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Method of decorating rubber extruded product
Verfahren zum Dekorieren von extrudierten Gummikörpern
Procédé pour décorer un article en caoutchouc extrudé

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The invention relates to a method of decorating a rubber extruded product, and is particularly suitable as the decorating method for use in decorating a trim portion of an extruded weather strip.

A method of decorating a rubber extruded product in which a decoration film, made of an uncured thermoplastic resin immediately after extrusion, is laminated directly or without using an adhesive agent layer on a decorating part of a rubber extruded product is disclosed in U.S. Patent No. 4537825 and European Patent No. 0372745B1.

The decoration film is laminated using thermal bonding by directly conducting an extrusion onto the surface of a vulcanized rubber extruded product in an offset die, and then regulating the thickness or shape of the decoration film in a sizing space defined by the surface of the decorating part of the vulcanized rubber extruded product and the die orifice.

In such a prior art method, however, the thickness of the decoration film is adjusted in the extrusion space defined by the vulcanized rubber extruded product and the die orifice while inserting the vulcanized rubber extruded product into the offset die and taking up the vulcanized rubber extruded product, since there is a possibility that the vulcanized rubber extruded product will move vertically during the taking-up process, thus make thickness control difficult to conduct. Furthermore, sliding friction, which is generated when the vulcanized rubber extruded product is moved in an extrusion die, causes the take-up resistance to be easily increased.

The document EP-A 0 412 217 discloses a method for molding elongate articles as, for example, windshield molding members for ensuring the connection between the edges of a windshield and the metal frame of a vehicle. The cross-section of such articles is varied by means of the intermittent thermobonding, to a main body, of a separately extruded sub-section of the elongate article. Main body and sub-section may be of different materials. The extruded main body and the separately extruded sub-section are either contacted while still hot or led separately by means of a guiding device which, in contacting operation, apply a certain pressure to the extruded sub-section.

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The document US-A 3,904,470 is concerned with a method for bonding rubber to plastics by contacting a vulcanised shaped structure of an ethylene/propylene copolymer rubber or an ethylene/propylene/diene copolymer rubber with a polyolefine plastic at a temperature above the softening point of said polyolefine plastic by methods like compression molding, injection molding, extrusion molding or blow molding.

None of these documents discloses or suggests the advantages of the present method in terms of thickness control and reduced friction, as does not the above document EP-A 0 327 745.

On the other hand, weather strips include those in which the whole periphery is not used as a decorating part or there is a part which is not to be decorated. For example, parts such as a rocker in an opening trim, hereinafter referred to as a "non-decorating part", will be present and also those in which a trim portion of such a part is changed in section shape. Where such a weather strip is adopted, it is possible to reduce the amount of material used for the decoration film.

Conventionally, when such a weather strip is to be intermittently decorated, different portions are separately extruded, the extruded portions are cut, and the cut portions are then connected to each other.

In such a prior art intermittent decorating method, however, operations of separately extruding portions, cutting the portions, and then connecting the portions to each other are required to be conducted, and hence it is difficult to mechanize the operations. Furthermore, an operation of applying an adhesive agent is also required. As a result, the method is inferior in productivity.

To comply with this, it may be considered to employ a method of decorating a rubber extruded product which is disclosed in the aforementioned documents US-A 4,537,825 or EP-A-0 372 745. The decoration film in a non-decorating part is cut away after the execution of the method. However, the bonding between the decoration film and the extruded vulcanized rubber is usually strong, and hence it is difficult to cleanly cut away the decoration film. Further, such cutting operation requires many manhours, with the result that the process is not practical.

The decoration film is laminated using thermal bonding by directly conducting an extrusion onto the surface of a vulcanized rubber extruded product (trim) in an offset die, and then extruding the decoration film from the extrusion space defined by the surface of the vulcanized rubber extruded product and the die orifice. Therefore, this lamination method cannot be applied to the case where the section of a vulcanized rubber extruded product is changed in a non-decorating part.

In other words, conventionally, the process is deemed difficult in which a decoration film is laminated on, e.g., adhered to, the upper face of a vulcanized rubber extruded product substantially concurrently with extrusion, thereby intermittently decorating the vulcanized rubber extruded product.

It is a first object of the present invention to provide a method of decorating a rubber extruded product in which, in view of the prior art described above, the thickness of a decoration film can be easily controlled and the take-up resistance of the vulcanized rubber extruded product is small.

It is a second object of the present invention to provide a method of intermittently decorating a rubber extruded product in which a decoration film is laminated onto the upper face of the vulcanized rubber extruded product substantially concurrently with extrusion, thereby enabling the vulcanized rubber extruded product to
be intermittently decorated with excellent productivity.

[0016] It is a third object of the present invention to provide a method of decorating a rubber extruded product which can attain the above objects and in which excellent adhesion properties between the decoration film and the vulcanized rubber extruded product can be ensured.

[0017] The method of decorating a rubber extruded product comprises the steps of: preparing a vulcanized rubber extruded product; extruding a decoration film made of thermoplastic resin or thermoplastic elastomer at a predetermined thickness and width independently of the vulcanized rubber extruded product; and thermally bonding the decoration film onto a surface of the vulcanized rubber extruded product by applying pressure with a pressure roller substantially concurrently with the extrusion of the decoration film whereby laminating the decoration film on the vulcanized rubber extruded product with thermal bonding and forming the rubber extruded product.

[0018] In the method of decorating a rubber extruded product according to the present invention, the decoration film is pressure-bonded to the vulcanized rubber extruded product intermittently so as to be laminated on the vulcanized rubber extruded product intermittently, and the decoration film in a non-pressure bonding part is cut away in an additional step.

[0019] In the method of decorating a rubber extruded product according to the present invention, the decoration film is supplied into a space between the vulcanized rubber extruded product and the pressure roller at a temperature which is substantially lower than the melt temperature of the thermoplastic resin or the thermoplastic elastomer, cooled by the pressure roller to a temperature which is substantially lower than the melt temperature of the thermoplastic resin or the thermoplastic elastomer, and then fed out from the space between the vulcanized rubber extruded product and the pressure roller.

[0020] This method of decorating a rubber extruded product, configured as described above, can attain the following functions and effects.

[0021] In the prior art method, extrusion is directly conducted on a decorating part of a vulcanized rubber extruded product (trim), and the thickness of a film is controlled in an extrusion space defined by the decorating part of the vulcanized rubber extruded product and the orifice of a film extrusion die. By contrast, in the present invention, the decoration film is independently extruded, and therefore not affected by any possible vertical movement of the surface of that part of the rubber product which is to be decorated, the decorating part, which movement is caused by the forwarding of the vulcanized rubber extruded product. Consequently, the thickness of the decoration film can be easily controlled.

[0022] In the prior art, sliding friction is generated when a vulcanized rubber extruded product is moved in an extrusion die. In the invention, the friction is generated in the form of rolling friction caused by a pressure roller, and therefore the take-up resistance of a vulcanized rubber extruded product is reduced to a very low level.

[0023] As a second aspect of the present invention, when the decoration film is extruded at a predetermined thickness and width independently of the vulcanized rubber extruded product, and the decoration film is then pressure-bonded using a pressure roller only to that part of the vulcanized rubber extruded product which is to be decorated, the decoration film in the non-decorating part, which is a non-pressure bonding part, is not substantially adhered to the vulcanized rubber extruded product unless pressure bonding is done. Accordingly, the decoration film in the non-pressure bonding part, the non-decorating part, can be easily cut away.

[0024] In the method of intermittently decorating a rubber extruded product according to the present invention, therefore, the process in which a decoration film is adhered to and laminated on the upper face of a vulcanized rubber extruded product concurrently with extrusion so as to intermittently decorate the product can be conducted with excellent productivity. As compared with the prior art method in which different portions are separately extruded, the extruded portions are cut, and the cut portions are then connected to each other, the present method attains a notable effect that the productivity can be remarkably improved.

[0025] As a third aspect of the present invention, the decoration film is supplied into the space between the vulcanized rubber extruded product and the pressure roller at a temperature which is equal to or higher than the melting temperature of the thermoplastic resin, cooled by the pressure roller to a temperature which is equal to or lower than the melting temperature of the thermoplastic resin or the thermoplastic elastomer, and then fed out from the space between the vulcanized rubber extruded product and the pressure roller. Therefore, excellent adhesion properties can be ensured between the decoration film and the vulcanized rubber extruded product. It is assumed that the reason of the above is as follows.

[0026] The decoration film in a molten state is supplied to the surface of the vulcanized rubber extruded product, and the decoration film is pressure-bonded while being rapidly cooled from the surface side. At the interface between the vulcanized rubber extruded product and the decoration film, therefore, the molten material forming the decoration film partially enters also into a large number of minute pores which exist in the surface of the vulcanized rubber extruded product. Even in the case where embossing, such as by texturing, is applied to the pressure roller, the decoration film is cooled. Accordingly, the material release properties are excellent so that the decoration film is prevented from twining around, or being pulled by, the pressure roller. Also, the pressuring force exerted by the pressure roller is effec-
Hereinafter, the invention will be described in detail on the basis of the preferred embodiments. Although examples in which a trim portion of a weather strip is decorated will be described, the invention is not restricted to such examples.

Rubber material for the weather strip W is first extruded by a crosshead type two-layered co-extruder 13 to form a section shown in Fig. 2. Thereafter, the extruded product is vulcanized by a UHF (microwave) vulcanizer 15, than in a hot air vulcanizer 17, so as to form the weather strip W which is a vulcanized rubber extruded product. The weather strip W includes a trim portion 23, or a decorating part 24 in which an insert 21 is embedded. This trim portion 23 is made of solid rubber. The decoration film 27, which is made of a thermoplastic material, can be recylcically applied to the decoration film. In addition to a chemical adhesion, therefore, a mechanical adhesion, an anchoring effect, is applied to the vulcanized rubber extruded product and the decoration film.

Hereinafter, the invention is further illustrated by means of the figures wherein Fig. 1 is a schematic flow diagram showing the method of decorating a vulcanized rubber extruded product according to the invention; Fig. 2 is a front view showing positional relationships between a film extrusion die and a vulcanized rubber extruded product in an embodiment of the method of the invention; Fig. 3 is a front view showing positional relationships between a pressure roller for pressing the upper face, a decoration film, and the vulcanized rubber extruded product in the embodiment; Fig. 4 is a front view showing positional relationships between a pressure roller for pressing the edge, the decoration film, and the vulcanized rubber extruded product in the embodiment; Fig. 5 is a front view showing positional relationships between a pressure roller provided with forced cooling means for pressing the upper face, a decoration film, and the vulcanized rubber extruded product in the embodiment; Fig. 6 is a front view showing positional relationships between a pressure roller provided with forced cooling means for pressing the edge, the decoration film, and the vulcanized rubber extruded product in the embodiment; and Figs. 7(a) and 7(b) are schematic flow diagrams showing another embodiment of the present invention.

Hereinafter, the invention will be described in detail on the basis of the preferred embodiments. Although examples in which a trim portion of a weather strip W is first extruded by a crosshead type two-layered co-extruder 13 to form a section shown in Fig. 2. Thereafter, the extruded product is vulcanized by a UHF (microwave) vulcanizer 15, than in a hot air vulcanizer 17, so as to form the weather strip W which is a vulcanized rubber extruded product. The weather strip W includes a trim portion 23, or a decorating part 24 in which an insert 21 is embedded. This trim portion 23 is made of solid rubber. The weather strip W also includes a hollow seal portion 25, which is formed on the side of the upper face of the trim portion 23, and is made of sponge rubber.

Ethylene propylene rubber and chloroprene rubber, which are excellent in weather resistance, are suitable as the rubber material for solid rubber and for the sponge rubber.

Thereafter, a decoration film 27, made of thermoplastic resin or thermoplastic elastomer, is extruded at a predetermined thickness and width independently of the weather strip W as the vulcanized rubber extruded product. The decoration film 27 is then pressure-bonded to the upper face 24 of the trim portion 23 by pressure rollers 31 and 33 before curing (see Fig. 1). This forms the upper face 24 into a decorating part of the product. The film 27 is, therefore, laminated on the decorating part 24 of the weather strip W.

As shown in Fig. 1, a decoration film extruding machine 35 is disposed at a position where the step of vulcanizing the weather strip W is terminated, which in the illustrated example is beyond the outlet of the hot air vulcanizer 17. The pressure rollers 31 and 33 are disposed down stream of the decoration film extrusion die 37 of the machine.

A film shaping orifice 39 of the film extrusion die 37, and the weather strip W are arranged in the relationships shown in Fig. 2. The pressure roller 31 for pressing the upper face and the pressure roller 33 for pressing the edge are arranged in the positional relationships shown in Figs. 3 and 4 with respect to the weather strip W. In the illustrated example, 29 designates take-up rollers. The pressure rollers 31, 33 are disposed in such a manner that it is possible to move them vertically and horizontally. Such vertical and horizontal movements of the pressure rollers are controlled by a conventional control apparatus, which is not shown, in such a manner that the separation and pressure contact, which are controlled by adjusting the roller interval, are enabled in accordance with the take-up rate of the vulcanized rubber extruded product. Further, a receiving roller 40, shown as a two-dot chain line in Fig. 1, may be disposed opposite pressure roller 31.

Any resin may be used as the thermoplastic resin forming the decoration film 27 so long as it can be thermally fused to the vulcanized rubber extruded product. When using ethylene propylene rubber, a thermoplastic elastomer, such as a polyolefin elastomer or a styrene elastomer, may be used.

Pressure roller 31, which presses the upper face, may be an embossing roller. In this case, it is possible to enhance the design of the decorating part embossing upper face 24.

The embossment is formed by a texturing process such as leather grain embossing, satin embossing, or linear embossing, or by an irregular processing such as knurling.

In the above embodiment, the whole periphery of the weather strip is set as the decorating part. On the other hand, where the weather strip includes a decorating part and non-decorating part, only the decorating part may be pressure-bonded by the pressure rollers. The decoration film can be easily cut away, e.g. by performing clipping on the interface between the non-decorating part and the decorating part after the lamination of the decoration film. The cut away decoration film, which is made of a thermoplastic material, can be recy-
To obtain the desired and necessary adhesion properties between the trim portion 23 of the weather strip W and the decoration film 27, preferably, the decoration film 27 is supplied into the space between the pressure rollers 31 and 33 and the weather strip W at a temperature which is equal to or higher than the melt temperature of the thermoplastic resin or the thermoplastic elastomer. Relative cooling will occur by the pressure rollers 31 and 33 to a temperature which is equal to or lower than the melt temperature of the thermoplastic resin or the thermoplastic elastomer. Then the resulting composite is fed out from the space between the pressure rollers 31 and 33 and the weather strip W.

The pressure rollers 31 and 33 are usually controlled at a temperature of 40 to 50°C. In order to extrude the decoration film 27 at a temperature higher by 10 to 50°C than the melting temperature of the thermoplastic resin or the thermoplastic elastomer, and then supply the decoration film 27 into the space between the pressure rollers 31 and 33 and the vulcanized rubber extruded product W at a temperature which is equal to or higher than the melting temperature of the thermoplastic resin or the thermoplastic elastomer, it is preferable to previously heat the vulcanized rubber extruded product W to a temperature which is lower by 50 to 80°C than the melt temperature of the thermoplastic resin or the thermoplastic elastomer. The melting temperature of the thermoplastic resin or the thermoplastic elastomer is about 150°C.

In this case, pressure rollers 31 and 33 may be forced cooled from the outside. As shown in Fig. 5 and 6, it is preferable to dispose any such forced cooling apparatus for circulating a cooling liquid, such as cooling water, through shafts 31a and 33a. The forced cooling apparatus has a configuration in which a cooling water supply pipe 32, attached to the shaft 31a or 33a, is rotatably supported by a rotary joint 30. Pipe 32 supplies cooling water to a substantially center portion in the longitudinal direction of the respective roller, such as 31 in Fig. 5, and the cooling water is returned through the outer periphery of the base portion of the cooling water supply pipe 32. The reference numerals 34 and 36 designate a cooling water inlet and outlet to which a flexible hose 38 is connected, respectively.

In this case, the mechanical adhesion also is expected to be exerted, and hence it is possible to use a polar thermoplastic elastomer, such as a polyester elastomer or a polyurethane elastomer, even if the thermoplastic resin forming the decoration film 27 is ethylene propylene rubber.

Hereinafter, the invention will be described in more detail on the basis of this embodiment.

As shown in Fig. 1, the weather strip, having the illustrated section W and obtained by extruding an EPDM compound having the composition listed below using a crosshead type co-extruder 13, is passed through the UHF vulcanizer 15 and the hot air vulcanizer 17 to form a vulcanized rubber extruded product. The extrusion rate of the decoration film 27 was synchronized with the take-up rate of the extruded product. The decoration film 27 was cooled to room temperature.

On the other hand, a thermoplastic elastomer ("SUMITOMO TPE 5280", EPDM/PP dynamic vulcanized polyolefin type) is extruded from the extrusion die 37 (Fig. 2) of the film extruding machine 35 which is disposed behind the hot air vulcanizer 17 so as to form a film of a thickness of 0.5 mm, thereby obtaining the decoration film 27. The extrusion conditions were as follows:

<table>
<thead>
<tr>
<th>Cylinder temperature</th>
<th>Extrusion rate</th>
<th>Temperature of an extrusion material</th>
</tr>
</thead>
<tbody>
<tr>
<td>220°C</td>
<td>5m/min</td>
<td>180°C</td>
</tr>
</tbody>
</table>

The extruded film is pressure-bonded by the pressure rollers 31 and 33 for pressing the upper face and edge shown in Figs. 3 and 4, thereby causing the decoration film 27 to be therally bonded to the trim surface of the weather strip W.

Test pieces were collected from the decorating part of the thus prepared weather strip. The test pieces were subjected to a 180 degrees peel test, with a rate of pulling: 10 cm/min, in accordance with JIS K 6301 so that the adhesive strength between the decoration film and the vulcanized rubber extruded product could be measured. The test revealed that the adhesive strength is 29.42 N/cm (3 kgf/cm) with the rubber substrate being broken. It was confirmed that a sufficient adhesive strength can be attained between the decoration film 27 and the weather strip W as a vulcanized rubber extruded product.

Further, under such a condition that the decoration film 27 is intermittently pressure-bonded to the weather strip W, such as creating a decorating part gap of 30 mm and a non-decorating part gap of 23 mm, it was confirmed that the same adhesive strength be attained as well as slight adhesive strength between the decoration film 27 and the weather strip.

Composition of EPDM compound (unit: part by weight) is as follows:

<table>
<thead>
<tr>
<th>EPDM</th>
<th>100 parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAF carbon</td>
<td>160 parts</td>
</tr>
<tr>
<td>Plasticizer</td>
<td>130 parts</td>
</tr>
<tr>
<td>Zinc white</td>
<td>2 parts</td>
</tr>
<tr>
<td>Stearic acid</td>
<td>1 part</td>
</tr>
<tr>
<td>Sulfur</td>
<td>1.5 parts</td>
</tr>
<tr>
<td>Vulcanization accelerator</td>
<td>4 parts</td>
</tr>
</tbody>
</table>

When the pressure rollers 31, 33 to which forced cooling means were disposed as shown in Figs. 5 and 6 were used, a film having a thickness of 0.5 mm was used. The extrusion conditions were as follows: cylinder temperature: 220°C, extrusion rate: 5m/min, and temperature of an extrusion material: 190°C. Thus, similar results such as shown previously can be obtained.

In the aforementioned embodiments, the dec-
oration film is pressure-bonded to the vulcanized rubber extruded product on one producing line immediately after extruding and vulcanizing a rubber material.

[0051] Another embodiment is shown in Figs. 7(a) and 7(b). The vulcanized rubber extruded product formed on a first producing line, shown in Fig. 7(a), is reeled up for safekeeping. After that, the decoration film is supplied while the vulcanized rubber extruded product formed on the first producing line is extruded on a second producing line as shown in Fig. 7(b). The decoration film and the vulcanized rubber extruded product are here adhered to each other by the heat of the decoration film. The adhesive strength can be increased if a heater is disposed between a reel 41 and the decoration film extruding machine 35 in order to heat up the vulcanized rubber extruded product to a temperature ranging from 70°C to 90°C.

Claims

1. A method of decorating a rubber extruded product characterized by the steps of

- preparing a vulcanized rubber extruded product;
- extruding a thermoplastic resin or thermoplastic elastomer decoration film (27) at a set thickness and width independently of the vulcanized rubber extruded product; and
- thermally bonding the decoration film (27) by applying pressure with a pressure roller (31, 33) onto a surface of the vulcanized rubber extruded product substantially concurrently with the extrusion of the thermoplastic resin or the thermoplastic elastomer thereby laminating the decoration film (27) onto the vulcanized rubber extruded product to form a decorated rubber extruded product.

2. The method according to claim 1, characterized in that the decoration film (27) is pressure-bonded to the vulcanized rubber extruded product intermittently by the pressure roller (31, 33) so as to be laminated on the vulcanized rubber extruded product intermittently, and non-pressure-bonded portions are cut away in an additional step.

3. The method according to claim 1 or claim 2, characterized by including a step of supplying the decoration film (27) into a space between the vulcanized rubber extruded product and the pressure roller (31, 33) at a temperature which is substantially higher than the melting temperature of the thermoplastic resin or the thermoplastic elastomer, and removing the completed product.

4. The method according to any of the claims 1 to 3, characterized by including the step of supplying the decoration film (27) at a temperature which is higher by 10 to 50°C than the melting temperature of said thermoplastic resin or thermoplastic elastomer before thermally bonding.

5. The method according to any of the claims 1 to 4, characterized by including the additional step of embossing the decoration film (27) at the same time with the step of thermally bonding by an embossing roller.

6. The method according to any of the claims 3 to 5, characterized by including the step of cooling the decoration film (27) and the vulcanized rubber extruded product by the pressure roller (31, 33) provided with forced cooling means.

Patentansprüche

1. Verfahren zum Dekorieren eines extrudierten Gummiproduktes, gekennzeichnet durch die Schritte

- Vorbereiten eines vulkanisierten, extrudierten Gummiproduktes;
- Extrudieren eines Dekorationsfilms (27) aus thermoplastischem Kunstharz oder thermoplastischem Elastomer mit einer eingestellten Dicke und Breite unabhängig von dem vulkanisierten, extrudierten Gummiprodukt; und
- thermisches Verbinden des Dekorationsfilms (27) durch Aufbringen von Druck mittels einer Druckwalze (31, 33) auf eine Oberfläche des vulkanisierten, extrudierten Gummiprodukts im wesentlichen gleichzeitig mit der Extrusion des thermoplastischen Kunstharzes oder des thermoplastischen Elastomers, wodurch der Dekorationsfilm (27) auf das vulkanisierte, extrudierte Gummiproduct laminiert wird, um ein dekoriertes, extrudiertes Gummiproduct zu bilden.

2. Verfahren nach Anspruch 1, dadurch gekennzeichnet, daß der Dekorationsfilm (27) mit dem vulkanisierten, extrudierten Gummiprodukt mittels der Druckwalze (31, 33) intermittierend druckverbunden wird, so daß er intermittierend auf das vulkanisierte, extrudierte Gummiprodukt laminiert wird, und daß nicht druckverbundene Bereiche in einem zusätzlichen Schritt wegeschnitten werden.

3. Verfahren nach Anspruch 1 oder 2, gekennzeichnet durch einen Schritt, bei dem der Dekorationsfilm
(27) in einen Raum zwischen dem vulkanisierten, extrudierten Gummiprodukt und der Druckwalze (31, 33) bei einer Temperatur, die wesentlich höher als die Schmelztemperatur des thermoplastischen Kunstharzes oder des thermoplastischen Elastomers des Dekorationsfilms (27) ist. Abkühlen des Dekorationsfilms (27) und des vulkanisierten, extrudierten Gummiproduktes auf eine Temperatur, die wesentlich geringer als die Schmelztemperatur des thermoplastischen Kunstharzes oder des thermoplastischen Elastomers ist, und Entfernen des fertigen Produktes.


6. Verfahren nach einem der Ansprüche 1 bis 5, dadurch gekennzeichnet, daß es den zusätzlichen Schritt enthält, bei dem der Dekorationsfilm (27) und das vulkanisierte, extrudierte Gummiprodukt mittels der Druckwalze (31, 33) abgekühlt werden, die mit einer Zwangskühlungseinrichtung versehen ist.

Revendications

1. Méthode de décoration d’un produit extrudé en caoutchouc caractérisée par les étapes de
- préparation d’un produit extrudé en caoutchouc vulcanisé ;
- extrusion d’un film décoratif en résine thermoplastique ou en élastomère thermoplastique (27) sous une épaisseur et une largeur définies indépendamment du produit extrudé en caoutchouc vulcanisé ; et
- fixation à chaud du film décoratif (27) par application d’une pression exercée par un cylindre de pression (31, 33) sur une surface du produit extrudé en caoutchouc vulcanisé sensiblement en même temps que l’extrusion de la résine thermoplastique ou de l’élastomère thermoplastique avec ainsi stratification du film décoratif (27) sur le produit extrudé en caoutchouc vulcanisé pour former un produit extrudé en caoutchouc décoré.

2. Méthode selon la revendication 1, caractérisée en ce que le film décoratif (27) est fixé par pression sur le produit extrudé en caoutchouc vulcanisé de façon intermittente au moyen du cylindre de pression (31, 33) de telle façon qu’il soit stratifié sur le produit extrudé en caoutchouc vulcanisé par endroits et en ce que les parties non fixées par pression sont éliminées par découpage dans une étape supplémentaire.

3. Méthode selon la revendication 1 ou la revendication 2, caractérisée par l’inclusion d’une étape d’admission du film décoratif (27) dans un espace entre le produit extrudé en caoutchouc vulcanisé et le cylindre de pression (31, 33), à une température sensiblement supérieure à la température de fusion de la résine thermoplastique ou de l’élastomère thermoplastique du film décoratif (27), de refroidissement du film décoratif (27) et du produit extrudé en caoutchouc vulcanisé à une température sensiblement inférieure à la température de fusion de la résine thermoplastique ou de l’élastomère thermoplastique et d’enlèvement du produit fini.

4. Méthode selon une quelconque des revendications 1 à 3, caractérisée par l’inclusion de l’étape d’admission du film décoratif (27) dans un espace entre le produit extrudé en caoutchouc vulcanisé et le cylindre de pression (31, 33) de telle façon qu’il soit stratifié sur le produit extrudé en caoutchouc vulcanisé par endroits et en ce que les parties non fixées par pression sont éliminées par découpage dans une étape supplémentaire.

5. Méthode selon une quelconque des revendications 1 à 4, caractérisée par l’inclusion de l’étape supplémentaire de création d’un relief dans le film décoratif (27) en même temps que l’étape de fixation à chaud au moyen d’un cylindre de gaufrage.
