



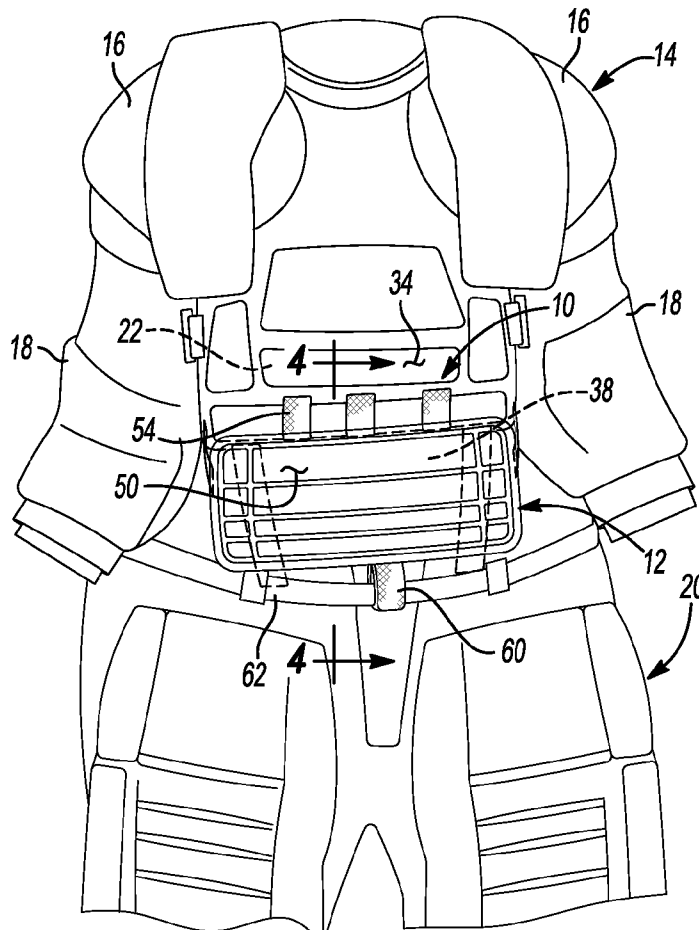
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(19) **United States**(12) **Patent Application Publication**
Legace(10) **Pub. No.: US 2013/0291294 A1**(43) **Pub. Date: Nov. 7, 2013**(54) **CHEST PROTECTOR WITH MOVABLE
ABDOMEN PROTECTOR****Publication Classification**(76) Inventor: **Manny Legace**, Novi, MI (US)(21) Appl. No.: **13/988,113**(22) PCT Filed: **Nov. 17, 2011**(86) PCT No.: **PCT/US11/61177**§ 371 (c)(1),
(2), (4) Date: **Jul. 24, 2013**(51) **Int. Cl.**
A63B 71/08 (2006.01)(52) **U.S. Cl.**
CPC **A63B 71/08** (2013.01)
USPC **2/463; 2/455**(57) **ABSTRACT**

A protector for a goaltender is provided and may include an upper portion having a first surface opposing a thorax of the goaltender and a second surface formed on an opposite side of the upper portion than the first surface. A lower portion may be attached to the upper portion and may include a third surface opposing an abdomen of the goaltender and a fourth surface formed on an opposite side of the lower portion than the third surface. The third surface may oppose the second surface throughout a range of relative motion between the upper portion and the lower portion.

Related U.S. Application Data

(60) Provisional application No. 61/415,058, filed on Nov. 18, 2010.



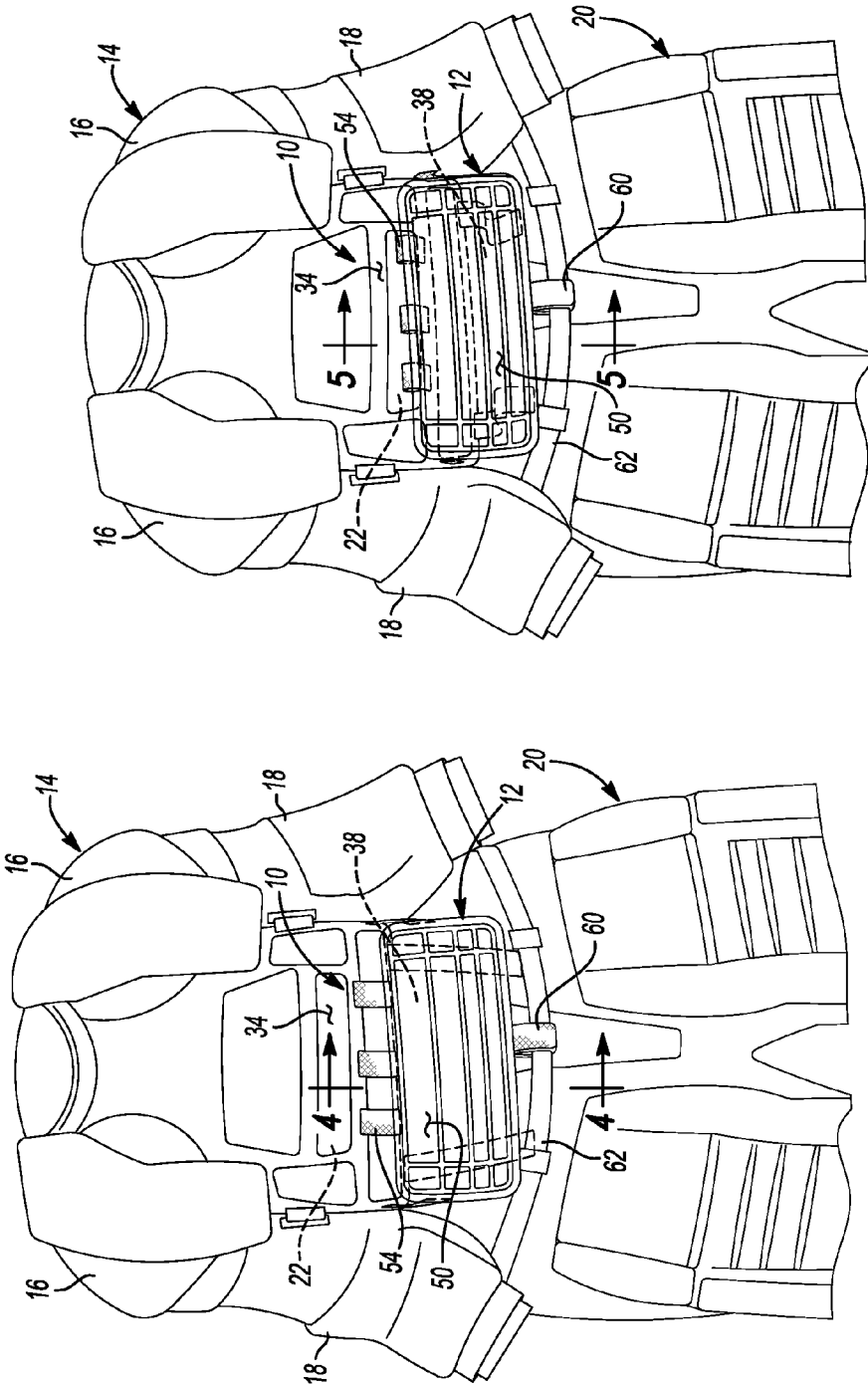


Fig-1

Fig-2

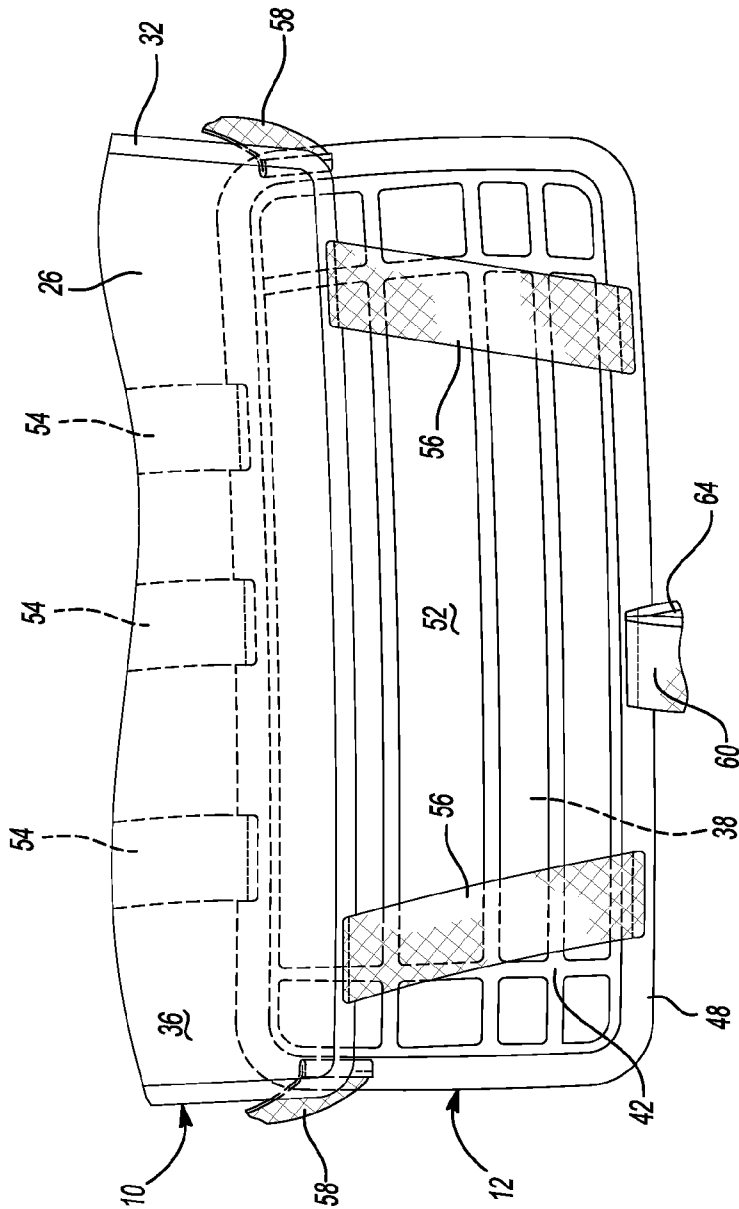


Fig-3

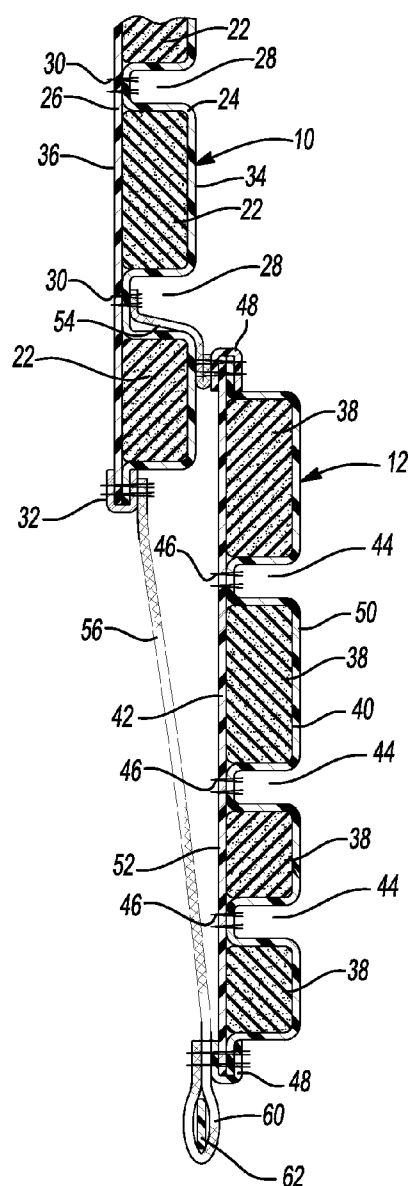


Fig-4

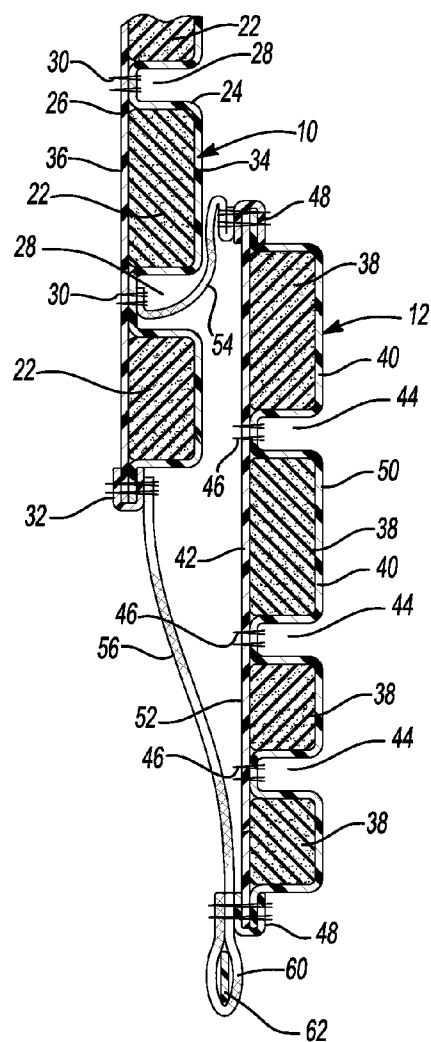


Fig-5

CHEST PROTECTOR WITH MOVABLE ABDOMEN PROTECTOR

FIELD

[0001] The present disclosure relates to protective equipment and more particularly to protective equipment for a goaltender.

BACKGROUND

[0002] This section provides background information related to the present disclosure which is not necessarily prior art.

[0003] Protective equipment is typically worn when playing hockey and lacrosse to protect a player from injury. For example, hockey players typically wear protective equipment to avoid or minimize injury caused by interaction with other hockey players and/or from being struck by a hockey puck. Likewise, lacrosse players typically wear protective equipment to avoid or minimize injuries caused by contact with other players and/or from being struck by a lacrosse ball.

[0004] While each player participating in a hockey game or a lacrosse game typically wears protective equipment, a hockey goaltender or lacrosse goaltender typically requires more protective equipment than do other hockey players or lacrosse players, as hockey goaltenders frequently utilize their body in stopping a hockey puck and lacrosse goaltenders typically utilize their body in stopping a lacrosse ball both in an effort to prevent other players from scoring a goal. Given the velocity with which a hockey puck and lacrosse ball are typically shot, modern protective equipment is typically designed to cover as much of a goaltender's body as possible to minimize injury associated with blocking a hockey puck or lacrosse ball.

[0005] Conventional protective equipment for a goaltender typically includes a chest protector having a central padded portion to protect a thorax of the goaltender, a series of shoulder pads and/or plates to protect the shoulders of the goaltender, and arm pads that extend between the shoulder pads/plates and respective ones of a pair of protective gloves to protect the arms of the goaltender. Providing an integral assembly having a chest protector, a shoulder protector, and arm protectors helps ensure that each portion of the upper body of the goaltender is covered and therefore protected.

[0006] While integrally forming a chest protector, shoulder protector, and arm protector adequately protects an upper-body portion of the goaltender, such an assembly is typically bulky and cumbersome. As a result, conventional protective equipment often impedes movement of a goaltender between a generally upright position and a crouched position, which reduces the effectiveness of the goaltender in stopping a hockey puck or a lacrosse ball. For example, when a hockey goaltender moves from a substantially upright position to a crouched position to stop a hockey puck, the central portion of the chest protector often moves upward and engages the neck and/or chin of the goaltender, thereby causing irritation and distracting the goaltender. Therefore, while conventional chest protectors adequately protect a thorax region and an abdomen region of the goaltender, such protectors often impede the performance and range of motion of the goaltender.

SUMMARY

[0007] This section provides a general summary of the disclosure, and is not a comprehensive disclosure of its full scope or all of its features.

[0008] A protector for a goaltender is provided and may include an upper portion having a first surface opposing a thorax of the goaltender and a second surface formed on an opposite side of the upper portion than the first surface. A lower portion may be attached to the upper portion and may include a third surface opposing an abdomen of the goaltender and a fourth surface formed on an opposite side of the lower portion than the third surface. The third surface may oppose the second surface throughout a range of relative motion between the upper portion and the lower portion.

[0009] In another configuration, a protector for a goaltender may include an upper portion having a first surface opposing a thorax of the goaltender and a lower portion attached to the upper portion at a first location and attached to a pair of pants of the goaltender at a second location. The lower portion may be movable relative to the upper portion and may include a second surface opposing an abdomen of the goaltender.

[0010] Further areas of applicability will become apparent from the description provided herein. The description and specific examples in this summary are intended for purposes of illustration only and are not intended to limit the scope of the present disclosure.

DRAWINGS

[0011] The drawings described herein are for illustrative purposes only of selected embodiments and not all possible implementations, and are not intended to limit the scope of the present disclosure.

[0012] FIG. 1 is a perspective view of a chest protector incorporating a movable abdomen protector in a first position and in accordance with the principles of the present disclosure;

[0013] FIG. 2 is a perspective view of the chest protector and movable abdomen protector of FIG. 1 shown in a second position;

[0014] FIG. 3 is a partial perspective view of the chest protector and movable abdomen protector of FIG. 1;

[0015] FIG. 4 is a partial cross-sectional view of the chest protector and movable abdomen protector of FIG. 1 taken along line 4-4 of FIG. 1; and

[0016] FIG. 5 is a partial cross-sectional view of the chest protector and movable abdomen protector of FIG. 1 taken along line 5-5 of FIG. 2.

[0017] Corresponding reference numerals indicate corresponding parts throughout the several views of the drawings.

DETAILED DESCRIPTION

[0018] Example embodiments will now be described more fully with reference to the accompanying drawings.

[0019] With reference to the figures, a chest or thorax protector 10 is shown in conjunction with a movable abdomen protector 12. The chest protector 10 and movable abdomen protector 12 may be incorporated into an assembly 14 having integral shoulder pads or plates 16 and arm/elbow pads 18. The assembly 14 including the chest protector 10 and movable abdomen protector 12 may be used in conjunction with protective pants 20 to provide a degree of protection to a goaltender, for example. While the chest protector 10 and

movable abdomen protector 12 will be described hereinafter and shown in the drawings as being used in conjunction with a hockey goaltender, the chest protector 10 and movable abdomen protector 12 may be used in conjunction with any goaltender such as, for example, a lacrosse goaltender.

[0020] With particular reference to FIGS. 4 and 5, the chest protector 10 is shown and may include a plurality of energy-absorbing pads 22 disposed between a first layer 24 and a second layer 26. The energy-absorbing pads 22 may be formed from an energy-absorbing material such as, for example, foam. While the energy-absorbing pads 22 are described as being constructed from a foam material, the energy-absorbing pads 22 may be formed from any suitable material that absorbs energy associated with an impact received at the first layer 24 that does not absorb or otherwise retain moisture. While an absorbent material having energy-absorbing properties may adequately absorb energy associated with a force applied to the chest protector 10 at the first layer 24, such absorbent material may retain moisture caused by perspiration or melted ice shavings, which unnecessarily increases the weight of the chest protector 10 during use.

[0021] The first layer 24 and the second layer 26 may retain the energy-absorbing pads 22 in a desired location and may provide a degree of protection for the energy-absorbing pads 22. The first layer 24 and the second layer 26 may be formed from a non-absorbent material such as, for example, nylon, to prevent absorption of moisture received at the first layer 24 or the second layer 26. While the first layer 24 and the second layer 26 are described as being formed from a nylon material, the first layer 24 and the second layer 26 could alternatively be formed from any material that wicks moisture.

[0022] As shown in FIG. 4, the first layer 24 extends over and generally surrounds the energy-absorbing pads 22 and positions the energy-absorbing pads 22 relative to one another by creating a gap 28 between adjacent energy-absorbing pads 22. The gaps 28 may be maintained by providing a stitch 30 within each gap 28 to attach the first layer 24 to the second layer 26. Providing the stitch 30 within each gap 28 maintains the gaps 28 between the energy-absorbing pads 22 and, as a result, maintains a relative position between each pad 22. While a stitch 30 is described as attaching the first layer 24 to the second layer 26 to define the gaps 28, any suitable method of attaching the first layer 24 to the second layer 26 such as, for example, adhesive, may be used in conjunction with or as an alternative to, the stitches 30.

[0023] In addition to providing the stitches 30 within each gap 28, an outer border 32 may be stitched or otherwise attached to the first layer 24 and the second layer 26 at an outer perimeter of the chest protector 10 to further attach the first layer 24 to the second layer 26 and create a sleeve for receiving the energy-absorbing pads 22. As with the stitches 30, the border 32 serves to not only attach the first layer 24 to the second layer 26 but also to retain the energy-absorbing pads 22 in a desired position relative to one another and relative to the first layer 24 and the second layer 26. The border 32 may be formed from the same material as the first layer 24 and second layer 26.

[0024] Once the first layer 24 is attached to the second layer 26 and the energy-absorbing pads 22 are positioned and retained between the first layer 24 and the second layer 26, the assembled chest protector 10 may include a first surface 34 defined by the first layer 24 and a second surface 36 defined by the second layer 26. As shown in FIG. 4, the first surface 34 may include a somewhat undulating profile due to the gaps 28

disposed between the individual energy-absorbing pads 22. Conversely, because the energy-absorbing pads 22 extend generally from the first layer 24, the second surface 36 defined by the second layer 26 may be substantially planar, as shown in FIG. 4.

[0025] With particular reference to FIGS. 3-5, the movable abdomen protector 12 is shown to include a plurality of energy-absorbing pads 38 disposed generally between a first layer 40 and a second layer 42. The energy-absorbing pads 38 may be formed from an energy-absorbing material such as, for example, foam. While the energy-absorbing pads 38 are described as being constructed from a foam material, the energy-absorbing pads 38 may be formed from any suitable material that absorbs energy associated with an impact received at the first layer 40 that does not absorb or otherwise retain moisture. While an absorbent material having energy-absorbing properties may adequately absorb energy associated with a force applied to the chest protector 10 at the first layer 40, such absorbent material may retain moisture caused by perspiration or melted ice shavings, which unnecessarily increases the weight of the chest protector 10 during use.

[0026] The first layer 40 and the second layer 42 may retain the energy-absorbing pads 38 in a desired location and may provide a degree of protection for the energy-absorbing pads 38. The first layer 40 and the second layer 42 may be formed from a non-absorbent material such as, for example, nylon, to prevent absorption of moisture received at the first layer 40 or the second layer 42. While the first layer 40 and the second layer 42 are described as being formed from a nylon material, the first layer 40 and the second layer 42 could alternatively be formed from any material that wicks moisture.

[0027] As shown in FIG. 4, the first layer 40 extends over and generally surrounds the energy-absorbing pads 38 and positions the energy-absorbing pads 38 relative to one another by creating a gap 44 between adjacent energy-absorbing pads 38. The gaps 44 may be maintained by providing a stitch 46 within each gap 44 to attach the first layer 40 to the second layer 42. Providing the stitch 46 within each gap 44 maintains the gaps 44 between the energy-absorbing pads 38 and, as a result, maintains a relative position between each pad 38. While a stitch 46 is described as attaching the first layer 40 to the second layer 42 to define the gaps 44, any suitable method of attaching the first layer 40 to the second layer 42 such as, for example, adhesive, may be used in conjunction with or as an alternative to, the stitches 46.

[0028] In addition to providing the stitches 46 within each gap 44, an outer border 48 may be stitched or otherwise attached to the first layer 40 and the second layer 42 at an outer perimeter of the chest protector 10 to further attach the first layer 40 to the second layer 42. As with the stitches 46, the border 48 serves to not only attach the first layer 40 to the second layer 42 but also to form a sleeve that retains the energy-absorbing pads 38 in a desired position relative to one another and relative to the first layer 40 and the second layer 42. The border 48 may be formed from the same material as the first layer 40 and second layer 42.

[0029] Once the first layer 40 is attached to the second layer 42 and the energy-absorbing pads 38 are positioned and retained between the first layer 40 and the second layer 42, the assembled chest protector 10 may include a first surface 50 defined by the first layer 40 and a second surface 52 defined by the second layer 42. As shown in FIG. 4, the first surface 50 may include a somewhat undulating profile due to the gaps 44 disposed between the individual energy-absorbing pads 38.

Conversely, because the energy-absorbing pads 38 extend generally from the first layer 40, the second surface 52 defined by the second layer 42 may be substantially planar, as shown in FIG. 4.

[0030] As shown in FIGS. 3-5, the movable abdomen protector 12 may be attached to the chest protector 10 via a series of upper tethers 54, a series of rear tethers 56, and a pair of side tethers 58. While the movable abdomen protector 12 is shown as being attached to the chest protector 10 by three upper tethers 54, two rear tethers 56, and two side tethers 58, any number of upper tethers 54, rear tethers 56, and side tethers 58 may be used to attach the abdomen protector 12 to the chest protector 10. The number and location of the upper tethers 54, rear tethers 56, and side tethers 58 may be chosen based on the particular configuration of the abdomen protector 12 and/or chest protector 10 and may be positioned to ensure the abdomen protector 12 is maintained in a desired position relative to the chest protector 10 such that at least a portion of the second surface 52 of the abdomen protector 12 opposes the first surface 34 of the chest protector 10 throughout a range of relative motion between the chest protector 10 and the abdomen protector 12, as will be described in greater detail below.

[0031] The upper tethers 54 may be attached to an outer perimeter of the abdomen protector 12 at a first end and may be attached to the chest protector 10 at a second end. In one configuration, the second end is attached to the chest protector 10 generally at the first surface 34 and within a gap 28. The upper tether 54 may be stitched or otherwise attached to the border 48 of the abdomen protector 12 and may likewise be stitched or otherwise fixedly attached to the first layer 24 within the gap 28. In one configuration, the upper tether 54 may be stitched to the first layer 24 utilizing the stitch 30 that attaches the first layer 24 to the second layer 26 within the gap 28. The upper tethers 54 may be formed from an elastic material that allows for movement of the abdomen protector 12 relative to the chest protector 10. While an elastic material is described, the upper tethers 54 may be formed from any material that permits movement of the abdomen protector 12 relative to the chest protector 10 within a prescribed range of motion.

[0032] The rear tethers 56 may likewise be formed from an elastic material and may extend generally from the border 32 of the chest protector 10 to the border 48 of the abdomen protector 12. In one configuration, the rear tethers 56 extend from an area proximate to the first surface 34 of the chest protector 10 to an area proximate to the second surface 52 of the abdomen protector 12. The rear tethers 56 may be attached to the border 32 of the chest protector 10 via a stitch and/or adhesive and may likewise be attached to the border 48 of the abdomen protector 12 via a stitch and/or adhesive. As with the upper tethers 54, the rear tethers 56 may be formed from an elastic material or any material that permits the abdomen protector 12 to move relative to the chest protector 10 within a prescribed range of motion.

[0033] The side tethers 58 may extend generally between the abdomen protector 12 and the chest protector 10 to further movably attach the abdomen protector 12 to the chest protector 10. As with the rear tethers 56, the side tethers 58 may be formed from an elastic material and may be attached at one end to the border 32 of the chest protector 10 and at a second end to the border 48 of the abdomen protector 12.

[0034] Regardless of the particular location and material chosen in forming the upper tethers 54, rear tethers 56, and

side tethers 58, the upper tethers 54, rear tethers 56, and side tethers 58 cooperate to permit the abdomen protector 12 to move relative to the chest protector 10 while concurrently restricting motion of the abdomen protector 12 relative to the chest protector 10. Specifically, the tethers 54, 56, 58 permit the abdomen protector 12 to move relative to the chest protector 10 while maintaining at least a portion of the second surface 52 of the abdomen protector 12 in opposition to the first surface 34 of the chest protector 10 to prevent the abdomen protector 12 from moving sufficiently down and behind the chest protector 10. Namely, the tethers 54, 56, 58 prevent the abdomen protector 12 from moving from a position adjacent to the first surface 34 of the chest protector 10 to a position adjacent to the second surface 36 of the chest protector 10. As such, the tethers 54, 56, 58 cooperate to ensure that the abdomen protector 12 is permitted to translate relative to the chest protector 10 within a prescribed range of motion while concurrently maintaining the second surface 52 of the abdomen protector 12 in opposition to the first surface 34 of the chest protector 10.

[0035] With particular reference to FIGS. 4 and 5, the range of motion of the abdomen protector 12 relative to the chest protector 10 is illustrated. In the configuration shown in FIG. 4, the upper tethers 54 are in an extended state, whereby the abdomen protector 12 is permitted to move generally away from the chest protector 10 such that an overlap between the abdomen protector 12 and chest protector 10 is minimized. While the overlap between the abdomen protector 12 and the chest protector 10 is minimized, the second surface 52 of the abdomen protector 12 is maintained in a position such that the second surface 52 opposes the first surface 34 of the chest protector 10. In the relationship shown in FIG. 5, the abdomen protector 12 is permitted to translate relative to the chest protector 10 such that the abdomen protector 12 moves closer to the chest protector 10. In this configuration, a greater overlap of the abdomen protector 12 relative to the chest protector 10 is achieved while maintaining the second surface 52 of the abdomen protector 12 opposing the first surface 34 of the chest protector 10. The relationship shown in FIG. 4 may be achieved when a goaltender is in a standing position (FIG. 1) while the relationship shown in FIG. 5 may be achieved when a goaltender is in a crouched position (FIG. 2).

[0036] In addition to the upper tethers 54, rear tethers 56, and side tethers 58, the abdomen protector 12 may include at least one attachment feature 60 extending from an opposite end of the abdomen protector 12 than the upper tethers 54. The attachment feature 60 may be used to attach the abdomen protector 12 to the protective pants 20 in an effort to maintain a position of the abdomen protector 12 relative to the protective pants 20. In one configuration, the attachment feature 60 is attached to a belt 62 or other feature of the protective pants 20 and may include a loop 64 that matingly receives the belt 62 or other attachment feature of the protective pants 20. Once the belt 62 or other attachment feature of the protective pants 20 is received within the loop 64 of the attachment feature 60, the position of the abdomen protector 12 is generally fixed relative to the protective pants 20. Therefore, as the goaltender moves between the upright position shown in FIG. 1 and the crouched position shown in FIG. 2, the position of the abdomen protector 12 relative to the protective pants 20 is maintained. Further, interaction between the attachment feature 60 and the protective pants 20 causes the protective pants 20 to exert a force on the abdomen protector 12 when a goaltender moves from a crouched position (FIG. 2) to a

substantially upright position (FIG. 1), thereby causing the abdomen protector 12 to move from the position shown in FIG. 5 to the position shown in FIG. 4 relative to the chest protector 10.

[0037] While a position of the abdomen protector 12 relative to the protective pants 20 is maintained due to engagement between the attachment feature 60 of the abdomen protector 12 and the belt 62 or other attachment feature of the protective pants 20 during movement between the upright position (FIG. 1) and the crouched position (FIG. 2), the abdomen protector 12 is permitted to translate or otherwise move relative to the chest protector 10 due to the attachment of the abdomen protector 12 to the chest protector 10 via the series of tethers 54, 56, 58. Such movement of the abdomen protector 12 relative to the chest protector 10 is further facilitated if any or all of the tethers 54, 56, 58 are formed from an elastic material.

[0038] The foregoing description of the embodiments has been provided for purposes of illustration and description. It is not intended to be exhaustive or to limit the disclosure. Individual elements or features of a particular embodiment are generally not limited to that particular embodiment, but, where applicable, are interchangeable and can be used in a selected embodiment, even if not specifically shown or described. The same may also be varied in many ways. Such variations are not to be regarded as a departure from the disclosure, and all such modifications are intended to be included within the scope of the disclosure.

What is claimed is:

1. A protector for a goaltender, the protector comprising: an upper portion having a first surface opposing a thorax of the goaltender and a second surface formed on an opposite side of said upper portion than said first surface; and a lower portion attached to said upper portion and including a third surface opposing an abdomen of the goaltender and a fourth surface formed on an opposite side of said lower portion than said third surface, said third surface opposing said second surface throughout a range of relative motion between said upper portion and said lower portion.
2. The protector of claim 1, wherein said lower portion is attached to said upper portion via at least one tether to permit relative movement between said upper portion and said lower portion.
3. The protector of claim 2, wherein said at least one tether is formed from an elastic material.
4. The protector of claim 2, wherein said at least one tether extends between said second surface and said third surface.
5. The protector of claim 2, further comprising an attachment feature operable to secure said lower portion to a pair of pants of the goaltender.

6. The protector of claim 5, wherein said attachment feature is integrally formed with one of said at least one tether.

7. The protector of claim 5, wherein said attachment feature includes a loop operable to receive at least one of a belt or other feature of said pants to secure said lower portion to said pants.

8. The protector of claim 1, further comprising an attachment feature operable to secure said lower portion to a pair of pants of the goaltender.

9. The protector of claim 1, wherein said lower portion is received within a sleeve, said sleeve defining said third surface and said fourth surface.

10. The protector of claim 9, wherein said sleeve is attached to said upper portion at said second surface.

11. The protector of claim 9, wherein said sleeve is formed from an elastic material to permit said relative motion between said upper portion and said lower portion.

12. A protector for a goaltender, the protector comprising: an upper portion having a first surface opposing a thorax of the goaltender;

a lower portion attached to said upper portion at a first location and attached to a pair of pants of the goaltender at a second location, said lower portion movable relative to said upper portion and including a second surface opposing an abdomen of the goaltender.

13. The protector of claim 12, wherein said upper portion includes a third surface formed on an opposite side of said upper portion than said first surface and said lower portion includes a fourth surface formed on an opposite side of said lower portion than said second surface, said third surface opposing said second surface throughout a range of motion of said lower portion relative to said upper portion.

14. The protector of claim 12, wherein said lower portion is attached to said upper portion by at least one tether.

15. The protector of claim 14, wherein said at least one tether is formed from an elastic material.

16. The protector of claim 12, further comprising an attachment feature operable to secure said lower portion to said pants.

17. The protector of claim 16, wherein said attachment feature includes a loop operable to receive at least one of a belt or other feature of said pants to secure said lower portion to said pants.

18. The protector of claim 12, wherein said lower portion is received within a sleeve, said sleeve defining said second surface.

19. The protector of claim 18, wherein said sleeve is attached to said upper portion.

20. The protector of claim 18, wherein said sleeve is formed from an elastic material to permit relative motion between said upper portion and said lower portion.

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