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(54) Packaging material for photosensitive materials.

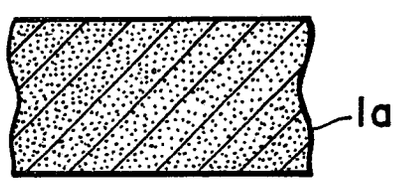
(57) A packaging material for photosensitive materials which comprises a single layer polyolefin resin light-shielding film comprising 0.5 to 40 wt. % of polyethylene resin having a melt index of 0.6 to 15 g/10 minutes and a density of 0.931 to 0.965 g/cm^3, more than 40 wt. % of linear low density polyethylene resin having a melt index of 0.6 to 10 g/10 minutes and a density of 0.919 to 0.930 g/cm^3, 0.1 to 20 wt. % of carbon black, more than 0.01 wt. % of fatty acid compound and 0.01 to 2 wt. % of antioxidant.

A packaging material for photosensitive materials which is a coextruded multilayer inflation film of which the inner surface layer is a polyolefin resin film layer to which 0.5 to 70 wt. % of polyethylene resin having a density of more than 0.936 g/cm^3.

A packaging material for photographic photosensitive materials which comprises an aluminum vacuum metalllized biaxially stretched thermoplastic resin film layer, a long fiber paper layer, of which more than 50 % of the fibers have a fiber length of longer than 3 mm, containing a paper reinforcing agent and having a cool water-extracting pH of 4 to 9, laminated on one side of the above thermoplastic resin film layer, and a polyolefin resin film layer containing 0.1 to 15 wt. % of carbon black having a pH of 4 to 9 and a mean particle size of 15 to 80 mμ and more than 5 wt. % of an ethylene copolymer resin laminated on the other side.

EP 0 326 181 A2

FIG. 1



PACKAGING MATERIAL FOR PHOTOSENSITIVE MATERIALS

BACKGROUND OF THE INVENTION

Field of the Invention

This invention relates to packaging materials for photosensitive materials.

Description of the Prior Art

Packaging bags capable of shielding completely from light are used for packaging the articles or the materials which lose commercial values by exposing to light, such as photosensitive materials. The packaging bags are necessary to have sufficient physical strength, such as tensile strength, tear strength and impact puncture strength, according to the size and weight of the materials to be packaged, as well as the above light-shielding ability. Moreover, since the opening portion of the packaging bags are usually heat-sealed, suitable heat sealing properties are necessary, and in order to prevent static electrification due to the friction between the photosensitive materials and the packaging bag, antistatic property is also necessary.

Heretofore, as the packaging materials used for such a packaging bag, there is a laminated film composed of a high pressure branched low density polyethylene (LDPE) resin film layer containing a light-shielding material, an aluminum foil layer and a breached kraft paper layer laminated successively each through an LDPE resin extrusion adhesive layer. In general, single layer films are difficult to satisfy the various properties required as the packaging material for photographic photosensitive materials, and only a thick light-shielding LDPE resin single layer film containing carbon black was used for packaging light low photosensitivity photographic photosensitive materials placed in protective pad papers and for packaging light photographic printing papers.

As the packaging material, particularly the light-shielding heat seal bag, for packaging a roll of a photographic photosensitive material and sheets of a photosensitive material having a weight of heavier than 1 kg, the inventor has already disclosed the laminated film composed of a cross laminated film using uniaxially stretched high density polyethylene (HDPE) resin films having a great physical strength and a LDPE resin film containing at least either a light-shielding material or an antistatic agent (USP 4,147,291). The inventor has also disclosed an inexpensive cross laminated film where heat sealing properties and light-shielding ability are improved (USP 4,258,848).

Furthermore, the inventor has disclosed other packaging materials, composed of a laminated film containing a light-shielding film layer composed of linear low density polyethylene (L-LDPE) resin blended with carbon black, having a great physical strength, being excellent in heat sealing properties, and being inexpensive (USP 4,701,359, Japanese Patent KOKAI No. 18547/1987). As a packaging material using a metallized film, the inventor has also disclosed a packaging material for photosensitive materials composed of a metallized film layer and two L-LDPE resin polymer layers containing more than 50 wt. % of L-LDPE resin laminated on both sides of the metallized film layer. One or both of the L-LDPE resin polymer layers contains 0.3 to 30 wt. % of a light-shielding material (USP 4,663,218).

However, the aforementioned conventional laminated film composed of the LDPE resin film layer, the aluminum foil layer and the bleached kraft paper layer is thick and stiff, and therefore, packaging workability is inferior. Physical strength, such as tear strength, is small, and curling is great. Moreover, heat sealing properties are inferior, and it is expensive. As a result, the packaging material was difficult to secure light-shielding, moistureproofness and gas barrier because of the generation of dust, puncture, tear or separation of heat sealed portion during packaging work or transportation. In the case of the thick light-shielding LDPE resin single layer film, physical strengh is small, and heat sealing properties are inferior. Therefore, it is difficult to secure the quality of the photosensitive materials completely.

The packaging materials having a corss laminated film disclosed in USP 4,147,291 and USP 4,258,848 have a strong physical strength such as tear strength and tensile strength, and they were put to practical use for packaging weight materials up to recently. However, since an uniaxially stretched HDPE resin film is used as the heat seal layer, they are stiff, and inferior in packaging workability and heat sealing properties.

Moreover, the physical strength and heat seal strength varies and curling occurs due to the uneven thickness of an adhesive layer, the uneven draw ratio of the uniaxially stretched HDPE resin films, or the like. Therefore, troubles occurred in processing or packaging process, and occasionally, they were punctured, or the heat sealed portion was separated during transportation. Moreover, the cross laminated film where a longitudinally uniaxially stretched film was laminated to a laterally uniaxially stretched film so that their orientation axes were crossed each other was expensive, because two kinds of film molding machines were necessary.

Since the packaging materials having a light-shielding L-LDPE resin single layer film disclosed in USP 4,701,359 or Japanese Patent KOKAI No. 18547/1987 are inexpensive and excellent in heat sealing properties and physical strength such as tear strength and impact puncture strength, they are excellent as the packaging material for photosensitive materials. However, in the case of packaging a weight photosensitive material or a photosensitive material having sharp edges, the light-shielding L-LDPE resin films were occasionally elongated and made thin due to their low Young's modulus, though they were not punctured nor torn. In this case, light-shielding and moistureproofness cannot be secured sufficiently. In addition, in the case of using a L-LDPE resin having a density of less than 0.925 g/cm^3, slipping character was insufficient, and blocking was liable to occur. In the packaging material disclosed in USP 4,663,218, physical strength such as tear strength was improved. However, when a light-shielding material was incorporated into one side of the L-LDPE resin polymer layer alone, curling was great, and processibility was inferior. While, when the melting point of both L-LDPE resin polymer layers were almost indentical with each other, the outside layer was melted and broken, unless the heat sealer was modified. As a result, pinhole occurred, and strength was decreased. Appearance was also inferior. Therfore, this packaging material was put to practical use as a laminated film laminated with an aluminum vacuum deposited nylon film or polyester film having a large Young's modulus and heat resistance. However, the curling of the laminated film was great, and the aluminum vacuum deposited nylon film and polyester film were expensive.

The inventor has also developed a coextruded multilayer inflation film comprising an L-LDPE resin film layer and a polyolefin resin film layer, as a film improved in physical strength such as impact puncture strength (Japanese Patent KOKAI No. 62-18548). Such a coextruded multilayer inflation film is formed by using an inflation film molding machine, such as shown in Figure 7. The inflation film molding machine is composed of extruders 8 heating and kneading the resin, ring die 9 extruding the molten resin from the slit (not indicated) into tube-shaped, blast tube 10 blowing compressed air, air ring 11 cooling the molten resin extruded in tube-shaped, guide rollers 12 guiding the tube-shaped resin film 13, guide plates 14 guiding the tube-shaped resin film 13 into flat, a pair of squeeze roll 15 (nip roll) nipping to attract the tube-shaped resin film 13, and winder 16 winding the film. When the aforementioned coextruded multilayer inflation film composed of an L-LDPE resin film layer and a polyolefin resin film layer is molded by using the inflation film molding machine, L-LDPE resin and HDPE resin having prescribed compositions respectively are melted and kneaded by the extruders 8 and extruded from the circular slit of the ring die 9 so that the L-LDPE resin film layer is disposed on the inside, i.e. the HDPE resin film layer is disposed on the outside. At that time, compressed air is blown from the blast tube 10, and cooling air is blown from the air ring 11. The tube-shaped resin film 13 having a prescribed diameter thus formed ascends with the guide of the guide rollers 12, ..., 12, and is led into flat by the guide plates 14. The film is made sheet shape by passing the squeeze roll 15, and wound with the winder 16.

However, in the above inflation film molding process wherein the L-LDPE resin film layer was disposed on the inside and the HDPE resin film layer was disposed on the outside, there was a problem that the L-LDPE resin film layer was contacted with each other to generate blocking at the time of winding it with the winder 16. Moreover, fatty acid or fatty acid compound such as fatty acid amide, paraffin wax or metal salt of fatty acid was added to the HDPE resin film layer in order to improve film moldability or to render halogen compounds harmless, the additive was exposed out of the HDPE resin film layer, and adhered to the guide rollers 12 resulting pressure mark and abrasion of the film 13. The adhered additive was detached from the guide rollers 12, adhered to the film in white lumps. When the film was wound, the white lumps rendered film rupture as well as pressure mark to the film. On the other hand, when the L-LDPE resin film layer was disposed on the outside and the HDPE resin film was disposed on the inside, wrinkling and furrows occurred, and the yield of the film decreased.

On the other hand, as the packaging bag for relatively heavy large photographic photosensitive materials, double-sheet bags were used. Such a double-sheet bag was, for example, composed of an outer sheet consisting of a Clupak paper, Duostress paper or unbleached kraft paper coated with polyethylene resin by extrusion laminating and an inner sheet consisting of an aluminum foil and two uniform polyethylene resin films containing carbon black laminated on both sides of the aluminum foil. The kind of

the packaged product, instructions and the like were printed on the outer surface of the outer sheet during the packaging process or another process. The double-sheet bag is excellent in physical strength, and when the paper of the outer sheet contains a substance harmful for photographic photosensitive materials, its affect can be shielded by the inner sheet being in contact with the photographic photosensitive materials. However, the double-sheet bags have problems in inferior workability and in expensive packaging material cost. Therefore, various laminated films were developed for solving the inconvenience in bag-making process to make the bag double. An example of the laminated film shown in Figure 15 is composed of an aluminum foil layer 27, a bleached kraft paper layer 26 mainly composed of bleached kraft pulp and an LDPE resin film layer 28a blended with a light-shielding material laminated on both sides of the aluminum foil layer 27 each through an adhesive layer 3. When a bag is made, the bleached kraft paper layer 26 is disposed on the outside, i.e. the LDPE resin film layer 28a is disposed on the inside. The physical strength of the laminated film is sufficient in the case of light photographic photosensitive materials, but it is insufficient for packaging heavy photographic photosensitive materials. Moreover, fibers occasionally adhered to the packaged photographic photosensitive materials, and caused developing troubles. Photographic photosensitive materials are liable to deteriorate because of utilizing oxidation-reduction reaction and containing a dye liable to degrade by pH, moisture, heat or the like. Therefore, even in the case that it was necessary to use an oxidizing or reducing substance for the surface of the packaging material to touch photographic photosensitive materials, the oxidizing or reducing substance was restricted in the kind and the blending amount. Moreover, unless the quality of the light-shielding material was limited in the particle size, pH, the content of impurities and the like, photographic troubles, such as fogging, spotting trouble and photosensitivity variation, occurred.

SUMMARY OF THE INVENTION

An object of the invention is to provide a packaging material for photosensitive materials excellent in physical strength, in little occurrence of blocking, curling and lump generation, and particularly in heat sealing properties, in spite of single layer film.

Another object of the invention is to provide a packaging material for photosensitive materials having the safty in photographic properties and capable of securing the quality of the photosensitive materials by using it as the inner surface layer, in the case of a laminated film.

Another object of the invention is to provide a packaging material for photosensitive materials excellent in the insertion of the photosensitive materials in the case of making a tube-shaped bag, and capable of providing inexpensive moistureproof light-shielding bag sesily.

Such objects have been achieved by a packaging material for photosensitive materials which comprises a single layer polyolefin resin light-shielding film comprising 0.5 to 40 wt. % of polyethylene resin having a melt index of 0.6 to 15 g/10 minutes and a density of 0.931 to 0.965 g/cm^3, more than 40 wt. % of linear low density polyethylene resin having a melt index of 0.6 to 10 g/10 minutes and a density of 0.919 to 0.930 g/cm^3, 0.1 to 20 wt. % of carbon black, more than 0.01 wt. % of fatty acid compound and 0.01 to 2 wt. % of antioxidant. In the above packaging material for photosensitive materials, since the composition of the polyolefin resin light-shielding film is a particular resin composition where a L-LDPE resin and a polyethylene resin having particular characteristics respectively are combined, the polyethylene resin compensates and further improves the defective properties of the L-LDPE resin with securing the advantageous properties thereof. Moreover, it has been found that the resin composition increases the haze of film and raises the light-shielding ability by more than 10 % That is, it has been found that, when more than 10 % of the blending amount of carbon black is decreased, almost the same light-shielding ability can be secured.

Still another object of the invention is to provide a packaging material for photosensitive materials which is a coextruded multilayer inflation film without the occurrence of blocking between the inner layers, pressure mark, abrasion, puncture, wrinkling nor furrowing.

Such an object has been achieved by a coextruded multilayer inflation film of which the inner surface layer is a polyolefin resin film layer to which 0.5 to 70 wt. % of polyethylene resin having a density of more than 0.936 g/cm^3.

Still another object of the invention is to provide a packaging material for photographic photosensitive materials having sufficient physical strength for packaging heavy photographic photosensitive materials and little problem in developing trouble.

Another object of the invention is to provide a packaging material for photographic photosensitive materials not affecting adversely the photographic photosensitive materials packaged therein and being

inexpensive.

Such objects have been achieved by a packaging material for photographic photosensitive materials which comprises an aluminum vacuum metallized biaxially stretched thermoplastic resin film layer, a long fiber paper layer, of which more than 50 % of the fibers have a fiber length of longer than 3 mm, containing a paper reinforcing agent and having a pH of 4 to 9 measured by cool water extracting method (JIS P-8133) laminated on one side of the above thermoplastic resin film layer, and a polyolefin resin film layer containing 0.1 to 15 wt. % of carbon black having a pH of 4 to 9 and a mean particle size of 15 to 80 mμ and more than 5 wt. of an ethylene copolymer resin laminated on the other side.

BRIEF DESCRIPTION OF THE DRAWINGS

Figures 1 to 3 are partially sectional views of preferred embodiment of the invention.

Figures 4 and 5 are partially sectional views of comparative packaging materials.

Figure 6 is a partially sectional view of a conventional packaging material.

Figure 7 is a schematic front view of an inflation molding machine.

Figure 8 is an enlarged sectional view of an inflation film of the invention at position A of Figure 7, and Figure 9 is an enlarged sectional view of the inflation film at position B of Figure 7.

Figures 10 to 13 are partially sectional views of preferred embodiment of the invention.

Figure 14 is a partially sectional view of a comparative packaging material.

Figure 15 is a partially sectional view of a conventional packaging material.

DETAILED DESCRIPTION OF THE INVENTION

The polyethylene resin of the single layer polyolefin resin light-shielding film has a melt index (HI, ASTM D-1238) of 0.6 to 15 g/10 minutes, preferably 1 to 5 g/10 minutes, and a density (ASTM D-1505) of 0.931 to 0.965 g/cm^3, preferably 0.941 to 0.958 g/cm^3. When the MI is less than 0.6 g/10 minutes, film moldability is inferior. Moreover, molecular orientation is liable to occur greatly in longitudinal direction, and a film having a good balance between the physical strength in longitudinal direction and that in lateral direction is difficult to be produced. Lumps are liable to be generated, and damage the photosensitive materials packaged. While, when the MI is beyond 15 g/10 minutes, physical strength decreases. Young's modulus and tensile strength are small, and film moldability is inferior. When the density is less than 0.931 g/cm^3, it is difficult to obtain a high Young's modulus polyolefin resin light-shielding film excellent in antiblocking ability. While, when the density is beyond 0.965 g/cm^3, film moldability is inferior. Moreover, molecular orientation is liable to occur greatly in longitudinal direction, and a film having a good balance between the physical strength in longitudinal direction and that in lateral direction is difficult to be produced.

Lumps are liable to be generated to damage the photosensitive materials packaged, and nevertheless, it is expensive. The polyethylene resin content of the light-shielding film is 0.5 to 40 wt. %. When the content is less than 0.5 wt. %, the disadvantages of L-LDPE resin such as low Young's modulus, low tensile strength, blocking problem and insufficient slipping character cannot be compensated. Besides, film moldability is inferior, and draw down occurs. Bubble stability is also insufficient. Even though film is formed, bag-making ability of the film is inferior because of blocking and deviated elongation due to insufficient tensile strength. While, when the content is beyond 40 wt. %, tear strength is small. The balance between the tear strength in longitudinal direction and that in lateral direction is inferior, and the bag made of the packaging material of the invention is punctured. Various physical properties and heat sealing properties becomes worse by blending carbon black, contrary to the case of the present invention. Lumps are liable to be generated, and adversely affect the photosensitive materials packaged, as well as the appearance of the packaging material is inferior.

The L-LDPE resin of the single layer polyolefin resin light-shielding film has a MI (ASTM D-1238) of 0.6 to 10 g/10 minutes and a density (ASTM D-1505) of 0.919 to 0.930 g/cm^3. When the MI is less than 0.6, since the fluidity of the resin is insufficient, film moldability is inferior. While, when the MI is beyond 10 g/10 minutes, physical strength decreases. Tear strength and impact puncture strength are insufficient, and blocking is liable to occur. When the density is less than 0.919 g/cm^3, Young's modulus and tensile strength are small. When blocking occurs, it is difficult to obtain a film capable of achieving the object of the invention by a single layer film alone. While, when the density is beyond 0.930 g/cm^3, molecular orientation

is liable to occur in longitudinal direction, and the balance between the physical strength in longitudinal direction and in lateral direction becomes worse. Particularly, anti-pinhole ability is insufficient, and the film is difficult to be put to practical use as a single layer film for heavy materials. The L-LDPE resin is called third polyethylene resin, and it is a low cost high strength resin, having the advantages of both low, medium density polyethylene resin and high density polyethylene resin, which meets the requirements, i.e. resource conservation and energy conservation, of the times. The L-LDPE resin is a copolymer of ethylene and α-olefin, and it has a linear structure having short branches. The number of carbon atoms of the α-olefin is 3 to 13. Preferable α-olefin has a number of carbon atoms of 4 to 10, and examples of the α-olefin are butene-1, 4-methylpentene- 1, hexene-1 and heptene-1. The density is usually in the range of 0.87 to 0.95 g/cm^3. Most of the L-LDPE resin is synthetic by low pressure method, and partly synthetic by modified high pressure method. Examples of commercial L-LDPE resin are "G-Resin" and "TUFLIN" and "NUC-FLX" (UUC), "NUC Polyethylene-LL" and "TUFTHENE" (Nippon Unicar) "Excelene V" (Sumitomo Chemical) "Idemitsu Polyethylene-L" and "Moretec" (Idemitsu Petrochemical), "Dowlex" (Dow Chemical), "Suclear" (Dupont de Nemour, Canada), "Marlex" (Phillips), "Neozex" and "Ultzex" (Mitsui Petrochemical Industries), "Nisseki Linirex" (Nippon Petrochemicals), "Stamilex" (DSM), and the like. The L-LDPE resin content of the light-shielding film is more than 40 wt. %, preferably more than 70 wt. %. When the content is less than 40 wt. %, the effect to increase the tear strength in longitudinal direction and that in lateral direction is insufficient. Particularly, in the case of a thin single layer film, tear strength, impact puncture strength, anti-pinhole ability and the like are insufficient as a packaging material for photosensitive materials.

The carbon black used for the light-shielding film is blendable or dispersible in the polyolefin resin. It blocks the transmission of visible and ultraviolet rays, and impart light-shielding property to the polyolefin resin film. The carbon black not only improves the tear strength, impact puncture strength and heat sealing properties of the polyolefin resin film, but also functions to prevent the generation of lumps caused by the oxidation of the resin, to prevent blocking, to adsorp harmful substances such as oxidizing substance, reducing substance and metals. Carbon blacks are divided into gas black, lamp blacks vegetable black and animal black according to their origin. Among these, oil furnace carbon black having a mean particle size of less than 200 mμ, particularly less than 50 mμ is preferred in terms of light-shielding character, cost, blendability and dispersibility. On the other hand, since acetylene black, Ketschen carbon black and graphite have antistatic characteristics, they are also preferred, though they are expensive. They may be blended with the oil furnace carbon black in order to improve its character. Suitable pH of carbon black is at 5 to 9, and suitable mean particle size is 10 to 200 mμ. The oil furnace carbon black having a pH 6 to 9 is preferred. By using the carbon black of such pH and particle size, a packaging material having the following merits is obtained. That is, the occurrence of fogging is rare, increase or decrease of photosensitivity rarely happens, light-shielding ability is great, the lumps of carbon black and pinholes such as fish eyes hardly occur, and the physical strength and heat sealing properties are improved. It is also preferred to improve conductivity by adding metal fiber, carbon fiber, metal powder or the like. The carbon black content of the light-shielding film is 0.1 to 20 wt. %, preferably 0.5 to 12 wt. %, further preferably 1.5 to 7 wt. %. When the content is less than 0.1 wt. %, the blending effect, such as to secure light-shielding and to prevent static electrification, is insufficient. While, when the content is beyond 20 wt. %, the physical strength of the film, particularly tear strength and impact puncture strength, decreases, and heat sealing properties are also inferior. Furthermore, the photosensitive materials are contaminated by touching the surface of the film or adhering carbon black released from the film to the photosensitive materials. The blending amount of carbon black per an unit area of the light-shielding film is preferably 0.3 to 50 g/m^2. The blending method of carbon black into the resin may be carried out by a known method such as the compound coloring method (colored pellets), the liquid color method, the dry color method, the dye color granule method and the masterbatch method, and the dye color granule method and the masterbatch method are preferred in view of cost and the contamination of the working place.

The fatty acid compound used for the light-shielding film neutralizes the halide and the like added as the polymerization catalyst of the polyolefin resin which are harmful and adversely affected the photosensitive materials, and thereby makes them harmless. The fatty acid compound improves the dispersibility of carbon black, antiblocking properties, slipping character, and bag-making ability. It also prevents completely the degradation of heat sealing properties by the gradual bleed out of the additives in the polyethylene resin, together with the inhibition by more than 40 wt. % of the L-LDPE resin blended in the resin composition of the invention. The fatty acid compound suitable for the invention includes various saturated or unsaturated fatty acids such as oleic acid, stearic acid, lauric acid, ricinoleic acid, naphthenic acid, octylic acid, phthalic acid, adipic acid, sebacid acid, acetylricinoleic acid and maleic acid, fatty acid amides, such as oleic acid amide, erucic acid amide stearic acid amide and bisfatty acid amides, metal salts of fatty acids, such as magnesium stearate, calcium stearate, zinc stearate, aluminum stearate, barium stearate,

calcium laurate, zinc octylate, and fatty acid esters, such as butyl oleate and bytyl stearate. Two or more fatty acid compounds may be combined. The fatty acid compound content of the light-shielding film is more than 0.01 wt. %, preferably 0.01 to 7 wt. %, more preferably 0.03 to 3.0 wt. %. When the content is less than 0.01 wt. %, the aforementioned effects cannot be obtained. While, since too much content results various troubles, such as the variation of ejection amount by the screw slip of extruder, bleed out problem and degradation of heat sealing properties. When two or more fatty acid compounds are used, the above content is the total amount of them.

The antioxidant used for the light-shielding film inhibits the generation of lumps due to the oxidation of the resin during the film molding continued for a long period, and thereby prevents the occurrence of pressure mark and abrasion due to the lumps, when it is used as a light-shielding bag for packaging photographic photosensitive materials. When a big lump generates, heat seal is incomplete, in addition to the above problems. As a result, light-shielding, moistureproofness and gas barrier are insufficient, and the quality of the photosensitive materials cannot be secured. By combining the antioxidant with carbon black, oxidation inhibition effect is synergistically exhibited. Suitable antioxidants are phenol antioxidants, sulfur-containing antioxidants, phsphorus-containing antioxidants and the like. The phenol antioxidants include n-octadecyl-3-(3′,5′-di-t-butyl-4′-hydroxyphenyl)propionate, 2,6-di-t-butyl-4-methylphenol, 2,6-di-t-butyl-p-cresol, 2,2′methylenebis(4-methyl-6-t-butylphenol), 4,4′-thiobis(3-methyl-6-t-butylphenol), 4,4′-butylidenebis (3-methyl-6-t-butylphenol), stearyl-β-(3,5-di-4-butyl-4-hydroxyphenyl)propionate 1,1,3-tris(2-methyl-4-hydroxy-5-t-butylphenyl)butane, 1,3,5-trimethyl-2,4,6-tris(3,5-di-t-butyl-4-hydroxybenzyl)benzene and tetrakis methylene-3(3′,5′-di-t-butyl-4′-hydroxyphenyl) propionate methane. The sulfur-containing antioxidants include dilauryl-3,3′-thiodipropionate, dimyristyl-3,3′-thiodipropionate, laurylstearylthiodipropionate, distearyl-3,3′-thiodipropionate and ditridecyl-3,3′-thiodipropionate. The phosphorus-containing antioxidants include trinonylphenylphosphite and triphenylphosphite. In addition, there are various antioxidants disclosed in "Plastic Handbook", pp 794-799, Kogyo Chosa Kai, "Plastic Additives Data List", pp 327-329, Kagaku Kogyo Sha and "Plastic Age Encyclopedia, Volume Advance", pp 211-212, Plastic Age, 1986. Preferable antioxidants are phenol antioxidants, such as 2,6-di-t-butyl-p-cresol (BHT), low volatile high molecular weight phenol antioxidant ("Irganox 1010", "Irganox 1076", trade names of Ciba-Geigy AG, "Topanol CA", trade name of I.C.L., "Ionox 330" trade name of Shell), dilaurylthiodipropionate, distearylthiodipropionate and dialkylphosphate. Two or more antioxidants may be combined. In some cases, oxidation inhibition effect is improved by combining antioxidants. Such a combination includes a combination of a phenol oxidant and a phosphorus-containing antioxidant and a combination of a volatile antioxidant and a heat-resistant antioxidant. The antioxidant content of the light-shielding film is 0.01 to 2 wt. %. The tolerance in the antioxidant content greatly varies according to the kind of the photosensitive material.

In the case of the single layer polyolefin resin light-shielding film of the invention, in general, antiblocking agent is not necessary. However, when the light-shielding film contains more than 80 wt. % of L-LDPE resin having a density of 0.919 to 0.925 g/cm^3 in order to improve tear strength, impact puncture strength, low temperature physical strength and the like, the blending of an antioxidant is effective for preventing blocking completely. Suitable antiblocking agents are silica, diatomaceous earth, calcium silicate, aluminum silicate, talc, magnesium silicate, calcium carbonate, higher fatty acid polyvinyl esters, n-octadecyl urea, dicarboxylic acid ester amides and the like.

Various additives may be added to the single layer polyolefin resin light-shielding film of the invention. Examples of the additives are described below.

(1) Plasticizer;

phthalic acid esters, glycol ester, fatty acid ester, phosphoric acid ester, etc.

(2) Stabilizer;

lead compounds, cadmium compounds, zinc compounds, alkaline earth metal compounds, organic tin compounds, etc.

(3) Antistatic agent;

cationic surfactants, anionic surfactants, nonionic surfactans, ampholytic surfactans, various carbon blacks, metal powder, graphite, etc.

(4) Flame retardant;

phosphoric acid esters phosphoric acid ester halides, halides, inorganic materials, polyols containing phosphor, etc.

(5) Filler;

alumina, kaolin, clay, calcium carbonate, mica, talc, titanium dioxide, silica, etc.

(6) Reinforcing agent:

glass lobing, metallic fiber, glass fiber, glass milled fiber, carbon fiber, etc.

(7) Coloring agent;

inorganic pigments (Al, Fe_2O_3, TiO_2, ZnO, Cds, etc.), organic pigments, dyes, etc.

(8) Blowing agent;

inorganic blowing agents (ammonium carbonate, sodium hydrogen carbonate), organic blowing agents (nitroso compounds, azo compounds), etc.

(9) Deterioration preventing agent;

ultraviolet absorber, antioxidant, metal deactivator, peroxide decomposing agent, etc.

(10) Coupling agent;

silane compounds, titanium compounds, chromium compounds, aluminum compounds, etc.

Various thermoplastic resins may be added to the polyolefin resin light-shielding film, such as various polyolefin resins including LDPE resin, MDPE resin, polypropylene resin, propyleneethylene copolymer resin, EVA resin, EMA resin, EEA resin, EAA resin, ionomer resin, ethylene-unsaturated carboxylic acid copolymer resins, various ethylene-alkyl ester copolymer resins and various elastomers.

The single layer polyolefin resin light-shielding film exhibits a great effect in the case of inflation film, and it is suitable as the package for a bulky and heavy cylindrical photosensitive material having a diameter of more than 25 cm and a cylinder length of more than 50 cm, called bulk roll. The light-shielding film is the most effective in the flat bags and gusset bags formed from a cylindrical film molded by inflation process of which the bottom is heat-sealed. On the other hand, both sides of the inflation film may be slit to form sheet-shaped films, and laminated with other flexible sheet(s). The laminated film may be used as a packaging material for silver halide photographic photosensitive materials, because of imparting further excellent properties by the lamination. Nevertheless, the most preferable uses are the packages of the above bulk roll or a magnetic material of pancake, in a shape of a single layer film. When the light-shielding film of the invention is used as a laminated film, the light-shielding film is preferably used as the inner surface layer.

The packaging material of the invention may be used for packaging photosensitive materials such as photographic photosensitive materials, foods, medicines or chemical substances, and it is particularly suitable for packaging silver halide photographic photosensitive materials, diazo photographic photosensitive materials, photofixing-type thermosensitive photosensitive materials, photosensitive resin photosensitive materials, ultraviolet curing-type photosensitive materials, transfer-type heat developing photosensitive materials, direct positive type photographic photosensitive materials, self-developing type photographic photosensitive materials, photosensitive materials for lithographic printing and other photographic materials which is degraded by little amount of moisture, light or gas.

In the single layer polyolefin resin light-shielding film of the invention, since a L-LDPE resin having particular properties is blended in the content of more than 40 wt. % the film is excellent in the balance between the physical strength in longitudinal direction and that in lateral direction, in tear strength and in impact puncture strength. The blending of less than 10 wt. % of carbon black improves tear strength and heat sealing properties contrary to conventional packaging materials for photosensitive materials using LDPE resin or HDPE resin wherein tear strength and heat sealing properties are degraded by blending

carbon black. Oxidation-inhibiting ability is also improved. 0.5 to 40 wt. % of the polyethylene resin having particular properties improves the disadvantages of the above L-LDPE resin, i.e. low Young's modulus, blocking melt fracture and crystallization rate, with securing the above advantages of the L-LDPE resin. Since tensile strength is also improved compared to the L-LDPE resin alone, deviated elongation of the film hardly occurs during molding process. Draw down, wrinkling and furrowing hardly occur, and bubble stability through the inflation molding process is excellent. Melt fracture hardly occurs, and the molded film is excellent in smoothness. The above combination of the L-LDPE resin and the polyethylene resin increases, and thereby, the amount of the light-shielding material can be saved by more than 10 %. Since an antioxidant and a fatty acid compound are used, the dispersibility of carbon black is improved. The generation of lumps by the oxidation of the polyolefin resin light-shielding film is prevented by the synergistic effect of carbon black and an antioxidant. The film moldability, the slipping character and antiblocking properties are also improved. Moreover, the generation of white powder is prevented by blending more than 40 wt. % of the L-LDPE resin. Carbon black powder is hardly generated, and does not affect bag-making ability nor packaging properties.

The light-shielding film of the invention is provided with all of necessary properties as a packaging material for photosensitive materials, in spite of a single layer film, and blocking hardly occurs. The film is soft, and its physical strength is great. The film is also excellent in film moldability and heat sealing properties. The inflation film can be used for packaging a big heavy product such as bulk roll, as it is. Besides, merely by cutting the inflation film in a prescribed length and heat-sealing the bottom, a packaging bag excellent in moistureproofness and light-shielding ability can easily be formed inexpensively. Since curling is little and heat sealing properties are excellent, packaging workability is superior, resulting the decrease of cost due to the reduction of packaging material cost and lavor saving.

The polyolefin resin film layer contains polyethylene resin having a density (ASTM D-1505) of more than 0.936 g/cm^3, preferably 0.941 to 0.970 g/cm^3. When the density is less than 0.936 g/cm^3 it is difficult to obtain a high Young's modulus polyolefin resin film excellent in antiblocking properties. Moreover, the MI (ASTM D-1238) of the polyethylene resin is preferably more than 0.3 g/10 minutes, further preferably 0.5 to 10 g/10 minutes. When the MI is less than 0.3 g/10 minutes, film moldability is inferior. Moreover, molecular orientation is liable to occur greatly in longitudinal direction, and it is difficult to produce a film having a good balance between the physical strength in longitudinal direction and that in lateral direction. Lumps are liable to be generated, and damage the photosensitive materials to be packaged. The polyethylene resin content of the polyolefin resin film layer is 0.5 to 70 wt. %, preferably 2 to 40 wt. %, further preferably 5 to 30 wt. %. Wnen the content is less than 0.5 wt. %, blocking occurs. While, when the content is beyond 70 wt. %, physical strength decreases. The inner surface layer is too slippery, and wrinkling and furrowing occur. The polyolefin resin film layer may contain other resins, such as L-LDPE resin or LDPE resin.

In order to prevent blocking and static electrification, the polyolefin resin film layer contains either or both of a light-shielding material and a fatty acid compound.

The light-shielding material is blendable or dispersible in the polyolefin resin film layer and capable of shielding visible and ultraviolet light. Examples of the light-shielding material are various carbon blacks, graphite, iron oxide, zinc white, titanium dioxide, clay, aluminum powder, aluminum paste, calcium carbonate, mica, barium sulfate, talc, cadmium pigments, red iron oxide, cobalt blue, copper-phthalocyanine pigments, monoazo and polyazo pigments and aniline blacks. Various carbon black, aluminum powder and aluminum paste from which volatile components are removed are preferred. Carbon black is similar to described previously.

As the preferable light-shielding material, metal powder is in second place. Metal powder is a light-reflective light-shielding material. It imparts a silver appearance, and it is excellent in moistureproofness, light-shielding, antistatic property, thermal shielding in the sunlight and gas barrier. As the metal powder, aluminum powder and its paste are preferable. The paste of aluminum powder is produced by adding mineral spirits and a small amount of a higher fatty acid such as stearic acid or oleic acid to form a paste at the production of aluminum powder according to a known method such as using a ball mill, a stamp mill or an atomizer. A polyolefin thermoplastic resin, such as various polypropylene resins, various polyethylene resins, EVA resin, EEA resin and EAA resin, is kneaded together with this aluminum paste while heating, and volatile components mainly mineral spirits are removed by a vacuum pump. This product is used as an aluminum paste compound resin or an aluminum paste masterbatch resin. The aluminum paste masterbatch resin is preferable because it eliminates the noxious smell and bad influences upon the photographic photosensitive materials. In order to eliminate the noxious smell and bad influences upon the photographic photosensitive materials, the content of mineral spirits should be less than 0.1 wt. %. When the aluminum paste content of coextruded double layer film is made 2 wt. % by using a masterbatch resin containing 40 wt. % of aluminum paste and 1.0 wt. % of the mineral spirits, one part by weight of the masterbatch resin is

blended with 19 parts by weight of the main resin. Since a part of the mineral spirits evaporates during molding, the final content of the mineral spirits is less than 0.05 wt. %. The aluminum powder includes microflakes produced from aluminum foil which is crushed by a ball mill or a stamp mill, in addition to usual aluminum powder manufactured by atomizaiton, dropping on a rotary disc or evaporation from melted aluminum. Since aluminum powder is unstable, it is stabilized by a known treatment, such as a surface treatment using a binder or a higher fatty acid.

The light-shielding material content of the polyolefin resin film layer is 0.1 to 20 wt. %, preferably 0.5 to 12 wt. %, further preferably 1.5 to 7 wt. %. When the content is less than 0.1 wt. %, the blending effect, such as to secure light-shielding and to prevent static electrification, is insufficient. While, when the content is beyond 20 wt. % the physical strength of the film, particularly tear strength and impact puncture strength, decreases, and heat sealing properties are also inferior. Furthermore, the photosensitive materials are contaminated by touching the surface of the film or adhering the light-shielding material released from the film to the photosensitive materials. The blending amount of the light-shielding material per an unit area of the inflation film is preferably 0.5 to 50 g/m^2. The blending method of the light-shielding material may be carried out by a known method, and the masterbatch method is preferable in view of cost and the contamination of the working place. Two or more light-shielding materials may be combined.

The fatty acid compound suitable for blending into the polyolefin resin film layer may be selected from mentioned previously.

The coextruded multi layer inflation film of the invention is extruded so that the polyolefin resin film layer is disposed on the inside.

In the coextruded multilayer inflation film, the layer extruded as the outer surface layer is preferably an L-LDPE resin film layer. Preferable L-LDPE resins in view of physical strength and heat seal strength are those having the number of carbon atoms is 6 to 8, a MI (ASTM D-1238) of 0.8 to 30 g/10 minutes and a density (ASTM D-1505) of 0.870 to 0.940 g/cm^3, produced by liquid phase process or vapor phase process. The L-LDPE resin content of the L-LDPE resin film layer is more than 30 wt. % preferably 50 to 95 wt. %. One or more other resins, such as LDPE resin, HDPE resin, ethylene copolymer resin or polypropylene resin, may be blended into the L-LDPE resin film layer. One or more of a light-shielding material, a fatty acid compound and an antiblocking agent may be blended into the L-LDPE resin film layer in order to prevent blocking, oxidation, molding and static electrification. The light-shielding material, the fatty acid compound and the antiblocking agent may be similar to mentioned previously.

The polyolefin resin film layer and the L-LDPE resin film layer may contain various additives selected from listed previously and lubricants including paraffin wax, fatty acids, fatty acid amides, silicones, esters, higher alcohols, various thermoplastic resins, deodorants, oxygen absorbers, absorber and rubbers.

One or more intermediate layers may be incorporated between the polyolefin resin film layer and the L-LDPE resin film layer.

The coextruded multi layer inflation film may be formed by using a known inflation film molding machine, such as a commercial machine.

The inflation film of the invention may be used for packaging photosensitive materials such as photographic photosensitive materials, foods, medicines or chemical substances.

The package form may be conventional, and includes a single-sheet flat bag, a double-sheet flat bag, a self-standing bag, a single-sheet gusset bag, a double-sheet gusset bag, inner lining for a moisture proff box, inner lining for a light room-loading light-shielding box, wrapping paper and a leader paper. The bag-making form may also be conventional, and includes heat sealing, side welding (heat-cut sealing), impulse heat sealing, supersonic sealing and high frequency sealing. The methods of using an adhesive may also be utilized.

Since the coextruded multi layer inflation film of the invention is mold so that the polyolefin resin film layer is disposed as the inner surface layer, when the tubular film is wound by a winder, the polyolefin resin film layers touch each other to prevent blocking. When the L-LDPE resin film layer is the outer surface layer, adhesion of the additives to guide rollers and the like does not occur. Therefore, a coextruded multilayer inflation film obtained is excellent in quality.

The aluminum vacuum metallized biaxially stretched thermoplastic resin film is a biaxially stretched thermoplastic resin film processed with the vacuum deposition method to form an aluminum vacuum deposition layer. The film improves tensile strength and bursting strength of the packaging material, and it prevents the generation of pinhole, bag rupture and thinning by the elongation of the packaging material, even when a heavy product is placed. It also improves moistureproofness, gas barrier, antistatic property and light-shielding. By stretching the thermoplastic resin film biaxially, the stretched film has a high Young's modulus, and is excellent in moistureproofness and gas barrier, in spite that it is thin. Since the stretched film has heat stability, crazing hardly occurs at the time of forming the aluminum vacuum deposition layer.

The crazing of the aluminum vacuum deposition layer is also prevented by the increased Young's modulus and the resistance to elongation. The resin suitable for the film includes polyester resin, polyamide (nylon) resin, polyethylene resin, polystyrene resin, polypropylene resin, polyvinyl chloride resin, polyvinylidene chloride resin, vinylon resin, copolymer resins of the above resins and other resins, including binary, ternary or more copolymers polymerized by random copolymerization or block copolymerization, modified or crosslinked resins, and blend resins of the above resins and other resins. Stretching may be carried out by a known biaxial drawing method such as simultaneously biaxial drawing or successively biaxial stretching, and both of the draw ratios in longitudinal direction (MD) and in lateral direction (CD) are 1.5 to 20 times, preferably 3 to 15 times, respectively. The drawing machine may be a known machine such as T die film molding machine or inflation film molding machine. A preferable thickness of the biaxially stretched thermoplastic resin film is 7 to 60 μm. When the thickness is less than 7 μm, wrinkling and cut occur in the laminating process. While, when the thickness is beyond 60 μm, the rigidity is too great. As a result, bag-making ability and handling are inferior, and the film is expensive. The biaxially stretched thermoplastic resin film may be a single layer film or a coextruded multi layer film.

Moreover, another resin, such as polyvnylidene chloride resin, silicone resin or teflon resin, is coated or printed, or a metal membrane is provided on the stretched film. The metal membrane may be provided by vacuum deposition, sputtering, ion plating, electron beam deposition, or the like.

A preferable thickness of the aluminum vacuum deposition layer is 55 to 1,200 Å, particularly 100 to 600 Å, in view of securing physical strength, light-shielding, antistatic property, moistureproofness and gas barrier, cost and quality. When the thickness is less than 55 Å, the static electrification generated around the aluminum vacuum deposition layer cannot be decreased. It is difficult to secure moistureproofness, gas barrier and light-shielding. While, when the thickness is beyond 1,200 Å, problems occur in the degradation of the stretched film, the wrinkling due to shrinkage the crazing of the vacuum deposition layer, caused by the heat of vacuum deposition, and the decrease of physical strength of the packaging bag, though antistatic property, moistureproofness, gas barrier and light-shielding are still secured.

A protection layer may be provided on the aluminum vacuum deposition layer, if necessary. The usable resin for the protection layer includes acrylic resin, cellulose resins such as cellulose acetate resin, urethane resin, epoxy resin, polyester resin, ionomer resin, polyethylene resin, ethylene copolymer resin and polypropylene resin. Besides, wax, gelatin, polyvinyl alcohol or the like is also usable. The thickness of the protection layer is made extremely thin such as thinner than 50 μm, preferably thinner than 5 μm, in order to eliminate static electricity effectively. Such a protection layer may be formed by a known extrusion coating, solution coating or spray coating.

More than 50 %, preferably more than 70 % of the fibers composing the long fiber paper have a fiber length of longer than 3 mm, usually 3 mm to 7 mm. When the fiber length is shorter than 3 mm, the generation of paper powder. and picking cannot be prevented effectively. When the fibers having a fiber length of longer than 3 mm are less than 50 % of total fibers, the generation of paper powder and picking cannot be prevented effectively. The paper reinforcing agent is incoporated into the long fiber paper in order to prevent the generation of paper powder and picking effectively. The paper reinforcing agent usable for the invention includes cation-induced styrene-acrylic copolymer, aminoamidepichlorohydrin condensate, carboxylmethglcellulose, various polyacrylamides and copolymers thereof, carboxyl-modified polyacrylamide, polyethyleneimine, gum oleoresin, sodium silicate, synthetic rubber latex, unacetylated PVA fiber, various starched including modified starches, sulfomethylated resin, urea resin, alkylstyrene resin, alkylketene dimer, gelatin, PVA, casein, methacylamide, polyamidaminepichlorohydrin, sodium polyacrylate, carboxyl-modified polyvinyl alcohol, hydroxylethylcellulose and the like. A suitable content of the paper reinforcing agnet is 0.05 to 8 wt. %, preferably 0.3 to 5 wt. %. A cool water-extracing pH (JIS P-8133) of the long fiber paper is in the range of 4 to 9, preferably 5 to 9. When the cool water-extracting pH is less than 4 or beyond 9, harmful substances for photographic photosensitive material are produced. Long fiber neutral papers are particularly preferable. The contents of all of harmful substances for photographic photosensitive materials should be less 1,000 ppm. The harmful substances are redioactive substances and the materials obtained using a radioactive substance, such as the paper made using the river water, the pulp, chip or waste paper exposed to the rain, after a nuclear test, mercury, alloys thereof, mercury compounds and agents containing mercury, such as mercury, organic mercury agents, broken fluoresent lamp and slime control agent used for paper-making, secondary processed products of silicone, such as silicone oil and silicone grease, sulfur compounds, such as Na_2S, H_2S and $Na_2S_2O_3$, lead compounds, such as PbS and $PbSO_4$, iron and iron compound, such as iron powder, Fe_2O_3, FeO and $FeCl_3$, copper and copper compounds, such as copper compounds, such as copper powder, CuO, $CuSO_4$ and $CuCl_2$, and aldehydes, such as formaldehyde and acetaldehyde. Wnen the content of one of the above substances is beyond 1,000 ppm, it adversely affect photographic photosensitive materials seriously. The adverse affect of the

substance can be decreased by neutralization, adsorption or the like. In this case, the content of the above harmful substance may be beyond 1,000 ppm. For example, the adverse affect of iron, iron compounds and other metal compounds can be removed by adding a chelating agent, and the adverse affect of formaldehyde can be removed by adding urea, thiourea, a hydrazine compound, dicyandiamide or an acid salt thereof, hydroxylamine or an acid salt thereof, such as hydroxylamine hydrochloride or hydroxylamine sulfate, or formamide. The adverse affect of the harmful substances can also be removed by selecting the equipments and materials so that the contamination amounts are minimized, using clean water such as spring water, and forbidding the use of the pulp, chip and waste paper exposed to rain. In order to reduce the generation of paper powder, the surface of the long fiber paper is preferably processed by Yankee calender or supercalender, and the surface strength is preferably more than 6. In order to increase the surface strength of the paper, beating is necessary. The beating is necessary to be carried out so that more than 50 % of the fibers have a fiber length of longer than 3 mm. The long fiber paper may be a combination paper, and white or colored.

The polyolefin resin film layer contains 0.1 to 15 wt. % of carbon black having a pH of 4 to 9 and a mean particle size of 15 to 80 mμ. The carbon black adsorbs harmful substances for photographic photosensitive materials, when the long fiber paper is contaminated, and it prevents the degradation of photographic properties, such as fogging, the variation of photosensitivity and the decrease of concentration, when a photographic photosensitive material is placed in the packaging material of the invention for a long time, in addition to the light-shielding. When the pH of the carbon black is less than 4 or beyond 9, the degradation of photographic properties, such as fogging, the variation of photosensitivity and the decrease of concentration occurs. When the mean particle size is less than 15 mμ, carbon black particles aggregate to produce lumps and fish eye problem. While, when the mean particle size is beyond 80 μm, light-shielding ability decreases. Moreover, it is preferable that the free sulfur content is less than 1,000 ppm, because the degradation of photographic properties, such as fogging, the variation of photosensitivity and the decrease of concentration occurs, when the content is beyond 1,000 ppm. The carbon black content is 0.1 to 15 wt. %. When the content is less than 0.1 wt. %, the effect of the carbon black, such as to secure light-shielding, to prevent electrification, and to prevent oxidation, is insufficient. While, when the content is beyond 15 wt. %, the physical strength of the film, particularly tear strength and impact puncture strength, decreases, and heat sealing properties are inferior. Furthermore, the surface strength decreases, and dust is liable to be generated. The dust adheres to photographic photosensitive materials, and causes developing trouble and contamination. The kind and preferable carbon blacks are similar to described previously, other than mentioned above.

The polyolefin resin film layer contains more than 5 wt. % of an ethylene copolymer resin. The ethylene copolymer resin improves heat sealing properties such as hot tack properties, sealability with other materials, elapsed heat seal strength, heat seal strength and heat seal tolerance, and the generation of pinhole at heat-sealed portion is prevented. The dispersibility of carbon black is also improved. The ethylene copolymer resin includes EVA resin, EEA resin, EMA resin, EAA resin and L-LDPE resin. L-LDPE resin is preferable in view of improving physical strength, heat sealing properties and the dispersibility of carbon black. The L-LDPE resin is similar to described previously except that the preferable MI is 0.4 to 20 g/10 minutes and the preferable density is 0.87 to 0.95 g/cm^3. The content of the ethylene copolymer resin is more than 5 wt. %, preferably 15 to 95 wt. %. When the content is less than 5 wt. %, unless the width of heat seal is increased, heat sealing properties, particularly elapsed heat seal strength and sealability with other materials are inferior,and pinhole is liable to be generated. Moreover, heat-sealed portion is liable to separate. When the ethylene copolymer resin is L-LDPE, the suitable content is 5 to 99.9 wt. %, preferably 10 to 97 wt. %. The polyolefin resin film layer may be oriented or stretched.

The above flexible sheet layers may be laminated according to a known method such as a heat sealing (hot bar sealing, impulse heat sealing, supersonic welding, etc.) or a method using an adhesive (wet laminating, dry laminating, hot melt laminating, extrusion laminating, etc.).

The adhesive is selected by considering both layers to be joined, and includes thermoplastic resin melt adhesives including a polyolefin adhesive, hot melt type gum adhesives and solution type adhesives. The polyolefin adhesives include a homopolymer and a copolymer of an olefin such as various polyethylenes, polypropylenes, polybutenes and ethylenepropylene copolymers and L-LDPE, a copolymer of an olefin and another monomer such as ethylene-vinyl acetate copolymer, ethylene-acrylate ester copolymer, various ionomers ("SURLYN" Dupont, "HIMIRAN" Mitsui Polychemicals Co., Ltd., etc.) and a graft copolymer. The solution type adhesives are divided into adheisves for wet lamination and adhesives for dry lamination. The adhesives for wet lamination are emulsion-type or latex-type. Examples of the emulsion-type adhesives are polyvinyl acetate emulsion, the emulsion of vinyl acetate-ethylene copolymer, the emulsion of vinyl acetate-acrylate ester copolymer, the emulsion of vinyl acetate-maleate ester copolymer, the emulsion of acrylic

copolymer and the emulsion of ethylene-acrylic acid copolymer. Examples of the latex-type adhesives are natural rubber latex, styrene-butadiene rubber latex, acrylonitrile-butadiene rubber latex and chloroprene rubber latex. An example of the adhesives for dry lamination is polyurethane adhesive. Adhesives for hot melt lamination containing paraffin wax, microcrystalline wax, ethylene-vinyl acetate copolymer and ethylene-ehtylacrylate copolymer, pressure-sensitive adhesives and temperature-sensitive adhesives may also be employed. The melting point of the adhesive employed is preferably more than 5 °C below the melting point of the flexible sheet in order to laminate without adverse influences upon the flexible sheet by a thermal melting adhesion.

The thickness of the adhesive layer formed by extrusion laminating using a thermoplastic resin is usually 6 to 50 μm, preferably 10 to 20 μm. However, the thickness is determined based upon cost, rate of application, thickness of the total layers, and etc., and accordingly, the thickness is not limited to the above range.

The adhesive strength of the adhesive layer may be improved by coating an anchor coating agent, physical surface treatment, chemical agent treatment, or etc.

Anchor coating agent is a generic name of adhesive promoter and cross-linking agent used in the field of laminating, and it is also called primer. Representative examples of the anchor coating agent are as follows:

Organic titanate anchor coating agent

Tetrapropyl titanate or tetraisobutyl titanate is used as the principal constituent, and tetrastearyl titanate is added as a hydrolysis-adjusting agent.

Polyethyleneimine anchor coating agent

A relatively high polymer of ethyleneimine $+CH_2-CH_2-NH+_n$ is used. This agent is particularly preferable because its handling is easy and its pot life is long.

Polyisocyanate anchor coating agent

One-component type; Polymer having isocyanate group alone
Two-component type; Combination of a polymer having isocyanate group and a polyester having OH group

A chemical reaction such as a crosslinking reaction occurs in both types, and an adhesive effect appears. Pot life is short, and this coating agent is expensive.

Polyester and urethane anchor coating agent

Saturated polyester resin or urethane resin is dissolved in a solvent such as ethyl acetate or toluene.

Polyolefin anchor coating agent

Polybutadiene anchor coating agent

The anchor coat layer is preferably made extremely thin. The coating method may be gravure roll coating, kiss roll coating, curtain coating, bar coating, reverse roll. coating, direct roll coating, air knife coating or the like.

Representative examples of the physical surface treatment are described below. Two or more kinds of the physical surface treatment may be combined, or the physical surface treatment may be combined with the coating of an anchor coating agent.

Flame treatment ..... Running cost is high, and there is the danger of fire.

Plasma treatment .... Argon gas is converted into plasma, and joining surface is treated with the plasma. The treating strength is several times as much as corona discharge treatment, but the equipment cost for

plasma treatment is several tenths higher than corona discharge treatment.

Corona discharge treatment ... Treatable materials are various polymer films and sheets, aluminum foil, aluminum vacuum metallized film, etc. This inexpensive treatment is widely utilized, and the treated effect is large.

Sandblasting treatment ... Sand such as silica sand is blasted at a high pressure to the joining surface, and the surface is made rough.

Representative examples other treatments are as follows:

Chemical agent treatment ... Treated with a dichromate solution or etc.

Ozone treatment ..... Treated in a box filled with ozone. gas. Even though the resin temperature of extrusion laminating is lowered, the adhesive strength is still improved.

Preheat treatment ... The flexible sheet to be conducted with extrusion laminating preheated with a heat drum, hot air or etc.

Ultraviolet irradiation

High-frequency heating

Dielectric heating

Mirrowave heating, etc.

The photographic photosensitive materials suitable for the above packaging material are similar to enumerated previously. The package form and bag-making form may be similar to mentioned in the case of the coextruded multilayer inflation film.

In the above packaging material for photographic photosensitive materials, the release of fibers and the picking of paper do not occur from the long fiber paper, and they do not adhere to photographic photosensitive materials as a foreign material. The long fiber paper improves the Young's modulus, heat resistance and drawing ability by writing tools. The aluminum vacuum metallized biaxially stretched thermoplastic resin film layer imparts antistatic property, moistureproofness, gas barrier and light-shielding, and prevents the penetration of harmful substances. The polyolefin resin film layer secures sealing and the carbon black contained therein does not affect the photogdraphic photosensitive materials adversely. The packaging bag formed of the packaging material may be a single sheet bag, and is excellent in bag-making ability and packaging workability.

Representative embodiments of the packaging material comprising a single layer polyolefin resin light-shielding film are illustrated in Figures 1 to 3.

The packaging material of Figure 1 is composed of a single layer of a polyolefin resin light-shielding film 1a containing carbon black.

The packaging material of Figure 2 is composed of three layers consisting of a polyolefin resin light-shielding film 1a containing carbon black, and a flexible sheet layer 4 laminated thereto through an adhesive layer 3.

The packaging material of Figure 3 is composed of three layers consisting of two polyolefin resin light-shielding film layers 1a, 1a laminated to each other through an adhesive layer 3.

Figure 4 indicates a comparative packaging material I composed of a single layer of a HDPE resin light-shielding film 5a.

Figure 5 indicates a comparative packaging material II composed of a single layer of a L-LDPE resin light-shielding film 6a.

Figure 6 indicates a conventional packaging material I composed of a single layer of a LDPE resin light-shielding film 7a.

Subsequently, representative embodiments of the packaging material comprising an aluminum vacuum metallized biaxially stretched thermoplastic resin film layer, a long fiber layer and a polyolefin resin film layer are illustrated in Figures 10 to 13.

The packaging material of Figure 10 is composed of an aluminum vacuum metallized biaxially stretched thermoplastic resin film layer 21 consisting of a biaxially stretched thermoplastic resin film layer 19 and an aluminum vacuum deposition layer 20, a long fiber paper layer 22 laminated on the aluminum vacuum deposition layer 20 as the outer layer, and a light-shielding polyolefin resin film layer 23a on the biaxially stretched thermoplastic resin film layer 19 as the inner layer, each through an adhesive layer 3.

The packaging material of Figure 11 is similar to the packaging material of Figure 10, except that the light-shielding polyolefin resin film layer 23a is replaced by a coextruded multilayer film layer 25a consisting of a light-shielding thermoplastic resin film layer 24a and a light-shielding polyolefin resin film layer 23a.

The packaging material of Figure 12 is similar to the packaging material of Figure 11, except that the aluminum vacuum metallized biaxially stretched thermoplastic resin film layer 21 is turned inside out.

The packaging material of Figure 13 is similar to the packaging material of Figure, 10, except that the light-shielding polyolefin resin film layer 23a is directly laminated by the extrusion laminating method.

Figure 14 indicates a comparative pckaging material VI similar to the packaging material of Figure 11, except that the long fiber paper layer 22 is replaced by a conventional bleached kraft paper layer 26.

EXAMPLES

Examples I, II and III are the examples of the packaging material comprising a single layer polyolefin resin light-shielding film.

The packaging material of Example I was a single layer inflation film 70 μm in thickness composed of 1.0 wt. % of HDPE resin having a MI of 1.1 g/10 minutes and a density of 0.954 g/cm^3, 95.85 wt. % of L-LDPE resin of a copolymer of ethylene and octene-1 having a MI of 4 g/10 minutes and a density of 0.925 g/cm^3, 3 wt. % of oil furnace carbon black ("#44B", mean particle size 21 mμ, pH 7.7, Mitsubishi Chemical Industries Ltd.), 0.03 wt. % of oleic acid amide, 0.07 wt. % of calcium stearate and 0.05 wt. % of antioxidant.

The packaging material of Example II was a single inflation layer film 70 um in thickness composed of 10 wt. % of HDPE resin having a MI os 1.1 g/10 minutes and a density of 0.954 g/cm^3, 86.85 wt. % of L-LDPE resin of a copolymer of ethylene and octene-1 having a MI of 2.0 g/10 minutes and a density of 0.920 g/cm^3, 3 wt. % of carbon black, 0.03 wt. % of oleic acid amide, 0.07 wt. % of calcium stearate and 0.05 wt. % of antioxidant.

The packaging material of Example III was a single layer inflation film 70 μm in thickness composed of 15 wt. % of HDPE resin having a MI of 2.0 g/10 minutes and a density of 0.935 g/cm^3, 81.85 wt. % of L-LDPE resin of a copolymer of ethylene and 4-methylpentene-1 having a MI of 2.1 g/10 minutes and a density of 0.920 g/cm^3, 3 wt. % of carbon black, 0.03 wt. % of oleic acid amide, 0.07 wt. % of calcium stearate and 0.05 wt. % of antioxidant.

Comparative packaging material I was a single layer inflation film 70 μm in thickness composed of 97 wt. % of HDPE resin of Example II having a MI of 1.1 g/10 minutes and a density of 0.954 g/cm^3, and 3 wt. % of carbon black.

Comparative packaging material II was a single layer inflation film 70 μm in thickness composed of 97 wt. % of L-LDPE resin of Example II of a copolymer of ethylene and butene-1 having a MI of 1.0 g/10 minutes and a density of 0.890 g/cm^3, and 3 wt. % of carbon black.

Conventional packaging material was a single layer inflation film 70 μm in thickness composed of 97 wt. % of LDPE resin having a MI of 2.4 g/10 minutes and a density of 0.923 g/cm^3, and 3 wt. % of carbon back.

Various properties of the above films were measured, and the results are tabulated in Table 1.

Table 1

	Unit	Invention			Comparative		Conventional
		I	II	III	I	II	I
Layer Composition	-	Fig. 1	Fig. 1	Fig. 1	Fig.4	Fig. 5	Fig. 6
Polyethylene Resin	-	HDPE	HDPE	HDPE	HDPE	-	LDPE
" MI	g/10 min.	1.1	1.1	2.0	1.1	-	2.4
" Density	g/cm^3	0.954	0.954	0.935	0.954	-	0.923
" Content	wt. %	1	10	15	97	-	97
L-LDPE Resin	-	L-LDPE	L-LDPE	L-LDPE	-	L-LDPE	-
" MI	g/10 min.	4	2.0	2.1	-	1	-
" Density	g/cm^3	0.925	0.920	0.920	-	0.890	-
" Content	wt. %	95.87	86.85	81.85	-	97	-
Tear Strength (MD)	g	1600	1275	1126	60	-	186
" (CD)	g	"	1518	1243	120	1600	453
Impact Puncture Strength	kg cm	30	25	35	7	"	10
Antiblocking Property	-	A	A	A	A	30	C
Heat Sealing Properties	-	A	A	A	D	A	C
Film Moldability	-	B	B	B	D-E	D-E	B

Evaluations in Table 1 were carried out as follows:

A very excellent
B excellent
C practical
D having a problem
E impractical

Testing methods are as follows:
Melt Index: ASTM D-1238
Density: ASTM D-1505
Tear Strength: JIS P-8116
Impact Puncture Strength: JIS P-8134

Antiblocking Property:

Each inflation film was molded under the conditions of the following film moldability, and wound. The film was cut in a size of 100 mm x 100 mm by a razor, and the antiblocking property was judged through opening of the cut portion.

Heat Sealing Properties:

Judged by hot tack properties, sealability with other materials, heat seal strength, elapsed heat seal strength and temperature tolerance of heat sealing collectively.

Film Moldability:

Judged by bubble stability, the occurrence of draw down, the occurrence of wrinkling and furrowing and the variation of film thickness collectively, when each inflation film 70 μm in thickness was molded using a ring die 100 mm in diameter having a lip clearance of 1 mm in a blow-up ratio of 1.76.

The coextruded multilayer inflation film of the invention was formed by using the inflation film molding machine shown in Figure 7. The resin composition composing the polyolefin resin film layer 17 was put into one of the extruders 8, and the resin composition composing the L-LDPE resin film layer 18 was put into the other extruder 8. They were melted by heating. Subsequently, the resin composition of the pololefin resin film layer 17 was extruded from the inside slit of the ring die 9, and the resin composition of the L-LDPE resin film layer 18 was extruded from the outside slit of the ring die 9. Compressed air was blown from the blast tube 10, and cooling air was blown from the air ring 11. Thus, a tube-shaped resin film 13 was molded so that the polyolefin resin film layer 17 was disposed on the inside and the L-LDPE resin film layer 18 was disposed on the outside, as shown in Figure 8. The tube-shaped resin film 13 asended with the guide of the guide rollers 12,•••, 12, and was led into flat by the guide plates 14. The film was deflated into sheet shap by passing the squeeze roll 15, and wound with the winder 16. In the above film-forming process, since the L-LDPE resin film layer 18 was contacted with the guide rollers 12,•••, 12, the guide plates 14 and the squeeze roll 15, the additives of the film did not adhere to them. Since the inflation film was wound in the state that the polyolefin resin film layers 17 were contacted with each other, as shown in Figure 9, blocking did not occur between the inner surface layers.

By the above process, the following packaging materials were produced.

The packaging material of Example IV:

The inner surface layer was a polyolefin resin film layer 35 μm in thickness composed of 20 wt. % of HDPE resin having a MI of 1.1 g/10 minutes and a density of 0.954 g/cm^3, 76.9 wt. % of L-LDPE resin of a copolymer of ethylene and 4-methylpentene-1 having a MI of 2.0 g/10 minutes and a density of 0.920 g/cm^3, 3 wt. % of oil furnace carbon black and 0.1 wt. % of oleic acid amide.

The outer surface layer was an L-LDPE resin film layer 35 μm in thickness composed of 96.75 wt. % of L-LDPE resin of a copolymer of ethylene and 4-methylpentene-1 having a MI of 2.1 g/10 minutes and a density of 0.920 g/cm^3, 3 wt. % of oil furnace carbon black, 0.05 wt. % of oleic acid amide and 0.2 wt. % of synthetic silica as an antiblocking agent.

The packaging material of Example V:

The inner surface layer was a polyolefin resin film layer 35 μm in thickness composed of 2 wt. % of HDPE resin having a MI of 1.1 g/10 minutes and a density of 0.954 g/cm^3, 93 wt. % of L-LDPE resin of a copolymer of ethylene and octene-1 having a MS of 2.0 g/10 minutes and a density of 0.920 g/cm^3, 3 wt. % of oil furnace carbon black 2 wt. % of calcium stearate and 0.1 wt. % of oleic acid amide, and the rest was the same as Example IV.

Comparative packaging material III:

The inner surface layer was an L-LDPE resin film layer 35 μm in thickness composed of 97 wt. % of L-LDPE resin of a copolymer of ethylene and octene-1 having a MI of 2.0 g/10 minutes and a density of 0.920 g/cm^3 and 3 wt. % of oil furnace carbon black.

The outer furface layer was an L-LDPE resin film layer 35 μm in thickness composed of 96.75 wt. % of L-LDPE resin of a copolymer of ethylene and 4methylpentene-1 having a MI of 2.1 g/10 minutes and a density of 0.920 g/cm^3, 3 wt. % of oil furnace carbon black, 0.05 wt. % of oleic acid amide and 0.2 wt. % of synthetic silica.

Comparative packaging material IV:

The inner surface layer was a HDPE resin film layer 25 μm in thickness composed of 95 wt. % of HDPE resin having a MI of 0.4 g/10 minutes and a density of 0.964 g/cm^3, 3 wt. % of oil furnace carbon black and 2 wt. % of calcium stearate.

The outer surface layer was an L-LDPE resin film layer 45 μm in thickness composed of 96.95 wt. % of L-LDPE resin of a copolymer of ethylene and 4methylpentene-1 having a MI of 2.1 g/10 minutes and a density of 0.920 g/cm^3, 3 wt. % of oil furnace carbon black, 0.05 wt. % of oleic acid amide and 0.2 wt. % of synthetic silica as antiblocking agent.

Comparative packaging material V:

Having the same layer composition as Example V, except that the inner surface layer and the outer surface layer were turned inside out.

Conventional packaging material II:

A single layer inflation film 70 μm in thickness composed of 96.95 wt. % of LDPE resin having a MI of 2.4 g/10 minutes and a density of 0.923 g/cm^3, 3 wt. % of oil furnace carbon black and 0.05 wt. % of oleic acid amide.

Various properties of the above films were measured, and the results are tabulated in Table 2.

Table 2

	Unit	Invention		Comparative			Conventional
		• IV	V	III	IV	V	II
Inner Surface Layer							
HDPE Resin Content	wt. %	20	2	-	95	-	-
Polyolefin Resin	-	C6 MI 2.1 g/10 min. L-LDPE Resin	C8 MI 2.0 g/10 min. L-LDPE Resin	C8 MI 2.0 g/10 min. L-LDPE Resin	-	C6 MI 2.1 g/10 min. L-LDPE Resin	-
" Content	wt. %	76.9	-	97	-	96.95	-
CB Content	"	3	3	3	3	3	-
Fatty Acid Comp. Content	"	Oleic Amide 0.1	Ca Stearate 2	-	Ca Stearate 2	Oleic Amide 0.1	-
Outer Surface Layer							
L-LDPE Content	"	C6 MI 2.1 g/10 min. 96.75	C6 MI 2.1 g/10 min. 96.75	C6 MI 2.1 g/10 min. 96.75	C6 MI 2.1 g/10 min. 96.75	(HDPE) (95)	(LDPE) (96.95)
CB Content	"	3	3	3	3	3	3
Fatty Acid Comp. Content	"	Oleic Amide 0.05	Oleic Amide 0.05	Oleic Amide 0.05	Oleic Amide 0.05	Ca Stearate 2	Oleic Amide 0.05
Antiblocking Agent Content	"	Silica 0.2	Silica 0.2	Silica 0.2	-	-	-
Properties							
Antiblocking Property	-	A	A	E	E	E	C
Film Moldability	-	B	B	C	C	C	B
White Powder Generation	-	B	B	B	E	E	B
Physical Strength	-	A	B	B	B	B	E
Wrinkling Furrowing	-	A	A	C	C	C	B
Bag-Making Ability	-	A	A	B	A	A	D

The meaning of the indications A through E in the table are the same as Table 1.

Antiblocking Property:

Each wound inflation film was cut in a size of 330 mm (lay-flat width) x 220 mm by a razor, and the antiblocking property was judged through opening of the cut portion.

Film Moldability:

Judged by motor load (electric current value), bubble stability, the position of frosting line, fish eye, lumps, wrinkling and the uniformity in film thickness collectively.

White Powder Generation:

Judged by the degree of the white powder and agglomerates thereof adhered to the guide rollers, guide plates and squeeze roll and wound film by visual observation, when each inflation film was molded using a die having a clearance of 1 mm at a blow-up ratio of 2.1.

Physical Strength:

Judged by tear strength (JIS P-8116), impact puncture strength, bursting strength (JIS P-8112) and heat seal strength collectively.

Wrinkling, Furrowing:

Judged by the generation degree of wrinkling and furrowing of each film by visual observation, when each film was molded using a die having a clearance of 1 mm at a blow-up ratio of 2.1.

Bag-Making Ability:

Judged by the difference of melting points between the inner surface layer and the outer surface layer, low temperature heat sealing properties, heat seal strength, hot tack properties, sealability with other materials, elapsed heat seal strength, curling, the generation of pinhole, bag rupture during transportation of products, collectively.

Examples VI and VII are the examples of the packaging material comprising an aluminum vacuum metallized biaxially stretched thermoplastic resin film layer, a long fiber paper layer and a polyolefin resin film layer.

The packaging material of Example VI corresponds to illustrated in Figure 11.

The long fiber paper layer 22 consisted of a bleached kraft paper composed of the fibers having a fiber length of about 4 mm, containing 2.5 wt. % of polyacrylamide resin ("Polystlon", Arakawa Rinsan Kagaku K.K.) as paper reinforcing agent and each less than 500 ppm of harmful substances for photographic photosensitive materials, and having a cool water extracting pH of 4.8, a surface strength of 9, an areal weight of 35 g/m^2, and a glossy face by Yankee calender, made by using aluminum sulfate as a fixer.

The biaxially stretched thermoplastic resin film 19 of the aluminum vacuum metallized biaxially stretched thermoplastic resin film layer 21 was a biaxially stretched nylon resin film 15 μm in thickness. The thickness of the aluminum vacuum deposition layer 20 was 400 Å.

The light-shielding polyolefin resin film layer 23a of the coextruded multilayer film layer 25a was composed of 91.75 wt. % of ethylene-4-methylpentenel-1 copolymer resin, 5 wt. % of LDPE resin, 3 wt. % of oil furnace carbon black having a pH of 8.0, a mean particle size of 21 mμ and a free sulfur content of 450 ppm and 0.2 wt. % of antioxidant, 0.05 wt. % of oleic acid amide, having a thickness of 40 μm.

The light-shielding thermoplastic resin film layer 24a was composed of 71.75 wt. % of ethylene-4-methylpentenel-1 copolymer resin, 20 wt. % of HDPE resin having a density of 0.954 g/cm^3, 5 wt. % of LDPE resin, 3 wt. % of the same oil furnace carbon black as the light-shielding polyolefin resin film layer 23a, 0.2 wt. % of antioxidant and 0.05 wt. % of oleic acid amide having a thickness of 40 μm.

The adhesive layers 3 were LDPE resin extrusion laminating adhesive layers 13 μm in thickness.

The laminations of laminated film was carried out in the same process using a tandem laminator.

The packaging material of Example VII corresponds to illustrated in Figure 11.

The long fiber paper layer 22 consisted of an unbleached kraft neutral paper composed of the fibers having a fiber length of about 3.5 mm, containing 0.2 wt. % of alkylketene dimer ("Aquapel", Dick Hercules) and 0. 5 wt. % of modified starch as paper reinforcing agent and each less than 1,000 ppm of harmful substances for photographic photosensitive materials, and having a cool water extracting pH of 6.8, a surface strength of 8, and an areal weight of 50 g/m^2, made by using aluminum sulfate as a fixer.

The other layers were the same as Example VI.

Comparative packaging material VI corresponds to illustrated in Figure 14.

The beached kraft paper layer 26 consisted of a semibleached kraft paper composed of the fibers having a fiber length of 2.5 mm, containing 2.0 wt. % of melamine-formaldehyde resin as paper reinforcing agent and 1870 ppm of formaldehyde adversely affecting photographic photosensitive materials, and having a cool water extracting pH of 4.3, a surface strength of 6 and an areal weight of 50 g/m^2, made by using aluminum sulfate as a fixer.

The other layers were the same as Example VI.

Conventional packaging material III corresponds to illustrated in Figure 15.

The bleached kraft paper layer 26 consisted of a bleached kraft paper composed of the fibers having a fiber length of 2.5 mm, having a cool water extracting pH of 4.5, a surface strength of 5 and an areal weight of 30 g/m^2 made by using aluminum sulfate as a fixer.

The metal foil layer 27 was aluminum foil 7 μm in thickness.

The thermoplastic resin film layer 28a was a LDPE resin film 80μm in thickness containing 3 wt. % of the same carbon black as Example VI.

The adhesive layers 3 were LDPE resin extrusion laminating adhesive layers 40 μm in thickness.

The laminated film was formed by laminating through twice extrusion laminating processes successively.

Various properties of the above films were measured, and the results are tabulated in Table 3.

Table 3

	Invention		Comparative	Conventional
	I	II	I	I
Layer Composition	Fig. 11	Fig. 11	Fig. 14	Fig. 15
Light-Shielding after Dropping Test	B	B	B	E
Hot Tack Properties	A	A	A	E
Sealability with Other Materials	A	A	A	E
Elapsed Heat Seal Strength	A	A	A	D
Bag Rupture Strength	A	A	A	E
Paper Powder Generation	B	B	D	D
Surface Strength	9	8	6	5
Photographic Properties	B	B	E	B
Tear Strength (MD) (g)	1120	1075	957	286
" (CD) (g)	1230	1186	1051	384

The meaning of the indications A through E in the table are the same as Table 1.

In the following tests, the packaging bag used was a single-sheet gusset bag, and 4 rolls of color printing paper of 8.9 cm in width x 180 m in length were placed in a corrugated board box in two layers through a corrugated board pad.

Light-Shielding after Dropping Test:

After the dropping test of JIS Z-0202 level I, each packaging bag was exposed to 80,000 luxes light for 1 hour. The color printing paper was developed, and the light-shielding was judged.

Hot Tack Properties (Hot-Seal Ability):

Two sheets of each exemplified film having 15 mm in width were heat-sealed at 170° C, and just after, the open ends were pulled by the weight of 45 g at the releasing angle of 22.5 degree. This character was estimated by the released length (cm).

Sealability with Other Materials:

Each exemplified film was cut in a width of 15 mm, and the cigarette end after smoking was smeared on

the heat seal face by using a finger. Thereafter, two sheets of the films were superposed, and heat-sealed at each optinal temperature at a sealing pressure of 1 kg/m^2 for one second. This character was estimated by the load necessary for releasing the sealed portion at 180 degrees.

Elapsed Heat Seal Strength:

Two sheets of each exemplied film having a width of 15 mm were heat sealed at each optimal temperature at a sealing pressure of 1 kg/m^2 for one second. This character was estimated by the load necessary for releasing the sealed portion at 180 degrees after one month from the heat seal.

Bag Rupture Strength:

Judged by the bag rupture state after the dropping test of JIS Z-0202 level I.

Paper Powder Generation:

Judged by the amount of paper powder after the shaking test of JIS Z-0232 level I.

Surface Strength:

Measured by the wax method of JIS P-8129, and it is expressed in wax number.

Photographic Properties:

According to a contact test with the uppermost layer.

Teat Strength:

According to JIS P-8116.

Claims

1. A packaging material for photosensitive materials which comprises a single layer polyolefin resin light-shielding film comprising 0.5 to 40 wt. % of polyethylene resin having a melt index of 0.6 to 15 g/10 minutes and a density of 0.931 to 0.965 g/cm^3, more than 40 wt. % of linear low density polyethylene resin having a melt index of 0.6 to 10 g/10 minutes and a density of 0.919 to 0.930 g/cm^3, 0.1 to 20 wt. % of carbon black, more than 0.01 wt. % of fatty acid compound and 0.01 to 2 wt. of antioxidant.

2. The packaging material of claim 1 which further contains an antiblocking agent.

3. The packaging material of claim 1 which is an inflation film processed into a single-sheet bag of which the bottom portion is heat-sealed.

4. A packaging material for photosensitive materials which is a coextruded multi layer inflation film of which the inner surface layer is a polyolefin resin film layer to which 0.5 to 70 wt. % of polyethylene resin having a density of more than 0.936 g/cm^3.

5. The packaging material of claim 4 wherein the polyethylene resin have a density of more than 0.941 g/cm^3 and a melt index of more than 0.5 g/10 minutes.

6. The packaging material of claim 5 wherein the polyolefin resin film layer contains either or both of a light-shielding material and a fatty acid compound.

7. The packaging material of claim 4 wherein the outer surface layer of the coextruded multilayer inflation film is an L-LDPE resin film layer containing more than 30 wt. % of L-LDPE resin.

8. The packaging material of claim 7 wherein the L-LDPE resin film layer contains at least one of a light-shielding material, a fatty acid compound and an antiblocking agent.

9. A packaging material for photographic photosensitive materials which comprises an aluminum vacuum metalllized biaxially stretched thermoplastic resin film layer, a long fiber paper layer, of which more than 50 % of the fibers have a fiber length of longer than 3 mm, containing a paper reinforcing agent and having a cool water-extracting pH of 4 to 9, laminated on one side of the above thermoplastic resin film

layer, and a polyolefin resin film layer containing 0.1 to 15 wt. % of carbon black having a pH of 4 to 9 and a mean particle size of 15 to 80 mu and more than 5 wt. % of an ethylene copolymer resin laminated on the other side.

10. The packaging material of claim 9 wherein the long fiber paper has a surface strength of more than 6.

11. The packaging material of claim 9 wherein the ethylene copolymer resin is L-LDPE resin.

FIG. 1

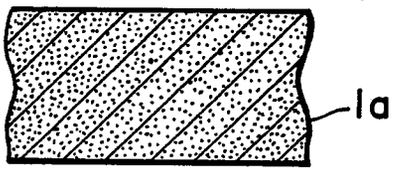


FIG. 2

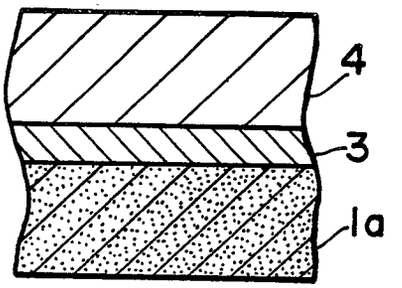


FIG. 3

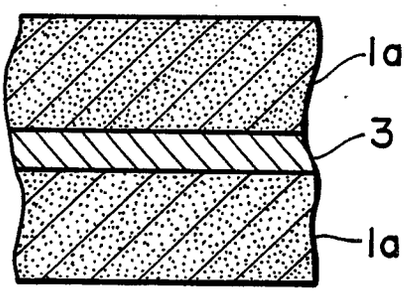


FIG. 4

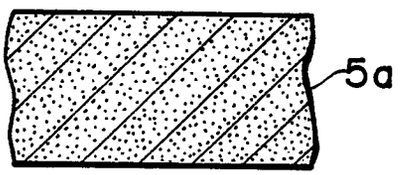


FIG. 5

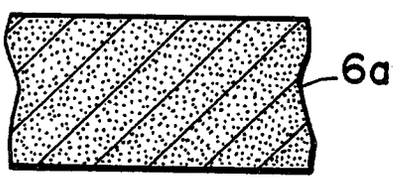


FIG. 6

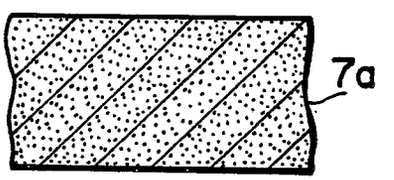


FIG. 7

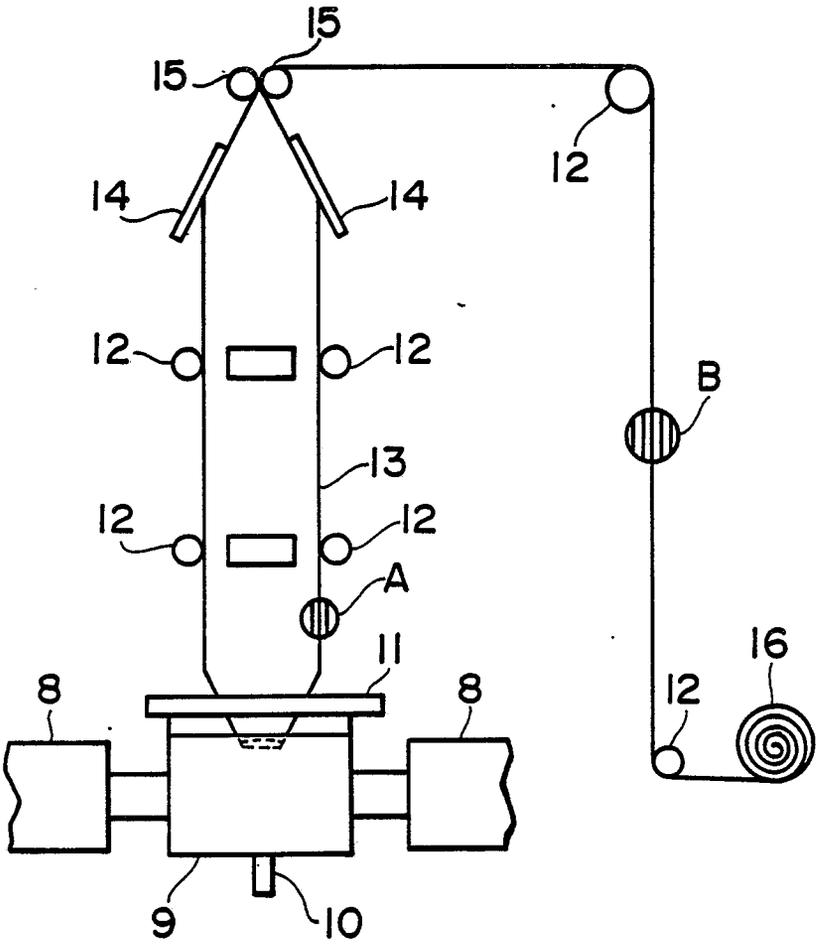


FIG. 8

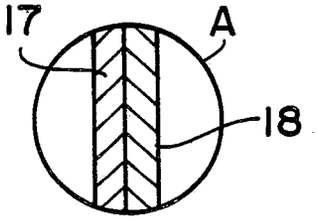


FIG. 9

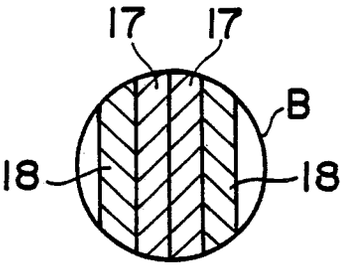


FIG.10

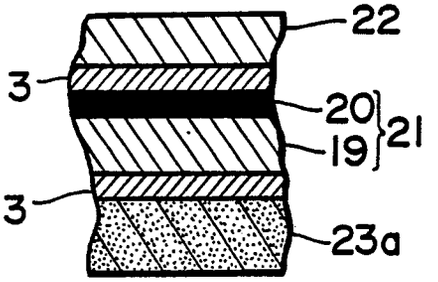


FIG.11

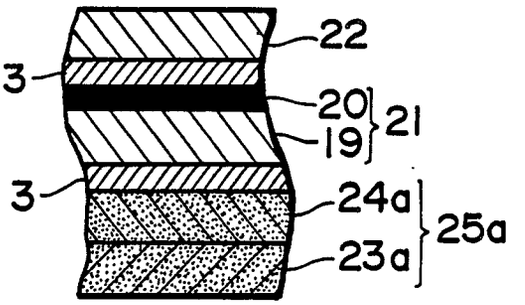


FIG.12

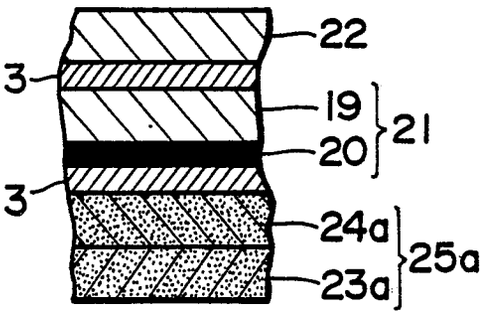


FIG.13

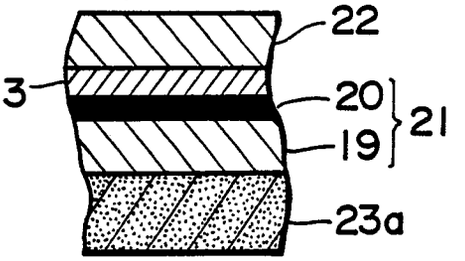


FIG.14

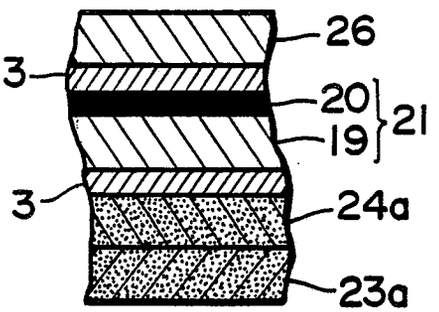


FIG.15
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