Use of a masking means and masking means.

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References cited:
EP-A-0 207 720
DE-A-2 362 584
US-A-3 536 569
US-A-4 714 633

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Description

The invention relates to the masking of at least a part of a surface to be treated wherein an element that is resistant to a surface treatment operation is removably applied to said part of said surface and is removed after finishing said treatment. The invention also relates to a masking means, for carrying out the masking.

The use of a masking tape, for masking purposes is described in US-A-3.536.569. This known masking tape is for example applied in priming and painting of vehicle coachwork, in particular automobile coachwork, or in refinishing work, sandblasting or other surface treatments. In order to prevent paint or other substances to be applied on a surface to be treated from penetrating or covering at least a part of the surface to be treated, that part is masked by using a sheet-like masking tape that is resistant to surface treatment operations. The masking tape masks the surface during the treatment and is removed following the treatment.

A drawback of the known sheet-like masking tape is that its application not always results in a satisfactory surface treatment. Turbulences can occur around openings, grooves or edges in the surface to be treated, causing an uneven application of the substance to be applied on that surface. Further, the dust left in the openings can cause contamination of the treated surface. The achievement quality, especially in the neighborhood of such openings, grooves or edges, is therefore not good enough.

An object of the invention is to mitigate the above mentioned drawbacks.

According to the present invention, use is made of an elongate compressible and bendable foam cushion that is resistant to surface treatment for masking at least a part of a surface to be treated, said cushion being removably applied on said part of said surface to be treated and removed after finishing said treatment.

Due to the fact that the masking element is formed by an elongate compressible and bendable cushion, a substantial improvement of the achievement quality is obtained by an easy and quick application of such a cushion. The elongate shape of the cushion renders the latter particularly suitable to be applied on a large variety of irregularities, such as openings, grooves or edges, and offers the advantage that it can be applied in one piece over the whole length of the irregularity to be masked, thus avoiding connection parts. The compressible cushion adapts itself for filling or covering surface irregularities such as openings or edges. Due to the fact that the cushion is bendable along the surface to be treated, it provides an adequate separation between the surface to be treated and the masked part. Thus the cushion prevents the formation of turbulences and so the contamination by dust originating from the openings, and enables an adequate masking of the irregularities.

The gist of the present invention is to use an elongate compressible cushion, instead of a sheet-like masking tape or a panel shaped masking member, for masking a part on a surface to be treated. Due to the fact that the cushion is compressible and bendable, it takes substantially the exact shape of the part to be masked, thus providing an excellent masking.

The invention also relates to a masking means which is made of a material that is resistant to the surface treatment and adapted to be removably applied to said part of said surface to be treated. Such a masking means is characterized in that it comprises an elongate compressible and bendable foam cushion.

Masking means having the shape of a particular irregularity to be masked are known and are for example described in the European patent application No. 0263637. However the difference between a masking means according to the present invention and the masking means according to the latter patent application is that the masking means according to EP-A-0263637 have a particular preformed shape which is beforehand completely adapted to the irregularity and can thus only be used for masking an irregularity of that particular shape. The masking means according to the present invention is not beforehand adapted to a a particular irregularity since it has an elongate shape but, due to its compressible and bendable character, adapts itself to the irregularity to which it is applied. The masking means according to the present invention is thus universally applicable to many kinds of surface parts, in particular irregularities to be masked while the masking means according to EP-A-0263637 is not universally applicable.

One should not confuse a masking gasket with a conventional sealing gasket. Indeed, in automobiles, such as for example described in DE-A-2362584, it is well known to apply a sealing gasket on the inner lip of a door, hood or a trunk, in the frame of the door or in the other openings which prevents inter alia water and noise from penetrating inside the vehicle. Those sealing gaskets are applied by the manufacturer of the car at a well-defined model. Those sealing gaskets are quasi-permanently fixed in place. On the other hand, a masking means according to the invention only serves for masking, as its name indicates, and not for permanent sealing purposes.

Nothing in DE-A-2362584 teaches the use of an elongate compressible and bendable foam cushion for masking purposes since, in relation to automobile technique, only the use as a sealing
gasket of such a cushion is taught.

The use of a thermoplastic foam for masking purposes is described in the U.S. patent 4,714,633. That patent describes the use of an expanding and shrinking thermoplastic foam member that contains a cavity. During the surface treatment operation or when the member is heated afterwards, the member according to the U.S. patent will change its form in order to be separated in a natural way from the article on which it has been fixed. On the other hand, the masking means of the invention resists surface treatment operations where its extending and shrinking properties are essential, while the masking means according to the invention is applied in surface treatment operations where its resistance to the treatment plays an important role.

The invention thus provides a non-evident application of a masking means. Indeed, the idea of using an elongate cushion is not evident with respect to the well known use of sheet-like masking tapes. Several solutions such as pre-treatment of surfaces (see for example the Japanese patent applications 85021787 or 87211929) have already been tested out in order to reduce secondary effects due to the masking during surface treatment operations. The use of a masking means according to the present invention not only enables a substantial time saving but also a quality improvement without use of pre-treatment operations or the like.

In a first preferred embodiment of the invention use is made of an absorbent cushion. There is thus avoided that the material used by the surface treatment and applied on the cushion could afterwards drip on the treated surface.

Preferably the cushion is applied to an irregularity situated on the body of a vehicle. Vehicles show a large number of irregularities such as for example door, hood or hatch openings, which can adequately be masked by using an elongated cushion according to the present invention.

In a second preferred embodiment according to the invention use is made of a cushion which is formed by applying to said part of said surface to be treated a polymerizing foam comprising at least a reactive substance. This is for example applied for masking parts which are difficult to access and thus provides an easy application of the foam on the part to be masked.

In another preferred embodiment according to the invention, said cushion is applied along a seal-
of the cushion and also the easy removing thereof after the surface treatment has been accomplished.

Preferably the cushion 1 is an elastic foam cushion which is made of a material resistant to surface treatment operations. The foam thus for example resists high temperatures of a spraying cabin for automobiles, solvents and humidity. The material used for manufacturing the cushion is preferably a synthetic material such as for example polypropylene, neoprene, polyester, polyurethane or acrylic. It will be evident that other materials, elastic or not, synthetic or natural, which resist surface treatment operations can also be used. The adhesive layer 2 is for example formed by an adhesive based on rubber, resin, acrylic, or other suitable material, having an immediate tack. If necessary, the cushion could be provided with a repositionable adhesive layer, which should be resistant to solvents and changes in temperature.

The cushion can have different cross-sections, for example it can have a diameter within a range of 5 to 50 mm, and is preferably presented rolled up. The cushion can also have a rectangular cross-section, such as shown in figure 2 or a cross-section of any other geometrical form, such as for example triangular or trapezoidal. Preferably the cushion has substantially the same cross-section over its whole length.

This cushion can be either solid or hollow, such as for example illustrated in dotted line in figure 1. A hollow cushion improves the elasticity of the masking means while saving material.

The adhesive layer 2 can be covered by a liner 3, which is removed before the masking means is applied. The adhesive layer can also be applied to the whole or to a substantial portion of the exposed portion of the cushion, for example when a rectangular cushion is used such as illustrated in figure 2, the adhesive layer can be applied to two or more sides of the cushion thus enabling a better and/or easier application of the cushion.

The adhesive substance is preferably self-sticking, thus forming with the foam a self-sticking assemblage realized either by a pressure sensitive adhesive film which at least partially covers the cushion, such as illustrated in figures 1 and 2, or by manufacturing a cushion from a foam which itself is tacky. In the latter case, the foam can be completely covered by a protection liner. A foam which is provided with a pressure sensitive adhesive is particularly advantageous for applications on vehicle body repairing. Indeed, the surface to be masked can sometimes impose multiple contortions upon the cushion. When the foam is provided with an adhesive layer, one can reliably obtain a satisfactory adhesion, notwithstanding the geometric form of the irregularity to be masked.

However the cushion 1 can also be fixed on the irregularity which has to be masked by other means, which are not necessarily self-sticking. For example it is possible to use a cushion which is not self-sticking and to first spray an adhesive on the surface on which the cushion has to be applied, and thereafter stick the cushion on the applied adhesive.

In another embodiment of the masking method, the elastic foam cushion is formed by applying on the surface, which has to be masked, a polymerising foam made from a suitable reactive substance or substances. That reactive substance is for example stored in an aerosol container and is sprayed on the surface to be masked. This enables a masking of places which are otherwise difficult to access for applying thereon a masking cushion.

The figures 3 and 4 illustrate the masking according to the invention as applied to the door of an automobile. Suppose that the external surface 11 of a door 4 has to be painted by spraying. In order to prevent paint from penetrating into a crevice or opening between the door and the surrounding parts of the coachwork and adhering to the sealing gasket, or weatherstrip 12, it is necessary to mask the opening. Therefore the cushion 1 according to the invention is applied for example by means of its adhesive layer, on the border of the lip of the door 4, of the side 5 of the door, and on all the other portions which represent an irregularity with respect to the surface of the door such as the border lines of the windows, bottom of the car body, the latches of the doors and other surrounding surfaces, that do not need to be treated. By closing the door, a pressure will be applied to the cushion. Due to the fact that the cushion is compressible, it will be lightly compressed thereby adapting itself to the portion or the whole irregularity on which it is applied and sealing the opening or at least partially filling or bridging the surface irregularity. When the paint is applied to the door, the cushion will, on the one hand, prevent the paint from penetrating in the opening by absorbing that paint and, on the other hand, due to the fact that the cushion obstructs the opening or fills at least partially the irregularity, the effects due to turbulences in and around the openings are practically eliminated and will not affect the achievement of a satisfactory surface treatment. Also due to the fact that the openings are obstructed, residues of dust, humidity and others, which remain in the openings will remain enclosed therein and will no longer be affected by the pressure of compressed air and will thus no longer affect the achievement of a satisfactory surface treatment.

When the surface treatment operation is finished, the cushion is removed from the parts on which it has been applied. The substances used for
the surface treatment can not reach and thus will not affect the protected surface irregularities. This is particularly the case when using an absorbing material for the cushion and which also absorbs any liquid substances used for the surface treatment. Due to the absorption capacity of the cushion, traces along the border forming the transition between the cushion which has just been removed and the treated surface can no longer be seen. Indeed, the substance used for the surface treatment and which is applied either on the cushion or on the border between the cushion and the treated surface is now absorbed by the cushion.

The cushion can also be applied on portions of the surface which are not damaged, or which are made from a different material as the one used for the door to be treated, such as for example the brightwork surrounding the windows.

The method according to the invention is very appropriate for application on modern vehicles having a low Cx value (in the order of 0.30; Cx = air penetration coefficient). Indeed for aerodynamical reasons some sealing gaskets are applied very close to the openings. Due to its compressibility and elasticity the cushion according to the invention allows simultaneously masking of the sealing gaskets and the opening which remains between the sealing gaskets and the coachwork.

As shown in the figures 1 and 2 the cushion is an elongated cushion. Such an elongated cushion is particularly suitable to be applied on an elongated irregularity such as for example a crevice between a door, a hood or a hatch and the vehicle body. Since the cushion is elongated it can be applied practically in one piece over the whole length of the elongated irregularity, thus avoiding openings between cushion parts which could cause turbulances during the surface treatment or penetration of paint and the like between those cushion parts. Further due to the fact that the cushion is compressible and elastic it can easily be bent in all kind of corners shown by the irregularity to be masked, which offers a continuous masking. Also due to the fact that the cushion is made of elastic foam its thickness can easily be adapted to the depth of the irregularity by simply stretching or compressing in length the elongated cushion.

Another advantage of the cushion according to the invention is that it is repositionable which offers the possibility to reposition the cushion when it has incorrectly be applied on the irregularity to be masked.

The cushion can be directly fixed to the metal body of the car or be superposed on the sealing gasket. Indeed, the adhesive characteristics of the masking gasket according to the invention allows the cushion to be applied as well on metal, rubber, as to any other materials, such as for example plastics. It is also possible to remove first the sealing gasket of the vehicle and then to mask the opening thus formed using a cushion according to the invention.

Due to the easy application and the technical characteristics of the cushion a substantial time saving of nearly two thirds of the time required for the conventional masking of a vehicle door opening using the masking tape method can be gained and thus a substantial economy realized.

The masking means according to the invention can be applied either by hand or by means of a device such as shown in figure 5. The device comprises a drum or core on which the cushion is wrapped. The device is provided with an handle 7 and with three rollers 8, 9 and 10. The cushion 1 passes between the rollers 8 and 9. By pressing the roller 8 against the surface to be masked, the rolling of the latter will engage the roller 9 which on its turn will cause the cushion to unwind from the drum 6. When the cushion comprises a protective liner covering the adhesive substance, that protective liner 3 passes between the rollers 9 and 10. The engagement of the rollers 9 and 10 will cause the detachment and the removal of the protection liner when the cushion is applied on the surface to be masked.

The device can also be provided with a further roller on which the protective liner is rolled after it has been removed from the cushion. The device enables an easy and quick application of the cushion on the surface to be masked.

Figure 6 illustrates a packing box 14 comprising a masking means according to the invention. The packing box 14 is provided with a central opening 16 through which the cushion is pulled out. The cushion is wound on a coil 15 in the same fashion as electrical wire often is marketed. This way of packing offers the advantage that the cushion is suitably protected when it is inside the box, that it remains coiled and that it can easily be pulled out of the box which during the application of the masking means can simply rest on the floor.

It is also possible to fix the device on a robot arm in which the trajectory along which the cushion has to be applied on the irregularity to be masked is loaded into the arm's memory.

It will be clear that the invention is not only applicable on automobiles but can also be applied on all kind of surface treatment operations such as for example the painting of the frame of a window of a home or cleaning at high pressure.

Claims

1. Use of an elongate compressible and bendable foam cushion that is resistant to surface treatment for masking at least a part of a surface to
be treated, said cushion being removably applied on said part of said surface to be treated and removed after finishing said treatment.

2. A use as claimed in claim 1, characterized in that as said cushion an absorbent cushion is used.

3. A use as claimed in claim 1, characterized in that said cushion is formed by applying to said part of said surface to be treated a polymerizing foam comprising at least a reactive substance.

4. A use as claimed in one of the claims 1 to 3, characterized in that said cushion is applied to said part which forms an irregularity situated on the body of a vehicle.

5. A use as claimed in claim 4, characterized in that said cushion is applied along and in an opening between a door, a hood or a hatch and the vehicle body.

6. A use as claimed in claim 5, characterized in that said cushion is lightly compressed between said door, hood or hatch and said vehicle body when spray paint is applied as surface treatment.

7. A use as claimed in one of the claims 1 to 6, characterized in that said cushion is applied along a sealing gasket of a vehicle body, said cushion being repositionably adhered to mask the sealing gasket.

8. A use as claimed in claim 4, characterized in that said cushion is applied to the irregularity in such a manner as to at least bridge the irregularity.

9. A use as claimed in one of the claims 1 to 8, characterized in that said cushion is repositionably adhered to said part of said surface to be treated.

10. A masking means for masking at least a part of a surface to be treated, wherein said masking means is made of a material that is resistant to the surface treatment and adapted to be removably applied to said part of said surface to be treated, characterized in that said masking means comprises an elongate compressible and bendable foam cushion.

11. A masking means as claimed in claim 10, characterized in that the cushion has substantially the same cross-section over its whole length.

12. A masking means as claimed in claim 10 or 11, characterized in that said cushion is provided with a pressure sensitive adhesive layer enabling said removable application, said layer covering at least a portion of an outer surface of said cushion.

13. A masking means as claimed in any one of the claims 10 to 12, characterized in that said cushion is hollow.

14. A masking means as claimed in any one of the claims 10 to 13, characterized in that said cushion is substantially cylindrically shaped.

15. A masking means as claimed in claim 10 or 11, characterized in that said foam itself is tacky.

16. A masking means as claimed in claim 12, characterized in that at least said adhesive layer is provided with a protection liner.

17. A masking means as claimed in any one of the claims 10 to 16, characterized in that said cushion is wound around a drum.

18. A masking means as claimed in any one of the claims 10 to 17, characterized in that said cushion is formed from an absorbent material.

Patentansprüche

1. Verwendung eines länglichen kompressiblen und biegbaren Schaumpolsters, das Flächenbehandlungen widersteht, zum Abdecken mindestens eines Teils einer zu behandelnden Fläche, wobei das Polster lösbar auf dem Teil der zu behandelnden Fläche aufgebracht und nach Beenden der Behandlung entfernt wird.

2. Verwendung nach Anspruch 1, dadurch gekennzeichnet, daß als das Polster ein absorbierendes Polster verwendet wird.

3. Verwendung nach Anspruch 1, dadurch gekennzeichnet, daß das Polster durch Aufbringen eines polymerisierenden Schaums mit mindestens einer reaktionsfähigen Substanz auf den Teil der zu behandelnden Fläche gebildet wird.

4. Verwendung nach einem der Ansprüche 1 bis 3, dadurch gekennzeichnet, daß das Polster auf den Teil aufgebracht wird, der eine Unregelmäßigkeit auf der Karosserie eines Fahr-

6. Verwendung nach Anspruch 5, dadurch gekennzeichnet, daß das Polster leicht zwischen der Tür, der Haube oder der Klappe und der Fahrzeugkarosserie komprimiert wird, wenn Sprühfarbe als Flächenbehandlung aufgebracht wird.

7. Verwendung nach einem der Ansprüche 1 bis 6, dadurch gekennzeichnet, daß das Polster entlang einer Dichtungseinrichtung einer Fahrzeugkarosserie aufgebracht wird, wobei das Polster wiederaufbringbar haftet, um die Dichtungseinrichtung abzudecken.

8. Verwendung nach Anspruch 4, dadurch gekennzeichnet, daß das Polster so an die Unregelmäßigkeit angebracht wird, daß es mindestens die Unregelmäßigkeit überbrückt.

9. Verwendung nach einem der Ansprüche 1 bis 8, dadurch gekennzeichnet, daß das Polster wiederaufbringbar an dem Teil der zu behandelnden Fläche haftend angebracht wird.

10. Abdeckmittel zum Abdecken mindestens eines Teils einer zu behandelnden Fläche, wobei das Abdeckmittel aus einem Material hergestellt ist, das der Flächenbehandlung widersteht, und angepaßt ist, lösbar auf dem Teil der zu behandelnden Fläche aufgebracht zu werden, dadurch gekennzeichnet, daß das Abdeckmittel ein längentliches kompressibles und biegbares Schaumpolster aufweist.

11. Abdeckmittel nach Anspruch 10, dadurch gekennzeichnet, daß das Polster über seine ganze Länge im wesentlichen den gleichen Querschnitt aufweist.

12. Abdeckmittel nach Anspruch 10 oder 11, dadurch gekennzeichnet, daß das Polster mit einer der lösbar aufbringen ermöglichen Druckempfindlichen Haftschicht versehen ist, wobei die Schicht mindestens einen Teil einer Außenfläche des Polsters bedeckt.

13. Abdeckmittel nach einem der Ansprüche 10 bis 12, dadurch gekennzeichnet, das das Polster hohl ist.


15. Abdeckmittel nach Anspruch 10 oder 11, dadurch gekennzeichnet, daß der Schaum selbsthaftend ist.


17. Abdeckmittel nach einem der Ansprüche 10 bis 16, dadurch gekennzeichnet, daß das Polster um eine Trommel gewickelt ist.

18. Abdeckmittel nach einem der Ansprüche 10 bis 17, dadurch gekennzeichnet, daß das Polster von einem absorbierenden Material gebildet wird.

Revendications

1. Utilisation d'un bourrelet de matériau cellulaire, allongé, compressible, flexible, qui est résistant à un traitement de surface, pour masquer au moins une partie d'une surface à traiter, le bourrelet étant appliqué de façon détachable sur la partie de la surface à traiter et étant détaché après avoir terminé le traitement.

2. Utilisation suivant la revendication 1, caractérisée en ce que pour le bourrelet est utilisé un bourrelet absorbant.

3. Utilisation suivant la revendication 1, caractérisée en ce que le bourrelet est formé en appliquant sur la partie de la surface à traiter un matériau cellulaire qui polymériser et qui comporte au moins une substance réactive.

4. Utilisation suivant l'une des revendications 1 à 3, caractérisée en ce que le bourrelet est appliqué sur la partie qui forme une inégalité située sur la carrosserie d'un véhicule.

5. Utilisation suivant la revendication 4, caractérisée en ce que le bourrelet est appliqué le long de et dans une ouverture entre une porte, un capot ou un hayon de la carrosserie de véhicule.

6. Utilisation suivant la revendication 5, caractérisée en ce que le bourrelet est légèrement comprimé entre la porte, le capot ou le hayon et la carrosserie du véhicule lorsqu'une peinture pulvérisée est appliquée en tant que traitement de surface.
7. Utilisation suivant l'une des revendications 1 à 6, caractérisée en ce que le bourrelet est appliqué le long d'un joint d'étanchéité d'une carrosserie de véhicule, le bourrelet étant collé, de façon à pouvoir être repositionné, pour masquer le joint d'étanchéité.

8. Utilisation suivant la revendication 4, caractérisée en ce que le bourrelet est appliqué sur l'inégalité de manière à au moins combler l'inégalité.

9. Utilisation suivant l'une des revendications 1 à 8, caractérisée en ce que le bourrelet est collé, de façon à pouvoir être repositionné, sur la partie de la surface à traiter.

10. Moyens de masquage pour masquer au moins une partie d'une surface à traiter, les moyens de masquage étant réalisés dans un matériau qui est résistant au traitement de surfaces et étant adapté pour être appliqué de façon détaillable à la partie de la surface à traiter, caractérisés en ce que les moyens de masquage comprennent un bourrelet de matériau cellulaire, allongé, compressible et flexible.

11. Moyens de masquage suivant la revendication 10, caractérisés en ce que le bourrelet présente sensiblement la même section transversale sur toute sa longueur.

12. Moyens de masquage suivant la revendication 10 ou 11, caractérisés en ce que le bourrelet est muni d'une couche d'adhésif autocollant qui permet une application de manière détaillable, cette couche couvrant au moins une partie d'une surface externe du bourrelet.

13. Moyens de masquage suivant l'une quelconque des revendications 10 à 12, caractérisés en ce que le bourrelet est creux.

14. Moyens de masquage suivant l'une quelconque des revendications 10 à 13, caractérisés en ce que le bourrelet a une forme sensiblement cylindrique.

15. Moyens de masquage suivant la revendication 10 ou 11, caractérisés en ce que le matériau cellulaire lui-même est adhésif.

16. Moyens de masquage suivant la revendication 12, caractérisés en ce qu'au moins la couche adhésive est munie d'un revêtement de protection.

17. Moyens de masquage suivant l'une quelconque des revendications 10 à 16, caractérisés en ce que le bourrelet est enrollé sur un tambour.

18. Moyens de masquage suivant l'une quelconque des revendications 10 à 17, caractérisés en ce que le bourrelet est façonné à partir d'un matériau absorbant.