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(54) **LINING FIXATION TO A SUITCASE FRAME**

(57) A frame construction (10) for a piece of luggage comprises a frame (1) with a profile (2) with a profile base (21) and a first profile wall (22) and a second profile wall (23) having first and second inner surfaces (24, 25) delimiting a seat (28) for a liner (6). The inner surfaces (24, 25) are provided with grooves (26, 27) and the frame construction (10) further comprises a strip (7) for being inserted in said grooves (26, 27) for fastening said liner (6) into said seat (28). A liner (6) for use with such a frame construction (10) comprises at least one fold (61) to be inserted into said seat (28, 28'), wherein one or more elongated members (62) are arranged at or in said fold (61). A piece of luggage (1000) with such a frame construction (10) comprises said liner (6).

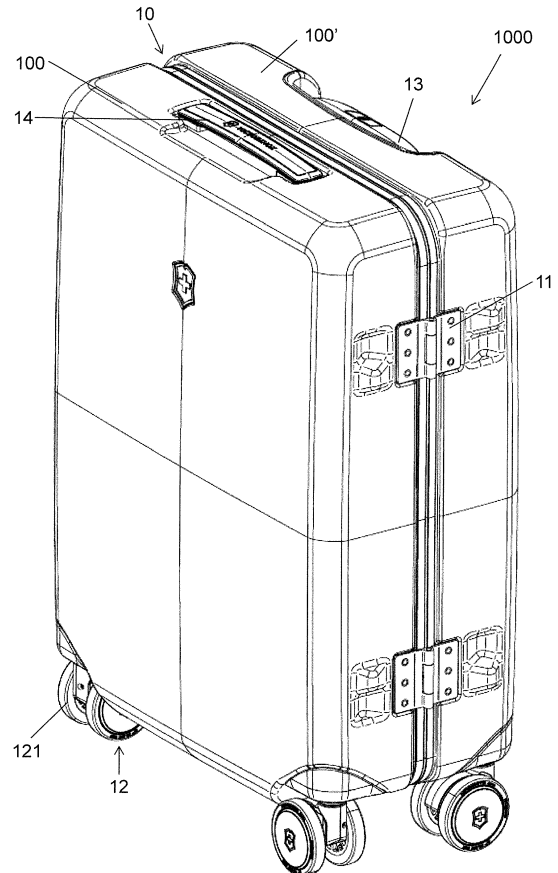


FIG. 1

EP 3 549 480 A1

Description

TECHNICAL FIELD

5 [0001] The present invention relates to a frame construction for a piece of luggage, preferably for a suitcase shell, according to claim 1 for fastening a liner to the piece of luggage, to a liner for such a frame construction, and to a method for attaching a liner to a suitcase shell by means of such a frame.

PRIOR ART

10 [0002] A common problem encountered with pieces of luggage is that their interior can quickly become soiled from liquid products or dirty objects stored therein or can be damaged by misuse. For this reason liners were developed that line and thus protect the interior. In addition, liners can also be used for partitioning the interior of a piece of luggage in order to separately house different objects. Many ways of securing or attaching liners to a piece of luggage are known. 15 For example, the liners can be adhesively secured or sewn to the piece of luggage. Such a permanent fixation can be advantageous due to the durability of fixation. However, it might be desirable to replace a dirty or damaged liner. Another possibility of securing a liner to a piece of luggage is to provide a connection such as a frame to which the liner can be attached and detached easily.

20 [0003] EP 2 672 857 teaches to fasten a liner to a stiffening frame of a suitcase shell by means of a T-shaped sliding element that is, with its one edge region, inserted into the stiffening frame and, with its other edge region, attached to the liner. Whereas this type of connection allows the replacing of the liner its mounting is however complicated. In fact, the liner has to be slid in the groove in a rather laborious and labor intensive manner.

SUMMARY OF THE INVENTION

25 [0004] It is an object of the present invention to provide an improved frame construction. In particular, it is an object to provide a frame construction which enables a flexible, reliable and detachable connection of a liner in a simple manner.

30 [0005] This object is achieved by the frame construction according to claim 1. According thereto, a frame construction for a piece of luggage, preferably for a suitcase shell, comprises a frame, said frame comprising a profile with a profile base and a first profile wall and a second profile wall. A seat for a liner is delimited by opposing first and second inner surfaces of said first and second profile walls, respectively, that face one another. The said first inner surface is provided with a first groove and said second inner surface is provided with a second groove, said first and second grooves facing one another and extending in a longitudinal direction of said profile. The said frame construction further comprises a strip for being inserted into said profile with opposing lateral edge regions in said first and second grooves for fastening 35 said liner being inserted into said seat.

40 [0006] That is, the frame construction comprises a frame with a profile having a profiled groove or profile slot, into which a liner can be inserted. Said liner is then secured within the profile by means of the strip. The strip secures the liner within the profile and thus prevents an unintentional removal of the liner. Furthermore, since the strip can be removed from the profile, the liner is thereby also removably fastened to the frame construction and as a result easily exchangeable. Said profile can be designed so as to be essentially U-shaped, i.e. with profile walls extending essentially perpendicularly with respect to the profile base. Other designs are however conceivable, too. For example, said profile could likewise be essentially C-shaped, i.e. with essentially curved profile walls.

45 [0007] The said first and second grooves can be arranged to be on the same height with respect to a depth of the profile. Or, in other words, the first and second grooves can be provided in the respective profile walls at equal distances from the profile base. In this case, the strip inserted into the grooves extends parallel to the profile base.

50 [0008] The strip preferably extends, when inserted into said first and second grooves, along said longitudinal direction of said frame around substantially the entire frame. Likewise, it is thus preferred that the profile extends along the longitudinal direction of the frame and around substantially the entire frame. In this way it is possible to attach the liner to the frame along the entire circumference of the frame, such that the suitcase shell can be completely lined. However, it is also conceivable that the strip, and thus also the profile, extends only partially and/or in sections along the longitudinal direction of the frame. In this way, it is possible to only partially line the suitcase shell.

55 [0009] Said first and second profile walls can extend parallel to one another or can diverge from one another towards their free edge regions or can converge towards one another in the direction of the profile base. Divergent profile walls as well as convergent profile walls are arranged inclined or tilted with respect to one another and with respect to the profile base, respectively. An inclination in the case of divergent profile walls has the advantage that the insertion of the strip is facilitated. An inclination in the case of convergent profile walls has the advantage that the seat has larger dimensions such that the liner is easier accommodated within the seat, while at the same time the profile walls in the region of their free edge regions reduce the insertion opening of the profile such that the liner is held better within the

seat. Divergent profile walls preferably include in each case an angle of inclination with respect to the profile base of larger than 90°, preferably between about 92° to 120°, particularly preferably between about 95° to 100°. Convergent profile walls preferably include in each case an angle of inclination with respect to the profile base of smaller than 90°, preferably between about 60° to 88°, particularly preferably between about 80° to 85°.

5 **[0010]** The first and second profile walls can be, in a cross-sectional view of the profile, straight, and/or the first and second profile walls can have the same heights. Straight profile walls are arranged perpendicularly with respect to the profile base and profile walls having the same heights extend from the profile base by the same amount. It is however also conceivable that the profile walls have different heights, i.e. that one of the profile walls extends from the profile base by a lesser amount than the other profile wall.

10 **[0011]** Said first and second grooves and said strip are preferably dimensioned such that, when said strip is inserted into said first and second grooves, a gap is formed between the strip and the first and second inner surfaces, the gap being provided for guiding said liner from within the profile around said strip to an outside of the profile. The gap allows the liner to extend from within the seat of the profile laterally around the lateral edge regions of the strip to the outside of the profile. In this way it is possible to guide the connected liner into the interior of a suitcase. In doing so, the strip preferably has a height that is slightly smaller than the diameter of the grooves and a width that is slightly smaller than the distance of the first and second profile walls from one another. Such an arrangement, especially if the first and second grooves are arranged on the same height with respect to the depth of the profile, has the advantage that in case a pulling force is exerted on one side of the liner the other side of the liner is thereby caused to move along the direction of the pulling force. Thereby, said other side of the liner pushes its associate lateral edge region of the strip against the groove in the profile wall. As a result, the strip and the liner are further clamped in the profile and hence a self-locking provided.

15 **[0012]** The frame can be a single piece element, preferably made from aluminium or plastics. However, it is also possible to form the frame in two or multiple parts, wherein said parts are connected with each other by means of appropriate connecting means such as adhesives or fastening means such as screws or profile pieces. In case that the frame is made of a material giving it stiffness, for example if it is made from aluminium, the frame constitutes a so-called stiffening frame. Such a stiffening frame has an increased stiffness and therefore also an increased stability over a frame manufactured from plastics, for example. In this case, the frame construction would likewise correspond to a stiffening frame construction.

25 **[0013]** The frame construction is preferably configured such that, when said liner is inserted into said seat, said strip may be clicked or snapped into said profile from a direction transverse to said longitudinal direction of said profile whilst said liner is pressed into said first and second grooves. It is also preferred that the frame construction is configured such that, when said liner is inserted into said seat, said strip may be slid into said profile along said longitudinal direction of said profile whilst said liner is pressed into said first and second grooves. In order to simplify the insertion of the strip into the grooves of the profile, especially in the case of fastening the strip by clicking or snapping, it is advantageous to form the strip slightly narrower than the distance between the first and second profile walls.

30 **[0014]** The frame construction preferably comprises a further frame, wherein the frame comprises a connection profile and the further frame comprises a further connection profile being designed complementary to the connection profile of the frame, the connection profile and the further connection profile being configured to enter into a preferably positive connection with one another. That is, the frame construction can comprise two frames which preferably in each case comprise a profile as described above. However, it is also conceivable that only one of the frames comprises a profile as described above. It is also preferred that the frames are connectable to one another by means of their complementary connection profiles. In the event that the frame construction is provided on a suitcase, the suitcase shells are preferably connected with each other by one or more articulated joints such as hinges. By pivoting the suitcase shells about the pivot axis provided by the articulated joints it is possible to open and close the suitcase shells of the suitcase. In the closed position, the complementary designed connection profiles of the frames come into engagement with each other. Moreover, if a liner as described above is inserted into the profiles of the frames, both suitcase shells and thus the entire interior of the suitcase can be lined.

35 **[0015]** In a further aspect, a liner for use with a frame construction as described above is provided. Said liner comprises at least one region of increased thickness to be inserted into said seat, wherein said region of increased thickness preferably corresponds to at least one fold, and wherein one or more elongated members are preferably arranged at or in said fold, said elongated members being preferably tubes, wires or strings. Said elongated members are preferably fixedly fastened to said liner, preferably by means of stitching, weaving, and/or adhesive. In addition or in alternative, said liner is a single-piece element or is made from different layer materials. In addition or in alternative, said elongated member is dimensioned such that, when inserted, together with said liner, into said seat, the elongated member exerts a self-locking force onto the profile so as to remain in place while said strip is inserted. Hence, it thereby assists the positioning of the liner.

40 **[0016]** The liner preferably corresponds to a fabric or textile which has at least one fold or kink that is inserted into the seat of the profile. Thereby, the liner can be provided as a single-piece element, e.g. in the form of a textile or fabric

formed in one piece and having homogeneous properties throughout the whole liner. In particular, it is possible to use a liner being made of a smooth and/or thin fabric which allows for an easy removal of the strip and replacement of the liner. However, it is also possible to provide a liner being made of a coarse fabric resulting in an increased friction between the fabric and the grooves and the lateral edge regions of the strip and/or with an increased material thickness leading to a better fixation of the liner within the profile.

[0017] Besides, the liner could also be provided as a multi-piece element, e.g. in the form of two or more textile or fabric pieces that are connected such as sewed or glued together. Said two or more textile or fabric pieces can again have the same or different properties. That is, the liner could consist of two textile pieces, one textile piece being thicker or courser or having a different mechanical property than the other textile piece. For example, the liner could comprise a first textile piece forming a first liner area made of a rigid or inelastic material and a second textile piece forming a second liner area made of a soft or elastic material. When folding said liner along the first and second liner areas and placing said folded liner into the profile, depending on the orientation of insertion, the inelastic material can be made to extend along the inner surface of the suitcase shell and the elastic material can be made to extend across the interior of the suitcase shell and serve the purpose of a divider or partition that divides the interior space of the suitcase into a first and a second space. However, it is likewise conceivable that both liner materials are made to extend along the inner surface of or across the suitcase shell. Furthermore, it is conceivable that the liner comprises a thicker or coarser liner area only in the region of the profile, particularly in the regions of the grooves. In doing so, an area of increased friction is provided in the region of connection between the strip and the profile only, while the remaining parts of the liner can continue to be, e.g. smooth or elastic.

[0018] In addition, the liner can be provided as a single layer material comprising one layer of a single-piece or multi-piece fabric. Or, the liner can be provided as a multi-layer material comprising two or more single-piece and/or multi-piece fabrics.

[0019] In order to assist the insertion of the liner into the profile it is preferred to attach one or more elongate members to the liner. Said elongate members can be provided in the form of a tube, string or a wire which, together with the liner, extend along substantially the entire profile and thus the frame. Once the liner together with the elongate member is inserted into the profile, particularly in its seat, the elongate member helps to keep the liner within the profile and thus also simplifies the insertion of the strip.

[0020] In a further aspect, a piece of luggage, preferably a suitcase, or a suitcase shell, with a frame construction as described above comprising said liner is provided. Said liner extends into said seat and said strip is secured in said first and second grooves whilst the strip presses said liner into said first and/or second groove(s). In other words, once the liner is inserted into the profile and the inserted liner is secured within the profile by means of the strip, a good fixing is achieved in that the strip thereby presses the liner into the grooves.

[0021] The liner can comprise at least one fold, said fold being inserted into said seat. One or more elongated members can be inserted into said at least one fold, said elongated members being preferably wires or strings. The elongated members are preferably fixedly fastened to said liner, preferably by means of stitching, weaving, and/or adhesive. As described above, the liner preferably corresponds to a fabric or textile which has at least one fold or kink that is inserted into the seat of the profile. In order to assist the insertion and proper positioning of the liner within the profile, one or more elongate member can be permanently or removably attached to the liner in the region of the fold, preferably within the fold.

[0022] In a further aspect, a method for fastening a liner into a frame construction of a piece of luggage, preferably a suitcase shell, comprises the steps of:

- providing a liner, preferably as described above, and a piece of luggage or a suitcase shell with a frame construction as described above;
- inserting said liner into said seat of the frame;
- fastening said liner in said seat by inserting said strip into said first and second grooves.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] Preferred embodiments of the invention are described in the following with reference to the drawings, which are for the purpose of illustrating the present preferred embodiments of the invention and not for the purpose of limiting the same. In the drawings,

- Fig. 1 shows a perspective view of a suitcase comprising a frame construction with an upper and lower frame;
 Fig. 2 shows a perspective view of the upper and lower frame of the frame construction according to figure 1, the frames comprising in each case a U-profile, a connection profile and a shell profile;
 Fig. 3 shows a cross-section of the upper frame according to figure 2;
 Fig. 4 shows a cross-section of the lower frame according to figure 2;

- Fig. 5 shows a sectional view of the frame construction according to figure 1, wherein the U-profiles are omitted;
 Fig. 6 shows a sectional view of the frame construction according to figure 1, wherein the shell profiles are omitted;
 Fig. 7 shows a perspective view of a strip of the frame construction according to figure 1;
 Fig. 8 shows a perspective view of the upper frame of the frame construction according to figure 1, wherein a liner
 5 is connected to the upper frame by the strip according to figure 7;
 Fig. 9 shows a perspective view of the upper frame comprising the liner according to figure 8, wherein the strip is removed;
 Fig. 10 shows a perspective view of the liner according to figures 8 and 9;
 Fig. 11 shows a perspective view of a fastening element insertable in the shell profile of the frame construction
 10 according to figure 1;
 Fig. 12 shows a further perspective view of the fastening element according to figure 11.

DESCRIPTION OF PREFERRED EMBODIMENTS

15 **[0024]** A suitcase 1000 comprising two suitcase shells 100, 100' and a frame construction 10 is shown in Figure 1. As will be explained in greater detail with reference to figures 2 to 5, the frame construction 10 comprises two frames 1, 1' which in each case are connectable to one of the suitcase shells 100, 100'. The suitcase shells 100, 100' can be made of a metal such as aluminium or of a polymeric material, for example polyethylene, polypropylene, acrylonitrile butadiene styrene, polycarbonate or the like. The frames 1, 1' are advantageously made of the same material as the
 20 suitcase shells 100, 100', i.e. they are preferably made from aluminium or plastics.

[0025] The frames 1, 1' are articulately jointed by means of hinges 11 so as to allow the opening and closing of the suitcase. In the present example, two hinges 11 are provided on one of the longitudinal sides of the suitcase. The suitcase is further equipped with closure means (not shown) such as snap fasteners or a zip closure. On the lower transverse
 25 side the suitcase has a wheel assembly 12, which in the present case consist of four wheels 121 that are arranged opposite each other in corner areas of the suitcase. On the upper transverse side of the suitcase a pull-out handle 13 is arranged on one of the suitcase shells 100' and a handgrip 14 is provided on the other suitcase shell 100. For a better understanding the suitcase shell 100 comprising the handgrip 14 is called in the following the upper suitcase shell 100 and the suitcase shell 100' comprising the pull-out handle 13 is called the lower suitcase shell, respectively.

[0026] Figures 2 to 4 depict the frames 1, 1' of the upper and lower suitcase shells 100, 100' individually. As becomes
 30 evident from these figures, the frames 1, 1' are provided as single piece elements of an essentially rectangular shape and with a profiled structure. That is, the frames 1, 1' in each case comprise a connection profile 3, 3' serving the purpose of connecting the frames 1, 1' with each other, a U-shaped profile 2, 2' serving the purpose of connecting a liner 6 to the frames 1, 1', and a shell profile 4, 4' serving the purpose of connecting the suitcase shells 100, 100' to the frames 1, 1', respectively. In the connected state, i.e. when the two connection profiles 3, 3' are connected with each other and
 35 the suitcase shells 100, 100' are received within the shell profiles 4, 4', the shell profiles 4, 4' and the suitcase shells 100, 100' face towards an outside of the suitcase. The connection profiles 3, 3' and the U-shaped profiles 2, 2' are facing towards the interior of the suitcase and are offset inwardly with respect to the suitcase shells 100, 100' and the shell profiles 4, 4'. The U-shaped profiles 2, 2' and the connection profiles 3, 3' are thereby arranged within a common plane that extends parallel to a plane of the suitcase shells 100, 100'.

[0027] However, it needs to be taken into consideration that the frames 1, 1' can be provided without such shell profiles
 40 4, 4' or connection profiles 3, 3' or U-shaped profiles 2, 2', respectively. For example, the frames 1, 1' could be secured to one another by means of external closure means only such as zip closures or snap fasteners. Likewise, especially if no liner is desired in the suitcase, it is possible to omit the U-shaped profiles 2, 2' from the frames 1, 1'. For the reason of simplicity, figure 5 shows frames 1, 1' in which the U-shaped profiles for connecting a liner are omitted. Similarly, the frames 1, 1' according to figure 6 are depicted without the shell profiles. Nevertheless it should be noted that any aspects
 45 discussed with respect to one of these frames 1, 1' can be present on the other frames 1, 1'.

[0028] As follows from figures 3 to 6, the connection profiles 3, 3' are arranged such on the frames 1, 1' that they can
 50 be brought into engagement with each other when the suitcase 1000 is closed. To this end, the lower frame 1' comprises a connection profile 3' which comprises inner and outer surfaces 31', 32' that run towards each other. The inner surface 31' refers to that surface of the connection profile 3' that faces towards an interior space 15' of the frame 1' and the outer surface 32' refers to the surface facing towards an outside of the frame 1', respectively. In the cross-section, the connection profile 3' of the lower frame 1' is essentially in the shape of a "V", wherein the length of the inner surface 31' is greater than the length of the outer surface 32'. Said V-shaped connection profile 3' on the lower frame 1' forms a receptacle
 55 for a correspondingly configured profiled structure 3 on the upper frame 1. That is, the connection structure 3 on the upper frame 1 is designed so as to be insertable into the receptacle formed by the inner and outer surfaces 31', 32' of the connection profile 3' of the lower frame 1' and has an essentially triangular cross-section.

[0029] As best seen in figure 5, the triangularly shaped connection profile 3 on the upper frame 1 has likewise an inner
 surface 31 facing the interior space 15 of the frame 1 and having a length that is greater than the length of an outer

surface 32 facing towards the outside of the frame 1. When the suitcase 1000 is in its closed position, the triangularly shaped connection profile 3 is essentially fully received within the V-shaped connection profile 3' as in the case of a tongue-and-groove connection, wherein the inclination of the respective inner surfaces 31, 31' and outer surfaces 32, 32' and the length of the respective outer surfaces 32, 32' are about the same. As a result, a positive connection between the upper and lower frames 1, 1' is provided which holds the two suitcase shells 100, 100' closed when the suitcase is in the closed position.

[0030] As further follows from figures 3 to 5, the shell profiles 4, 4' on the upper and lower frames 1, 1' are of an identical design and in each case are substantially U-shaped when viewed in cross-section. An end portion of the suitcase shells 101, 101' can be inserted into the U-shaped seat 41, 41' provided in the shell profiles 4, 4'. Different possibilities to secure the end portions 101, 101' of the suitcase shells 100, 100' into the shell profiles 4, 4' are conceivable. For example, the end portions 101, 101' could be permanently adhered to the shell profiles 4, 4' by e.g. gluing them into the seats 41, 41'. A releasable securing could be achieved by means of a clamping connection, where the end portions 101, 101' have dimensions that approximately correspond to the dimensions of the seats 41, 41'. Or else, the dimensions of the end portions 101, 101' could be smaller than of the clear width the seats 41, 41' and a fastening could be achieved with the aid of an additional fastening element 42 as shown in figures 5 and 11-12.

[0031] The shell profiles 4, 4' are thereby arranged on their respective frame 1, 1' in a mirrored manner with respect to one another. In particular, when the suitcase shells 100, 100' are inserted into the frames 1, 1' and the suitcase is in its closed position, the shell profiles 4, 4' are mirrored with respect to a plane extending perpendicularly to a plane spanned by the suitcase shells 100, 100' in the region of the shell profiles 4, 4'. Between the upper and lower suitcase shell 100, 100' a gap 102 is formed which allows the insertion of a zip closure, for example. Though, as has been mentioned earlier, the connection established between the connection profiles 3, 3' of the frames 1, 1' is already sufficient for a tight closing of the suitcase. Said gap 102 is caused by the particular design of the connection profiles 3, 3', in particular by the inner surface 31 of the triangularly shaped connection profile 3 on the upper frame 1 having a length that is greater than the length of the corresponding inner surface 31' of the V-shaped connection profile 3' on the lower frame 1'.

[0032] The U-shaped profiles 2, 2' for connecting a liner 6 to the frames 1, 1' are now discussed in greater detail with respect to figures 3, 4 and 6 to 10. As follows from these figures, the upper and lower frames 1, 1' in each case comprise such a U-shaped profile 2, 2'. For reasons of simplicity reference will be made in the following to only one of the frames and thus to only one of the U-shaped profiles for connecting to a liner. However, it should be noted that the following explanations likewise apply to the other frame and its U-shaped profile.

[0033] The U-shaped profile 2, 2' for connecting to a liner 6 has a profile base 21, 21', a first profile wall 22, 22' and a second profile wall 23, 23'. A seat 28, 28' for a liner 6 is delimited by the opposing first inner surface 24, 24' of the first profile wall 22, 22' and the second inner surface 25, 25' of the second profile wall 23, 23' that face one another. In the embodiment shown, the first and second profile walls 22, 22', 23, 23' extend from the profile base 21, 21' towards their free edge regions 29, 29', 210, 210' in a slightly divergent manner with respect to one another. However, it is likewise conceivable that these profile walls extend parallel to one another. Furthermore, in the cross-sectional view, the first and second profile walls 22, 22', 23, 23' have the same heights. The first inner surface 24, 24' is provided with a first groove 26, 26' and the second inner surface 25, 25' is provided with a second groove 27, 27', said grooves 26, 26', 27, 27' facing one another and being arranged on the same height with respect to a depth D of the U-shaped profile 2, 2'. The grooves 26, 26', 27, 27' extend in a longitudinal direction L of said U-shaped profile 2, 2' and along a circumferential direction of the frame 1, 1'. In case that the suitcase shell 100, 100' is in connection with the frame 1, 1', the grooves 26, 26', 27, 27' also extend parallel to a plane spanned through the suitcase shell 100, 100' in the region of the U-shaped profile 2, 2'.

[0034] The frame construction 10 further comprises a strip 5 which can be received in the U-shaped profile 2, 2' and which has opposing lateral edge regions 51, 52 that can be inserted in the grooves 26, 26', 27, 27' in order to fasten a liner 6 that is inserted into the seat 28, 28' to the frame 1, 1'. The strip 5 has an elongate rectangular shape as shown in figure 7. In order to securely fix the liner 6 to the frame 1, 1' the strip 5 extends, when inserted into the grooves 26, 26', 27, 27' along the longitudinal direction L of the frame 1, 1' and circumferentially around the entire frame 1, 1'. The grooves 26, 26', 27, 27' and the strip 5 are dimensioned such that, when the strip 5 is inserted into the grooves 26, 26', 27, 27', a small gap 211, 211' is formed between the strip 5 and the first and second inner surfaces 24, 24' 25, 25'. The gap 211, 211' allows the liner 6 to extend from within the seat 28, 28' of the U-shaped profile 2, 2' laterally around the lateral edge regions 51, 52 of the strip 5 to the outside of the U-shaped profile 2, 2'.

[0035] The dimensions of the U-shaped profile 2, 2' and the strip 5 are thereby such that, when said liner 6 is inserted into the seat 28, 28', the strip 5 may be clicked or snapped into the U-shaped profile 2, 2' from a transverse direction T running perpendicularly to the longitudinal direction L of the U-shaped profile 2, 2'. In doing so the liner 6 is pressed into the first and second grooves 26, 26', 27, 27' by the strip 5. In addition, the dimensions of the U-shaped profile 2, 2' and the strip 5 are such that, when the liner 6 is inserted into the seat 28, 28', the strip 5 may be slid into the U-shaped profile 2, 2' along the longitudinal direction L of the U-shaped profile 2, 2' whilst said 6 liner is likewise pressed into said first

and second grooves 26, 26', 27, 27'. That is to say, when the liner 6 is fastened to the U-shaped profile 2, 2' by means of the strip 5, the lateral edge regions 51, 52 of the strip 5 press part of the liner 6 into the grooves 26, 26', 27, 27'. In the present example, the clear width WU, WU' of the seat 28, 28' is between about 2 to 5 millimetres, the distance DG, DG' between the first groove 26, 26' and the second groove 27, 27' is between about 3 to 6 millimetres, and the cross-section CG of the first and second grooves 26, 26', 27, 27' is between about 0.5 and 1.5 millimetres. The width WS of the strip 5 is between about 2.5 to 5.5 millimetres and the height HS of the strip 5 is between about 0.25 and 1.25 millimetres.

[0036] In the embodiment shown in figures 8 to 10, the liner 6 is a single layer material consisting of a two-piece fabric, wherein a thick and elastic fabric piece 63 is sewed to a thin and inelastic fabric piece 64. As further follows from these figures, one elongate member 62 in the form of a plastic string is attached to the liner 6, wherein the two pieces of fabric are sewn around the string 62 such that the string 62 is received within the fold 61 of the liner 6. Said fold 61 together with the string 62 is inserted into the seat 28 of the U-shaped profile 2 such, that the thick and elastic fabric piece 63 extends around the first lateral edge region 51 of the strip 5 and the thin and inelastic fabric piece 64 extends around the second lateral edge region 52 of the strip 5 once the strip 5 is inserted into the grooves 26, 27 of the U-shaped profile 2.

[0037] Although not shown in the figures it is also conceivable to provide two or more such U-shaped profiles on the same frame. Said two or more U-shaped profiles could be arranged one above the other with respect to a direction extending perpendicular to the longitudinal direction. In this way, two or more liners could be connected to the frame.

[0038] The shell profiles 4, 4' for removably fasten the shells 100, 100' to the frames 1, 1' are now discussed in greater detail with respect to figures 3-5 and 11-12. As best seen in figures 3-5, the fastening element 42 is formed separately from the frame 1 and from the shell 100. The shell profiles 4, 4' in each case comprise a profile base 43, 43' and a first profile wall 44, 44' and a second profile wall 45, 45', wherein a seat 41, 41' for receiving the end portion 101, 101' of the shell 100, 100' is delimited by opposing first and second inner surfaces 46, 46', 47, 47' of said first and second profile walls 44, 44', 45, 45'. Once the shells 100, 100' are inserted in the seats 41, 41' of the respective shell profile 4, 4', said shells 100, 100' are fastened by means of fastening elements 42, 42' which are inserted into the seats 41, 41', namely in each case within a space 412, 412' formed between the end portion 101, 101' of the shell 100, 100' and the first or the second profile wall 44, 44', 45, 45' of the shell profile 4, 4'. For reasons of simplicity, reference is made in the following to one of the frames and accordingly to one of the shell profiles and fastening elements only. However, any aspects regarding one of the profile shells and fastening elements are equally present on the other profile shell and fastening element, respectively.

[0039] In the present case, the fastening element 42' can be seen as a clamping element which is clamped within the space 412' formed between the profile wall 44', 45' and the shell 100', wherein the fastening element 42', the seat 41' and the end portion 101' of the shell 100' are dimensioned such, that the distance between the first profile wall 44' and the second profile wall 45' essentially equals the sum of the thickness of the end portion 101' of the shell 100' and the thickness of the fastening element 42' in the region of insertion of the end portion 101' in the seat 41' of the shell profile 4'. Or, in other words, the fastening element 42' is configured such, that when the end portion 101' of the shell 100' is received in the seat 41', the fastening element 42' may be slid into the shell profile 4' along an extension direction E or may be pushed along a direction TE transverse to said extension direction E into the space 412' formed between the end portion 101' of the shell 100' and the first profile wall 44' or the second profile wall 45', respectively, whilst the end portion 101' of the shell 100 is pressed against the second profile wall 45' or against the first profile wall 44', respectively. The fastening element 42', and as a result also the end portion 101' of the shell 100', are thereby fastened by means of a friction fit and a positive-locking fit only, i.e. without the need of any additional fastening means such as an adhesive or by sewing, for example.

[0040] An additional fixation of the fastening element 42' and the end portion 101' of the shell 100' is achieved by means of retaining structures provided on the fastening element and the profile walls. In fact, the second profile wall 45' and the fastening element 42' comprise mutually interacting retaining structures 413', 414'. Here, the retaining structure of the second profile wall 45' is provided as a lug 414' formed on the free end 411' of the second profile wall 45', which lug extends from the second inner surface 47' inwards in the direction of the seat 41'. Said lug 414' provides a stop for the retaining structure in the form of a protrusion 413' formed on the fastening element 42', such that a removal of the fastening element 42' being inserted into the shell profile 4' out of the shell profile 4' is made more difficult, e.g. because a greater amount of force is needed for the removal. The fastening element 42' is thus engaged or snapped in the shell profile 4'. Moreover, the fastening element 42' comprises a further retaining structure 415' in the form of a further protrusion, which, when the end portion 101' of the shell 100' is received in the seat 41', presses against the surface 102' of the shell 100' facing said further retaining structure 415', such that an additional fastening of the end portion 101' being received in the seat 41' is effected. As best seen in figures 11 and 12, the fastening element 42' has an elongate shape with an upper side 418' and a lower side 419', wherein the retaining structures 413', 415' are arranged opposite one another and in each case extend along an entire width WF of the fastening element 42'. Since the further retaining structure 415' is formed on the upper side 419' of the fastening element 412', the fastening element 412' essentially takes the form of an "L". Furthermore, the fastening element 42' extends, when inserted in the seat 41' of the shell profile 4', partially along the extension direction E of the shell profile. In fact, the fastening element 42' has a width WF that is

EP 3 549 480 A1

a small fraction of the extension lengths of the first and second profile walls 44', 45' along the extension direction E. It is therefore conceivable to provide two or more, in particular a plurality of such fastening elements 42' which can be distributed along said extension direction E around substantially the entire frame 1. However, it is also possible to provide one single fastening element only, in which case said single fastening element preferably has a width that essentially corresponds to the extension lengths of the first and second profile walls along the extension direction E, and as a result, the single fastening element extends along said extension direction E around substantially the entire frame. In the present example, the fastening element 42' is dimensioned such, that a gap 417' is formed between the profile base 43' and the lower side 418' of the fastening element 42' and that the upper side 419' of the fastening element 42' is essentially flush with the free end 411' of the second profile wall 45' when the fastening element 42' is inserted in the seat 41' of the frame 1'. However, it is likewise conceivable to dimension the fastening element 42' such, that its upper side 419' projects beyond the free end 411' of the second profile wall 45' when the fastening element 42' is inserted in the seat 41' of the frame 1'. Such a design would facilitate the removal of the fastening element 42' being inserted in the seat 41', since the projecting upper side 419' could be grasped by a tool such as pliers. In addition, the free end region 48' of the first profile wall 44' has a retaining structure 416' in the form of a lug extending inwards in the direction of the seat 41', wherein said retaining structure 416', when the end portion 101' of the shell 100' is received in the seat 41', presses against the surface 103' of the shell 100' facing said retaining structure 416' such that an additional fastening of the end portion 101' being received in the seat 41' is effected.

[0041] In the region of the seat 41', the first and second profile walls 44', 45' extend essentially parallel to one another, wherein the second profile wall 45' has a length LP2 which is greater than the length LP1 of the first profile wall 44' along the transverse direction TE. In other words, the shell profile 4 has essentially the shape of a "U", wherein the first and second profile walls 44', 45' correspond to the side legs of said "U", and wherein the side leg associated with the second profile wall 45' is longer than the side leg associated with the first profile wall 44'. Moreover, the region of the second profile wall 45' that is extended with respect to the first profile wall 44' is arranged offset with respect to the remaining part of said second profile wall 45'. By means of said offset arrangement as well as the retaining structure 414' in the form of the lug provided at the free end 411' of the second profile wall 45' a groove 420' is formed, within which groove 420' the retaining structure 413' of the fastening element 42' can be received. The shell 100' in turn has a curvature 104' dividing the shell 100' into the end portion 101' and a main portion 105', whereby the main portion 105' is arranged offset with respect to the end portion 101', and wherein the length LP2 of the second profile wall 45' essentially equals the overall length of the end portion 101' and the curvature 104' in the transverse direction TE. When the fastening element 42' is inserted in the seat 41' of the frame 1, the second retaining structure 415' of the fastening element 42' presses against the first surface 102' of the shell 100' in the region of the curvature 104'. The curvature 104', in particular its inclination and its longitudinal extension, is selected in this case such, that the main portion 105' is laterally offset with respect to the end portion 101' of the shell 100' and essentially flush with the first profile wall 44'. In other words, the main portion 105' of the shell 100' and the first profile wall 44' essentially extend in a common plane.

[0042] It should be noted that the frame construction as described above is not restricted to the suitcase shown in the present figures. Instead, it is conceivable to provide such a frame construction to other types of suitcases, e.g. suitcases without wheels, and in particular to any type of luggage comprising two shells to be interconnected.

LIST OF REFERENCE SIGNS

40	1000	suitcase	32, 32'	outer surface
	100, 100'	suitcase shell		
	101, 101'	end portion	4, 4'	shell profile
	102, 102'	first surface	41, 41'	seat
45	103, 103'	second surface	42	fastening element
	104, 104'	curvature	43, 43'	profile base
	105, 105'	main portion	44, 44'	first profile wall
			45, 45'	second profile wall
	10	frame construction	46, 46'	first inner surface
50	11	hinge	47, 47'	second inner surface
	12	wheel assembly	48, 48'	free end region of first profile wall
	121	wheel		
	13	pull-out handle	49, 49'	free end region of second profile wall
	14	handgrip	410, 410'	free end of first profile wall
55	1, 1'	frame	411, 411'	free end of second profile wall
	2, 2'	U-shaped profile		
	21, 21'	profile base	412, 412'	space

(continued)

	22, 22'	first profile wall	413, 413'	retaining structure of fastening element
	23, 23'	second profile wall		
5	24, 24'	first inner surface	414, 414'	retaining structure of second profile wall
	25, 25'	second inner surface		
	26, 26'	first groove	415, 415'	retaining structure of fastening element
	27, 27'	second groove		
10	28, 28'	seat	416, 416'	retaining structure of first profile wall
	29, 29'	free edge region		
	210, 210'	free edge region	417, 417'	gap
	211, 211'	gap	418, 418'	lower side of fastening element
	3, 3'	connection profile	419, 419'	upper side of fastening element
15	31, 31'	inner surface		
	420, 420'	groove	L	longitudinal direction
			T	transverse direction
	5	strip	D	depth
20	51	lateral edge region	HS	height of strip
	52	lateral edge region	WS	width of strip
			WU, WU'	clear width of seat
	6	liner	DG, DG'	distance between grooves
	61	fold	E	extension direction
25	62	elongate member	TE	transverse direction
	63	first liner piece	LP1	length of first profile wall
	64	second liner piece	LP2	length of second profile wall

30 **Claims**

- 35 **1.** A frame construction (10) for a piece of luggage, preferably for a suitcase shell (100), comprising a frame (1), said frame (1) comprising a profile (2) with a profile base (21) and a first profile wall (22) and a second profile wall (23), a seat (28) for a liner (6) being delimited by opposing first and second inner surfaces (24, 25) of said first and second profile walls (22, 23), respectively, that face one another, **characterized in that** said first inner surface (24) is provided with a first groove (26) and said second inner surface (25) is provided with a second groove (27), said first and second grooves (26, 27) facing one another and extending in a longitudinal direction (L) of said profile (2); and **that** said frame construction (10) further comprises a strip (5) for being inserted into said profile (2) with opposing lateral edge regions (51,52) in said first and second grooves (26, 27) for fastening said liner (6) being inserted into said seat (28).
- 40 **2.** The frame construction (10) according to claim 1, wherein said first and second grooves (26, 27) are arranged to be on the same height with respect to a depth (D) of the profile (2).
- 45 **3.** The frame construction (10) according to any one of the preceding claims, wherein said strip (5) extends, when inserted into said first and second grooves (26, 27), along said longitudinal direction (L) of said frame (1) around substantially the entire frame (1).
- 50 **4.** The frame construction (10) according to any one of the preceding claims, wherein said first and second profile walls (22, 23) extend parallel to one another or diverge from one another towards their free edge regions (29, 210) or converge towards one another in the direction of the profile base (21).
- 55 **5.** The frame construction (10) according to any one of the preceding claims, wherein said first and second profile walls (22, 23) are, in a cross-sectional view of the profile (2), straight, and/or wherein the first and second profile walls (22, 23) have the same heights.
- 6.** The frame construction (10) according to any one of the preceding claims, wherein said first and second grooves

(26, 27) and said strip (5) are dimensioned such that, when said strip (5) is inserted into said first and second grooves (26, 27), a gap (211) is formed between the strip (5) and the first and second inner surfaces (24, 25), the gap (211) being provided for guiding said liner (6) from within the profile (2) around said strip (5) to an outside of the profile (2).

- 5 7. The frame construction (10) according to any one of the preceding claims, wherein said frame (1) is a single piece element, preferably made from aluminium or plastics.
- 10 8. The frame construction (10) according to any one of the preceding claims, wherein said frame construction (10) is configured such that, when said liner (6) is inserted into said seat (28), said strip (5) may be clicked or snapped into said profile (2) from a direction (T) transverse to said longitudinal direction (L) of said profile (2) whilst said liner (6) is pressed into said first and second grooves (26, 27).
- 15 9. The frame construction (10) according to any one of the preceding claims, wherein said frame construction (10) is configured such that, when said liner (6) is inserted into said seat (28), said strip (5) may be slid into said profile (2) along said longitudinal direction (L) of said profile (2) whilst said liner (6) is pressed into said first and second grooves (26, 27).
- 20 10. The frame construction (10) according to any one of the preceding claims comprising a further frame (1'), wherein the frame (1) comprises a connection profile (3) and the further frame (1') comprises a further connection profile (3') being designed complementary to the connection profile (3) of the frame (1), the connection profile (3) and the further connection profile (3') being configured to enter into a preferably positive connection with one another.
- 25 11. A liner (6) for use with a frame construction (10) according to any one of the claims 1 to 10, wherein said liner (6) comprises at least one region of increased thickness (61) to be inserted into said seat (28);
 wherein said region of increased thickness preferably corresponds to at least one fold (61);
 wherein one or more elongated members (62) are preferably arranged at or in said fold (61), said elongated members (62) being preferably tubes, wires or strings;
 wherein said elongated members (62) are preferably fixedly fastened to said liner (6), preferably by means of stitching, weaving, and/or adhesive; and/or
 30 wherein said liner (6) is a single-piece element or is made from different layer materials; and/or
 wherein said elongated member (62) is dimensioned such that, when inserted, together with said liner (6), into said seat (28), the elongated member (62) exerts a self-locking force onto the profile (2) so as to remain in place while said strip (5) is inserted.
- 35 12. A piece of luggage (1000), preferably a suitcase, or a suitcase shell (100, 100'), with a frame construction (10) according to any one of the claims 1 to 10 comprising said liner (6), wherein said liner (6) is extending into said seat (28, 28') and said strip (5) is secured in said first and second grooves (26, 27, 26', 27') whilst the strip (5) presses said liner (6) into said first and/or second groove(s) (26, 27, 26', 27').
- 40 13. The piece of luggage (1000) or the suitcase shell (100, 100') according to claim 12, wherein said liner (6) comprises at least one fold (61), said fold (61) being inserted into said seat (28, 28').
- 45 14. The piece of luggage (1000) or the suitcase shell (100, 100') according to claim 12 or 13, wherein one or more elongated members (62) are inserted into said at least one fold (61), said elongated members (62) being preferably wires or strings;
 wherein said elongated members (62) are preferably fixedly fastened to said liner (6), preferably by means of stitching, weaving, and/or adhesive.
- 50 15. Method for fastening a liner (6) into a frame construction (10) of a piece of luggage, preferably a suitcase shell (100, 100'), comprising the steps:
- providing a liner (6), preferably according to claim 11, and a piece of luggage (1000) or a suitcase shell (100, 100') with a frame construction (10) according to any one of the claims 1 to 10;
 - inserting said liner (6) into said seat (28, 28') of the frame (1, 1');
 - fastening said liner (6) in said seat (28, 28') by inserting said strip (5) into said first and second grooves (26, 27, 26', 27').
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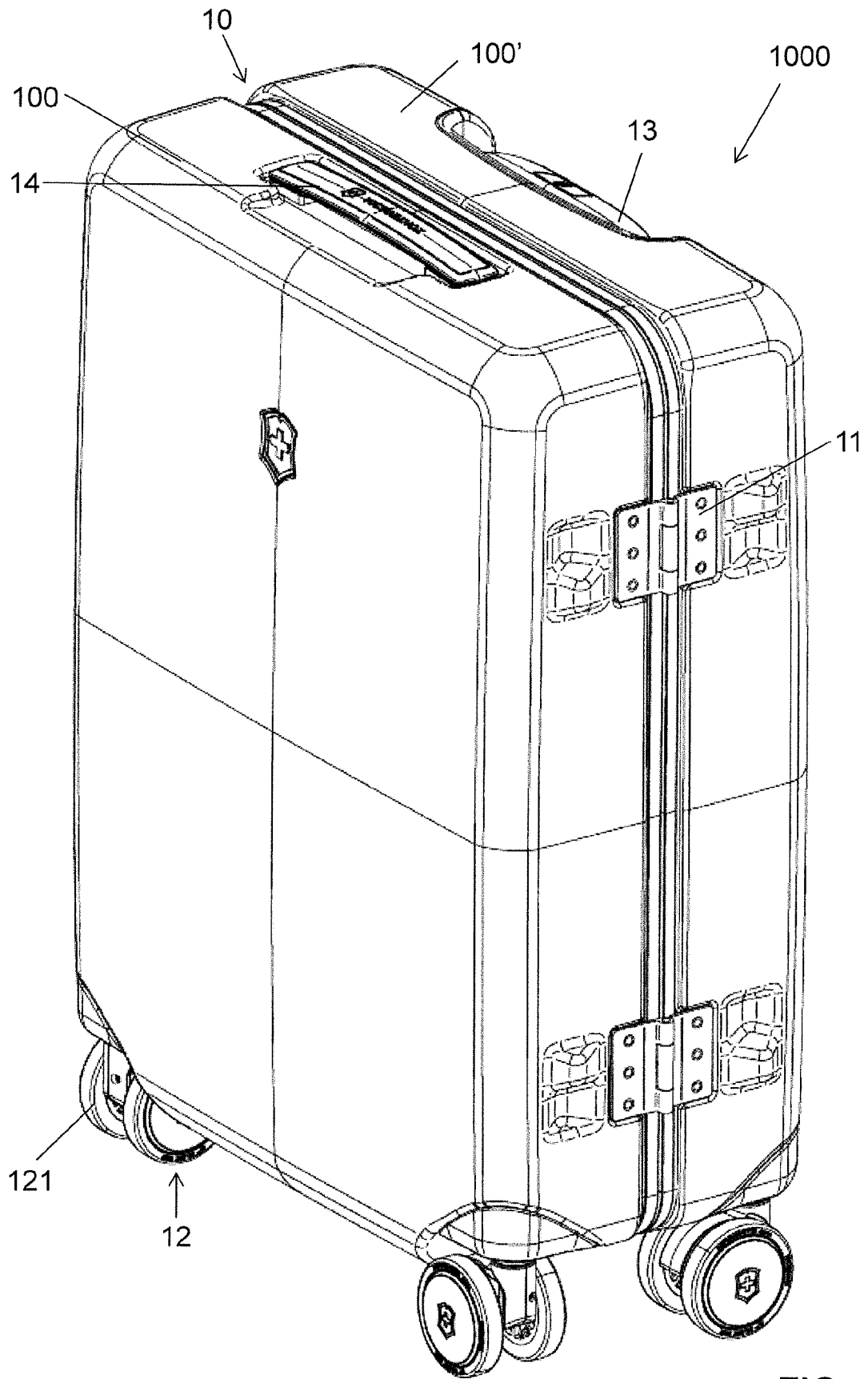


FIG. 1

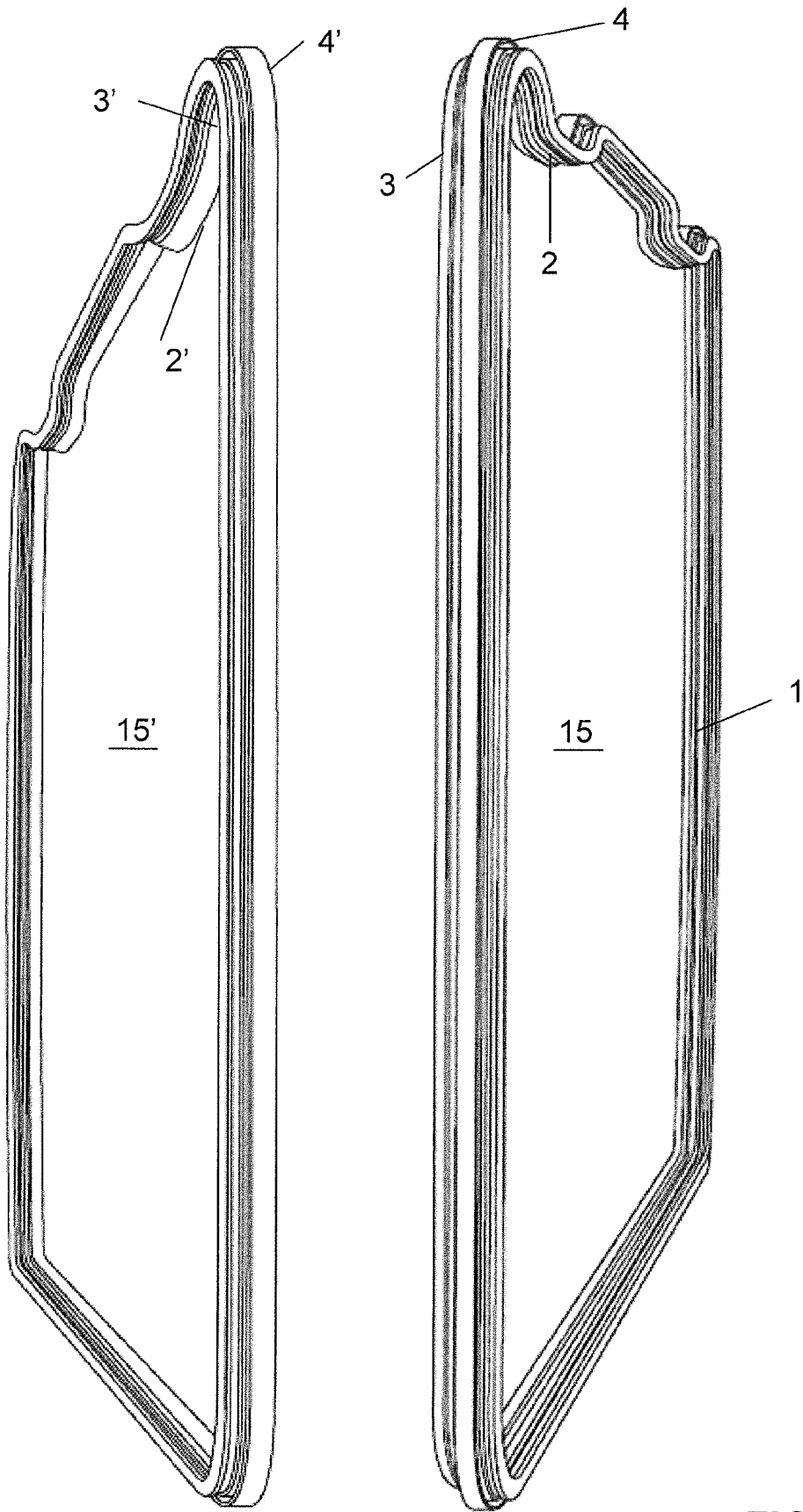


FIG. 2

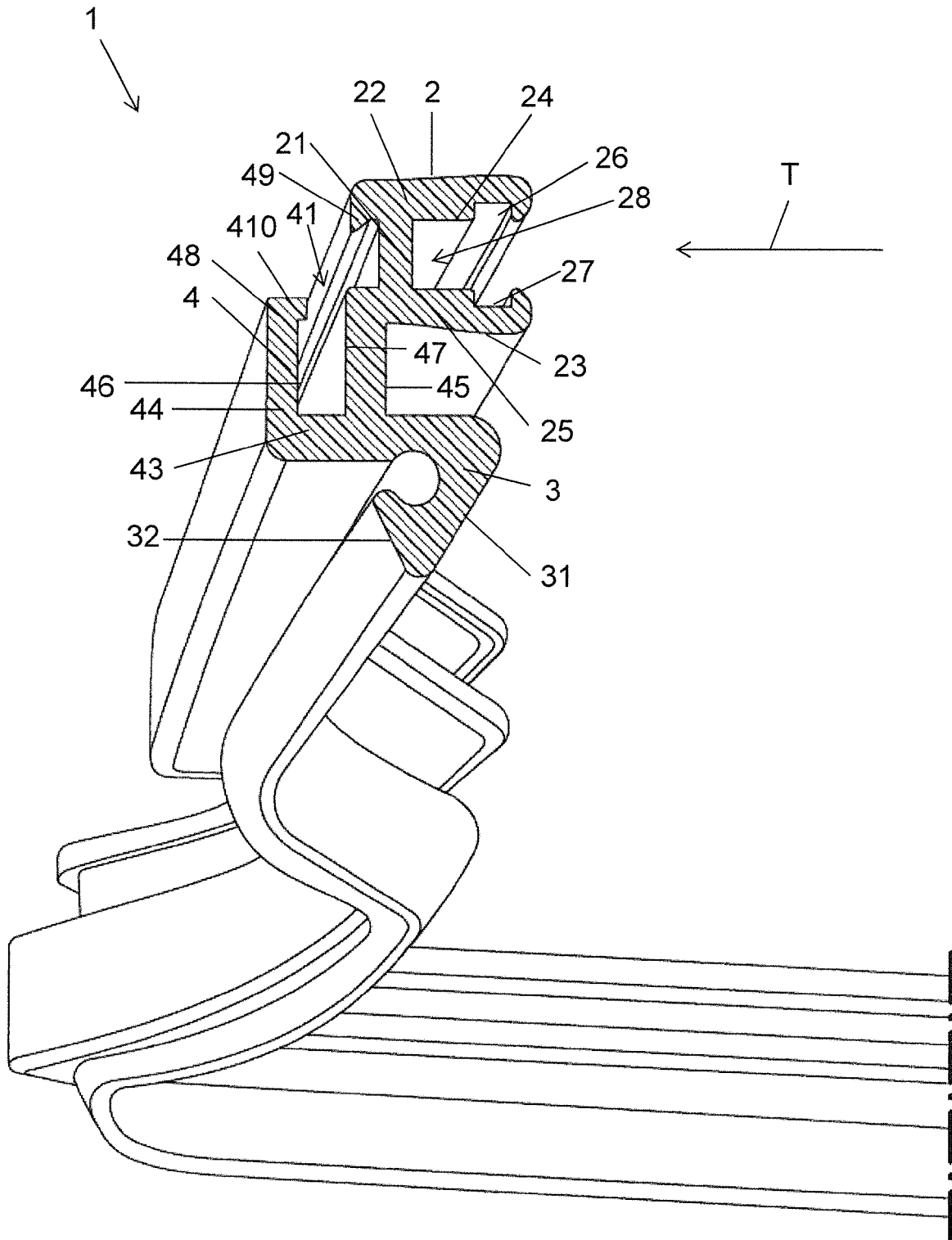


FIG. 3

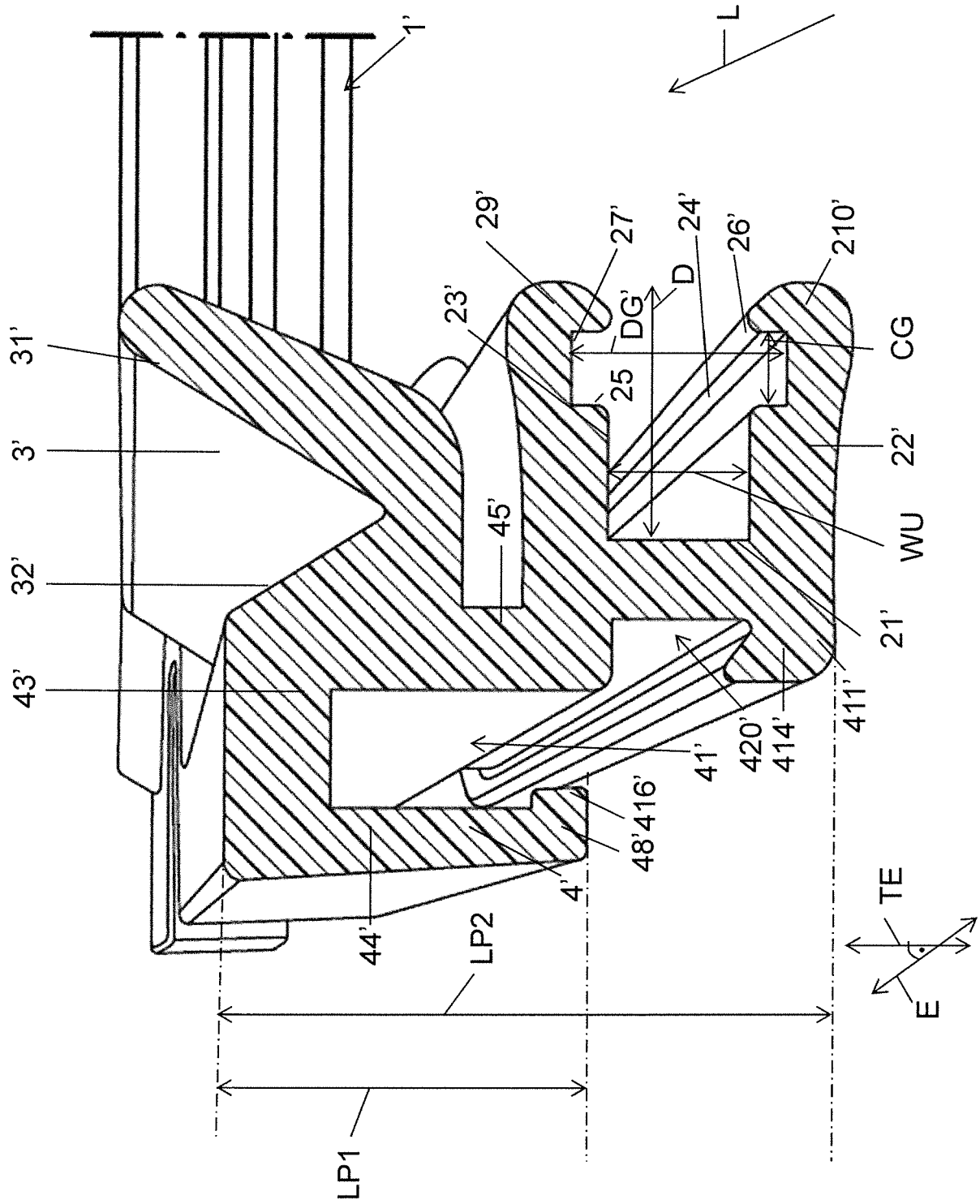


FIG. 4

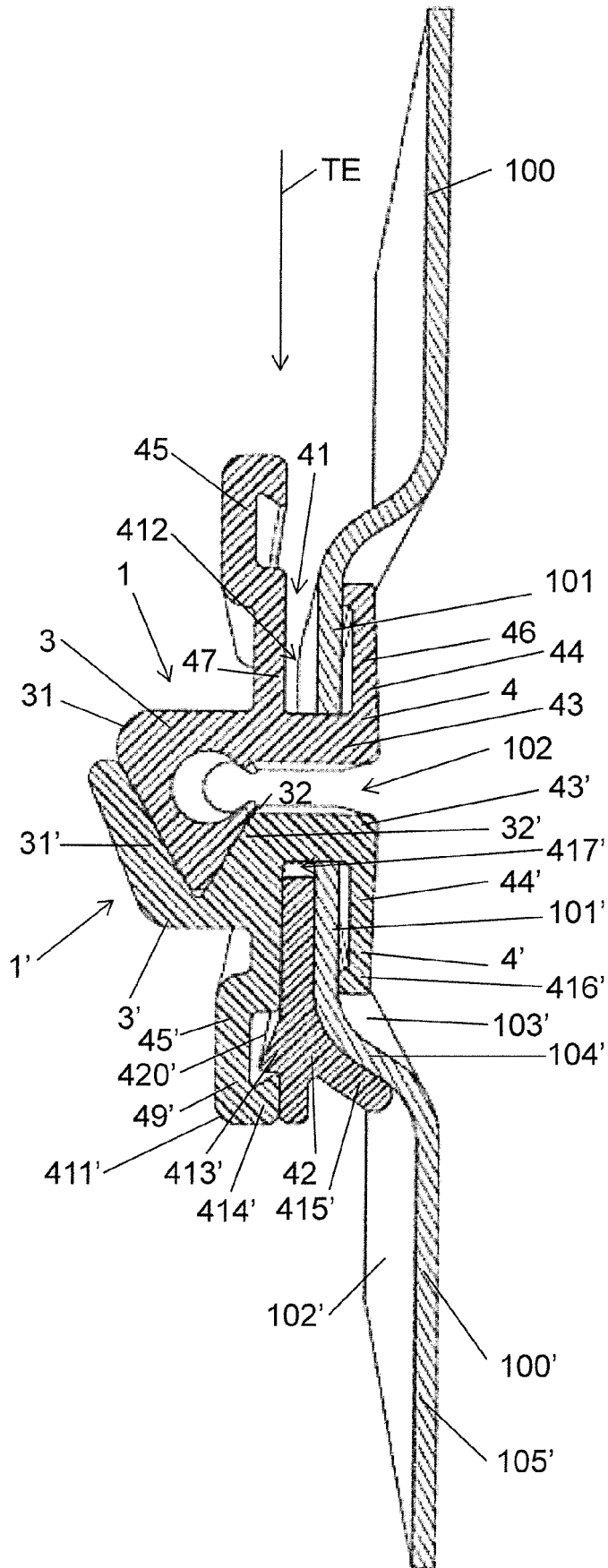


FIG. 5

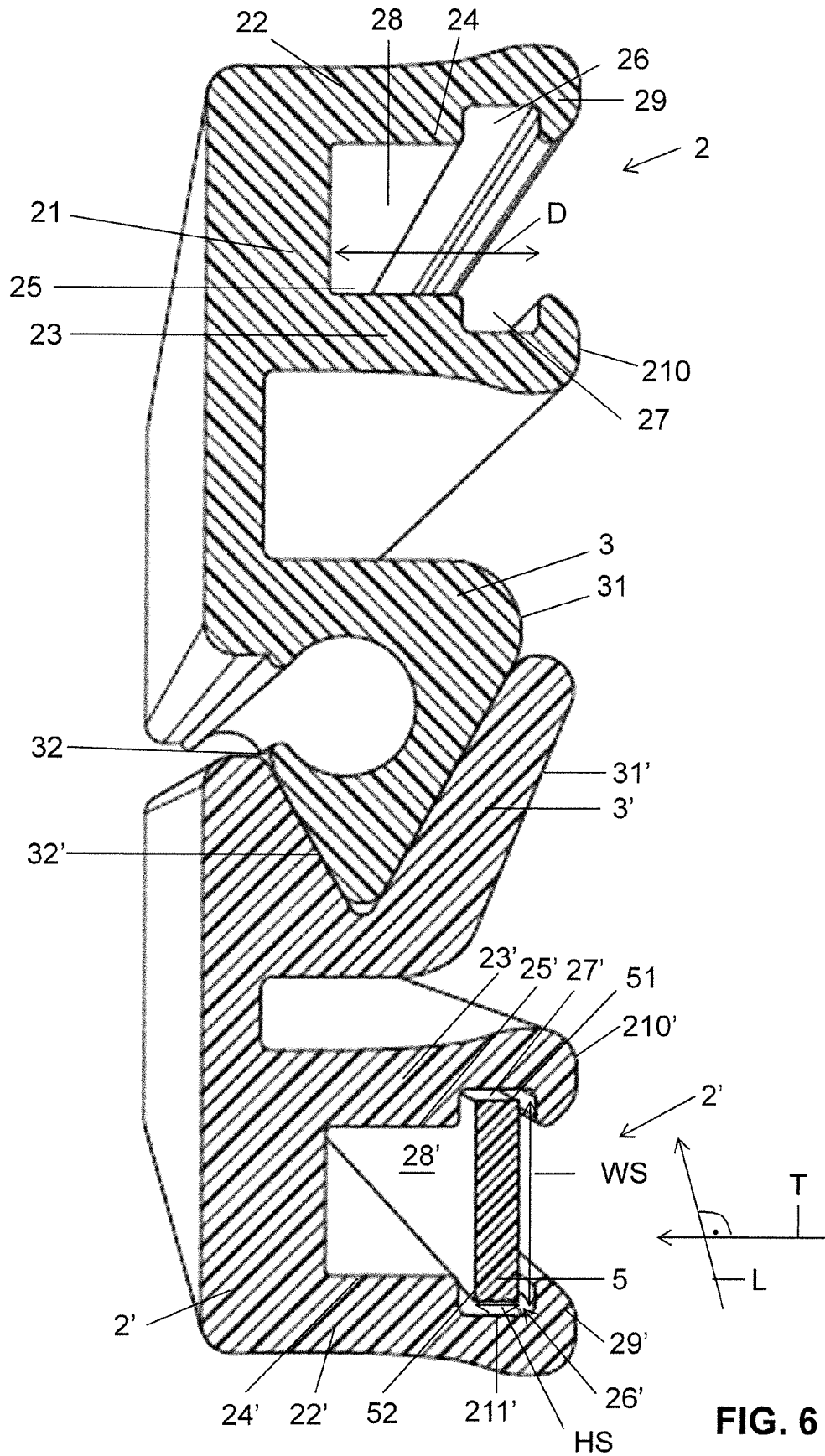


FIG. 6

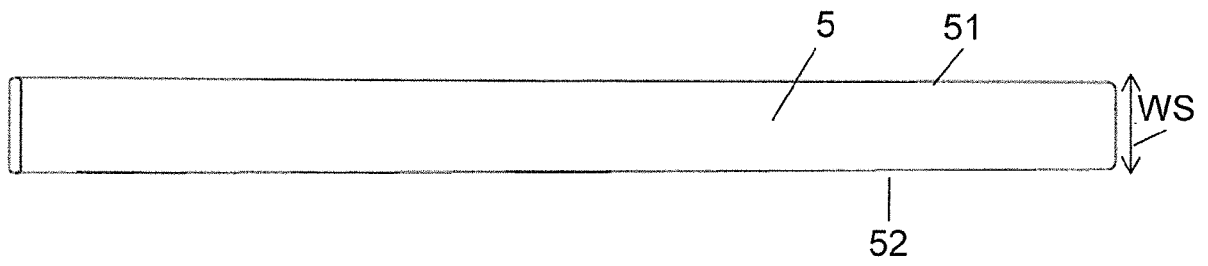


FIG. 7

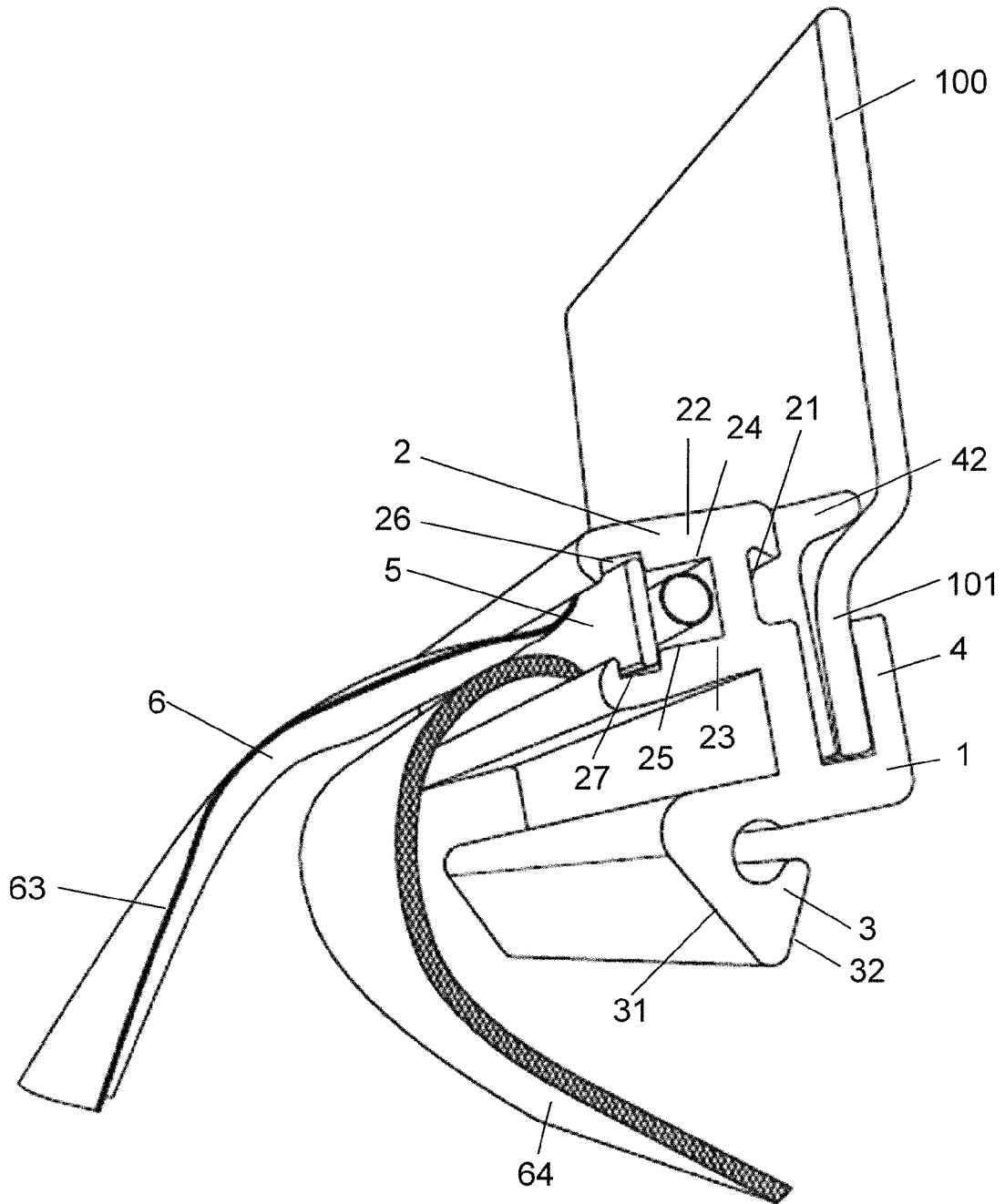


FIG. 8

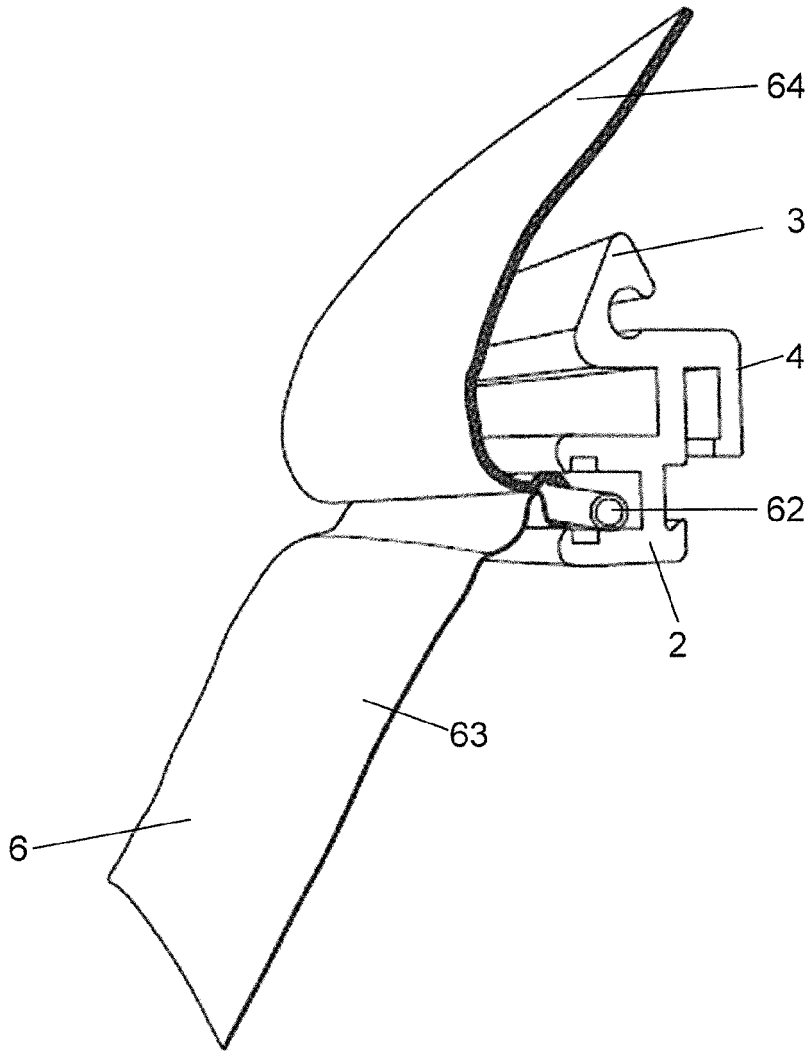


FIG. 9

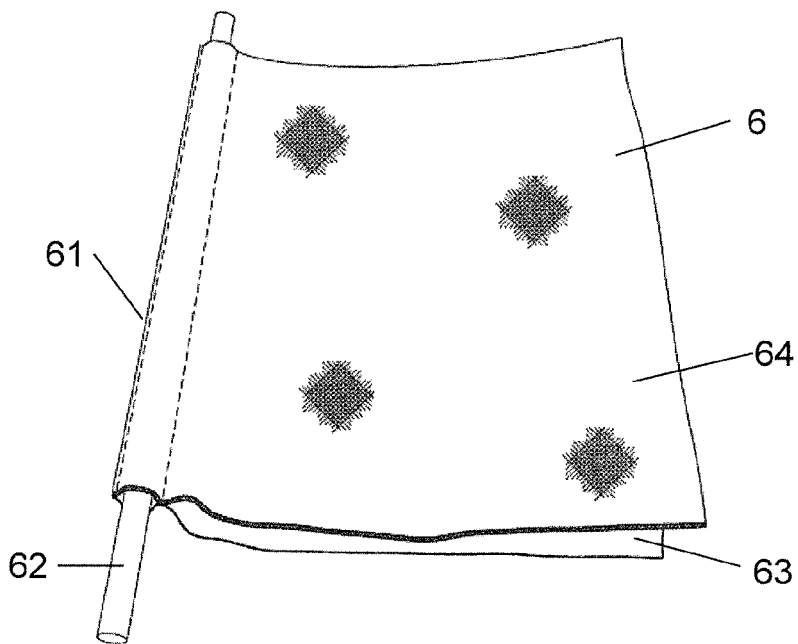


FIG. 10

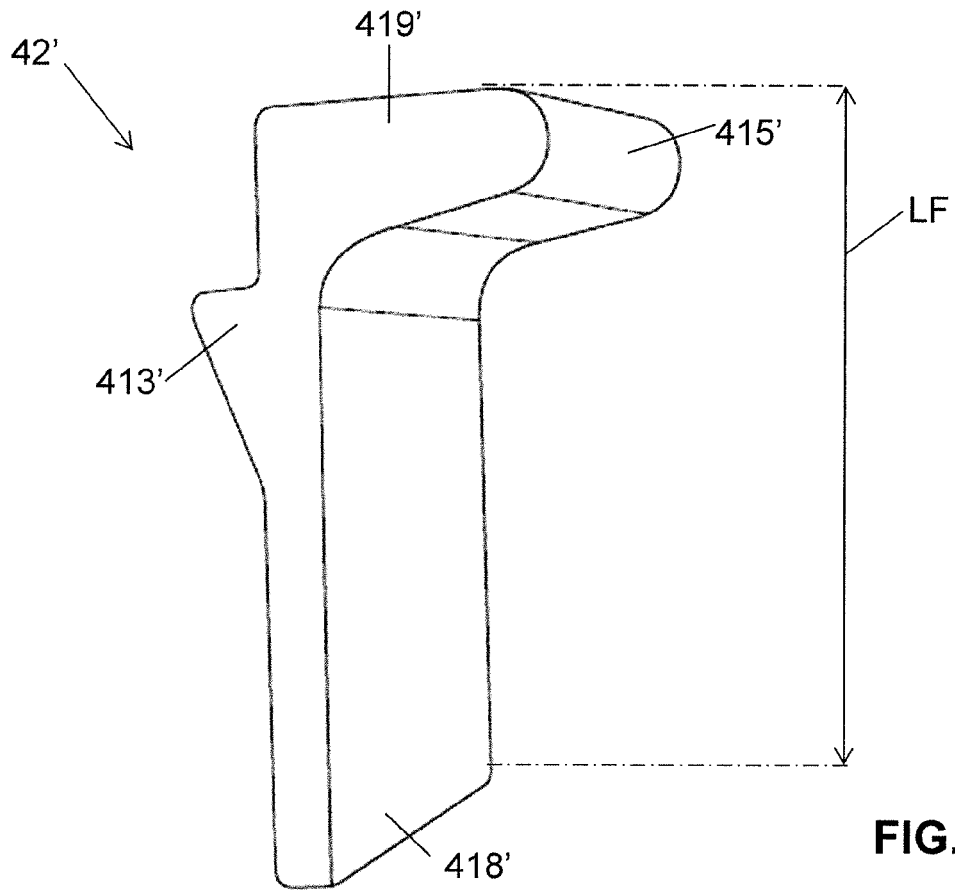


FIG. 11

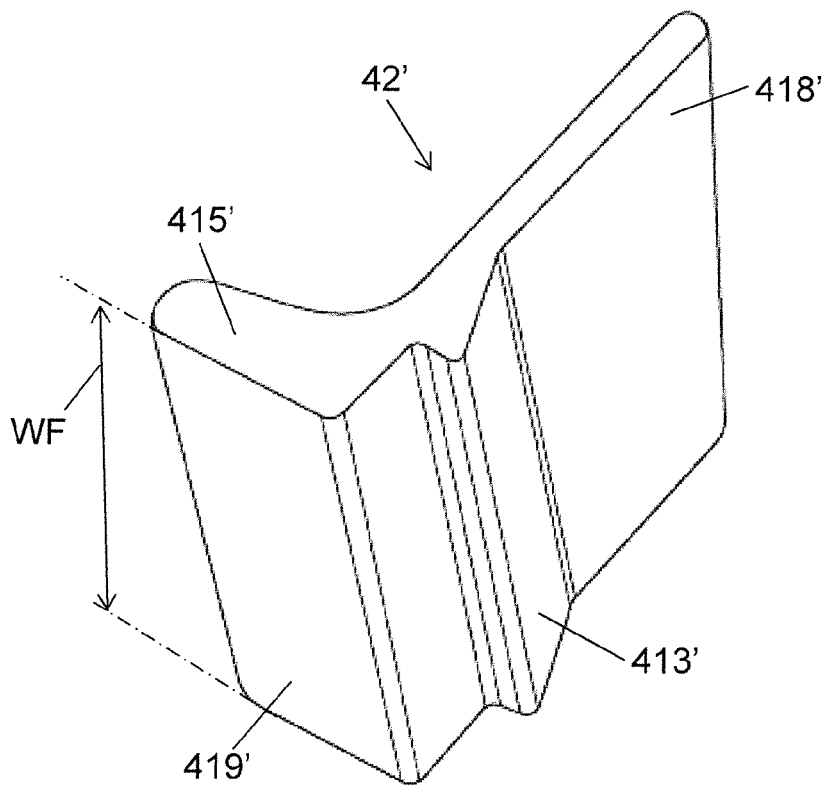


FIG. 12



EUROPEAN SEARCH REPORT

Application Number
EP 18 16 5560

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X	GB 2 121 093 A (BLACK PETER) 14 December 1983 (1983-12-14)	1-9	INV. A45C13/04 A45C13/00 A45C5/03
Y	* the whole document *	10	
A		11-15	
X	WO 2010/038244 A1 (VALIGERIA RONCATO SPA [IT]; RONCATO CRISTIANO [IT]) 8 April 2010 (2010-04-08)	11	
Y	* abstract; figure 2 *	10	
X	DE 24 34 325 A1 (CARASYN PLASTICS CARL RAEUBER) 29 January 1976 (1976-01-29) * figures 1-3 *	1-9	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			A45C
Place of search		Date of completion of the search	Examiner
The Hague		26 September 2018	Nicolás, Carlos
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EP 18 16 5560

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26-09-2018

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			WO 2010038244 A1	08-04-2010

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REFERENCES CITED IN THE DESCRIPTION

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