DESCRIPTION

TITLE OF INVENTION: PROCESSING AID, THERMOPLASTIC RESIN COMPOSITION, AND FILM, AND PRODUCTION METHOD THEREOF

TECHNICAL FIELD

[0001]

The disclosure relates to processing aids, thermoplastic resin compositions, and films, as well as production methods thereof.

BACKGROUND ART

[0002]

In processing of melt-fabricable thermoplastic resin, rapid extrusion is required to achieve improved productivity and low cost. Still, melt-fabricable thermoplastic resin compositions inevitably have a critical shear rate and extrusion at a rate higher than this critical shear rate causes a rough surface called melt fracture, resulting in a failure in providing a good molded article.

[0003]

Patent Literature 1, for example, proposes a technique of improving the processibility of thermoplastic resin, specifically use of a predetermined amount of ethylene-vinyl alcohol copolymer. However, the effects thereof are insufficient.

CITATION LIST

- Patent Literature

[0004]

Patent Literature 1: JP H1-215840 A

SUMMARY

- Technical Problem

the thermoplastic resin composition according to any one of the disclosures (12) to (16), including a mixing step and an ejecting step.

[0025]

The disclosure (20) relates to a method for producing the film according to the disclosure (17), including a molding step.

[0025a]

In an aspect, the disclosure provides a processing aid, which is for extrusion molding, comprising an ethylene-vinyl alcohol copolymer,

the processing aid having a water content of 0.3% by mass or less,

wherein the processing aid is a masterbatch further comprising a thermoplastic resin (A).

[0025b]

In another aspect, the disclosure provides a thermoplastic resin composition comprising:

the processing aid, which is for extrusion molding, as described herein, and

a thermoplastic resin (B).

[0025c]

In another aspect, the disclosure provides a thermoplastic resin composition comprising:

a processing aid, which is for extrusion molding, and

a thermoplastic resin (B),

wherein the processing aid comprises an ethylene-vinyl alcohol copolymer,

wherein the processing aid has a water content of 0.3% by mass or less,

wherein the ethylene-vinyl alcohol copolymer is contained in an amount of 0.001 to 2% by mass.

[0025d]

In another aspect, the disclosure provides a film comprising the thermoplastic resin composition as described herein.

- Advantageous Effects

[0026]

The disclosure can improve the processibility of thermoplastic resin.

DESCRIPTION OF EMBODIMENTS

[0027]

The disclosure will be specifically described hereinbelow.

[0028]

<Processing aid>

The processing aid of the disclosure contains an ethylene-vinyl alcohol copolymer (EVOH) and has a water content of 0.3% by mass or less.

[0029]

As later described in EXAMPLES, adding an ethylene-vinyl alcohol copolymer to a thermoplastic resin during processing improves the state of melt fracture but tends to lower pressure stability compared to when no ethylene-vinyl alcohol copolymer is added. In contrast, the processing aid of the disclosure can improve pressure stability to a good level while improving the state of melt fracture.

[0030]

The ethylene-vinyl alcohol copolymer has a melt flow rate (MFR) of preferably 0.001 g/10 min or higher, more preferably 0.1 g/10 min or higher, still more preferably 0.5 g/10 min or higher, further preferably 1.5 g/10 min or

CLAIMS

Claim 1. A processing aid, which is for extrusion molding, comprising an ethylene-vinyl alcohol copolymer,

the processing aid having a water content of 0.3% by mass or less,

wherein the processing aid is a masterbatch further comprising a thermoplastic resin (A).

Claim 2. The processing aid, which is for extrusion molding, according to claim 1,

wherein the ethylene-vinyl alcohol copolymer has a melt flow rate of 50 g/10 min or lower at 190°C and a 2.16 kgf load.

Claim 3. The processing aid, which is for extrusion molding, according to claim 1 or 2,

wherein the ethylene-vinyl alcohol copolymer has an ethylene content of 5 to 50 mol%.

Claim 4. The processing aid, which is for extrusion molding, according to any one of claims 1 to 3,

wherein the ethylene-vinyl alcohol copolymer has a melt flow rate of 1.5 g/10 min or higher and 50 g/10 min or lower at 190°C and a 2.16 kgf load, and

the ethylene-vinyl alcohol copolymer has an ethylene content of 32 to 48 mol%.

Claim 5. The processing aid, which is for extrusion molding, according to any one of claims 1 to 4,

wherein the thermoplastic resin (A) includes a polyolefin resin, preferably polyethylene.

Claim 6. The processing aid, which is for extrusion molding, according to any one of claims 1 to 5,

wherein the thermoplastic resin (A) and the ethylene-vinyl alcohol copolymer have a mass ratio (thermoplastic resin (A):ethylene-vinyl alcohol copolymer) of 99:1 to 40:60.

Claim 7. The processing aid, which is for extrusion molding, according to any one of claims 1 to 6,

wherein the thermoplastic resin (A) includes at least one selected from the group consisting of low-density polyethylene, metallocene-catalyzed linear low-density polyethylene, and Ziegler-Natta-catalyzed low-density polyethylene, and

the thermoplastic resin (A) and the ethylene-vinyl alcohol copolymer have a mass ratio (thermoplastic resin (A):ethylene-vinyl alcohol copolymer) of 93:7 to 25:75.

Claim 8. The processing aid, which is for extrusion molding, according to any one of claims 1 to 7,

wherein the processing aid is substantially free from fluorine.

Claim 9. The processing aid, which is for extrusion molding, according to any one of claims 1 to 7,

wherein the processing aid has a melt flow rate of 0.01 to 100 g/10 min at 190°C and a 2.16 kgf load.

Claim 10. A thermoplastic resin composition comprising:

the processing aid, which is for extrusion molding, according to any one of claims 1 to 9, and

a thermoplastic resin (B).

Claim 11. A thermoplastic resin composition

comprising:

a processing aid, which is for extrusion molding, and a thermoplastic resin (B),

wherein the processing aid comprises an ethylene-vinyl alcohol copolymer,

wherein the processing aid has a water content of 0.3% by mass or less,

wherein the ethylene-vinyl alcohol copolymer is contained in an amount of 0.001 to 2% by mass.

Claim 12. The thermoplastic resin composition according to claim 10 or 11,

wherein the thermoplastic resin (B) includes a polyolefin resin, preferably polyethylene.

Claim 13. The thermoplastic resin composition according to claim 10,

wherein the ethylene-vinyl alcohol copolymer is contained in an amount of 0.001 to 2% by mass.

Claim 14. The thermoplastic resin composition according to any one of claims 10 to 13,

wherein the thermoplastic resin (B) includes at least one selected from the group consisting of metallocene-catalyzed linear low-density polyethylene and Ziegler-Natta-catalyzed low-density polyethylene, and

the ethylene-vinyl alcohol copolymer is contained in an amount of 0.04 to 0.2% by mass.

Claim 15. A film comprising the thermoplastic resin composition according to any one of claims 10 to 14.