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(54) **RECYCLABLE PLASTICS MATERIALS**

WIEDERVERWENDBARE KUNSTSTOFFMATERIALIEN

MATERIAUX PLASTIQUES RECYCLABLES

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(56) References cited:
EP-A- 0 563 510
EP-A- 0 910 976
EP-A- 1 191 076

- **PATENT ABSTRACTS OF JAPAN vol. 1997, no. 02, 28 February 1997 (1997-02-28) & JP 08 269407 A (SATO YOSHIHIRO), 15 October 1996 (1996-10-15)**

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Description

[0001] This invention concerns improvements in and relates to recyclable plastics materials, in particular to recyclable hangers made from plastics materials.

[0002] A wide variety of hanger shapes and sizes are currently available, the hangers being made from a variety of materials, with however the majority of hangers being formed from polystyrene (PS). Garment hangers are used in the clothing trade as a method of transporting garments from a factory to a retail outlet and as a method of displaying the garments within the retail outlets. Very often hangers are also used to display various features of the garment, such as size and/or cost to the prospective consumer. In addition, hangers can also be used to display the numeric code or bar code of the garment. This enables a retailer to quickly access the numeric code or bar code rather than spending time locating the garment label attached to the inside of the garment when dealing with queries in respect of said garment. Generally this information is displayed on a label which is then attached to the hanger, by adhesive means.

[0003] Once a hanger has been used, it is either;

(i) Dumped into a landfill site,
(ii) Cleaned and reused (eventually leading to (i)), or
(iii) Recycled into its raw material.

[0004] Increasingly, dumping waste materials into landfill sites is becoming more difficult, and there is increasing pressure not to send waste to these sites. Cleaning hangers for reuse is a labour intensive operation and in most cases is uneconomical. When cleaning the hangers for reuse, each hanger must be sorted into the various types and the adhesive labels removed. The hangers are then cleaned and repackaged into cartons for shipment back to the factory and/or the retail outlets.

[0005] Recycling hangers into its raw material is also a labour intensive operation. The component parts of the hanger such as a metal hook (if present) must be removed. If the metal hook is not removed, the metal will damage the recycling equipment and contaminate the raw material. Likewise the adhesive label must also be removed. Adhesive labels are usually composed of paper or materials that are not compatible with PS. If the label is not removed prior to recycling, the label will contaminate the raw material. Removing labels is a time consuming operation, often an unsuccessful operation as many labels often leave a residue on the hanger, which renders the hanger unacceptable for recycling. Furthermore once a label has been removed it is necessary to then dispose of the label.

[0006] It is an object of the present invention to seek to alleviate the aforementioned problems.

[0007] EP-A-0 910 976 (WILLPUETZ KUNSTSTOFFVERARBEITU) 28 April 1999 discloses a polystyrene hanger. EP-A-0 563 510 (ZWECKFORM ETIKETTIERTECHNIK) discloses a polystyrene label for adhering to a polystyrene object. EP-A-1 191 076 describes a fluorescent varnish for applying to different materials and PATENT ABSTRACTS OF JAPAN vol. 1997, no. 02, 28 February 1997 (1997-02-28) & JP 08 269407 A (SATO YOSHIHIRO), discloses a recyclable plastics material including a polystyrene compatible label, which is attachable to an object using a pressure sensitive adhesive.

[0008] The present invention provides an object made from recyclable polystyrene or polystyrene compatible material including a polystyrene compatible label, characterised in that the polystyrene compatible label is attachable to the object using a polystyrene compatible adhesive such as a high tack hot melt rubber adhesive or a high tack modified acrylic adhesive.

[0009] Advantageously, the object is in the form of a hanger, where the hanger can be formed in the various shapes and sizes required for display and transportation of different sized and/or types of garments. It is preferable for the hook of the hanger to be formed from polystyrene or a polystyrene compatible material. Ideally the hook will be either a fixed attachment or a pivoting attachment. The hook may be made from polystyrene or metal. However, if the hook used is a metal hook, the hanger will only need to undergo a hook removal process prior to recycling.

[0010] Preferably the label is formed from polystyrene. Advantageously print can be applied to the label by letterpress, flexographic or screen processes. Any other suitable method of applying print to the label known to a person skilled in the art may also be used. Optionally, once the print has been applied to the label, a fluorescent varnish can be applied, enabling a specific radiant colour luminance when the printed matter is exposed to Ultra Violet (UV) light.

[0011] Conveniently, the label can also be attached to polystyrene products. Ideally, where the object is a polystyrene film for use as packaging in the food industry with the label being supplied either blank or pre-printed for thermal transfer or direct thermal print applications. This allows variable information to be applied at the point of manufacture or sale. An example of information applied is barcode information, best before data and so forth.

[0012] The primary advantage of the invention is that the label does not have to be removed from the object formed from polystyrene or a polystyrene compatible material, for example the hanger or the polystyrene product prior to the object or film being recycled.

[0013] The invention will now be described more particularly with reference to the accompanying drawings in which are shown a number of embodiments in accordance with the invention:

Figure 1 is a front view of a hanger according to the invention; and

Figures 2 to 16 are front views of different embodiments of hangers according to the invention.

[0014] Referring to Figure 1, there is shown a first embodiment of a hanger 1, with component parts comprising a main rail hook 20, arms 30 and minor garment hooks 40. The hanger 1 and the component parts of hanger 1 are formed from either general purpose PS, high impact PS or a blend of general purpose PS and high impact PS. The PS compatible label is positioned at area 50.

[0015] In this preferred embodiment the label is formed from a 66 micron satin white non-topcoated (or pretreated topcoated) PS with either a high tack hot melt rubber adhesive or a high tack modified acrylic adhesive being used to attach the label to the hanger. The non-topcoated polystyrene product provides a printable surface, which has prior corona treatment. Print is then applied to this surface using either letterpress, flexographic or screen processes. Either a water based flexo ink or a UV curing flexo ink are suitable for printing onto synthetic materials. Any other suitable ink type or method of applying print to the label known to a person skilled in the art may also be used. Optionally, once the print has been applied to the label, a UV invisible fluorescent varnish can be applied, enabling a specific radiant colour luminesce when the printed matter is exposed to UV light but will remain invisible in conventional indoor light or day light.

[0016] The inks and varnishes used in printing and protecting the label are also polystyrene compatible and contain carefully selected raw materials which will cause as little skin irritation and odour as possible.

[0017] Further embodiments of hangers 2 to 16 respectively are shown in Figures 2 to 16. Each of the further embodiments are variations of the basic design of the hanger 1 shown in figure 1.

[0018] It is to be understood that the invention is not limited to the specific details described above, which are given by way of example only, and that various modifications and alterations are possible without departing from the scope of the invention as defined in the appended claims.

Claims

1. An object (1) made from recyclable polystyrene or polystyrene compatible material including a polystyrene compatible label (10), **characterised in that** the polystyrene compatible label is attachable to the object using a polystyrene compatible adhesive such as a high tack hot melt rubber adhesive or a high tack modified acrylic adhesive.

2. An object made from recyclable plastics material as claimed in Claim 1, in which the object is in the form of a hanger (1 to 18). wherein the hanger is formable in various shapes and sizes required for display and transportation of different sized and/or types of garments.

3. A garment hanger formed from a recyclable plastics material as claimed in Claim 2, the hanger having a hook (20) and in which the hook of the hanger is formed from polystyrene or a polystyrene compatible material.

4. A garment hanger as claimed in Claim 4, in which the hook (20) is either a fixed attachment or a pivotable attachment.

5. A garment hanger as claimed in Claim 3 or Claim 4, In which the label is formed from polystyrene.

6. A garment hanger as claimed in Claim 5, in which print is applied to the label by letterpress, flexographic, screen processes or the like.

7. A garment hanger as daimed in Claim 6, in which a fluorescent varnish is applied over any print enabling a specific radiant colour luminance when the printed matter is exposed to ultra violet (UV) light.

8. An object made from recyclable plastics material as claimed in Claim 1, in which the object is a polystyrene film for use as packaging in the food industry with the label being supplied either blank or preprinted for thermal transfer or direct thermal print applications.

Patentansprüche

1. Ein Gegenstand (1), hergestellt aus wiederverwertbarem Polystyrol oder polystyrolkompatiblem Material, einschließlich eines polystyrolkompatiblen Etiketts (10), **dadurch gekennzeichnet, dass** das polystyrolkompatible Etikett unter Verwendung eines polystyrolkompatiblen Klebstoffs, wie etwa eines Schmelzkautschukklebstoffs mit hoher Klebkraft oder eines modifizierten Acrylklebstoffs mit hoher Klebkraft, an dem Gegenstand befostigbar ist.

2. Ein aus einem wiederverwertbaren Kunststoffmaterial hergestellter Gegenstand, wie in Anspruch 1 beansprucht, wobei der Gegenstand in Form eines Bügels (1 bis 1B) vorliegt, wobei der Bügel in verschiedenen Formen und Größen formbar ist, die für Ausstellung und Transport verschiedener Großen und/oder Typen von Kleidungsstücken benötigt werden.

3. Ein aus einem wiederverwertbaren Kunststoffmaterial geformter Kleiderbügel, wie in Anspruch 2 beansprucht, wobei der Bügel einen Haken (20) auf-

weist und wobei der Haken des Bügels aus Polystyrol oder einem polystyrolkompatiblen Material geformt ist.

4. Ein Kleiderbügel, wie in Anspruch 4 beansprucht, wobei der Haken (20) entweder eine feste Befestigung oder eine schwenkbare Befestigung ist.

5. Ein Kleiderbügel, wie in Anspruch 3 oder Anspruch 4 beansprucht, wobei das Etikett aus Polystyrol geformt ist.

6. Ein Kleiderbügel, wie in Anspruch 5 beansprucht, wobei der Aufdruck durch Hochdruck, Flexodruck, Siebdruckverfahren oder dergleichen auf das Etikett aufgebracht wird.

7. Ein Kleiderbügel, wie in Anspruch 6 beansprucht, wobei ein fluoreszierender Lack über einem Aufdruck angebracht wird, der eine spezifische strahlende Farbluminanz ermöglicht, wenn das Gedruckte ultraviolettem (UV-) Licht ausgesetzt wird.

8. Ein aus wiederverwertbarem Kunststoffmaterial hergestellter Gegenstand, wie in Anspruch 1 beansprucht, wobei der Gegenstand eine Polystyrolfolie zur Verwendung als Verpackung in der Lebensmittelindustrie ist, wobei das Etikett entweder unbedruckt oder vorbedruckt für Thermotransfer- oder direkte Thermadruckanwendungen zugefuhrt wird.

Revendications

1. Objet (1) réalisé en une matière de polystyrène recyclable ou en une matière recyclable compatible avec le polystyrène englobant une étiquette (10) compatible avec le polystyrène, **caractérisé en ce que** l'étiquette compatible avec du polystyrène peut être fixée à l'objet en utilisant un adhésif compatible avec le polystyrène tel qu'un adhésif thermofusible à base de caoutchouc du type à adhérence instantanée élevée ou un adhésif modifié à base d'acrylique à adhérence instantanée élevée.

2. Objet réalisé en une matière plastique recyclable, selon la revendication 1, dans lequel l'objet se présente sous la forme d'un cintre (1 à 18), le cintre étant de type déformable pour prendre différentes formes et différentes dimensions requises pour l'étalage et le transport de vêtements de différents types et/ou de différentes tailles.

3. Cintre pour vêtement constitué d'une matière plastique recyclable selon la revendication 2, le cintre possédant un crochet (20) et le crochet étant réalisé à partir d'une matière de polystyrène ou d'une matière compatible avec du polystyrène.

4. Cintre pour vêtement selon la revendication 4, dans lequel le crochet (20) est constitué, soit d'un accessoire fixe, soit d'un accessoire apte à pivoter.

5. Cintre pour vêtement selon la revendication 3 ou la revendication 4, dans lequel l'étiquette est constituée de polystyrène.

6. Cintre pour vêtement selon la revendication 5, dans lequel un imprimé est appliqué sur l'étiquette par un procédé de typographie, un procédé de flexographie ou un procédé de sérigraphie.

7. Cintre pour vêtement selon un revendication 7, dans lequel un vernis fluorescent est appliqué pardessus n'importe quelle impression ce qui permet d'obtenir une luminance rayonnante spécifique lorsque la matière imprimée est exposée à de la lumière ultraviolette (UV).

8. Objet réalisé en une matière plastique recyclable selon la revendication 1, dans lequel l'objet est constitué d'un film de polystyrène à utiliser comme emballage dans l'industrie alimentaire, l'étiquette étant fournie soit à l'état tel quel, soit à l'état préimprimé pour des applications d'impression par transfert thermique ou d'impression thermique directe.

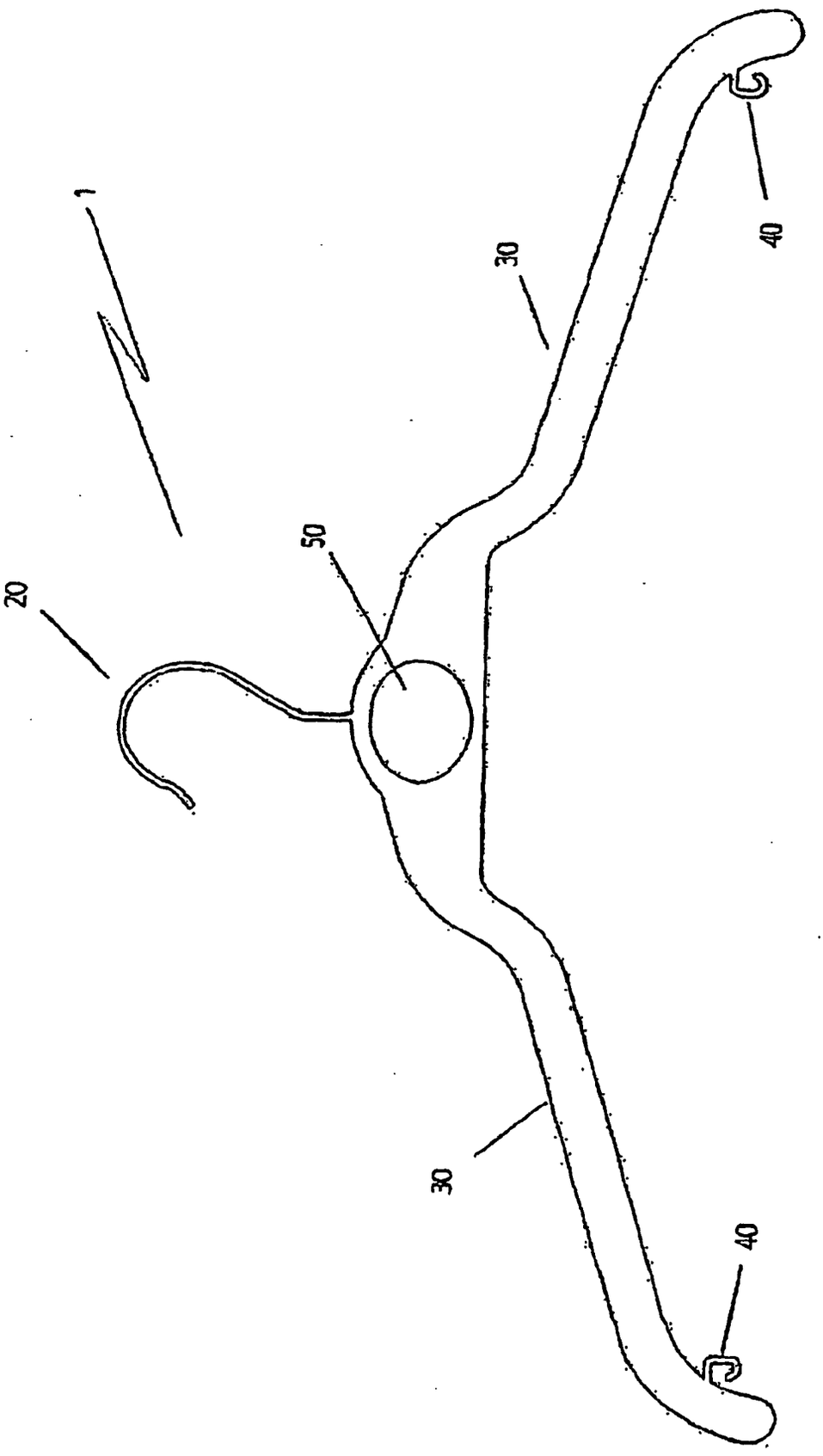


FIGURE 1

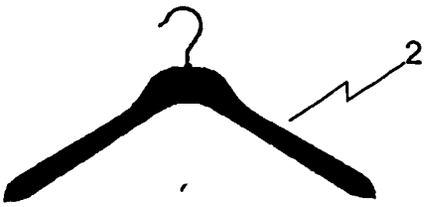


FIGURE 2



FIGURE 3



FIGURE 4

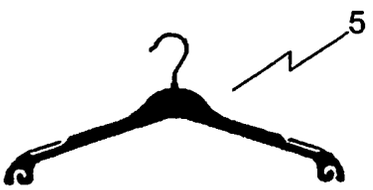


FIGURE 5

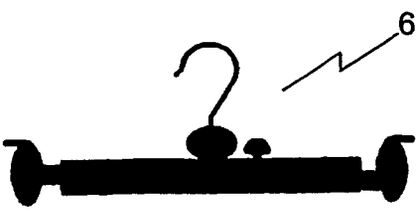


FIGURE 6

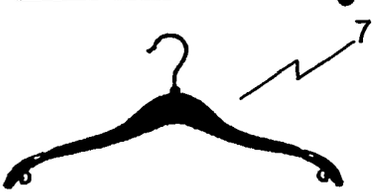


FIGURE 7

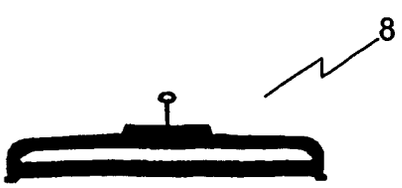


FIGURE 8

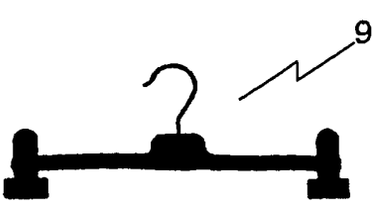


FIGURE 9



FIGURE 10



FIGURE 11



FIGURE 12



FIGURE 13



FIGURE 14

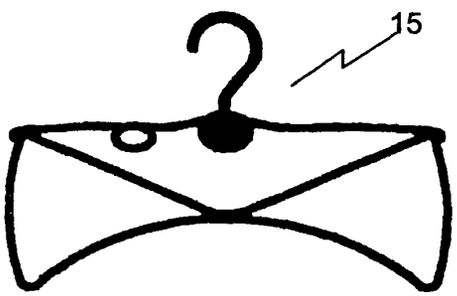


FIGURE 15



FIGURE 16