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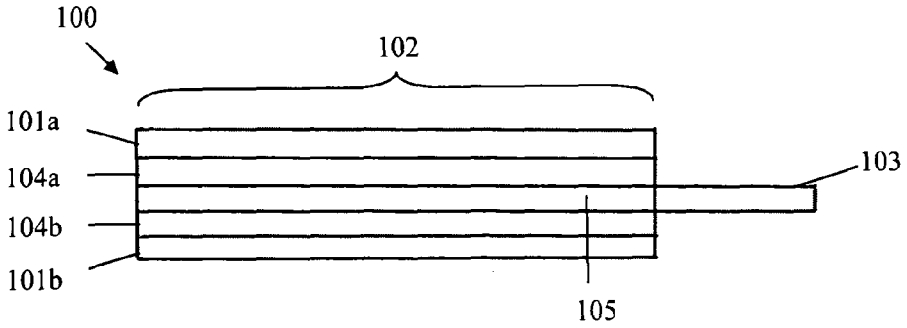

Figure 1

(57) Abstract: The present invention relates to a datasheet (100) of an identity booklet (200), comprising a data page (102) having two layers of polycarbonate core (104a, 104b) with pre-printed background; and two layers of polycarbonate overlay (101a, 101b) which carries identification information of the booklet owner, each being laminated onto an outer surface of each of the layers of polycarbonate core (104a, 104b); and an attachment layer (105) made of polyurethane-reinforced polyester sandwiched between the two layers of polycarbonate core (104a, 104b) of the data page (102), which is extending beyond an outer edge (110) of the data page (102) to form a flap (103); wherein the flap (103) is secured to the identity booklet (200) along the outer edge (110) of the data page (102).

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DATASHEET FOR IDENTITY BOOKLET

FIELD OF INVENTION

The present invention relates to a datasheet or identification information sheet for use in an identity booklet, such as a passport. In more particular, the present invention provides a datasheet made of an innovative combination of polymeric materials, and provided with improved security features.

BACKGROUND OF THE INVENTION

Identity or security booklets such as the travel documents, or generally known as passports, shall be manufactured with the necessary safety or security features which prevent it from being counterfeited. There have been numerous systems or methods used in the passport manufacturing industry to enhance the anti-counterfeiting property of passports from various aspects. One of these systems or methods is the embedment of identity codes, optical memories, electronic or magnetic chips, onto the passport booklets or their datasheets. Another direction of the research and development in the manufacture of identity booklet lies in the security design of the datasheet and its innovative attachment to the identity booklet which is highly secured and anti-counterfeiting.

There have been a few existing technologies in the prior art relating to the datasheet and its attachment to the identity booklet. A PCT Publication No. WO2012098216 discloses a security document and method of manufacturing thereof, in which a sleeve is provided to attach a data page to a booklet of the security document. The data page is made of polycarbonate (PC); whereas the sleeve comprises three layers of different materials, including a first layer of polyester fabric, second layer of plastic

polyurethane (PU) or polyester based adhesive, and a third layer of PC. As the sleeve is an external piece of material with its PC surface thermally joined onto the PC data page, therefore, the attachment of the data page to the booklet is sufficiently strong, which may ease the forgery of the data page for the identity booklet.

A European Patent No. EP2433810 discloses an electronic passport in the form of a booklet, which contains a one piece datasheet that defines a data page bearing identification data of a subject and a connecting page glued onto a cover sheet of the booklet. The datasheet is a multilayer material in which all layers are made of PC, and the first and second layer contains one or more safety or anti-counterfeiting elements. However, there is no intermediate layer or specific design provided for the attachment portion of the datasheet to the booklet as a simple adhesive method has been applied for the attachment. The use of glue or adhesive is risky, because aging may occur and cause the datasheet to be delaminated from the passport booklet.

Another invention of passport also disclosed in Poland Patent No. PL333063, in which an information page with the identification information and a photograph of the passport owner is provided. This information page also contains thermoplastic materials such as PC, which is personalized by means of laser beam inscribing. However, similar to the electronic passport as disclosed in EP2433810, there is no intermediate layer or reinforcing material added to the attachment portion of the information page. Besides, there is also no disclosure on the method or system of attaching the information page to the rest of the passport booklet.

A laminate sheet for security booklets and method for making the same is disclosed in European Patent No. EP1574359. The laminate sheet comprises at least two hard core layers of PC and a flexible component of nylon there between which is extending beyond an outer edge of the core layers to form a flexible band. The flexible component may be provided as an intermediate layer and comprises a plurality of apertures within which the core layer is laminated together and affixes the flexible

component to the laminate sheet. This laminate sheet may be used for a travel document such as passport and may comprise a hard core inlay layer configured for containing a contactless integrated circuit chip. However, there is no disclosure on any reinforcing material used for enhancing the strength of the nylon in order to provide a strong and durable attachment of the laminate sheet for security booklet.

Therefore, it is desirable for the present invention to provide a datasheet of identity booklet, particularly of passport or travel document, which is incorporated with improved security features, especially within the datasheet and the attachment portion of the datasheet to the identity booklet.

SUMMARY OF INVENTION

One of the objects of the present invention is to provide a datasheet for an identity booklet, such as a passport, which is made of an innovative combination of polymeric materials that gives higher mechanical strength, and with improved security features.

Another object of the present invention is to provide a datasheet with anti-counterfeiting property, in which the datasheet can be durably and imperishably attached to the booklet, thus the datasheet is difficult to be forged.

Still another object of the present invention is to provide a datasheet having a reinforced portion which enables the security codes to be embedded therein, thus improving the security level of the identity booklet or document.

At least one of the preceding objects is met, in whole or in part, by the present invention, in which one of the embodiments of the present invention describes a datasheet (100) of an identity booklet (200), comprising a data page (102) having two layers of PC core (104a, 104b) with pre-printed background; and two layers of PC

overlay (101a, 101b) which carries identification information of the booklet owner, each being laminated onto an outer surface of each of the layers of PC core (104a, 104b); and an attachment layer (105) made of PU-reinforced polyester sandwiched between the two layers of PC core (104a, 104b) of the data page (102), which is extending beyond an outer edge (110) of the data page (102) to form a flap (103); wherein the flap (103) is secured to the identity booklet (200) along the outer edge (110) of the data page (102).

One of the preferred embodiments of the present invention discloses that the pre-printed background includes authentication information of the identity booklet (200).

Another preferred embodiment of the present invention discloses that the two layers of PC overlay (101a, 101b) are coated with laser printing pigments. Preferably, these two layers of PC overlay (101a, 101b) are laser-printed with the personal data of the booklet owner.

According to still another preferred embodiment of the present invention, the PU-reinforced polyester of the attachment layer (105) is further coated with starch.

Yet another preferred embodiment of the present invention discloses that the flap (103) is secured to the identity booklet (200) by a stitching method. Preferably, the flap (103) is embedded with security code.

In accordance with a further embodiment of the present invention, lamination of the layers of PC overlay (101a, 101b) onto the layers of PC core (104a, 104b) as well as the layers of PC core (104a, 104b) onto the PU-reinforced and starch-coated polyester attachment layer (105) are performed using heat and pressure.

Unlike the nylon used in the prior art, the starch-coated polyester yarn employed in the present invention is a more hydrophobic materials and it adsorb less water than the

nylon does. Being reinforced by PU and further coated with starch, the attachment layer (105), together with its flap (103) is further strengthened and it is substantially water-resistant. This PU-reinforced and starch-coated polyester attachment layer (105) allows the strong bonding of the layers of PC core (104a, 104b) thereon. Therefore, the attachment of this datasheet (100) to the identity booklet (200) is more strong and imperishable.

One skilled in the art will readily appreciate that the present invention is well adapted to carry out the objects and obtain the ends and advantages mentioned, as well as those inherent therein. The embodiments described herein are not intended as limitations on the scope of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

For the purpose of facilitating an understanding of the invention, there is illustrated in the accompanying drawing the preferred embodiments from an inspection of which when considered in connection with the following description, the invention, its construction and operation and many of its advantages would be readily understood and appreciated.

Figure 1 is a cross-sectional view of the datasheet (100) as described in one of the preferred embodiments of the present invention, showing the two outer layers of PC overlay (101a, 101b), two inner layers of PC core (104a, 104b) and the attachment layer (105) with a flap (103) extended therefrom.

Figure 2 is a perspective view of an identity booklet (200) attached with the datasheet (100), which is having a data page (102) and a flap (103) as described in one of the preferred embodiments of the present invention.

Figure 3 is a fragmented cross-sectional view along the A-B line of Figure 2, showing the attachment of the datasheet (100) to the identity booklet (200) along the outer edge (110) or the folding line of the data page (102).

Figure 4 is a microscopic image of the polyester yarn which made up the attachment layer (105) of the datasheet (100), before being reinforced with PU and coated with starch, as described in one of the preferred embodiments of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

The present invention relates to a datasheet or identification information sheet for use in an identity booklet, such as a passport. In more particular, the present invention provides a datasheet made of an innovative combination of polymeric materials, and provided with improved security features.

Hereinafter, the invention shall be described according to the preferred embodiments of the present invention and by referring to the accompanying description and drawings. However, it is to be understood that limiting the description to the preferred embodiments of the invention and to the drawings is merely to facilitate discussion of the present invention and it is envisioned that those skilled in the art may devise various modifications without departing from the scope of the appended claim.

The present invention discloses a datasheet (100) of an identity booklet (200), comprising a data page (102) having two layers of PC core (104a, 104b) with pre-printed background; and two layers of PC overlay (101a, 101b) which carries identification information of the booklet owner, each being laminated onto an outer

surface of each of the layers of PC core (104a, 104b); and an attachment layer (105) made of PU-reinforced polyester sandwiched between the two layers of PC core (104a, 104b) of the data page (102), which is extending beyond an outer edge (110) of the data page (102) to form a flap (103); wherein the flap (103) is secured to the identity booklet (200) along the outer edge (110) of the data page (102).

As illustrated in Figure 1, the datasheet (100) of the present invention is made of at least five layers of polymeric materials, in which most of these materials are PC-based, including the two inner layers of PC core (104a, 104b) and two outer layers of PC overlay (101a, 101b). According to one of the preferred embodiments of the present invention, the inner layers, which are the front PC core (104a) and back PC core (104b) layers, are pre-printed with a background. This pre-printed background preferably includes authentication information of the identity booklet (200). For example, the pre-printed background can contain an authentication hologram (111a), as shown in Figure 2, to show that the identity booklet (200), or passport, is not fraudulent or counterfeited. Alternatively, the pre-printed background can also contain a logo, symbol, hologram or other graphical representations of a particular country which issues the identity booklet. Figure 2 also shows a data page (102) having the pre-printed background with the name of a country (111a) besides the authentication hologram (111a) for both identification and authentication purposes of the identity booklet (200). Preferably, the layers of PC core (104a, 104b) are having a thickness of approximately 150 to 200 microns.

As set forth in the preceding description, the outer layers of the datasheet (100) are two layers of PC overlay (101a, 101b), which are the front PC overlay (101a) and the back PC overlay (101b). Accordingly, the front PC overlay (101a) is laminated onto the outer surface of the front PC core (104a), while the back PC overlay (101b) is laminated onto the outer surface of the back PC core (104b). Preferably, the layers of PC overlay (101a, 101b) are transparent and able to provide a glossy effect to the data page (102). In accordance with another preferred embodiment of the present

invention, the layers of PC overlay (101a, 101b) are having a thickness of approximately 80 to 100 microns.

According to another preferred embodiment of the present invention, these two layers of PC overlay (101a, 101b) are coated with laser printing pigments and they are provided for the personalization process of the identity booklet (200). Preferably, the personalized identification information of the booklet owner is laser-engraved or laser-printed onto these two layers of PC overlay (101a, 101b). The laser-printed identification information is preferably the personal data of the booklet owner. This personal data may include photograph, name, nationality, date of birth, place of birth, identity number, sex and height of the booklet owner. It can also include the type, country code, serial number, date of issue, issuing office and expiry date of the identity booklet (200). It is to be noted that, high security requirements are to be met in order to laser-engrave the personal data of the booklet owner onto the data page (102), particularly into the inner layers of the data page (102). Therefore, the data engraved thereon would not be easily removed by the common sanding or scraping process, thus diminishing the possibility of counterfeiting the identity booklet (200).

The datasheet of the present invention is further characterized by an attachment layer (105) which is also an intermediate layer that sandwiched between the two layers of PC core (104a, 104b) of the data page (102). As illustrated in Figure 1, the attachment layer (105) extends beyond an outer edge (110) of the data page (102) to form a flap (103), wherein the flap (103) can be secured to the identity booklet (200) along the outer edge (110) of the data page (102), which is further shown in Figure 2. According to yet another preferred embodiment of the present invention, the flap (103) is secured to the identity booklet (200) by a stitching method. As shown in Figure 2, the stitch (112) can be sewn along the folding line, which is also the outer edge (110) of the data page (102). The flap (103) is capable of strengthening the attachment of the data page (102) to the identity booklet (200).

In accordance with still another preferred embodiment of the present invention, the thermoplastic material applied for the fabrication of the attachment layer (105) is polyester, preferably 100% polyester yarn. The polyester employed is preferably having a thickness of 120 to 150 microns, and containing longitudinal and latitudinal yarns having gaps of approximately 0.02 to 0.03 microns therebetween, as shown in Figure 4. It is having a semi-dull mono mechanical stretch effect. The tensile strength created by the longitudinal and latitudinal yarns allows it to be able to resist approximately 10 to 15 kg of pulling strength, which is 150% stronger than any other woven materials which are usually used for the manufacture of data page (102) in the existing technologies. The gaps formed therebetween are designed for the layers of PC to easily melt and penetrate thereinto in order to form the sandwich of PC-polyester-PC.

According to another preferred embodiment of the present invention, the polyester yarn is reinforced with PU and further coated with starch. The PU-reinforced and starch-coated polyester yarn is preferably having a thickness of approximately 100 to 200 microns. It is having improved and stronger tensile strength, ultimate elongation resistance and tear strength. The PU-reinforced and starch-coated polyester attachment layer (105) of the present invention is able to reach approximately 35 to 45 kg of pulling strength. Therefore, the datasheet (100) with its flap (103) could be closely stitched to the identity booklet (200), and is difficult to be detached therefrom, hence preventing the counterfeiting of the data page (102).

In accordance with a further embodiment of the present invention, heat and pressure force are preferably applied for the lamination of the layers of PC overlay (101a, 101b) onto the layers of PC core (104a, 104b) as well as the layers of PC core (104a, 104b) onto the PU-reinforced and starch-coated polyester attachment layer (105). The PC materials which form the data page (102) can be fused into the gaps within the polyester, hence they can be firmly adjoined during the full heating and pressure applying process. The pure heat and pressure lamination is capable of ensuring the

firm bonding among the polymeric materials and prevent any possible delamination.

Figure 2 shows an example of an identity booklet (200) with the booklet cover page (107) and inner sheets (108), which is attached with a datasheet (100) as described in one of the preferred embodiments of the present invention. Figure 3 is a fragmented cross-sectional view of the A-B line as depicted in Figure 2, showing the configuration of the booklet cover page (107), the datasheet (100) and the inner sheets (108) before stitching. As illustrated in Figure 3, the attachment of the datasheet (100) to the booklet (200) can leave the multilayer data page (102) at one end and the thin flap (103) at the other end. The data page (102) is preferably having a page size which is similar to that of the booklet cover page (107) as well as the inner sheets (108) of the booklet (200).

As being made up of PU-reinforced and starch-coated polyester, the flap (103) appears to be transparent. Preferably, the flap (103) is embedded with security code. The security code can be printed using an invisible frozen ink onto the flap (103) with qualifying ultraviolet (QUV) discolouration to provide additional features for authentication of the identity booklet (200). Hence, this system further ensures that the identity booklet would not be fraudulent. Apart from that, the system also enhances the durability of the identity booklet as well as the attachment of the authentic data page (102) thereto.

The present disclosure includes as contained in the appended claims, as well as that of the foregoing description. Although this invention has been described in its preferred form with a degree of particularity, it is understood that the present disclosure of the preferred form has been made only by way of example and that numerous changes in the details of construction and the combination and arrangements of parts may be resorted to without departing from the scope of the invention.

CLAIMS

1. A datasheet (100) of an identity booklet (200), comprising:
   a data page (102) having
      two layers of polycarbonate core (104a, 104b) with pre-printed background; and
      two layers of polycarbonate overlay (101a, 101b) which carries identification information of the booklet owner, each being laminated onto an outer surface of each of the layers of polycarbonate core (104a, 104b); and
   an attachment layer (105) made of polyurethane-reinforced polyester sandwiched between the two layers of polycarbonate core (104a, 104b) of the data page (102), which is extending beyond an outer edge (110) of the data page (102) to form a flap (103);
   wherein the flap (103) is secured to the identity booklet (200) along the outer edge (110) of the data page (102).

2. A datasheet (100) according to claim 1, wherein the pre-printed background includes authentication information of the identity booklet (200).

3. A datasheet (100) according to claim 1, wherein the two layers of polycarbonate overlay (101a, 101b) are coated with laser printing pigments.

4. A datasheet (100) according to claim 1, wherein the identification information is personal data of the booklet owner.

5. A datasheet (100) according to claim 1, wherein the two layers of polycarbonate overlay (101a, 101b) are laminated onto the layers of polycarbonate core (104a, 104b) by heat and pressure.

6. A datasheet (100) according to claim 1, wherein the polyurethane-reinforced

polyester is further coated with starch.

7. A datasheet (100) according to claim 1, wherein the two layers of polycarbonate core (104a, 104b) are laminated onto attachment layer (105) by heat and pressure.

8. A datasheet (100) according to claim 1, wherein the flap (103) is secured to the identity booklet (200) by stitching.

9. A datasheet (100) according to claim 1, wherein the flap (103) is embedded with security code.

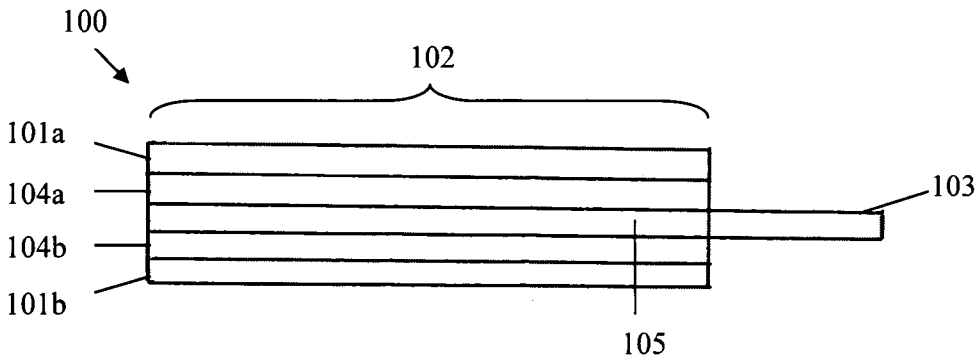

Figure 1

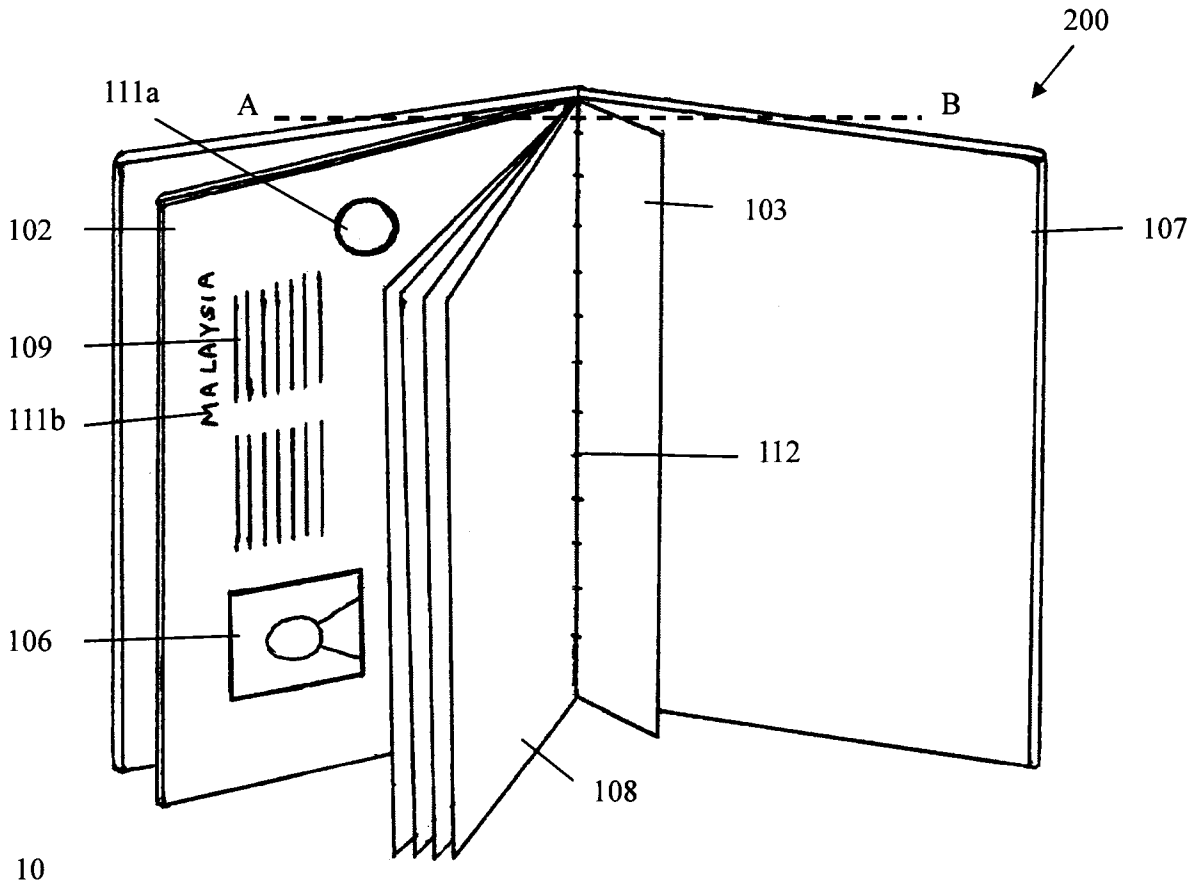

Figure 2

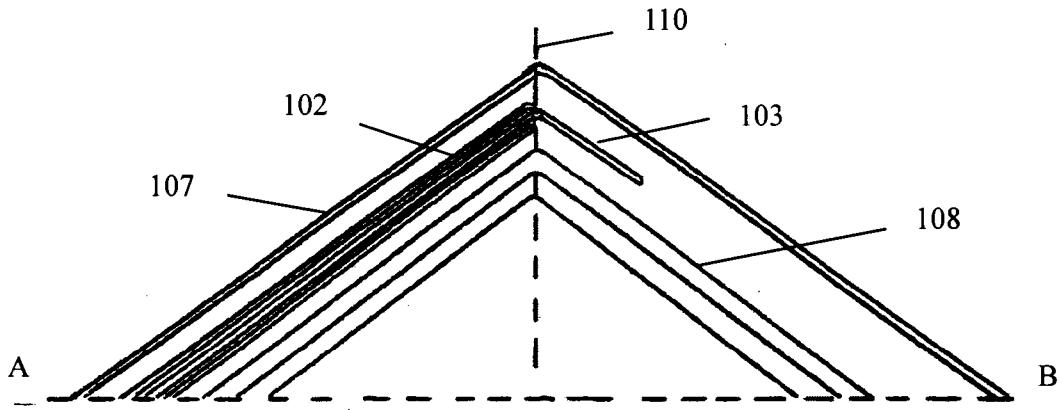

Figure 3

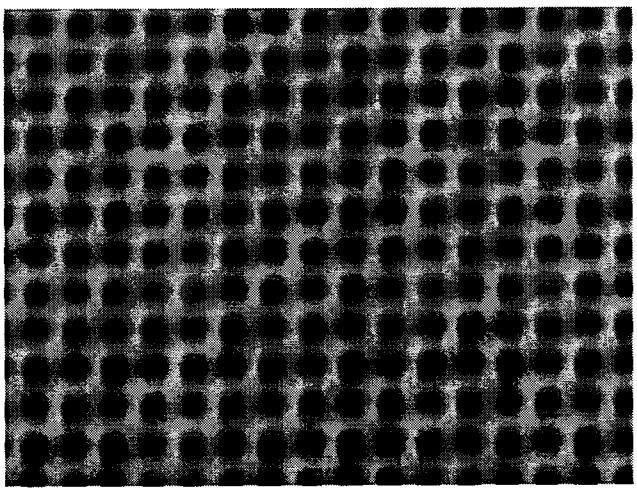

Figure 4