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3,425,145

INDEX TAB AND PREPARATION THEREOF

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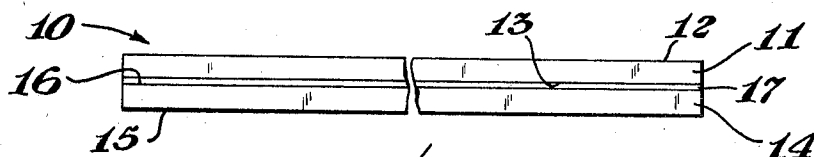


Fig. 1

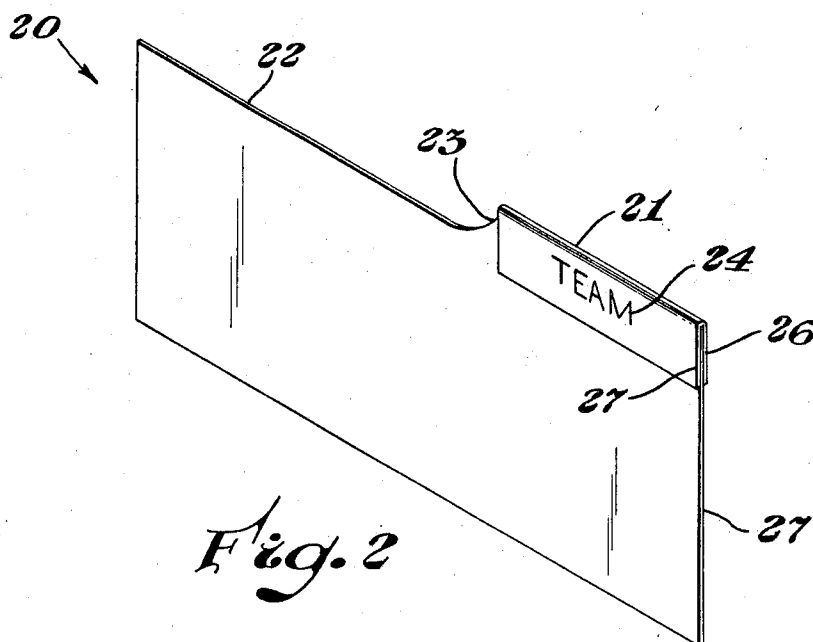


Fig. 2

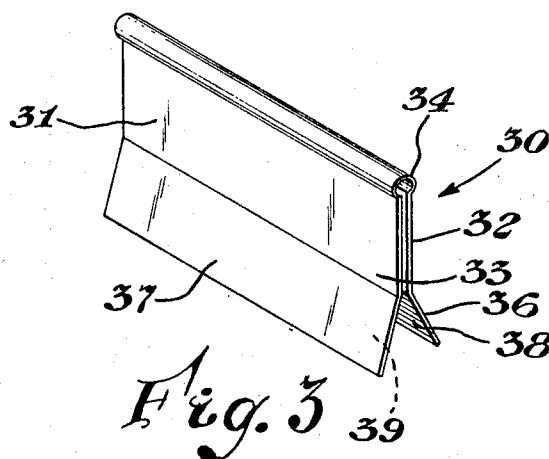


Fig. 3

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INDEX TAB AND PREPARATION THEREOF

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ABSTRACT OF THE DISCLOSURE

An improved index tab is provided which consists of an outer layer of Mylar, an inner layer of polyethylene having an oxidized surface which is readily bonded to paper. Index sheets are readily fabricated by heat sealing without warping. The resultant tab is very resistant to cracking, deformation and scratching.

This invention relates to an improved index tab and to the preparation thereof, and more particularly relates to an index tab having improved physical characteristics.

Index tabs, particularly of the transparent variety, have been employed for many years. Such transparent index tabs in general are formed from a generally U-shaped transparent plastic element glued, sealed or otherwise affixed to a paper sheet. Such tabs generally fall into two types. The custom tab is applied to the edge of a sheet of paper or like material by folding over a portion of one edge thereof and adhering the transparent tab material such as cellulose acetate or the like to the paper which has previously been printed and a portion of the edge of the sheet of paper or card cut away in such a manner to leave a projecting printed portion protected by the tab material. A second type of popular index tab is the insertable variety which consists generally of a channel formed of a transparent plastic material wherein the legs of the channel are adhered to a U-shaped member of fabric or paper to which an adhesive has been applied on the inner surface thereof. Such a tab is adapted to receive a suitably sized piece of paper, card or other indicia-bearing material which is then inserted into the transparent channel. Known index tabs usually suffer from a number of serious disadvantages. Generally, such index tabs are not highly resistant to cracking and tend to be brittle. Oftentimes, such tabs are not resistant to flexing or bending. This represents a significant disadvantage in both the fabrication of the tab and in the end use wherein a plurality of such tabs may project from a file, and if the file is used frequently, damage oftentimes results due to careless handling by the user of the file. Many known index tabs are sensitive to climatic conditions which is oftentimes a very important factor both in the fabrication and handling of such tabs. Brittleness at low humidity can often require careful handling and subsequent loss of time both in use and in preparation of the tabs. Furthermore, in the preparation of index tabs, it is desirable that the material from which the tabs are formed be of a non-blocking variety. By "blocking" is meant the tendency of a sheet material to adhere to itself or a like material when stored in face to face or face to back relationship over a period of time.

It would be advantageous if there were available an improved custom index tab. It would also be beneficial if there were available an improved insertable filing tab. It would be further advantageous if there were available an improved material for the preparation of such tabs. It would also be advantageous if there were available an improved method for the preparation of such filing tabs.

These benefits and other advantages in accordance with the present invention are achieved in an index tab comprising a laminated synthetic resinous structure compris-

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ing a first layer of a polymeric linear terephthalate ester adhered to a layer of polyethylene, the composite structure being transparent, the polyethylene layer having at least one exposed surface remote from the polyethylene terephthalate, the exposed surface of the polyethylene being capable of retaining a drop of water disposed thereon when such a surface is inclined at an angle of 25° from the horizontal.

Also contemplated within the scope of the present invention are index sheets having tabs such as hereinbefore described adhered thereto and a method of forming such sheets comprising treating the polyethylene laminate by an oxidative procedure until the polyethylene surface of such a laminate will retain a drop of water when disposed at an angle of at least 25° from the horizontal and up to an angle of 45° from the horizontal.

Further features and advantages of the present invention will become more apparent from the following specification when taken in connection with the drawing wherein:

FIGURE 1 is a schematic end view of a laminate in accordance with the present invention.

FIGURE 2 is a representation of an index sheet having affixed thereto a tab in accordance with the present invention.

FIGURE 3 is a view of an insertable index tab prepared in accordance with the present invention.

In FIGURE 1, there is illustrated a laminate generally designated by the reference numeral 10. The laminate 10 has a first or outer layer 11 of polyethylene terephthalate having a haze level of up to 10 percent in accordance with the American Society for Testing Materials, Haze Test D-1003-52, corrected for thickness of 2 mils. The polyethylene terephthalate layer hereinafter referred to as "polyester" has an outer surface 12 and an inner surface 13. A polyethylene layer 14 is disposed generally adjacent the inner surface 13 of the polyester layer 11. The polyethylene has an outer or exposed surface 15 and an inner surface 16. An adhesive layer 17 bonds the surfaces 13 and 16 of the layers 11 and 14 together. The outer surface 15 of the polyethylene layer 14 is treated in such a manner that a drop of water disposed thereon when the surface 15 is upwardly facing remains on the surface when the surface is inclined on the horizontal by an angle of from about 25° to about 45°.

In FIGURE 2, there is depicted an index sheet generally designated by the reference numeral 20. The index sheet 20 has disposed thereon an index tab 21 of the custom variety. The index sheet 20 has an index edge 22 defining a projection 23. The projection 23 has disposed on at least one surface thereof indicia 24 covered by the tab 21. The tab 21 has a first or rear leg 26 and a second or front leg 27 and is composed of a transparent material such as the laminate 10 of FIGURE 1.

In FIGURE 3, there is illustrated an index tab of the insertable variety generally designated by the reference numeral 30. The tab 30 comprises a channel or U-shaped body 31 composed of transparent material such as the laminate 10 of FIGURE 1. The body 31 defines a first leg or side 32 and a second leg or side 33. The legs 32 and 33 extend in generally parallel relationship. A beaded section 34 joins the legs 32 and 33. A pair of adhesive carrying members 36 and 37 are secured to the terminal portions of the legs 32 and 33 remote from the beaded portion 34 of the body 31. The adhesive carrying members 36 and 37 have adhesive disposed on adjacent faces 38 and 39, respectively, of the members 36 and 37. In the embodiments of FIGURES 2 and 3, the laminate is disposed in such a manner that the polyethylene layer is innermost, that is, adjacent the sheet or adhesive carrying members, and the polyester layer forms the outer surface.

Laminates suitable for the practice of the present invention in general are well known in the art and such

and 3. Characteristics of the laminates are set forth in the following table.

TABLE I

Sample	Polyethylene				Polyester thickness in mils	Adhesive
	Density	Melt index	Thickness in mils	Haze value (percent)		
1-----	.919	2	.5	7	2	Urethane.
2-----	.919	2	.5	5	4	Urethane with green dye.
3-----	.922	3	3	8	1	Do.
4-----	.924	2	2.5	3	3	Norac.*
5-----	.917	7	1.5	4	0.5	Polyester.
6-----	.919	6	4	7	2	Polyester with blue dye.
7-----	.928	1.8	1	7	3	Polyester with yellow dye.
8-----	.918	3.5	1	8	6.5	Urethane.

*Melt extruded on corona treated polyester.

laminates and the method for the preparation of the laminates are set forth in U.S. Letters Patents 2,961,365, 3,081,214 and 2,911,321, wherein the bonding of polyethylene to polyester films is set forth.

In the practice of the present invention in order to obtain a useful and desirable index tab, it is essential and critical that both the polyester component and the polyethylene component be bonded together with an adhesive that results in substantially transparent laminate. Such a laminate must have a haze level in accordance with the ASTM Haze Test D-1003-52 or D-1003-61 not greater than 10 percent.

Beneficially, if desired, laminates in accordance with the present invention are readily prepared employing colored adhesives, that is, adhesives to which there have been added an oil-soluble dye. The use of a dyed adhesive is a significant and substantial advantage in that colored index tabs are readily and easily prepared in a wide variety of colors without the necessity of attempting to dye or otherwise color the polyethylene or the polyester layer.

In preparing index tabs in accordance with the present invention, it is critical that the total thickness of the laminate be not less than 2 mils and not greater than 7.5 mils.

It is beneficial and advantageous that the polyethylene employed in the preparation of laminates in accordance with the present invention have a density not greater than about .94 g./cc. and a melt index of from about 1 to 10. Usually, it is preferable to employ polyethylene of the high pressure variety in order to obtain a heat seal at temperatures of from about 220° to 250° F. The thickness of the individual layers can vary widely. Generally, it is desirable that the thickness of the polyethylene layer be at least ¼ of a mil and the minimal thickness of the polyester layer be about ¾ of a mil. Usually, it is desirable to maintain the adhesive layer thickness as thin as possible except in instances where intense color is desired and only relatively low levels of the dye may be incorporated into the adhesive.

It is essential and critical to the practice of the present invention that the surface of the polyethylene layer remote from the polyester layer be treated by an oxidative treatment such as corona discharge, chemical oxidation or like well known techniques until the water wettability of the surface is such that a drop of water placed on the surface of the polyethylene will remain on the surface when the surface is disposed from the horizontal (with the treated surface upward at an angle of at least 25° and beneficially up to an angle of about 45°). In such an evaluation, the greater the angle indicates a greater degree of treatment, and in general is indicative of the adherence of the polyethylene to a substrate such as paper, fabric or the like when heat sealed. Such treatments are well known in the art and typically set forth in U.S. Letters Patents 2,910,723, 2,937,066, 2,969,463 and 3,113,208; Canadian Patent 703,971 and the like.

By way of further illustration, a plurality of laminates were prepared and formed into index tabs and applied to index sheets in the manner set forth in FIGURES 2

The foregoing laminates are readily formed into custom and insertable tabs such as are illustrated in FIGURES 2 and 3 after the surface of the polyethylene layer is treated by a corona discharge procedure until a drop of water remains upon the surface of the film when disposed with the treated surface upwardly at an angle of 25°, 30°, 40° and 45° from the horizontal. At the higher treatment level, heat sealing is more readily accomplished at lower temperatures, and the most beneficial of such treatments is that which results at an angle of at least 30° in the water drop test. In all cases, the haze value of the polyethylene was less than 10 percent resulting in clear, serviceable tabs which age well, resist scratching and are insensitive to climatic conditions. Tabs are readily prepared from the laminates under conditions of both high and low humidity and no tendency to crack is observed in the laminate or the resultant tab formed therefrom.

As is apparent from the foregoing specification, the present invention is susceptible of being embodied with various alterations and modifications which may differ particularly from those that have been described in the preceding specification and description. For this reason, it is to be fully understood that all of the foregoing is intended to be merely illustrative and is not to be construed or interpreted as being restrictive or otherwise limiting of the present invention, excepting as it is set forth and defined in the hereto-appended claims.

What is claimed is:

1. An index tab comprising a laminated synthetic resinous structure having opposed first and second legs, the tab comprising a first or outer layer of a polymeric linear terephthalate ester adhered to a layer of polyethylene, the laminated structure being transparent, the polyethylene layer having at least one surface remote from the terephthalate layer, the surface of the polyethylene remote from the terephthalate layer being capable of retaining a drop of water disposed on the surface when inclined at an angle of at least 25° from the horizontal.

2. The index tab of claim 1 having a layer of adhesive disposed between the terephthalate ester layer and the polyethylene layer.

3. The index tab of claim 1 wherein the haze level is not greater than 10 percent.

4. The index tab of claim 1 wherein the total thickness of the structure is from about 2 mils to about 7½ mils.

5. The index tab of claim 1 wherein a colored adhesive layer is disposed between the terephthalate ester layer and the polyethylene layer.

6. The index tab of claim 1 wherein the polyethylene layer has a thickness of at least ¼ of a mil.

7. The index tab of claim 1 wherein the polyester layer has a thickness of at least ¾ of a mil.

8. An index sheet having a tab thereon, the tab having opposed first and second legs and comprising a laminated synthetic resinous structure comprising a first or outer layer of a polymeric linear terephthalate ester adhered to a second or inner layer of polyethylene, the laminated structure being transparent, the polyethylene layer having at least one surface remote from the polyethylene terephthalate, the surface of the polyethylene remote from

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the terephthalate layer being capable of retaining a drop of water disposed on the surface when inclined at an angle of at least 25° from the horizontal, the index sheet being cellulosic paper and the index tab being heat sealed thereto.

9. A method of forming an index sheet comprising treating a transparent laminate of polyethylene and a polymeric linear terephthalate ester by oxidizing the polyethylene surface of the laminate until a polyethylene surface will retain a drop of water when disposed at an angle of at least 25° from the horizontal, forming the polyethylene laminate into a generally U-shaped configuration and subsequently heat-sealing the oxidized polyethylene surface to a cellulosic paper sheet.

10. The method of claim 9 including the step of providing a transparent colored material in an adhesive layer between the linear polymeric terephthalate layer and the polyethylene layer.

11. The method of claim 9 including the step of subsequently shaping the laminate and the paper to a desired configuration.

12. A cellulosic paper index sheet having a tab thereon, the tab having opposed first and second legs, the tab comprising a laminated synthetic resinous structure having a first or outer layer of a polymeric linear terephthalate ester adhered to a second or inner layer of polyethylene, the combined thickness of the polyethylene and the polyester being from about 2 to 7.5 mils, wherein the thickness

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of the polyester layer is at least ¾ of a mil and the polyethylene layer is at least ¼ of a mil, the laminated structure being transparent and having a haze level of not greater than 10 percent, the polyethylene layer having at least one surface remote from the polyethylene terephthalate layer, the surface of the polyethylene remote from the terephthalate layer being capable of retaining a drop of water disposed on the surface when inclined at an angle of at least 25° on the horizontal, the index sheet being cellulosic paper and the index tab being heat sealed thereto.

13. The index tab of claim 12 wherein a colored adhesive layer is disposed between the terephthalate ester layer and the polyethylene layer.

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