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(54) **FALL MAT WITH HINGED INTERLOCKING BODIES**

(75) Inventor: **Arone Yacov Silverman**, Bennington, VT (US)

(73) Assignee: **M.P.L. LIMITED**, Belize City (BZ)

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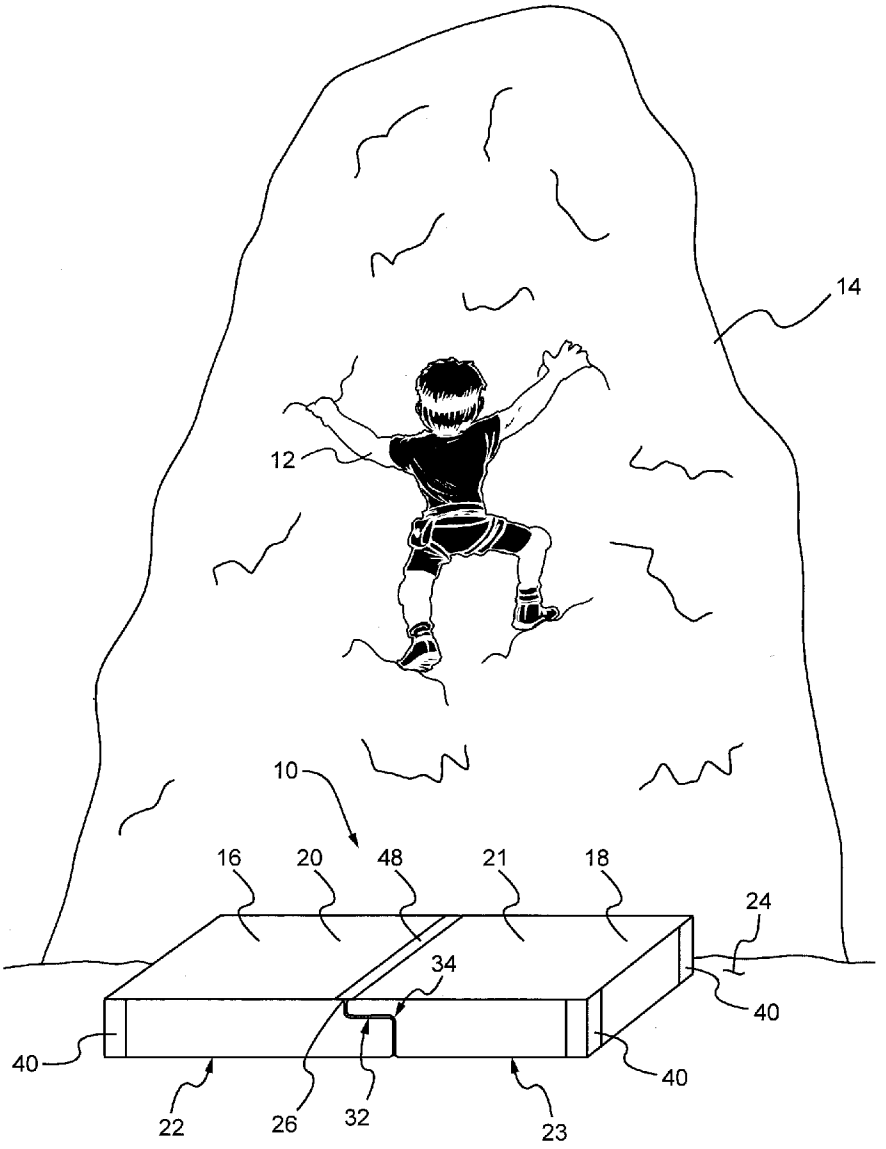
(57) **ABSTRACT**

Disclosed herein is a fall mat that includes a first padded body including a first top surface, a first bottom surface, and a first connecting side including a first step. The fall mat further includes a second padded body including a second top surface, a second bottom surface, and a second connecting side including a second step. Moreover, the fall mat includes a hinge connecting the first padded body with the second padded body such that the second padded body is configured to rotate about the first padded body. The first step and the second step interlock when the first top surface and the second top surface of the first padded body and the second padded body are in a co-planar position.



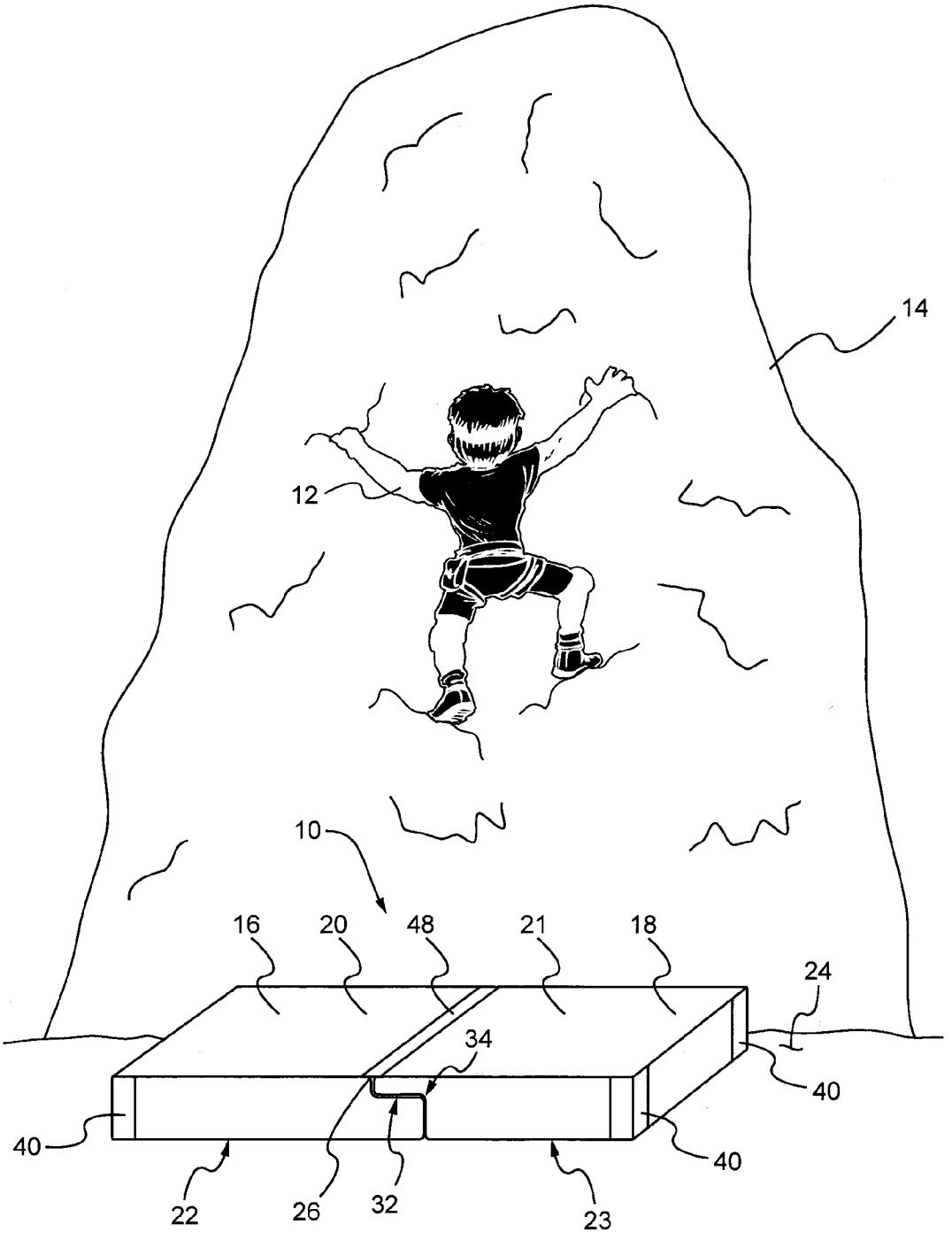


Fig. 1

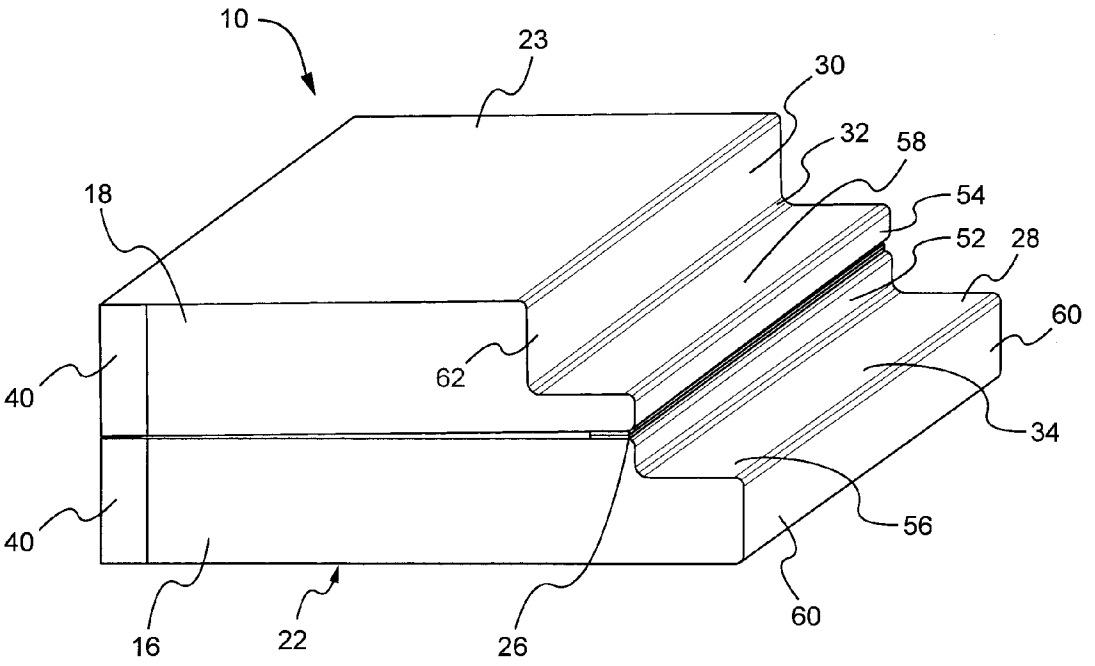


Fig. 2

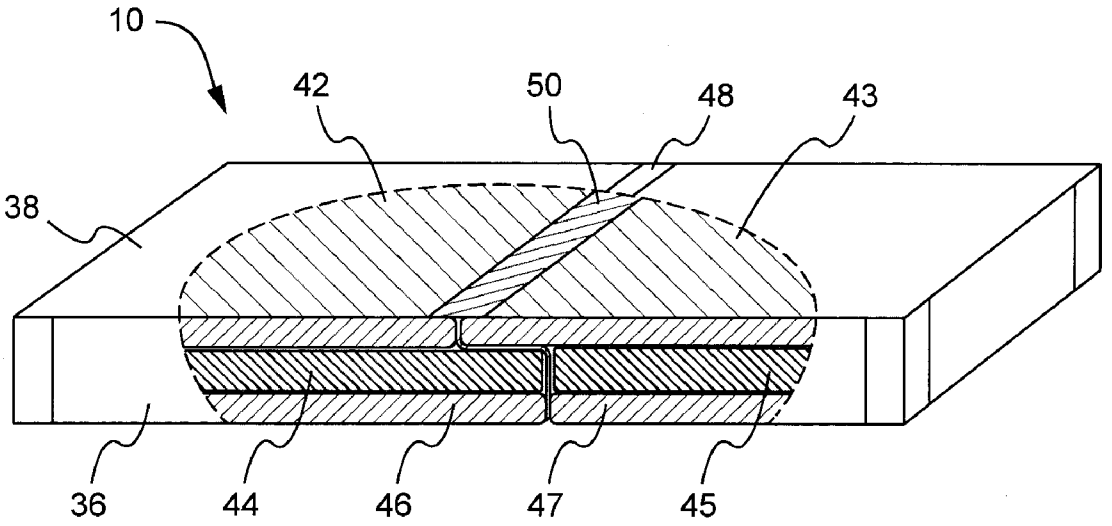


Fig. 3

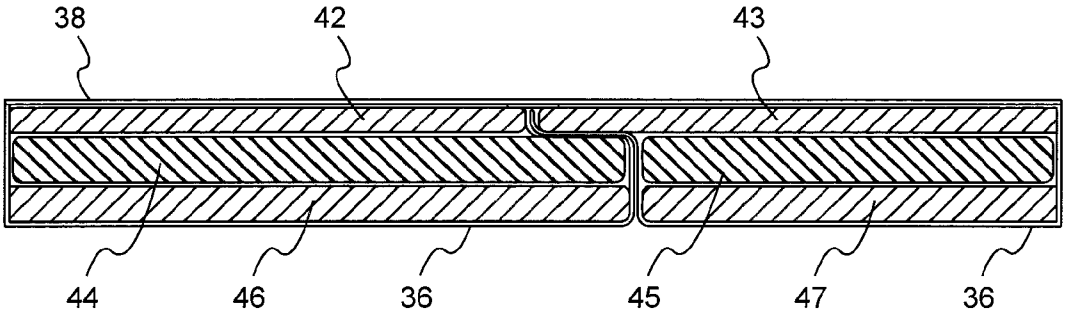


Fig. 4

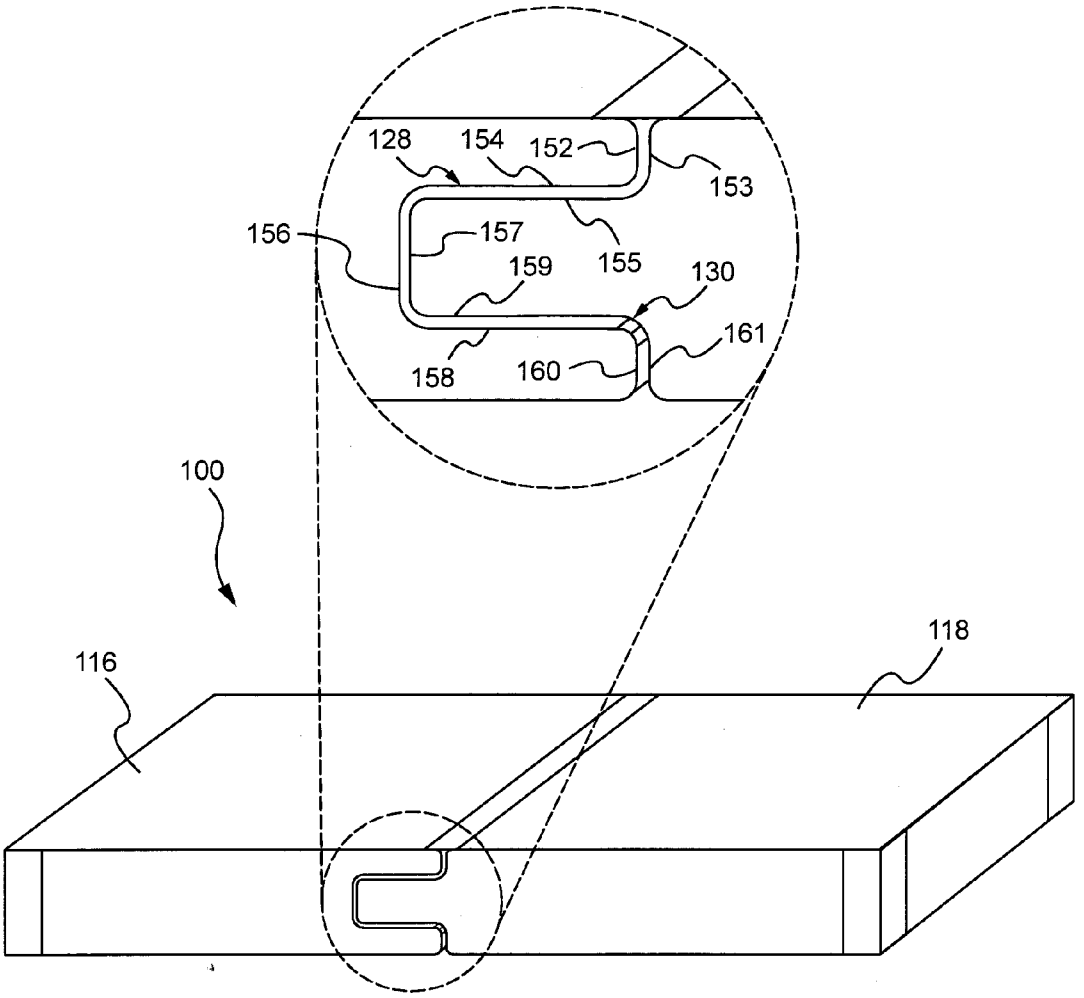


Fig. 5

FALL MAT WITH HINGED INTERLOCKING BODIES

FIELD OF THE TECHNOLOGY

[0001] The subject matter disclosed herein relates to fall mats for rock climbing. More particularly, the subject matter relates to a fall mat with hinged interlocking bodies that is foldable for easy transportation and storage.

BACKGROUND

[0002] Fall mats, also referred to as bouldering mats or crash pads, are used for rock climbing to prevent serious injury when a climber falls from a boulder or rock wall. Fall mats are often used to cover dangerous sections of the ground below a chosen climb such as protruding rocks or grass tufts. Fall mats typically cover about a three feet by four feet area beneath a climber and are three to five inches thick. Fall mats may be foldable once along a seam in order to reduce the transportation and storing dimensions to about three feet by two feet by ten inches. A typical fall mat utilizes two layers of foam in order to provide different levels of support. The upper layer of foam is generally higher in density than the lower level of foam. This prevents a climber's foot from sinking through the foam and either gaining impact on the floor or getting a foot stuck in the crash pad which would increase the chance of injury. To transport a fall mat, a climber typically folds the mat in half. Some fall mats include a crease or hinge to accommodate folding. However, rocks, roots or other ground protrusions are capable of penetrating into the crease or hinge during use such that very little padding is between a falling climber and the ground protrusion. This is potentially dangerous for a falling climber.

[0003] Thus, a fall mat with hinged interlocking bodies that is foldable for easy transportation and storage would be well received in the art.

BRIEF DESCRIPTION

[0004] According to one aspect, a fall mat comprises: a first padded body including a first top surface, a first bottom surface, and a first connecting side including a first step; a second padded body including a second top surface, a second bottom surface, and a second connecting side including a second step; and a hinge connecting the first padded body with the second padded body such that the second padded body is configured to rotate about the first padded body, wherein the first step and the second step interlock when the first top surface and the second top surface of the first padded body and the second padded body are in a co-planar position.

[0005] According to another aspect, a fall mat comprises: a first padded body having a first top surface and a first bottom surface, and a first connecting side, wherein a cross section of the first connecting side has an inverted step profile; a second padded body having a second top surface and a second bottom surface, and a second connecting side, wherein a cross section of the second connecting side has a step profile that corresponds to the inverted step profile of the first connecting side of the first padded body such that a substantial portion of the first connecting side and the second connecting side abut; and a hinge connecting the first padded body to the second padded body such that the second padded body is configured to rotate about the first padded body.

[0006] According to another aspect, a fall mat comprises: a first padded body having a first outer envelope surrounding a first top pad and a first lower pad, the first lower pad extending on a first connecting side a greater distance than the first top pad to create a first step; and a second padded body having a second outer envelope surrounding a second top pad and a second lower pad, the second top pad extending on a second connecting side a greater distance than the second lower pad to create a second step; wherein the first outer envelope and the second outer envelope are connected between the first connecting side and the second connecting side such that the first padded body is rotatable about the second padded body.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] The subject matter which is regarded as the invention is particularly pointed out and distinctly claimed in the claims at the conclusion of the specification. The foregoing and other features and advantages of the invention are apparent from the following detailed description taken in conjunction with the accompanying drawings in which:

[0008] FIG. **1** depicts a perspective view of a fall mat set up under a climber in accordance with one embodiment;

[0009] FIG. **2** depicts a perspective view of the fall mat of FIG. **1** with a first body rotated about an interlocking hinge with respect to a second body in accordance with one embodiment;

[0010] FIG. **3** depicts a cutaway view of the fall mat of FIGS. **1-2** in an open position in accordance with one embodiment;

[0011] FIG. **4** depicts a cross sectional side view of the fall mat of FIGS. **1-3** in an open position taken at arrows **4-4** in accordance with one embodiment; and

[0012] FIG. **5** depicts a perspective view of a fall mat in accordance with another embodiment.

DETAILED DESCRIPTION

[0013] A detailed description of the hereinafter described embodiments of the disclosed apparatus and method are presented herein by way of exemplification and not limitation with reference to the Figures.

[0014] Referring first to FIGS. **1-4**, a fall mat **10** is shown. The fall mat **10** may also be referred to as a bouldering mat, a crash pad, or the like. Whatever the embodiment, the fall mat **10** may be configured to break the fall of a climber **12** that falls from a boulder **14** or other climbing surface, as shown in FIG. **1**. The fall mat **10** includes a first padded body **16** and a second padded body **18**. The first padded body **16** includes a first top surface **20** facing the climber **12** when in use, and a first bottom surface **22** facing the ground **24**. The second padded body **18** also includes a second top surface **21** facing the climber when in use, and a second bottom surface **23** facing the ground. The fall mat **10** includes a hinge **26** that allows the fall mat **10** to fold for easy transportation and storage, as shown in FIG. **2**. The hinge **16** connects the first padded body **16** and the second padded body **18** at respective first and second connecting sides **28**, **30**. The first connecting side **28** of the first padded body **16** includes a first step **32**. Likewise, the second connecting side **30** of the second padded body **18** includes a second step **34**. The first and second steps **32**, **34** interlock when the top surfaces **20**, **21** and the bottom surfaces **22**, **23** of the first padded body **16** and the second padded body **18** are in a co-planar position, as shown in FIG. **1**. Because of the stepped interlocking nature of the padded bodies **16**, **18**, the fall mat **10** may be configured to prevent rocks, roots, or other ground protrusions from penetrating into the crease up

to the hinge **26**. Thus, there may always be padding between the falling climber **12** and the ground **24** or any ground protrusions extending therefrom.

[0015] The first padded body **16** and the second padded body **18** may each be enveloped by an outer envelope **36** that includes a top cover **38**. The top cover **38** may comprise a different and more robust material than the rest of the outer envelope **36**. For example, the top cover **38** of the outer envelope **36** may comprise a thousand denier Cordura® nylon. This is meant to be exemplary, and more or less denier nylon may be utilized. Further, other embodiments may use other material other than nylon. The rest of the cover **38** may comprise a brazen resistant nylon of a lower denier count. Further, corners **40** of the outer envelope **36** may be reinforced by higher denier nylon, like the cover **38**. This may protect the fall mat **10** and increase the durability by reinforcing the areas that are likely to break down and wear out from use.

[0016] Shown in FIGS. **3-4**, within the outer envelope **36** of the first padded body **16** is a first top pad **42**, a first middle pad **44**, and a first bottom pad **46**. Likewise, within the outer envelope **36** of the second padded body **18** is a second top pad **43**, a second middle pad **45**, and a second bottom pad **47**. The top pads **42**, **43** the middle pads **44**, **45** and the bottom pads **46**, **47** may each be made of a foam material, for example. The top pads **42**, **43** and the bottom pads **46**, **47** may each be made of the same material in one embodiment. The top pads **42**, **43** and the bottom pads **46**, **47** for example, may be made from closed cell polyethylene foam. The top pads **42**, **43** and bottom pads **46**, **47** may be made from relatively hard foam having a high-density, for example over 2 pounds per cubic foot. In one embodiment, the density range may be between 1.8 pounds per cubic foot to 3.0 pounds per cubic foot. The high density of the top pads **42**, **43** may prevent a climber's foot from sinking into the fall-mat **10** and impacting protrusions from the ground **24** that may be felt on a fall. The middle pads **44**, **45** may be made from softer foam than the top pads **42**, **43** and the bottom pads **46**, **47**. For example, the middle pads **44**, **45** may be made from an open cell softer polyurethane foam. The softer foam of the middle pads **44**, **45** may be less dense. For example, the softer foam may have a density of 1.8 pounds per cubic feet. In one embodiment, the density range of the polyurethane foam may be between 1.0 pounds per cubic foot to 2.5 pounds per cubic foot. Further, the middle layer may have an ILD (impression load deflection) firmness between **40** and **80**.

[0017] The top pads **42**, **43** are thicker than the bottom pads **46**, **47** in the embodiment depicted. However, this embodiment is not limiting, and the thicknesses of the pads **42**, **43**, **44**, **45**, **46**, **47** may vary. For example, the top pads **42**, **43** may have a 1 inch thickness, the middle pads **44**, **45** may have a 3 inch thickness and the bottom pads **46**, **47** may have a 0.5 inch thickness in one embodiment. Further, the top pads **42**, **43** may have a thickness between 0.25 inches-1.5 inches, the middle pads **44**, **45** may have a thickness between 1 inch and 4 inches, and the bottom pads **46**, **47** may have a thickness between 0 inches and 1 inch.

[0018] It is also possible to change the arrangement of the layers. In one embodiment, for example, it is possible to add a thin layer of soft polyurethane foam above the top pads **42**, **43**. Another embodiment may include softer open cell polyurethane foam on top, with a middle pad of denser closed cell polyethelene foam, with a bottom pad of softer open cell polyurethane foam. Still another embodiment may include a top layer of closed cell polyethylene foam, a second layer of softer open cell polyurethane foam, with a third layer of closed cell polyethylene foam, a fourth layer of softer open cell polyurethane foam, and a fifth lowest layer of closed cell polyethylene foam. These options are meant to be exemplary, as many more embodiments that would be apparent to those skilled in the art are contemplated.

[0019] In other embodiments, the fall mat **10** may not include the bottom pads **46**, **47**. Instead the fall mat **10** may only include two layers. In this embodiment, the middle pads **44**, **45** may be referred to as a "lower pad," as there would be no other layer under the middle pads **44**, **45** and the middle pads **44**, **45** are still lower than the top pads **42**, **43**. Other embodiments are also contemplated having more than three layers. Any internal layering of material may be appropriate. Furthermore, the pads **42**, **43**, **44**, **45**, **46**, **47** may be made of other materials than foam. For example, the pads **42**, **43**, **44**, **45**, **46**, **47** may be made of any soft, elastic, resilient material that would cushion a falling bouldering rock climber, such as the climber **12**.

[0020] The pads **42**, **43**, **44**, **45**, **46**, **47** may be joined together within the outer envelope **36** by hook and loop fastener or the like. In other embodiments, the pads **42**, **43**, **44**, **45**, **46**, **47** may be joined together with a glue or epoxy. However, it is also possible that the pads **42**, **43**, **44**, **45**, **46**, **47** are not joined together with any adjoining means, but instead held into place by the tightness of the outer envelope **36** surrounding the pads **42**, **43**, **44**, **45**, **46**, **47**.

[0021] The hinge **26** of the fall mat **10** connects the first padded body **16** and the second padded body **18** at the top surfaces **20**, **21**. The connection at the top surfaces **20**, **21** may be optimal in order to prevent a climber from slipping between the crack if there was an opening between the first top surface **20** and the second top surface **21**. The hinge **26** may comprise a strip of material connecting the first and second padded bodies **16**, **18** along the length of the first and second connecting sides **28**, **30**. In one embodiment, the hinge **26** may include additional reinforcing nylon **48** stitched between the top surfaces **20**, **21** of the fall mat **10**. The reinforcing nylon **48** may run the entire length of the hinged seam. While the strip **48** may be nylon, other fabric materials are contemplated. Furthermore, the hinge **26** may be reinforced internally by a strip of polyester seatbelt webbing material **50**. The hinge **26** may allow the first and second padded bodies **16**, **18** to rotate with respect to each other. Thus, the hinge **26** may allow the fall mat **10** to achieve both an in-use co-planar configuration as shown in FIG. **1**, and a transportation and storage configuration as shown in FIG. **2**. In the transportation and storage configuration, the top surfaces **20**, **21** of both the first and second padded bodies **16**, **18** may be rotated so that they face each other. While the hinge **26** is shown between the top surfaces **20**, **21**, in other embodiments, the hinge **26** may be located between the bottom surfaces **22**, **23**. In this embodiment, first and second padded bodies **16**, **18** may be rotated such that the bottom surfaces **22**, **23** face each other.

[0022] In the in-use configuration, the fall mat **10** may be unfolded such that the first padded body **16** and the second padded body **18** are co-planar. In this position, the hinge **26** is located at or close to the middle of the top surfaces **20**, **21** facing the climber **12**. Beneath the hinge **26**, the first connecting side **28** and the second connecting side **30** come together such that a substantial portion or all of the first connecting side **28** and the second connecting side **30** abut. In the embodiment depicted in the Figures, the first connecting side

28 has an inverted step profile and the second connecting side **30** has a step profile. These steps **32**, **34** are correspondingly adjacent, abutting, and interlocking when the fall mat **10** is in the in-use, co-planar configuration.

[0023] The first inverted steps **32** is shown with substantially perpendicular edges, having a first vertical edge **52**, a second vertical edge **56**, and an intermediary horizontal edge **60** that is between the first and second vertical edges **52**, **56**. The second step **34** is shown also with substantially perpendicular edges, having a first vertical edge **54** corresponding with and abutting the first vertical edge **52**, a second vertical edge **58** corresponding with an abutting the second vertical edge **56**, and a horizontal edge **62** corresponding with and abutting the horizontal edge **60**.

[0024] As shown in FIGS. **3-4**, first vertical edges **52**, **54** extend a vertical distance that corresponds with the vertical height of the first and second top pads **42**, **43**. The second vertical edges **56**, **58** extend a vertical distance that corresponds with the vertical height of the first and second middle pads **44**, **45** and first and second bottom pads **46**, **47**. In other words the second top pad **43** of the second padded body **18** extends on the second connecting side a greater distance than the second middle pad **45** and the second bottom pad **47** to create the second step **34**. Likewise, the first middle pad **44** and the first bottom pad **46** extend on the first connecting side a greater distance than the first top pad **42** to create the first inverted step **32**.

[0025] The perpendicular edges of the steps **32**, **34** prevent roots, rocks or other ground protrusions from protruding into the space between the first connecting side **28** and the second connecting side **30** all the way to the top surface **20**. No matter what the size of the ground protrusion, at least the first and second top pads **42**, **43** will remain between the ground protrusion and the falling climber.

[0026] Referring now to FIG. **5**, another embodiment of a fall mat **100** is shown. The fall mat **100** may be similar to the fall mat **10**. Thus, the fall mat **100** may include a first padded body **116** and a second padded body **118**, and a first connecting side **128** and a second connecting side **130**. Internally, the fall mat **100** may include top pads, middle pads, and bottom pads (not shown) similar to the fall mat **10**. However, unlike the fall mat **10**, the first and second connecting sides **128**, **130** have a different stepped and interlocking shape. The first connecting side **128** is shown having a first vertical edge **152**, a first horizontal edge **154**, a second vertical edge **156**, a second horizontal edge **158**, and a third vertical edge **160**. Likewise, the second connecting side **130** is shown having a first vertical edge **153**, a first horizontal edge **155**, a second vertical edge **157**, a second horizontal edge **159**, and a third vertical edge **161**. The first vertical edges **152**, **153** are correspondingly abutting in the in-use position shown in the Figure. Likewise, the first horizontal edges **154**, **155** are correspondingly abutting, the second vertical edges **156**, **157** are correspondingly abutting, the second horizontal edges **158**, **159** are correspondingly abutting, and the third vertical edges **160**, **161** are correspondingly abutting. The first connecting side **128** is shown having a generally U-shaped stepped profile, while the second connecting side **130** is shown having a corresponding T-shaped profile that is configured to interlock with the first connecting side **128**. It should be understood that internal top pads (not shown) may correspond with the first vertical edges **152**, **153** similar to the embodiment described hereinabove. Likewise, internal middle pads (not shown) may correspond with the second vertical edges **156**, **157** and internal bottom pads (not shown) may correspond with the third vertical edges **160**, **161**.

[0027] Elements of the embodiments have been introduced with either the articles "a" or "an." The articles are intended to mean that there are one or more of the elements. The terms "including" and "having" and their derivatives are intended to be inclusive such that there may be additional elements other than the elements listed. The conjunction "or" when used with a list of at least two terms is intended to mean any term or combination of terms. The terms "first" and "second" are used to distinguish elements and are not used to denote a particular order.

[0028] While the invention has been described in detail in connection with only a limited number of embodiments, it should be readily understood that the invention is not limited to such disclosed embodiments. Rather, the invention can be modified to incorporate any number of variations, alterations, substitutions or equivalent arrangements not heretofore described, but which are commensurate with the spirit and scope of the invention. Additionally, while various embodiments of the invention have been described, it is to be understood that aspects of the invention may include only some of the described embodiments. Accordingly, the invention is not to be seen as limited by the foregoing description, but is only limited by the scope of the appended claims.

I claim:

1. A fall mat comprising:

a first padded body including a first top surface, a first bottom surface, and a first connecting side including a first step;

a second padded body including a second top surface, a second bottom surface, and a second connecting side including a second step; and

a hinge connecting the first padded body with the second padded body such that the second padded body is configured to rotate about the first padded body, wherein the first step and the second step interlock when the first top surface and the second top surface of the first padded body and the second padded body are in a co-planar position.

2. The fall mat of claim **1**, wherein the first padded body includes a first top pad, a first middle pad, and a first bottom pad, wherein the second padded body includes a second top pad, a second middle pad, and a second bottom pad.

3. The fall mat of claim **2**, wherein the first and second top and bottom pads are made of a denser material than the first and second middle pads.

4. The fall mat of claim **2**, wherein the first top pad of the first padded body extends on the first connecting side a greater distance than the first middle pad and the first bottom pad to create the first step, and wherein the second bottom pad and second middle pad of the second padded body extends on the second connecting side a greater distance than the second top pad to create the second step.

5. The fall mat of claim **1**, wherein the hinge is a length of material that connects the first and second top surfaces of the first padded body and the second padded body.

6. The fall mat of claim **5**, wherein the first padded body is enclosed by a first envelope and where the second padded body is enclosed by a second envelope, the first and second envelopes are connected at the hinge.

7. The fall mat of claim **6**, wherein a length of polyester seatbelt webbing material is located within the first envelope

and the second envelope under the hinge, the length of polyester seatbelt webbing material configured to reinforce the hinge.

8. The fall mat of claim **1**, wherein the first top surface of the first padded body is rectangular in shape, and wherein the second top surface of the second padded body is rectangular in shape.

9. The fall mat of claim **1**, wherein the first step extends along the entire length of the first connecting side, and wherein the second step extends along the entire length of the second connecting side.

10. A fall mat comprising:

a first padded body having a first top surface and a first bottom surface, and a first connecting side, wherein a cross section of the first connecting side has an inverted step profile;

a second padded body having a second top surface and a second bottom surface, and a second connecting side, wherein a cross section of the second connecting side has a step profile that corresponds to the inverted step profile of the first connecting side of the first padded body such that a substantial portion of the first connecting side and the second connecting side abut; and

a hinge connecting the first padded body to the second padded body such that the second padded body is configured to rotate about the first padded body.

11. The fall mat of claim **10**, wherein the first padded body includes a first top pad, a first middle pad, and a first bottom pad, wherein the second padded body includes a second top pad, a second middle pad, and a second bottom pad.

12. The fall mat of claim **11**, wherein the first and second top and bottom pads are made of a denser material than the first and second middle pads.

13. The fall mat of claim **12**, wherein the first top pad of the first padded body extends on the first connecting side a greater distance than the first bottom pad and the first middle pad to create first step, and wherein the second bottom pad and second middle pad of the second padded body extends on the second connecting side a greater distance than the second top pad to create the second step.

14. The fall mat of claim **10**, wherein the hinge is a length of material that connects the top surfaces of the first padded body and the second padded body.

15. The fall mat of claim **14**, wherein the first padded body is enclosed by a first envelope and where the second padded body is enclosed by a second envelope, the first and second envelopes are connected at the hinge.

16. The fall mat of claim **15**, wherein a length of polyester seatbelt webbing material is located within the first envelope and the second envelope under the hinge, the length of polyester seatbelt webbing material configured to reinforce the hinge.

17. The fall mat of claim **10**, wherein the first top surface of the first padded body is rectangular in shape, and wherein the second top surface of the second padded body is rectangular in shape.

18. The fall mat of claim **10**, wherein the inverted step profile extends along the entire length of the first connecting side, and wherein the step profile extends along the entire length of the second connecting side.

19. A fall mat comprising:

a first padded body having a first outer envelope surrounding a first top pad and a first lower pad, the first lower pad extending on a first connecting side a greater distance than the first top pad to create a first step; and

a second padded body having a second outer envelope surrounding a second top pad and a second lower pad, the second top pad extending on a second connecting side a greater distance than the second lower pad to create a second step;

wherein the first outer envelope and the second outer envelope are connected between the first connecting side and the second connecting side such that the first padded body is rotatable about the second padded body.

20. The fall mat of claim **19**, wherein the first padded body includes a first top surface and a first bottom surface and wherein the second padded body includes a second top surface and a second bottom surface, and wherein the first step is an inverted step, and wherein the first step and the second step interlock when first and second top and bottom surfaces of the first padded body and the second padded body are co-planar.

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