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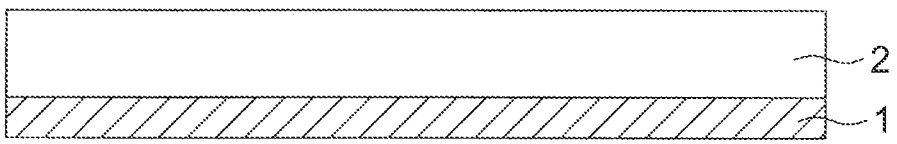


Fig. 1

(57) Abstract: A protective film for an outer underbody of a vehicle and a manufacturing method thereof are disclosed. The protective film includes a chipping resistant layer of a high-wear resistance polymer resin, and an adhesive damping layer of an adhesive elastic resin. The protective film for the outer underbody according to the present invention is manufactured 10 by a simple process, and has excellent mechanical and physical properties.

PROTECTIVE FILM FOR OUTER UNDERBODY OF VEHICLE AND MANUFACTURING METHOD THEREOF

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a protective film for an outer underbody of a vehicle which not only absorbs the noise and vibration, but also prevents rust or corrosion from occurring on an exterior trim of the vehicle.

Description of the Related Art

Generally, vehicles include a desired protection means for protecting a lower portion of the vehicle against the shock which is generated from gravel or sand bounded when the vehicle travels, and for preventing vibration or noise induced when the vehicle travels. Conventionally, an outer underbody of the vehicle is usually coated with paint, as the protection means.

For example, a PVC paint film is usually used as the protective paint film coated on the outer underbody of the vehicle. The PVC paint film is usually formed by a composition comprising a PVC-based resin as a main component, and additives such as a plasticizer, an adhesive providing agent, a filler, a moisture absorbing agent, a heat resistant stabilizer, a diluent, etc. The PVC paint film has superior physical properties in view of wear resistance, viscosity stability, gelation, and fusibility.

In order to apply the PVC paint film, however, it should be subjected to a complicated process, such as a masking tape adhering step for dividing the underbody of the vehicle into a painted portion and a non-painted portion, a spray coating step, an oven curing step, and a masking tape removing step. In particular, toxic substances harmful to a human body are discharged during a spray coating which is widely used as a coating method, thereby polluting surrounding environments. Also, there is another problem in

that an extended working period is required in the oven curing step.

In case that the vehicle is scrapped, it is difficult to detach the PVC paint film from the underbody of the vehicle, and the reuse of the PVC paint film is impossible. In addition, when the iron of the vehicle is recycled, because the PVC paint film is not eliminated completely, dioxin may be generated by catalytic reaction by the iron in a temperature furnace, thereby causing a secondary environmental pollution.

SUMMARY OF THE INVENTION

Therefore, it is an object of the present invention to provide a protective film for protecting an outer underbody of a vehicle, where the protective film has at least one or more, and preferably all, of following properties: an excellent chipping resistance for preventing an exterior trim of the vehicle from being scratched or damaged, sound insulation, vibration absorption, rust resistance, and is easily attached or detached to or from the outer underbody.

As a result, the inventors have developed a protective film that can be easily attached to the underbody to protect the underbody from exterior environmental damages. The protective film can be manufactured by using a laminated film comprising a polymer resin having excellent physical/mechanical properties, such as wear resistance, and an adhesive elastic layer having high adhesive force and impact resistance. The present invention is intended to achieve one or more of the objects and other advantages embodied and described herein.

In accordance with one aspect of the present invention, there is provided a protective film for an outer underbody of a vehicle, which includes a chipping resistant layer formed of a high-wear resistance polymer resin, and an adhesive damping layer formed of an adhesive elastic resin laminated on the chipping resistant layer.

According to another aspect of the present invention, there is provided a method of manufacturing a protective film for an outer underbody of a vehicle, which comprises the steps of providing a chipping resistant layer formed of a high-wear resistance polymer

resin; laminating an adhesive damping layer formed of an adhesive elastic resin on one surface of the chipping resistant layer; and curing the adhesive damping layer.

According to still another aspect of the present invention, there is provided a method of manufacturing a protective film for an outer underbody of a vehicle, which comprises the steps of providing a chipping resistant layer formed of a high-wear resistance polymer resin; forming an adhesive damping layer formed of an adhesive elastic resin on a release sheet, and laminating the adhesive damping layer on the chipping resistant layer.

Additional advantages, objects, and features of the invention will be set forth in part in the description which follows and in part will become apparent to those having ordinary skill in the art upon examination of the following or may be learned from practice of the invention. The objectives and other advantages of the invention may be realized and attained by the structure particularly pointed out in the written description and claims hereof as well as the appended drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this application, illustrate embodiment(s) of the invention and together with the description serve to explain the principle of the invention. In the drawings:

FIG. 1 is a cross-sectional view illustrating a protective film for an outer underbody of a vehicle comprising a chipping resistant layer and an adhesive damping layer according to an embodiment of the present invention;

FIG. 2 is a cross-sectional view illustrating a protective film for an outer underbody of a vehicle with a primer layer interposed between a chipping resistant layer and an adhesive damping layer according to an embodiment of the present invention;

FIG. 3 is a cross-sectional view illustrating a protective film for an outer underbody of a vehicle comprising an adhesive reinforcing layer formed on an adhesive

damping layer for reinforcing an adhesive force of the adhesive damping layer according to an embodiment of the present invention;

FIG. 4 is a cross-sectional view illustrating a protective film for an outer underbody of a vehicle with a prominence and depression formed on one surface of an adhesive damping layer according to an embodiment of the present invention; and

FIG. 5 is a cross-sectional view illustrating a protective film for an outer underbody of a vehicle with a plurality of pin holes formed penetrating the protective film, according to an embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Reference will now be made in detail to the preferred embodiment of the present invention, an example of which is illustrated in the accompanying drawing.

Herein, the term 'chipping' includes cracking, flaking, peeling, scratch, etc. that may happen on a surface of a protective film.

The protective film for an outer underbody of a vehicle according to the present invention is characterized in that an adhesive damping layer formed of an adhesive elastic resin is layered on one surface of a chipping resistant layer of a high-wear resistance polymer resin.

A resin having high wear resistance is used as the polymer resin forming the chipping resistant layer, for example, a polyvinyl-based resin, a polyester-based resin, a silicon-based resin, and so forth. In an exemplary embodiment of the present invention, a PVC-based resin is preferably used.

According to one embodiment of the present invention, the chipping, that is, scratch or damage of the underbody of the vehicle, can be prevented by using a PVC-based resin having high wear resistance as the chipping resistant layer. Also, vibration, noise, and shock generated when the vehicle travels can be absorbed by the presence of the adhesive damping layer.

In addition, the protective film can be easily attached or detached to or from the

underbody of the vehicle by using a polymer resin having elastic and adhesive properties as the adhesive damping layer. Also, since the protective film is provided with the elasticity, the vibration, noise and shock absorbing effects can be further improved.

Referring to FIG. 1, the protective film for the underbody of the vehicle according to the present invention includes a chipping resistant layer 1 and an adhesive damping layer 2 layered on the chipping resistant layer.

The chipping resistant layer 1 comprises mainly a polymer resin having wear resistance, and if necessary, additives, such as a plasticizer, an adhesive providing agent, a filler, a moisture absorbing agent, a heat resistant stabilizer, or a diluent, may be selectively added to the chipping resistant layer 1. According to one embodiment of the present invention, the chipping resistant layer has a thickness of about 0.2 to 2.0mm. In addition, the chipping resistant layer has mechanical and physical properties such as tensile strength, elongation property, resistance to thermal shrinkage, etc. According to one exemplary embodiment of the present invention, in case when the chipping resistant layer has a width of 1270mm, a thickness of 0.090mm, and a length of 1800 to 2000mm, its tensile strength may be 20 to 24N (min) in machine direction (MD) and 18 to 22N (min) in cross direction (CD), elongation may be 150 to 190% (min) in machine direction (MD) and 17 to 25% (min) in cross direction (CD), and thermal shrinkage is +3 to +7% (max) in machine direction (MD) and -1 to -2% (max) in cross direction (CD) at 100℃ during 20 minutes. Mechanical and physical property of the chipping resistant layer according to the present invention is not limited thereto. According to an embodiment of the present invention, a PVC-based resin may be used as the chipping resistant layer.

The protective film is provided with the adhesive damping layer 2 for improving a damping effect against vibration, noise, and shock due to bounded gravel or sand, and ensuring an adhesive force. As a material of the adhesive damping layer 2, any polymer resin having physical properties to absorb the vibration, the noise, and the shock and having the property to easily attach or detach the protective film to or from the underbody of the vehicle may be used. For example, an elastic adhesive polymer resin may be used as

the material for the adhesive damping layer. In addition to the elastic adhesive polymer resin additives, which does not affect adversely to present invention, may be added into the adhesive damping layer. According to an embodiment of the present invention, additives, such as a plasticizer, an adhesive providing agent, a filler, a moisture absorbing agent, a heat resistant stabilizer, a pigment or an antioxidant may be added.

According to an embodiment of the present invention, a thickness of the adhesive damping layer may be thicker than that of the chipping resistant layer. The adhesive damping layer may have a thickness of about 0.2 to 3.0mm, while the chipping resistant layer may have a thickness of about 0.2 to 2.0mm.

The adhesive damping layer 2 may have a plurality of prominences and depressions 21 on one surface thereof. The prominence and depression may be formed by an embossed roll conventionally used in the art. The prominence and depression may be formed in a triangular shape, wave, rectangular shape, embossing shape, etc. The plurality of prominences and depressions are formed on the adhesive damping layer, so that the protective film of the present invention can be easily attached to surfaces of various conditions, for example, even to a rough surface.

According to an embodiment of the present invention, the protective film of the present invention may further include a primer layer 3 for improving the interlayer adhesive between the chipping resistant layer and the adhesive damping layer. The primer layer may be interposed between the chipping resistant layer and the adhesive damping layer (see FIG. 2).

As a material of the primer layer, a polymer resin which can provide crosslinkage between the chipping resistant layer and the adhesive damping layer may be used. For example, the primer layer may be made of a polyurethane-based resin, a polyacrylate-based resin, a polychlorinated olefin-based resin, or a polyamide-based resin. In an embodiment of the present invention, the primer layer 3 has a thickness of 0.5 to 10μm, and in another embodiment, 1 to 2μm. When the primer layer is formed between the chipping resistant layer and the adhesive damping layer, the shape of the protective film of

the present invention can be maintained more effectively under the external environment, such as shock at high or low temperature, thereby more effectively protecting the outer underbody of the vehicle against scratch or wearing.

According to an embodiment of the present invention, the protective film of the present invention may further include an adhesive reinforcing layer 4 layered on the adhesive damping layer 2 for reinforcing the adhesiveness of the adhesive damping layer(see FIG. 3). The adhesive reinforcing layer may be made of an adhesive polymer resin which does not comprise any filler that may impede the adhesiveness, thereby further improving the adhesiveness. According to an embodiment of the present invention, the adhesive reinforcing layer may be made of an acrylic-based adhesive elastic resin. According to an embodiment of the present invention, the adhesive reinforcing layer has a thickness of about 1 to 2μm.

According to an embodiment of the present invention, the protective film of the present invention may include a plurality of pin holes 5 penetrating the protective film (see FIG. 5). The pin holes can reduce an air layer or air bubble generated between the protective film and the underbody of the vehicle when the protective film is applied on the underbody of the vehicle. Also, by the presence of the pin holes, the protective film can be easily attached to various surfaces, for example, even to a rough surface.

A diameter of the pin hole or an interval between the pin holes may be varied according to the position of the underbody of the vehicle to which the protective film is applied. As one example of the present invention, the pin hole has a diameter of about 0.1 to 1mm, and an interval between the pin holes is about 2 to 10mm.

In addition, according to one aspect of the present invention, there is provided a method of manufacturing a protective film for an outer underbody of a vehicle.

According to one embodiment of the present invention, the protective film of the present invention is manufactured by laminating an adhesive damping layer formed of an adhesive elastic resin on a chipping resistant layer formed of a wear-resistance polymer resin.

According to an embodiment of the present invention, the protective film may be manufactured by a method comprising the steps of: providing a chipping resistant layer; coating an uncured composition for an adhesive damping layer; and curing the uncured composition. In this instance, a part of material with a small size from the uncured composition for the adhesive damping layer can be diffused into the chipping resistant layer, so that crosslinkage is formed between the chipping resistant layer and the adhesive damping layer by the diffused material, when the curing process is completed. As a result, the chipping resistant layer and the adhesive damping layer are not easily detached from each other even at extreme conditions, for example, at a high temperature, due to the crosslinkage.

A method widely known in the art, such as thermal curing or ultraviolet curing, may be used to cure the uncured composition for the adhesive damping layer. The characteristic of the protective film or each layer of the protective film can be varied according to the curing method. Therefore, it is preferable that the curing method is selected in view of a kind of a product applied with the protective film and the physical properties required.

According to another embodiment of the present invention, after an adhesive damping layer is formed on a separate release sheet, the protective film of the present invention may be manufactured by laminating the adhesive damping layer onto a chipping resistant layer. In this instance, the release sheet may be made of any one selected from the group consisting of a plastic release film such as PET release film, a release paper, a non-woven fabric, a glass, and a metal.

In case that the adhesive damping layer is formed independently on a release sheet, and is laminated on a chipping resistant layer, a step of forming a primer layer on the chipping resistant layer may be conducted before the adhesive damping layer is laminated on the chipping resistant layer.

The primer layer may be formed on the chipping resistant layer by a roll coating method or a die coating method which is well known in the art. According to an

embodiment of the present invention, the primer layer may be made of a polymer resin having low molecular weight and high functional group, for example, a polyurethane-based resin, a polyacrylate-based resin, a poly chlorinated olefin-based resin, or a polyamide-based resin may be coated on the chipping resistant layer as the primer layer.

The method of manufacturing the protective film according to the present invention may further include a step of forming a plurality of prominences and depressions on one surface of the adhesive damping layer so as to easily attach the protective film to various surfaces. The prominence and depression may be formed in a triangular shape, wave, rectangular shape, embossing shape, etc.

Also, the method of manufacturing the protective film according to the present invention may further include a step of forming a plurality of pin holes penetrating the protective film. By the presence of the pin holes, an air layer or air bubbles generated between the protective film and the underbody of the vehicle when the protective film is applied on the underbody of the vehicle can easily be removed. A diameter of the pin hole or an interval between the pin holes may be varied according to the position of the underbody of the vehicle to which the protective film is applied. The holes can be formed by using a punching machine conventionally used in the art.

The method of manufacturing the protective film according to the present invention may further include a step of forming a thin adhesive reinforcing layer on the adhesive damping layer for reinforcing the adhesiveness of the damping adhesive.

The present invention will now be described in detail with reference to Examples and comparative Examples, which do not limit the scope of the present invention.

Example 1

A film made of a PVC resin (MKB/GR119) of 490g/m^2 and a film shaped foam made of a PE adhesive elastic resin (GreenTech Korea/#4420) of 490g/m^2 were laminated each other and cured during about 7 days to manufacture a protective film for an outer underbody of a vehicle.

Example 2

A film made of a PVC resin (MKB/GR119) of 300g/m^2 and a film shaped foam made of an acrylic adhesive elastic resin (3M Korea) of 300g/m^2 were laminated each other and cured during about 3 days, and then the same process as Example 1 was performed.

Example 3

Except that an acrylic primer was coated on the PVC film before the film shaped foam made of a PE adhesive elastic resin is laminated on the PVC film, the film was prepared with a same method as described in Example 1.

Example 3

On the PE adhesive elastic resin of a protective film prepared with a same method as described in Example 3, an acryl based adhesive reinforcing layer was further applied to manufacture a protective film for an outer underbody of a vehicle.

Comparative Example 1

After a masking tape was attached to a coated steel plate, a spray type composition of a PVC resin was sprayed on the panel. The coated steel plate was put and cured in an oven, and then, the attached masking tape was released, so that a PVC coating was formed on the surface of the coated steel plate.

Experimental Example 1 - Peeling Strength

After a coated steel plate was cleaned with isopropyl alcohol and was left alone during about 3 minutes, samples of the films (50mm x 50mm) manufactured in Examples 1 and 2 were attached to the coated steel plate. Peeling strength of the samples was measured under the following conditions.

Condition 1. After each sample was left along at 23℃ during 24 hours, a peeling load was applied to each sample in a direction of 180° at 50mm/min by using a tensile tester (Instron) having a load-displacement recording device to peel each sample from the coated steel plate.

Condition 2. Each sample was subjected to the following process three times: it

was left alone at 80℃ during 3 hours, immersed in water of 20℃, left alone at 30℃ during 3 hours, left alone at 20℃ during 1 hour, and finally left alone at 95% RH during 13 houses. After that, a peeling load was applied to each sample in a direction of 180° at 50mm/min by using a tensile tester (Instron) having a load-displacement recording device to peel each sample from the coated steel plate.

Condition 3. After each sample was left alone at 20℃ during 24 hours, it was immersed in water of 40℃ during 118 hours. After that, a peeling load was applied to each sample in a direction of 180° at 50mm/min by using a tensile tester (Instron) having a load-displacement recording device to peel each sample from the coated steel plate.

Condition 4. After each sample was left along at 20℃ during 24 hours, it was left along at 80℃ during 118 hours. After that, a peeling load was applied to each sample in a direction of 180° at 50mm/min by using a tensile tester (Instron) having a load-displacement recording device to peel each sample from the coated steel plate.

In case of the protective film manufactured in Examples 1 and 2, average peeling strength was about 2.8N/A and about 4.225N/A for each case which is higher than that of conventional requirement of the client 0.5 (see Table 1). In particular, in case of the protective film manufactured in Example 2, peeling happened at about 5.6N/A event after heat treatment (condition 4). Accordingly, it was verified that the protective film of the present invention had high adhesive force at room temperature and high temperature.

Table 1

	Condition	Example 1	Example 2	Standard requirement
180° Peeling Load (Adhesive Strength) (Kfg/25mm)	1	2.9	3.3	0.5
	2	3.1	4.5	
	3	2.3	3.5	
	4	2.9	5.6	

Experimental Example 2 - Chipping resistance

After a coated steel plate was cleaned with isopropyl alcohol and was left alone during about 3 minutes, samples of the films (50mm x 50mm) manufactured in Examples

1 and 2 were attached to the coated steel plate. A painted metal plated sample coated with PVC spray composition as described in Comparative Example 1 was also prepared. Chipping resistance of the samples was measured under the following conditions.

Condition 1. After each sample was collided with a ROAD FINISH of 300g at a pressure of 0.39MPa (about 4kg/cm^2) in an instrument Gravelometer (SAE-J400), cracking and peeling were verified.

Condition 2. After each sample was left alone in a cold reservoir of -30℃ during 3 hours, and collided with a road finish of 300g at a pressure of 0.39MPa (about 4kg/cm^2) in an instrument Gravelometer (SAE-J400), cracking and peeling were verified.

In case of the sample according to Comparative Example 1, at a temperature of -30℃ the coating was cracked and peeled off. And when salt water was sprayed onto the portion where cracking and peeling are, rust was generated.

On the contrary, in case of the protective film manufactured in Examples 1 and 2, the cracking and peeling are not found at a room temperature and a cold temperature -30℃ (see Table 1). Also, in case of spraying salt water onto the film, only one to three numbers of rust were found per 1 square meter. Consequently, it was verified that the protective film of the present invention is not easily cracked or peeled by vibration or shock generated when the vehicle travels or is placed at low temperature, and no rust happens on the film.

Table 2

	Condition	Example 1	Example 2	Comparative Example 1	Standard
Chipping Resistance (N/A)	1	Excellent	Excellent	Good	Cracking, Peeling
	2	Good	Excellent	Bad	

With the above description, the protective film for the outer underbody of the vehicle is manufactured in a simple process, and is easily attached to the vehicle, contrary to the conventional protective film manufactured through a complicated coating process comprising coating and heat curing. In addition, the protective film has excellent mechanical and physical properties.

The forgoing embodiments are merely exemplary and are not to be construed as limiting the present invention. The present teachings can be readily applied to other types of apparatuses. The description of the present invention is intended to be illustrative, and not to limit the scope of the claims. Many alternatives, modifications, and variations will be apparent to those skilled in the art.

What is claimed is:

1. A protective film for an outer underbody of a vehicle, comprising:

a chipping resistant layer formed of a high-wear resistance polymer resin; and

an adhesive damping layer formed of an adhesive elastic resin and laminated on the chipping resistant layer.

2. The protective film as claimed in claim 1, wherein a peeling strength onto a coated steel plate in a direction of 180° is 2.0 to 6.0kgf/25mm.

3. The protective film as claimed in claim 1, wherein the chipping resistant layer has tensile strength of 20 to 24N (min) in machine direction (MD) and 18 to 22N (min) in cross direction (CD), elongation of 150 to 190% (min) in machine direction (MD) and 17 to 25% (min) in cross direction (CD), thermal shrinkage of +3 to +7% (max) in machine direction (MD) and -1 to -2% (max) in cross direction (CD) at 100℃ during 20 minutes, on the condition that chipping resistant layer has a width of 1270mm, a thickness of 0.090mm, and a length of 1800 to 2000mm.

4. The protective film as claimed in claim 1, wherein the adhesive damping layer is thicker than the chipping resistant layer.

5. The protective film as claimed in claim 1, wherein the chipping resistant layer has a thickness of 0.2 to 2.0mm.

6. The protective film as claimed in claim 1, wherein the adhesive damping layer has a thickness of 0.2 to 3.0mm.

7. The protective film as claimed in claim 1, wherein a plurality of pin holes are

formed penetrating the protective film.

8. The protective film as claimed in claim 7, wherein a diameter of the pin hole is 0.1 to 1mm, and an interval of the pin holes is 2 to 10mm.

9. The protective film as claimed in claim 1, wherein a plurality of prominences and depressions are formed on one surface of the adhesive damping layer.

10. The protective film as claimed in claim 1, further comprising a primer layer between the chipping resistant layer and the adhesive damping layer.

11. The protective film as claimed in claim 10, wherein the primer layer is made of at least one selected from the group consisting of a polyurethane-based resin, a polyacrylate-based resin, a poly chlorinated olefin-based resin, and a polyamide-based resin.

12. The protective film as claimed in claim 1, wherein the high-wear resistance polymer resin is a polyvinyl chloride (PVC)-based resin.

13. The protective film as claimed in claim 1, wherein the adhesive elastic resin is polyethylene (PE) or acrylic resin.

14. A method of manufacturing a protective film for an outer underbody of a vehicle, comprising:

providing a chipping resistant layer formed of a high-wear resistance polymer resin; and

laminating an adhesive damping layer of an adhesive elastic resin on one surface of the chipping resistant layer; and

curing the adhesive damping layer.

15. The method as claimed in claim 14, further comprising forming a primer layer between the chipping resistant layer and the adhesive damping layer.

16. The method as claimed in claim 14, further comprising forming a plurality of pin holes penetrating the protective film.

17. The method as claimed in claim 14, further comprising forming a plurality of prominences and depressions on one surface of the adhesive damping layer.

18. A method of manufacturing a protective film for an outer underbody of a vehicle, comprising:

providing a chipping resistant layer formed of a high-wear resistance polymer resin; and

forming an adhesive damping layer of an adhesive elastic resin on a release sheet; and

laminating the adhesive damping layer on the chipping resistant layer.

19. The method as claimed in claim 18, further comprising forming a primer layer between the chipping resistant layer and the adhesive damping layer.

20. The method as claimed in claim 18, further comprising forming a plurality of pin holes on a surface of the film.

21. The method as claimed in claim 18, further comprising forming a plurality of prominences and depressions on one surface of the adhesive damping layer.

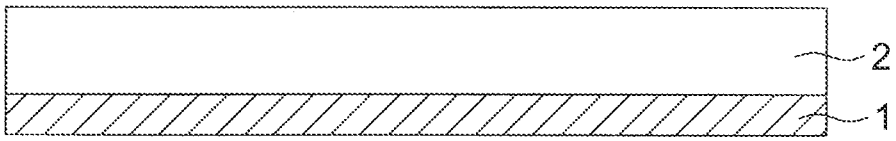


Fig. 1

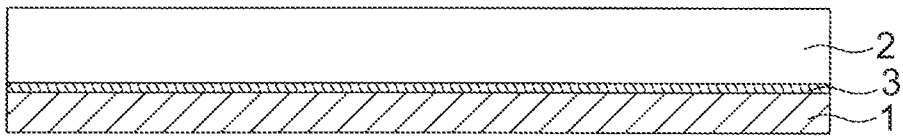


Fig. 2

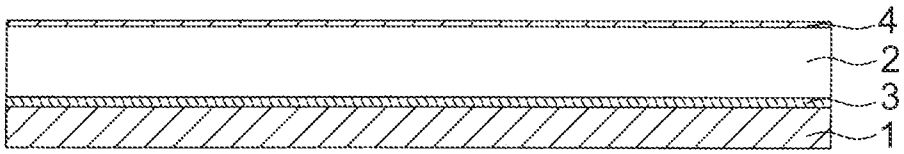


Fig. 3

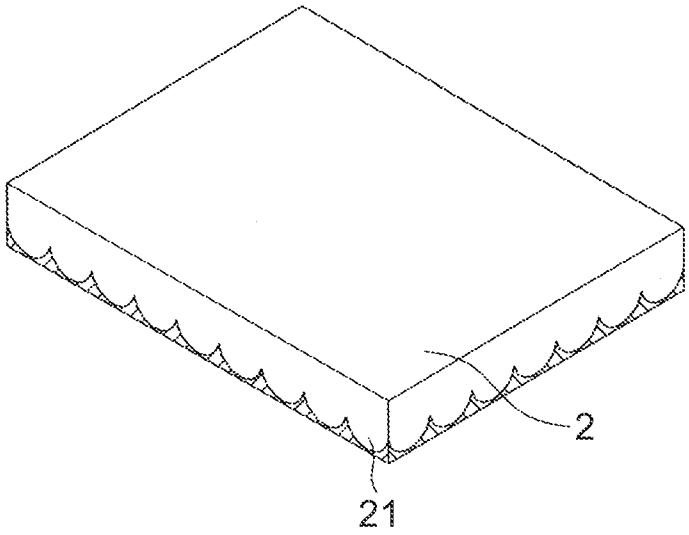


Fig. 4

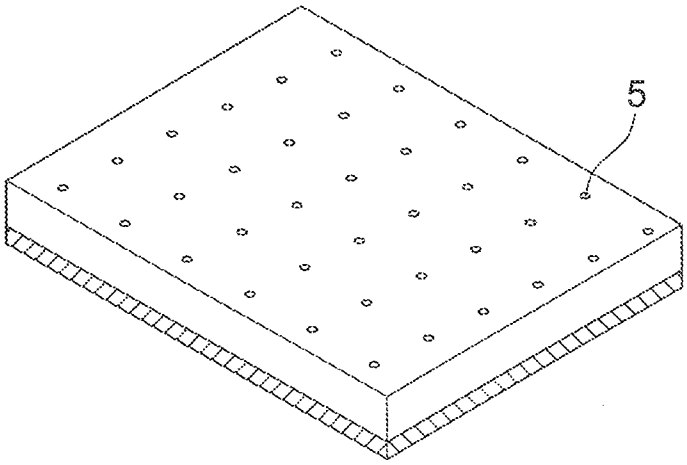


Fig. 5

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2008/071441

A. CLASSIFICATION OF SUBJECT MATTER
INV. C09J7/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
C09J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical; search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 10 2005 029729 A1 (ROECHLING AUTOMOTIVE AG & CO K [DE]) 28 December 2006 (2006-12-28) claims 1-29; example 1	1-21
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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
25 September 2008	07/10/2008

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Glomm, Bernhard

INTERNATIONAL SEARCH REPORT

International application No
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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X	EP 1 132 444 A (BASF AG [DE]) 12 September 2001 (2001-09-12) claims 1-10; example 1	1-21
X	EP 1 225 209 A (BASF AG [DE]) 24 July 2002 (2002-07-24) claims 1-7; example 1	1-21
X	DE 200 06 192 U1 (ODENWALD CHEMIE GMBH [DE]) 9 August 2001 (2001-08-09) claims 1-20; example 1	1-21
X	DE 197 58 566 A1 (NITSCHE LARS [DE]) 18 November 1999 (1999-11-18) claims 1-4; example 1	1-21
X	EP 0 365 442 A (PLASTOCHIM SARL [FR]) 25 April 1990 (1990-04-25) claims 1,2; example 1	1-21
X	US 4 496 628 A (DEATCHER JOHN H [US] ET AL) 29 January 1985 (1985-01-29) claims 1-15; examples 1-4	1-21

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