Decision on Opposition

Opposition No. 2018-700579

Patentee	Sekisui Fuller Company, Ltd.
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Opponent	SATO, Sachiyo

The case of opposition to the granted patent regarding inventions of Patent No. 6262585 titled the "HOT MELT ADHESIVE AND PAPER-MADE PACKAGING MATERIAL" has resulted in the following conclusion.

Conclusion

The patent according to Claims 1 to 4 of Patent No. 6262585 shall be revoked.

Reason

No. 1 History of the procedures

The application of the patent according to Claims 1 to 4 of Patent No. 6262585 was filed on March 27, 2014 [Priority Date: March 29, 2013, Japan (JP)]. The establishment of patent right was registered on December 22, 2017, and a gazette containing the patent was published on January 17, 2018. Thereafter, the opposition to the granted patent of inventions according to Claims 1 to 4 was filed on July 13, 2018 by Sachiyo Sato (hereinafter, referred to as the "Opponent").

The history of procedures after the filing of the opposition is as follows:

September 28, 2018(drafting dat	te)	Notificat	ion	of]	Reasons	for
Revocation of the Patent						
November 30, 2018	Written	Opinion	and	Written	Request	for
Correction (submitted by Patentee)						
dated December 17, 2018	Notificat	ion of the	fact th	nat the V	Vritten Req	uest
for Correction has been filed						
January 17, 2019	Written (Opinion (s	ubmitt	ed by O	pponent)	
January 31, 2019(drafting date)	Notificat	ion of R	leason	s for F	Refusal of	the
Correction						
March 7, 2019	Written	Opinion	and	Writter	n Amendr	nent

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(submitted by Patentee)	
March 19, 2019(drafting date)	Notification of Reasons for Revocation
(advance notice of decision)	
May 21, 2019	Written Opinion and Written Request for
Correction (submitted by Patentee)	
May 23, 2019(drafting date)	Notification of the fact that the Written Request
for Correction has been filed	
June 18, 2019	Written Opinion (submitted by Opponent)
July 4, 2019(drafting date)	Notification of Reason(s) for Refusal of the
Correction	
August 8, 2019	Written Opinion and Written Amendment
(submitted by Patentee)	

No. 2 Legitimacy of the Correction

1. Contents of the Correction

The request for Correction dated November 30, 2018 has been deemed to be withdrawn under the provisions of Article 120-5(7) of the Patent Act.

The object of the demand of the Correction according the written request for correction dated May 21, 2019 (hereinafter referred to as "the correction of the case") is that "the Description and the Scope of Claims of Patent No. 6262585 are requested to be corrected, as for a group of claims according to Claims 1 to 4 after the correction, according to the corrected Description and the corrected Scope of Claims attached to the written request." The details of the Correction are the following corrections A to D (corrected portions are underlined).

(1) Correction A

"The hot melt adhesive according to Claim 1, wherein a polypropylene is contained in an amount of 25 to 400 parts by weight with respect to 100 parts by weight of an ethylene- α -olefin copolymer" in Claim 3 before the correction is corrected to "<u>A hot melt adhesive containing an ethylene- α -olefin copolymer in which α -olefin has 6 to 8 carbon atoms and a polypropylene having a softening point of 80 to 100°C, the hot melt adhesive comprising 50 to 120 parts by weight of a petroleum resin having a softening point of 110 to 130°C and 25 to 75 parts by weight of a Fischer-Tropsch wax with respect to a total of 100 parts by weight of the ethylene- α -olefin copolymer and the polypropylene, the hot melt adhesive comprising an amount of 25 to 400 parts by weight of the ethylene- α -olefin copolymer and the polypropylene with respect to 100 parts by weight of the ethylene- α -olefin copolymer and the polypropylene with respect to 100 parts by weight of the ethylene- α -olefin copolymer and the polypropylene with respect to 100 parts by weight of the ethylene- α -olefin copolymer and the polypropylene with respect to 100 parts by weight of the ethylene- α -olefin copolymer and the polypropylene with respect to 100 parts by weight of the ethylene- α -olefin copolymer and the polypropylene with respect to 100 parts by weight of the ethylene- α -olefin copolymer and the polypropylene with respect to 100 parts by weight of the ethylene- α -olefin the ethylene- α -olefin copolymer and the polypropylene with respect to 100 parts by weight of the ethylene- α -olefin the eth</u>

copolymer" in Claim 3 after the correction. (Claim 4, which directly depends from Claim 3, is also corrected.)

(2) Correction BClaim 1 of the Scope of Claims is deleted.

(3) Correction CClaim 2 of the Scope of Claims is deleted.

(4) Correction D

"The hot melt adhesive of the invention contains an ethylene- α -olefin copolymer, a polypropylene having a softening point of 80 to 100°C, a tackifier having a softening point of 110 to 150°C, and a wax." in paragraph 0007 of the Description is corrected to "The hot melt adhesive of the present invention contains an ethylene- α -olefin copolymer in which α -olefin has 6 to 8 carbon atoms and a polypropylene having a softening point of 80 to 100°C, the hot melt adhesive containing 50 to 120 parts by weight of a petroleum resin having a softening point of 110 to 130°C and 25 to 75 parts by weight of a Fischer-Tropsch wax with respect to a total of 100 parts by weight of the ethylene- α -olefin copolymer and the polypropylene, and the polypropylene is contained in an amount of 25 to 400 parts by weight with respect to 100 parts by weight of the ethylene- α -olefin copolymer" after the correction.

As for the corrected Scope of Claims attached to the written request for correction, "the hot melt adhesive of any one of Claims 1 to 3" stated in Claim 4 before the correction changes to "the hot melt adhesive of Claim 3" after the correction. That is not included in the above Corrections 1 to 4. However, in spite of an inquiry about the deficiency, no appropriate amendment has been made in the written amendment dated August 8, 2019.

2. Regarding the amendment according to the written amendment dated August 8, 2019(1) Details of the amendment

The amendment according to the written amendment dated August 8, 2019 (hereinafter, referred as "the altering amendment") includes the amendment of replacing "A hot melt adhesive containing an ethylene- α -olefin copolymer in which α -olefin has 6 to 8 carbon atoms and a polypropylene having a softening point of 80 to 100°C, the hot melt adhesive comprising 50 to 120 parts by weight of a petroleum resin having a

softening point of 110 to 130°C and 25 to 75 parts by weight of a Fischer-Tropsch wax with respect to a total of 100 parts by weight of the ethylene- α -olefin copolymer and the polypropylene, the hot melt adhesive comprising an amount of 25 to 400 parts by weight of the polypropylene with respect to 100 parts by weight of the ethylene- α -olefin copolymer." in Claim 3 of the corrected scope of claims for patent with

"A hot melt adhesive containing an ethylene- α -olefin copolymer in which α -olefin has 6 <u>or</u> 8 carbon atoms and a polypropylene having a softening point of 80 to 100°C, the hot melt adhesive comprising 50 to 120 parts by weight of a <u>tackifier</u> having a softening point of 110 to 130°C and 25 to 75 parts by weight of a Fischer-Tropsch wax with respect to a total of 100 parts by weight of the ethylene- α -olefin copolymer and the polypropylene, the hot melt adhesive comprising an amount of 25 to 400 parts by weight of the polypropylene with respect to 100 parts by weight of the ethylene- α -olefin copolymer, wherein the tackifier is a hydrogenated petroleum resin product." (the amended portion is underlined).

(2) Whether the "altering amendment" is approved of or not

The provision of Article 131-2(1) of the Patent Act as applied mutatis mutandis under Article 120-5(ix) of the Patent Act stipulates that "an amendment of the written request shall not change the gist thereof." Changing the gist means losing the sameness of the correction requested or changing the scope thereof by changing the object of the demand (the matters of correction). Since the corrected Scope of Claims attached to the Written Correction Request is an essential part of the object of the demand, amending the Scope of Claims shall be treated as changing the object of the demand.

The altering amendment of the Correction includes a change of the "petroleum resin" recited in Claim 3 of the corrected Scope of Claims before the amendment into the "tackifier" of the "hydrogenated petroleum resin product" after the amendment. In other words, the amendment alters substantially the scope of matters for correction requested before the amendment since the "hydrogenated petroleum resin product" in the amendment differs from the "petroleum resin" before the amendment in that they have a different structure in terms of hydrogenation.

Therefore, taking into consideration the above stipulation, since the amendment includes amendment that alters the "object of the demand" of the correction of the case, the amendment violates the provision of Article 131-2(1) of the Patent Act as applied mutatis mutandis under Article 120-5(ix) of the Patent Act and thus cannot be permitted.

3. Legitimacy of the correction of the case

(1) Regarding Correction A

A. Purpose of Correction

Correction A includes, in Claim 3, which depends from Claim 1 only before the correction, a correction of changing the matter specifying the invention, "50 to 120 parts by weight of a tackifier having a softening point of 110 to 130°C." before the correction into the matter specifying the invention, "50 to 120 parts by weight of a petroleum resin having a softening point of 110 to 130°C." after the correction.

Specifically, Correction A can be said to include a correction that changes "tackifier" specified by a "property of a substance" before the correction into the "petroleum resin" not specified by "property of a substance" after the correction.

It cannot be immediately understood that all "petroleum resins" have a "tackifying" property as a "property of a substance" in view of the description in Reference Material 2 (Encyclopedia Dictionary of Chemistry 5) attached to the written opinion dated June 18, 2019 by the Opponent, which states in the item "petroleum resin" on page 319 that petroleum resins are "resins directly prepared from petroleum-based unsaturated hydrocarbons as starting materials" and are "used as color-developing agents such as aluminum paints, softening agents for rubbers, printing inks, waterproofing materials for clothes and concrete, and adhesives."

In view of the above, the correction that changes the "tackifier" in Claim 3, which depends from Claim 1 only before the correction, into the "petroleum resin" in Claim 3 after the correction cannot be recognized as one restricting the scope of Claim 3 after the correction, in that the correction "remove" a property of a substance as a tackifier. It cannot be recognized that the purpose of Correction A is "the restriction of the Scope of Claims" stipulated in Article 120-5(2) (i) of the Patent Act.

In addition, it cannot be recognized that the purpose of Correction A is "the correction of errors or incorrect translations" stipulated in Article 120-5(2)(ii), "the clarification of an ambiguous statement" stipulated in Article 120-5(2)(iii), or "the correction of a statement of claims which cites another statement of claims to a statement which does not cite that other statement of claims" stipulated in Article 120-5(2)(iii), or "the correction of a statement of claims which cites another statement of claims to a statement which does not cite that other statement of claims" stipulated in Article 120-5(2)(iv).

In addition, Correction A includes a correction that changes the matter specifying the invention, "the polypropylene is contained in an amount of 25 to 400 parts by weight," in Claim 3 before the correction to the matter specifying the invention, "comprising ... a polypropylene having a softening point of 80 to 100°C ... the

polypropylene is contained in an amount of 25 to 400 parts by weight," in Claim 3 after the correction.

Specifically, Correction A defines the amount of polypropylene including "a polypropylene having a softening point of less than 80 and higher than 100°C" in Claim 3 before the Correction as being "contained in an amount of 25 to 400 parts by weight." However, in Claim 3 after the correction, the amount of polypropylene including "a polypropylene having a softening point of 80 to 100°C" but not including "a polypropylene having a softening point of less than 80 and higher than 100°C" is defined to be "contained in an amount of 25 to 400 parts by weight." Therefore, Correction A can be said to include a correction for "enlargement" of the amount of polypropylene including a "polypropylene having a softening point to be of a broader scope of than one being "contained in an amount of 25 to 400 parts by weight."

In view of the above, it cannot be recognized that the purpose of Correction A is "the restriction of the Scope of Claims" stipulated in Article 120-5(2) (i) of the Patent Act since it includes that enlargement as described above.

Furthermore, the notification of reasons for revocation dated March 19, 2019 on page 42 indicates as follows:

"For example, since it is not configured that 'the hot melt adhesive of the present invention contains only a polypropylene having a softening point of 80 to 100°C as polypropylene,' even if the descriptions in the whole Description including the described details in paragraphs 0014 to 0017 of the Description of the Patent are combined, it cannot be understood that 'polypropylene' recited in Claim 3 of the Patent and paragraph 0017 of the Description of the Patent uniquely means 'a polypropylene having a softening point of 80 to 100°C." Then, the correction including the above "enlargement" has obscured the range of propylene including "a polypropylene having a softening point of higher than 80 and less than 100°C." Thus, it cannot be recognized that the purpose of Correction A including such a correction is "the clarification of an ambiguous statement" stipulated in Article 120-5(2) (iii) of the Patent Act.

Furthermore, it cannot be recognized that the purpose of Correction A including such a correction is "the correction of errors or incorrect translations" stipulated in Article 120-5(2) (ii) of the Patent Act or "the correction of a statement of claims which cites another statement of claims to the statement which does not cite that other statement of claims" stipulated in Article 120-5(2) (iv) of the Patent Act.

Therefore, Correction A does not fall under the purpose of any of the matters

listed in Article 120-5, Paragraph 2 of the Patent Act.

B. Whether or not there is an existence or an absence of enlargement or alteration of the Scope of Claims

As stated in the above A, Correction A is to "alter" and/or "enlarge" Claim 3 before the correction and thus the correction substantially enlarges or alters the Scope of Claims.

Therefore, it can be said that Correction A substantially enlarges or alters the Scope of Claims, and thus it cannot be said that Correction A complies with the provision of Article 126(6) of the Patent Act as applied mutatis mutandis under Article 120-5(ix) of the Patent Act.

C. Whether or not the correction remains within the matters described in the patent Description and other materials

In the written opinion dated November 27, 2017 (Exhibit A13), the Patentee explained as follows: "The amendment is defining Claim 1 with '50 to 120 parts by weight of a tackifier having a softening point of 110 to 130°C ... with respect to a total of 100 parts by weight of the ethylene- α -olefin copolymer and the polypropylene.' The upper limit of the softening point of the tackifier (130°C) is described as 'tackifier B (softening point Sp: 130°C)' in paragraph [0045] of the Description and the content of the tackifier is described in paragraph [0025] of the Description. The above amendment is made based on these descriptions."

However, in paragraph 0045 of the Description of the Patent, there is described "Tackifier B (softening point Sp: 130°C, hydrogenated petroleum resin product, product name 'Easttack H130W' manufactured by Eastman Chemical Company"), and "Petroleum resin" and the "hydrogenated petroleum resin" are not recognized as the same type in the technical field of tackifiers. Even considering the state of the art at the time of filing of the Patent, there are no grounds for saying that the introduced definition of "petroleum resin having a softening point of 130°C" would be obvious to those skilled in the art.

For this reason, even if the Description and the Scope of Claims attached to the application are combined, it cannot be recognized that the matter, "50 to 120 parts by weight of a petroleum resin having a softening point of 110 to 130°C," introduced in Claim 3 after the correction can be derived.

Furthermore, in the written correction request dated May 21, 2019, page 5, lines

6 to 11, the Patentee asserts that Correction A is made within the scope of the matters described in the Description, the Scope of Claims, or the Drawings attached to the application since as for Fischer-Tropsch wax there is a sentence "Of these, Fischer-Tropsch wax and paraffin wax are preferable, and Fischer-Tropsch wax is more preferable" in paragraph [0027] of the description originally attached to the application, However, it cannot be said that the Japanese spelling " $7 \neq 2 \pi$ -" in Claim 3 after the correction can be derived based on the Japanese spelling " $7 \neq 2 \pi$ -" mentioned in paragraph 0027 of the Description of the Patent (or the Description originally attached to the application in the case of correction for the purpose of correcting errors or incorrect translations).

Thus, it cannot be recognized that the matter "Fischer-Tropsch wax (7 + 2 +)" introduced in Claim 3 after the correction can be derived even if the Description and the Scope of Claims attached to the application are taken into consideration.

Therefore, Correction A is not made within the range of matters described in the Description, the Scope of Claims, or drawings attached to the application and does not fall under the provision of Article 126(5) of the Patent Act as applied mutatis mutandis under Article 120-5(ix) of the Patent Act.

(2) Regarding Correction D

Correction D includes a correction of introducing the matter, "50 to 120 parts by weight of a petroleum resin having a softening point of 110 to 130°C" into the description of paragraph 0007 in the Description of the Patent. However, for the same reason as that shown in the above (1) C, even if the descriptions in the Description and the Scope of Claims attached to the application are combined, it cannot be recognized that the matter, "50 to 120 parts by weight of a petroleum resin having a softening point of 110 to 130°C," introduced in paragraph 0007 after the correction can be derived.

Therefore, Correction D is not made within the range of matters described in the Description, the Scope of Claims, or drawings attached to the application and does not fall under the provision of Article 131-2(1) of the Patent Act as applied mutatis mutandis under Article 120-5(ix) of the Patent Act.

(3) A group of claims

Regarding Claims 1 to 4 before the Correction According to Correction A, Claims 2 to 4 all cite Claim 1 directly or indirectly. Thus, the corrected Claims 1 to 4 corresponding to the Claims 1 to 4 before the Correction constitute a group of claims stipulated in Article 120-5(4) of the Patent Act.

Therefore, the correction of the case with Correction A is made for the group of claims stipulated in Article 120-5(4) of the Patent Act.

Furthermore, claims involved in the correction of the Description with Correction D are Claims 1 to 4 before the correction. Thus, the group of claims relating to Correction D are subjected to the Correction Request.

Therefore, the correction of the case with Correction D complies with Article 126(4) of the Patent Act as applied mutatis mutandis pursuant to the provisions of Article 120-5(9) of the Patent Act.

3. Summary

Correction A is not done for the purposes stipulated in Article 120-5(2) of the Patent Act. Also, Correction A does not fall under the provision of Article 126(6) of the Patent Act as applied mutatis mutandis by replacing certain terms pursuant to Article 120-5(9) of the Patent Act. Furthermore, Correction A and D do not fall under the provision of Article 126(5) of the Patent Act as applied mutatis mutandis by replacing certain terms pursuant to Article 120-5(9) of the Patent to Article 120-5(9) of the Patent Act. Therefore, the provision of Article 126(5) of the Patent Act as applied mutatis mutandis by replacing certain terms pursuant to Article 120-5(9) of the Patent Act. Therefore, the all corrections relating to a group of claims according to Claims 1 to 4 cannot be approved.

No. 3 The Invention

As stated above, the correction of the case cannot be approved. Then, the inventions according to claims 1 to 4 of Patent No. 6262585 (hereinafter, also referred to as "Invention 1" to "Invention 4") are specified by the matters recited in Claims 1 to 4 of the Scope of Claims as follows:

"[Claim 1] A hot melt adhesive comprising ethylene- α -olefin copolymer and a polypropylene having a softening point of 80 to 100°C, and also comprising 50 to 120 parts by weight of a tackifier having a softening point of 110 to 130°C and 25 to 75 parts by weight of a wax with respect to a total of 100 parts by weight of the ethylene- α -olefin copolymer and the polypropylene.

[Claim 2] The hot melt adhesive according to Claim 1, wherein an ethylene- α -olefin copolymer comprises an ethylene-1-octene copolymer.

[Claim 3] The hot melt adhesive according to Claim 1, wherein a polypropylene is contained in an amount of 25 to 400 parts by weight with respect to 100 parts by weight of an ethylene- α -olefin copolymer.

[Claim 4] A paper-made packaging material formed by using the hot melt adhesive according to any one of Claims 1 to 3."

No. 4 Outline of the Notification of Reasons for Revocation

The outline of the reasons for revocation notified by the Notification of Reasons for Revocation (advance notice of decision) dated March 19, 2019 provides the following reasons:

Reason 1 (prior art effect): Inventions 1 to 4 are identical to the inventions disclosed in the Description originally attached to the internal application for Evidence A No. 1. The priority date of the internal application for Evidence A No. 1 is before the priority date of the Invention and has been effected after the present invention. Moreover, the inventors of the present application are not the same as a person who made an invention described in Evidence A No. 1, and at the time of this application, the applicant is not the same as the applicant of Evidence A No. 1. Therefore, the appellant should not be granted a patent for the invention under the provisions of Articles 29-2 of the Patent Act. Thus, a patent shall not be granted for the invention under the provisions of Articles 29-2 of the Patent Act.

Reason 2 (inventive step): Inventions 1 to 4 could be easily invented by those skilled in the art based on the invention disclosed in Evidence A2 or based on the invention disclosed in Evidence A2 and the descriptions in Evidence A3. Thus, a patent shall not be granted for the invention under the provisions of Article 29(2) of the Patent Act. Therefore, the patent for Inventions 1 to 4 shall be revoked.

Reason 3 (requirements for support): The Scope of Claims of the patent for Inventions 1 to 4 has inaccuracies in the matters noted below and the patent was granted on a patent application that does not comply with the requirements stipulated in Article 36(6)(i) of the Patent Act. Therefore, the patent for Inventions 1 to 4 shall be revoked.

Notes

- A Regarding "wax"
- B Regarding "tackifier"
- C Regarding "ethylene- α -octene copolymer"
- D Regarding "the content of propylene"

Reason 4 (requirements for clarity): The Scope of Claims of the patent for Inventions 1

to 4 has inaccuracies in the matter noted below and the patent was granted on a patent application that does not comply with the requirements stipulated in Article 36(6)(ii) of the Patent Act.

Note

E Regarding "the softening point of polypropylene"

Reason 5 (prior application): Inventions 1 to 4 are identical to the inventions disclosed in the Description or drawings originally attached to the patent application "X" mentioned below, which was filed before the filing date of the application for Inventions 1 to 4 and, after filling the application, internationally published under Article 21 of the Patent Cooperation Treaty enacted in Washington on June 19, 1970. Moreover, the inventors of this application are not the same as the inventors of the above inventions in the patent application before the filing, and at the time of this application, the applicant is not the same as the applicant of the above patent application. Therefore, the appellant should not be granted a patent for the invention under the provisions of Articles 29-2 of the Patent Act (see Articles 41(3) and 184-15(2) of the Patent Act).

X: Patent Application No. 2013-33908 (International Publication No. WO 2014/077258)

Therefore, the patent for Inventions 1 to 4 was granted in violation of the provisions of Article 29-2 of the Patent Act and should be invalidated under the provisions of Article 113(1)(ii) of the Patent Act.

No. 5 Judgment by the body

1. Regarding Reasons 1 and 5

(1) Matters described in the originally attached description of an international patent application relating to Evidence A No. 1 (International Publication No. WO 2014/077258)

"[Claim 1] A propylene-based polymer satisfying the following (a1) to (d1):

(a1) [mmmm] = 60 to 80 mol%;

(b1) weight-average molecular weight (Mw) = 10,000 to 55,000;

(c1) Mw/Mn \leq 2.5; and

(d1) [rmrm] < 2.5 mol%.

[Claim 2] The propylene-based polymer according to Claim 1, wherein the following (b1') is satisfied:

(b1') weight average molecular weight (Mw) = 10,000 to 51,000

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[Claim 3] A hot melt adhesive, comprising the propylene-based polymer (B1) according to Claim 1 in an amount of 1 to 30 parts by mass with respect to 100 parts by mass of an ethylene-based polymer (A).

[Claim 4] A hot melt adhesive, comprising a propylene-based polymer (B2) which satisfies the following (a2) and (b2) in an amount of 1 to 30 parts by mass with respect to 100 parts by mass of an ethylene-based polymer (A):

(a2) [mmmm] = 20 to 80 mol%; and

(B2) weight average molecular weight (Mw) = 1,000 to 150,000.

[Claim 5] The hot melt adhesive according to Claim 3 or 4, wherein the ethylene-based polymer (A) is an ethylene- α -olefin copolymer.

[Claim 6] The hot melt adhesive according to any one of Claims 3 to 5, wherein the ethylene-based polymer (A) is an ethylene-1-octene copolymer.

[Claim 7] The hot melt adhesive according to any one of Claims 3 to 6, wherein the ethylene-based polymer (A) is an ethylene-1-octene copolymer containing 63 to 65% by mass of a structural unit derived from ethylene and 35 to 37% by mass of a structural unit derived from 1-octene.

[Claim 8] The hot melt adhesive according to any one of Claims 3 to 7, further comprising a tackifier resin (C) in an amount of 50 to 200 parts by mass and a wax (D) in an amount of 50 to 200 parts by mass with respect to 100 parts by mass of the ethylene-based polymer (A).

[Claim 9] A method for bonding a base material to another base material, comprising a step of melting the hot melt adhesive according to any one of Claims 3 to 8, and coating the adhesive onto at least one base material, and a step of bonding the other base material to the coated hot melt adhesive."

"[0018] (e1) Melting point (Tm-D)

The melting point (Tm-D) of the propylene-based polymer of the present invention is preferably 0 to 140°C, more preferably 20 to 120°C, furthermore preferably 90 to 120°C from the viewpoint of improvement of open time and also improvement of heat creep resistance."

"[0057] (Ethylene-based polymer (A))

The ethylene-based polymer (A) to be used in the present invention is a base polymer of the hot melt adhesive of the present invention, and specific examples thereof include polyethylene, and copolymers of ethylene and an olefin having 3 to 10 carbon atoms. From the viewpoint of adhesiveness, the ethylene-based polymer (A) is preferably an

ethylene- α -olefin copolymer. Specific examples of the α -olefin include propylene, 1butene, 1-pentene, 4-methyl-1-pentene, 1-hexene, 1-octene, 1-decene, 1-dodecene, 1tetradecene, 1-hexadecene, 1-octadecene, and 1-eicosene. In the present invention, among these, one type or two or more types can be used. Among these α -olefins, 1octene is preferred. From the viewpoint of adhesiveness, the ethylene-based polymer (A) to be used in the present invention is more preferably an ethylene-1-octene copolymer, furthermore preferably an ethylene-1-octene copolymer containing 63 to 65% by mass of a structural unit derived from ethylene and 35 to 37% by mass of a structural unit derived from 1-octene."

"[0059] Examples of commercially available products of the ethylene-based polymer (A) to be used in the present invention include Exact series (manufactured by Exxon Mobil Corporation) and Affinity Polymer series (manufactured by The Dow Chemical Company), and more preferred examples thereof include Affinity GA1950 (manufactured by The Dow Chemical Company) (all are trade names).

[0060] (Tackifier resin (C))

The hot melt adhesive of the present invention may contain a tackifier resin (C).

Examples of the tackifier resin (C) include materials which are composed of a rosin derivative resin, a polyterpene resin, a petroleum resin, an oil-soluble phenolic resin, or the like and are in the form of a solid, a semi-solid, or a liquid at normal temperature. Among these materials, one type may be used alone, or two or more types may be used in combination. In the present invention, in consideration of compatibility with the base polymer, use of a hydrogenated material is preferred. In particular, a hydrogenated petroleum resin material having excellent heat stability is more preferred. Examples of commercially available products of the tackifier resin (C) include I-MARV P-125, I-MARV P-100, and I-MARV P-90 (all manufactured by Idemitsu Kosan Co., Ltd.), Yumex 1001 (manufactured by Sanyo Chemical Industries, Ltd.), Hi-Rez T 1115 (manufactured by Mitsui Chemicals, Incorporated), Clearon K 100 (manufactured by Yasuhara Chemical Co., Ltd.), ECR 227 and Escorez 2101 (both manufactured by Tonex Co., Ltd.), Arkon P-100 (manufactured by Arakawa Chemical Industries, Ltd.), Regalrez 1078 (manufactured by Hercules, Inc.), and Eastotac H-130R (manufactured by Eastman Chemical Company) (all are trade names).

From the viewpoint of improvement of adhesiveness and also improvement of wettability to an adherend due to a decrease in the viscosity, the content of the tackifier resin (C) in the hot melt adhesive of the present invention is preferably 50 to 200 parts by mass, more preferably 70 to 150 parts by mass, further more preferably 80 to 120

parts by mass with respect to 100 parts by mass of the ethylene-based polymer (A). [0061] (Wax (D))

The hot melt adhesive of the present invention may contain a wax (D).

Examples of the wax (D) include animal waxes, vegetable waxes, carnauba waxes, candelilla waxes, Japan waxes, beeswaxes, mineral waxes, petroleum waxes, paraffin waxes, microcrystalline waxes, petrolatum, polyethylene waxes, polyethylene oxide waxes, polypropylene waxes, polypropylene oxide waxes, higher fatty acid waxes, higher fatty acid ester waxes, and Fischer-Tropsch waxes.

From the viewpoint of improvement of flexibility and also improvement of wettability due to a decrease in viscosity, the content of the wax (D) in the hot melt adhesive of the present invention is preferably 50 to 200 parts by mass, more preferably 60 to 150 parts by mass, further more preferably 70 to 120 parts by mass with respect to 100 parts by mass of the ethylene-based polymer (A). The viscosity of the hot melt adhesive decreases with the increase in the addition amount of the wax."

"[0063] [Hot melt adhesive of the second embodiment of the Invention]

The hot melt adhesive of the second embodiment of the present invention contains an ethylene-based polymer (A) and the propylene-based polymer (B2) which satisfies the following (a2) and (b2):

(a2) [mmmm] = 20 to 80 mol%; and

(b2) weight average molecular weight (Mw) = 1,000 to 150,000.

The hot melt adhesive of the second embodiment of the present invention contains the propylene-based polymer (B2) of the present invention described above in an amount of 1 to 30 parts by mass, preferably 5 to 25 parts by mass, more preferably 10 to 20 parts by mass with respect to 100 parts by mass of the ethylene-based polymer (A), from the viewpoint of balance between favorable heat creep resistance and moderate open time. By blending the propylene-based polymer (B2) of the present invention as a modifier in the ethylene-based polymer (A) serving as a base polymer, the hot melt adhesive of the second embodiment of the present invention has an excellent balance between favorable heat creep resistance and moderate open time.

[0064] The ethylene-based polymer (A), the tackifier resin (C), the wax (D), and a variety of additives in the hot melt adhesive of the second embodiment of the present invention are the same as those described in relation to the hot melt adhesive of the first embodiment of the present invention.

[0065] (Propylene-based polymer (B2))

The propylene-based polymer (B2) to be used in the hot melt adhesive of the second

embodiment of the present invention satisfies the following (a2) and (b2), and preferably further satisfies the following (c2) to (e2):

(a2) [mmmm] = 20 to 80 mol%;

(b2) Weight average molecular weight (Mw) = 1,000 to 150,000;

(c2) Mw/Mn ≤ 2.5 ;

(d2) $[rmrm] \ge 2.5 \text{ mol}\%$; and

(e2) melting point (Tm-D) = 0 to 140° C"

"[0073] Examples of commercially available propylene-based polymer (B2) include L-MODU S400 (manufactured by Idemitsu Kosan Co., Ltd.)."

"[0084] Production Example 3

(Production of polypropylene 3)

To a stainless steel reactor having an internal volume of 68 m³ and equipped with a stirrer, n-heptane at 5.2 m³/h, triisobutylaluminum at 0.6 mol/h, and further a catalyst component obtained by previously bringing dimethylanilinium tetrakis(pentafluorophenyl)-borate, the complex B, triisobutylaluminum, and propylene into contact with one another at 0.7 mmol/h in terms of zirconium were continuously supplied.

Then, propylene and hydrogen were continuously supplied thereto so that a hydrogen concentration in the gas phase was kept at 5.0 mol% and the total pressure in the reactor was kept at 1.7 MPa·G at a polymerization temperature of 85°C.

To the thus obtained polymerization solution, Irganox 1010 (trade name, manufactured by BASF Co., Ltd.) was added so that the content thereof in the polymerization solution was 1,000 ppm, and then the solvent was removed, whereby a propylene homopolymer (polypropylene 3) was obtained."

"[0094] [Table 1-1]

	製造例1	製造例2	製造例3	製造例4	製造例5	製造例6
	ホリプロピレン1	木 リプロビレン2	*'97'0t'223	オリプロピレン4	キリプロビレン5	\$'J7'FL'L'26
[mmmm] (モル%)	62	62	47	70	70	70
[rmrm] (モル%)	1.5	1.4	3.0	0.9	0.9	1.0
種最粘度n (dl/g)	0.32	0.41	0.44	0.30	0.20	0.45
重量平均分子量Mw	36,000	51,000	51,000	32,000	14,000	51,000
分子量分布Mw/Mn	1.9	2.0	2.0	23	1.9	2.4
融点Tm-D(℃)	103	103	75	117	117	117

表 1 (a) Table 1(a) 製造例 Production example ポリプロピレン Polypropylene モル mole 極限粘度 Limiting viscosity 重量平均分子量 Weight average molecular weight 分子量分布 Molecular weight distribution 融点 Melting point

"

"[0096] Starting materials used in the production of the following hot melt adhesives are shown.

<Ethylene-based polymer (A) (base polymer)>

An ethylene-1-octene copolymer (trade name: Affinity GA1950, manufactured by The Dow Chemical Company, weight-average molecular weight: 38,000, 1-octene content: 35 to 37% by weight, melt flow rate: 500 g/10 min)

<Propylene-Based Polymer (B)>

(B-X) An ethylene-propylene copolymer (trade name: Licocene PP 2602, manufactured by Clariant Corporation, ethylene: propylene = 15 mol%: 85 mol%)

(B-Y) A polypropylene (trade name: VISCOL 660-P, manufactured by Sanyo Chemical Industries, Ltd.)

(B-Z) An ethylene-propylene-butene copolymer (trade name: VESTOPLAST 708, manufactured by Evonik Industries, weight-average molecular weight (Mw): 75,000, molecular weight distribution (Mw/Mn): 6.5)

<Tackifier Resin (C)>

(C-1) A hydrogenated derivative of an aliphatic hydrocarbon petroleum resin (trade name: Eastotac H-130R, manufactured by Eastman Chemical Company, softening point: 130°C)

(C-2) a hydrogenated petroleum resin (trade name: I-MARV P-125, manufactured by Idemitsu Kosan Co., Ltd., softening point: 125°C)

<Wax (D)>

(D-1) A Fischer-Tropsch wax (trade name: Paraflint H1, manufactured by Sasol Wax GmbH)

(D-2) A polypropylene wax (trade name: VISCOL 660-P, manufactured by Sanyo Chemical Industries, Ltd.)

[0097] Comparative Examples 1 to 4, Examples 1 to 14, and Reference Examples 1 to 5

(Production of hot melt adhesive for packaging)

The materials shown in Tables 2 and 3 were put into SUS cans at the blending ratios shown in Tables 2 and 3 and melted by heating to 180°C for 30 minutes, followed by mixing and stirring with a stirring blade for 15 minutes, whereby hot melt adhesives were produced. With respect to the thus obtained hot melt adhesives, the following evaluation was carried out."

"[0105] [Table 2-1]

			比較例	比較例	比較例	比較例	939	参考例	参考例	多 考例	***
	(A)	エチレン系共重合体 *1	35	40	35	35	35	35	35	35	30
		ポリプロピレン1	-	-	-	-	-	-	-	-	-
		ポリプロピレン2	-	-	-	-	-	-	-	-	-
0		ポリプロピレン3	-	-	-	-	5	10	5	5	5
2	6	ポリプロビレン4	-	-	-		-			-	-
B	1.87	ポリプロピレン5	-	-	-	-	-	-	-	-	-
ŝ		ポリプロピレン6	-	-	-	-	-	-	-	-	-
*		プロピレン系共重合体(B-X) +2	-	-	5	-		~	-	-	-
		ポリプロピレン(B-Y) +3	-	-	-	5	-	-	-	-	-
	(C)	粘着付与樹間(C-1) +4	35	30	35	35	35	35	30	35	35
	(D)	ワックス(D-1) +5	30	30	25	25	30	30	30	25	30
*-	-ブ:	ンタイム (500)	12	12	13	5	15	16	14	17	13
t,	ットタ	イム (sec)	8	9	7	10	7	7	8	7	6
tu i	ミク	リーブ 60°C、30% (min)	59	20	29	49	37	15	17	38	65
		オーブンタイム評価	D	D	С	D	A	•	в	A	C
		耐熱クリーブ性評価	D	E	E	ε	E	E	E	E	C
		総合評価	×	×	×	×	Δ	Δ	Δ	Δ.	Δ

44: 脂肪族系炭化水素石油樹脂の水素化調準体(商品名:Eastotac H-130R、イーストマン・ケミカル社園)
 45: フィッシャートロプシュワックス(商品名:Parafint H1、サゾール・ワックス社園)

表 2 一 1 Table 2-1

比較例 Comparative example

参考例 Reference example

組成(質量部) Composition (parts by mass)

エチレン系共重合体 Ethylene-based copolymer

ポリプロピレン Polypropylene

プロピレン系共重合体 Propylene-based copolymer

粘着付与樹脂 Tackifier resin

ワックス Wax

オープンタイム Open time

セットタイム Set time

恒温クリープ Isothermal creep

オープンタイム評価 Open time evaluation

耐熱クリープ性評価 Heat creep resistance evaluation

総合評価 Comprehensive evaluation

エチレン-1-オクテン共重合体(商品名:Affinity GA1950、 ダウ・ケミカル社製) Ethylene-1-octene copolymer (Product name: Affinity GA1950, manufactured by The Dow Chemical Company)

エチレンープロピレン共重合体(商品名:Licocene PP2602、 クラリアント社製) Ethylene-propylene copolymer (trade name: Licocene PP2602, manufactured by Clariant Co., Ltd.)

ポリプロピレン(商品名:ビスコール 660-P、三洋化成工業(株)製)

Polypropylene (trade name: VISCOL 660-P, manufactured by Sanyo Chemical Industries, Ltd.)

脂肪族系炭化水素石油樹脂の水素化誘導体(商品名:Eastotac H -130R、イーストマン・ケミカル社製) Hydrogenated derivative of an aliphatic hydrocarbon petroleum resin (trade name: Eastotac H-130R, manufactured by Eastman Chemical Company)

フィッシャー・トロプシュワックス(商品名: Paraflint H1、サ ゾール・ワックス社製) Fischer-Tropsch wax (trade name: Paraflint H1, manufactured by Sasol Wax GmbH)

[0106] [Table 2-2]

24.1		•	実施例 1	実施例 2	実施例 3	実施例 4	実進例 5	実施例 6	実施例 7	実施例 8	実施例	実施例 10
	(A)	エチレン系共重合体 +1	35	30	35	35	35	35	35	35	35	35
		ポリプロピレン1	5	-	-	10	-	-	-	-	-	-
		ポリプロピレン2	-	5	5	-	-	-	-	-	-	-
0	L .	ポリプロピレン3	-	-	-	-	-	2.5	-	1.25	2.5	3.75
2		ポリプロピレン4	-	-	-	-	5	-	-	-	-	-
E	(B)	ポリプロピレン5	-	-	-	-	-	2.5	-	-	-	-
ĕ		ポリプロビレン6	-	-	-	-	-	-	5	3.75	2.5	1.25
*		プロビレン系共宣合体(B-X) +2	-	-	-	-	-	-	-	-	-	-
		ポリプロピレン(B-Y) +3	-	-	-	-	-	-	-	-	-	-
	(C)	粘着付与樹脂(O-1)+4	35	35	35	35	35	35	35	35	35	35
	(D)	ワックス(D-1) +5	25	30	25	20	25	25	25	25	25	25
オー	ープ	ンタイム (sec)	17	12	16	18	t5	12	15	16	15	15
tr:	ットク	14 (sec)	7	5	7	8	8	5	8	8	8	8
恒	ヨク	リーブ 60°C、30% (min)	83	122	87	128	52	88	59	83	77	65
		オープンタイム評価	A	D	A	A	A	D	A	•	A	
		財魅クリーブ性評価	A	AA	A	AA	D	A	D	A	B	C
		総合評価	0	0	0	0	0	0	0	0	0	0

表2-2 Table 2-2

実施例 Example

Composition (parts by mass) 組成(質量部)

エチレン系共重合体 Ethylene-based copolymer

ポリプロピレン Polypropylene

^{+1:} エテレンー1-オクラン共重合体 (商品名:Affinity GA1950、ダウ・ケヒカル社製) +2: エチレンーブロビレン共宣合体 (商品名:Licocome PP 2002、クラリアント社製) +3: ポリプロビレン (商品名:ビスコール 660-P- 三澤化成工業(税)製) +4: 国防販販児化水石(減損間の水素(に既導体 (支通名:Eartotac H+130R、イーストマン・ケミカル社製) +5: フィッシャートロブシュワックス (商品名:Perefint H1、サゾール・ワックス社製)

プロピレン系共重合体 Propylene-based copolymer

粘着付与樹脂 Tackifier resin

ワックス Wax

オープンタイム Open time

セットタイム Set time

恒温クリープ Isothermal creep

オープンタイム評価 Open time evaluation

耐熱クリープ性評価 Heat creep resistance evaluation

総合評価 Comprehensive evaluation

エチレンー1ーオクテン共重合体(商品名: A f f i n i t y GA1950、 ダウ・ケミカル社製) Ethylene-1-octene copolymer (Product name: Affinity GA1950, manufactured by The Dow Chemical Company)

エチレンープロピレン共重合体(商品名:Licocene PP2602、 クラリアント社製) Ethylene-propylene copolymer (trade name: Licocene PP2602, manufactured by Clariant Co., Ltd.)

ポリプロピレン(商品名:ビスコール 660-P、三洋化成工業(株)製)

Polypropylene (trade name: VISCOL 660-P, manufactured by Sanyo Chemical Industries, Ltd.)

脂肪族系炭化水素石油樹脂の水素化誘導体(商品名: Eastotac H-130R、イーストマン・ケミカル社製) Hydrogenated derivative of an aliphatic hydrocarbon petroleum resin (trade name: Eastotac H-130R, manufactured by Eastman Chemical Company)

フィッシャー・トロプシュワックス(商品名: Paraflint H1、サ ゾール・ワックス社製) Fischer-Tropsch wax (trade name: Paraflint H1, manufactured by Sasol Wax GmbH)

"

"[0114] The propylene-based polymer of the present invention can be favorably used in the field of hot melt adhesives. Further, the hot melt adhesive of the present invention can be favorably used as an adhesive for packaging such as corrugated cardboards, and as an adhesive for sanitary articles, woodwork, bookbinding, fibers, electrical materials, canning, building, bag making, and the like."

(2) Matters described in the Description originally attached to the application X (Patent Application No. 2013-33908)

Description X1: Claims 1 to 9

A propylene-based polymer satisfying the following (a1) to (d1):

(a1) [mmmm] = 60 to 80 mol%;

(b1) weight-average molecular weight (Mw) = 10,000 to 55,000;

(c1) Mw/Mn \leq 2.5; and

(d1) $[rmrm] \le 2.5 \text{ mol}\%$.

[Claim 2] The propylene-based polymer according to Claim 1, wherein the following (b1') is satisfied:

(b1') weight average molecular weight (Mw) = 10,000 to 51,000

[Claim 3] A hot melt adhesive, comprising the propylene-based polymer (B1) according to Claim 1 or 2 in an amount of 1 to 30 parts by mass with respect to 100 parts by mass of an ethylene-based polymer (A).

[Claim 4] A hot melt adhesive, comprising a propylene-based polymer (B2) which satisfies the following (a2) and (b2) in an amount of 1 to 30 parts by mass with respect to 100 parts by mass of an ethylene-based polymer (A):

(a2) [mmmm] = 20 to 80 mol%; and

(B2) weight average molecular weight (Mw) = 1,000 to 150,000.

[Claim 5] The hot melt adhesive according to Claim 3 or 4, wherein the ethylene-based polymer (A) is an ethylene- α -olefin copolymer.

[Claim 6] The hot melt adhesive according to any one of Claims 3 to 5, wherein the ethylene-based polymer (A) is an ethylene-1-octene copolymer.

[Claim 7] The hot melt adhesive according to any one of Claims 3 to 6, wherein the ethylene-based polymer (A) is an ethylene-1-octene copolymer containing 63 to 65% by mass of a structural unit derived from ethylene and 35 to 37% by mass of a structural unit derived from 1-octene.

[Claim 8] The hot melt adhesive according to any one of Claims 3 to 7, further comprising a tackifier resin (C) in an amount of 50 to 200 parts by mass and a wax (D) in an amount of 50 to 200 parts by mass with respect to 100 parts by mass of the ethylene-based polymer (A).

[Claim 9] A method for bonding a base material to another base material, comprising a step of melting the hot melt adhesive according to any one of Claim 3 to 8 and coating the adhesive onto at least one base material, and a step of bonding the other base material to the coated hot melt adhesive."

Description X2: Paragraphs 0018 to 0057 "[0018] (e1) Melting point (Tm-D) The melting point (Tm-D) of the propylene-based polymer of the present invention is preferably 0 to 140°C, more preferably 20 to 120°C, furthermore preferably 40 to 100°C from the viewpoint of improvement of open time and also improvement of heat creep resistance. ...

"[0057] (Ethylene-based polymer (A))

The ethylene-based polymer (A) to be used in the present invention is a base polymer of the hot melt adhesive of the present invention, and specific examples thereof include polyethylene and copolymers of ethylene and an olefin having 3 to 10 carbon atoms. From the viewpoint of adhesiveness, the ethylene-based polymer (A) is preferably an ethylene- α -olefin copolymer. Specific examples of the α -olefin include propylene, 1-butene, 1-pentene, 4-methyl-1-pentene, 1-hexene, 1-octene, 1-decene, 1dodecene, 1-tetradecene, 1-hexadecene, 1-octadecene, and 1-eicosene. In the present invention, among these, one type or two or more types can be used. Among these α olefins, 1-octene is preferred. From the viewpoint of adhesiveness, the ethylene-based polymer (A) to be used in the present invention is more preferably an ethylene-1-octene copolymer, furthermore preferably an ethylene-1-octene copolymer containing 63 to 65% by mass of a structural unit derived from ethylene and 35 to 37% by mass of a structural unit derived from 1-octene."

Description X3: Paragraphs 0059 to 0061

"[0059] Examples of commercially available products of the ethylene-based polymer (A) to be used in the present invention include Exact series (manufactured by Exxon Mobil Corporation) and Affinity Polymer series (manufactured by The Dow Chemical Company), and more preferred examples thereof include Affinity GA1950 (manufactured by The Dow Chemical Company) (all are trade names). [0060] (Tackifier resin (C))

The hot melt adhesive of the present invention may contain a tackifier resin (C).

Examples of the tackifier resin (C) include materials which are composed of a rosin derivative resin, a polyterpene resin, a petroleum resin, an oil-soluble phenolic resin, or the like and are in the form of a solid, a semi-solid, or a liquid at normal temperature. Among these materials, one type may be used alone, or two or more types may be used in combination. In the present invention, in consideration of compatibility with the base polymer, use of a hydrogenated material is preferred. In particular, a hydrogenated petroleum resin material having excellent heat stability is more preferred.

Examples of commercially available products of the tackifier resin (C) include I-

MARV P-125, I-MARV P-100, and I-MARV P-90 (all manufactured by Idemitsu Kosan Co., Ltd.), Yumex 1001 (manufactured by Sanyo Chemical Industries, Ltd.), Hi-Rez T 1115 (manufactured by Mitsui Chemicals, Incorporated), Clearon K 100 (manufactured by Yasuhara Chemical Co., Ltd.), ECR 227 and Escorez 2101 (both manufactured by Tonex Co., Ltd.), Arkon P-100 (manufactured by Arakawa Chemical Industries, Ltd.), Regalrez 1078 (manufactured by Hercules, Inc.), and Eastotac H-130R (manufactured by Eastman Chemical Company) (all are trade names).

From the viewpoint of improvement of adhesiveness and also improvement of wettability to an adherend due to a decrease in viscosity, the content of the tackifier resin (C) in the hot melt adhesive of the present invention is preferably 50 to 200 parts by mass, more preferably 70 to 150 parts by mass, further more preferably 80 to 120 parts by mass with respect to 100 parts by mass of the ethylene-based polymer (A). [0061] (Wax (D))

The hot melt adhesive of the present invention may contain a wax (D).

Examples of the wax (D) include animal waxes, vegetable waxes, carnauba waxes, candelilla waxes, Japan waxes, beeswaxes, mineral waxes, petroleum waxes, paraffin waxes, microcrystalline waxes, petrolatum, polyethylene waxes, polyethylene oxide waxes, polypropylene waxes, polypropylene oxide waxes, higher fatty acid waxes, higher fatty acid ester waxes, and Fischer-Tropsch waxes.

From the viewpoint of improvement of flexibility and also improvement of wettability due to a decrease in viscosity, the content of the wax (D) in the hot melt adhesive of the present invention is preferably 50 to 200 parts by mass, more preferably 60 to 150 parts by mass, further more preferably 70 to 120 parts by mass with respect to 100 parts by mass of the ethylene-based polymer (A). The viscosity of the hot melt adhesive decreases with the increase in the addition amount of the wax."

Description X4: Paragraphs 0063 to 0065

"[0063] [Hot melt adhesive of the second embodiment of the Invention]

The hot melt adhesive of the second embodiment of the present invention contains an ethylene-based polymer (A) and the propylene-based polymer (B2) which satisfies the following (a2) and (b2):

(a2) [mmmm] = 20 to 80 mol%; and

(b2) weight average molecular weight (Mw) = 1,000 to 150,000.

The hot melt adhesive of the second embodiment of the present invention contains the propylene-based polymer (B2) of the present invention described above in an amount of 1 to 30 parts by mass, preferably 5 to 25 parts by mass, more preferably

10 to 20 parts by mass with respect to 100 parts by mass of the ethylene-based polymer (A), from the viewpoint of the balance between favorable heat creep resistance and moderate open time. By blending the propylene-based polymer (B2) of the present invention serving as a modifier in the ethylene-based polymer (A) serving as a base polymer, the hot melt adhesive of the second embodiment of the present invention has an excellent balance between favorable heat creep resistance and moderate open time.

[0064] The ethylene-based polymer (A), the tackifier resin (C), the wax (D), and a variety of additives in the hot melt adhesive of the second embodiment of the present invention are the same as those described with respect to the hot melt adhesive of the first embodiment of the present invention.

[0065] (Propylene-based polymer (B2))

The propylene-based polymer (B2) to be used in the hot melt adhesive of the second embodiment of the present invention satisfies the following (a2) and (b2), and preferably further satisfies the following (c2) to (e2):

(a2) [mmmm] = 20 to 80 mol%;

(b2) Weight average molecular weight (Mw) = 1,000 to 150,000;

(c2) Mw/Mn ≤ 2.5 ;

(d2) $[rmrm] \ge 2.5 \text{ mol}\%$; and

(e2) Melting point (Tm-D) = 0 to 140° C"

Description X5: Paragraph 0073

"[0073] Examples of commercially available products of the propylene-based polymer (B2) include L-MODU 5400 (manufactured by Idemitsu Kosan Co., Ltd.)."

Description X6: Paragraph 0082

"[0082] Production Example 3

(Production of Polypropylene 3)

To a stainless steel reactor having an internal volume of 68 m³ and equipped with a stirrer, there were continuously supplied n-heptane at $5.2 \text{ m}^3/\text{h}$, triisobutylaluminum at 0.6 mol/h, and further a catalyst component obtained by previously bringing dimethylanilinium tetrakis(pentafluorophenyl)-borate, the complex B, triisobutylaluminum, and propylene into contact with one another at 0.7 mmol/h in terms of zirconium.

Then, propylene and hydrogen were continuously supplied thereto so that a hydrogen concentration in the gas phase was kept at 5.0 mol% and the total pressure in the reactor was kept at 1.7 MPa·G at a polymerization temperature of 85°C.

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To the thus obtained polymerization solution, Irganox 1010 (trade name, manufactured by BASF Co., Ltd.) was added so that the content thereof in the polymerization solution was 1,000 ppm, and then the solvent was removed, whereby a propylene homopolymer (polypropylene 3) was obtained."

Description X7: Paragraph 0092 "[0092] [Table 1]

表1

	製造例1	製造例2	製造例3	製造例4	製造例5	製造例6
	ポリプロピ レン1	ポリプロピレン2	ポリプロピレン3	ポリプ ロピレン4	オ゚リプ゚ロピレン5	ポリプロピレンモ
[mmmm] (モル%)	62	62	47	70	70	70
[rmrm] (モル%)	1.5	1.4	3.0	0.9	0.9	1.0
種限粘度 η (di/g)	0.32	0.41	0.44	0.30	0.20	0.45
重量平均分子量Mw	36,000	51,000	51,000	32,000	14,000	51,000
分子量分布Mw/Mn	1.9	2.0	2.0	2.3	1.9	2.4

表1 Table 1

製造例 Production Example ポリプロピレン Polypropylene モル mol 極限粘度 Limiting viscosity 重量平均分子量 Weight-average molecular weight 分子量分布 Molecular weight distribution

"

Description X8: Paragraphs 0093 to 0094

"[0093] Starting materials used in the production of the following hot melt adhesives are shown.

<Ethylene-based polymer (A) (base polymer)>

An ethylene-1-octene copolymer (trade name: Affinity GA1950, manufactured by The Dow Chemical Company, weight-average molecular weight: 38,000, 1-octene content: 35 to 37% by weight, melt flow rate: 500 g/10 min)

<Propylene-based polymer (B)>

An ethylene-propylene copolymer (trade name: Licocene PP 2602, manufactured by Clariant Corporation, ethylene: propylene=15 mol%: 85 mol%)

A polypropylene (trade name: VISCOL 660-P, manufactured by Sanyo Chemical Industries, Ltd.)

<Tackifier resin (C)>

A hydrogenated derivative of an aliphatic hydrocarbon petroleum resin (trade name: Eastotac H-130R, manufactured by Eastman Chemical Company, softening point: 130°C)

<Wax (D)>

Fischer-Tropsch wax (trade name: Paraflint H1, manufactured by Sasol Wax GmbH)

[0094] Comparative Examples 1 to 4, Examples 1 to 8, and Reference Examples 1 to 5 (Production of hot melt adhesive for packaging)

The materials shown in Table 2 were put into SUS cans at the blending ratios shown in Table 2 and melted by heating to 180°C for 30 minutes, followed by mixing and stirring with a stirring blade for 15 minutes, whereby hot melt adhesives were With respect to the thus obtained hot melt adhesives, the following produced. evaluation was carried out."

Description X9: Paragraphs 0101 to 0102

"[0101] [Table 2-1]

主0-1

		·	比較例	比較例	比較例	比較例	参考例	参考例	参考例	参考例	参考例
		Tチレンズサ香合は +1	25	2	3	4	25	2	3	4	5
	(A)		- 35	40	35	35	35	35	35	35	30
		ホリフロビレシ1	-	-	-	-		-	-	-	-
		ポリプロピレン2	-	-	-	-	-		-	-	-
3		ポリプロピレン3	-	-	-	-	5	10	5	5	5
市		ポリプロピレン4	-		-	-	-	-	-	- 1	-
1	(6)	ポリプロピレン5	-	-	~	-	-	-	-	-	-
IR		ポリプロピレン6		_	-		-	_	-	-	-
*		プロピレン系共重合体 *2	-	-	5	-	-	-	-	-	-
		ポリプロピレン *3	-	-	-	5	_	_		-	
	(C)	粘着付与樹脂 *4	35	30	35	35	35	35	30	35	35
	(D)	ワックス *5	30	30	25	25	30	30	30	25	30
オー	ープン	ンタイム (sec)	12	12	13	6	15	16	14	17	13
セ	ハタ	イム (sec)	8	9	7	10	7	7	8	7	6
恒	温クリ	ノープ 60°C、30% (min)	59	20	29	49	37	15	17	38	65
		オープンタイム評価	D	D	c	D	A	A	В	A	С
į.		耐熱クリープ性評価	D	E	E	E	E	E	Е	E	С
		総合評価	×	×	×	×	Δ	Δ	Δ	Δ	Δ

*1: エチレン-1-オクテン共重合体 (商品名:Affinity GA1950、ダウ・ケミカル社製) *2: エチレン-ブロビレン共重合体 (商品名:Licocene PP 2602、クラリアント社製) *3: ポリプロビレン (商品名:ビスコール 660-P、三洋化成工業(株)製) *4: 脂肪族系炭化水素石油樹脂の水素化誘導体 (商品名:Eastotac H-130R、イーストマン・ケミカル社製) *5: フィッシャートロプシュワックス (商品名:Paraflint H1、サゾール・ワックス社製)

表2-1 Table 2-1

比較例 Comparative example

参考例 Reference example

組成(質量部) Composition (parts by mass)

エチレン系共重合体 Ethylene-based copolymer

25 / 57

ポリプロピレン Polypropylene

プロピレン系共重合体 Propylene-based copolymer

粘着付与樹脂 Tackifier resin

ワックス Wax

オープンタイム Open time

セットタイム Set time

恒温クリープ Isothermal creep

オープンタイム評価 Open time evaluation

耐熱クリープ性評価 Heat creep resistance evaluation

総合評価 Comprehensive evaluation

エチレン-1-オクテン共重合体(商品名: A f f i n i t y GA1950、 ダウ・ケミカル社製) Ethylene-1-octene copolymer (Product name: Affinity GA1950, manufactured by The Dow Chemical Company)

エチレンープロピレン共重合体(商品名:Licocene PP2602、 クラリアント社製) Ethylene-propylene copolymer (trade name: Licocene PP2602, manufactured by Clariant Co., Ltd.)

ポリプロピレン(商品名:ビスコール 660-P、三洋化成工業(株)製) 脂肪族系炭化水素石油樹脂の水素化誘導体(商品名:Eastotac H-130R、イーストマン・ケミカル社製) Polypropylene (trade name: VISCOL 660-P, manufactured by Sanyo Chemical Industries, Ltd.)

フィッシャー・トロプシュワックス(商品名: Paraflint H1、サ ゾール・ワックス社製) Hydrogenated derivative of an aliphatic hydrocarbon petroleum resin (trade name: Eastotac H-130R, manufactured by Eastman Chemical Company)

[0102] [Table 2-2]

表2	2-2	2								
			実施例 1	実施例 2	実施例 3	実施例 4	実施例 5	実施例 6	実施例 7	実施例 8
	(A)	エチレン系共重合体 *1	35	30	35	35	35	35	35	35
		ポリプロピレン1	5	-		10	-	-	-	-
		ポリプロピレン2	-	5	5	-	—	-	-	-
\$	ĺ	ポリプロピレン3	-	-	-	-	—	2.5	-	2.5
副		ポリプロピレン4	-	-	-	—	5	-	-	-
質		ポリプロピレン5	-	-	-	-	-	2.5	-	-
成正		ポリプロピレン6		-	-	-	-	-	5	2.5
34		プロピレン系共重合体 *2	-	-	-		-	-	-	-
		ポリプロピレン *3	-	-	-	—	-		-	-
	(C)	粘着付与樹脂 *4	35	35	35	35	35	35	35	35
	(D)	ワックス *5	25	30	25	20	25	25	25	25
オー	ープン	レタイム (sec)	17	12	16	18	15	12	15	15
セッ	トタ	イム (sec)	7	5	7	8	8	5	8	8
恒》	温クリ	Jープ 60℃、30% (min)	83	122	87	128	52	88	59	77
		オープンタイム評価	A	D	A	Α	А	D	A	A
		耐熱クリープ性評価	A	AA	A	AA	D	A	D	В
		総合評価	0	0	0	0	0	0	0	0

 *1: エチレンー1-オクラン共重合体(商品名:Affinity GA1950、ダウ・ケミカル社製)

 *2: エチレンープロピレン共重合体(商品名:Licocene PP 2002、クラリアント社製)

 *3: ポリプロピレン(商品名:ビスコール 660-P、三洋化成工業(株)製)

 *4: 脂肪族系炭化水素石油樹脂の水素化誘導体(商品名:Eastotac H-130R、イーストマン・ケミカル社製)

 *5: フィッシャートロプシュワックス(商品名:Paraflint H1、サゾール・ワックス社製)

表2-2 Table 2-2

実施例 Example

組成 (質量部) Composition (parts by mass)

エチレン系共重合体 Ethylene-based copolymer

ポリプロピレン Polypropylene

プロピレン系共重合体 Propylene-based copolymer

粘着付与樹脂 Tackifier resin

ワックス Wax

オープンタイム Open time

セットタイム Set time

恒温クリープ Isothermal creep

オープンタイム評価 Open time evaluation

耐熱クリープ性評価 Heat creep resistance evaluation

総合評価 Comprehensive evaluation

エチレン-1-オクテン共重合体(商品名:Affinity GA1950、 ダウ・ケミカル社製) Ethylene-1-octene copolymer (Product name: Affinity GA1950, manufactured by The Dow Chemical Company)

エチレンープロピレン共重合体(商品名:Licocene PP2602、 クラリアント社製) Ethylene-propylene copolymer (trade name: Licocene PP2602, manufactured by Clariant Co., Ltd.)

ポリプロピレン(商品名:ビスコール 660-P、三洋化成工業(株)製)

Polypropylene (trade name: VISCOL 660-P, manufactured by Sanyo Chemical Industries, Ltd.)

脂肪族系炭化水素石油樹脂の水素化誘導体(商品名: Eastotac H-130R、イーストマン・ケミカル社製) Hydrogenated derivative of an aliphatic hydrocarbon petroleum resin (trade name: Eastotac H-130R, manufactured by Eastman Chemical Company)

フィッシャー・トロプシュワックス(商品名: Paraflint H1、サ ゾール・ワックス社製) Fischer-Tropsch wax (trade name: Paraflint H1, manufactured by Sasol Wax GmbH)

"

Description X10: Paragraph 0104

"[0104] The propylene-based polymer of the present invention can be favorably used in the field of hot melt adhesives. Further, the hot melt adhesive of the present invention can be favorably used as an adhesive for packaging such as corrugated cardboards."

(3) Inventions disclosed in the Description originally attached to the application X and Evidence A No. 1

A. Evidence A1A Invention

It can be said that Claim 8 of the application X and Evidence A No. 1 (Claim 8 depends from Claim 6, and Claim 6 depends from Claim 4) recites the following:

"A hot melt adhesive further comprising a tackifier resin (C) in an amount of 50 to 200 parts by mass and a wax (D) in an amount of 50 to 200 parts by mass with respect to 100 parts by mass of the ethylene-based polymer (A), the propylene-based polymer satisfying the following (a2) and (b2):

(a2) [mmmm] = 20 to 80 mol%; and

(b2) weight-average molecular weight (Mw) = 1,000 to 150,000."

Here, the total of 100 parts by mass of an ethylene-based polymer (A) and 1 to 30 parts by mass of a propylene-based polymer (B2) is 101 to 130 parts by mass. If the total is converted to 100 parts by mass, the amount of the tackifier resin (C) added is within the range of 38.5 to 198.0 with respect to 100 parts by mass in total (if the total is 101 parts by mass, it is 49.5 to 198.0, and, if the total is 130 parts by mass, it is 38.5 to 153.8). In this case, similarly, the amount of the wax (D) added is in the range of 38.5

to 198.0.

Therefore, it is recognized that the following invention is disclosed in the Description originally attached to the application X and Evidence A No. 1 (hereinafter referred to as " Evidence A1A Invention "). In addition, "part(s) by mass" shall be read as "part(s) by weight."

"A hot melt adhesive comprising 1 to 30 parts by weight of a propylene-based polymer (B2) with respect to 100 parts by weight of an ethylene-1-octene copolymer as an ethylene-based polymer (A) and further comprising 38.5 to 198.0 parts by weight of a tackifier resin (C) and 38.5 to 198.0 parts by weight of a wax (D) with respect to 100 parts by weight of the above ethylene-based polymer (A) and propylene-based polymer, the propylene-based polymer (B2) satisfying the following (a2) and (b2):

(a2) [mmmm] = 20 to 80 mol%; and

(b2) weight-average molecular weight (Mw) = 1,000 to 150,000."

B. Evidence A1B Invention

In each of paragraph [0104] in the application X and paragraph [0114] in Evidence A No 1, there is described "the hot melt adhesive of the present invention can be favorably used as an adhesive for packaging such as corrugated cardboards." Therefore, it is recognized that the following invention is also disclosed in the Description originally attached to the application X and Evidence A No. 1 (hereinafter, referred to as "Evidence A1B invention").

"A corrugated cardboard produced using a hot melt adhesive according to Evidence A1A Invention"

(4) Regarding Invention 1

A. Comparison between Invention 1 and Evidence A1A Invention

"An ethylene-1-octene copolymer as an ethylene-based polymer (A)," "a propylene-based polymer (B2)," "a tackifier resin (C)", and "wax (D)" in the Evidence A1A Invention correspond to "an ethylene- α -olefin copolymer," "a polypropylene," "a tackifier," and "a wax" in Invention 1, respectively.

Comparing between the feature of comprising "38.5 to 198.0 parts by weight of a tackifier resin (C) and 38.5 to 198.0 parts by weight of a wax (D) with respect to 100 parts by weight of the above ethylene-based polymer (A) and propylene-based polymer" and

the feature of "comprising 50 to 120 parts by weight of a tackifier having a softening point of 110 to 130°C and 25 to 75 parts by weight of a wax with respect to a total of 100 parts by weight of the ethylene- α -olefin copolymer and the polypropylene" in Invention 1,

the two are common in that the amount of the tackifier is in the range of "50 to 120 parts by weight and the amount of the wax added is in the range of "38.5 to 75 parts by weight."

Then, the corresponding and differences between Invention 1 and the Evidence A1A Invention in comparison therebetween are as follows:

<Corresponding Feature>

"A hot melt adhesive comprising an ethylene- α -olefin copolymer and polypropylene, and also comprising 50 to 120 parts by weight of a tackifier and 38.5 to 75 parts by weight of a wax with respect to a total of 100 parts by weight of the ethylene- α -olefin copolymer and the polypropylene."

<Difference 1>

Regarding the softening point of polypropylene, Invention 1 specifies "80 to 100°C," whereas that of the Evidence A1A Invention is unknown.

<Difference 2>

Regarding the softening point of the tackifier, the Invention specifies "110 to 130°C," whereas that of the Evidence A1A Invention is unknown.

B. Judgment

(A) Regarding Difference 1

In paragraph [0073] in the application X and paragraph [0073] in Evidence A No. 1, the "polypropylene-based polymer (B2)" is described such that "Examples of commercially available propylene-based polymer (B2) include L-MODU S400 (manufactured by Idemitsu Kosan Co., Ltd.)." In addition, according to Evidence A No. 4, the softening point of "Elmodu S400" is 93°C.

Therefore, the term "polypropylene-based polymer (B2)" in the Evidence A1A Invention encompasses one having a softening point of 93°C, and Difference 1 is thus not a substantial difference.

(B) Regarding Difference 2

In paragraph [0060] in the application X and paragraph [0060] in Evidence A No. 1, there is described "Examples of commercially available products of the tackifier resin (C) include I-MARV P-125, I-MARV P-100, and I-MARV P-90 (all manufactured by Idemitsu Kosan Co., Ltd.), Yumex 1001 (manufactured by Sanyo Chemical Industries, Ltd.), Hi-Rez T 1115 (manufactured by Mitsui Chemicals, Incorporated), Clearon K 100 (manufactured by Yasuhara Chemical Co., Ltd.), ECR 227 and Escorez 2101 (both manufactured by Tonex Co., Ltd.), Arkon P-100 (manufactured by Arakawa Chemical Industries, Ltd.), Regalrez 1078 (manufactured by Hercules, Inc.), and Eastotac H-130R (manufactured by Eastman Chemical Company) (all are trade names)." Among them, "I-MARV P-90" (Evidence A No. 6), which has a softening point of 90°C, is mentioned as an example of one having a low softening point, and also "Yumex 1001" having a softening point of 153°C (Evidence A No. 7, page 79) is mentioned as an example of a material having a high softening point. Specifically, it can be said that the application X and Evidence A No. 1 describe a tackifier having a softening point of 90°C to 153°C

Then, in "Example 4" of the application X and Evidence A No. 1, "a hydrogenated derivative of an aromatic hydrocarbon petroleum resin (trade name: Eastotac H-130R, manufactured by Eastman Chemical Company)" is used as a tackifier resin. Specifically, this tackifier resin corresponds to "a tackifier resin having a softening point of 130°C" because, in paragraph 0096 of Evidence A No. 1, the tackifier resin is described as "a hydrogenated derivative of a derivative hydrocarbon petroleum resin (trade name: Eastotac H-130R, manufactured by Eastman Chemical Company, softening point: 130°C)."

Therefore, the softening point of the "tackifier resin (C)" in Evidence A1A Invention is highly probably 90°C to 153°C. In the specific example of Example 4, since the tackifier resin having a softening point of 130°C is actually used, Difference 2 is not a substantial difference.

(C) Summary of Comparison / Judgment

Based on the above, since Differences 1 and 2 are not substantial, Invention 1 is substantially identical to the Evidence A1A Invention.

C. Regarding the Patentee's allegation

(A) On page 3 of the Written Opinion (Patentee) dated November 30,2018, the Patentee alleges that "since in Corrected Invention 1 and Corrected Inventions 2 to 4 which directly or indirectly depend from Corrected Invention 1, the amount of the polypropylene added is 33 to 300 parts by weight with respect to 100 parts by weight of

the ethylene- α -olefin copolymer, none of them are identical to the above Evidence A1A Invention or the above Evidence A1B Invention." However, Invention 1 identifies polypropylene as being "contained in an amount of 25 to 400 parts by weight." Thus, the above allegation shall not be adopted.

(B) On page 3 of the Written Opinion (submitted by Patentee) dated November 30, 2019, the Patentee alleges that "only Example 4, Example 14, and Reference Example 2 (all 29 parts by weight) contain polypropylene having a softening point of 80 to 100°C in an amount of 25 to 400 parts by weight as a considerable amount with respect to 100 parts by weight of ethylene- α -olefin copolymer as the hot melt adhesives of Corrected Invention 3 and 4, however, it cannot be said that the softening points of polypropylenes used in those products (polypropylenes 1 to 3, respectively) are not 80 to 100°C." On the contrary, in paragraph [0018] of the application X and paragraph [0018] of Evidence A No. 1, there is described "The melting point (Tm-D) of the propylene-based polymer of the present invention is preferably 0 to 140°C, more preferably 20 to 120°C, ... from the viewpoint of improvement of open time and also improvement of heat creep resistance," and "more preferable" ranges are described as "40 to 100°C" in the application X and "90 to 120°C" in Evidence A No. 1. In paragraph [0073] of the application X and the paragraph [0073] of Evidence A No. 1, there are described "Examples of commercially available propylene-based polymer (B2) include L-MODU S400 (manufactured by Idemitsu Kosan Co., Ltd.)." In addition, according to Evidence A No. 4, the softening point of "Elmodu S400" is 93°C. Therefore, the above allegation shall not be adopted.

(C) On pages 7 to 9 of the Written Opinion dated August 8, 2019, the Patentee alleges that "The invention of the application X is to provide a hot melt adhesive having a good balance between favorable heat creep resistance and moderate open time (a time from when the hot melt adhesive is applied to an adherend to when the hot melt adhesive loses its tackiness due to a decrease in temperature) ... Unlike the hot melt adhesive that is excellent in both heat-resistant adhesion and cold-resistant adhesion by selecting specific components and compounding ratios. ... Thus, regardless of whether or not the "softening point" of "L-MODU S400" described in the application X is "93°C," the hot melt adhesives of Corrected Inventions 3 and 4 cannot be said to be disclosed in the application X." However, there is no substantial difference in constitution between Invention 1 and the Evidence A1A Invention. Therefore, the above allegation shall not

be adopted.

(5) Regarding Invention 2

Invention 2 specifies the ethylene- α -olefin copolymer in Invention 1 as "ethylene-1-octene copolymer".

However, the Evidence A1A Invention uses an ethylene-1-octene copolymer as the ethylene-based polymer (A). Thus, no difference can be found other than the above Differences 1 and 2 even when comparing Invention 2 with the Evidence A1A Invention.

Then, as stated in the above (4)B, Differences 1 and 2 are not substantial. Therefore, Invention 2 is substantially the same as the Evidence A1A Invention.

(6) Regarding Invention 3

Invention 3 adds to Invention 1 the limitation that "a polypropylene is contained in an amount of 25 to 400 parts by weight with respect to 100 parts by weight of an ethylene- α -olefin copolymer".

However, the Evidence A1A Invention contains "1 to 30 parts by weight of a propylene-based polymer (B2) with respect to 100 parts by weight of ... an ethylene-based polymer (A)." Comparing Invention 3 and the Evidence A1A Invention, the two are common having in a range of "25 to 30 parts by weight." Thus, no difference can be found other than the above Differences 1 and 2 even when comparing the two.

Then, as stated in the above (4)B, Differences 1 and 2 are not substantial. Therefore, Invention 3 is substantially the same as the Evidence A1A Invention.

(7) Regarding Invention 4

Invention 4 is a paper-made packaging material formed using the hot melt adhesive of Invention 1.

However, the "paper-made packaging material" of Invention 4 corresponds to the "corrugated cardboards" recited in the Evidence A1B Invention. Thus, no difference can be found other than the above Differences 1 and 2 even when comparing Invention 4 with the Evidence A1B Invention.

Then, as stated in the above (4)B, Differences 1 and 2 are not substantial. Therefore, Invention 4 is substantially the same as the Evidence A1B Invention.

(8) Summary as to Reasons 1 to 5

As stated above, Inventions 1 to 4 are substantially identical to the Evidence

A1A Invention or the Evidence A1B Invention.

2. Regarding Reason 2

(1) Described matters in Cited Publications

A. Evidence A No. 2 (International Publication No. WO 2013/039261) includes the following descriptions in Japanese.

Description 2a: Claims 1 to 4

"1. A hot melt adhesive comprising:

(A) a propylene homopolymer having a melting point of 100°C or lower which is obtainable by polymerizing propylene using metallocene catalyst; and (B) an ethylene-based copolymer.

2. The hot melt adhesive according to Claim 1, wherein the ethylene-based copolymer (B) is an ethylene- α -olefin copolymer which is obtainable by polymerization using a metallocene catalyst.

3. The hot melt adhesive according to Claim 2, wherein the ethylene- α -olefin copolymer (B) contains at least one selected from an ethylene/propylene copolymer and an ethylene/octene copolymer.

4. Disposable products obtainable by using the hot melt adhesive according to any one of Claims 1 to 3."

Description 2b: Paragraph 0009

"[0009] An object of the present invention is to provide a hot melt adhesive, which is excellent in high-speed coating and spiral coating at low temperature and is also excellent in adhesion to polyethylene and a nonwoven fabric; and disposable products obtainable by the hot melt adhesive."

Description 2c: Paragraph 0022

"[0022] In the present invention, the propylene homopolymer (A) refers to a homopolymer of propylene, which is produced by using a metallocene catalyst as a polymerization catalyst. The melting point of the propylene homopolymer (A) is 100°C or lower, more preferably 60 to 90°C, and most preferably 65 to 85°C."

Description 2d: Paragraphs 0026 and 0027

"[0026] Examples of the propylene homopolymer (A) include: (Al) a propylene homopolymer having a weight average molecular weight of 60,000 or less; and (A2) a propylene homopolymer having a weight average molecular weight of more than

60,000.

The weight average molecular weight of the propylene homopolymer (Al) is preferably 30,000 to 60,000, and particularly preferably 30,000 to 55,000.

[0027] The weight average molecular weight of the propylene homopolymer (A2) is more than 60,000, preferably more than 60,000 and 90,000 or less, and more preferably more than 60,000 and 80,000 or less.

Examples of a commercially available product of the propylene homopolymer (Al) include L-MODU X400S (trade name) manufactured by Idemitsu Kosan Co., Ltd., and examples of a commercially available product of the propylene homopolymer (A2) include L-MODU X600S (trade name) manufactured by Idemitsu Kosan Co., Ltd."

Description 2e: Paragraph 0029

[0029] In the present invention, the amount of the propylene homopolymer (A) is preferably 60 to 95 parts by weight, and particularly preferably 70 to 90 parts by weight, based on 100 parts by weight of the total weight of the propylene homopolymer (A) and the ethylene-based copolymer (B).

When the propylene homopolymer (A) contains both the propylene homopolymer (Al) and the propylene homopolymer (A2), a weight ratio of the two polymers is preferably from 1:3 to 3:2 ((A1):(A2)).

Description 2f: Paragraphs 0032 to 0033

"[0032] In the present invention, the ethylene-based copolymer (B) refers to a copolymer of ethylene and a copolymerizable monomer which is copolymerizable with ethylene.

[0033] Examples of the copolymerizable monomer include:

a-olefin such as ethylene, propylene, octene, and butene;

carboxylic acid (esters) such as vinyl acetate, (meth) acrylic acid, (meth) acrylic acid ester, maleic acid, and maleic acid ester;

carboxylic anhydrides such as maleic anhydride, phthalic anhydride, and succinic anhydride; and the like."

Description 2g: Paragraphs 0037 to 0038

"[0037] The ethylene copolymer (B) of the present invention is preferably the ethylene/a-olefin copolymer. The ethylene/a-olefin copolymer is particularly preferably an ethylene/a-olefin copolymer obtained by polymerization using a metallocene catalyst.

When the hot melt adhesive of the present invention contains the ethylene/a-olefin copolymer obtained by polymerization using a metallocene catalyst, the spiral coatability at low temperature is improved and the adhesion to a polyethylene film and a nonwoven fabric is more excellent.

[0038] Examples of the ethylene/a-olefin copolymer obtained by polymerization using a metallocene catalyst include an ethylene/propylene copolymer, an ethylene/octene copolymer, an ethylene/butene copolymer and an ethylene/propylene/butene copolymer, and the ethylene/propylene copolymer and the ethylene/octene copolymer are particularly desirable.

When the hot melt adhesive of the present invention contains at least one selected from the ethylene/propylene copolymer and the ethylene/octene copolymer, the spiral coatability at low temperature is further improved."

Description 2h: Paragraph 0045

"[0045] It is preferred that the hot melt adhesive for disposable products of the present invention further includes: (C) a tackifier resin. The tackifier resin (C) is preferably blended in the amount of 20 to 180 parts by weight, more preferably 40 to 150 parts by weight, and particularly preferably 60 to 150 parts by weight, based on 100 parts by weight of the total weight of the propylene homopolymer (A) and the wax (B).

When the tackifier resin (C) is blended in the above proportion, the hot melt adhesive can be applied by spiral coating at low temperature of 150°C or lower. Furthermore, the hot melt adhesive can be uniformly applied to a polyethylene film and a nonwoven fabric, and thus the obtained adhesive is more suitable for the production of disposable products.

Description 2i: Paragraph 0047

"[0047] It is possible to use, as the tackifier resin (C), commercially available products. Examples of these commercially available products include Alcon P100 (trade name) and Alcon M100 (trade name) manufactured by Arakawa Chemical Industries, Ltd.; Clearon M105 (trade name) manufactured by YASUHARA CHEMICAL CO., LTD.; ECR5400 (trade name) and ECR179EX (tradename) manufactured by Exxon Corporation; and QuintonDX390 (trade name) manufactured by Zeon Corporation. These commercially available tackifier resins can be used alone, or in combination."

Description 2j: Paragraph 0050

"[0050] The hot melt adhesive of the present invention preferably contains: (E) a wax. As used herein, the 'wax' refers to an organic substance having a weight average molecular weight of less than 10,000, which is solid at normal temperature and becomes liquid when heated, and is commonly considered a 'wax.' No particular limitation is imposed on the wax so long as the hot melt adhesive according to the present invention can be obtained, if it has wax-like properties."

Description 2k: Paragraphs 0066 to 0067 and 0072

"[0066] With regard to the hot melt adhesive for disposable products according to the present invention, a melt viscosity at 150°C is preferably 7,000 mPa·s or less, more preferably 1,000 to 6,000 mPa·s, and particularly preferably 2,000 to 6,000 mPa·s. The 'melt viscosity' is a viscosity of a melt of the hot melt adhesive and is measured by a Brookfield RVT-type viscometer (spindle No. 27).

[0067] By controlling the melt viscosity within the above range, the hot melt adhesive is more suitable for low-temperature coating. Furthermore, the hot melt adhesive is uniformly applied to a nonwoven fabric and is likely to penetrate, and thus the adhesive is more suitable for use in disposable products.

As mentioned above, the hot melt adhesive according to the present invention can also be employed in paper processing, bookbinding, disposable products, and the like, and it is suitable for use in disposable products, since it is excellent in adhesion to a nonwoven fabric and a polyethylene film. ...

[0072] It is extremely useful for the production of the disposable products that the hot melt adhesive can be applied in a wide width by spray coating.

Description 21: Paragraphs 0078 to 0081

"[0078] The present invention will be described for the purpose of describing the present invention in a more detailed and specific manner by way of Examples. These are exemplary of the present invention and are not to be considered as limiting. Components for blending (or formulating) a hot melt adhesive are shown below.

[0079] (A) Propylene homopolymer having a melting point 100°C or lower which is obtained by polymerization using a metallocene catalyst

(A1) Propylene homopolymer having a melting point of 75°C and a weight average molecular weight of 45,000, manufactured by Idemitsu Kosan Co., Ltd. under the trade name of 'L-MODU 400S'

(A2) Propylene homopolymer having a melting point of 80°C and a weight average molecular weight of 70,000, manufactured by Idemitsu Kosan Co., Ltd. under the trade name of 'L-MODU X600S'

(A'3) Propylene homopolymer having a melting point of 145°C obtained by

polymerization using a metallocene catalyst, manufactured by Clariant K.K. under the trade name of 'Pliocene PP6102'

(A'4) Propylene homopolymer having a melting point of 145°C obtained by polymerization using a Ziegler-Natta catalyst, manufactured by Eastman Chemical Company under the trade name of 'Eastoflex P1010'

(A'5) Polyethylene homopolymer having a melting point of 128°C obtained by polymerization using a metallocene catalyst, manufactured by Clariant K.K. under the trade name of 'Licocene PE 201GR'

[0080] (B) Ethylene-based copolymer

(Bl) Propylene/ethylene copolymer having a melt index of 200 (g/10 minutes: 230°C) obtained by polymerization using a metallocene catalyst, manufactured by Exxon Mobil Corporation under the trade name of 'Vistamaxx 2330'

(B2) Propylene/ethylene copolymer having a melt index of 20 (g/10 minutes: 230°C) obtained by polymerization using a metallocene catalyst, manufactured by Exxon Mobil Corporation under the trade name of 'Vistamaxx 6202'

(B3) Propylene/ethylene copolymer (having a random copolymerization structure of propylene/ethylene) having a melt index of 25 (g/10 minutes: 230°C) obtained by polymerization using a metallocene catalyst, manufactured by Dow Chemical Company under the trade name of 'VERSIFY 4301'

(B4) Ethylene/octene copolymer (having a block structure of ethylene/octene) having a melt index of 15 (g/10 minutes: 190°C) which is obtained by polymerization using a metallocene catalyst, manufactured by Dow Chemical Company under the trade name of 'INFUSE 9807'

(B5) Ethylene/octene copolymer (having a random copolymerization structure of ethylene/octene) having a melt index of 13 (g/10 minutes: 190°C) obtained by polymerization using a metallocene catalyst, manufactured by Dow Chemical Company under the trade name of 'ENGAGE 8137'

(B6) Ethylene/octene copolymer (having a random copolymerization structure of ethylene/octene) having a melt index of 500 (g/10 minutes: 190°C) obtained by polymerization using a metallocene catalyst, manufactured by Dow Chemical Company under the trade name of 'AFFINITY GA1950'

(B7) Propylene/ethylene copolymer 'REXtac 2780A' (trade name), manufactured by Huntsman Corp., which is obtained by polymerization using a Ziegler-Natta catalyst
(B8) Propylene/ethylene/butene copolymer obtained by polymerization using a Ziegler-Natta catalyst, manufactured by Evonik under the trade name of 'VESTOPLAST 703'
(B9) Ethylene/vinyl acetate copolymer obtained by polymerization using a Ziegler-

Natta catalyst, manufactured by TOSOH CORPORATION under the trade name of 'Ultracene 722'

(B'10) Propylene/butene copolymer obtained by polymerization using a Ziegler-Natta catalyst, manufactured by Huntsman Corp. under the trade name of 'REXtac 2780A'

(B' 11) Acrylic copolymer, manufactured by Mitsubishi Rayon Co., Ltd. under the trade name of 'BR-106'

[0081] (C) Tackifier resin

(C1) Hydrogenated dicyclopentadiene-based resin, manufactured by Exxon Mobil Corporation under the trade name of 'ECR179EX'

(C2) Hydrogenated dicyclopentadiene-based resin, manufactured by Exxon Mobil Corporation under the trade name of 'ECR5400'

(C3) Hydrogenated cyclic aliphatic petroleum hydrocarbon resin manufactured by Arakawa Chemical Industries, Ltd. under the trade name of 'Alcon Ml00'

(C4) Hydrogenated cyclic aliphatic petroleum hydrocarbon resin manufactured by Arakawa Chemical Industries, Ltd. under the trade name of 'Alcon P100'

(C5) Unhydrogenated aliphatic aromatic copolymer-based resin manufactured by Zeon Corporation under the trade name of 'Quintone DX390N'

(C6) Hydrogenated terpene-based resin manufactured by YASUHARA CHEMICAL

CO., LTD. under the trade name of 'Clearon M105'"

Description 2m: Paragraph 0083

"[0083] (E) Wax modified with carboxy1ic acid and/or carboxy1ic anhydride

(E1) Maleic acid-modified wax, manufactured by Clariant K.K. under the trade name of "Licocene MA6252TP"

(E2) Fischer-Tropsch wax, manufactured by Sasol under the trade name of 'Sasol Wax H-1'"

Description 2n: Paragraphs 0085 and 0097

"[0085] These components (A) to (F) were blended according to the formulations shown in Tables 1 to 3, and then melt-mixed at about 150°C over 2 hours using a universal stirrer to prepare hot melt adhesives of Examples 1 to 19 and Comparative Examples 1 to 9. All numerical values with respect to the composition (blend) of the hot melt adhesives shown in Tables 1 to 3 are parts by weight."

With respect to the respective hot melt adhesives (Examples and Comparative Examples), thermal stability, coatability, high-speed coatability, and peel strength were evaluated. A summary of the respective evaluations is described below."

"[0097] [Table 3]

実施例	12	13	14	15	16	17	18	19
(A) (A1)	94	90	80	80	75	70	75	60
(A2)								
(A'3)								
(A'4)								
(A' 5)								
(B) (B1)								
(B2)								
(B3)								
(84)	6	10	20	20	25	30		
(85)							25	40
(86)								40
(B7)								
(88)								
(B9)								
	60			80				
	60		10	80				
(02)		60	40					
(03)					100		85	
(05)			35					
(C6)						100		60
(D) (D1)			45					
(D2)				40			50	
(D3)	40	A. W						40
(D4)					50			
(D5)		40						
(D6)						50		
(E) (E1)			3	3				
(E2)							15	
(F) (F1)	2	2	4	2	2	2	2	2
		0		0			-	
<u>熱安定性</u>	0	0	0	0	0	0	0	0
塗上週任	0	0	0	15	15	14	16	17
<u> </u>	20	20	10	15	2740	5000	2250	2210
150°C浴配粘度(m·Pas) 言情除于 液性	3500	3630	4380	0000	3/40	2990	3250	3210
商还堂上遊社		Š	0	0	0	0		ŏ
冷て症 (かか)	20	20	17	16	17	19	19	18
	20	20	17	10		19	13	10
小胆油皮	0	0	0	0	0	0	0	0
副離治度 (N)	288	329	3.05	3.98	248	4.53	3.90	0.80
副離状能	材破							
①貼り合せ ポリエチレンフィルム	0	0	0	0	0	0	0	0
到離銷度 (N)	0.10	0.13	0.22	0.40	0.58	0.34	0.40	0.41
剥離状態	糖候面界	界面剥離						
外観	0	0	0	0	0	0	0	O

実施例 Examples

熱安定性 Thermal stability

塗工適性 Coatability

塗工幅 Coating width

150℃溶融粘度 Melt viscosity at 150℃

高速塗工適性 High-speed coatability

ホットメルトの飛散 Scatter of hot melt adhesive

剥離粘度 Peel strength

- 張り合せ 不織布 Lamination Nonwomen fabric
- 剥離強度 Peel strength
- 剥離状態 Peel state
- 張り合せ ポリエチレンフィルム Lamination Polyethylene film

外観 Appearance 材破 Material fracture 界面剥離 Interfacial peel

"

B. Evidence A No. 3 (National Publication of International Patent Application No. 2005-505679) includes the following descriptions:

Description 3a: Paragraph 0005

"[0005] In accordance with the present invention, it has been found that a mixture comprising a polymer blend of SPP and APAO, a tackifying resin, a plasticizer, and, optionally, a synthetic polyolefin wax or petroleum wax provides a sprayable hot melt adhesive composition. The composition has novel combinations of properties including toughness, low or no shrinkage, high cohesive strength, low viscosity, excellent heat stability, and good adhesion to a variety of substrates. The composition of the present invention is particularly useful in assembly of disposable nonwoven articles for bonding of polyethylene and polypropylene films, nonwoven fabrics, and elastic strands to each other or to themselves."

Description 3b: Paragraph 0027

"[0027] SUMMARY OF THE INVENTION

The present invention is directed to a hot melt adhesive composition based on a polymer blend of the SPP and APAO. The adhesive comprises, in addition to the SPP/APAO blend, a tackifying resin, an optional plasticizer, and an optional wax as the primary ingredients. The composition of the present invention takes advantage of complimentary properties between SPP and APAO and has overcome the shortcomings of the prior art APAO blend adhesives and tackified SPPs. The composition of the present invention provides well balanced properties of tensile strength, toughness, flexibility and adhesion. It shows complete compatibility, excellent heat stability, adjustable open time, improved cohesive strength, low viscosity, low shrinkage upon solidification, low or no tack when set, and good processibility with conventional coating equipment. In particular, the present invention leads to an adhesive composition that is well suited for a variety of spray coating application techniques, such as, for example, spiral spray, melt-blowing, control coat, control wave, and the like, whereas the prior art APAO and SPP based adhesives lack such broad processibility."

Description 3c: Paragraph 0030

"[0030] Another objective of the present invention is directed towards a sprayable hot melt adhesive for construction of disposable nonwoven articles for binding polyethylene, polypropylene films, nonwoven fabrics, and the like to each other and to themselves. The adhesive provides excellent peel strength and bond durability in such application."

Description 3d: Paragraph 0042

"[0042] Although amounts varying from about 0% to 35% by weight may be used in the composition of the present invention, the preferred amounts are 0% to 18% by weight. These waxes can also affect the set-up time and the softening point of the adhesive. Among the useful waxes are:

1. low molecular weight, that is, number average molecular weight (Mn) equal to 500 - 6000, polyethylene having a hardness value, as determined by ASTM method D-1321, of about 0.1 to 120, having an ASTM softening point of about 65°C to 140°C;

2. petroleum waxes such as paraffin wax having a melting point of about 50°C to 80°C and microcrystalline wax having a melting point of about 55°C to 100°C, the latter melting points being determined by ASTM method D 127-60;

3. synthetic waxes made by polymerizing carbon monoxide and hydrogen such as Fischer-Tropsch wax; and

4. polyolefin waxes. As used herein, the term 'polyolefin wax" refers to those polymeric or long-chain entities comprised of olefinic monomer units. These types of materials are commercially available from Eastman Chemical Co. under the trade name designation 'Epolene.' The materials which are preferred for use in the composition of the present invention have a Ring and Ball softening point of from about 100°C to 170°C. As should be understand, each of these wax diluents is solid the room temperature."

Description 3e: Paragraphs 0048 and 0053

"[0048] The resulting hot melt adhesives may then be applied to substrates using a variety of application techniques. Examples includes hot melt glue gun, hot melt slotdie coating, hot melt wheel coating, hot melt roller coating, melt blown coating, spiral spray, and the like. ...

[0053] Sprayability was measured empirically on a Meltex CT225 (Nordson) hot melt coater. The coating conditions varied depending on the adhesive sample. Fina EOD 98-05 and EOD 99-19 are propylene-ethylene copolymer type SPPs prepared by using a

single-site metallocene catalyst system such as that disclosed in US Patent 5,476,914. The polymers contain about 10% by weight of ethylene and are commercially available from AtoFina Petrochemicals Inc, Houston, TX. They both have an r value of about 95%, a density of 0.87 g/cc, and a DSC melting point of 130°C. Fina EOD 98-05 has a melt flow rate of about 20 g/10 min as determined by using ASTM Method D-1238, and Fina EOD 99-19 has a melt flow rate of 25g/10 min."

Description 3f: Paragraph 0055

"[0055] Rexflex RT2180 is an atactic homopolypropylene type of APAO having a Brookfield viscosity of about 8,000 cP at 190°C, a Tg of about -20°C, and a softening point of about 157°C. It is available from Huntsman Corporation."

Description 3g: Paragraphs 0062 and 0064

"[0062] Eastotac H130R, available from Eastman Chemical Company, is a partially hydrogenated C5 hydrocarbon resin having an R&B softening point of 130°C. ...

[0064] Marcus 300, available from Marcus Oil & Chemicals, Inc., is a synthetic polyethylene wax having a melting point of about 240°F.

The invention is further illustrated by way of the examples which are set forth below."

Description 3g: Paragraph 0067 "[0067] [Table 1]

表	1 実施例	1~3						
	重量パーセント(%)							
成 分	1	2	3					
Fina EOD 98-05	10.0	-	-					
Fina EOD 99-19	-	10.0	22.0					
Eastoflex P1010	40.0	-	-					
Rexflex RT2280	-	40.0	-					
Rexflex RT2180	-	-	15.0					
Pennznap 500	10.0	-	25.0					
Kaydol Oil	-	10.0	-					
Eastotac H130R	39.5	39.5	-					
Sylvaros ZT105	-	-	25.0					
Marcus 300	-	-	12.5					
Antioxidant	0.5	0.5	0.5					
室温粘着性	なし	なし	なし					
ブルックフィールド粘度	3350	9300	7000					
(cP)								
R&B 軟化点 (°F.)	285	288	260					
噴霧性	良好	良好	良好					
Creep Retention (%)	66	80	72					

表1 実施例 1~3 Table 1 EXAMPLES 1 to 3 成分 Ingredients 重量パーセント Percent(%) by weight 室温粘着性 Room Temperature Tack ブルックフィールド粘度 Brookfield Vis. (cP) R&B 軟化点 R&B Softening Point 噴霧性 Sprayability なし None 良好 Good

"

C. Well-Known Example A (International Publication No. WO 2012/147951) includes the following description:

Description A1: Claims 1, 4, and 6

"[Claim 1] A hot melt adhesive comprising a polyolefin wax having a softening point of 105 to 165°C, an elastomer, and a tackifier, wherein

when a temperature at which a viscosity of 500 Pa·s is attained during heating is X[°C] and a temperature at which a viscosity of 500 Pa·s is attained during cooling is Y[°C], X is larger than Y (X > Y) and X - Y is 5 or more. ...

[Claim 4] The hot-melt pressure-sensitive adhesive according to Claim 1, further comprising a softening agent.

•••

[Claim 6] The hot melt adhesive according to Claim 4, wherein the polyolefin wax is a polyethylene wax and the content thereof is 10 to 30% by weight, the content of the elastomer is 10 to 20% by weight, the content of the tackifier is 25 to 40% by weight, and the content of the softening agent is 25 to 40% by weight.

D. Well-Known Example B (Japanese Unexamined Patent Application Publication No. 2006-188580) includes the following description:

Description B1: Claims 1, 12, and 13

"[Claim 1] A hot melt adhesive composition comprising: a first component comprising at least one ethylene/C3 to C20 α -olefin copolymer;

a second component comprising at least one ethylene/(meth)acrylic acid ester copolymer in an amount of 6 to 12 parts by weight per 100 parts by weight of the first component;

and a third component comprising at least one tackifying resin, in an amount of 50 to 200 parts by weight per 100 parts by weight of the first component, the third component being compatible with the first and second components. ...

[Claim 12] The composition according to any one of Claims 1-11, further comprising at least one wax.

[Claim 13] The composition according to Claim 12, wherein the wax is present in an amount of 30 to 80 parts by weight based on 100 parts by weight of the ethylene/octene copolymer."

(2) Evidence A No. 2 includes the following description:

A. Evidence A2A Invention

According to Claim 3 of Evidence A No. 2 (Claim 3 depends from Claim 2, and Claim 2 depends from Claim 1) of Evidence A No. 2, it can be said that the following invention is described (hereinafter, "Evidence A2A Invention").

"A hot melt adhesive comprising:

(A) a propylene homopolymer having a melting point of 100°C or lower, which is obtainable by polymerizing propylene using a metallocene catalyst; and

(B) an ethylene-based copolymer containing at least one selected from an ethylene/propylene copolymer and an ethylene/octene copolymer."

B. Evidence A2B Invention

Claim 4 of Evidence A No. 2 specifies "disposable products obtainable by using the hot melt 20 adhesive according to any one of Claims 1 to 3." In paragraph [0067] of Evidence A No. 2, furthermore, there is described "the hot melt adhesive according to the present invention can also be employed in paper processing, bookbinding, disposable products, and the like." Thus, it can be said that Evidence A No. 2 also describes a product obtained by processing paper using a hot melt adhesive. Therefore, Evidence A No. 2 is also recognized to include the following invention (hereinafter referred to as the "Evidence A2B Invention"):

"A product obtained by processing paper using a hot melt adhesive according to the Evidence A2A Invention."

(3) Comparison between Invention 1 and Evidence A2A Invention

A. Comparison

Compering Invention 1 and the Evidence A2A Invention, "(A) a propylene homopolymer ... which is obtainable by polymerizing propylene using a metallocene catalyst" and "(B) an ethylene-based copolymer containing at least one selected from an ethylene/propylene copolymer and an ethylene/octene copolymer" in the Evidence A2A Invention correspond to the "propylene" and "ethylene- α -olefin copolymer" in Invention 1, respectively.

Therefore, comparing Invention 1 and the Evidence A2A Invention, corresponding and differences are as follows:

<Corresponding Feature>

"A hot melt adhesive comprising an ethylene- α -olefin copolymer and a polypropylene."

<Difference 1'>

Invention 1 contains "a polypropylene having a softening point of 80 to 100°C," whereas the Evidence A2A Invention contains "a polypropylene homopolymer having a melting point of 100°C or less."

<Difference 2'>

The hot melt adhesive of Invention 1 contains "50 to 120 parts by weight of a tackifier having a softening point of 110 to 130° C ... with respect to a total of 100 parts by weight of the ethylene- α -olefin copolymer and the polypropylene," whereas the Evidence A2A Invention does not specify such a feature.

<Difference 3'>

The hot melt adhesive of Invention 1 contains "25 to 75 parts by weight of a wax with respect to a total of 100 parts by weight of the ethylene- α -olefin copolymer and the polypropylene," whereas the Evidence A2A Invention does not specify such a feature.

B. Judgment

The above Differences 1' to 3' will be examined.

<Regarding Difference 1'>

In paragraph [0027] of Evidence A No. 2, a propylene homopolymer, which is one type of polypropylene, is described as "Examples of a commercially available product of the propylene homopolymer (Al) include L-MODU X400S (trade name) manufactured by Idemitsu Kosan Co., Ltd.," and actually Examples describe the use of "Elmodu X400S" and "Elmodu X600S" ([0079] and [0097]).

According to Evidence A No. 8, which is a written material of Idemitsu Kosan Co., Ltd., the softening point of "L-MODU X400S" is 90°C and the softening point of "L-MODU X600S" is 100°C.

Then, it can be said that "a polypropylene having a softening point of 80 to 100°C" in the Evidence A2A Invention includes "L-MODU X400S" and "L-MODU X600S." Thus, it can be said that "a polypropylene having a softening point of 80 to 100°C" includes a polypropylene homopolymer having a softening point of 90°C or 100°C.

Thus, comparing "a polypropylene having a softening point of 80 to 100°C" in the Evidence A2A Invention with "a polypropylene having a softening point of 80 to 100°C" in Invention 1, they are in common in that each of them contains polypropylene having a softening point of 90°C or 100°C.

Therefore, it can be said that Difference 1' is not a substantial difference.

<Regarding Difference 2'>

As for the "tackifier" in Invention 1, paragraph [0021] of the Description of the Patent describes that a petroleum resin and a hydrogenated product thereof are preferred.

On the other hand, in paragraph [0045] of Evidence A No. 2, there is described "It is preferred that the hot melt adhesive for disposable products of the present invention further includes: (C) a tackifier resin. The tackifier resin (C) is preferably blended in the amount of 20 to 180 parts by weight, more preferably 40 to 150 parts by weight, and particularly preferably 60 to 150 parts by weight, based on 100 parts by weight of the total weight of the propylene homopolymer (A) and the wax (B)." (note that, although "wax (B)" is included in the above, it is recognized from the description in the Description that it is a mistaken description of "(B) ethylene-based copolymer.")

The above "(C) tackifier resin" corresponds to the "tackifier" in Invention 1.

The hot melt adhesives containing (C) a tackifier resin are also described in Examples of Evidence A No. 2 ([0081], [0097], etc.). For example, in Examples 12 to 19, there are described examples using 60 to 100 parts by weight of the tackifier resin (C) with respect to a total of 100 parts by weight of the propylene homopolymer (A) and the ethylene copolymer (B).

Therefore, it can be said that the Evidence A2A Invention substantially includes (C) a tackifier resin in addition to (A) a propylene homopolymer and (B) an ethylene copolymer. Then, it can be said that the content of the tackifier resin (C) added is 20 to 180 parts by weight with respect to 100 parts by weight of a total of the propylene homopolymer (A) and the ethylene copolymer (B).

Furthermore, Evidence A No. 2 describes that specific examples of the above "(C) tackifier resin" include "Alcon P100 (trade name) and Alcon Ml00 (trade name) manufactured by Arakawa Chemical Industries, Ltd.; Clearon M105 (trade name) manufactured by YASUHARA CHEMICAL CO., LTD.; ECR5400 (trade name) and ECR179EX (tradename) manufactured by Exxon Corporation; and QuintonDX390 (trade name) manufactured by Zeon Corporation" ([0047]). Among these listed tackifier resins (C), for example, "Clearon M105" has a softening point of $105 \pm 5^{\circ}$ C. (Evidence A No. 9). This softening point range overlaps at a softening point of 110° C when compared with the range of "a softening point of 110 to 130° C" specified in Invention 1. Specifically, the use of ""Clearon M105" is described in Examples 17 and 19 of Evidence A No. 2 [Evidence A No. 2].

Then, it can be said that Evidence A No. 2 also describes the case of mixing of 20 to 180 parts by weight of a tackifier having a softening point of 110°C with a propylene homopolymer (A) and an ethylene-based polymer in a total amount of 100 parts by weight. It can be also said that this case is included in Evidence A2A Invention, and Difference 2' is thus not a substantial difference.

Even if it is a substantial difference, in the technical field of hot melt adhesive, those skilled in the art could commonly consider the properties of the adhesive, such as the properties related to coatability and temperature (e.g., melt viscosity, softening point, and melting point). In other words, those skilled in the art could easily conceive of variously examining the above (C) tackifier resin and considering the softening point thereof as one overlapped with the range of Invention 1.

<Regarding Difference 3'>

Paragraphs [0050] and [0083] of Evidence A No. 2 describe that a hot melt adhesive may further include a wax, such as Fischer-Tropsch wax, and Examples thereof describe the exemplified uses of the wax (e.g., Example 18).

However, Evidence A No. 2 does not describe the content of the wax in the hot melt adhesive and the appropriate content of the wax.

However, it is a well-known technique that the wax content is about 25 to 75 parts by weight with respect to 100 parts by weight of the total of ethylene- α -olefin copolymer and polypropylene.

Specifically, Evidence A No. 10 (Japanese Unexamined Patent Application Publication No. 2005-290296) discloses a resin composition containing 33 parts by weight of wax with respect to 100 parts by weight of the total of amorphous ethylene/propylene copolymer and amorphous polypropylene ([0034], [0035], and

Table 1).

In addition, Evidence A No. 11 (Japanese Unexamined Patent Application Publication No. 2009-35646) discloses an easily-peelable adhesive for polyolefin containing 25 parts by weight of a low-molecular weight ethylene-vinyl acetate copolymer wax with respect to a total of 100 parts by weight of ethylene-vinyl acetate copolymer resin and crystalline polypropylene ([0036], [0040], [0042], [0045], [0047], [0048], Table 1, and Table 2).

Furthermore, Evidence A No. 12 (National Publication of International Patent Application No. 2003-533551) discloses a hot melt adhesive containing 50 parts by weight of a synthetic polyethylene wax with respect to 100 parts by weight of a homopolymer FPO (flexible polyolefin) composed of polypropylene monomer units (Example 1), a hot melt adhesive (Example 5) containing 75 parts by weight of a synthetic polyethylene wax with respect to 100 parts by weight of a copolymer FPO composed of ethylene and propylene polymer units (Example 5), and a hot melt adhesive containing 68 parts by weight of a propylene-derived synthetic wax with respect to 100 parts by weight of a copolymer FPO composed of ethylene and propylene monomer units (Example 8) ([0043], [0044], [0045], [0048], [0049], [0052], and Table 1).

In addition, for example, Claim 6 of Well-Known Example A (International Publication No. WO 2012/147951), which indirectly depends from Claim 1 (Description A1) discloses the invention of a hot melt adhesive in which the content of a polyethylene wax is 10 to 30% by weight, the content of an elastomer (trade name: L-MODU S400, etc.) is 10 to 20% by weight, the content of a tackifier is 25 to 40% by weight, and the content of the softening agent (e.g., a paraffine-based process oil) is 25 to 40% by weight.

Similarly, in Well-Known Example B (Japanese Unexamined Patent Application Publication No. 20086-188580), Claim 13 (Description B1), which indirectly depends from Claim 1, discloses the invention of a hot-melt adhesive composition containing about 50 to 200 parts by weight of a tackifier resin (trade name: I-MARV P-125, etc.) and about 30 to 80 parts by weight of a wax (trade name: BARECO PX-100, etc.) with respect to 100 parts by weight of the first component (trade name: AFFINITY GA1950, etc.).

Therefore, as described in Well-Known Examples A to B as well as Evidence A Nos. 10 to 12, it can be said that it is a well-known technique to use 25 to 75 parts by weight of a wax with respect to 100 parts by weight of a thermoplastic resin. Thus, those skilled in the art could easily conceive of making the Evidence A2A Invention

contain 25 to 75 parts by weight of a wax with respect to a total of 100 parts by weight of a polypropylene homopolymer, which is a thermoplastic resin, and an ethylene-based copolymer.

Regarding the above Difference 3', even if it is not a well-known technique to make a wax 25 to 75 parts by weight with respect to 100 parts by weight of a thermoplastic resin in a hot melt adhesive, as stated below, those skilled in the art could easily conceive of it based on the matters described in the Evidence A2 Invention and Evidence A No. 3.

A problem to be solved by each of the Evidence A2A Invention and the Evidence A2B Invention is to provide "a hot melt adhesive, which is excellent in high-speed coating and spiral coating at low temperature and is also excellent in adhesion to polyethylene and a nonwoven fabric; and disposable products obtainable by the hot melt adhesive." ([0009]). On the other hand, the invention disclosed in Evidence A No. 2 is directed towards "a sprayable hot melt adhesive for construction of disposable nonwoven articles for binding polyethylene, polypropylene films, nonwoven fabrics, and the like to each other and to themselves," and its problem to be solved is to allow the adhesive to "provide excellent peel strength and bond durability in such application." Thus, the problems to be solved by the respective inventions are common in providing an excellent hot melt adhesive to be used in disposable products.

Evidence A No. 2 describes that, by controlling the melt viscosity within the above range, the hot melt adhesive is more suitable for low-temperature coating, uniform application to a nonwoven fabric, and is likely to penetrate, thereby being more suitable for use in disposable products ([0066] and [0067]). On the other hand, Evidence A No. 3 discloses that a wax can be used to reduce the melt viscosity of a hot melt adhesive composition ([0042]), and also Example 3 of Evidence A No. 3 discloses a hot melt adhesive containing 34 parts by weight of a wax with respect to a total of 100 parts by weight of an ethylene- α -olefin copolymer and a polypropylene ([0067] and Table 1).

In view of the above, in order to lower the melt viscosity of a hot melt adhesive and make it more suitable for disposable products, those skilled in the art could easily apply the content of a wax described in Evidence A No. 3 to Evidence A2A Invention. Therefore, Invention 1 lacks an inventive step.

Further, the effect of the hot melt adhesive according to the present invention that "excellent adhesiveness can be maintained even in a wide temperature range of - 20°C to 55°C" ([0042]) is within the prediction of those skilled in the art who try to obtain a hot melt adhesive suitable for low-temperature coating by controlling the melt

viscosity. Therefore, it cannot be regarded as a particularly distinguishing feature.

C. Summary

As described above, Invention 1 could be easily conceived by those skilled in the art based on the invention disclosed in Evidence A No. 3 and the well-known arts (Evidence A Nos. 10 to 12, Well-Known Examples A to B, etc.).

D. Regarding the Patentee's allegation

On page 13 of the Written Opinion dated August 8, 2019, the Patentee alleges as follows: "The hot melt adhesive of Evidence A No. 2 is one to be applied to the surface of the object by means of 'high-speed coating and spiral coating' (paragraph [0009]), whereas the hot melt adhesive of Evidence A No. 3 is one being 'sprayable' (paragraph [0005]), which can be sprayed onto the surface of an object. It is considered that the viscosities of these hot melt adhesives and the amounts of waxes added, which affect the viscosities, are different from each other. Thus, it cannot be said that there would be some motivation to combine Evidence A No. 2 and Evidence A. Therefore, those skilled in the art could easily conceive of the hot melt adhesives of Corrected Inventions 3 and 4 based on the inventions disclosed in Evidence A No. 2 and Evidence A No. 3."

However, Evidence A No. 2 includes the description "It is extremely useful for the production of the disposable products that the hot melt adhesive can be applied in a wide width by the spray coating." ([0072]). Also, Evidence A No. 2 includes the description "The resulting hot melt adhesives may then be applied to substrates using a variety of application techniques. Examples includes hot melt glue gun, hot melt slotdie coating, hot melt wheel coating, hot melt roller coating, melt blown coating, spiral spray, and the like." ([0048]). It cannot be said that Evidence A No. 2 and Evidence A No. 3 are based on respective coating methods different from each other. Thus, the above allegation shall not be adopted.

(4) Comparison between Invention 2 and Evidence A2A Invention

Invention 2 specifies the ethylene- α -olefin copolymer in Invention 1 as an "ethylene-1-octene copolymer."

However, the Evidence A2A Invention includes the case where an ethyleneoctene copolymer is used as an ethylene-based copolymer (B), and the "ethylene-octene copolymer" is equivalent to the "ethylene-1-octene copolymer" in Invention 2.

Therefore, comparing Invention 2 and the Evidence A2A Invention, there is no difference other than the above Differences 1' to 3'.

As the above Differences 1' to 3' are as stated in the above (3)B, Invention 2 could be easily conceived by those skilled in the art based on the Evidence A2A Invention, the invention disclosed in Evidence A No. 3, and the inventions disclosed in the well-known arts (Evidence A Nos. 10 to 12, etc.) or could be easily conceived by those skilled in the art based on based on the inventions disclosed in the Evidence A2A Invention and Evidence A No. 3.

(5) Comparison between Invention 3 and Evidence A2A Invention

Invention 3 adds to Invention 1 the limitation that "a polypropylene is contained in an amount of 25 to 400 parts by weight with respect to 100 parts by weight of an ethylene- α -olefin copolymer".

Comparing Invention 3 and the Evidence A2A Invention, the two are different from each other because of the following difference in addition to the above Differences 1' to 3'.

<Difference 4'>

Invention 3 specifies that "a polypropylene is contained in an amount of 25 to 400 parts by weight with respect to 100 parts by weight of an ethylene- α -olefin copolymer," whereas the Evidence A2A Invention does not specify such a matter.

However, Evidence A No. 2 describes that "the amount of the propylene homopolymer (A) is preferably 60 to 95 parts by weight, ..., based on 100 parts by weight of the total weight of the propylene homopolymer (A) and the ethylene-based copolymer (B)" ([0029]). From this description, the preferable amount of the propylene homopolymer (A) can be calculated to be "150 to 1900 parts by weight" with respect to 100 parts by weight of the ethylene-based polymer (B).

Then, comparing the "25 to 400 parts by weight" in Invention 3 with the "150 to 1900 parts by weight" described in Evidence A No. 2, the two are mostly overlapped.

Therefore, Difference 4' is not a substantial difference.

As the above Differences 1' to 3' are as stated in the above (3)B, Invention 3 could be easily conceived by those skilled in the art based on the Evidence A2A Invention, the invention disclosed in Evidence A No. 3, and the inventions disclosed in the well-known arts (Evidence A Nos. 10 to 12, etc.).

(6) Comparison between Invention 4 and Evidence A2B Invention

Invention 4 is a paper-made packaging material formed by using the hot melt adhesive of Invention 1.

However, Evidence A2B Invention is "a product obtained by processing paper using a hot melt adhesive according to Evidence A2A Invention," and the "paper-made packaging material" corresponds to "a product obtained by processing paper using a hot melt adhesive" of the Evidence A2B Invention. Thus, no difference can be found other than the above Differences 1' to 4' even when comparing Invention 4 with the Evidence A2B Invention.

As the above Differences 1' to 3' are as stated in the above (3)B and Invention 4 is as stated in the above (5), Invention 4 could be easily conceived by those skilled in the art based on Evidence A2B Invention, the invention disclosed in Evidence A No. 3, and the inventions disclosed in the well-known arts (Evidence A Nos. 10 to 12, etc.).

3. Regarding Reason 3

(1) Regarding the problem and effect of the Invention

According to the Description of the Patent, an object of the problem to be solved by the Invention is "to provide a hot-melt adhesive excellent in both heat-resistant adhesion and cold-resistant adhesion and a paper-made packaging material formed using the same" ([0006]). The hot melt adhesive of the invention is configured as one that "contains an ethylene- α -olefin copolymer, a polypropylene having a softening point of 80 to 100°C, a tackifier having a softening point of 110 to 150°C, and a wax" ([0007]) to solve the problem ([0007]).

(2) Judgment

A. Regarding "wax"

In paragraph [0026] of the Description of the Patent, there is described "Examples of the wax include: synthetic waxes, such as Fischer-Tropsch wax and polyethylene wax; petroleum waxes, such as paraffin wax and microcrystalline wax; and natural waxes, such as wood wax, carnauba wax, beeswax, and vegetable wax. Examples of the vegetable wax include waxes derived from plants, such as sunflower and rice. The waxes may be used alone or in combination of two or more." It includes description stating that various kinds of waxes other than "Fischer-Tropsch wax," which has been confirmed to be effective in the examples, can be used.

However, it is common general technical knowledge that the physical properties (melting point, melt viscosity, compatibility with other components, etc.) of waxes vary greatly depending on their types. Even when using a wax other than "Fischer-Tropsch wax," which is the only one actually confirmed in the examples, it is unknown whether or not it has the effect of being excellent in both heat-resistant adhesion and cold-

resistant adhesion.

Further, in the Description, paragraph [0030] describes that the coating property and the adhesive force are not lowered by setting the content of the wax within the specific range. However, even in the case of various waxes other than "Fischer-Tropsch wax," it is not clear why the content should be within the specified range.

Therefore, in light of the common general technical knowledge at the time of application, it is not recognized that the problem of the Invention can be solved by specifying only the "wax." The content disclosed in the Description of the Patent cannot be enlarged or generalized to the extent of Invention 1.

Furthermore, the same also applies to Inventions 2 to 4, which depend from Invention 1.

B. Regarding "tackifier"

In the Description of the Patent, paragraph [0020] describes that "Examples of the tackifier include styrene block copolymer, phenolic resin, modified phenolic resin, terpene phenolic resin, xylene-phenolic resin, cyclopentadiene-phenolic resin, coumarone indene resin, rosin resin, rosin ester resin, petroleum resin, terpene resin, and hydrogenated products thereof. The tackifier may be used alone or in combination of two or more." It also describes that various tackifiers other than the "hydrogenated petroleum resin product", the effects of which are confirmed in Examples, can be used.

However, it is common general technical knowledge that various properties of tackifier (softening point, compatibility with other components, etc.) vary greatly depending on its type. Therefore, it is not clear whether or not a tackifier other than the "hydrogenated petroleum resin product" actually confirmed in Examples can be used to exert an effect of being excellent in both heat-resistant adhesion and cold-resistant adhesion.

In addition, the Description describes that "the tackifier has excellent compatibility with the ethylene- α -olefin copolymer and the wax" by setting the softening point of the tackifier within a specific range ([0022]). However, even in the case of various tackifiers other than the "hydrogenated petroleum resin product," it is not clear why the content should be within the specified range.

Therefore, in light of the common general technical knowledge at the time of application, it is not recognized that the problem of the Invention can be solved by specifying only the "tackifier." The content disclosed in the Description of the Patent cannot be enlarged or generalized to the extent of Invention 1.

Furthermore, the same also applies to Inventions 2 to 4, which depend from

Invention 1.

C. Regarding "ethylene-α-olefin copolymer"

In the Description of the Patent, paragraph [0020] describes that " The ethylene- α -olefin copolymer is a copolymer of ethylene and α -olefin. The carbon number of the α -olefin is preferably 3 to 20, and more preferably 6 to 8. Examples of the α olefin include propylene, isobutylene, 1-butene, 1-pentene, 1-hexene, 4-methyl-1pentene, and 1-octene." Therefore, it is described that copolymers containing various α -olefins other than the "1-octene," which has been confirmed to be effective as an α olefin in Examples, can be used.

However, even in the case of ethylene- α -olefin copolymers in general, it is common general technical knowledge that the physical properties, such as melt flow rate, of ethylene- α -olefin copolymers may vary depending on their respective types and contents of α -olefin components.

In addition, the Description describes that the heat-resistant adhesiveness and adhesive strength are not reduced by setting the content and melt flow rate of the α -olefin component in the ethylene- α -olefin copolymer to a specific range ([0009] and [0010]). Even in the case of various ethylene- α -olefin copolymers other than "ethylene-1-octene", it is not clear that the contents and melt flow rates of their respective α -olefin components should be within common specific ranges.

Therefore, in light of the common general technical knowledge at the time of application, it is not recognized that the problem of the present invention can be solved by specifying only the "ethylene- α -olefin copolymer." The content disclosed in the Description of the Patent cannot be enlarged or generalized to the extent of Invention 1.

Furthermore, the same also applies to Inventions 3 and 4, which depend from Invention 1.

D. The content of propylene with respect to ethylene- α -olefin copolymer

In the Description of the Patent, paragraph [0017] describes that "the content of propylene in the hot melt adhesive is preferably 25 to 400 parts by weight, more preferably 30 to 350 parts by weight, and particularly preferably 80 to 120 parts by weight with respect to 100 parts by weight of the ethylene- α -olefin copolymer." In Examples, there is a description about the case where polypropylene A is 33 to 300 parts by weight with respect to 100 parts by weight of an ethylene-1-octene copolymer provided as an ethylene- α -olefin copolymer.

On the other hand, Invention 1 does not specify the content of propylene with

respect to the ethylene- α -olefin copolymer.

However, even if the Detailed Description of the Invention is taken into consideration, there is no description that the problem of the present invention can be solved regardless of the content of propylene with respect to the ethylene- α -olefin copolymer. Rather, paragraph [0017] describes that "If the content of propylene in the hot melt adhesive is too small, the heat creep resistance of the hot melt adhesive may be reduced. In addition, if the content of propylene in the hot melt adhesive is excessive, the flexibility of the cured product of the hot melt adhesive is reduced. Thus, there is a possibility that the adhesive strength of the cured product of the hot melt adhesive may be reduced in a low temperature environment." Therefore, it can be said that the above problem of the Invention cannot be solved depending on the content of propylene.

Therefore, it is not recognized that the problem of the present invention can be solved by specifying only that propylene is contained. The content disclosed in the Description of the Patent cannot be enlarged or generalized to the extent of Invention 1.

Furthermore, the same also applies to Inventions 2 to 4, which depend from Invention 1.

4. Regarding Reason 4

Regarding both the matter specifying the invention, "a polypropylene having a softening point of 80 to 100°C" recited in Claim 1 of the Patent, and the matter specifying the invention, "a polypropylene is contained in an amount of 25 to 400 parts by weight with respect to 100 parts by weight of an ethylene- α -olefin copolymer" recited in Claim 3, which directly depends from Claim 1, Claim 3 is not specifically stated as, for example, "the polypropylene is contained in an amount of 25 to 400 parts," and therefore the relationship between "a polypropylene having a softening point of 80 to 100°C" of Claim 1 and "polypropylene" of Claim 3 is not clear.

Then, regarding the "polypropylene" recited in Claim 3 and described in paragraph 0017 of the Description of the Patent,

it is not clear whether the "polypropylene" means the wording "a polypropylene having a softening point of 80 to 100°C" in Claim 1 above or "all polypropylenes with unlimited softening points (i.e., also including polypropylenes with softening points below 80°C and above 101°C)."

Therefore, the statements of Claims 1 and 3 and claims, which depend therefrom, of the Patent do not comply with Article 36(6)(ii) of the Patent Act because the invention for which a patent is sought is not clear.

Regarding the allegation that "it is considered that the term 'polypropylene' in

paragraphs [0015] to [0017] of the Description of the Patent is clearly 'a polypropylene having a softening point of 80 to 100°C' in paragraph [0014] of the Description of the Patent served as a precondition" in the Written Opinion dated March 7, 2019, pages 3 to 4, paragraph [0014] of the Description of the Patent describes that "the hot melt adhesive of the present invention contains a polypropylene having a softening point of 80 to 100°C" but does not describe that, for example, "the adhesive of the present invention contains only a polypropylene having a softening point of 80 to 100°C as polypropylene." Thus, even if the descriptions in the whole Description including the descriptions in paragraphs 0014 to 0017 of the Description of the Patent are combined, it cannot be understood that "polypropylene" recited in Claim 3 of the Patent and paragraph 0017 of the Description of the Patent uniquely means "a polypropylene having a softening point of 80 to 100°C".

No. 7 Closing

As stated above, the patent for Inventions 1 to 4 has been granted for a patent application that violates the provisions of Article 29 and Article 29-2 of the Patent Act, and shall be revoked under the provisions of Article 113(2) of the Patent Act.

In addition, the patent for Inventions 1 to 4 has been granted for a patent application that does not meet the requirement stipulated in Article 36(6) of the Patent Act, and shall be revoked under the provisions of Article 113(4) of the Patent Act.

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

October 8, 2019

Chief administrative judge: FU Administrative judge: KIMUR Administrative judge: AM

FUJI, Yoshihiro KIMURA, Toshiyasu AMANO, Hiroki