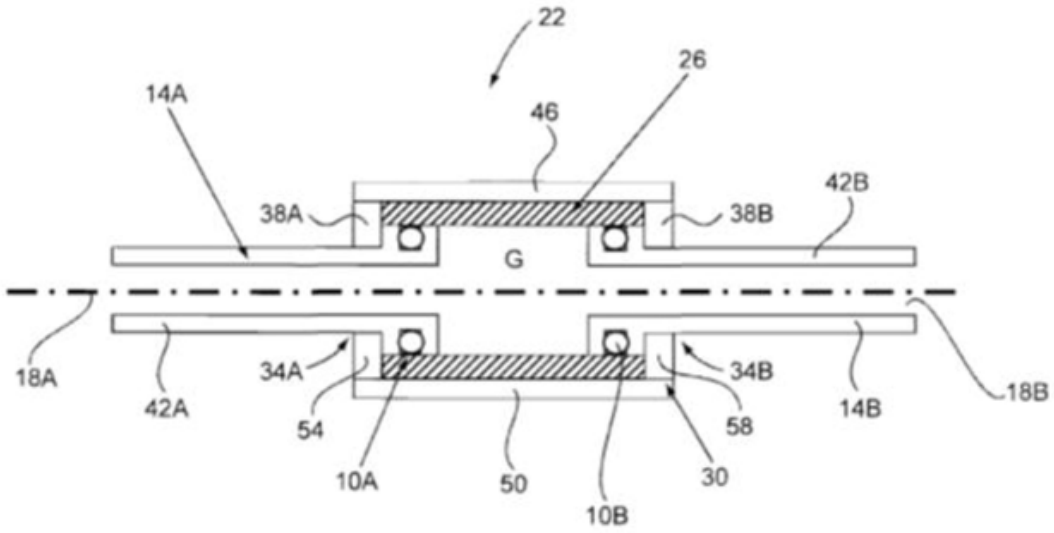
[0017]

Element 22 may include seals 10A and 10B as well as either or both of a proof ring 26 and a coupling ring 30. If present, each of the proof ring 26 and the coupling ring 30 is preferably made of electrically conductive material, although the coupling ring 30 in particular need not necessarily conduct electricity. Such material may comprise one or more metals, composites, or thermoplastics, although any suitable material may be used. Hence, all of the pipes 14A and 14B, the proof ring 26, and the coupling ring 30 are beneficially configured to conduct electricity."

"[0021]

Testing was performed for an exemplary assembly consistent with the FIGURE. For the testing, pipes 14A-B comprised two 500 mm long tubes made of conductive, fiberglass-reinforced epoxy resin. Each of ferrules 38A-B was made of conductive, fiberglass-reinforced polyetheretherketone (PEEK), and the proof ring 26 and the coupling ring 30 were made of aluminum. Each of seals 10A-B was made of fluorosilicon charged with carbon and had volumetric resistivity less than six ohm-centimeters. Tests conducted on the assembly yielded resistance of only 3×10^6 ohms."

"[FIGURE]



"

When the above-mentioned descriptions are integrated, in Cited Document 1,

there is described the following invention (hereinafter, referred to as "Cited Invention").

"A system for establishing electrical continuity of pipes and other conduit tubes intended to carry a flammable fluid, wherein

the system provides a means for diffusing electric charge at a joint between fuel lines using conductive seals, and comprises: pipes 14A and 14B defining channels 18A and 18B through which fluid may flow, respectively; and an element 22 for connecting the pipe 14A and pipe 14B, wherein

the element 22 includes seals 10A and 10B, and either or both of a proof ring 26 and a coupling ring 30, the proof ring 26 and the coupling ring 30 are made of aluminum, each of the seals 10A and 10B is made of fluorosilicon charged with carbon and has volumetric resistivity less than six ohm-centimeters,

an assembly composed of the pipes 14A and 14B comprising two 500 mm long tubes made of conductive, fiberglass-reinforced epoxy resin, the proof ring 26, the coupling ring 30, and the seals 10A and 10B has resistance of 3×10^6 ohm."

(2) Comparison / Judgment

The Amended Invention and the Cited Invention are compared.

"A system for establishing electrical continuity of pipes and other conduit tubes intended to carry a flammable fluid" in Cited Invention is one for use in transportation of fluid, and thus corresponds to "a fluid transport system" in the Amended Invention.

Regarding "pipes 14A and 14B defining channels 18A and 18B through which fluid may flow, respectively" in Cited Invention, it can be said that the pipes 14A and 14B transport fluid, and therefore it corresponds to "a plurality of transport members" in the Amended Invention.

"An element 22 for connecting the pipe 14A and pipe 14B" in Cited Invention corresponds to "an optional number of connections interconnecting transport members of the plurality of transport members" in the Amended Invention, and, in addition, "an element 22 for connecting the pipe 14A and pipe 14B" in Cited Invention corresponds to "one connection of the optional number of connections (112)" that "is configured to connect a first transport member (302) of the plurality of transport members (302, 304) and a second transport member (304) of the plurality of transport members (302, 304)" in the Amended Invention.

It is recognized that "provides a means for diffusing electric charge at a joint between fuel lines using conductive seals" in Cited Invention means that the discharge intensity in the system is reduced by diffusion of electric charge, and, in addition, it is

obvious that the discharge intensity is designed such that it becomes less than a given acceptable value at the time of system design. In addition, in Cited Invention, since specific materials are selected, such as conductive, fiberglass-reinforced epoxy resin for the pipes 14A and 14B, aluminum for the proof ring 26 and the coupling ring 30, and fluorosilicon charged with carbon for the seals 10A and 10B, this corresponds to "the plurality of transport members (302, 304) and the optional number of connections (112) comprise a material selected such that the intensity of the discharge occurring in the fluid transport system falls within a selected tolerance" in the Amended Invention.

In Cited Invention, the materials used are conductive, fiberglass-reinforced epoxy resin for the pipes 14A and 14B, aluminum for the proof ring 26 and the coupling ring 30, and fluorosilicon charged with carbon for the seals 10A and 10B, and, when comparing conductive, fiberglass-reinforced epoxy resin that is nonmetal and aluminum that is metal, it is obvious that aluminum has a lower electric resistance, and thus it has the constitution of "the connection is configured so as to make an electrical resistance of the entire connection be smaller than an electrical resistance through a specific length of at least one of the first transport member (302) and the second transport member (304)" in the Amended Invention.

In view of the above, the corresponding feature and different features between the Amended Invention and Cited Invention are as follows.

<<Corresponding Feature>>

"A fluid transport system, comprising:

a plurality of transport members; and

an optional number of connections interconnecting transport members of the plurality of transport members, wherein

the plurality of transport members and the optional number of connections comprise a material selected such that the intensity of the discharge occurring in the fluid transport system falls within a selected tolerance, wherein

one connection of the optional number of connections is configured to connect a first transport member of the plurality of transport members and a second transport member of the plurality of transport members, and the connection is configured so as to make an electrical resistance of the entire connection be smaller than an electrical resistance through a specific length of at least one of the first transport member and the second transport member."

<<Different Feature 1>>

In the Amended Invention, a material of the transport members (302, 304) is selected so as to make the transport members (302, 304) have an electric resistance within a selection range, and the selection range includes an electric resistance level per unit length of at least one of a value exceeding 100 kiloohm/m such that voltage and current to be caused is limited to or below a level over which undesirable discharge is formed, and a value less than 100 megaohm/m under which electrostatic dissipation is allowed, whereas, in Cited Invention, although the resistance of an assembly composed of the pipes 14A and 14B, the proof ring 26, the coupling ring 30, and the seals 10A and 10B is 3×10^6 ohm as a whole, the electric resistances of the pipes 14A and 14B themselves are unclear.

<<Different Feature 2>>

The material of the transport members (302, 304) in the Amended Invention includes a carbon reinforced plastic material or a non-homogeneous metal material, whereas, the pipes 14A and 14B in Cited Invention use conductive, fiberglass-reinforced epoxy resin as a material.

The above-mentioned Different Feature 1 will be examined.

In Cited Invention, the resistance of the assembly including the pipes 14A and 14B is 3×10^6 ohm (3 megaohm) as a whole, and it is illustrated that the pipes 14A and 14B, and the other components of the assembly; that is, the proof ring 26, the coupling ring 30, and the seals 10A and 10B, are connected electrically in series, and therefore it is obvious as viewed from the common general knowledge that the resistance value of the pipes 14A and 14B, which are components of the assembly, never exceeds 3×10^6 ohm.

In addition, although the resistance value of the assembly as a whole includes the electric resistances of the proof ring 26, the coupling ring 30, and the seals 10A and 10B, the proof ring 26 and the coupling ring 30 use aluminum as the material in Cited Invention, and, in addition, the proof ring 26 and the coupling ring 30 are ones that connect the pipes 14A and 14B and their lengths in the axis direction, which is an electric charge diffusion direction thereof, are shorter than the total length of the pipes 14A and 14B (this is also obvious from the figure), it can be understood that the proof ring 26 and the coupling ring 30 have far smaller electric resistance than that of the pipes 14A and 14B composed of conductive, fiberglass-reinforced epoxy resin. Furthermore, the electric resistance of the seal itself is very small at 6 Ωcm or less, and thus it is not one that has a significant influence on the total resistance value of the assembly.

As a consequence, 3×10^6 ohm that is the total resistance of the assembly in Cited Invention can be understood roughly as the electric resistance of the pipes 14A and 14B, and it is recognized that at least it is never well below 3×10^6 ohm.

Then, since the pipes 14A and 14B are composed having two 500 mm length tubes, they have one meter length together, and thus it can be understood that the pipes 14A and 14B having one meter length together have an electric resistance that is approximately 3×10^6 ohm, and at least it is never well below 3×10^6 ohm.

When the above matters are summarized, it is recognized that, in Cited Invention, the electric resistance of the pipes 14A and 14B together is less than 3×10^6 Ω/m (3 megaohm/m), and, in addition, it is not well below 3×10^6 Ω/m.

In view of the above, the electric resistance value of the pipes 14A and 14B in Cited Invention becomes within the range of "an electric resistance level per unit length of at least one of a value exceeding 100 kiloohm/m, and a value less than 100 megaohm/m" in the Amended Invention. In addition, it is recognized that the electric resistance in Cited Invention that is less than 3×10^6 Ω/m and is not well below 3×10^6 Ω/m has, as a matter of course, the constitution of "such that voltage and current to be caused is limited to or below a level over which undesirable discharge is formed" and the constitution of "under which electrostatic dissipation is allowed" in the Amended Invention.

Therefore, Different Feature 1 mentioned above is not a substantive different feature.

Different Feature 2 will be examined.

It was a well-known art (hereinafter, referred to as "Well-Known Art") before the application date of the present application to use a carbon fiber reinforced plastic material as a transportation component such as a pipe and the like while taking into consideration the electric resistance of the material constituting the transportation component, as described in:, for example, International Publication No. 2012/032406 (refer to Claim 1 and Claim 4 of the description: there is described that a material having an electric resistance of about 10^5 to about 10^9 Ω/m is used as the material of a transportation component in order to dissipate electrical static charge, and, as one of the relevant materials, a material combining carbon fibers and resin is used); and International Publication No. 2009/087372 (it is described, in page 3, line 10 to page 4, line 2, that a complex pipe having an electric resistance value of 50 kΩ/m to 4.0 MΩ/m is used as a fuel pipe of an aircraft, preferably the resistance value is 150 kΩ to 1.4 MΩ, and also it is described, on page 5, line 7 to 17, and Fig. 1, as an embodiment that carbon fiber reinforced plastic is used for the core unit of the complex pipe).

Then, also in Cited Invention, conductive, fiberglass-reinforced epoxy resin is used as a material of the pipes 14A and 14B, and it is obvious that selection of the material

is conducted while taking conductivity into consideration, and therefore there is no difficulty in adopting, as the material thereof, a carbon fiber reinforced plastic material after the above-mentioned Well-Known Art, and making the pipes have an electric resistance level of more than 100 kΩ/m and less than 100 MΩ/m.

Therefore, the constitution of the Amended Invention concerning Different Feature 2 is one that could have been conceived with ease by a person skilled in the art based on Cited Invention and Well-Known Art.

Also, the effect of the Amended Invention is in a range predictable from Cited Invention and Well-Known Art, and thus it cannot be said that it is remarkable in particular.

The Appellant alleges, in the written statement of September 2, 2020 that "in paragraph [0008] of Cited Document 1, there is only a description about rubber, and it is not specifically disclosed or suggested that 'carbon reinforced plastic material' is used as a material of the transport members, as is the case with the Invention. Therefore, even if it is assumed that carbon reinforced plastic material itself was well-known, it cannot be said that there is motivation to apply a carbon reinforced plastic material to the technology of Cited Document 1."

However, in Cited Invention, as the material of the pipes 14A and 14B, "conductive, fiberglass-reinforced epoxy resin" is used, and thus it is obvious that an attempt is made to use a material that has "conductivity", and the properties of being "lightweight" and "strong". Then, in Cited Invention, there is no difficulty in using a carbon fiber reinforced plastic material having conductivity, and lightweight and strong properties together to make the material further preferable after Well-Known Art, and therefore the Appellant's allegation cannot be adopted.

(3) Summary

Therefore, since the Amended Invention could have been invented by a person skilled in the art with ease based on Cited Invention and Well-Known Art, it is one for which the Appellant should not be granted a patent independently at the time of patent application in accordance with the provisions of Article 29(2) of the Patent Act.

4 Closing

As above, the Amendment violates the provision of Article 126(7) of the Patent Act applied mutatis mutandis pursuant to Article 17-2(6) of the same act, and thus it should be dismissed in accordance with the provisions of Article 53(1) of the same Act

applied mutatis mutandis by replacing certain terms pursuant to Article 159(1) of the same Act.

Therefore, the decision has been made as [Conclusion of Decision to Dismiss Amendment].

No. 3 Regarding the Invention

1 The Invention

Since the Amendment has been dismissed as above, the inventions according to Claims 1 to 13 of the present application are ones that are specified by the matters recited in Claims 1 to 13 of the scope of claims amended by the written amendment submitted on July 1, 2019, and the invention according to Claim 1 thereof (hereinafter, referred to as "the Invention") is one as has been described in No. 2 [Reason] 1(1) mentioned above.

2 Reasons for refusal stated in Examiner's decision

A summary of the Examiner's decision is as follows.

(1) Since the inventions according to Claims 1 to 6 of the present application are inventions recited in the following Cited Document 1, they fall under Article 29(1)(iii) of the Patent Act, and thus the Appellant should not be granted a patent.

(2) Since the inventions according to Claims 1 to 13 of the present application could have been invented by a person skilled in the art with ease based on the invention described in the following Cited Document 1, the Appellant should not be granted a patent for these in accordance with the provisions of Article 29(2) of the Patent Act.

Cited Document 1: The description of U.S. Patent Publication No. 2012/0056416

3 Cited Document

The described matters of Cited Document 1 cited in the reasons in Examiner's decision and Cited Invention are as have been described in No. 2 [Reason] 3(1) mentioned above.

4 Comparison / Judgment

The Invention corresponds to an invention made by eliminating from the Amended Invention examined in No. 2 [Reason] 2 the limitation of "the material of the transport members (302, 304) includes a carbon reinforced plastic material or a non-homogeneous metal material", which is the matter specifying the invention corresponding

to <<Different Feature 2>> of No. 2 [Reason] 3(2) mentioned above.

Then, although the Invention and Cited Invention are literally different only in <<Different Feature 1>> of No. 2 [Reason] 3(2) mentioned above, <<Different Feature 1>> is not a substantive different feature as described in the examination of Different Feature 1 in No. 2 [Reason] 3(2) mentioned above.

Therefore, there is no different feature between the Invention and Cited Invention.

In addition, even if it is assumed that the Invention and Cited Invention are different, the Invention is one that could have been conceived by a person skilled in the art with ease based on Cited Invention.

5 Summary

As above, the Invention is Cited Invention, and therefore corresponds to Article 29(1)(iii) of the Patent Act, and thus the Appellant should not be granted a patent for that. Furthermore, since the Invention could have been invented by a person skilled in the art with ease based on Cited Invention, the Appellant should not be granted a patent for that in accordance with the provisions of Article 29(2) of the Patent Act.

No. 4 Closing

As No. 3 mentioned above, the Invention corresponds to Article 29(1)(iii) of the Patent Act, and the Appellant should not be granted a patent for that, and, in addition, in accordance with the provisions of Article 29(2) of the Patent Act, the Appellant should not be granted a patent for that. Therefore, the present application should be rejected without examining other claims.

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

January 7, 2021

Chief administrative judge: YAMAZAKI, Katsushi
Administrative judge: KAWAKAMI, Kei
Administrative judge: MATSUSHITA, Akira