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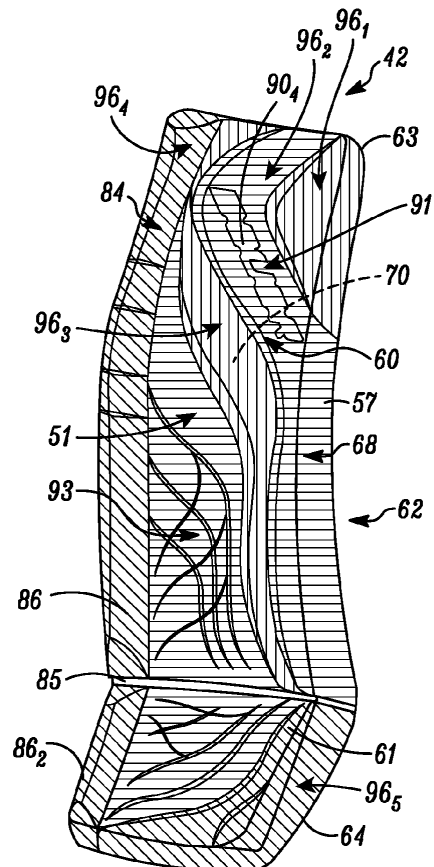
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(54) Leg pads for a hockey goalkeeper

(57) A leg pad (10) for a hockey goalkeeper playing hockey is provided. The leg pad comprises a frontal portion (26), a medial portion (27), and a lateral portion (28) respectively configured to be positioned adjacent to a front, a medial side, and a lateral side of a goalkeeper's leg when the leg pad is worn on the leg. The leg pad comprises a molded outer shell (42) comprising an outer surface (51) of the leg pad, an inner liner (44) for facing the leg, and protective padding (40) disposed between the molded outer shell and the inner liner. The outer shell may comprise molded foam.

**FIG. 13****EP 2 777 779 A1**

Description

FIELD OF THE INVENTION

[0001] The invention relates to leg pads for hockey goalkeepers.

BACKGROUND OF THE INVENTION

[0002] Leg pads are worn by hockey goalkeepers to protect their legs against impacts from pucks, balls, hockey sticks or other objects and/or to protect their legs when moving (e.g., dropping) them onto a playing surface.

[0003] A hockey goalkeeper's leg pad typically comprises protective padding for providing padded protection to the goalkeeper's leg and an outer covering disposed over the protective padding. The outer covering is typically made of one or more panels of synthetic pliable material such as synthetic leather (e.g., polyurethane (PU) leather) or fabric (e.g., nylon fabric, polyester fabric, Cordura™ fabric, etc.) that are cut into a desired configuration so as to cover the protective padding.

[0004] The synthetic leather or fabric used for a leg pad's outer covering may have some drawbacks. For example, in some cases, the synthetic leather or fabric may be limited in its ability to provide protection in and of itself and/or may require additional components to be added to the leg pad, such as fabric overlays for decoration and/or separate panels for attaching straps of the leg pad.

[0005] For these and other reasons, there is a need for improvements in a hockey goalkeeper's leg pads.

SUMMARY OF THE INVENTION

[0006] According to an aspect, the invention provides a leg pad for a hockey goalkeeper. The leg pad is wearable on a leg of the hockey goalkeeper to protect the leg. The leg pad comprises a frontal portion, a medial portion, and a lateral portion respectively configured to be positioned adjacent to a front, a medial side, and a lateral side of the leg when the leg pad is worn on the leg. The leg pad comprises a molded outer shell comprising an outer surface of the leg pad, an inner liner for facing the leg, and protective padding disposed between the molded outer shell and the inner liner.

[0007] According to another aspect, the invention provides a leg pad for a hockey goalkeeper. The leg pad is wearable on a leg of the hockey goalkeeper to protect the leg. The leg pad comprises a frontal portion, a medial portion, and a lateral portion respectively configured to be positioned adjacent to a front, a medial side, and a lateral side of the leg when the leg pad is worn on the leg. The leg pad comprises an outer shell comprising an outer surface of the leg pad. The outer shell comprises molded foam. The leg pad comprises an inner liner for facing the leg and protective padding disposed between the outer shell and the inner liner.

[0008] According to further aspect, the invention pro-

vides a leg pad for a hockey goalkeeper. The leg pad is wearable on a leg of the hockey goalkeeper to protect the leg. The leg pad comprises a frontal portion, a medial portion, and a lateral portion respectively configured to be positioned adjacent to a front, a medial side, and a lateral side of the leg when the leg pad is worn on the leg. The leg pad comprises a molded outer shell comprising an outer surface of the leg pad. The molded outer shell comprises an upper leg portion, a knee portion, and a lower leg portion. The molded outer shell has a molded bent configuration such that the molded outer shell is bent in a longitudinal direction of the leg pad. The leg pad comprises an inner liner for facing the leg and protective padding disposed between the molded outer shell and the inner liner.

[0009] According to another aspect of the invention, there is provided a leg pad for a hockey goalkeeper. The leg pad is wearable on a leg of the hockey goalkeeper to protect the leg. The leg pad comprises a frontal portion, a medial portion, and a lateral portion respectively configured to be positioned adjacent to a front, a medial side, and a lateral side of the leg when the leg pad is worn on the leg. The leg pad comprises an outer shell comprising an outer surface of the leg pad. The outer shell comprises: molded foam and a skin affixed to the molded foam and constituting at least part of the outer surface of the leg pad. The leg pad comprises: an inner liner for facing the leg; and protective padding disposed between the outer shell and the inner liner.

[0010] According to another aspect of the invention, there is provided a leg pad for a hockey goalkeeper. The leg pad is wearable on a leg of the hockey goalkeeper to protect the leg. The leg pad comprises a frontal portion, a medial portion, and a lateral portion respectively configured to be positioned adjacent to a front, a medial side, and a lateral side of the leg when the leg pad is worn on the leg. The leg pad comprises: an outer shell comprising an outer surface of the leg pad; a molded inner liner for facing the leg; and protective padding disposed between the outer shell and the molded inner liner.

[0011] According to another aspect of the invention, there is provided a leg pad for a hockey goalkeeper. The leg pad is wearable on a leg of the hockey goalkeeper to protect the leg. The leg pad comprises a frontal portion, a medial portion, and a lateral portion respectively configured to be positioned adjacent to a front, a medial side, and a lateral side of the leg when the leg pad is worn on the leg. The leg pad comprises: an outer shell comprising an outer surface of the leg pad; a molded calf wing; an inner liner for facing the leg; and protective padding disposed between the outer shell and the inner liner.

[0012] According to another aspect of the invention, there is provided a leg pad for a hockey goalkeeper. The leg pad is wearable on a leg of the hockey goalkeeper to protect the leg. The leg pad comprises a frontal portion, a medial portion, and a lateral portion respectively configured to be positioned adjacent to a front, a medial side, and a lateral side of the leg when the leg pad is worn on

the leg. The leg pad comprises: an outer shell comprising an outer surface of the leg pad; a molded knee wing; an inner liner for facing the leg and protective padding disposed between the outer shell and the inner liner.

[0013] According to another aspect, the invention provides a leg pad for a hockey goalkeeper. The leg pad is wearable on a leg of the hockey goalkeeper to protect the leg. The leg pad comprises a frontal portion, a medial portion, and a lateral portion respectively configured to be positioned adjacent to a front, a medial side, and a lateral side of the leg when the leg pad is worn on the leg. The leg pad comprises: an outer shell comprising an outer surface of the leg pad; an inner liner for facing the leg; and protective padding disposed between the outer shell and the inner liner. The protective padding comprises a plurality of padding materials that are different from one another. The padding materials are disposed relative to one another to control a rebound effect in different areas of the protective padding.

[0014] According to a further aspect, the invention provides a leg pad for a hockey goalkeeper. The leg pad is wearable on a leg of the hockey goalkeeper to protect the leg. The leg pad comprises a frontal portion, a medial portion, and a lateral portion respectively configured to be positioned adjacent to a front, a medial side, and a lateral side of the leg when the leg pad is worn on the leg. The leg pad comprises: an outer shell comprising an outer surface of the leg pad; an inner liner for facing the leg; and protective padding disposed between the outer shell and the inner liner. The protective padding comprises a plurality of padding materials that are different from one another. A first one of the padding materials is disposed in at least one limited area of the protective padding on a second one of the padding materials.

[0015] According to another aspect of the invention, there is provided a leg pad for a hockey goalkeeper. The leg pad is wearable on a leg of the hockey goalkeeper to protect the leg. The leg pad comprises a frontal portion, a medial portion, and a lateral portion respectively configured to be positioned adjacent to a front, a medial side, and a lateral side of the leg when the leg pad is worn on the leg. The leg pad comprises: an outer shell comprising an outer surface of the leg pad; an inner liner for facing the leg; and protective padding disposed between the outer shell and the inner liner. The protective padding comprises: a lower leg padding portion; and a foot padding portion separate from the lower leg padding portion and assembled with the lower leg padding portion during manufacturing of the leg pad.

[0016] According to another aspect of the invention, there is provided a method of customizing a leg pad for a hockey goalkeeper. The leg pad is wearable on a leg of the hockey goalkeeper to protect the leg. The leg pad comprises a frontal portion, a medial portion, and a lateral portion respectively configured to be positioned adjacent to a front, a medial side, and a lateral side of the leg when the leg pad is worn on the leg. The leg pad comprises an outer shell comprising an outer surface of the leg pad.

The outer shell comprises a first material. The leg pad comprises: an inner liner for facing the leg; and protective padding disposed between the outer shell and the inner liner. The method comprises: obtaining a second material different from the first material to create a desired design for the outer surface of the leg pad; and bonding the second material to the first material to implement the desired design for the outer surface of the leg pad.

[0017] These and other aspects of the invention will now become apparent to those of ordinary skill in the art upon review of the following description of embodiments of the invention in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] A detailed description of embodiments of the invention is provided below, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 shows a front view of an example of leg pads for protecting legs of a hockey goalkeeper in accordance with an embodiment of the invention;

Figure 2 shows a front view of the right leg pad;

Figures 3 to 6 show front, side, and back views of the right leg pad with certain details omitted;

Figure 7 shows an exploded view of certain parts of the right leg pad;

Figure 8 shows a molded outer shell of the right leg pad;

Figures 9A to 9D show renderings of at least part of the molded outer shell;

Figure 10 shows molded ornaments of the molded outer shell;

Figure 11 shows protective padding of the right leg pad;

Figure 12 shows a variant of the molded outer shell in another embodiment; and Figure 12 shows a variant in which molded material of the molded outer shell comprises two different constituents in accordance with another embodiment of the invention;

Figures 13 and 14 show a variant in which the molded outer shell comprises a skin affixed to a molded material in accordance with another embodiment of the invention;

Figures 15 and 16 show a variant in which the protective padding comprises separate pads in accordance with another embodiment of the invention;

Figures 17 and 18 show a variant of an interconnection between the molded outer shell and an inner liner of the leg pad in accordance with another embodiment of the invention;

Figure 19 shows a variant in which the inner liner is a molded inner liner in accordance with another embodiment of the invention;

Figure 20 shows a variant in which the leg pad comprises a molded knee wing and a molded calf wing in accordance with another embodiment of the invention; and

Figure 21 and 22 show front and side views of the goalkeeper's right leg.

[0019] The description and drawings are only for the purpose of illustrating certain embodiments of the invention and are an aid for understanding. They are not intended to be a definition of the limits of the invention.

DETAILED DESCRIPTION OF THE EMBODIMENTS OF THE INVENTION

[0020] Figures 1 to 6 show an example of leg pads 10₁, 10₂ wearable by a hockey goalkeeper in accordance with an embodiment of the invention. The leg pads 10₁, 10₂ are worn on the hockey goalkeeper's legs 16₁, 16₂ while playing hockey to protect the legs 16₁, 16₂ against an impact from a puck, ball, hockey stick or other object and/or to protect the legs 16₁, 16₂ when moving (e.g., dropping) them onto a playing surface 12. In this embodiment, a type of hockey played is ice hockey such that the leg pads 10₁, 10₂ are ice hockey goalkeeper leg pads, the hockey goalkeeper is an ice hockey goalkeeper, and the playing surface 12 is an ice playing surface.

[0021] The leg pads 10₁, 10₂ protect various regions of the goalkeeper's legs 16₁, 16₂. With additional reference to Figures 21 and 22, each leg 16_x of the goalkeeper comprises an upper leg 18, a knee 19, a lower leg 20, and a foot 21. The upper leg 18 is above the knee 19, while the lower leg 20 is below the knee 19 and above the foot 21. The leg 16_x of the goalkeeper has a front 22, a back 23, a medial side 24 (sometimes referred to as an "inner side"), and a lateral side 25 (sometimes referred to as an "outer side").

[0022] In this embodiment, each leg pad 10_x comprises an upper leg portion 30, a knee portion 31, a lower leg portion 32, and a foot portion 33 respectively configured to be positioned adjacent to the upper leg 18, the knee 19, the lower leg 20, and the foot 21 of the goalkeeper's leg 16_x when the leg pad 10_x is worn on the leg 16_x. The upper leg portion 30 is above the knee portion 31, while the lower leg portion 32 is below the knee portion 31 and above the foot portion 33. Each of these portions of the leg pad 10_x comprises a frontal part, a medial part, and a lateral part such that the leg pad 10_x comprises a frontal

portion 26, a medial portion 27, and a lateral portion 28 respectively configured to be positioned adjacent to the front 22, the medial side 24, and the lateral side 25 of the goalkeeper's leg 16_x when the leg pad 10_x is worn on the leg 16_x. The frontal portion 26 comprises a front 34 of the leg pad 10_x, the medial portion 27 comprises a medial side 35 of the leg pad 10_x, and the lateral portion 28 comprises a lateral side 36 of the leg pad 10_x. In this embodiment, the knee portion 31 comprises a knee wing 39 and the lower leg portion 32 comprises a calf wing 59.

[0023] The leg pad 10_x can be secured to the goalkeeper's leg 16_x in any suitable way. For example, in this embodiment, the leg pad 10_x comprises straps 50₁-50₅ to secure the leg pad 10_x to the goalkeeper's leg 16_x.

[0024] With additional reference to Figure 7, in this embodiment, the leg pad 10_x comprises an outer shell 42, an inner liner 44, and protective padding 40 disposed between the outer shell 42 and the inner liner 44.

[0025] The outer shell 42 comprises an outer surface 51 of the leg pad 10_x that faces away from the goalkeeper's leg 16_x. With additional reference to Figures 8 and 9A to 9D, in this embodiment, the outer shell 42 comprises an upper leg portion 52, a knee portion 53, a lower leg portion 54, and a foot portion 55 which constitute respective parts of the upper leg portion 30, the knee portion 31, the lower leg portion 32, and the foot portion 33 of the leg pad 10_x. Each of these portions of the outer shell 42 comprises a frontal part, a medial part, and a lateral part such that the outer shell 42 comprises a frontal portion 56, a medial portion 57, and a lateral portion 58 which constitute respective parts of the frontal portion 26, the medial portion 27, and the lateral portion 28 of the leg pad 10_x.

[0026] In this embodiment, the outer shell 42 is a molded outer shell. That is, the outer shell 42 is formed by a molding process. A shape of the outer shell 42 is thus a molded shape imparted during the molding process. The outer shell 42 comprises molded material 70 that constitutes at least a majority (i.e., a majority or an entirety) of the outer shell 42 and has been formed during the molding process to impart the shape of the outer shell 42. More particularly, in this embodiment, the upper leg portion 52, the knee portion 53, the lower leg portion 54, and the foot portion 55 of the outer shell 42 comprise respective parts of the molded material 70 which have been configured by the molding process. Also, in this example of implementation, the outer shell 42 includes molded features for functional and/or aesthetic purposes, as further discussed later.

[0027] The molded shape of the outer shell 42 may have any suitable configuration. In this embodiment, the outer shell 42 has a molded bent configuration such that it bends in a longitudinal direction of the leg pad 10_x. More particularly, in this embodiment, the outer shell 42 includes a bend 60 in the longitudinal direction of the leg pad 10_x between the upper leg portion 52 and the lower leg portion 54 adjacent to the knee portion 53, and a bend 61 in the longitudinal direction of the leg pad 10_x between

the lower leg portion 53 and the foot portion 55. In this example, the bend 60 is a curved part which defines a curvature of the outer shell 42, while the bend 61 is an angular part which defines an oblique angle. Also, in this embodiment, the molded bent configuration of the outer shell 42 is such that the outer shell 42 bends in a widthwise direction of the leg pad 10_x. More particularly, in this embodiment, the outer shell 42 includes a bend 68 in the widthwise direction of the leg pad 10_x between the frontal portion 56 and the medial portion 57 of the outer shell 42, and a bend 69 in the widthwise direction of the leg pad 10_x between the frontal portion 56 and the lateral portion 58 of the outer shell 42. The molded bent configuration of the outer shell 42 may be arranged in any other suitable way in other embodiments (e.g., include any number of bends, curved or angular, disposed in any suitable manner).

[0028] In addition, in this embodiment, the outer shell 42 comprises a cavity 62 receiving and holding the protective padding 40. The cavity 62 lies opposite the outer surface 51 of the leg pad 10_x such that it faces the goalkeeper's leg 16_x. More particularly, in this embodiment, the medial portion 57 and the lateral portion 58 of the outer shell 42 project rearwardly relative to the frontal portion 56 of the outer shell 42 to define the cavity 62. In this example, the outer shell 42 also comprises a top portion 63 and a bottom portion 64 which project rearwardly relative to the frontal portion 56 to define the cavity 62.

[0029] Once the protective padding 40 is placed in the cavity 62 of the outer shell 42, in this embodiment, the inner liner 44 is placed behind the protective padding 40 and secured into position. To that end, in this embodiment, the outer shell 42 comprises a fastening zone 65 to fasten the outer shell 42 to at least one of the inner liner 44 and the protective padding 40. In this example, the fastening zone 65 is provided to fasten the outer shell 42 to both the inner liner 44 and the padding 40. More particularly, in this embodiment, the fastening zone 65 comprises a fastening lip 66 in at least one, in this case each, of the medial portion 57, the lateral portion 58, the top portion 63, and the bottom portion 64 of the outer shell 42. A fastener 67 interacts with the fastening lip 66 of the outer shell 42 and the inner liner 44 to secure the inner liner 44, the protective padding 40, and the outer shell 42 together. In this example, the fastener 67 is a series of stitches that stitch together the inner liner 44, the protective padding 40, and the outer shell 42. The fastener 67 may be any other suitable fastener in other examples (e.g., an adhesive, a series of staples, etc.). The fastening zone 65 may be implemented in any other suitable way in other embodiments. In addition to being retained between the outer shell 42 and the inner liner 44, in this embodiment, the protective padding 40 is also laced to the inner liner 40 via laces 15₁-15_L.

[0030] In this embodiment, the outer shell 42 has molded functional features which provide certain functions to the leg pad 10_x.

[0031] For example, in this embodiment, the outer shell 42 comprises a plurality of flexion facilitators 81, 80₁-80_F located at predetermined locations which are spaced from one another to facilitate flexing of the outer shell 42 at these predetermined positions when the goalkeeper's leg 16_x moves. The flexion facilitators 81, 80₁-80_F are formed during the molding process of the outer shell 42. More particularly, in this embodiment, the flexion facilitator 81 is located between the lower leg portion 53 and the foot portion 55 of the outer shell 42 to facilitate flexion of the foot portion 55 relative to the lower leg portion 53 when the goalkeeper's foot 21 moves relative to his/her lower leg 20. The flexion facilitator 81 thus provides a hinge between the lower leg portion 53 and the foot portion 55 of the outer shell 42. The flexion facilitators 80₁-80_F are located adjacent to the upper leg portion 52 and the knee portion 53 of the outer shell 42 to facilitate flexion of the upper leg portion 52 and the knee portion 53 relative to the lower leg portion 53 when the goalkeeper's knee 19 bends. In this embodiment, each of the flexion facilitators 80, 80₁-80_F comprises a reduction in thickness of the outer shell 42 at its predetermined position. More particularly, in this embodiment, each of the flexion facilitators 80, 80₁-80_F comprises a recess 82. These localized thickness reductions tend to induce bending of the outer shell 42 at the predetermined positions of the flexion facilitators 80, 80₁-80_F rather than at other positions. The flexion facilitators 80, 80₁-80_F may be implemented in various other ways in other embodiments.

[0032] As another example, in this embodiment, the outer shell 42 comprises a strap attachment 71 for attaching the straps 50₁-50_S to the leg pad 10_x. The strap attachment 71 is formed during the molding process of the outer shell 42. More particularly, in this embodiment, the strap attachment 71 comprises a plurality of strap connectors 72₁-72_C to connect respective ones of the straps 50₁-50_S to the leg pad 10_x. In this example, each strap connector 72_i comprises a strap-receiving opening 73 for receiving a given one of the straps 50₁-50_S. A first subset of the strap connectors 72₁-72_C is disposed in the medial portion 57 of the outer shell 42, while a second subset of the strap connectors 72₁-72_C is disposed in the lateral portion 58 of the outer shell 42, such that respective ones of the strap connectors 72₁-72_C in the medial and lateral portions 57, 58 of the outer shell 42 are generally aligned with one another in the longitudinal direction of the leg pad 10_x to receive corresponding ones of the straps 50₁-50_S. The strap attachment 71 may be implemented in various other ways in other embodiments.

[0033] As yet another example, in this embodiment, the outer shell 42 comprises an edge projection 84 located in an edge region of the outer shell 42 adjacent to the lateral portion 58 of the outer shell 42. The edge projection 84 emulates a so-called "outer roll" of a conventional ice hockey goalkeeper leg pad and may help to prevent a puck from hitting the leg pad 10_x and skipping over the leg pad 10_x into the net. The edge projection 84 is formed during the molding process of the outer shell

42. In this example, the edge projection 84 is elongated in the longitudinal direction of the leg pad 10_x. More particularly, in this example, the edge projection 84 extends longitudinally from the upper leg portion 52 to the foot portion 55 of the outer shell 42. Also, in this example, the edge projection 84 includes a break 85 facilitating movement of a first part 86₁ of the edge projection 84 in the upper and lower leg portions 52, 54 and the knee portion 53 of the outer shell 42 relative to a second part 86₂ of the edge projection 84 in the foot portion 55 of the outer shell 42. The edge projection 84 may be implemented in various other ways in other embodiments.

[0034] As yet another example, in this embodiment, the outer shell 42 comprises a calf wing member 97 constituting at least part of the calf wing 59 of the leg pad 10_x and a knee wing member 98 constituting at least part of the knee wing 39 of the leg pad 10_x. The calf wing member 97 and the knee wing member 98 are formed during the molding process of the outer shell 42. Hinges 75₁, 75₂ are respectively located between the calf wing member 97 and the lower leg portion 54 of the outer shell 42 and between the knee wing member 98 and the knee portion 53 of the outer shell 42. In this example, the hinges 75₁, 75₂ are formed during the molding process of the outer shell 42. More particularly, in this example, each of the hinges 75₁, 75₂ is a reduction in thickness of the outer shell 42 at its location. The calf wing member 97 and the knee wing member 98 may be implemented in various other ways in other embodiments.

[0035] In this embodiment, the outer shell 42 comprises a plurality of molded ornaments 90₁-90₀ to enhance an appearance of the leg pad 10_x. The molded ornaments 90₁-90₀ are molded relief elements that define a molded relief of the outer shell 42 which is formed during the molding process of the outer shell 42. With additional reference to Figure 10, each of the molded ornaments 90₁-90₀ includes a recess or projection relative to a base area 92 of the outer shell 42. For instance, in this example, the molded ornaments 90_i, 90_j, 90_k are projections, while the molded ornament 90_m is a recess. As they are formed during the molding process, the molded ornaments 90₁-90₀ allow the leg pad 10_x to have an aesthetic design without requiring fabric overlays as is conventionally done in ice hockey goalkeeper leg pads.

[0036] More particularly, in this embodiment, various ones of the molded ornaments 90₁-90₀ define a molded decorative pattern 93 of the outer shell 42. In this example, some of those molded ornaments 90₁-90₀ defining the molded decorative pattern 93 are elongated projections (e.g., ribs) or recesses. In this case, some of those molded ornaments 90₁-90₀ defining the molded decorative pattern 93 are curved and intersect other ones of these molded ornaments. The molded decorative pattern 93 may have any other suitable design in other embodiments.

[0037] Also, in this embodiment, certain ones of the molded ornaments 90₁-90₀ graphically convey information to an observer of the leg pad 10_x. For example, in

this embodiment, each of the molded ornaments 90₄, 90₅ conveys a word (i.e., a combination of characters), in this case "BAUER", which is indicative of a brand of the leg pad 10_x. The molded ornaments 90₁-90₀ may graphically convey any other suitable information (e.g., a model name, a logo, indicia, a serial number, etc.) in other embodiments.

[0038] In addition, in this embodiment, a plurality of decorative layers 95₁-95₀ may be received by given ones of the molded ornaments 90₁-90₀. Each of the decorative layers 95₁-95₀ may comprise a decal, a sticker, paint, or any other decorative element that can be applied to the molded material 70 of the outer shell 42. For example, in this embodiment, the molded ornaments 90₄, 90₅ include recesses which receive the decorative layers 95₁, 95₂ constituting colored words. The decorative layers 95₁-95₃ may be implemented in any other suitable manner in other embodiments.

[0039] In this embodiment, the molded material 70 of the outer shell 42 comprises molded foam. This provides shock absorbability to the outer shell 42 which may help in protecting the goalkeeper's leg 16_x. More particularly, in this embodiment, the molded foam 70 is ethylene vinyl acetate (EVA) foam. Any other suitable foam may be used in other embodiments (e.g., polyethylene foam (e.g., low-density polyethylene foam), polyurethane foam, polypropylene foam, etc.).

[0040] In some examples of implementation, the molded foam of the molded material 70 may include a single type of foam. In other examples of implementation, the molded foam of the molded material 70 may include two or more different types of foam, such as foams having different densities and/or different material compositions (e.g., an outer layer of foam that is denser than an inner layer of foam; a layer of EVA foam and another layer of polyurethane foam; etc.).

[0041] The molded material 70 may comprise any suitable material other than foam in other embodiments (e.g., polymeric material such as thermoplastic polyurethane or any other elastomeric material, a gel, etc.). For example, in some embodiments, as shown in Figure 12, the molded foam of the molded material 70 be a foam layer 83 and the molded material 70 may comprise a non-foam layer 88 over the foam layer 83. For instance, in some examples of implementation, the non-foam layer 88 may be thinner than the foam layer 83 and/or may have a greater resistance to wear and/or a greater resistance to rupture (i.e., to cutting or tearing) than the foam layer 83. For example, in some cases, the non-foam layer 88 may be a polyurethane layer or a layer of any other non-foam polymeric material. In this example of implementation, the non-foam layer 88 forms a skin disposed on the foam layer 83 and constituting at least part of the outer surface 51 of the leg pad 10_x. For instance, the skin 88 may constitute at least a majority (i.e., a majority or an entirety) of the outer surface 51 of the leg pad 10_x. In this example of implementation, the non-foam layer 88 forms a skin disposed on the foam layer 83 and constituting at least

part of the outer surface 51 of the leg pad 10_x. For instance, the skin 88 may constitute at least a majority (i.e., a majority or an entirety) of the outer surface 51 of the leg pad 10_x.

[0042] A thickness T of the molded material 70 of the outer shell 42 may have any suitable value. For example, in some embodiments, the thickness T of the molded material 70 may be at least 4 mm, in some cases at least 5 mm, in some cases at least 6 mm, in some cases at least 7 mm, in some cases at least 8 mm, and in some cases even more (e.g., 10 mm or more). The thickness T of the molded material 70 may have any other suitable value in other embodiments. In some examples, the thickness T of the molded material 70 may be substantially constant over the outer shell 42. In other examples, the thickness T of the molded material 70 may vary such that it has different values in different regions of the outer shell 42.

[0043] The molding process of the outer shell 42 may employ any suitable molding method. In this embodiment, the molding process is compression molding such that the outer shell 42 is a compression molded outer shell. An amount of material which is to become the molded material 70 of the outer shell 42 is introduced into a mold that is initially open and then shaped into the outer shell 42 by heat and by pressure created as the mold is closed and the material is forced into contact with all mold areas. A deflashing (i.e., flash removal) operation may be performed to remove any excess material from the molding operation. The outer shell 42 may be molded using any other suitable molding method in other embodiments (e.g., injection molding, thermoforming, etc.).

[0044] The outer shell 42 may be implemented in various other ways in other embodiments. For example, in other embodiments, the outer shell 42 may not comprise any molded strap attachments such as the strap attachment 71 for attaching the straps 50₁-50₅ to the leg pad 10_x, but may rather be fastened (e.g., sewn) to a separate strap attachment (e.g., a fabric panel) to which the straps 50₁-50₅ are attached. As another example, in other embodiments, flexion facilitators such as the flexion facilitators 80, 80₁-80_F may be formed after molding of the outer shell 42 (e.g., by being cut after molding). As yet another example, in some embodiments, such as in some examples mentioned above, the molded material 70 of the outer shell 42 may include two or more different constituents (e.g., two or more layers of different foams, or a foam layer and a non-foam layer). As yet another example, in some embodiments, a layer of paint may be applied to at least part of the outer shell 42 for decoration.

[0045] The protective padding 40 provides padded protection to the goalkeeper's leg 16_x. With additional reference to Figure 11, in this embodiment, the protective padding 40 comprises an upper leg padding portion 48₁, a knee padding portion 48₂, a lower leg padding portion 48₃ and a foot padding portion 48₄ constituting respective parts of the upper leg portion 30, the knee portion 31, the lower leg portion 32, and the foot portion 33 of the leg

pad 10_x. In this example, respective ones of the padding portions 48₁-48_P are part of a common continuous pad that extends from the upper leg portion 30 to the foot portion 33 of the leg pad 10_x.

[0046] In this embodiment, the protective padding 40 comprises a plurality of padding materials 89₁-89₃ that are different from one another. In this example, the padding materials 89₁-89₃ are different types foam, such as polyurethane foam, ethylene vinyl acetate (EVA) foam, polypropylene (PP) foam, polyethylene (PE) foam, vinyl nitrile (VN) foam, or any other suitable foam. More particularly, in this example, the padding material 89₁ is a type of polyethylene foam (e.g., high-density polyethylene foam), the padding material 89₂ is a different type of polyethylene foam (e.g., low-density polyethylene foam), and the padding material 89₃ is a polyurethane foam (e.g., Poron XRD™). In other embodiments, one or more of the padding materials 89₁-89₃ may be material other than foam, such as a gel or any other suitable shock-absorbing material.

[0047] More particularly, in this embodiment, the padding material 89₁ forms an outer layer 38 of the protective padding 40 and is stiffer (e.g., denser) than the padding material 89₂ which forms an inner layer 41 of the protective padding 40. This may impart rigidity to the protective padding 40 or enhance an impact resistance and/or a shock absorbance of the protective padding 40.

[0048] Also, in this embodiment, the padding material 89₃ is disposed in specific limited areas 37₁-37₃ of the protective padding 40 relative to the padding material 89₁ to control a rebound effect at these areas when a puck hits these areas. For example, the goalkeeper may prefer a long rebound or a short rebound when a puck hits in a particular area and the padding material 89₃ may be distributed to customize a puck rebound profile of the leg pad 10_x according to the goalkeeper's preference. For a given puck impact speed, the rebound effect is thus different in the areas 37₁-37₃ of the protective padding 40 than in other areas 46₁-46₄ of the protective padding 40 outside these areas 37₁-37₃.

[0049] More particularly, in this embodiment, the padding material 89₁ and the padding material 89₃ constitute respective parts of an outer surface 45 of the protective padding 40 that faces away from the goalkeeper's leg. In this example, the areas 37₁-37₃, which are spaced from one another, are respectively located in the upper leg padding portion 48₁, the lower leg padding portion 48₃ and the foot padding portion 48₄ of the protective padding 40. Each of the areas 37₁-37₃ is limited in that it occupies less than a width of the protective padding 40 and less than a length of the protective padding 40. In this case, each of the areas 37₁-37₃ occupies less than 90%, here less than 80%, of the width of the protective padding 40 and less than half, here less than one-third, of the length of the protective padding 40. Also, in this example, each of the areas 37₁-37₃ has a tapered configuration. More particularly, in this example, each of the areas 37₁-37₃ tapers in the widthwise direction of the leg

pad 10_x.

[0050] A shape of the protective padding 40 generally conforms to the outer shell 42. In this embodiment, the protective padding 40 has a bent configuration such that it bends in a longitudinal direction of the leg pad 10_x to generally conform to the molded bent configuration of the outer shell 42. More particularly, in this embodiment, the protective padding includes a bend 29 in the longitudinal direction of the leg pad 10_x between the upper leg padding portion 48₁ and the lower leg padding portion 48₃ and a bend 43 in the longitudinal direction of the leg pad 10_x between the lower leg padding portion 48₃ and the foot padding portion 48₄. In this example, the bend 29 is a curved part which defines a curvature of the protective padding 40, while the bend 43 is an angular part which defines an oblique angle. The bent configuration of the protective padding 40 may be arranged in any other suitable way in other embodiments (e.g., include any number of bends, curved or angular, disposed in any suitable manner).

[0051] The protective padding 40 may be manufactured in any suitable way. In this embodiment, the outer layer 38 of the protective padding 40, which is made of the padding material 89₁, is molded or machined, while the inner layer 41 of the protective padding 40, which is made of the padding material 89₂, is machined. Also, in this embodiment, the padding materials 89₁-89₃ are adhesively bonded. Any suitable adhesive may be used (e.g., Contact Cement™, Spray Glue, etc.). The padding materials 89₁-89₃ may be retained together in any other suitable way in other embodiments (e.g., by being overmolded). The protective padding 40 may be made using any other suitable manufacturing methods in other embodiments.

[0052] The protective padding 40 may be implemented in various other ways in other embodiments. For example, in other embodiments, the padding 40 may be made of a single shock-absorbing material (e.g., a single foam). As another example, in other embodiments, different ones of the padding portions 48₁-48₄ may be part of distinct pads separate from one another. For instance, in some embodiments, with additional reference to Figure 15, the foot padding portion 48₄ may be separate from the lower leg padding portion 48₃. That is, the foot padding portion 48₄ and the lower leg padding portion 48₃ may be distinct pads that are separate from one another and assembled during manufacturing of the leg pad 10_x. For example, each of the foot padding portion 48₄ and the lower leg padding portion 48₃ may be a pad molded, machined, or otherwise formed individually as a distinct piece. In some cases, a link 87 may be affixed to the foot padding portion 48₄ and the lower leg padding portion 48₃ to interconnect the foot padding portion 48₄ and the lower leg padding portion 48₃. For example, the link 84 may comprise a band stitched, adhesively bonded, or otherwise affixed to the foot padding portion 48₄ and the lower leg padding portion 48₃. In other cases, there may be no link between the foot padding portion 48₄ and the

lower leg padding portion 48₃, which may be retained purely by their placement between the outer shell 42 and the inner liner 44.

[0053] The inner liner 44 faces the goalkeeper's leg 16_x and may comprise any suitable material. For example, in this embodiment, the inner liner 44 comprises fabric 76. For instance, in some examples of implementation, the fabric of the inner liner 44 may comprise a woven fabric, a nonwoven fabric, synthetic microfibers, a synthetic woven knit, a polyurethane laminate, a mesh, or any other suitable fabric. The inner liner 44 may be implemented in various other ways in other embodiments.

[0054] The leg pads 10₁, 10₂ may be constructed in various other ways in other embodiments. For example, in other embodiments, the leg pads 10₁, 10₂ may have any other suitable shape and/or be made of any other suitable material.

[0055] As another example, in some embodiments, with additional reference to Figures 13 and 14, the outer shell 42 may comprise a skin 91 bonded to the molded material 70 and constituting at least part of the outer surface 51 of the leg pad 10_x. For instance, the skin 91 may constitute at least a majority (i.e., a majority or an entirety) of the outer surface 51 of the leg pad 10_x. The skin 91 is applied on the molded material 70 after molding of the molded material 70 into the shape of the outer shell 42 and is significantly thinner than the molded material 70.

[0056] The skin 91 may be implemented in any suitable way. In this embodiment, the skin 91 comprises a layer of polymeric material 94 bonded to the molded material 70. In this example of implementation, the polymeric material 94 is polyurethane and is adhesively bonded to the molded material 70. The polymeric material 94 may be any other suitable material in other examples of implementation.

[0057] More particularly, in this embodiment, the skin 91 comprises a plurality of separate pieces 96₁-96_S of the polymeric material 94 that are separately bonded to the molded material 70 using adhesive. For instance, in some cases, each of the separate pieces 96₁-96_S of the polymeric material 94 may be a sheet of the polymeric material 94. Each of the separate pieces 96₁-96_S of the polymeric material 94 may include an adhesive backing that can be adhesively bonded to the molded material 70. Alternatively, an adhesive may be applied between the molded material 70 and a backside of each of the separate pieces 96₁-96_S of the polymeric material 94 when the skin 91 is being provided on the molded material 70. In other examples of implementation, the skin 91 may be chemically bonded to the molded material 70, instead of being adhesively bonded.

[0058] In some embodiments, respective ones of the separate pieces 96₁-96_S of the polymeric material 94 of the skin 91 may be visually different from one another. This may facilitate provision of different designs for the outer surface 51 of the leg pad 10_x. For example, a separate piece 96_i of the polymeric material 94 may have a different shape and/or a different coloring (i.e., a different

color or set of colors) than another separate piece 96_j of the polymeric material 94. Different designs for the outer surface 51 of the leg pad 10_x may thus be achieved by placing different ones of the separate pieces 96₁-96_s of the polymeric material 94 at various locations on the molded material 70.

[0059] For instance, in some embodiments, this may facilitate personalization or customization of the outer shell 42. For example, a desired design for the outer surface of the leg pad 10_x may be determined by the goalkeeper or another person (e.g., an equipment manager, a parent, etc.), and the separate pieces 96₁-96_s of the polymeric material 94 of the skin 91 may be obtained and bonded to the molded material 70 to implement the desired design. For instance, in some cases, the goalkeeper or another person may convey a request for the outer shell 42 to have the desired design to a provider of the outer shell 42 (e.g., a manufacturer of the leg pad 10_x, a distributor of the leg pad 10_x, a retailer where the leg pad 10_x is purchasable, etc.). This request may be conveyed in any suitable manner, including in person, via telephone, or using a computer system (e.g., an online process implemented over the Internet). Upon receiving this request, the provider of the outer shell 42 provides (e.g., makes or orders) the separate pieces 96₁-96_s of the polymeric material 94 and places and affixes (e.g., adhesively bonds) them on the molded material 70 to create the skin 91 such as to implement the desired design. As another example, the goalkeeper or another person may purchase or otherwise obtain a kit including pieces of the polymeric material 94 (e.g., of various shapes and/or coloring) and may proceed to create the separate pieces 96₁-96_s of the polymeric material 94 and place and affix (e.g., adhesively bond) them on the molded material 70 to create to implement a desired design.

[0060] The skin 91 may be implemented in any other suitable way in other embodiments. For example, in some embodiments, the skin 91 may include a layer of paint or another coating applied to at least part of the molded material 70 for decoration or other purposes.

[0061] As another example, in other embodiments, the outer shell 42 and the inner liner 44 may be secured in various other ways. For instance, in some embodiments, with additional reference to Figures 17 and 18, the outer shell 42 may be secured to the inner liner 44 through a binding 47 that extends along at least part of a periphery of the outer shell 42 and at least part of a periphery of the inner liner 44. In this example, the binding 47 extends along a majority, in this case substantially all, of the periphery of the outer shell 42 and the periphery of the inner liner 44. The binding 47 thus extends along the fastening lip 66 of the outer shell 42 in the medial portion 57, the lateral portion 58, the top portion 63, and the bottom portion 64 of the outer shell 42. The fastener 67, in this case stitches, extends through the binding 47 and fastens the outer shell 42 and the inner liner 44 together.

[0062] The binding 47 may be implemented in any suitable way. In this embodiment, the binding 47 is a band

of fabric between which are sandwiched the outer shell 42 and the inner liner 44. In this example, the band of fabric 47 is a braiding. For instance, in some examples of implementation, the band of fabric 47 may comprise a woven fabric, a nonwoven fabric, or any other suitable textile that can include fibers of any suitable material (e.g., polyester, nylon, of any other suitable material). The binding 47 may be configured in various other manners and/or made of any other suitable material in other embodiments (e.g., a band of polyurethane, rubber or another elastomer, spandex, etc.).

[0063] In this embodiment, the outer shell 42 comprises a reinforcement 49 to reinforce its fastening zone 65 where it is fastened to the inner liner 44. More particularly, in this embodiment, the reinforcement 49 is disposed on the outer shell 42 at its fastening zone 65 beneath the binding 47. The reinforcement 49 is affixed to the molded material 70 and/or the skin 91 disposed on the molded material 70, if present, along the fastening zone 65 of the outer shell 42. The fastener 67, in this case stitches, extends through the binding 47 and the reinforcement 49 and fastens the outer shell 42 and the inner liner 44 together.

[0064] The reinforcement 49 may be implemented in any suitable way. In this embodiment, the reinforcement 49 is a reinforcing fabric layer. For example, the reinforcing fabric layer 49 may comprise a woven fabric, a nonwoven fabric, or any other suitable textile that can include fibers of any suitable material (e.g., polyester, nylon, of any other suitable material). The reinforcement 49 may be configured in various other manners and/or made of any other suitable material in other embodiments.

[0065] The reinforcement 49 may be affixed to the molded material 70 and/or the skin 91 disposed on the molded material 70, if present, in any suitable way. In this embodiment, the reinforcement 49 is adhesively bonded to the molded material 70 and/or the skin 91 disposed on the molded material 70, if present.

[0066] As another example, in other embodiments, other components of the leg pad 10_x may be constructed using principles described above in respect of the outer shell 42.

[0067] For instance, in some embodiments, as shown in Figure 19, the inner liner 44 may be a molded inner liner, i.e., may be formed by a molding process, as described above in respect of the outer shell 42. In this embodiment, a shape of the inner liner 44 is a molded shape imparted during the molding process. The inner liner 44 comprises molded material 170 that constitutes at least a majority (i.e., a majority or an entirety) of the inner liner 44 and has been formed during the molding process to impart the shape of the inner liner 44. In this example of implementation, the inner liner 44 has a molded bent configuration such that it bends in the longitudinal direction of the leg pad 10_x. For instance, in this example, the inner liner 44 includes a bend 161 in the longitudinal direction of the leg pad 10_x between its lower leg portion and its foot portion. The molded bent configuration of the

inner liner 44 may also be such that the inner liner 44 bends in the widthwise direction of the leg pad 10_x.

[0068] In embodiments where they are both molded, the outer shell 42 and the inner liner 44 may be joined together at a fastener-less joint, i.e., a joint that is stitch-less (i.e., free of stitches) or otherwise free of any fastener. For example, in some embodiments, the outer shell 42 and the inner liner 44 may be joined at their joint by fusing their molded materials 70, 170 (e.g., using a "heat sealing" or other heat-based fusing process), after the protective padding 40 has been placed between them.

[0069] In some embodiments, as shown in Figure 20, the knee wing 39 and the calf wing 59 of the leg pad 10_x may be a molded knee wing and a molded calf wing, i.e., may be formed by a molding process, as described above in respect of the outer shell 42, separately from a remainder of the outer shell 42 or even without the outer shell 42 being molded at all. In this embodiment, a shape of each of the knee wing 39 and the calf wing 59 is a molded shape imparted during the molding process. The knee wing 39 and the calf wing 59 respectively comprise molded material 270, 370 that constitutes at least a majority (i.e., a majority or an entirety) of the knee wing 39 and the calf wing 59 and has been formed during the molding process to impart the respective shape of the knee wing 39 and the calf wing 59. Notably, the molded material 270, 370 of the knee wing 39 and the calf wing 59 constitutes at least a majority (i.e., a majority or an entirety) of a respective outer surface 13, 17 of each of the knee wing 39 and the calf wing 59. The knee wing 39 and the calf wing 59 may be secured to the remainder of the outer shell 42 via fasteners 74₁-74₄.

[0070] Although in embodiments considered above the leg pads 10₁, 10₂ are designed for playing ice hockey, in other embodiments, leg pads constructed using principles described herein in respect of the leg pads 10₁, 10₂ can be hockey goalkeeper leg pads for playing roller hockey or another type of hockey (e.g., field or street hockey) on a dry playing surface (e.g., a polymeric, concrete, wooden, or turf playing surface or any other dry playing surface on which roller hockey or field or street hockey is played).

[0071] To facilitate the description, any reference numeral designating an element in one figure has been used to designate the same element if used in any other figures. In describing the embodiments, specific terminology has been resorted to for the sake of clarity but the invention is not intended to be limited to the specific terms so selected, and it is understood that each specific term comprises all equivalents.

[0072] Unless otherwise indicated, the drawings are intended to be read together with the specification, and are to be considered a portion of the entire written description of this invention. Unless otherwise indicated, the terms "horizontal", "vertical", "left", "right", "up", "down" and the like, as well as adjectival and adverbial derivatives thereof (e.g., "horizontally", "rightwardly",

"upwardly", "radially", etc.), simply refer to the orientation of the illustrated structure.

[0073] Although various embodiments and examples have been presented, this was for the purpose of describing, but not limiting, the invention. Various modifications and enhancements will become apparent to those of ordinary skill in the art and are within the scope of the invention, which is defined by the appended claims.

Claims

1. A leg pad (10) for a hockey goalkeeper, the leg pad being wearable on a leg of the hockey goalkeeper to protect the leg, the leg pad comprising a frontal portion (26), a medial portion (27), and a lateral portion (28) respectively configured to be positioned adjacent to a front, a medial side, and a lateral side of the leg when the leg pad is worn on the leg, the leg pad comprising:
 - a) a molded outer shell (42) comprising an outer surface (51) of the leg pad;
 - b) an inner liner (44) for facing the leg; and
 - c) protective padding (40) disposed between the molded outer shell and the inner liner.
2. The leg pad of claim 1, wherein the molded outer shell comprises an upper leg portion (52), a knee portion (53), and a lower leg portion (54), the molded outer shell having a molded bend (60) such that the molded outer shell is bent in a longitudinal direction of the leg pad.
3. The leg pad of claim 2, wherein the molded bend (60) is a curved part which defines a curvature of the molded outer shell.
4. The leg pad of claim 2 or 3, wherein the molded bend (60) is a first bend and the molded outer shell comprises a second bend (61) in the longitudinal direction of the leg pad between the lower leg portion of the molded outer shell and a foot portion of the molded outer shell.
5. The leg pad of claim 4, wherein the second bend (61) is an angular part which defines an oblique angle.
6. The leg pad of any one of claims 1 to 5, wherein the protective padding comprises a plurality of padding materials (89₁-89₃) that are different from one another and wherein a first one of the padding materials is disposed in a first one of limited areas (37₁-37₃) and a second one of the padding materials is disposed in a second one of limited areas to control a rebound effect.

7. The leg pad of any one of claims 1 to 6, wherein the molded outer shell comprises molded foam (70).
8. The leg pad of any one of claims 1 to 7, wherein the inner liner is a molded inner liner. 5
9. The leg pad of any one of claims 1 to 8, further comprising a molded calf wing (59) or a molded knee wing (39). 10
10. The leg pad of any one of claims 1 to 9, wherein the molded outer shell comprises a molded bend (68) in a widthwise direction of the leg pad between the frontal portion of the leg pad and a medial portion of the leg pad. 15
11. The leg pad of claim 10, wherein the molded bend (68) in the widthwise direction is a first bend and the molded outer shell comprises a second bend (69) in the widthwise direction of the leg pad between the frontal portion of the leg pad and the lateral portion of the leg pad. 20
12. The leg pad of any one of claims 1 to 11, wherein the molded outer shell comprises a cavity (62) for receiving and holding the protective padding. 25
13. The leg pad of any one of claims 1 to 12, wherein the molded outer shell comprises a fastening zone (65) to fasten the molded outer shell to at least one of the inner liner and the protective padding. 30
14. The leg pad of any one of claims 1 to 13, wherein the molded outer shell comprises a plurality of molded flexion facilitators (81, 80₁) spaced from one another to facilitate flexing of the outer shell when the goalkeeper's leg moves. 35
15. The leg pad of any one of claims 1 to 14, wherein the molded outer shell comprises a molded strap attachment (71) for attaching a strap (50₁-50_S) to the leg pad. 40
16. The leg pad of any one of claims 1 to 15, wherein the molded outer shell comprises a plurality of molded ornaments (90₁-90_O) that define a molded relief of the molded outer shell. 45
17. The leg pad of any one of claims 1 to 16, wherein the molded outer shell comprises different molded constituents including a first foam and a second foam that is different from the first foam. 50
18. The leg pad of any one of claims 1 to 17, wherein the molded outer shell comprises a foam layer (83) and a non-foam layer (88), the non-foam layer forming a skin disposed on the foam layer and constitutes at least part of the outer surface of the leg pad. 55

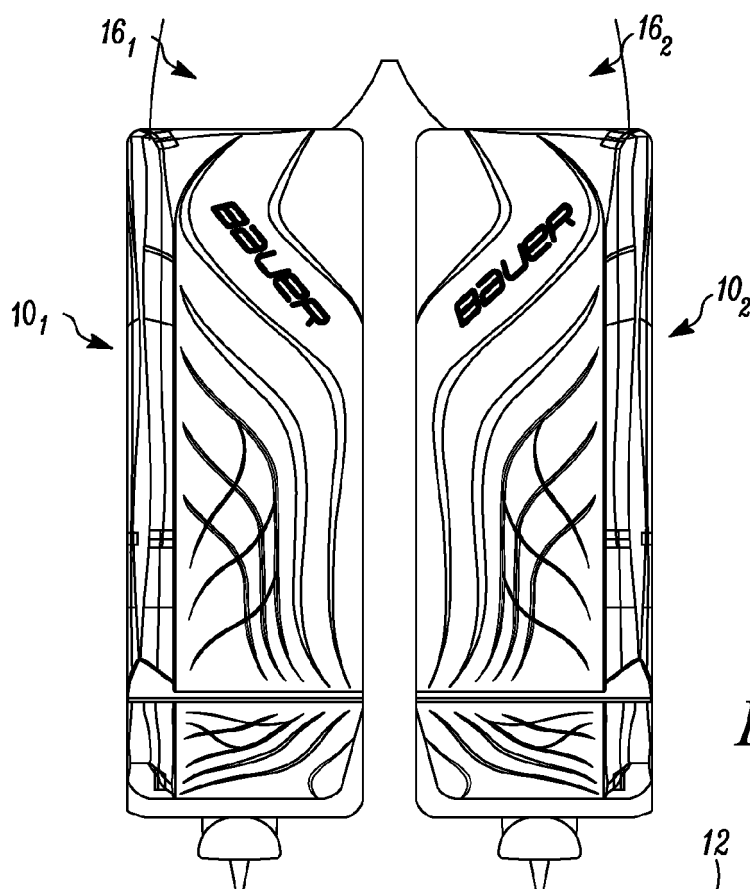


FIG. 1

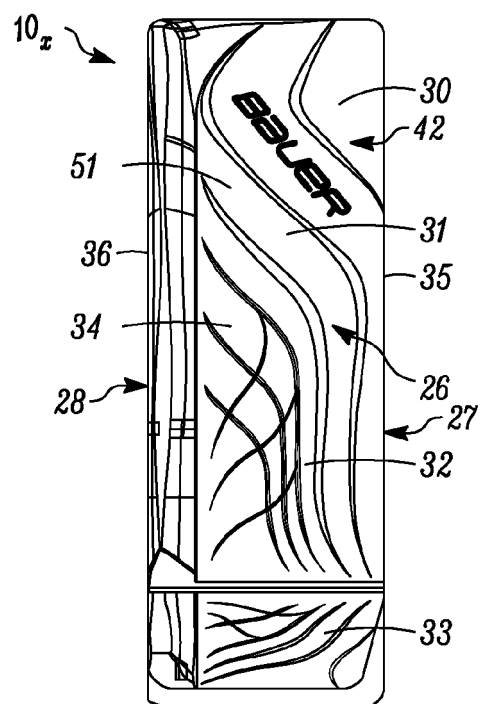


FIG. 2

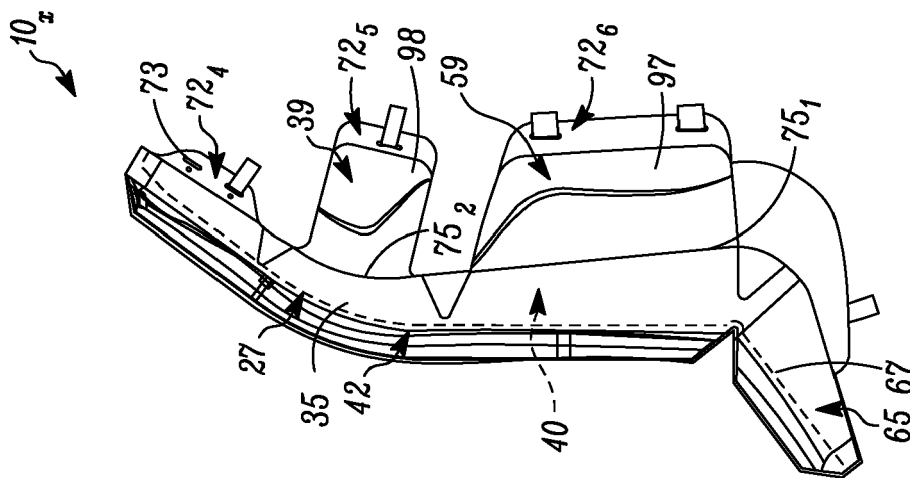


FIG. 5

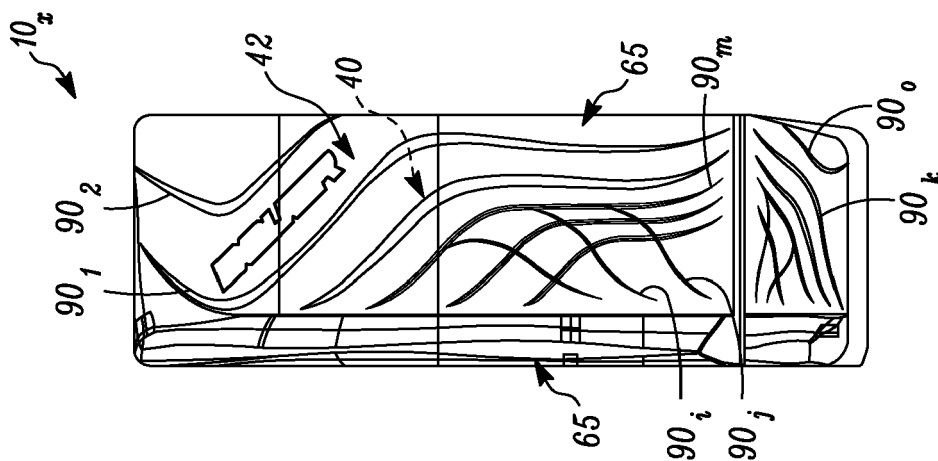


FIG. 3

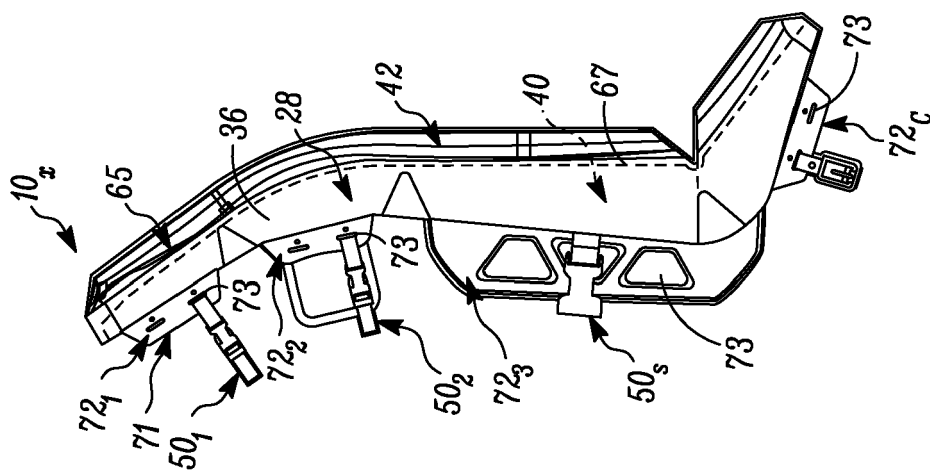


FIG. 4

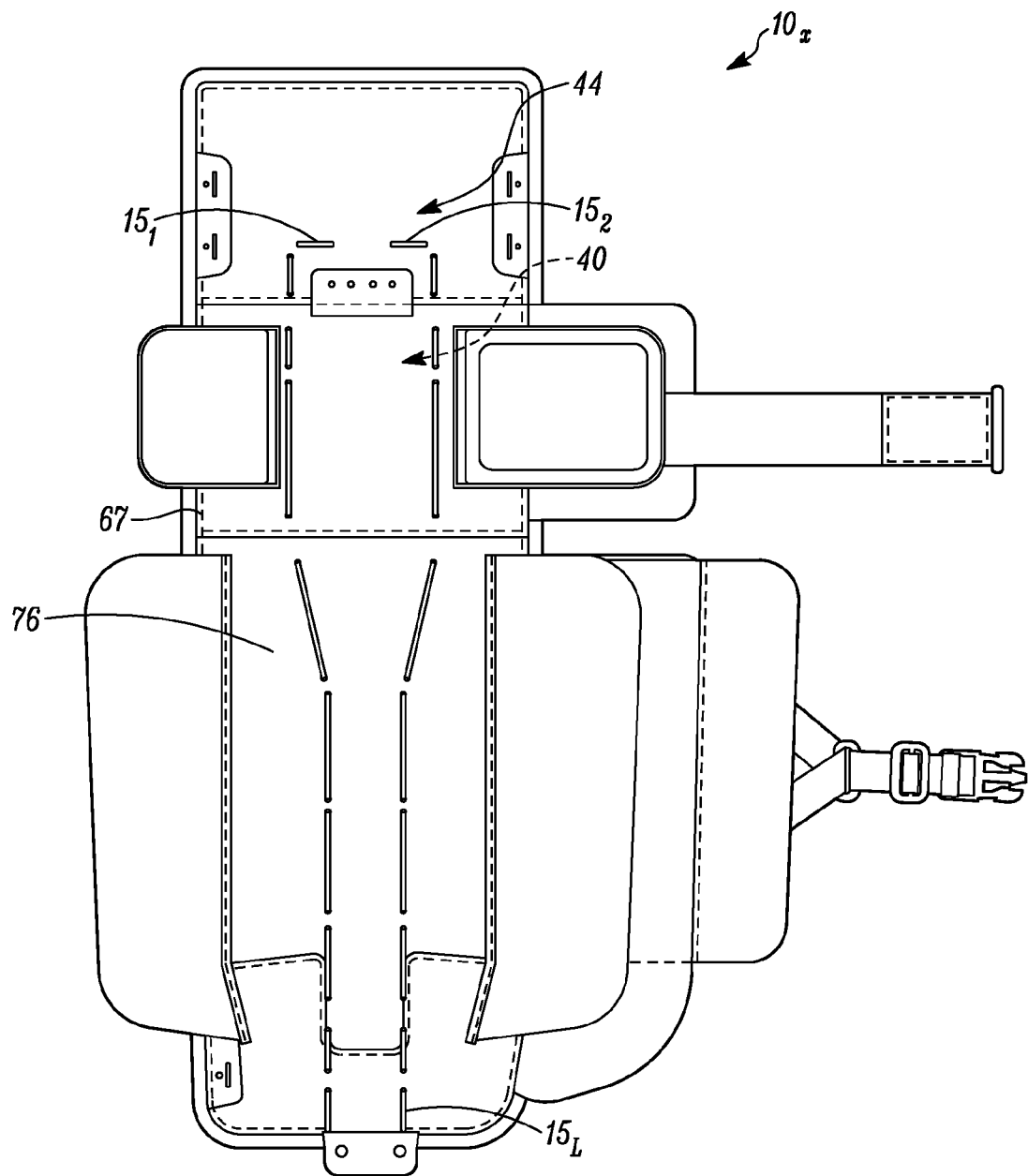


FIG. 6

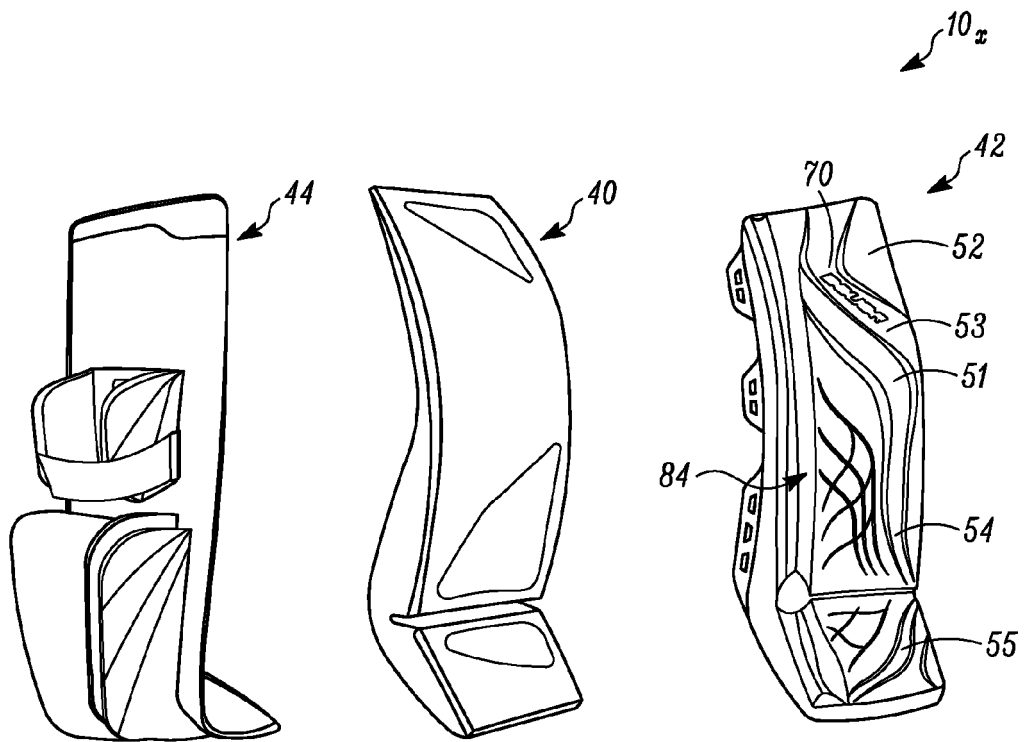


FIG. 7

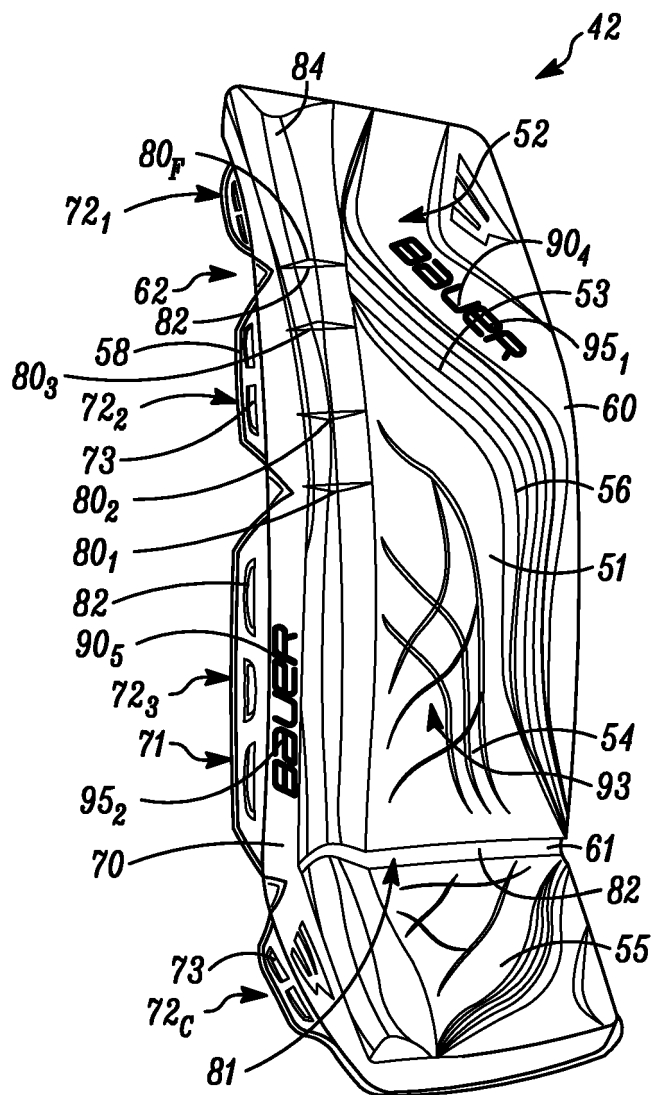
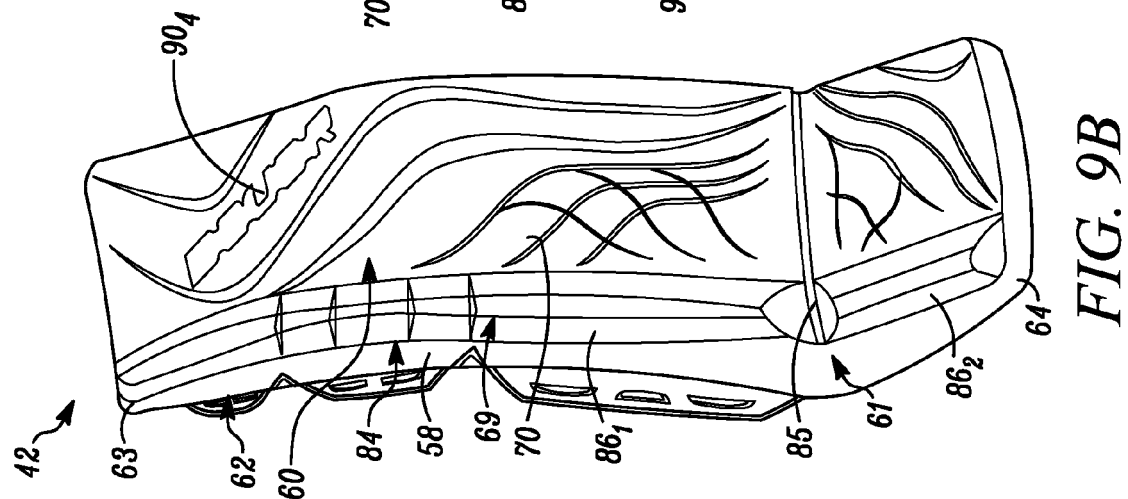
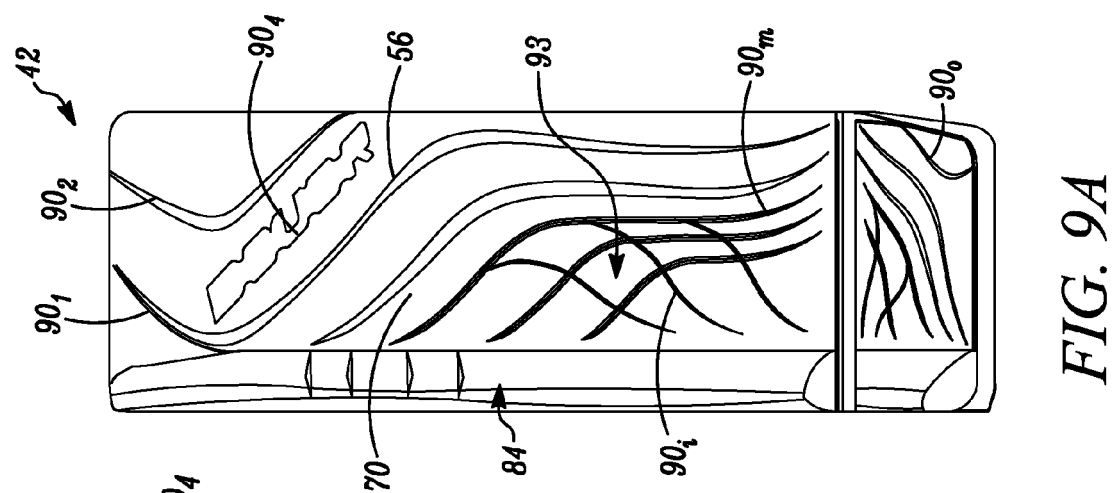
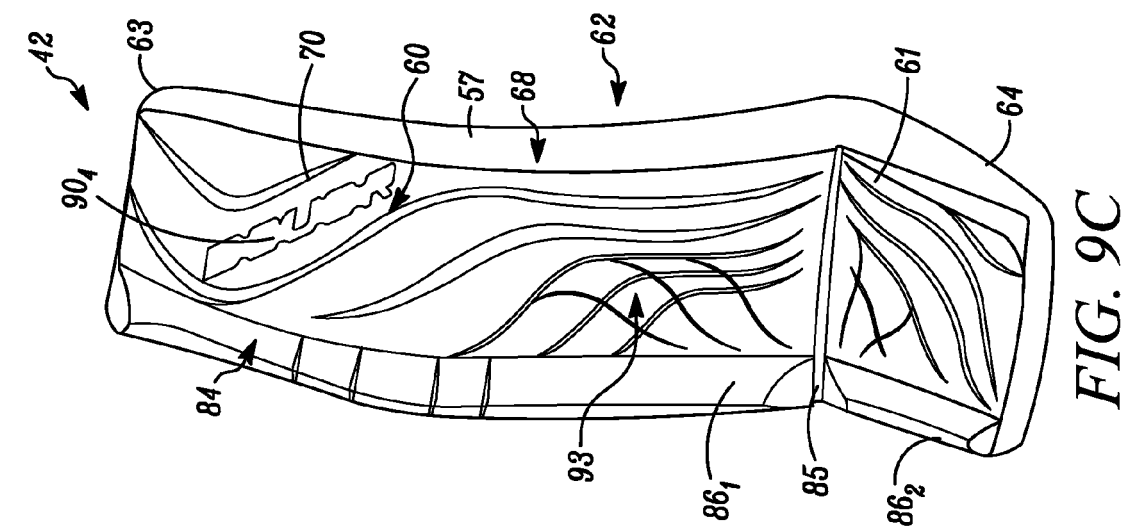


FIG. 8



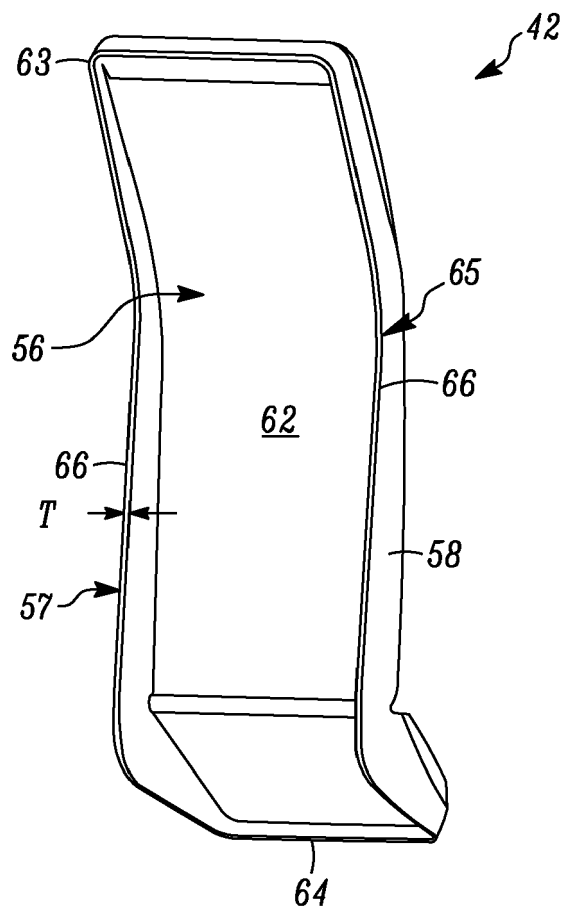


FIG. 9D

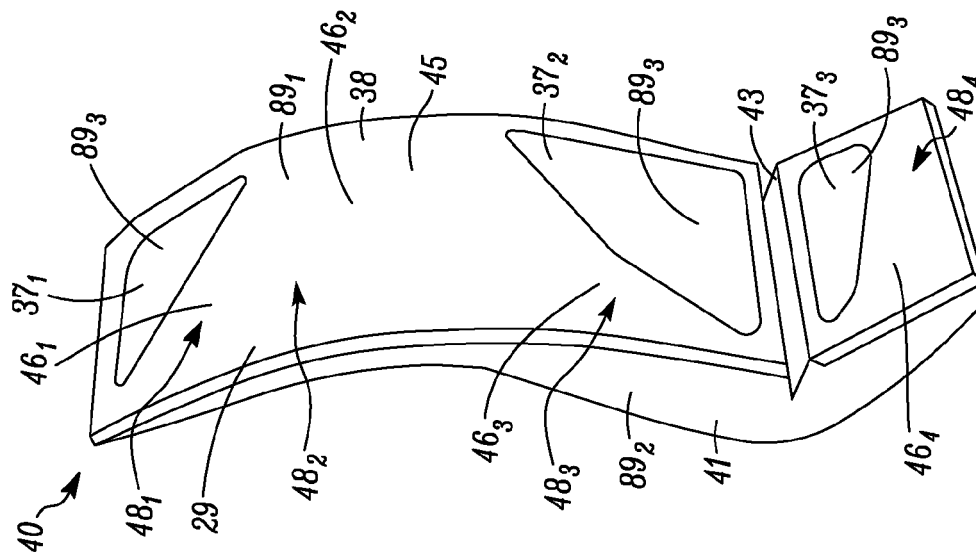


FIG. 11

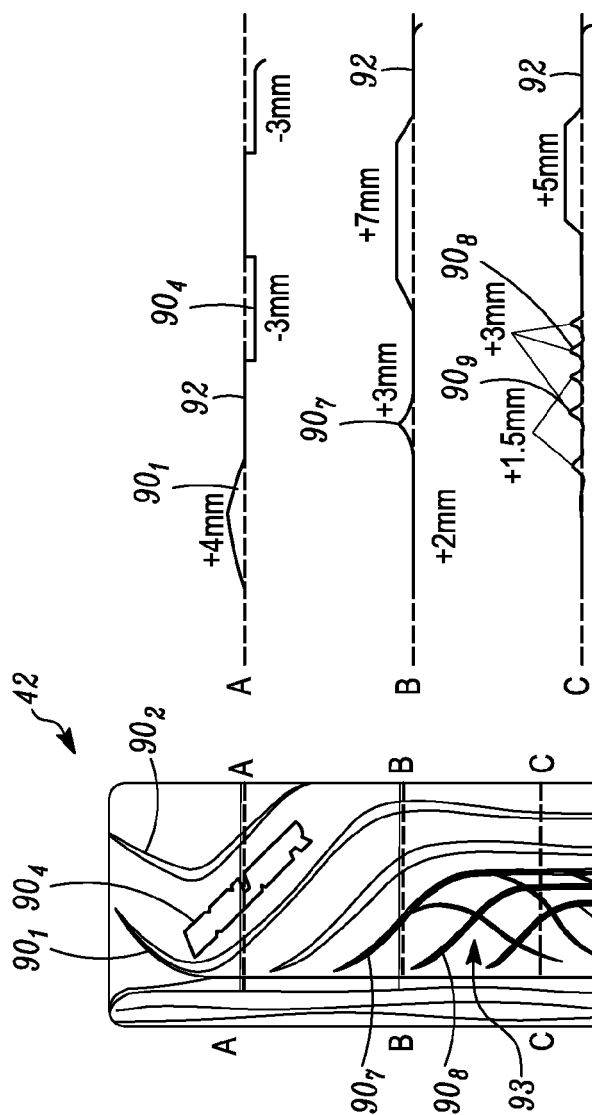


FIG. 10

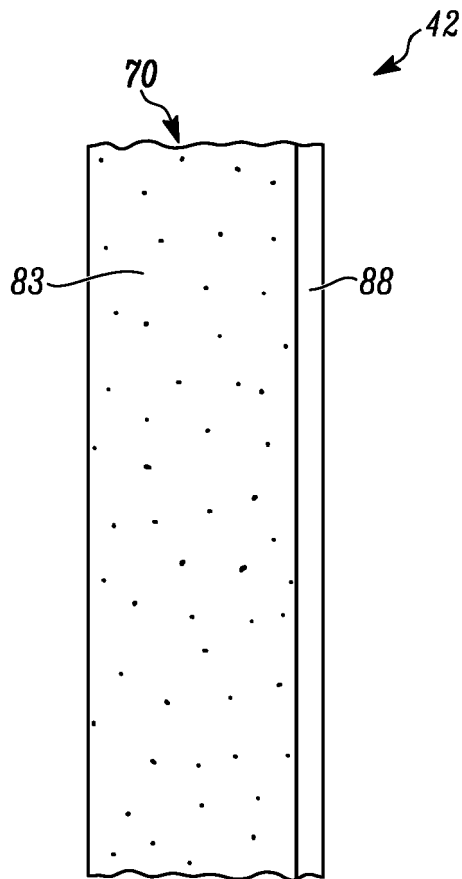


FIG. 12

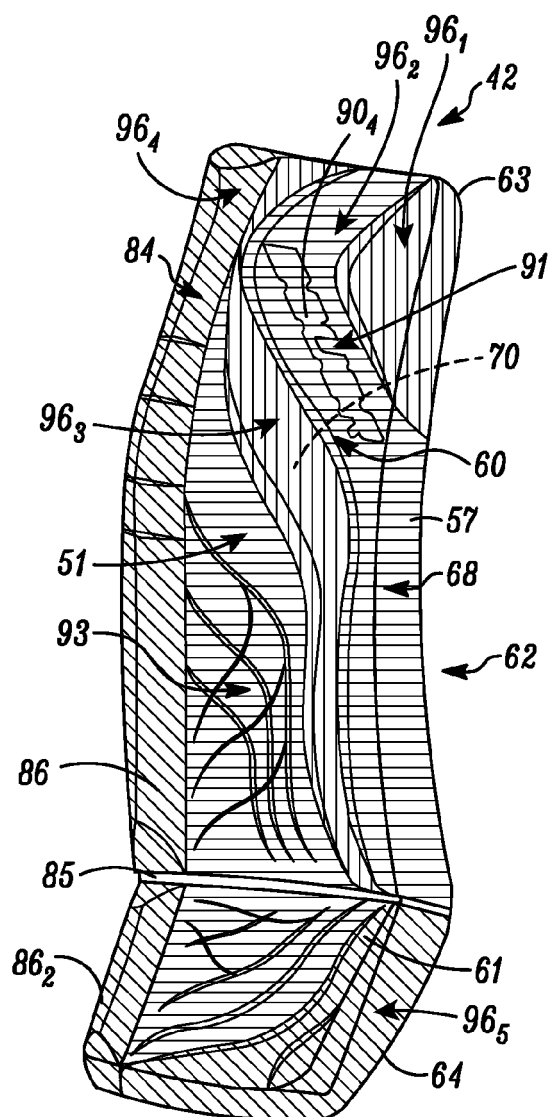


FIG. 13

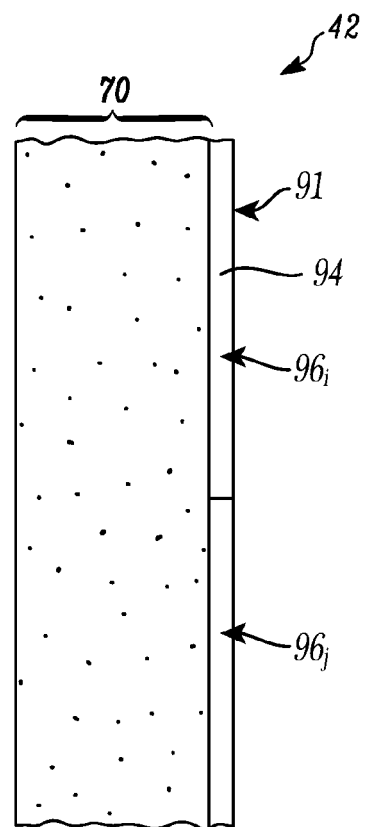


FIG. 14

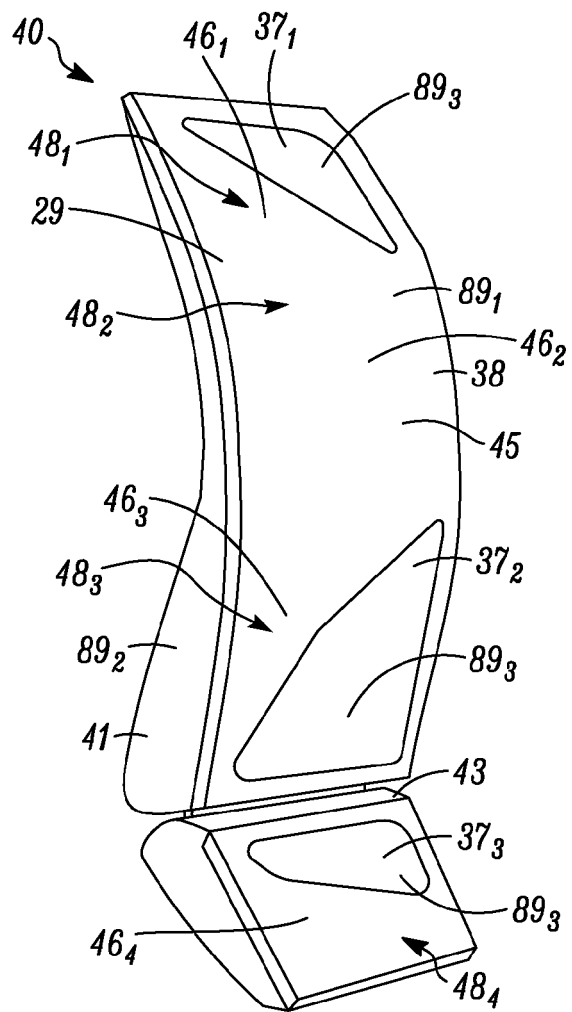


FIG. 15

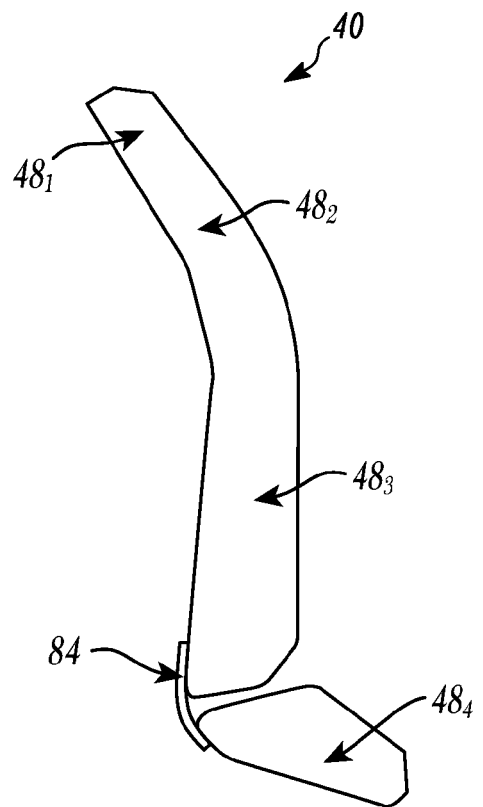


FIG. 16

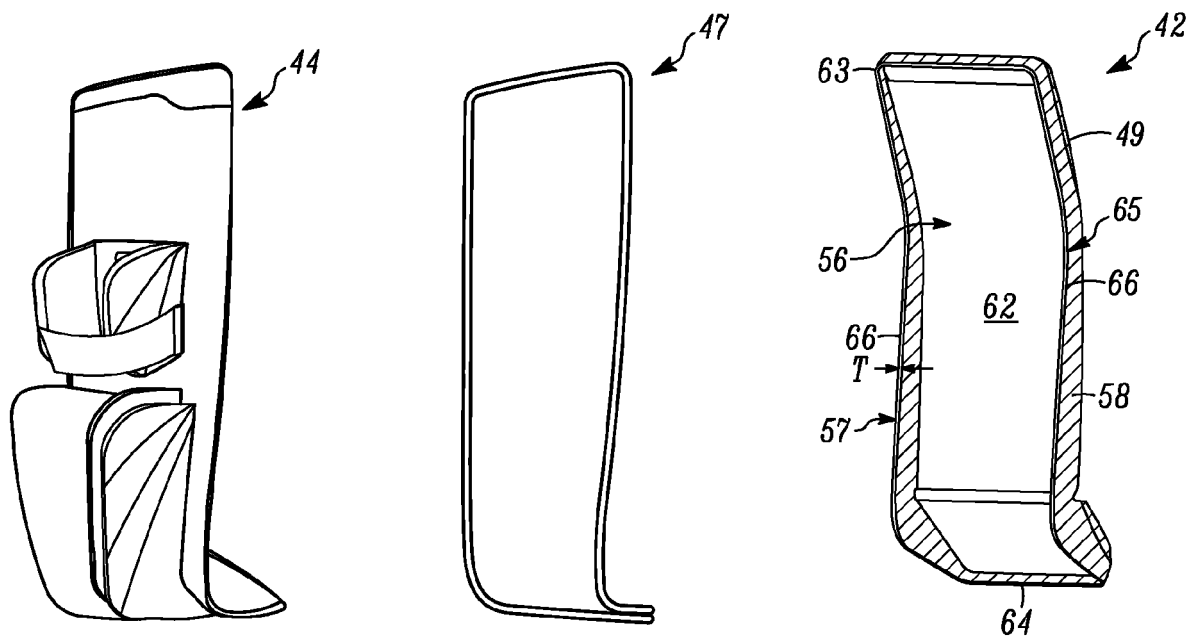


FIG. 17

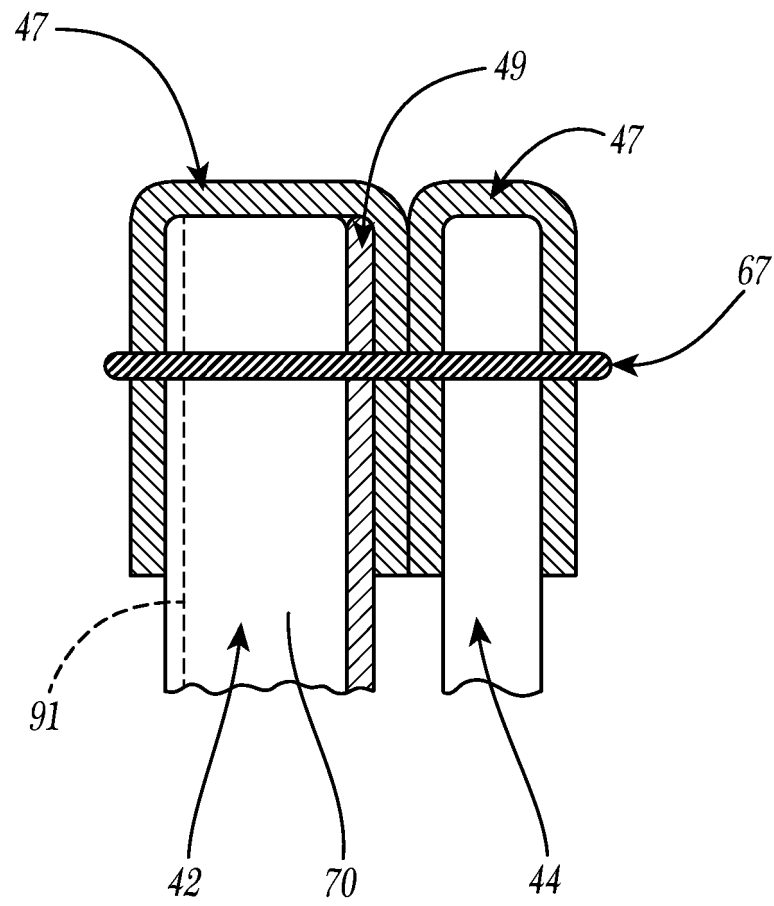


FIG. 18

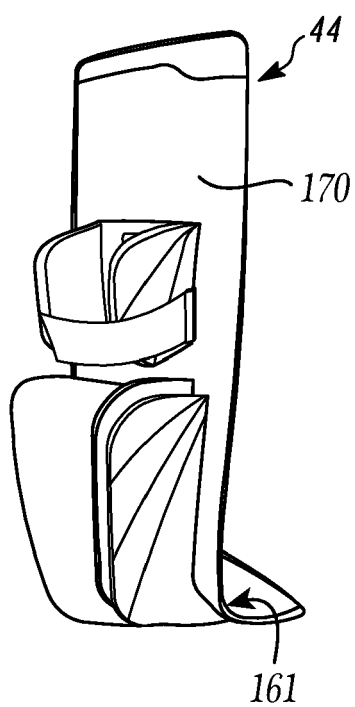


FIG. 19

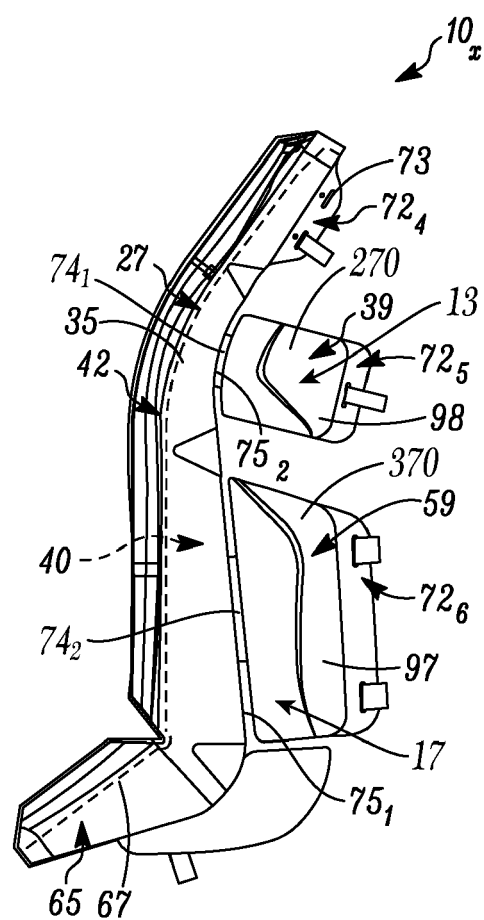


FIG. 20

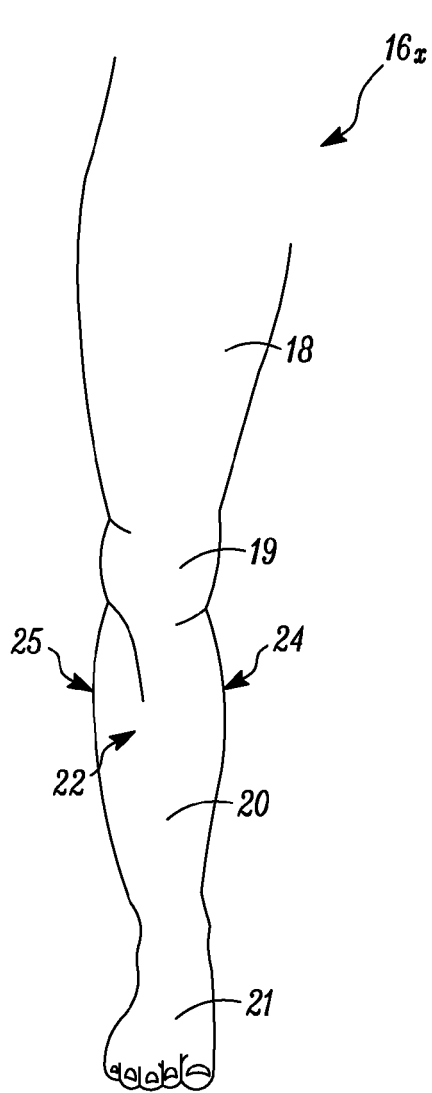


FIG. 21

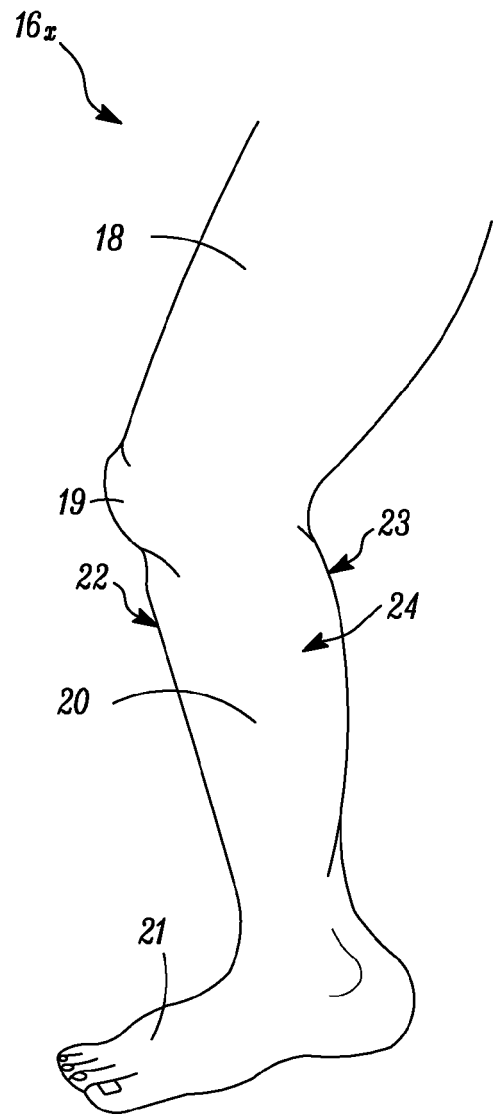


FIG. 22



EUROPEAN SEARCH REPORT

Application Number
EP 14 16 0313

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 2009/025114 A1 (HUDON JULES [CA] ET AL) 29 January 2009 (2009-01-29)	1,6,7, 13,14	INV. A63B69/00
Y	* paragraph [0020] - paragraph [0029]; figures 1-3 *	8,9,12, 15-18	A63B71/12
Y	US 2012/255096 A1 (WESLEY GLEN EDWIN [US]) 11 October 2012 (2012-10-11) * paragraph [0028] - paragraph [0046]; figures 1-6 *	8,9	
Y	US 3 877 077 A (CHAPDELAINE ROMEO) 15 April 1975 (1975-04-15) * column 1, line 59 - column 2, line 58; figures 1-6 *	12,15,16	
Y	EP 1 886 717 A1 (UHLSPORT GMBH [DE]) 13 February 2008 (2008-02-13) * paragraph [0001] - paragraph [0032]; claims 1-22 *	16-18	
A	WO 96/23556 A1 (DICESARE VINCE [CA]; CONRAD GRANT P [CA]; FLOOD THOMAS J [CA]) 8 August 1996 (1996-08-08) * page 10, line 3 - page 17, line 29; figures 1-14 *	1-18	TECHNICAL FIELDS SEARCHED (IPC) A63B A41D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 10 June 2014	Examiner Jekabsons, Armands
CATEGORY OF CITED DOCUMENTS 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 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			

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