Title of the Invention: FILM AND METHOD OF MANUFACTURING FLUORORESIN COMPOSITION

Technical Field

[0001]

The present invention relates to a film and a method of manufacturing a fluororesin composition, and more specifically relates to a film having excellent weatherability and a method of manufacturing a fluororesin composition used for manufacturing such film.

Background Art

[0002]

Various surface protection films have been developed so far. Each surface protection film has a composition or a layer structure suitable for each purpose. For example, Patent Document 1 listed below discloses a surface protection film formed by laminating and integrating a base layer consisting of a thermoplastic resin and an adhesive agent layer, wherein the resin part constituting the adhesive agent layer contains a specific fluorine compound in amount of 0.5 to 5 parts by weight relative to 100 parts by weight of a rubber-based polymer (claim 1). It is described that the surface protection film exhibits good initial close contactness to an adherend and that, after pasting, it can be easily peeled when peeling from the adherend (paragraph 0034).

Citation List

Patent Document

[0003]

Patent Document 1: JP-A 2001-106995

Summary of the ~~Invention~~Disclosure

Technical Problem

[0004]

An electric appliance product mostly should have indication of its quality on the product itself under regulations. The indication may for example be engraved on the surface of a nameplate or a seal pasted on an apparatus. The indication is preferably visible anytime for example over the period of use.

[0005]

However, an indication provided on the surface of an outdoor electric appliance such as an outdoor unit of an air conditioner, which is exposed to sunlight or rain occasionally, readily disappears. A nameplate or seal, on which the indication has been engraved, also tends to be degraded due to sunlight or rain. Accordingly, the present ~~invention~~ disclosure is intended to provide a film having excellent weatherability which allows the indication to be maintained over a prolonged period and/or allows a nameplate or a seal having the indication to be protected over a prolonged period.

[0006]

As a resin having excellent weatherability, a fluororesin can be exemplified. It is further preferable that the weatherability of the fluororesin is further improved. As an additive for improving the weatherability, a photostabilizer is exemplified.

[0007]

Nevertheless, the photostabilizer is sparingly dispersed in the fluororesin, and it was difficult to obtain a photostabilizer-containing fluororesin composition suitable for constituting a film layer.

Solution to Problem

[0008]

The inventors of the present ~~invention~~ disclosure have found that it becomes possible to

disperse a photostabilizer uniformly in a fluororesin by a specific technique. As a result, it became possible to manufacture a film having a fluororesin layer which contains a photostabilizer.

[0008a]

In one aspect, there is provided a film comprising:

a base layer formed of a thermoplastic resin, and

a fluororesin layer laminated to one face of the base layer,

wherein the fluororesin layer is one layer consisting of a cured product of one fluororesin composition containing a tetrafluoroethylene polymer, a curing agent and a photostabilizer, and, only the one layer is laminated to the one face of the base layer, and

a tetrafluoroethylene resin content in the fluororesin layer, relative to the total mass of the fluororesin, is 80% by mass or more, and the photostabilizer comprises a triazine-based ultraviolet absorber.

[0009]

Thus, the present ~~invention~~ disclosure provides a film comprising a base layer formed of a thermoplastic resin, and a fluororesin layer laminated to one face of the base layer, wherein the fluororesin layer comprises a tetrafluoroethylene resin and a photostabilizer.

The photostabilizer is any single compound or a combination of two or more compounds selected from the group consisting of triazine-based ultraviolet absorber, benzotriazole-based ultraviolet absorber, benzophenone-based ultraviolet absorber and hindered amine-based photostabilizer.

The thermoplastic resin may be a polyester-based resin.

The film may be transparent.

The film may further comprise an adhesive layer laminated to the other face of the base layer.

The adhesive layer may be formed of an acrylic resin composition.

A separator may be laminated to the face opposite to the face in contact with the base layer, among two faces of the adhesive layer,.

The film may be one for outdoor use.

The film may be used for covering a face having letters or patterns formed thereon.

The face is a metal face or resin face.

[0009a]

In another aspect, there is provided a method of manufacturing a transparent film comprising:

a dissolving step in which a photostabilizer is dissolved in any single solvent or a solvent mixture of two or more selected from the group consisting of an ester-based solvent, a ketone-based solvent and an aromatic solvent thereby obtaining a solution, and

a mixing step in which the solution is mixed with a tetrafluoroethylene polymer to obtain a fluororesin composition, and

a curing step in which the fluororesin composition is applied to a base layer and cured.

[0010]

Also the present ~~invention~~ disclosure provides a method of manufacturing a fluororesin composition, wherein the method comprises a dissolving step in which a photostabilizer

is dissolved in an ester-based, ketone-based or aromatic solvent thereby obtaining a solution, and a mixing step in which the solution is mixed with a tetrafluoroethylene polymer.

Advantageous Effects of ~~Invention~~Disclosure

[0011]

According to the present ~~invention~~disclosure, a film having excellent weatherability can be obtained. The film allows an indication provided on the surface for example of an electric appliance for outdoor use to be maintained over a prolonged period.

The effect of the ~~invention~~ disclosure is not necessarily limited to that described in this paragraph and may be any of the effect described in the present specification.

Brief Description of Drawings

[0012]

Fig. 1 is a view showing an example of the structure of a film of the present invention.

Fig. 2 is a view showing the results of evaluation of weatherability.

Fig. 3 is a view showing the results of evaluation of weatherability.

Description of Embodiments

[0013]

Embodiments for carrying out the present invention will now be described in detail. Embodiments described below are merely examples of typical embodiments of the present invention, and the present invention is not limited to these embodiments.

[0014]

1. Film

[0015]

A film of the present invention comprises at least a base layer formed of a

CLAIMS

[Claim 1]

A film comprising:

a base layer formed of a thermoplastic resin, and

a fluororesin layer laminated to one face of the base layer,

wherein the fluororesin layer is one layer consisting of a cured product of one fluororesin composition containing a tetrafluoroethylene polymer, a curing agent and a photostabilizer, and, only the one layer is laminated to the one face of the base layer, and

a tetrafluoroethylene resin content in the fluororesin layer, relative to the total mass of the fluororesin, is 80% by mass or more, and the photostabilizer comprises a triazine-based ultraviolet absorber.

~~the fluororesin layer comprises a tetrafluoroethylene resin and a photostabilizer~~

~~[Claim 2]~~

~~The film according to claim 1, wherein the photostabilizer is any single compound or a combination of two or more compounds selected from the group consisting of triazine-based ultraviolet absorber, benzotriazole-based ultraviolet absorber, benzophenone-based ultraviolet absorber and hindered amine-based photostabilizer.~~

[Claim ~~3~~2]

The film according to claim 1 ~~or 2~~, wherein the thermoplastic resin is a polyester-based resin.

[Claim ~~4~~3]

The film according to ~~any one of~~ claim~~s~~ 1 or 2~~to 3~~, wherein the film is transparent.

[Claim ~~5~~4]

The film according to any one of claims 1 to 34, further comprising an adhesive layer laminated to the other face of the base layer.

[Claim ~~6~~5]

The film according to claim ~~4~~5, wherein the adhesive layer is formed of an acrylic resin composition.

[Claim ~~7~~6]

The film according to claim ~~4~~5 or ~~5~~6, wherein a separator is laminated to the face, among two faces of the adhesive layer, which is opposite to the face in contact with the base layer.

[Claim ~~8~~7]

The film according to any one of claims 1 to ~~6~~7, wherein the film is for outdoor use.

[Claim ~~9~~8]

The film according to any one of claims 1 to ~~7~~8, wherein the film is used for covering a face having letters or patterns formed thereon.

[Claim ~~10~~9]

The film according to claim ~~8~~9, wherein the face is a metal face or a resin face.

[Claim ~~11~~10]

A method of manufacturing a transparent film~~fluororesin composition~~ comprising:

a dissolving step in which a photostabilizer is dissolved in any single solvent or a solvent mixture of two or more selected from the group consisting of an ester-based solvent, a ketone-based solvent and an aromatic solvent thereby obtaining a solution, and

a mixing step in which the solution is mixed with a tetrafluoroethylene polymer to obtain a fluororesin composition, and

a curing step in which the fluororesin composition is applied to a base layer and cured.