



Comparative Case Study on Inventive Step

JEGPE 2011

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I. Introduction

Joint Expert Group for Patent Examination (JEGPE) was established in 2009 in order to promote patent cooperation and to harmonize examination practices among JPO, KIPO and SIPO. In 2010, JEGPE conducted a comparative study on the guidelines and practices in evaluating inventive step which is one of the most frequent reasons for refusal in patent examination. From the results of the study, it was found that most of the examination guidelines and practice are similar, but there exist some differences in the procedure for evaluating inventive step, citation of prior art literature or well-known art and definition of a person skilled in the art.

Therefore, at the second JEGPE meeting in 2010, the three offices agreed to carry out the case study on inventive step for hypothetical cases. This study aimed to analyze how different outcomes would be drawn when the above-mentioned differences among the offices played a role in the actual examination cases.

For the case study, each office proposed three cases separately and out of these nine cases, five cases were selected for the case study. Three cases were selected by each office's preference and two cases were chosen by voting.

Because this study was not mainly focused on the prior art searching, the same prior art literatures were presented and each office selected relevant prior arts and compared them with the claim(s) of the invention.

The three offices evaluated inventive step for the selected cases according to each office's examination guidelines and practices, and had a discussion on the result of the case study as well as the differences in evaluating inventive step.

II. Results of Case Studies

1. Case 1

1.1 Overview of the invention

(1) Title : RAILWAY DRAWBAR WITH FABRICATED SECTION

(2) Claim(s)

An improved slackless type drawbar assembly for use in connecting together adjacently disposed ends of a pair of railway cars in a substantially semi-permanent fashion, said slackless type drawbar assembly comprising:

(a) at least one female connection member, said at least one female connection member including;

(i) a first end portion, having a first predetermined configuration to enable said first end portion of said at least one female connection member to be engaged within an outer end portion of a center sill member disposed on a bottom portion of a car body member of a first railway car, and

(ii) a radially opposed second end portion which extends outwardly from such outer end portion of such center sill member;

(b) a cavity formed in said radially opposed second end portion of said at least one female connection member, said cavity being defined by an inner surface of a back wall portion, having a second predetermined configuration, an inner surface of a top wall portion and an inner surface of a pair of side wall portions, each side wall portion having a third predetermined configuration, said cavity being open adjacent at least a portion of a bottom and an outer end of said radially opposed second end portion of said at least one female connection member;

(c) a first opening, having a fourth predetermined configuration, formed through a first one of said pair of side wall portions;

(d) a radially opposed second opening, having a fifth predetermined configuration, formed through a second one of said pair of side wall portions;

(e) at least one male connection member having a sixth predetermined configuration, said at least one male connection member including;

(i) a first end portion, at least a portion of said first end portion of said at least one male connection member being movably disposed within said cavity formed in said radially opposed second end portion of said at least one female connection member, and

(ii) and a radially opposed second end portion;

(f) an aperture formed through a predetermined portion of said at least one male connection member adjacent said first end portion thereof;

(g) a spherical shaped member, at least a portion of said spherical shaped member being disposed within said aperture formed through said first end portion of said at least one male connection member;

(h) a pair of substantially horizontally disposed shaft members extending outwardly for a predetermined distance from radially opposed and substantially vertically disposed outer surface portions of said spherical shaped member, at least a portion of a first one of said pair of shaft members being disposed within said first opening formed through said first one of said pair of side wall portions and at least a portion of a second one of said pair of shaft members being disposed within said second opening formed through said second one of said pair of side wall portions, each respective one of said pair of shaft members has a radially opposed and substantially flat surface portion formed thereon;

(i) a race assembly having at least a portion thereof disposed within said aperture and secured to said first end portion of said at least one male connection member, an inner surface of said race assembly being disposed around said at least a portion of said spherical shaped member disposed within said aperture formed through said first end portion of said at least one male connection member;

(j) a pair of wedge means, a first surface of a first one of said pair of wedge means being engaged with a first one of said radially opposed and substantially flat surface portions formed on said pair of shaft members and a second surface of said first one of said pair of wedge means being engaged with a substantially flat and vertically disposed surface portion formed on said first one of said pair of side wall portions adjacent a portion of said first opening and a first surface of a second one of said pair of wedge means being engaged with a second one of said radially opposed and substantially flat surface portions formed on said pair of shaft members and a second surface of said second one of said pair of wedges means being engaged with a substantially flat and vertically disposed surface portion formed on said second one of said pair of side wall portions adjacent a portion of said second opening; and

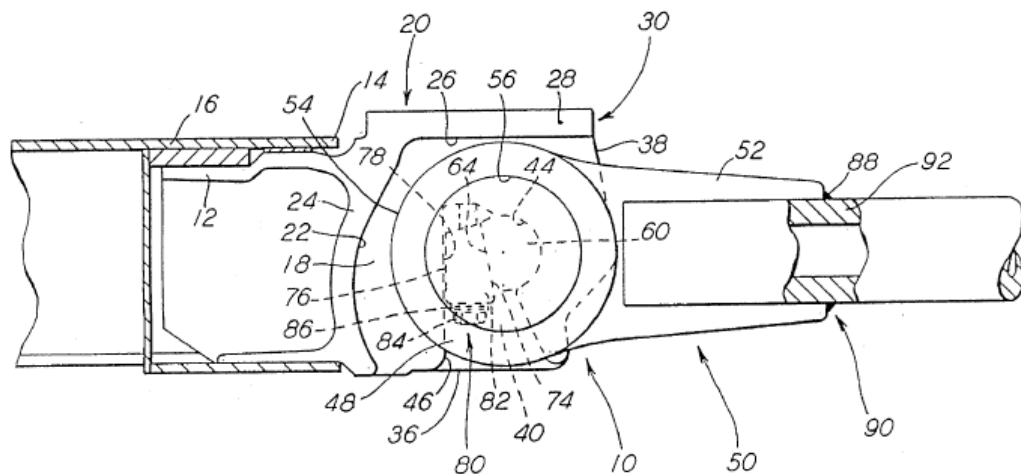
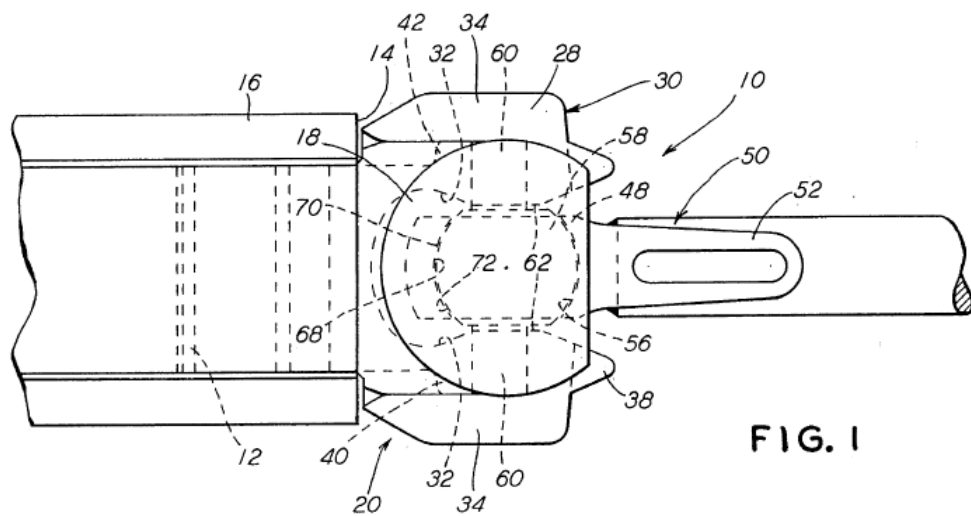
(k) a means engageable with said second end portion of said at least one male connection member and a second end portion of another male connection member for securing said second end portion of said at least one male connection member to said second end portion of said another male connection member thereby forming an improved slackless type drawbar assembly.

(3) Core aspects of a description that supports the invention:

"It is, therefore, one of the primary objects of the present invention to provide an improved slackless type drawbar assembly for use in connecting adjacently disposed ends of a pair of railway freight cars together, in a substantially semi-permanent fashion, in which a ball and race assembly is used adjacent each end of such slackless drawbar assembly." (OBJECTS OF THE INVENTION)

Reference for detail description : EP0701938A1, US5547089A

(4) Representative drawings:



(5) Overview of the prior arts

D1: US 5232106A

D2: US 5042393A

D3: US 4580686A

[D1]

D1 discloses a standard fixed end drawbar 5 which includes vertical openings 8, 10 on each butt end head 12 and 14 and is intended to be used in connecting a pair of railway cars in a substantially semi-permanent fashion. A pin member inserted through openings 8 and 10, secures drawbar 5 to the center sill 110 of railcar 100. The drawbar 5 consists of an elongated intermediate shank portion 50 and coupling pieces 16 and 18 fixed to each end of the shank portion 50 by welding (See lines 8-10, page 4; lines 11-24, page 7; lines 8-12, page 9, figures 1-5).

[D2]

D2 discloses the articulated coupling apparatus 10 for the connection of railway cars, which includes a male connection member 20 and a female connection member 30, similar to the configuration specified by (a), (c) to (j) in the claimed invention (See figures 1-4, line 6, page 8 to line 27, page 13).

[D3]

As can be seen in FIG. 1, the longitudinal force F1 on the couplers is broken into a lateral force F2 and a force F3 which extends along the axis of the car. The lateral force F2 exerts a sideways force on the truck 22 which is taken by the wheel flanges. The force F2 also produces a moment about the kingpin 18 tending to twist the car about its center point. This lateral force produces relatively severe stresses on the car and in some cases can cause a derailment.

In FIG. 2, a condition is illustrated wherein three cars 32, 34 and 36 are undergoing jackknifing motions under a buff load. Again, lateral forces F2 are exerted on the cars at the connection of couplers 26 and 28 thereto, these forces tending to twist the cars about their center points or centers of gravity.

The arrangement of the present invention is shown in FIGS. 3 and 4 wherein the couplers 26 and 28 of FIG. 1 are replaced by a drawbar 40 which is pivotally connected at the ends of center sills 16. The center sills 16 are preferably reduced in length so that the ends of the drawbar 40 pivot about axes which are as close as possible to the center 24 of trucks for the car. As a result, the distance between the longitudinal axis of the drawbar and the central axis of each car 10 and 12 is much less, resulting in a lower wheel flange to rail force produced by force F2. In addition, there is a reduced moment about the kingpin whose axes are indicated by the reference numeral 24.

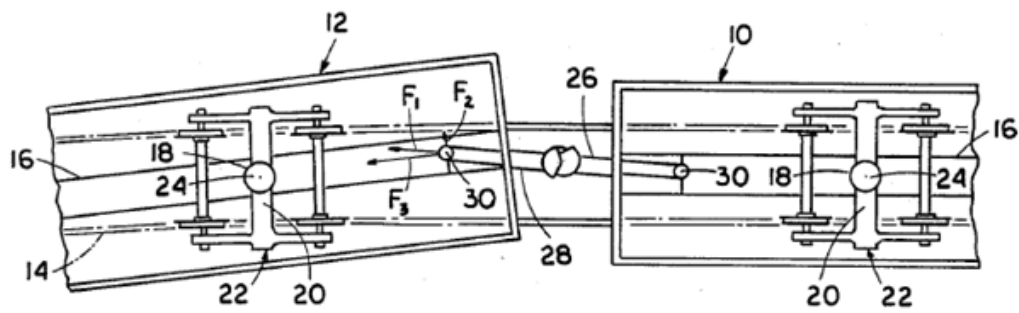


FIG. 1

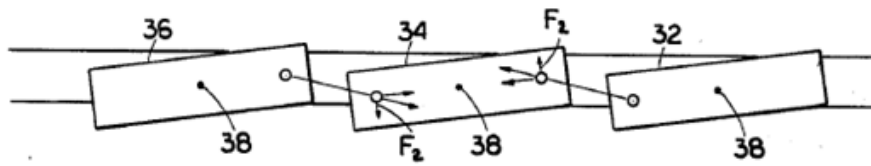


FIG. 2

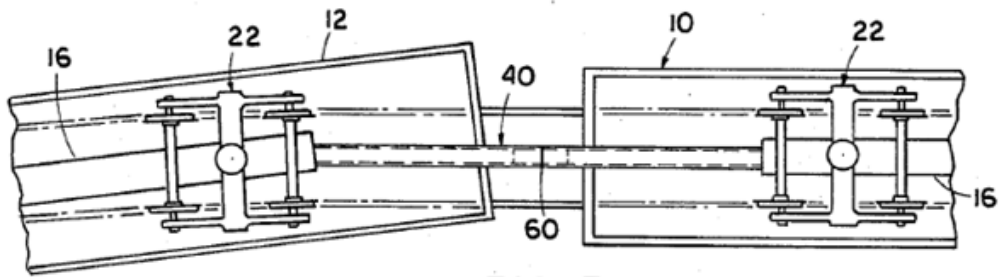


FIG. 3

(6) Requirements for assessing inventive step

No specific situations.

1.2 Examination Results

1.2.1 JPO

(1) Analysis

It is perceived that D1 discloses the drawbar “for use in connecting adjacently disposed ends of a pair of railway cars together, in a substantially semi-permanent fashion”(lines 12-16, column 1 and lines 15-35, column 3). And given the common general knowledge in the technical field concerned, it is perceived that “the coupling pieces 16, 18” situated on both sides of the drawbar operate as a male member and a “slackless drawbar assembly” is formed through connecting the male member with a female member that is situated on the center sill member disposed on the bottom part of the car body.

In addition, it is clear that the “shank portion 50” described in D1 corresponds to “a means engageable with said second end portion of said at least one male connection member and a second end portion of another male connection member for securing said second end portion of said at least one male connection member to said second end portion of said another male connection member” indicated in (k) of the claim.

Therefore, comparing the claimed invention and the invention described in D1, both inventions are identical in that “An improved slackless type drawbar assembly for use in connecting together adjacently disposed ends of a pair of railway cars in a substantially semi-permanent fashion”, which has male connection members and female connection members on each railway car, comprises “a means engageable with said second end portion of said at least one male connection member and a second end portion of another male connection member for securing said second end portion of said at least one male connection member to said second end portion of said another male connection member,” but they are different in the following point.

Difference:

While the claimed invention has the connection members specified by (a) to (j), the invention described in D1 does not have the structure of connection members specified by (a) to (j) plainly.

The above difference is discussed below.

D2 discloses the invention related to the connecting part of the railway car composed of male and female connection members. Although the claimed invention and the invention described in D2 differ in that while the “cavity 26” of the invention in D2 is open upwardly, the “cavity” of the claimed invention is open downwardly, it is apparent that D2 discloses the components specified by (a) to (j) of the claimed invention, which is relevant to the connecting part of the railway car composed of the male and female connection members.

There is a reasoning to employ the connecting part described in D2 to the invention described in D1 as a connecting part for a drawbar because D1 and D2 belong to the same technical field of connecting part of the railway cars.

Then, there are many possibilities regarding the position of the connecting part. For instance, it is likely that the connecting part of a male and female connection member is located under the floor of a railway car, as disclosed in Figures 1 and 3 in D3.

Therefore, it is mere design variation for a person skilled in the art to select the appropriate direction of the cavity in consideration of the difficulty of the insertion when the constitution described in D2 is employed to the connecting part described in D1.

(2) Conclusion

The claimed invention does not involve an inventive step over D1 in view of D2.

1.2.2 KIPO

The procedures of assessing the inventive step are as follows:

(1) Specify the claimed invention

Claimed invention is an improved slackless type drawbar assembly for use in connecting together adjacently disposed ends of a pair of railway cars in a substantially semi-permanent fashion, and main technical features are i) engageable means(90) which connect male connection member and female connection member in semi-permanent fashion and ii) detail structure of ball & race assembly of female connection member.

(2) Specify the cited invention(s)

D1: US 5232106 A

D1 discloses a standard fixed end drawbar(5) which includes vertical openings(8, 10) on each butt end head(12,14). A pin member inserted through openings(8,10), secures drawbar(5) to the center sill(110) of railcar(100). The drawbar(5) consists of an elongated intermediate shank portion(50), which is a fabricated member, with cast end coupling pieces(16,18) attached to each end (See lines 8-10, page 4; lines 11-24, page 7; lines 8-12, page 9, figures 1-5).

D2: US 5042393 A

D2 discloses the articulated coupling apparatus(10) which includes a male connection member(20) and a female connection member(30), similar to the configuration specified by (a), (c) to (j) in the claimed invention (See figures 1-4, line 6, page 8 to line 27, page 13).

D3: US 4580686 A

D3 discloses a slackless drawbar arrangement for unit train service and the like including a drawbar having enlarged butt end portions each provided with essentially spherical buff and draft load bearing surfaces on the rear and forward surfaces thereof(See figures 1, 3).

(3) Select the cited invention which is the closest to the claimed invention and make a clear difference by comparing the closest cited invention with the claimed invention

D2 is considered as the closest prior art because it discloses the ball & race assembly which is one of the main technical features of the claimed invention. Detail components are compared in Appendix 1.1.

(4) Assess whether an invention described in the claims would have been easily made by a person skilled in the art, in view of cited inventions and the common general knowledge before the filing as for the difference between the claimed invention and the cited invention(s).

D2, which is the closed prior art, discloses all the components of claim 1, except the shape of cavity(18) and that male connection member is connected with female connection member in semi-permanent fashion by engageable means.

Cavity(18) of claim 1 differs from cavity(26) of D2 in that said another end(30) located in the opposite direction from the radius of at least one of the said female connection has a opening, adjacent to at least parts of a bottom and center sill end.

However, to place an opening of cavity in the opposite direction from the radius of the articulated coupling apparatus(10) deems to be a simple design change to a person skilled in the art, because it does not make any special technical effect.

Though articulated coupling apparatus of D2 does not disclose that the connection with other part is made in semi-permanent fashion, engageable means which can connect two members in semi-permanent type is well known art and a person skilled in the art would apply the well-known semi-permanent connection structure to D2.

Accordingly, a person skilled in the art would easily invent the claimed invention from D2.

1.2.3 SIPO

(1) Closest prior art

D2 relates to railway car coupling devices in the same technical field as the invention under discussion. In addition, the great majority of the technical features defined in claim 1 are disclosed, as can be seen clearly from the following comparison between D2 and the claimed invention. Thus, D2 is eligible to serve as the closest prior art when the inventive step of the invention is concerned.

(2) Identify distinguishing features of the invention

The claimed invention has two distinguishing features when compared with D2. Namely, it is the top wall portion 28, rather than the bottom wall as in D2, constitutes part of the cavity, and distinguishing feature 2 lies in component (k) of the claimed invention. The claimed invention and the technical solution of D2 are compared in Appendix 2.

(3) Is the claimed invention obvious?

Regarding distinguishing feature 1, the selection of either the top wall or the bottom wall of the female connecting member for constituting the said cavity along with side walls etc is easy for a skilled person in the art to make. And this difference does not bring about prominent technical effect at all to the claimed invention.

When it comes to the second distinguishing feature, namely component (k), it objectively solves the technical problem that long drawbars capable of withstanding encountered forces such as bending, twisting, shearing, tension or compression can be produced. D1 where a standard fixed end drawbar 5 is disclosed is highly related to this distinguishing feature. The said drawbar 5 consists of an elongated intermediate shank portion 50 which is a fabricated member, with cast end coupling pieces 16 and 18 attached to each end. The coupling pieces include vertical openings 8, 10 on each butt end head 12 and 14. A pin member inserted through openings 8 and 10, secures drawbar 5 to the center sill 110 of railcar 100. If body 24 was of a shape different to that of shank portion 50, body 24 would then require that the reduced sleeve portion 40 be the only part constructed with a complementary piece to that of intermediate shank portion 50 so that the two sections can be easily joined. Conceptually, if only the butt end heads 12,14 were to be cast, the casting would still contain the reduced sleeve portion 40 attached directly to the butt end head, while the length of the fabricated shank portion 50 would be increased, thereby displacing the need for an actual body portion 24. As far as can be seen from the description and claims of the invention under discussion, the intermediate shank portion 50 serves the same function as the means engageable with said second end portion of said at least one male connection member and a second end portion of another male connection member in the claimed invention.

As a result, it is obvious for a person skilled in the art to get the claimed invention based on D2 and D1.

1.3 Comparison & Discussion

(1) Comparison

Inventive Step		
JPO	KIPO	SIPO
No	No	No

Cited Documents		
JPO	KIPO	SIPO
D1+D2	D2	D2+D1

All three offices agreed that the claimed invention does not involve an inventive step over given prior arts. However, there was a little difference in selecting the closest prior art¹.

JPO selected D1 as the closest prior art and D2 was chosen as a secondary reference to deny the inventive step of the claimed invention.

On the contrary, SIPO selected D2 as the closest prior art and D1 was chosen as a secondary reference in combination with D2.

KIPO selected the single prior art D2 for denial of the inventive step of the claimed invention.

KIPO had the differing view from JPO or SIPO citing that the claimed invention can be denied its inventive step without combination with D1 since the structure with the coupling of a female connection member and a male connection member in a semi-permanent manner, which is the technical feature in D1, is well-known to a person skilled in the art.

(2) Discussion

The three offices discussed about their own examination guidelines and practices in selecting the closest prior art among multiple prior arts.

The general guidelines of each office are as follows:

JPO selects the prior art most suitable for developing the logic for denying inventive step of the claimed invention as a closest prior art. In general, an prior art, of which technical field or

¹ In this report, "closest prior art" means a prior art which is selected as a core prior art to deny the inventive step of the claimed invention.

problem to be solved is the same as or close to that of the claimed invention, should be selected as the closest prior art, however, this practice is not always adopted. In addition, a prior art which contains the greatest number of common technical features with a claimed invention is not necessarily selected as a closest prior art. And how an examiner determines a closest prior art depends on cases.

SIPO prefers to choose the prior art as the closest which is in the same or similar technical field and solves the same or similar technical problem as a claimed invention, although the number of technical features disclosed in a prior art is also taken into account in determining the closest prior art. However, there exist some differences case by case.

KIPO selects the closest prior art which contains the greatest number of common technical features in its examination guidelines and has the closest technical background or problems to be solved. But the general guidelines that examiners refer to for the selection of the closest prior art may change according to cases.

2. Case 2

2.1 Overview of the invention

(1) Title : A CARBON-FILM-COATED DRINK BOTTLE

(2) Claim(s)

A carbon-film-coated drink bottle comprising a plastic drink bottle whose inside wall surface is coated with hard carbon films.

(3) Core aspects of a description that supports the invention:

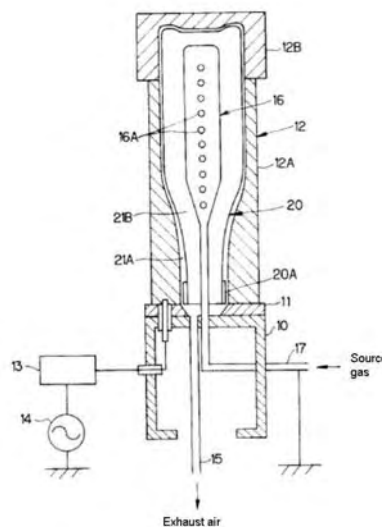
The present invention intends to solve the problems of gas barrier properties and sorption specific to plastic while maintaining the characteristics of plastic containers, and to provide carbon-film-coated plastic containers for returnable use, expanding the range and form of utility of plastic containers, producible continuously at a low cost and damage-free during handling.

In order to achieve the above-mentioned purposes, a carbon-film-coated plastic container of the present invention has such characteristics that a hard carbon film is formed on the inside wall surface of the container made by plastic materials and that this hard carbon film is a diamond-like carbon film.([0017]-[0018])

Reference for detail description : JPH6-189223

(4) Representative drawings:

Fig. 1



(5) Overview of the prior arts

D1: JPH5-35660U1

D2: JPH2-70059A

[D1]

D1 discloses the following points:

“A small plastic container on whose surface a silicon oxide film is formed by plasma CVD”(claim 1)

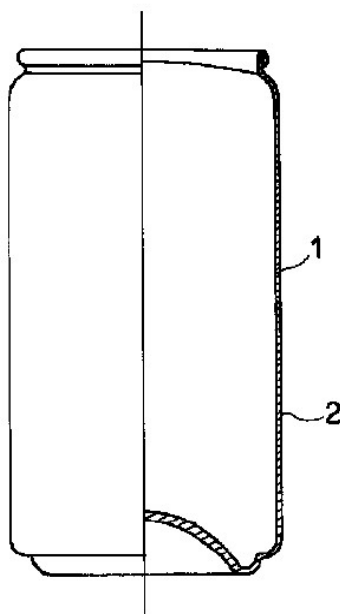
“Polyethylene terephthalate (PET), polycarbonate (PC), acrylonitrile (AN), polybutylene terephthalate (PBT), polyethylene naphthalate (PEN), polypropylene (PP) and polystyrene (PS), etc. have been widely used as molding materials for a variety of drink containers, as they have excellent formability, and can be made into light molded products. Among these materials, PET has frequently been used as a blow molding material for a variety of drink containers, because it neither has smell of resin nor absorbs its content, and therefore it does not damage the taste of food. However, small PET containers have higher gas permeability than large ones, so small PET containers are not suitable for small containers for carbonated drink, especially for those less than 1,000cc having a high ratio of surface area per volume...” ([0002]-[0004])

“The present invention intends to provide small, recyclable and reasonable plastic containers capable of solving the above-mentioned shortcomings, increasing gas barrier properties and solving the recent environmental problems.” ([0009])

“The above-mentioned purpose can be achieved by forming silicone oxide thin films on the surface of small plastic containers by plasma CVD which has relatively low temperature and low degree of vacuum and does not require costly high vacuum resistance.” ([0010])

“Furthermore, silicone oxide can be evaporated uniformly even on a cubic shape and the plasma CVD processing can be performed on both the interior and exterior surface of containers. Thus, silicone oxide can be evaporated directly and uniformly on ribbed materials having a cubic shape such as PET containers.” ([0015])

Fig. 1



[D2]

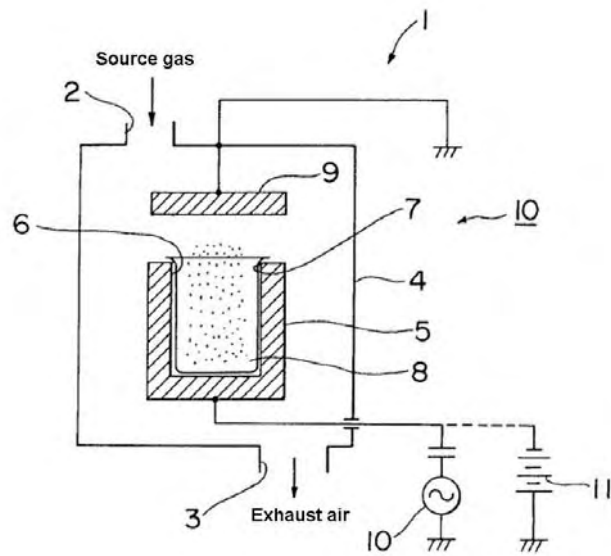
D2 disclosed the following points:

“An instrument with an opening, including an inner space of which cross-sectional area parallel to that of the opening is equal to and/or greater than the area of the opening, wherein a film of diamond-like carbon and/or diamond is formed on an inner surface of the instrument.” (line 5-9, left column, page 1)

“As a material of the instrument, glass and plastic etc. are included.” (lines 9-10, lower right column, page 2)

“The instrument according to the present invention can be widely used for, for example, a beaker; a flask; various kinds of dishes, such as a crystallizing dish and an evaporating dish; bottles, such as a weighing bottle, a suction bottle, an extraction bottle; laboratory wares, such as a cooler, a desiccator, suction unit, a pipet, a graduated cylinder, a buret, a funnel, a Kipp's gas generator, and a filter; livingwares, such as a drinking cup, a dish, and a bowl; and industrial members, such as a steel pipe lined with glass, wherein a thin film of diamond-like carbon or diamond is formed on the surface thereof.” (from line 14, lower right column, page 3, to line 3, upper left column, page 4)

Fig. 1



(6) Requirements for assessing inventive step

Assume the following situation:

The fact that hard carbon films have gas barrier properties is well-known to a person skilled in the art.

2.2 Examination Results

2.2.1 JPO

(1) Analysis

In consideration of the description in paragraphs [0002]-[0004] in D1, the “small plastic container” described in D1 corresponds to the “plastic drink bottle” described in claim1.

Therefore, comparing the claimed invention and the invention described in D1, the both inventions are identical in the point that they consist of “a film-coated drink bottle, which has been formed out of plastic material, and is characterized by the fact that the inside wall surface has been coated with film.”

On the other hand, the both inventions differ in the point that the film used in the claimed invention is a “hard carbon film”, while the film used in the invention described in D1 is a “silicone oxide thin film”.

Meanwhile, it is perceived that D2 discloses the art of coating hard carbon films on the inner wall surface of drinking bottles because the art of coating diamond-like hard carbon films on the inner wall surface of plastic instrument described in D2 can be applied to drinking containers, namely “livingware such as a drinking cup”.

Furthermore, it is well-known that hard carbon films have gas barrier properties.

Therefore, it is easy for a person skilled in the art to focus on increasing gas barrier properties and adopt a hard carbon film, which is well-known to have effective gas-barrier properties and be able to be coated on the inside wall of the plastic drink bottle as described in D2, as the inside-coating of the plastic drink bottles described in D1 instead of a silicon oxide thin film.

In addition, regarding the characteristic effect of the claimed invention, i.e., the claimed invention can be “used as returnable containers”, based on the well-known properties inherent in hard carbon film, a person skilled in the art would easily foresee that coating a hard carbon film on the inner wall surface achieves the effects such as high strength, abrasion resistance, chemical stability, etc.

(2) Conclusion

The claimed invention does not involve an inventive step over D1 in view of D2 and well-known art.

2.2.2 KIPO

The procedures of assessing the inventive step are as follows:

(1) Specify the claimed invention

Claimed invention is a carbon-film-coated drink bottle comprising a plastic drink bottle whose inside wall surface is coated with hard carbon films.

(2) Specify the cited invention(s)

D1: JPH5-35660U1

D1 discloses small, recyclable and reasonable plastic containers forming silicone oxide thin films on the surface of small plastic containers by plasma CVD which has relatively low temperature and low degree of vacuum and does not require costly high vacuum resistance

D2 : JPH2-70059A

D2 discloses an instrument with an opening, including an inner space of which cross-sectional area parallel to that of the opening is equal to and/or greater than the area of the opening, wherein a film of diamond-like carbon and/or diamond is formed on an inner surface of the instrument.

As a material of the instrument, glass and plastic etc. are included.” (line 36, page 3)

“The instrument according to the present invention can be widely used for, for example, a beaker; a flask; various kinds of dishes, such as a crystallizing dish and an evaporating dish; bottles, such as a weighing bottle, a suction bottle, an extraction bottle; laboratory wares, such as a cooler, a desiccator, suction unit, a pipet, a graduated cylinder, a buret, a funnel, a Kipp's gas generator, and a filter; livingwares, such as a drinking cup, a dish, and a bowl; and industrial members, such as a steel pipe lined with glass, wherein a thin film of diamond-like carbon or diamond is formed on the surface thereof.

(3) Select the cited invention which is the closest to the claimed invention and make a clear difference by comparing the closest cited invention with the claimed invention

D2 is considered as the closest prior art because it discloses all the technical features of the claimed invention. Detail technical features are compared in Appendix 1.2.

(4) Assess whether an invention described in the claims would have been easily made by a person skilled in the art, in view of cited inventions and the common general knowledge before the filing as for the difference between the claimed invention and the cited invention(s).

D2, which is the closed prior art, discloses an instrument with opening whose inside wall is formed with a film of diamond-like carbon.

Though D2 does not explicitly specify an instrument as a plastic drink bottle, various kinds of instruments in shape and materials including plastic are disclosed in description(see page 3 lines 30-36). Also D2 discloses a motivation for coating an instrument made of plastic to overcome its defects(see page 1 lines 17-19).

Accordingly, a person skilled in the art would easily invent the claimed invention from D2.

2.2.3 SIPO

The invention claims a carbon-film-coated drink bottle comprising a plastic drink bottle whose inside wall surface is coated with hard carbon films.

D1(JP5-35660U1) discloses a PET drink bottle whose exterior surface is coated with a silicone oxide thin film by plasma CVD (see example 1, Fig. 1). The difference between the invention and D1 is that: the inner surface of the bottle in the invention is coated with hard carbon films, while the outside wall surface of the bottle in D1 is coated with silicone oxide thin film. The problem solved by the invention is providing an alternative film material to coat the surface of the bottle in order to solve the problems of gas barrier properties and sorption specific to plastic while maintaining the characteristics of plastic containers, and at the same time preventing the coat from being damaged.

D2 (JP2-70059A) discloses an instrument whose inner surface is coated with a diamond-like carbon film (hard carbon film)(see claim 1). Furthermore, D2 teaches that the instrument can be living wares, such as a drinking cups(see page 5 line 21), the material of the instrument can be glass or plastic(see page 3 line36). Although the function of the diamond-like carbon film in D2 is improving the instrument's chemical resistance and solvent resistance, it is well-known to a person skilled in the art that hard carbon films, e.g. diamond-like carbon films, have gas barrier properties.

It is obvious for a person skilled in the art to replace the silicone oxide thin film in D1 with diamond-like carbon films, and coat the film on the inner surface in order to prevent the coat from being damaged.

Thus the invention has no inventive step in light of D1 and D2.

2.3 Comparison & Discussion

(1) Comparison

Inventive Step		
JPO	KIPO	SIPO
No	No	No

Cited Documents		
JPO	KIPO	SIPO
D1+D2	D2	D1+D2

All three offices agreed that the claimed invention does not involve an inventive step over given prior arts. However, there was a little difference in selecting the closest prior art.

JPO selected D1 as the closest prior art and D2 was chosen as a secondary reference to deny the inventive step of the claimed invention.

In the same way, SIPO selected D1 as the closest prior art and D2 was chosen as a secondary reference in combination with D1.

KIPO selected the single prior art D2 for denial of the inventive step of the claimed invention.

KIPO had the differing view from JPO or SIPO citing that the claimed invention can be denied its inventive step without combination with D1 since the technical feature in D1 that the coating with hard carbon films is applied to a plastic container is easily derived from the detailed description in D2 that the invention in D2 can be applied to a plastic container and to achieve many other purposes.

(2) Discussion

The three offices discussed the logic for denying the inventive step of the claimed invention.

Both JPO and SIPO selected D1 as a closest prior art and D2 as a secondary prior art.

JPO focused on the gas-barrier property to combine D1 and D2, while SIPO focused on both the gas-barrier property and the effect of preventing the coat from being damaged to combine the two inventions. Both JPO and SIPO considered the fact that hard carbon films have gas barrier properties is well-known to a person skilled in the art.

On the other hand, KIPO selected D2 as the closest prior art for the denial of the inventive step of the claimed invention since KIPO recognized that D2 discloses the “core technical idea” of the claimed invention. And KIPO denied the inventive step of the claimed invention based only on the prior art D2.

3. Case 3

3.1 Overview of the invention

(1) Title : Preventive, Relieving or Therapeutic Composition for Diabetes Mellitus and/or Diabetic Nephropathy

(2) Claim(s)

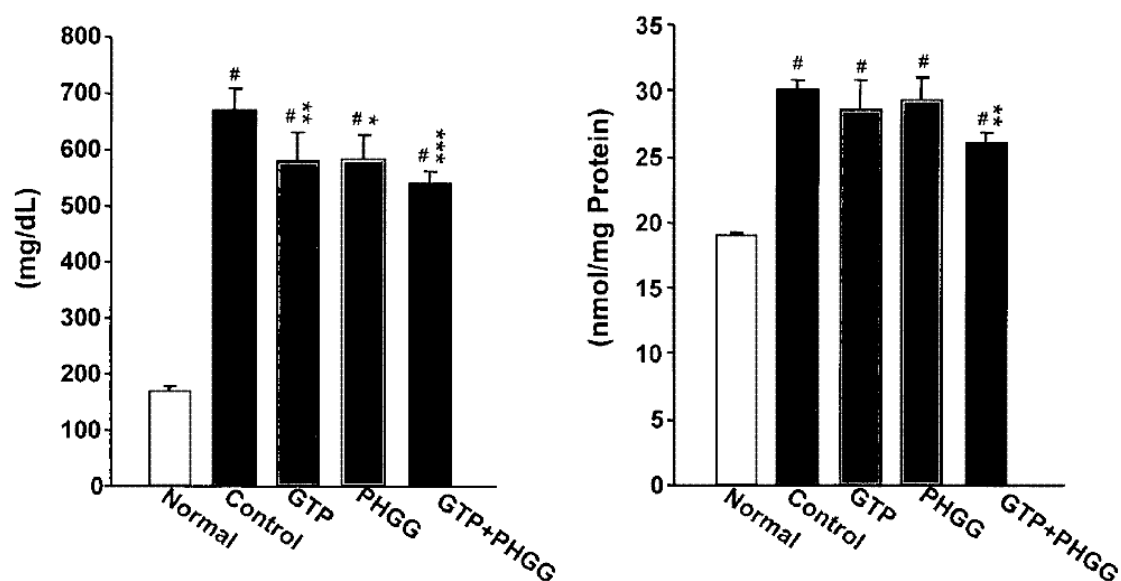
A composition for prevention, amelioration, or treatment of diabetes mellitus and/or diabetic nephropathy, comprising one or more dietary fiber selected from the group consisting of a degraded galactomannan, an indigestible dextrin, a polydextrose, insulin, arabinogalactan, dietary fiber derived from corn, a water-soluble soybean polysaccharide, psyllium, and a low-molecular weight sodium alginate, and a polyphenol compound obtained from a hot-water extract fraction of green tea.

(3) Core aspects of a description that supports the invention:

A composition containing specified dietary fiber and/or a polyphenol compound has a remarkable action of prevention, amelioration, or treatment of diabetes mellitus and/or diabetic nephropathy.

Reference for detail description : US 20080069910A1

(4) Representative drawings:



(5) Overview of the prior arts

D1: JP 2002-275076A (English Translation)

D1: KR 10-2003-0056987A (English Translation)

[D1]

D1 discloses a blood glucose elevation depressant containing an extract from pine tree bark and dietary fibers(see claim 1). It also claims that said blood glucose elevation depressant can be used in the prevention of diabetes mellitus(see Par. [0003]).

And D1 also discloses the following points:

“A blood glucose elevation depressant characterized by its containing a pine tree bark extract and a dietary fiber”. (Claim 1)

“The pine-bark extract used contained catechin which comprised 1.0% or more of the extract by weight...It is known that catechin has the effect of controlling diabetes-mellitus in terms of its ability to control the rise of blood sugar levels...”([0019])

“In this embodiment, dietary fibers are used. For example, insoluble fiber such as cellulose, hemicellulose, lignin, agar, chitin, collagen, and carrageenan can be used. And, soluble fibers such as pectin, a guar gum, psyllium, galactomannan, xyloglucan, locust bean gum, glucomannan, sodium alginate, chondroitin sulfate, low-molecular alginic acid, a low-molecular guar gum, hard-to-digest dextrin, pullulan, phi PARON, and chondroitin sulfate can be also used. Furthermore, derivatives of these dietary fibers can be used. Examples of derivatives of dietary fibers include cellulose derivatives such as methyl cellulose, hydroxypropylcellulose, and carboxymethyl cellulose; derivatives such as chitin or chitosan carboxymethyl oxides; phosphates, sulfur oxides, and dihydroxy propyl; and starch derivatives such as polydextrose. It should be noted that in this description, the term dietary fibers also includes derivatives of dietary fibers as well, unless otherwise stated.”([0023])

“Dietary fibers have the effects of controlling the absorption of cholesterol, excreting ingested sodium, controlling the digestion of sugar, increasing useful bacteria in the intestines, relieving constipation, normalizing blood pressure, maintaining illustrious skin, preventing tooth decay, preventing intestinal cancer, and preventing diverticulosis. And dietary fibers are also known to control the rise of blood glucose levels; and are generally used in the dietary treatment of diabetes.”([0027])

“0.1g of pine-tree-bark extract, the gross weight of which was made up of 40% or more of OPC (OPC-85 made by INC), as one example of a pine-tree-bark extract; 5g of sodium alginate, as one example of a dietary fiber, and 95g of a base feed were mixed and a blood glucose elevation depressant, which was an empirical example 1 of this invention, was prepared.”([0035])

“...The base feed mixture in which both pine-tree-bark extract and dietary fiber had been added was found to have a synergistic effect that controlled the rise in blood glucose levels.

This effect did not result when either the pine-tree-bark extract alone, or the dietary fiber alone, were added to base feed. Based on the above, it was found that there was an effect on controlling the rise in blood-sugar levels after meals by combining both pine-tree-bark extract together with dietary fiber; while this effect did not result when either the pine-tree-bark extract alone, or the dietary fiber alone, were ingested independently.”([0039])

[D2]

D2 discloses the composition for the prevention of the cardiovascular disease of the diabetes comprising the green tea catechin as active ingredient(see claim 1). And it also discloses that catechin(polyphenol) among the principal component of the green tea has various pharmacological activities including the serum cholesterol declining effect, the anti-oxidant activity, the antihypertensive action, platelet aggregation control possibility and etc(see background art)

(6) Requirements for assessing inventive step

Does the invention have the inventive step over D1 in view of D2, especially at the point of a combined synergistic effect?

3.2 Examination Results

3.2.1 JPO

(1) Analysis

It is apparent from above reference in 3.1(5) that the blood glucose elevation depressant described in D1 can be used for the prevention, amelioration, and/or treatment of diabetes.

Then, it is perceived that D1 discloses a composition for the prevention, amelioration and/or treatment of diabetes, comprising a pine tree bark extract containing catechin and dietary fiber.

Comparing the invention in claim 1 with the invention described in D1, both inventions differ in the point that the catechin in claim 1 is obtained from a hot-water extract fraction of green tea, while the catechin in D1 is obtained from a pine tree bark extract.

D1 states in effect that catechin is known to have an anti-diabetic effect to control the rise of blood sugar levels. In addition, it is common general knowledge that a hot-water-extract fraction of green tea contains catechin.

Therefore, when taking into consideration the description in D1 and the common general knowledge, it would be easy for a person skilled in the art to arrive at using catechin (a type of polyphenolic compound) obtained from a hot-water-extract fraction of green tea instead of the catechin (a type of polyphenolic compound) obtained from a pine tree bark extract described in D1.

In addition, even considering experimental results described in the experimental example provided in the detailed description of the invention, it cannot be said that the claimed invention has any remarkable effect exceeding the prediction of a person skilled in the art.

(2) Conclusion

The claimed invention does not involve an inventive step over D1 and common general knowledge.

3.2.2 KIPO

The procedures of assessing the inventive step are as follows:

(1) Specify the claimed invention

A composition for prevention, amelioration, or treatment of diabetes mellitus and/or diabetic nephropathy, comprising one or more dietary fiber selected from the group consisting of a degraded galactomannan, an indigestible dextrin, a polydextrose, insulin, arabinogalactan, dietary fiber derived from corn, a water-soluble soybean polysaccharide, psyllium, and a low-molecular weight sodium alginate, and/or a polyphenol compound obtained from a hot-water extract fraction of green tea.

(2) Specify the cited invention(s)

D1 : JP 2002-275076 A

D1 discloses a blood glucose elevation depressant containing an extract from pine tree bark and dietary fiber (see claim 1). It also claims that said blood glucose elevation depressant can be used in the prevention of diabetes mellitus (see paragraph 0003).

D2 : KR 10-2003-0056987 A

D2 discloses the composition for the prevention of the cardiovascular disease of the diabetes comprising the green tee catechin as active ingredient (see claim 1). And it also discloses that catechin (polyphenol) among the principal component of the green tea has various pharmacological activities including the serum cholesterol declining effect, the anti-oxidant activity, the antihypertensive action, platelet aggregation control possibility and act (see background art).

(3) Select the cited invention which is the closest to the claimed invention and make a clear difference by comparing the closest cited invention with the claimed invention

D1 is considered as the closest prior art because it discloses all the chemical composition of the claimed invention. Detail technical features are compared in Appendix 1.3.

(4) Assess whether an invention described in the claims would have been easily made by a person skilled in the art, in view of cited inventions and the common general knowledge before the filing as for the difference between the claimed invention and the cited invention(s).

As for the technical field and the purpose, the claimed invention is a composition for

prevention, amelioration and treatment of diabetic nephropathy, containing polyphenol compounds such as dietary fiber and catechins. D1 discloses a composition for depressing a blood glucose elevation, comprising an extract from pine tree bark containing dietary fiber and catechins (polyphenol compounds) as an effective component. D2 discloses a composition for prevention of diabetic nephropathy, comprising catechins (polyphenol compounds) as an effective component. Therefore, the claimed invention and D1 and D2 are all identical since they all present a composition for treatment of diabetes mellitus and/or diabetic nephropathy, comprising polyphenol compounds and dietary fiber as effective components.

When the claimed invention and the technical features of D1 are compared, the claimed invention comprises one or more dietary fiber selected from the group consisting of a degraded galactomannan, an indigestible dextrin, a polydextrose, insulin, arabinogalactan, dietary fiber derived from corn, a water-soluble soybean polysaccharide, psyllium, and a low-molecular weight sodium alginate, and/or a polyphenol compound obtained from a hot-water extract fraction of green tea. However, D1 discloses a composition comprising an extract from pine tree bark with galactomannan, sodium alginate, low molecular alginates or soluble dietary fiber (indigestible dextrin) and catechins (polyphenol compounds) as effective components. The claimed invention and D1 are identical in that they all present dietary fiber and polyphenol compounds. Therefore, a person skilled in the art would easily conceive the technical features of the claimed invention in view of D1.

The claimed invention only differs from D1 in that the invention is developed for the prevention, amelioration, or treatment of diabetic nephropathy, whereas D1 is designed for antihypertensive action.

However, the fact that diabetic nephropathy is one of the most frequent complications among diabetics and is caused by diabetic peripheral neuropathy is obvious in the technical filed as described in D2 (see 14-2 in D2). The antihypertensive effect in D2 ultimately means the prevention and treatment of diabetes mellitus, leading to the prevention and treatment of diabetic nephropathy. Moreover, D2 describes that only a composition comprising catechins as an effective component is effective in treating diabetic nephropathy. Therefore, the purpose of the claimed invention would be easily conceived by a person skilled in the art in light of the aggregation of D1 and D2.

Moreover, when it comes to efficacy of the claimed invention, the detailed description of the invention presents the results of the experiments : changes in the level of glucose and glycosylated protein in the composition comprising green tea extracts(hereinafter, referred to as 'GTP') and galactomannan hydrolysates (hereinafter, referred to as 'PHGG' or partially hydrolyzed guar gum) by using diabetic rats in experiments(see [Figure 1]); changes in the level of urea nitrogen, triglyceride and MDA(see [Figure 2]); and changes in the level of urinary protein and serum creatinine (see [Figure 3]). However, such results are obviously expected from D1 and D2 that GTP and/or PHGG are effective in the prevention and treatment of the diabetes mellitus or diabetic nephropathy. Also, the efficacy created by combining GTP and PHGG is a mere aggregation of each effect of GTP and PHGG and is not assumed to present unexpected synergy effects from D1 and D2. Therefore, the claimed

invention is not considered to have a remarkable efficacy in light with the aggregation of D1 and D2.

Therefore, the claimed invention is not acknowledged to have complicated technical features compared to the mere aggregation of D1 and D2 and to present a prominent efficacy. Accordingly, a person skilled in the art would arrive at the claimed invention by simply combining D1 and D2. Therefore, the invention lacks an inventive step.

3.2.3 SIPO

The invention claims a composition for prevention, amelioration, or treatment of diabetes mellitus and/or diabetic nephropathy, comprising one or more dietary fiber and a polyphenol compound obtained from a hot-water extract fraction of green tea.

D1(JP2002-275076A) discloses a blood glucose elevation depressant containing an extract from pine tree bark and dietary fiber content raw material prepared among wheat verdure (dietary fiber derived from corn) (see claim 6). The blood glucose elevation depressant can be used in the prevention of diabetes mellitus (see paragraph. [0003]). The difference between the invention and D1 is that: the composition of the invention contains polyphenol compound obtained from a hot-water extract fraction of green tea, while the blood glucose elevation depressant in D1 contains an extract from pine tree bark. The problem solved by the invention is providing an alternative therapeutic composition for diabetes mellitus. However, D1 discloses that pine tree bark extract contains catechin (polyphenol compound) and it is preferred when said extract contains catechin 1.0 wt% or more (see paragraph [0007]). Furthermore, D2 (KR20030056987A) discloses a composition for the prevention of the cardiovascular disease of the diabetes comprising the green tea catechin an active ingredient(see claim 1). It also discloses that catechin (polyphenol) among the principal components of the green tea has various pharmacological activities including the serum cholesterol declining effect, the anti-oxidant activity, the antihypertensive action, platelet aggregation control possibility and etc(see background art). Thus, it is obvious for a person skilled in the art to combine specific dietary fiber with catechin in green tea as a therapeutic composition for diabetes mellitus. Furthermore, since polyphenol compound is easily dissolved in hot water, it is obvious for a person skilled in the art to obtain polyphenol compound from a hot-water extract fraction of green tea.

Since there is no evidence in the application to show any unexpected effect, the inventive step cannot be acknowledged.

3.3 Comparison & Discussion

(1) Comparison

Inventive Step		
JPO	KIPO	SIPO
No	No	No

Cited Documents		
JPO	KIPO	SIPO
D1	D1+D2	D1+D2

All three offices agreed that the claimed invention does not involve an inventive step over given prior arts.

JPO selected D1 as the closest prior art, and the inventive step of the claimed invention was denied with the single prior art D1 and common general knowledge.

SIPO and KIPO selected D1 as the closest prior art and D2 was chosen as a secondary reference to deny the inventive step of the claimed invention.

(2) Discussion

The three offices discussed the logic for denying the inventive step of the claimed invention.

JPO and SIPO recognized that the claimed invention and the invention described in D1 differed in the origin of the catechin. Regarding this point, JPO denied inventive step of the claimed invention because it is common general knowledge that a hot-water extract fraction of green tea includes catechin. Regarding this point, SIPO judged that it is obvious for a person skilled in the art to apply a green tea catechin described in D2 to the invention described in D1, and to acquire a polyphenolic compound from the hot-water extract fraction of green tea.

Here, the claimed invention is related to the composition for prevention, amelioration or treatment of diabetes mellitus and/or diabetic nephropathy. KIPO recognized that the invention in D1 was used as anti-hypertensive drug while the claimed invention was used for prevention, amelioration or treatment of the diabetic nephropathy and, therefore, the both inventions differed in this point. And KIPO concluded that the difference was easily conceived by a person skilled in the art based on D2.

Furthermore, all the three offices considered that the results of the experiments in the invention cannot be assumed to be unexpected synergy effects.

4. Case 4

4.1 Overview of the invention

(1) Title : Flash Discharge Lamp and Light Energy Irradiation Equipment

(2) Claim(s)

Claim 1

A flash discharge lamp comprising:

A translucent and slim airtight vessel; a pair of electrodes which sealed inside both ends thereof; and a discharge medium containing krypton (Kr) and xenon (Xe), consisting of a rare gas with a partial pressure ratio P (%) of krypton to xenon satisfying a formula: $70 \leq P \leq 98$ and sealed inside the vessel to emit light in flush discharging.

Claim 2

Flash discharge lamp according to claim 1, wherein the flash lighting is carried out under the condition that the current density in the section which intersects perpendicularly with the tube axis in the tight container is above 8000 A/cm^2 .

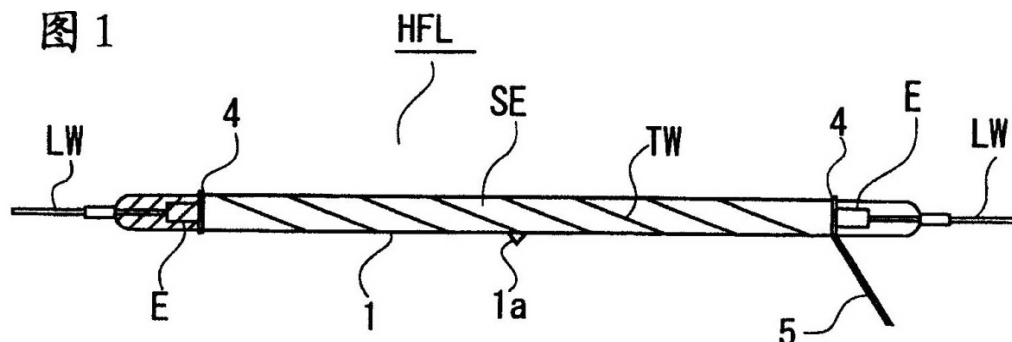
(3) Core aspects of a description that supports the invention:

To provide a flash discharge lamp and a light energy irradiation equipment using the same, increasing in ultraviolet ray radiation, particularly, in ultraviolet ray radiation of wavelengths of 200-400 nm.

The flash discharge lamp HFL comprises a translucent and slim airtight vessel SE; a pair of electrodes E, E sealed inside both ends thereof; and a discharge medium containing krypton (Kr) and xenon (Xe), consisting of a rare gas with a partial pressure ratio P (%) of krypton to xenon satisfying a formula: $70 \leq P \leq 98$ and sealed inside the vessel SE to emit light in flush discharging.

Reference for detail description : JP 2006-139992 A, KR 10-2006-0052588 A

(4) Representative drawings:



(5) Overview of the prior arts

D1 : US2002/0135299A1

D2 : US4914347A

[D1]

This piece of prior art is concerned with a flash discharge lamp comprising: a glass tube 11; a pair of electrodes, i.e., an anode 12 and a cathode 13, oppositely disposed in at both ends of said glass bulb; a electro-conductive member 14 is provided on the outer surface of the glass tube; a electrode 15 and a triggering electrode 18 mounted on the cathode 13 and xenon gas sealed in said glass tube, therein the triggering electrode 18 is electrically connected to said electro-conductive member 14. In operation, when an operating voltage is applied between two electrodes, trigger coil is activated to apply a high trigger voltage to xenon gas whereby molecules thereof are electroionized. Under the action of the field formed between two electrodes, ions and electrons are accelerated and come into collision with each other so that an electron avalanche effect is created. While all the xenon gas is nearly ionized and the high temperature is produced, a high temperature plasma is formed in the glass tube and emits bright light, which closes to sunlight, in a short period of time. All these information are presented in the paragraphs 0002, 0014 to 0017, and figure 1 and 2.

Figures 1 and 2 is as follows:

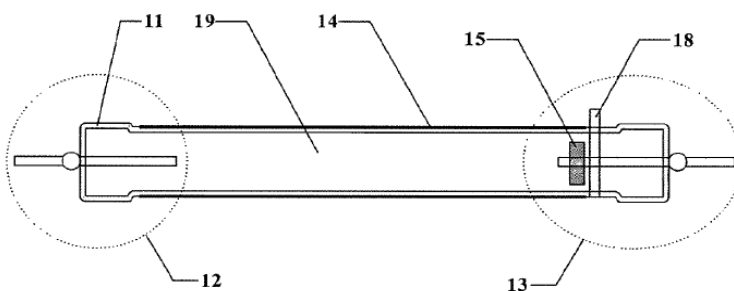


FIG. 1
Prior Art

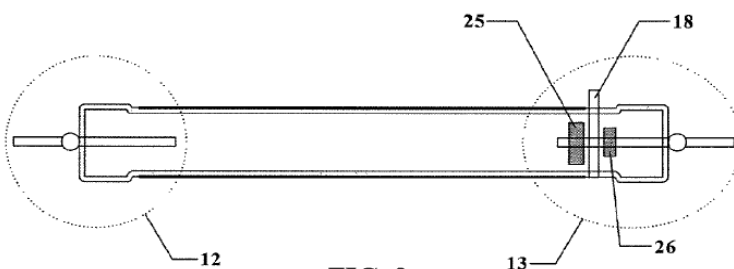


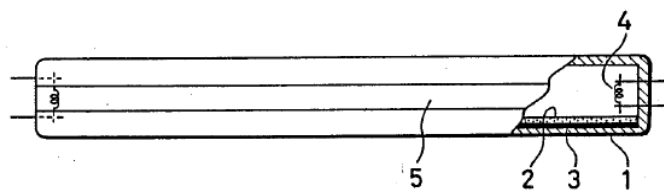
FIG. 2

[D2]

This piece of prior art is concerned with a hot-cathode discharge fluorescent lamp comprising: a linear glass bulb with a wall thickness of 0.7 mm is used for the bulb 1, and a pair of electrodes 4 is provided on the both ends; in the lamp, Xe was filled with the same pressure of 0.5 Torr and additionally Ne was filled with a pressure of 4.5 Torr, that is total pressure of 5.0 Torr (Xe:20%, and Ne:80%). And D2 also discloses not only Ne gas can be used as the additional gas, but also other rare gases such as He, Ar, and Kr all are effective as Ne, or mixed gases may be used. All these information are presented in the paragraphs between line 1 and 10, column 3, and paragraphs between line 67, column 3 and line 2, column 4. The advantage of this invention is to provide hot-cathode discharge fluorescent lamps filled with low pressure rare gas which can be used as usual fluorescent lamps for general illumination and is convenient for use having independence on temperature and short response time performance.

Figures 1:

FIG. 1



(6) Requirements for assessing inventive step

1) Can the inventive step of claim 1 be denied based on D1 and D2? And which one should be determined as the closest prior art?

2) Reference document D2 discloses: "in the lamp, Xe was filled with the same pressure of 0.5 Torr and additionally Ne was filled with a pressure of 4.5 Torr, and other rare gases such as Kr which is effective as Ne may be used". Does there exist such a technical motivation that "Xe and Kr can be filled in the bulb with the same pressure 0.5 Torr: 4.5 Torr" in D2.

3) Can the technical feature "the flash lighting is carried out under the condition that the current density in the section which intersects perpendicularly with the tube axis in the tight container is above 8000 A/cm²" be considered as a feature of function in claim 2? Is this technical feature clear? And what is the difference in structure between claim 1 and claim 2? What is the influence of this technical feature during the process of assessing the inventive step of claim 2?

4) The standard of common knowledge. For example: the function feature "the flash lighting is carried out under the condition that the current density in the section which intersects perpendicularly with the tube axis in the tight container is above 8000 A/cm²" in claim 2, we know that by using higher current density we can get higher illumination, so can we regard this technical feature as a common knowledge.

4.2 Examination Results

4.2.1 JPO

(1) Analysis

D1 discloses a flash discharge lamp consisting of a discharge medium which contains only Xe as the sealed.

Comparing the invention in claim1 with the invention described in D1, the inventions differ in the point that the rare gas in the former consists of both Xe and Kr with a predetermined partial pressure ratio, while the rare gas in the latter is only Xe.

As described in paragraph [0002], the discharge lamp described in D1 is designed for a camera strobe lamp; and the hot-cathode discharge fluorescent lamp described in D2 is, as described in lines 7-10, column 1, designed for office automation equipments such as FAX machines and copiers. Based on this, the functions of the lamps differ from each other. In addition, in D2, the purpose of adding He, Ne, Ar, and Kr with Xe is to improve the luminous maintenance, even when the tube of the lamp is made thin in order to be utilized as a light source in office automation equipments. This problem, then, does not exist in the type of lamp described in D1, designed for use in camera strobes.

Thus, D1 and D2 differ in terms of their functions and problems, and there is no other reasoning to combine the subject matters of D1 and D2.

And, the invention in claim1, flash-discharge lamp suitable for irradiating ultraviolet light, has an advantageous effect of increasing ultraviolet light emissions at a wavelength of 200-400 nm by utilizing Xe and Kr as rare gases.

(2) Conclusion

The reasoning of denying an inventive step of the invention in claim 1 cannot be made over D1 in view of D2. Therefore, the inventions in claims 1 and 2 involve inventive steps.

4.2.2 KIPO

The procedures of assessing the inventive step are as follows:

(1) Specify the claimed invention

A flash discharge lamp HFL comprises a translucent and slim airtight vessel SE; a pair of electrodes E, E sealed inside both ends thereof; and a discharge medium containing krypton (Kr) and xenon (Xe), consisting of a rare gas with a partial pressure ratio P (%) of krypton to xenon satisfying a formula: $70 \leq P \leq 98$ and sealed inside the vessel SE to emit light in flush discharging.

(2) Specify the cited invention(s)

D1 : US2002/0135299

A flash discharge lamp comprising:

a glass tube; a pair of electrodes i.e. an anode and a cathode, oppositely disposed in at both ends of the glass tube; a electro-conductive member is provided on the outer surface of the glass tube; a triggering electrode mounted on said cathode and electrically connected to said electro-conductive member; and xenon gas sealed in said glass tube, characterized in that said flash discharge lamp further includes at least one High Temperature Resistant electrode mounted on said cathode and at least one Getter electrode mounted on said cathode and/or said anode.

D2 : US 4,914,347

A hot-cathode discharge fluorescent lamp filled with low pressure rare gas comprising:

a tubular glass bulb made of thin glass having fluorescent material layer on an inside surface thereof, and an inner diameter of 16 mm or less; and
a pair of electrodes, one on each end of the tubular glass bulb, at least one of which operates as a hot-cathode at least in a stable discharge condition,
the tubular glass bulb containing a mixture of rare gases, the mixture containing Xe and at least one of He, Ne, Ar and Kr at predetermined pressure values,
the fluorescent material being illuminated with radiation from a discharge in the mixture of rare gases.

(3) Select the cited invention which is the closest to the claimed invention and make a clear difference by comparing the closest cited invention with the claimed invention

Technical features of the claimed invention are compared with D1 or D2 in Appendix 1.4

(4) Assess whether an invention described in the claims would have been easily made by a person skilled in the art, in view of cited inventions and the common general knowledge before the filing as for the difference between the claimed invention and the cited invention(s).

1. Requirements for assessing inventive step

(1) Can the inventive step of claim 1 be denied based on D1 and D2? And which one should be determined as the closest prior art?

The inventive step of claim 1 don't be denied base on D1, D2. And D1 is determined as the closest prior art because it discloses a flash discharge lamp

(2) Reference document D2 discloses: "in the lamp, Xe was filled with the same pressure of 0.5 Torr and additionally Ne was filled with a pressure of 4.5 Torr, and other rare gases such as Kr which is effective as Ne may be used". Does there exist such a technical motivation that "Xe and Kr can be filled in the bulb with the same pressure 0.5 Torr: 4.5 Torr" in D2.

If the numerical range of invention is included by prior art, the invention is not always denied by prior art but admitted its inventive step when it has critical meaning. The action and effect of invention change dramatically in its numerical range, then critical meaning of numerical range can be allowed. In this invention, it is said that "if the ratio of partial pressure of Kr is less than 70% or over 98%, then ultraviolet light, its wave length is 200~400nm, generation rate is same or less than the lamp that has Kr by 100%", so the inventive step of this invention is allowed by the numerical range of critical meaning. Also, examiner consider that there is motivation or better effects in the contents of the prior arts which can make a person having ordinary skill in the art arrive at the invention as mentioned in claims, when he or she judges the inventive step of inventions. However, the purpose of D2 is to provide hot-cathode discharge fluorescent lamps filled with low pressure rare gas which can be used as usual fluorescent lamps for general illumination and is convenient for use having not only independence on temperature and short response time performance, which are inherent for rare gas filled discharge lamps, but also improved luminous maintenance deterioration due to utilization of thinner tubes. And there is no motivation or effect which makes a person having ordinary skill in the art arrive at the purpose of increasing the amount of ultraviolet light in discharge lamp. Therefore, we cannot say that claim 1 is lack of inventive step, although D2 includes the score range of claim 1.

(3) Can the technical feature "the flash lighting is carried out under the condition that the current density in the section which intersects perpendicularly with the tube axis in the tight container is above 8000 A/cm²" be considered as a feature of function in claim2? Is this technical feature clear? And what is the difference in structure between claim 1 and claim 2? What is the influence of this technical feature during the process of assessing the inventive step of claim 2?

Although the functional expressions which show functions or effects of inventions are

included in claims, in case that the meaning of functional expressions is able to clearly decided by explanation and drawing of inventions, the claims is allowed to written clearly. The expression that is written in claim 2 is able to be clearly decided by explanation and drawing of the invention, so it cannot be seemed to be unclear. Also, it is considered that things which are able to written in claims are not only structure but also functions or effects.

(4) The standard of common knowledge. For example: the function feature “the flash lighting is carried out under the condition that the current density in the section which intersects perpendicularly with the tube axis in the tight container is above 8000 A/cm²” in claim 2, we know that by using higher current density we can get higher lamination, so can we regard this technical feature as a common knowledge.

In claim 2, ‘the current density above 8000 A/cm²’ means the score range which shows dramatic increase of ultraviolet light. And this score range cannot be regarded as a common knowledge

2. Assessing Inventive Step

Claim 1 of the present invention relate to a flash discharge lamp. Compared with D1-D2, the subject matter of claim 1 differs from these prior art documents in that a discharge medium containing krypton (Kr) and xenon (Xe), consisting of a rare gas with a partial pressure ratio P (%) of krypton to xenon satisfying a formula: $70 \leq P \leq 98$ and sealed inside the vessel SE to emit light in flush discharging. And it is not obvious to a person skilled in the art over the documents individually or in combination. Therefore, the subject matter of claim 1 is considered to involve an inventive step.

Claim 2 is dependent on claim 1. Consequently, the subject matter of claim 2 is also considered to involve an inventive step.

4.2.3 SIPO

1. The claim 1 is concerned with a kind of flash discharge lamp comprising: a translucent and slim airtight vessel; a pair of electrodes which sealed inside both ends thereof; and a discharge medium containing krypton (Kr) and xenon (Xe), consisting of a rare gas with a partial pressure ratio P (%) of krypton to xenon satisfying a formula: $70 \leq P \leq 98$ and sealed inside the vessel to emit light in flush discharging.

D1 (US2002/0135299A1) discloses a flash discharge lamp comprising: a glass tube 11; a pair of electrodes, i.e., an anode 12 and a cathode 13, oppositely disposed in at both ends of said glass bulb; a electro-conductive member 14 is provided on the outer surface of the glass tube; a electrode 15 and a triggering electrode 18 mounted on the cathode 13 and xenon gas sealed in said glass tube, therein the triggering electrode 18 is electrically connected to said electro-conductive member 14 (see paragraphs 0002,0014 to 0017,figure 1 and 2).

The distinguishing features between the claim 1 and D1 is that: a discharge medium containing krypton (Kr) and xenon (Xe), consisting of a rare gas with a partial pressure ratio P (%) of krypton to xenon satisfying a formula: $70 \leq P \leq 98$. The technical problem solved by the invention is: to increase the ultraviolet radiation of the flash discharge lamp.

D2 (US4914347A) discloses a hot-cathode discharge fluorescent lamp comprising: a linear glass bulb with a wall thickness of 0.7 mm is used for the bulb 1, and a pair of electrodes 4 is provided on the both ends; in the lamp, Xe was filled with the same pressure of 0.5 Torr and additionally Ne was filled with a pressure of 4.5 Torr, that is total pressure of 5.0 Torr (Xe:20%, and Ne:80%). Therefore the partial pressure ratio P (%) of Ne to Xe is 80, which is satisfying the formula: $70 \leq P \leq 98$. And D2 also discloses not only Ne gas can be used as the additional gas, but also other rare gases such as He, Ar, and Kr all are effective as Ne, or mixed gases may be used (see paragraphs between line 1 and 10, column 3, and paragraphs between line 67, column 3 and line 2, column 4). But the function of this mixed rare gas is to improve the luminance maintenance of the lamp, which is different from the technical problem solved by the invention

At the same time, the distinguishing feature is not a common knowledge. So, there does not exist a technical motivation in the prior art as to apply said distinguishing features to the D1 in solving the existing technical problem, so the claim 1 involves an inventive step over D1 and D2.

2. The claim 2 is the dependent claim of claim 1, considering that claim 1 involves an inventive step over D1 and D2, the claim 2 also involves an inventive step

4.3 Comparison & Discussion

(1) Comparison

Inventive Step		
JPO	KIPO	SIPO
Yes	Yes	Yes

Cited Documents		
JPO	KIPO	SIPO
-	-	-

All three offices agreed that the claimed invention involves an inventive step over given prior arts.

(2) Discussion

The three offices all agreed that the claimed invention cannot be easily derived from cited inventions or by combining cited inventions since the claimed invention and the cited inventions have different technical tasks to be solved or technical functions.

JPO stated that the combination of D1 and D2 was impossible because the functions and the problems of the inventions described in D1 and D2 differed. And KIPO stated that a person skilled in the art could not be arrived at the purpose of the claimed invention and the inventive step of this invention is allowed by the numerical range of critical meaning. SIPO commented that the technical problems of the claimed invention and the invention in D2 differed.

In determining the inventive step of this case, the technical features defined by numerical scope were not an important issue in the discussion. However, there was a discussion over the determination of the inventive step on the invention defined by numerical limitation.

In general, KIPO determines the inventive step based on whether the limitation of numerical scope has a critical meaning. However, SIPO's examination guidelines define that if the invention resides in the choice of particular dimensions, temperature ranges, or other parameters from a limited range of possibilities, while such choice can be made by the person skilled in the art through normal design procedures and does not produce any unexpected technical effect, the invention does not involve an inventive step.

In addition, regarding the claim 2, SIPO raised the issue regarding clarity of the invention.

SIPO entertained doubts about the clarity of the claim 2. However, three offices agreed that the detail of this issue should be addressed in the future since clarity requirement is out of topic in this study.

5. Case 5

5.1 Overview of the invention

(1) Title : Automatic personal playlist generation with implicit user feedback

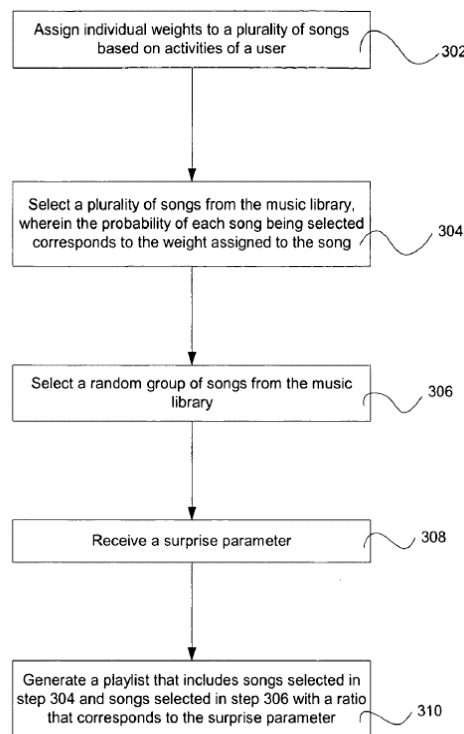
(2) Claim(s)

A method of generating an audio playlist from a music library, the method comprising: (a) assigning individual weights to a plurality of songs based on activities of a user in relation to the songs; (b) selecting a plurality of songs from the music library, wherein the probability of each song being selected corresponds to the weight assigned to the song; (c) selecting a random group of songs from the music library; and (d) generating a playlist that includes songs selected in (b) and songs selected in (c) with a ratio that corresponds to a surprise parameter.

(3) Core aspects of a description that supports the invention:

Reference for detail description : US 7345232 B2

(4) Representative drawings:



(5) Overview of the prior arts

D1: US 20050219963 A1

D2: US 6,446,080 B1

[D1]

D1 discloses three types of play lists. The first type is a play list in which a predetermined number of music programs to which the user had most recently listened have been registered. The second type is a play list in which a predetermined number of music programs to which the user had most frequently listened have been registered. The third type is a play list in which music programs selected from all the virtual slots by the user have been registered. (See Paragraph [0157])

[D2]

D2 discloses shuffle operation that simply shuffles in random order a number of tracks. The shuffle operation may be accomplished using a random number generator, for instance, in the manner known in the art. (See Paragraph 5, lines 55-59)

(6) Requirements for assessing inventive step

Does the invention have the inventive step over D1 in view of D2, especially in view of obviousness of combination?

5.2 Examination Results

5.2.1 JPO

(1) Analysis

In consideration of the description in paragraphs [0156]-[0157], [0209] and Fig. 1, Fig. 21D, it is perceived that D1 discloses a method of generating a play list from albums tracks, which is a method of making a reproduction frequency play list by assigning to each track the reproduction frequency data which indicate the number of times a user has played and sorting in descending order of the reproduction frequency data of each track.

In addition, D2 discloses a method of generating a playlist by simply shuffling a number of tracks in random order. (See lines 55-59, column 5)

However, D1 and D2 neither disclose nor indicate a structure with the above steps (b) ~ (d). In particular, in generating a play list, it is not within the exercise of ordinary creativity of a person skilled in the art to put the music data extracted from differing two steps into the play list with a ratio corresponding to a predetermined parameter.

Therefore, it would not be easy for a person skilled in the art to conceive the claimed invention from D1 and D2.

(2) Conclusion

The reasoning of denying an inventive step of the claimed invention cannot be made over D1 in view of D2. The claimed invention involves an inventive step.

5.2.2 KIPO

The procedures of assessing the inventive step are as follows:

(1) Specify the claimed invention

Claimed invention is a method of generating an audio playlist from a music library, the method comprising:

- (a) assigning individual weights to a plurality of songs based on activities of a user in relation to the songs;
- (b) selecting a plurality of songs from a music library, wherein the probability of each song being selected corresponds to the weight assigned to the song;
- (c) selecting a random group of songs from the music library; and
- (d) generating a playlist includes songs selected in (b) and songs selected in (c) with a ratio that corresponds to a surprise parameter.

(2) Specify the cited invention(s)

D1: US 2005/0219963 A1

[D1]

A reproducing and editing apparatus which allows a representative portion of a music program to be registered

A play list is used to register music programs the user desires. In reality, the user selects his or her desired music programs from albums stored in the HD recording and reproducing devices. 101 and registers the selected music programs to a play list (in paragraph [0156]).

According to the embodiment of the present invention, three types of play lists are provided. The first type is a play list in which a predetermined number of music programs to which the user had most recently listened have been registered (hereinafter this type of play list is referred to as reproduction history play list). The second type is a play list in which a predetermined number of music programs to which the user had most frequently listened have been registered (hereinafter this type of play list is referred to as reproduction frequency play list). The third type is a play list in which music programs selected from all the virtual slots by the user have been registered (hereinafter this type of play list is referred to as selection play list). To select one of the three types of play lists, the user presses the menu key of the operating device 304 of the system controller 301 and selects a desired type on the menu displayed on the display device (in paragraph [0157]).

D2: US 6,446,080 B1

[D2]

A method for creating, modifying, and playing a customized playlist that may be utilized by such digital audio/visual actuation devices at any later time.

Alternately, the playlist may be created with little user intervention at all. The digital audio/visual actuator device can be programmed to recognize those tracks that are played the most frequently and to create the custom playlist to include them. For instance, the digital audio/visual actuator device can choose the ten tracks that the user has played the most within a given time period, such as within the last week. The digital audio/visual actuator device may further have a select button on its control panel that the user may press to add a track that is being played to the playlist. Additionally, the playlist may be created by a shuffle operation that simply shuffles in random order a number of tracks. The shuffle operation may be accomplished using a random number generator, for instance, in the manner known in the art. (in col.5 lines 45-58).

(3) Select the cited invention which is the closest to the claimed invention and make a clear difference by comparing the closest cited invention with the claimed invention

Technical features of the claimed invention are compared with D1 or D2 in Appendix 1.5

(4) Assess whether an invention described in the claims would have been easily made by a person skilled in the art, in view of cited inventions and the common general knowledge before the filing as for the difference between the claimed invention and the cited invention(s).

The difference between the claimed invention and the cited inventions is that the cited inventions D1 and D2 do not disclose a technical feature of selecting songs from different type playlists according to a ratio to the different type playlists.

As stated in paragraph [0156] of D1, a playlist is composed of titles of songs which a user selects according to his or her desire. The ratio corresponding to a surprise parameter in the claimed invention seems to be one of user's various desires to select songs. However, the cited prior arts D1 and D2 do not provide any motivation of selecting the ratio to the different type playlists as one of the user's various desires to a person skilled in the art. Thus, the difference between the claimed invention and the cited inventions would not be considered as an exercise of ordinary creativity,

Therefore, the claimed invention is considered to involve an inventive step.

5.2.3 SIPO

(1) Inventive step of the invention

For evaluating the inventive step of the invention, the opinion is as follows:

The invention claims a method of generating an audio playlist from a music library, the method comprising: (a) assigning individual weights to a plurality of songs based on activities of a user in relation to the songs; (b) selecting a plurality of songs from the music library, wherein the probability of each song being selected corresponds to the weight assigned to the song; (c) selecting a random group of songs from the music library; and (d) generating a playlist that includes songs selected in (b) and songs selected in (c) with a ratio that corresponds to a surprise parameter.

D1 (US2005021996) discloses a reproducing apparatus and an editing apparatus which allow a representative portion of a program to be registered. This apparatus can generate an audio playlist from a hard disk drive which stores a plurality of albums. Three types of play lists are provided(see paragraph [0157]). The first type is a play list in which a predetermined number of music programs to which the user had most recently listened have been registered (hereinafter this type of play list is referred to as reproduction history play list). The second type is a play list in which a predetermined number of music programs to which the user had most frequently listened have been registered (hereinafter this type of play list is referred to as reproduction frequency play list). The third type is a play list in which music programs selected from all the virtual slots by the user have been registered (hereinafter this type of play list is referred to as selection play list), just like the (a) and (b) in the claim of the invention.

The distinguishing features between the invention and D1 are that: (c) selecting a random group of songs from the music library; and (d) generating a playlist that includes songs selected in (b) and songs selected in (c) with a ratio that corresponds to a surprise parameter. The technical problem solved by the invention is: to automatically generate lists that include media pieces that a user likes while minimizing repetition and keeping aspects of surprise within the lists.

D2 (US 6446080) discloses an improved method for creating, modifying, and playing a customized playlist that may be utilized by digital audio/visual actuation devices. And the playlist may be created by a shuffle operation that simply shuffles in random order a number of tracks. The shuffle operation may be accomplished using a random number generator, for instance, in the manner known in the art. (See Paragraph 5, lines 55-59). This playlist generate by the “shuffle operation” just like “(c) selecting a random group of songs from the music library” in the claim, but D2 do not disclose that the playlist includes songs selected in the playlist generate by the “shuffle operation” with a ratio that corresponds to a surprise parameter (like (d) in the claim).

At the same time, the distinguishing feature (d) is not a common knowledge. There does not

exist a technical motivation in the prior art as to apply said distinguishing features to the D1 in solving the existing technical problem, so the invention has the inventive step over D1 in view of D2.

(2) Patentability of the invention

According to the guidelines of SIPO: In the examination procedures, first of all, the examiner shall examine whether the subject matter of the application is in conformity with the provisions of Article 2.2; Then, the examiner shall examine whether the technical solutions defined by the claims possess novelty and involve inventive step as required in the provisions of Article 22.2 and Article 22.3.

For this application, the examiner of SIPO doubts that the invention is not the technical solution as provided for in Article 2.2 and is not the subject matter of patent protection.

Considering that patentability is out of the topic in this study, it is proposed to discuss the detail of this issue in the future.

5.3 Comparison & Discussion

(1) Comparison

Inventive Step		
JPO	KIPO	SIPO
Yes	Yes	Yes

Cited Documents		
JPO	KIPO	SIPO
-	-	-

All three offices agreed that the claimed invention involves an inventive step over given prior arts.

(2) Discussion

1. Interpretation of prior art

Regarding how to interpret the technical features not explicitly disclosed in the prior art, the examination practices of KIPO determine that even though the technical features corresponding to the claimed invention in the prior arts are not directly disclosed, they are deemed to be disclosed in the prior arts based on the technical level at the time of filing the application. The examination practices of SIPO are similar to those of KIPO. JPO indicates that the practices of JPO are also similar to those of KIPO and SIPO. That is, JPO interprets the technical features of the prior arts in consideration of the common general knowledge at the time of filing. However, despite the examination practices among each office regarding interpretation of prior arts are similar, JPO's interpretation in this case differed from those of other offices. In this regard, however, JPO commented that the technical features that three office's recognitions were not identical were considered to be easily conceived by a person skilled in the art.

2. Subject matter eligibility of claimed invention

The examination practices of SIPO may have some differences from those of JPO or KIPO in determining the subject matter eligibility of BM inventions(inventions related to computer programs) Since the subject matter eligibility is out of topic in this study, it is suggested to be addressed in detail in future discussions.

III. Conclusion

In this study, JEGPE analyzed the results of the five cases in evaluating the inventive step in order to examine how the comparative study on inventive step conducted in 2010 are applied in the actual examination cases

The results show that evaluations of the inventive step on the cases were identical among the three offices. However, in the process of evaluating the inventive step, there existed some differences such as selection of the closest prior art or combination of prior arts.

The above-mentioned differences in evaluating the inventive step were discussed at the 2011 JEGPE meeting. Based on the outcomes of a series of discussions, it was identified that the fundamental examination guidelines are similar among the three patent offices, but the application of such guidelines may have some differences.

In conclusion, the three offices confirmed that the similar results on inventive step may be expected when the conditions such as the same prior arts and the same technical background are provided to examiners from the three offices.

Appendix

Comparison table of technical features

1. KIPO

1.1 Case 1

Claimed Invention	D1	D2	D3	Comment
(a)female connection member(20)	butt end head(12,14)	articulated coupling apparatus(10)	rear support block(46), front draft block(52)	
(b)cavity(18)	opening(8,10)	cavity(26)	spherical butt end portion(49)	cavity(26) of D2 is different from cavity(18) of claimed invention
(c)first opening(40)		opening(38)		
(d)second opening(42)		opening(38)		
(e)male connection member(50)		male connection member(20)	shank(50)	
(f)aperture(56)		aperture(16)		
(g)spherical shaped member(58)		spherical member(42)	convex spherical draft load bearing surface(51)	
(h)shaft member(60)		shaft member(46)		
(i)race assembly(66)		race assembly(44)		
(j)wedge means(80)		wedge like member(71)		
(k)engageable means(90)		first end(12)		

1.2 Case 2

Claimed Invention	D1	D2	Comment
carbon-film-coated drink bottle	plastic containers	An instrument with an opening	
a plastic drink bottle		a material of the instrument, glass and plastic etc. are included	
inside wall surface is coated with hard carbon films		a film of diamond-like carbon	

1.3 Case 3

Claimed Invention	D1	D2	Comment
A composition for prevention, amelioration, or treatment of diabetes mellitus and/or diabetic nephropathy,	A blood glucose elevation depressant for prevention of diabetes mellitus	A composition for prevention of the renal function against damage of diabetes	
one or more dietary fiber selected from the group consisting of a degraded galactomannan, an indigestible dextrin, a polydextrose, insulin, arabinogalactan, dietary fiber derived from corn, a water-soluble soybean polysaccharide, psyllium	an extract from pine tree bark and dietary fiber which have a galactomannan, sodium alginate, a kind of polyphenol mixture (catechin)	an extract catechin from green tea	
a low-molecular weight sodium alginate and/or a polyphenol compound obtained from a hot-water extract fraction of green tea			

1.4 Case 4

Claimed Invention	D1	D2	Comment
vessel	glass tube	tubular glass bulb	
electrodes	electrodes	electrodes	
a discharge medium containing krypton (Kr) and xenon (Xe), consisting of a rare gas with a partial pressure ratio P (%) of krypton to xenon satisfying a formula: $70 \leq P \leq 98$ and sealed inside the vessel SE to emit light in flush discharging	-	-	

1.5 Case 5

Claimed Invention	D1	D2	Comment
(a) assigning individual weights to a plurality of songs based on activities of a user in relation to the songs	Music programs to which the user had most recently or frequently listened	Tracks that are played the most frequently	D1 and D2 disclose techniques of assigning a weight to each song based on the user activity of listening frequency or listening history.
(b) selecting a plurality of songs from a music library, wherein the probability of each song being selected corresponds to the weight assigned to the song	A predetermined number of music programs to which the user had <u>most recently listened</u> have been registered or a predetermined number of music programs to which the user had <u>most frequently listened</u> have been registered	Recognizing those tracks that are <u>played the most frequently</u> in order to create the custom playlist to include them	
(c) selecting a random group of songs from the music library		Playlist may be created by a shuffle operation that simply <u>shuffles in random order</u> a number of tracks	
(d) generating a playlist includes songs selected in (b) and songs selected in (c) with a ratio that corresponds to a surprise parameter	Creating a reproduction history play list or a reproduction frequency play list	Creating a playlist based on listening frequency or shuffling operation.	For creating a playlist, D1 and D2 do not disclose a technical feature of selecting songs from different type playlists according to a ratio to the different type playlists.

2. SIPO – Case 1

Claim 1	Corresponding information disclosed in D2	Distinguished features
An improved slackless type drawbar assembly for use in connecting together adjacently disposed ends of a pair of railway cars in a substantially semi-permanent fashion	provide an apparatus to removably-secure a bearing assembly to an articuable coupling apparatus used for connecting adjacent ends of a pair of railway cars together, in a semi-permanent manner	
a) a at least one female connection member, said at least one female connection member including;	a female connecting member 30	
(i) a first end portion, having a first predetermined configuration to enable said first end portion of said at least one female connection member to be engaged within an <u>outer end portion</u> of a center sill member disposed on a <u>bottom portion</u> of a car body member of a first railway car,	the first end 24 of the female connecting member 30, which has a particular configuration as can be seen from the attached figures of D2, enables the connecting member 30 to be engaged with and connected to an adjacent end of a center sill member disposed substantially along a longitudinal centerline of an opposite one of such first railway car and such second railway car. Besides, it is derivable directly and unambiguously to a person skilled in the art that in D2 it must be the outer end portion of the center sill member that engages with the female connecting member, and the center sill member must be disposed on a bottom portion of a car body member.	
(ii) a radially opposed second end portion which extends outwardly from such outer end portion of such center sill member;	The female connecting member 30 includes a second end in which a cavity 26 is formed.	
(b) a cavity formed in said radially opposed second end portion of said at least one female connection member, said cavity being defined by an inner surface 22 of a back wall 24 portion, having a second predetermined configuration, an inner surface of a <u>top wall portion 28</u> and an inner surface of a pair of side wall portions, each side wall portion having a third predetermined configuration,	A cavity 26 is formed in a second end of the female connection member, which has a predetermined configuration. This cavity 26 is formed by a substantially horizontally-disposed <u>bottom wall portion 32</u> , a substantially vertically-disposed back wall portion 34 connected along a bottom edge thereof to a rear edge of such bottom wall portion 32, and a pair of vertically-disposed side wall portions 36 connected along a bottom edge thereof to the bottom wall portion 32 and along a rear edge thereof to such back wall	Distinguishing feature 1 : The top wall portion 28 constitutes part of the cavity, whereas in D2 it is the bottom wall portion 32.

said cavity being open adjacent at least a portion of a bottom and an outer end of said radially opposed second end portion of said at least one female connection member;	portion 34. the bottom wall portion 32 is formed in the second end 24 of such female connection member 30. This feature can be clearly seen in the figures of D2	
(c) a first opening, having a fourth predetermined configuration, formed through a first one of said pair of side wall portions;	An opening 38 is formed through a predetermined portion of each one of the pair of side wall portions 36. the two openings 38 are radially opposed.	
(d) a radially opposed second opening, having a fifth predetermined configuration, formed through a second one of said pair of side wall portions;		
(e) at least one male connection member having a sixth predetermined configuration, said at least one male connection member including;	A male connecting member 20 having a particular configuration.	
(i) a first end portion 48, at least a portion of said first end portion of said at least one male connection member being movably disposed within said cavity formed in said radially opposed second end portion of said at least one female connection member,	the second end 14 of such male connection member 20 has a predetermined configuration adjacent an outermost end 18 thereof. Part of the second end 14 is movably disposed within said cavity 26.	
(ii) and a radially opposed second end portion;	The first end 12 of the male connection member 20	
(f) an aperture formed through a predetermined portion of said at least one male connection member adjacent said first end portion thereof;	Disposed within such second end 14 is an aperture 16, includes a predetermined size and a predetermined shape. Such aperture 16 is formed through a predetermined portion of the second end 14 of such male connection member 20.	
(g) a spherical shaped member, at least a portion of said spherical shaped member being disposed within said aperture formed through said first end portion of said at least one male connection member;	The articulated coupling apparatus 10 includes a bearing assembly 40. Such bearing assembly 40 includes a substantially spherical member 42. At least a predetermined portion of such spherical member 42 is positioned within such aperture 16 formed through the predetermined portion of the second end 14.	
(h) a pair of substantially horizontally	A pair of shaft members 46 extends	

<p>disposed shaft members extending outwardly for a predetermined distance from radially opposed and substantially vertically disposed outer surface portions of said spherical shaped member, at least a portion of a first one of said pair of shaft members being disposed within said first opening formed through said first one of said pair of side wall portions and at least a portion of a second one of said pair of shaft members being disposed within said second opening formed through said second one of said pair of side wall portions,</p> <p>each respective one of said pair of shaft members has a radially opposed and substantially flat surface 64 portion formed thereon;</p>	<p>outwardly a predetermined length from axially-opposed surfaces of such spherical member 42. One of such pair of shaft members 46 being engaged in a respective one of such opening 38 formed through such each one of such pair of side wall portions 36 of such cavity 26 formed in the second end of such female connection member 30. At least a portion of each of such pair of shaft members 46 having a substantially identical configuration as at least a portion of such predetermined configuration of such opening 38 formed through such side wall portions 36.</p> <p>a tapered flat surface 79 of one of the shaft members 46 which engages with the second substantially flat surface 77 of the wedge-like member 71</p>	
<p>(i) a race assembly having at least a portion thereof disposed within said aperture and secured to said first end portion of said at least one male connection member, an inner surface of said race assembly being disposed around said at least a portion of said spherical shaped member disposed within said aperture formed through said first end portion of said at least one male connection member;</p>	<p>A race assembly 44, having a substantially spherical inner surface, is positioned around such predetermined portion of the spherical member 42 is positioned within the aperture 16 to enable movement of such male connection member 20 in relation to such female connection member 30 in both a vertical direction and a horizontal direction. It can be seen clearly from figure 2 that the race assembly 44 is secured to the first end of the male connecting member 20.</p>	
<p>(j) a pair of wedge means, a first surface of a first one of said pair of wedge means being engaged with a first one of said radially opposed and substantially flat surface portions formed on said pair of shaft members and a second surface of said first one of said pair of wedge means being engaged with a substantially flat and vertically disposed surface portion formed on said first one of said pair of side wall portions adjacent a portion of said first opening and a first surface of a second one of said pair of wedge means being engaged with a second one of said radially opposed and substantially flat surface portions</p>	<p>a pair of securing means 50 is used to secure the bearing assembly 40 to the female connecting member 30(see figure 2 or 3). each securing means includes at least a wedge-like member 71. Wedge-like member 71 includes a first substantially flat surface 73 which engages a flat surface 75 on such opening 38 in an upstanding side wall portion 36 and a second substantially flat surface 77 which engages a tapered flat surface 79 of one of the shaft members 46. Such second surface 77 includes a taper which corresponds to the tapered flat surface 79. Additionally, the wedge-like member 71 includes a longitudinal bore 78 extending</p>	

formed on said pair of shaft members and a second surface of said second one of said pair of wedges means being engaged with a substantially flat and vertically disposed surface portion formed on said second one of said pair of side wall portions adjacent a portion of said second opening;	therethrough. Such bore 78 receives a bolt-like member 81 therethrough to secure the wedge-like member 71 to the female connection member 30 and thereby locking such articulated coupling apparatus together.	
(k) <u>a means engageable with said second end portion of said at least one male connection member and a second end portion of another male connection member for securing said second end portion of said at least one male connection member to said second end portion of said another male connection member thereby forming an improved slackless type drawbar assembly</u>	male connection member 20 to be engaged with and connected to one predetermined end of a center sill member disposed substantially along a longitudinal centerline of one of such first railway car and such second railway car.	Distinguishing feature 2 : (k)