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(54) **TRAFFIC SIGN**

(57) Traffic sign formed by a post (2) and sign body manufactured from a vulcanized elastomeric material and method of manufacture of the sign body which allows subsequent construction of the complete sign. The structure of the vulcanized elastomeric body (1) such that the sign is readily secured to the post by means of a flange assuring a durable securing, and at the same time, the sign body made of an elastomeric material shows a suitable degree of structural stability and rigidity. The sign thus constructed drastically reduces the effects of the impact and damages occurring when a vehicle with passengers hits it. The method of manufacture allows a rapid manufacture while at the same time providing a structurally stable and durable product.

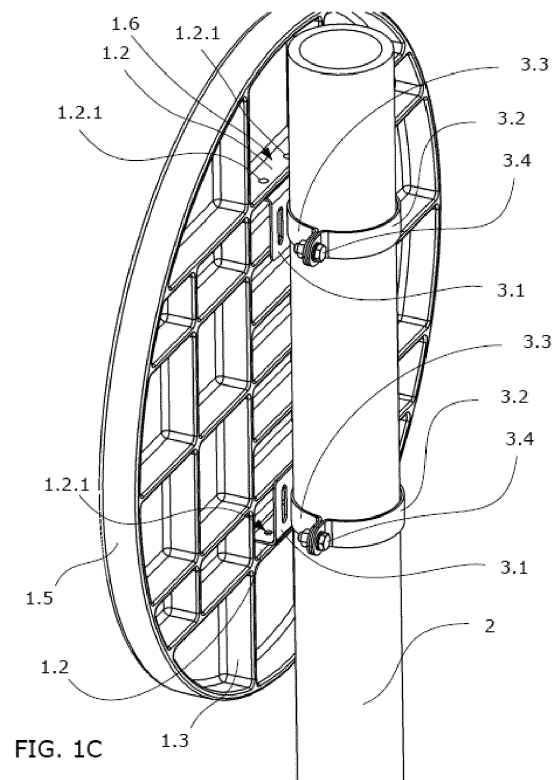


FIG. 1C

Description

Object of the Invention

[0001] A first aspect of the present invention relates to a traffic sign formed by a post and a sign body manufactured from a vulcanized elastomeric material. A second aspect of the invention relates to the method of manufacture of the sign body which allows subsequent construction of the complete sign.

[0002] The present invention is characterized by a structure of the vulcanized elastomeric body such that the sign is readily secured to the post by means of a flange assuring a durable securing, and at the same time, the sign body made of an elastomeric material shows a suitable degree of structural stability and rigidity.

[0003] The sign thus constructed drastically reduces the effects of the impact and damages occurring when a vehicle with passengers hits it. The method of manufacture allows a rapid manufacture while at the same time providing a structurally stable and durable product.

Background of the Invention

[0004] Traffic signs are conventionally formed by a resistant element or support, for example a post, and a plate manufactured by means of stamping previously die-cut sheet metal. The sheet metal is subsequently painted or protected by means of adding several layers of products protecting it from the elements.

[0005] Both the sign body and the post are made of metallic materials such that, in the event of the impact of a vehicle, the post does not give way but rather bends, and the sign body then adopts a dangerous position since it is in the path of the passengers in the vehicle. As a result, the sign causes serious deformations in the vehicle, and the sign body is an element that if it also hits the passenger, there is a high likelihood that it will generate even further damage. Once the impact has occurred, there is no part of the sign that can be reused, nor are elements that result from recycling used in the manufacture thereof either.

[0006] The present invention solves the problems discussed above given that the sign body is a body manufactured from a vulcanized elastomer, which has high deformability, such that it generates less damage in the event of the impact and said body recovers the original shape and can be reinstalled without needing to incorporate a new one.

[0007] The use of all metallic components assures compliance with the regulations that call for stability of the sign body in the event of strong winds. Use of an elastomeric material makes it difficult to comply with these regulations; nevertheless, contrary to what is expected, use of the proposed structure has proven to sufficiently comply with the requirements provided under said regulations.

[0008] If the post is made of an also elastomeric ma-

terial, the sign is able to give way in the event of a vehicle running into it, minimizing passenger injuries, and it can also be manufactured from materials where at least a certain percentage of such materials comes from recycling other products of an elastomeric type, for example. Materials that come from recycling can also be added during manufacture of the sign body.

Description of the Invention

[0009] According to a first aspect of the invention, the problems identified above are solved by providing a traffic sign comprising a support, a sign body and a flange for attaching these two components, wherein the sign body has a specific structure formed from a vulcanized elastomeric material.

[0010] The flange must be interpreted, in its broadest sense, as being constituted by any mechanical element offering a first attachment between said flange and the sign body, and also a second attachment also between the flange and the support, such that it establishes the mechanical attachment between the sign body and the support.

[0011] The sign body is characterized by the fact that said body comprises:

- a main plate having a planar configuration with a front and a back for showing a graphic and/or text sign on the front;
- at least one reinforcing rib placed on the back of the main plate, wherein said reinforcing rib comprises a securing strip with at least one perforation, said securing strip being embedded in the reinforcing rib; and
- wherein the reinforcing rib comprising the securing strip is perforated with the perforation coinciding with the at least one perforation of the securing strip;

and wherein the first attachment of the coupling flange to the sign body is through the at least one perforation of the reinforcing rib.

[0012] The main plate is configured in the form of planar plate, where the fact that this planar plate may incorporate perforations or small cavities for making the main body lighter is not excluded. A planar surface makes it easier to attach a printed sheet showing a graphic and/or text sign by means of an adhesive. In the event that the main plate has a perforation, the sheet covers the surface, showing what is shown on the sheet on the planar front.

[0013] The printed sheet is adhered on the front of the main plate, and the reinforcing rib or ribs are located on the back. The sign body particularly comprises at least one reinforcing rib serving for the attachment between the structure formed by the sign body and the support by means of the flange.

[0014] This reinforcing rib is formed from an elastomeric material and has a preferably metallic securing strip

embedded therein, providing rigidity to the rib by increasing resistance of the rib intended for securing to the flange.

[0015] The flange is preferably attached by means of a screwed attachment, although another type of attachment, such as attachment by riveting, is allowed, such that the support is attached to this reinforcing rib. The strip embedded in the reinforcing rib gives rise to the reinforcing rib behaving like a rigid element, distributing the holding forces of the flange to a large region of the main plate of the sign body.

[0016] As a result, the main plate of the sign body possesses high rigidity to withstand wind loads, preventing excessive deformation.

[0017] The optional use of reinforcing ribs extending perpendicularly or obliquely from this first reinforcing rib with the strip embedded therein increases the rigidity of the rest of the area of the main plate.

[0018] According to the preferred embodiments of the invention, the sign body comprises two reinforcing ribs intended for attachment with the support, these two reinforcing ribs being arranged horizontally in their operating position and spaced apart from one another. Each of these two reinforcing ribs is attached by means of its flange to the support. It has been found that this configuration maximizes stability of the sign against high wind loads with a minimal amount of material. The vertical ribs prolong the area of rigidity both in the region located between both reinforcing ribs and in the rest of the area until reaching the perimeter.

[0019] According to one embodiment, the reinforcing rib having the strip embedded therein for securing by means of the flange does not extend out to the perimetral edge. The interruption of the reinforcing rib prevents the shrinkage the rib experiences during manufacture due to shrinkage of the material from causing the deformation of the perimeter of the sign body, since deformations in this perimetral zone have a major visual impact.

[0020] The arrangement of some reinforcing ribs with an interruption also allows the formation of cavities that make access easier for the operator who must install the sign and who, depending on the specific shape of such sign, may need this extra space for securing the sign to the post.

[0021] The configuration of the peripheral boundaries of the sign body has a shape that is determined by the graphic or text sign, where the embodiments include sign bodies with a circular, rectangular, hexagonal or triangular shape.

[0022] Various embodiments will be described below with the support of the drawings.

[0023] A second aspect of the invention relates to a method of manufacture of the traffic sign. The method of manufacture comprises the following prior steps:

- providing a heatable mold and a heatable counter-mold for vulcanizing the parts, wherein

the mold is for configuring the back of the sign body and comprises protrusions between which channels are defined, the channels being intended for configuring the reinforcing ribs of the sign body;

the counter-mold is for configuring the front of the sign body and is configured in the form of a cavity having a planar bottom for configuring the planar surface on which a graphic and/or text sign is placed;

- providing one or more non-vulcanized rubber sheets;
- providing one or more securing strips having at least one perforation.

[0024] Once the mold and counter-mold are closed, they leave a cavity therein the volume of which corresponds with the shape of the sign body. The mold and counter-mold heating temperature is also adjustable, since it must be capable of establishing a temperature that allows the elastomer to melt in order to allow the flow thereof through the inside of the mold and subsequent vulcanization.

[0025] The use of the terms mold and counter-mold are simply ways of identifying two parts, the name corresponding to each of them being interchangeable. This form of identification is used to establish a correspondence with the part which allows the configuration of the front and the part which allows the configuration of the back.

[0026] With these components, the method comprises the following molding steps:

- with the mold and the counter-mold being separated from one another, wrapping the at least one securing strip in a portion of non-vulcanized rubber sheet and inserting the assembly into the channel of the mold corresponding to the reinforcing rib for the securing thereof to the flange for subsequent attachment of the sign body and the support;
- placing non-vulcanized rubber on the mold such that the volume of the non-vulcanized rubber placed on the mold has at least the volume defined by mold and counter-mold in the closed position;
- closing the mold with the counter-mold and applying heat to melt the non-vulcanized rubber leaving it the time required for it to flow, filling up the empty volume defined between mold and counter-mold;
- maintaining the temperature of the mold and counter-mold at the vulcanization temperature, maintaining said temperature until complete vulcanization of the rubber;
- opening the mold assembly and removing the molded part from the mold;
- perforating each reinforcing rib containing a securing strip at a point coinciding with the securing strip.

[0027] In a first step, the mold and counter-mold are open, leaving at least one channel between the protrusions accessible, which channel gives rise to the reinforcing rib. To obtain the reinforcing rib with the strip embedded therein, the strip is wrapped in a non-vulcanized rubber sheet and inserted into the channel. The spatial position of the strip with respect to the mold is assured with this operation so that said strip is embedded therein, i.e., once the sign body has been manufactured, the strip is wrapped entirely in rubber.

[0028] The rest of the rubber needed to complete the volume of the sign body is provided by placing it on the mold. If all of the non-vulcanized rubber that is provided is in the form of sheets, then one way to complete the volume of rubber is by stacking the rubber sheets, where this stack has the required volume.

[0029] The mold and counter-mold are closed, raising the temperature to the rubber melting temperature. According to one embodiment, the mold and counter-mold closing operation is progressive with heat already being applied, particularly if the volume of rubber is high, such that when moving the mold and counter-mold closer together, there is already a flow of rubber being distributed throughout the entire volume the rubber is supposed to occupy. The heat of the mold and counter-mold is gradually transferred to the non-vulcanized rubber, causing the latter to flow, due to the action of the pressure, until filling up the entire space available between mold and counter-mold.

[0030] Even though the temperature is enough to cause the rubber to melt, it has been observed that the rubber provided in the form of a sheet around the strip remains stable in its position and still covers the strip, assuring that said strip is embedded in the rubber after the manufacture thereof.

[0031] Once the rubber has flowed in, filling up the entire volume of the mold and counter-mold, maintaining the temperature at a vulcanization temperature causes a reaction in the rubber and therefore the vulcanization thereof. Once the rubber is vulcanized it no longer flows.

[0032] Once the sign body is taken out of the mold, the perforations of the strip are concealed, embedded in the rubber. In a subsequent operation, a perforation is carried out such that it coincides with the strip, giving rise to a reinforcing rib with perforations which allow the securing thereof to the support by means of the flange.

[0033] According to a preferred embodiment of the invention, the strip already has perforations such that the perforation of the reinforcing rib is carried out such that it coincides with the perforations of the strip. To make it easier for these perforations to coincide, in the preferred embodiment of the invention, the pre-existing perforations in the strip have larger dimensions than the perforations made in the reinforcing rib once it is molded.

[0034] The different embodiments of the invention will also be described in the following section with the support of the drawings.

Description of the Drawings

[0035] These foregoing and other features and advantages of the invention will become clear based on the following detailed description of a preferred embodiment provided only by way of illustrative and non-limiting example in reference to the attached drawings.

Figures 1A and 1B show front view and lateral views, respectively, of a traffic sign according to a first embodiment of the invention, wherein the sign body has a circular configuration and the support is a post.

Figure 1C shows a perspective view of the same first embodiment from a rear viewpoint to allow visual access to the flange for attaching the body of the sign and the post.

Figure 2A shows a second embodiment of the sign body, having a triangular configuration, shown from the back portion.

Figures 2B and 2C show two sections of the sign body according to the second embodiment to show the reinforcing rib having the strip embedded therein in greater detail.

Figures 2D and 2E show lateral and front views, respectively, of the same second embodiment.

Figures 3A and 3B show a third embodiment of the sign body, wherein said sign body has an octagonal perimetral configuration. Figure 3A is a front view showing the back and Figure 3B is a section view according to section C-C.

Figures 4A and 4B show a fourth embodiment of the sign body, wherein said sign body has a circular perimetral configuration. Figure 4A is a front view showing the back and Figure 4B is a section view according to section D-D.

Figures 5A and 5B show a counter-mold and mold, respectively, where one is intended for being coupled with the other, for manufacturing a sign body having a circular perimetral configuration according to the fourth embodiment.

Figures 6A and 6B show the mold and counter-mold of Figures 5A and 5B, in the operating position, and separated from one another for visual access to the inside. Figure 6A shows a perspective view of both elements and Figure 6B shows a front view.

Detailed Description of the Invention

[0036] According to the first inventive aspect, the present invention relates to a traffic sign. Figures 1A, 1B and 1C show a first embodiment where the traffic sign has a circular configuration.

[0037] In this first embodiment, the traffic sign comprises a sign body (1) made of a vulcanized elastomeric material, with a front and a back. The front is the face of the sign body showing a graphic and/or text sign, for example the thick white horizontal bar on a red background of a "do not enter" sign.

[0038] The vulcanized elastomeric material of this embodiment is vulcanized rubber in which a percentage of ground rubber and textile fibers recovered and recycled from tires has been incorporated.

[0039] The sign body (1) is secured to a support (2) by means of a flange (3). In this embodiment, the support (2) is a post having a hollow circular section (also referred to with reference number 2 given that it is a specific case of a support) as shown in Figure 1C. According to other embodiments, the post (2) has a polygonal outer surface or an outer surface with slots to prevent rotation of the attachment of the flange (3) to the post (2) and also of the post (2) to the ground, if, for example, concrete has been cast on said ground. Additionally, the material of the post (2) of this embodiment is PVC (polyvinyl chloride) with 1% vulcanized rubber recovered from recycled tires incorporated during the extrusion operation. This rubber material, with percentages between 1% and 5%, has been proven to allow, without reducing the resistance of the PVC, better performance of the post (2) in the event of the impact of a vehicle since the post (2)-sign body (1) assembly is more readily removed from the path of the impacting vehicle given its greater deformability.

[0040] According to the state of the art, the sign bodies are made of stamped sheet metal, where this material allows for spot welding to parts that make the attachment thereof easier.

[0041] The use of rubber like in the present invention does not allow for spot welding, therefore it is provided with a configuration that allows for securing by screws or rivets, for example. For this purpose, the sign body (1) is configured in a specific manner, as described in the following examples, provided with rapid anchoring means assuring stability of the attachment for a long time and complying with regulations relating to structural stability due to wind.

[0042] Figures 1B and 1C show that the flange (3) has a first attachment between the flange (3) and the sign body (1) and a second attachment between the flange (3) and the post (2). For the second attachment, the flange has two clamps (3.2, 3.3) which are attached to one another by screws (3.4), trapping the post (2) between both clamps (3.2, 3.3).

[0043] One of the clamps (3.3) in turn has an L-shaped structure (3.1) welded thereto. As can be seen in Figure 1C, the lower flange (3) uses an L-shaped structure (3.1) and the upper flange (3) also uses an L-shaped structure (3.1) but positioned upside down. In any case, one of the strips of the L-shaped structure projects horizontally.

[0044] The strip of the L-shaped structure (3.1) that projects horizontally shows slots intended for receiving screws for securing to the sign body (1). The slots make it easier to adjust the position of the two parts to be attached.

[0045] In turn, the sign body (1) has reinforcing ribs (1.2, 1.3) on its back, i.e., horizontal reinforcing ribs (1.2) and vertical reinforcing ribs (1.3). According to other embodiments, it will be shown that they also have oblique

reinforcing ribs (1.4).

[0046] Among the horizontal reinforcing ribs (1.2), in this embodiment two of them serve for the securing thereof to the post (2) by means of the flanges (3).

[0047] These horizontal ribs (1.2) rest on the strip of the L-shaped structure (3.1) and have perforations (1.2.1) for the passage of screws or rivets which in turn pass through the slots of the strip of the L-shaped structure (3.1) and assure the attachment.

[0048] The perforations (1.2.1) of the horizontal reinforcing ribs (1.2) for integrally securing the strip of the L-shaped structure (3.1) to one of the clamps (3.3) of the flange (3) in turn has a securing strip (1.6) embedded in said horizontal reinforcing rib (1.2).

[0049] The securing strip (1.6) embedded in the horizontal reinforcing rib (1.2) is in turn perforated, where the perforations (1.6.1) of said securing strip (1.6) coincide with the perforation or perforations (1.2.1) of the horizontal reinforcing rib (1.2).

[0050] According to another embodiment, the strip (1.6) can be embedded in the reinforcing rib (1.2) without having a previously made perforation such that once manufactured, the sign body (1) it is then perforated together with the rubber in order to make holes in their corresponding location.

[0051] According to the embodiments that will be described, the perforations (1.6.1) of the securing strip (1.6) are already in place before it is embedded in the rubber, and they have larger dimensions than the perforations of the horizontal reinforcing rib (1.2) where it is embedded, particularly they are slots.

[0052] This configuration, i.e., the securing strip (1.6) having perforations (1.6.1) that have larger dimensions than the perforations (1.2.1) of the horizontal reinforcing rib (1.2), makes it easier to perforate the reinforcing rib (1.2) during the manufacture thereof so that it coincides with the configuration and position of the slots of the strip of the L-shaped structure (3.1) that projects horizontally and to which it is attached.

[0053] The difficulty is in the vulcanized material experiencing shrinkage during manufacture, and the final position of the securing strip (1.6) within the vulcanized material may also change. Since the dimensions of the perforations (1.6.1) of the securing strip (1.6) are larger, the possibility of perforating the horizontal reinforcing rib (1.2) in the right position is assured since in said right position there will always be a passage from one side of the reinforcing rib (1.2) to the other side through the perforation (1.6.1) of the securing strip (1.6).

[0054] Figure 2A shows a second embodiment where the sign body (1) has a triangular configuration, and Figures 2B and 2C with two horizontal sections which allow seeing the horizontal reinforcing ribs (1.2) with the strip (1.6) embedded therein.

[0055] It can be seen in this second embodiment that the sign body (1) comprises a main plate (1.1) offering the planar surface having an essential triangular configuration on the front, and it also has a planar configuration

on the back but all of the reinforcing ribs (1.2, 1.3, 1.4), as well as a rib in the form of a strip perimetral (1.5), emerge on this planar surface.

[0056] Figure 2A shows the front of the main body (1) configured with a plurality of horizontal reinforcing ribs (1.2) distributed along the height of the sign body (1), traversed by two vertical reinforcing ribs (1.3). In the lower portion (according to the position of the drawing and also according to the position of the sign body (1) in the operating position), one of the horizontal reinforcing ribs (1.2) is interrupted between the two vertical reinforcing ribs (1.3), preventing in this longer rib the pulling caused by the shrinkage of the rubber during the vulcanization operation and subsequent cooling.

[0057] In this embodiment, the purpose of this interruption of the reinforcing rib (1.2) is also to enable sufficient space to allow for placing the securing elements and readily manipulating them.

[0058] Another, longer horizontal reinforcing rib (1.2) is placed below this horizontal reinforcing rib (1.2), having the securing strip (1.6) embedded therein as shown in Figure 2C according to section B-B. In this case, although the length of the horizontal reinforcing rib (1.2) is longer, the embedded securing strip (1.6) limits shrinkage of the vulcanized material, minimizing this effect.

[0059] Likewise, the first horizontal reinforcing rib (1.2), starting from above, also has a securing strip (1.6) embedded therein, as shown in section A-A in Figure 2B.

[0060] Figures 2B and 2C show the strip occupying the entire length of the horizontal reinforcing rib (1.2) as is the case of Figure 2C, or part of the entire length as is the case of Figure 2B.

[0061] In these views, the strip is shaded in to differentiate the horizontal reinforcing rib (1.2) and the strip (1.6). Likewise, it is observed that the strip has perforations (1.6.1) in the form of slots where even the width of such slots is greater than the perforations (1.2.1) of the reinforcing rib (1.2). Only the perforation (1.2.1) of the horizontal rib (1.2) can be seen from the outside.

[0062] Part of the horizontal reinforcing ribs (1.2) reach the perimetral strip (1.5) and part of them reach an oblique reinforcing rib (1.4) such that the back of the main plate (1.1) has reinforcing ribs (1.2, 1.3, 1.4) distributed homogeneously throughout the entire area thereof.

[0063] Figure 2E is a front view of the sign body (1), and Figure 2D is a profile view of the same sign body (1) and corresponding to the areas that are visible for the user in the operating mode. In all of the embodiments, the front of the main plate (1.1) has a sheet with the graphic and/or text sign depicted adhered thereto.

[0064] Figure 3A is a third embodiment where the shape of the sign body (1) is octagonal. In this embodiment, the two end horizontal reinforcing ribs (1.2), i.e., the upper one and the lower one, contain the securing strip (1.6) embedded therein. Figure 3B corresponds to section C-C, where the section corresponding to the upper horizontal reinforcing rib (1.2) can be seen in detail.

[0065] Figure 4A is a fourth embodiment where the

shape of the sign body (1) is circular. In this embodiment, the two end horizontal reinforcing ribs (1.2), i.e., the upper one and the lower one, contain the securing strip (1.6) embedded therein. Figure 4B corresponds to section D-D, where the section corresponding to the upper horizontal reinforcing rib (1.2) can be seen in detail.

[0066] In both the third embodiment with the octagonal configuration and the fourth embodiment with the circular configuration only horizontal reinforcing ribs (1.2) and vertical reinforcing ribs (1.3) are used, dispensing with the use of oblique reinforcing ribs (1.4).

[0067] Also in both cases the number of horizontal reinforcing ribs (1.2) is greater than the number of vertical reinforcing ribs (1.3) since it has been proven that are the first ones to provide greater structural stability to the assembly when it is subjected to wind.

[0068] Figure 5A and Figure 5B show the inner faces of a counter-mold (4) and a mold (5), respectively, for the manufacture of a sign body (1) according to the fourth embodiment, i.e., the one having the circular configuration shown in Figures 4A and 4B.

[0069] In this embodiment, the mold (5) is the part which is placed in the lower portion in the operating mode with the face forming the back of the sign body (1) facing upwards. Figure 5B shows the mold (5) with the protrusions (5.1) giving rise to the cavities on the back of the sign (1), and between the channels (5.2) said protrusions (5.2) giving rise to the horizontal and vertical reinforcing ribs (1.2, 1.3). If there were oblique reinforcing ribs (1.4) in the sign body to be manufactured, there would be channels (5.2) between protrusions (5.1) in an oblique position with respect to the rest of the channels (5.2).

[0070] The channels (5.2) and side walls of the space defining the sign body (1) have an angle for removal from the mold which makes extraction easier once the rubber is vulcanized.

[0071] The mold (5) has a square configuration and has a perforation (5.3) at each of the ends intended for receiving a corresponding lug (4.2) also placed in each of the corners of the counter-mold (4), such that the correct position of the counter-mold (4) with respect to the mold (5) when both parts (4, 5) are closed is assured.

[0072] Figures 6A and 6B show the counter-mold (4) placed on the mold (5) according to perspective and front views, respectively, both of which are spaced apart from one another.

[0073] In all the described embodiments, the thickness of the reinforcing ribs (1.2, 1.3, 1.4) defined by the channels (5.2) and the thickness of the main plate (1.1) defined by the separation of the planar upper surface of the protrusions (5.1) and the planar surface of the bottom of the counter-mold (4) when the counter-mold (4) and the mold (5) are closed are the same. It has been found that under this condition, or with variations in thickness preferably less than 10% and more preferably less than 5%, the degree of deformation of the sign body (1) due to shrinkage of the material after molding is minimal.

[0074] In this open position, for the manufacture of the

sign body the first thing that is done is to wrap the securing strip or strips (1.6), where this strip (1.6) according to the described embodiments already has the perforations or slots (1.6.1), in a non-vulcanized rubber sheet by inserting this assembly in the channels of the mold (5), giving rise to the horizontal reinforcing ribs (1.2) which will have the securing strip (1.6) embedded therein. This insertion may require the use of pressure elements or a hammer which helps in the placement in the channel (5.2).

[0075] Both the mold (5) and the counter-mold (4) have heating means communicated with temperature control devices.

[0076] Once the securing strip (1.6) is placed with the non-vulcanized rubber sheet, non-vulcanized rubber is added on the mold (5) such that the volume of the non-vulcanized rubber placed in the mold (5) has at least the volume defined by mold (5) and counter-mold (4) in the closed position.

[0077] According to one embodiment, the non-vulcanized rubber is configured in sheets to enable wrapping the securing strip (1.6) such that the rubber completing the volume is incorporated with a stack of sheets establishing the volume condition.

[0078] To assure correct filling of the mold, the volume of rubber is somewhat greater than the volume of the inside of the closed mold (5) and closed counter-mold (4), where the counter-mold (4) has an overflow cavity (4.1.1) communicated with the inner cavity (4.1).

[0079] Once the non-vulcanized rubber is placed on the mold (5), the mold (5) is closed with the counter-mold (4), and heat is applied by the heating means to melt the non-vulcanized rubber, leaving the rubber the time required for it to flow, filling up the empty volume defined between mold (5) and counter-mold (4).

[0080] During this filling process, the excess rubber will completely or partially fill up the overflow cavity (4.1.1), giving rise to a rubber protrusion in the sign body that can be cut after manufacture. This overflow cavity (4.1.1) can likewise alternatively be placed in the mold (5) or in both (4, 5).

[0081] According to this embodiment of the method of manufacture, partial openings of the mold (understood in this case as the mold (5) and counter-mold (4) assembly) are carried out for removing the gas from the enclosed space between the mold (5) and counter-mold (4) during the filling operation with the melting temperature being maintained. The trapped air can thereby get out, completing the flow process of the rubber through all of the channels (5.2).

[0082] Once it is known that the inner space has been filled up, the temperature of the mold (5) and counter-mold (4) is maintained, using the heating means, at the vulcanization temperature, maintaining said temperature until complete vulcanization of the rubber.

[0083] After vulcanization the mold (5)-counter-mold (4) assembly is opened by separating its portions, i.e., in this case by lifting the counter-mold (4) with respect to the mold (5), and removing the molded part from the

mold.

[0084] Once the part is taken out, the horizontal reinforcing ribs (1.2) containing respective securing strips (1.6) are perforated at a point coinciding with the perforation (1.6.1) of the securing strip (1.6).

[0085] Manufacture of the sign body (1) is completed with these steps. Finally, the post (2) is attached to the sign body (1) by means of the flange (3), the attachments being configured as described above to give rise to the traffic sign.

Claims

1. A traffic sign comprising:

- a support (2);
- a sign body (1);
- a coupling flange (3) for coupling the sign body (1) to the support (2) by means of a first attachment of the flange (3) to the sign body (1) and by means of a second attachment of the flange (3) to the support (2);

characterized in that the sign body (1) is configured in a vulcanized elastomeric body comprising:

- a main plate (1.1) having a planar configuration with a front and a back for showing a graphic and/or text sign on the front;
- at least one reinforcing rib (1.2, 1.3, 1.4) placed on the back of the main plate, where said reinforcing rib (1.2, 1.3, 1.4) comprises a securing strip (1.6) with at least one perforation (1.6.1), said securing strip (1.6) being embedded in the reinforcing rib (1.2, 1.3, 1.4); and
- wherein the reinforcing rib (1.2, 1.3, 1.4) comprising the securing strip (1.6) is perforated (1.2.1) with the perforation (1.2.1) coinciding with the at least one perforation (1.6.1) of the securing strip (1.6);

and wherein the first attachment of the coupling flange (3) to the sign body (1) is through the at least one perforation (1.2.1) of the reinforcing rib (1.2, 1.3, 1.4).

2. The sign according to claim 1, wherein the main plate (1.1) comprises a perimetral rib on the back in the form of a perimetral strip (1.5).
3. The sign according to any of the preceding claims, wherein the at least one reinforcing rib (1.2, 1.3, 1.4) comprising the securing strip (1.6) has a horizontal orientation in the operating position.
4. The sign according to any of the preceding claims, wherein the main plate (1.1) comprises one or more

vertical reinforcing ribs (1.3) on the back.

5. The sign according to any of the preceding claims, wherein the main plate (1.1) comprises two horizontal and spaced-apart reinforcing ribs (1.2) on the back with the securing strip (1.6) embedded therein, with each of the reinforcing ribs (1.2) being attached to the support (2) by a flange (3). 5
6. The sign according to any of the preceding claims, wherein the main plate (1.1) comprises one or more reinforcing ribs on the back with a strip embedded therein for reinforcement purposes. 10
7. The sign according to any of the preceding claims, wherein the thickness of the main plate (1.1) and the thickness of the reinforcing ribs (1.2, 1.3, 1.4) is the same with maximum variations of 10%. 15
8. The sign according to claim 7, wherein the maximum variations of thickness are 5%. 20
9. The sign according to any of the preceding claims, wherein the graphic and/or text sign is printed on a sheet adhered to the front of the sign body (1). 25
10. A method of manufacture of a sign body (1) made of vulcanized elastomer, comprising the following prior steps: 30
 - providing a heatable mold (5) and a heatable counter-mold (4) for vulcanizing the parts, wherein
 - the mold (5) is for configuring the back of the sign body (1) and comprises protrusions (5.1) between which channels (5.2) are defined, the channels (5.2) being intended for configuring the reinforcing ribs (1.2, 1.3, 1.4) of the sign body (1); 35
 - the counter-mold (4) is for configuring the front of the sign body (1) and is configured in the form of an inner cavity (4.1) having a planar bottom for configuring the planar surface on which a graphic and/or text sign is placed; 40
 - providing one or more non-vulcanized rubber sheets; 45
 - providing one or more securing strips (1.6) having at least one perforation (1.6.1); 50

and the following molding steps:

- with the mold (5) and the counter-mold (4) being separated from one another, wrapping the at least one securing strip (1.6) with a portion of non-vulcanized rubber sheet and inserting the 55

assembly into the channel (5.2) of the mold (5) corresponding to the reinforcing rib (1.2, 1.3, 1.4) for the securing thereof to the flange (3) for subsequent attachment of the sign body (1) and the support (2);

- placing non-vulcanized rubber on the mold (5) such that the volume of the non-vulcanized rubber placed in the mold (5) has at least the volume defined by mold (5) and counter-mold (4) in the closed position;
- closing the mold (5) with the counter-mold (4) and applying heat to melt the non-vulcanized rubber leaving it the time required for it to flow, filling up the empty volume defined between mold (5) and counter-mold (4);
- maintaining the temperature of the mold (5) and counter-mold (4) at the vulcanization temperature, maintaining said temperature until complete vulcanization of the rubber;
- opening the mold (5)-counter-mold (4) assembly and removing the molded part from the mold;
- perforating each reinforcing rib (1.2, 1.3, 1.4) containing a securing strip (1.6) at a point coinciding with the securing strip (1.6).

11. The method of manufacture according to claim 10, wherein the mold (5) or the counter-mold (4) comprises an additional overflow cavity (4.1.1) for the exit of the excess rubber.

12. The method of manufacture according to claim 11, wherein partial openings of the mold are carried out for removing the gas from the enclosed space between the mold (5) and the counter-mold (4) while closing the mold (5) with the counter-mold (4) by applying heat to melt the non-vulcanized rubber.

13. The method of manufacture of a traffic sign, which comprises:

- manufacturing a sign body (1) according to any of claims 10 to 12;
- adhering a sheet printed with the graphic and/or text sign to the front of the sign body (1);
- attaching the sign body (1) to the support (2) by means of a flange (3).

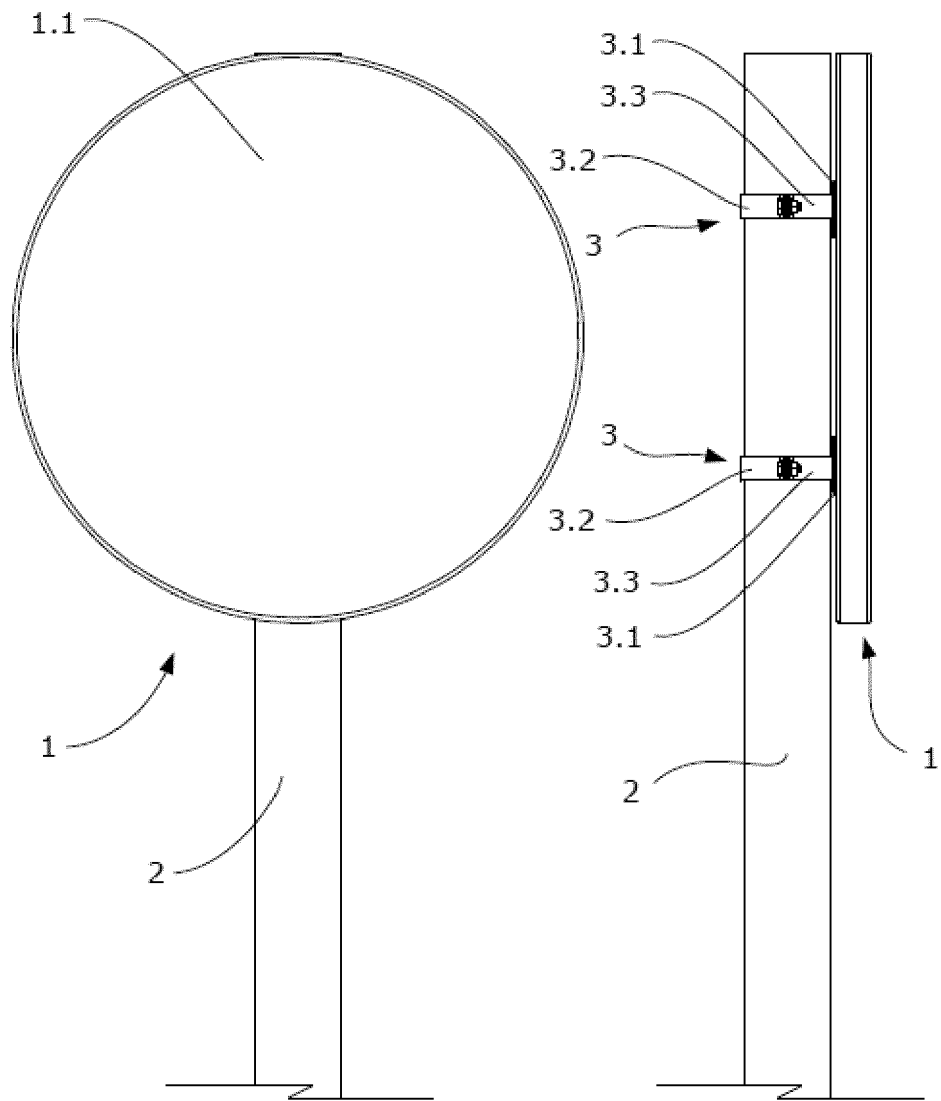
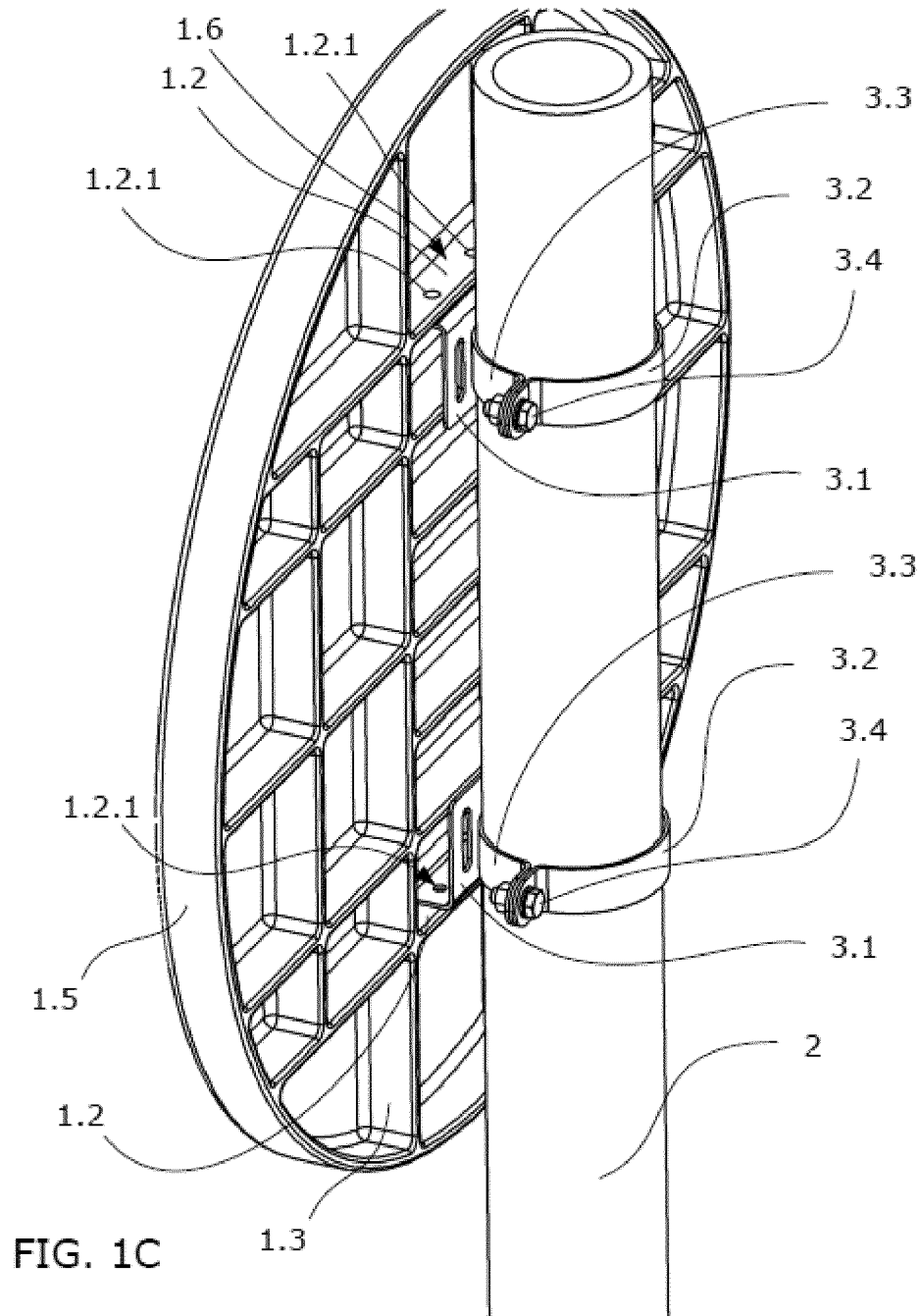
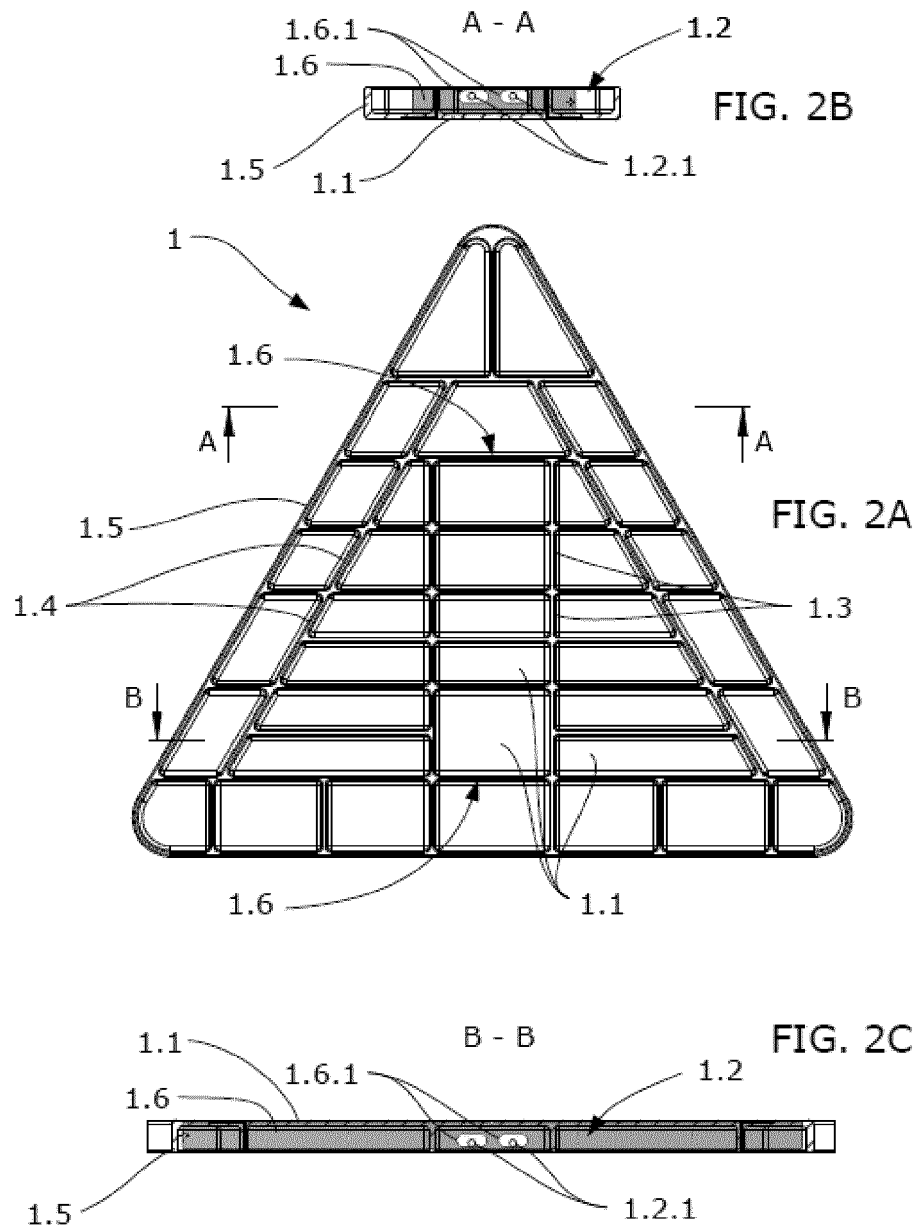


FIG. 1A

FIG. 1B





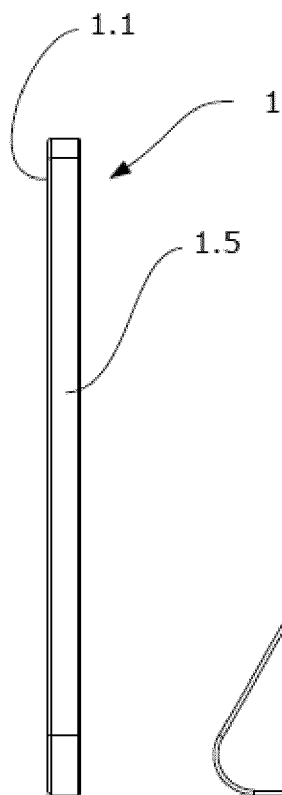


FIG. 2D

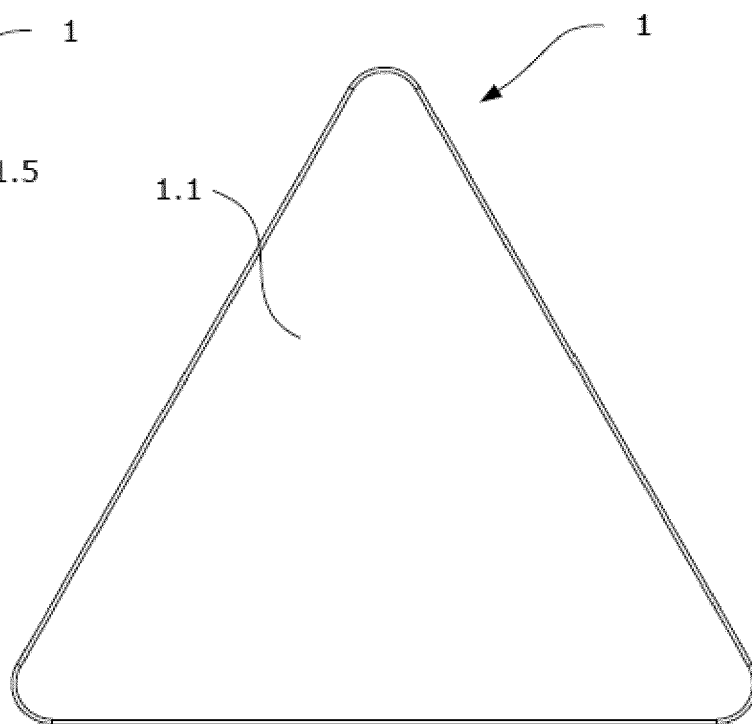


FIG. 2E

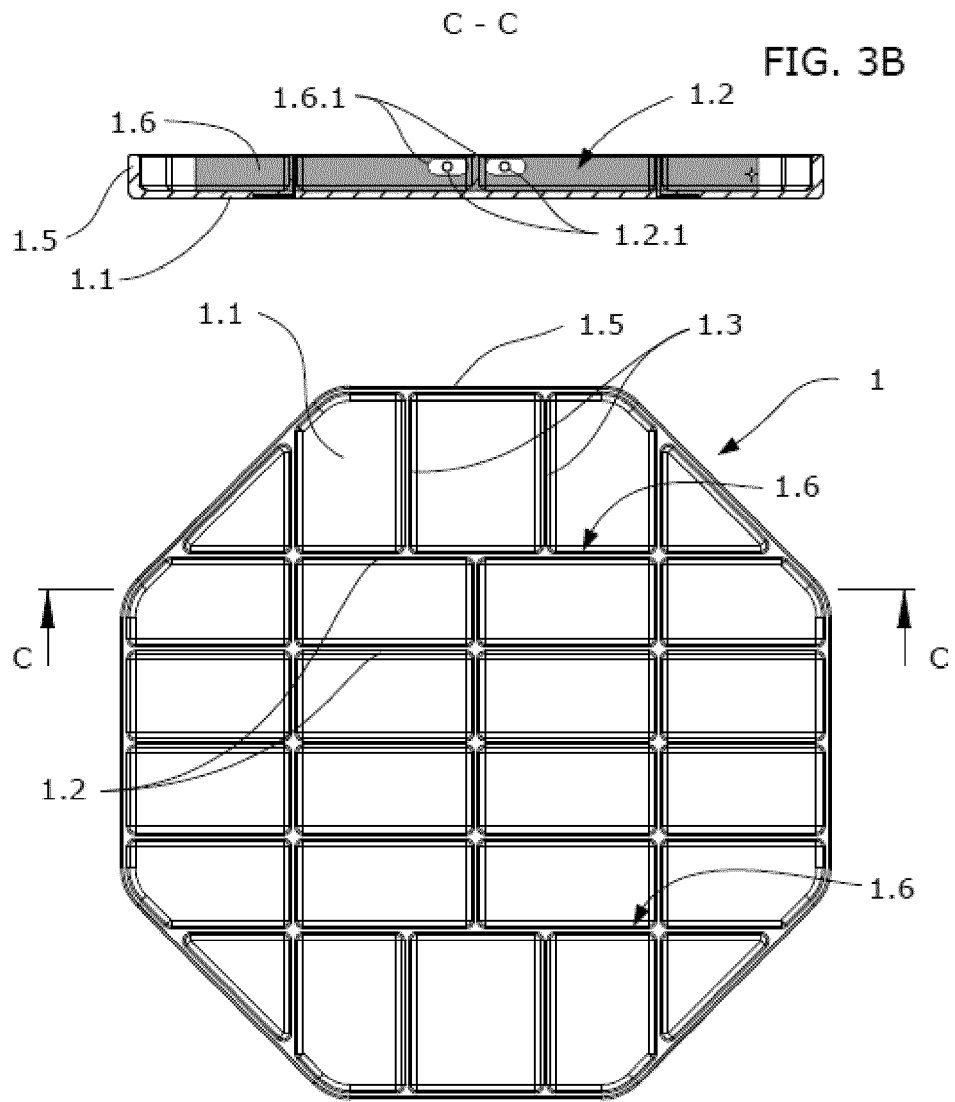
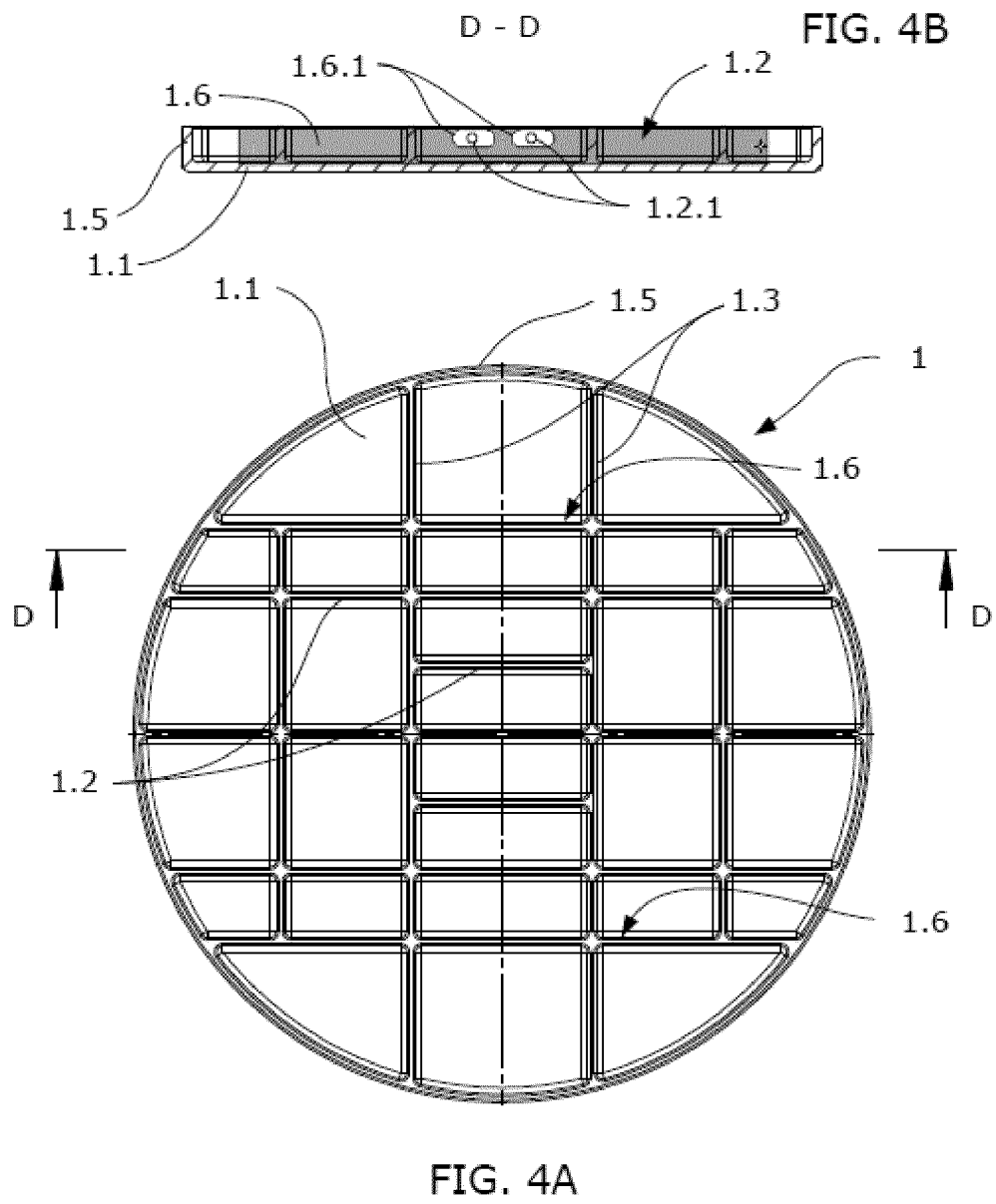
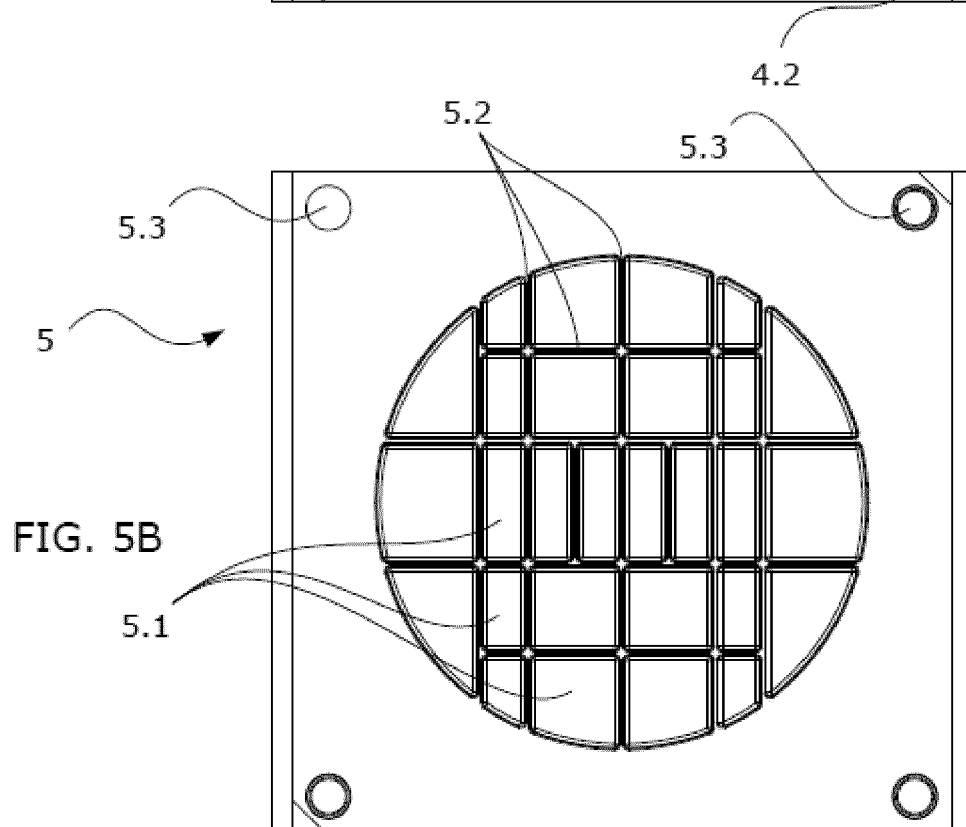
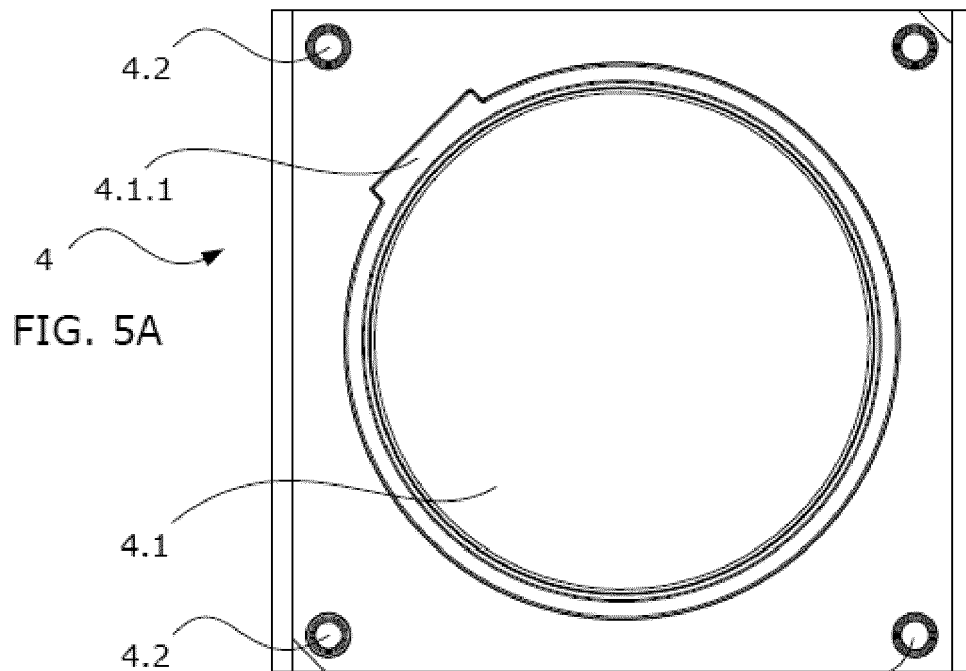
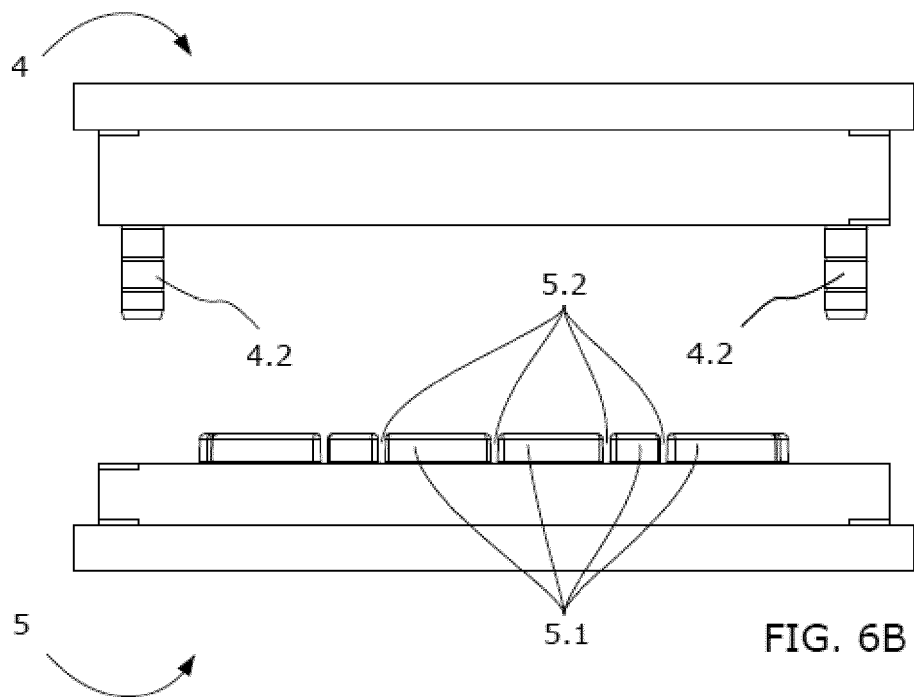
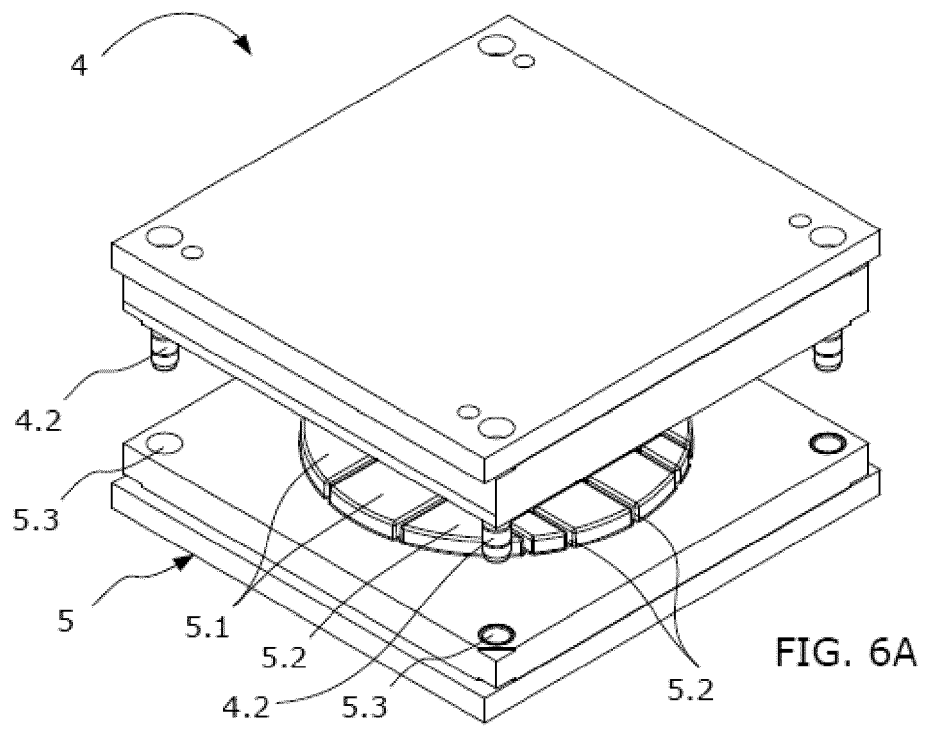


FIG. 3A









EUROPEAN SEARCH REPORT

Application Number
EP 17 38 2597

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2007/214693 A1 (HILLSTROM DAVID U [US] ET AL) 20 September 2007 (2007-09-20)	1-9	INV. E01F9/65 G09F7/18
A	* paragraphs [0002], [0008], [0027] - [0031], [0033], [0034] - [0036], [0046] *	10-13	
	* claims 1,20; figures 1-6 *		
A	EP 0 439 304 A1 (RINGWAY SIGNS LTD [GB]) 31 July 1991 (1991-07-31)	1-13	
	* column 1, lines 2-45 *		
	* column 2, lines 25-44 *		
	* column 3, lines 20-37 *		
	* figures 1-3,6b *		
A	GB 2 431 502 A (SIGN LTD N [GB]) 25 April 2007 (2007-04-25)	1-13	
	* page 1, paragraph 1 *		
	* page 3, paragraph 2 *		
	* page 4, paragraph 2 *		
	* figures 1,3,3a *		
A	CN 205 205 716 U (WU JIAJIE) 4 May 2016 (2016-05-04)	1-13	TECHNICAL FIELDS SEARCHED (IPC)
	* paragraphs [0014], [0015], [0023] - [0025] *		E01F
	* figures 1-3 *		F16B
			G09F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 29 January 2018	Examiner Kremsler, Stefan
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

EPO FORM 1503 03.02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 17 38 2597

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The members are as contained in the European Patent Office EDP file on
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29-01-2018

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2007214693 A1	20-09-2007	NONE	
EP 0439304 A1	31-07-1991	NONE	
GB 2431502 A	25-04-2007	GB 2431502 A WO 2007045932 A1	25-04-2007 26-04-2007
CN 205205716 U	04-05-2016	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82