(12) STANDARD PATENT APPLICATION (11) Application No. **AU 2012201690 A1**
(19) AUSTRALIAN PATENT OFFICE

(54) Title
Exercise mat

(51) International Patent Classification(s)
A47G 27/02 (2006.01) ***B32B 27/40*** (2006.01)
A63B 26/00 (2006.01)

(21) Application No: **2012201690** (22) Date of Filing: **2012.03.22**

(30) Priority Data

(31) Number	(32) Date	(33) Country
61/467,233	**2011.03.24**	**US**

(43) Publication Date: **2012.10.11**
(43) Publication Journal Date: **2012.10.11**

(71) Applicant(s)
lululemon athletica canada inc.

(72) Inventor(s)
Dandapure, Yogendra V.;Boghosian, Glenn Malcolm;Kao, Chen I.

(74) Agent / Attorney
A J PARK, Level 11 60 Marcus Clarke Street, Canberra, ACT, 2601

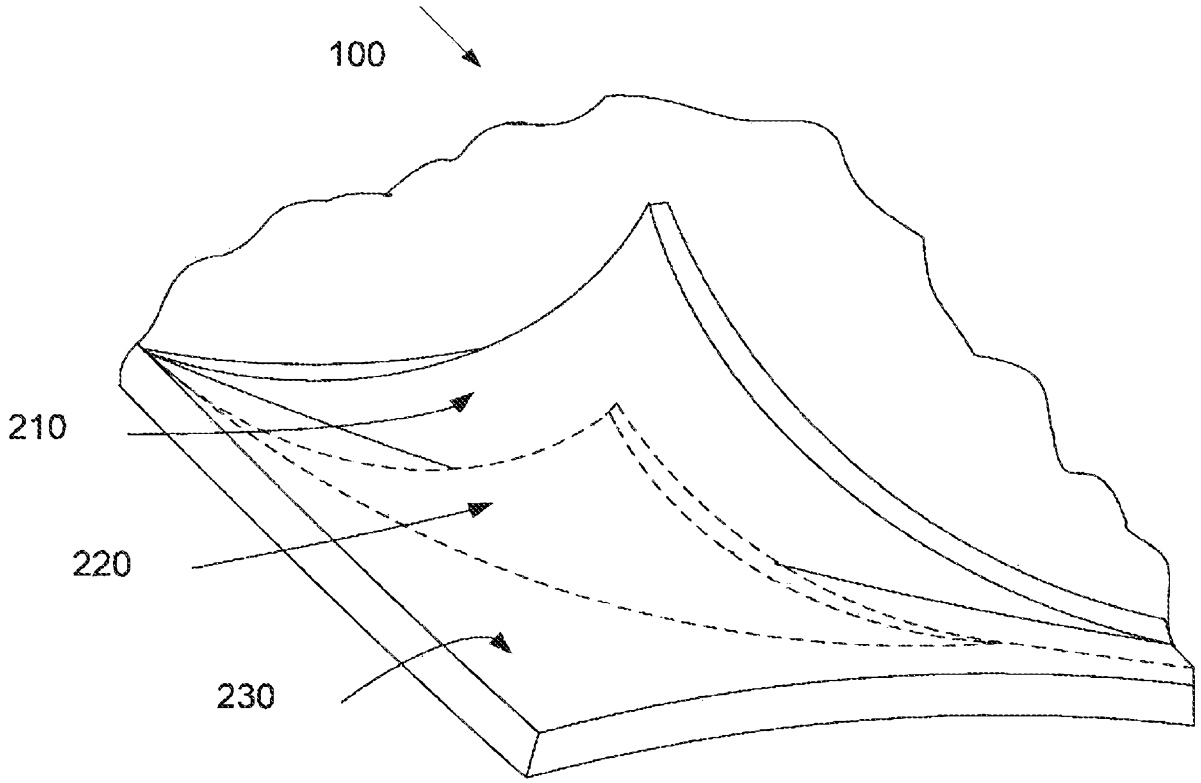
2012201690 22 Mar 2012

ABSTRACT

An exercise mat is disclosed comprising a top layer, the top layer comprising polyurethane; and a bottom layer adjacent to the top layer, the bottom layer comprising a thermoplastic elastomer.

2012201690 22 Mar 2012

FIGURE 2



2012201690 22 Mar 2012

Regulation 3.2

AUSTRALIA
PATENTS ACT, 1990

COMPLETE SPECIFICATION

FOR A STANDARD PATENT

ORIGINAL

Name of Applicant:	lululemon athletica canada inc.
Actual Inventors:	Yogendra V. DANDAPURE and Glenn Malcolm BOGHOSIAN
Address for service in Australia:	A J PARK, Level 11, 60 Marcus Clarke Street, Canberra ACT 2601, Australia
Invention Title:	EXERCISE MAT

The following statement is a full description of this invention, including the best method of performing it known to us.

TITLE

EXERCISE MAT

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is based on and derives the benefit of the filing date of United States Provisional Patent Application No. 61/467,233, filed March 24, 2011. The entire content of this application is herein incorporated by reference in its entirety.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1A depicts a top-down view of an exercise mat, according to an embodiment of the present invention.

FIG. 1B depicts a side view of an exercise mat, according to an embodiment of the present invention.

FIGS. 2-3 depict embodiments of an exercise mat with three structural layers, according to one embodiment of the present invention.

DESCRIPTION OF EMBODIMENTS OF THE INVENTION

FIGS. 1A and 1B depict an exercise mat 100, according to an embodiment of the present invention. The exercise mat 100 may be placed on a flat surface by a user to provide cushioning, grip, support, or stability, or any combination thereof, allowing the user to more easily and effectively perform yoga or other exercises. The exercise mat 100 can comprise several layers of varying materials and structures disposed atop one another. FIG. 1A is a top view of the exercise mat 100. This view depicts a rectangular exercise mat 100 of sufficient size to support a typical user's body through a wide range of yoga positions. Example sizes may include, but are not limited to, widths of 26 inches to 30 inches and lengths of 70 inches

2012201690 22 Mar 2012

to 78 inches. Although a rectangular exercise mat 100 is shown in FIG. 1A, it should be noted that the exercise mat 100 may have other shapes, such as a square, circle, or oval, or any other shape or design.

FIG. 1B is a side view of the exercise mat 100. As illustrated in FIG. 1B, the thickness of the exercise mat 100 can be significantly less than its length and width. Example thicknesses may include, but are not limited to, thicknesses of 2.0 mm to 7.0 mm.

FIG. 2 is a view of an exercise mat 100 with three layers, according to one embodiment of the present invention. The three layers are separated in FIG. 2 to illustrate their arrangement. It should be noted that although three layers are explained with respect to FIG. 2, in some embodiments only one or two of the layers may be used. In addition, in some embodiments, additional layers may be added to the one, two, or three layers that are pictured.

The exercise mat 100 can comprise a top layer 210. In some embodiments, the top layer 210 can have an open cell structure. This structure can allow the top layer 210 to absorb or wick away moisture, keeping the top layer 210 dry during exercise. The top layer 210 may provide a level of friction that gives sufficient grip (e.g., in wet and/or dry conditions) to a user without restricting the user's movement. The top layer 10 may be made of: polyurethane; another suitable flexible material such as a woven or non woven polyester/polyurethane blend fabric made with nano fibers; or micro fibers with wicking properties; thermoplastic elastomer (TPE); natural rubber; synthetic rubber; or any combination thereof. The top layer 210 may also be treated with an antimicrobial agent. Examples of antimicrobial agents include silver based antimicrobial or 3-trimethoxy silyl propyl dimethyl octadecyl ammonium chloride, but other antimicrobial agents may also be employed. (It should be noted that any layer of any mat described herein may also be treated with an antimicrobial agent.) The top layer may also be made of a suitable material which

2012201690 22 Mar 2012

can help the exercise mat 100 hold its shape, provide cushioning, provide flexibility, or provide support, or any combination thereof; or a material that bonds well with other exercise mat 100 layers; or any combination thereof. In one embodiment, the top layer 210 may be 0.35 to 0.95 millimeters thick, although this may vary in other embodiments to achieve different flexibility or cushioning requirements for the exercise mat 100.

The exercise mat 100 of the embodiment in FIG. 2 can have a middle layer 220. The middle layer 220 can provide structural integrity and cushioning for the exercise mat 100. The middle layer 220 may be made of, for example: a non-woven polyester cotton blended fabric; a 50% polyester 50% cotton blend; a woven or non woven fabric made of either 100% cotton or 100% polyester or a blend of cotton and polyester; thermoplastic elastomers; a polyvinyl chloride; polyurethane; a foam material made of natural rubber, synthetic rubber, or nylon spandex, or any combination thereof; a suitable material which can help the exercise mat 100 hold its shape, provide cushioning, provide flexibility, or provide support, or any combination thereof; or a material that bonds well with other exercise mat 100 layers; or any combination thereof. In some embodiments of the invention, the middle layer 220 may be 0.2-2.0 millimeters thick, although this may vary in other embodiments with different flexibility or cushioning requirements for the exercise mat 100.

The exercise mat 100 of the embodiment in FIG. 2 can also have a bottom layer 230. This bottom layer 230 can provide friction and/or traction (e.g., in wet and/or dry conditions), so that when it is placed in contact with a floor by a user, the exercise mat 100 does not slide when the user utilizes the exercise mat 100 (e.g., for yoga or another exercise). The bottom layer 230 can also provide cushioning for a user of the exercise mat 100. In some embodiments, the bottom layer 230 may be provided with a textured surface to enhance grip. The bottom layer 230 may be made of a thermoplastic elastomer, polyvinyl chloride, polyurethane, natural rubber, synthetic rubber or another material which provides cushioning

2012201690 22 Mar 2012

and/or grip, or any combination thereof. In other embodiments, the bottom layer 230 may be made of rubber, including natural rubber, synthetic rubber, or a blend of the two, or mix of natural rubber, synthetic rubber and thermoplastic elastomers as well as the above-mentioned materials, or any combination thereof. In some embodiments, the bottom layer may also be made of a suitable material which can help the exercise mat 100 hold its shape, provide cushioning, provide flexibility, provide wear and tear resistance, or provide support, or any combination thereof; or a material that bonds well with other exercise mat 100 layers; or any combination thereof. The bottom layer 230 may also be perforated (e.g., with punched holes as shown in FIGURE 3) to allow moisture to pass through and for quick drying of exercise mat 100. (It should be noted that any layers described herein may also be perforated.) In one embodiment, the bottom layer 230 may be 1.5 to 5.5 millimeters thick, although this may vary in other embodiments with different flexibility or cushioning requirements for the exercise mat 100.

Note that the terms "top layer" and "bottom layer" in the embodiments above are used for ease of explanation only. Either the top layer 210 or the bottom layer 230 may be placed in contact with a floor by a user, with the opposite side forming an exercise surface for the user. This may allow a user to use different layer characteristics to enhance different exercises and/or to suit personal preferences. For example, a user may use the top layer 210, which may have moisture absorbing and/or antimicrobial properties, as an exercise surface when the user anticipates sweating. The user may use the bottom layer 230, which may have high friction and/or cushioning properties, as an exercise surface when the user does not anticipate sweating.

The various layers described above may be bonded to one another using any suitable bonding technique. In one embodiment, the layers may have thermoplastic bonding properties that cause adjacent layers to bond with one another when heated. In one example

2012201690 22 Mar 2012

heat bonding process, liquid polyurethane may be cured on non woven fabric and rubber may be vulcanized on the other side of the non woven fabric at or near, for example, 180 degrees Celsius. In another bonding process, liquid polyurethane may be cured on non woven fabric and a thermoplastic elastomer may be glued to the other side of the non woven fabric with a non-toluene lamination adhesive (e.g., a non-toluene lamination adhesive, such as but not limited to 635NT) and/or other suitable adhesive. Alternatively, layers may be bonded using other adhesives and/or mechanical connections. In addition, any combination of these methods or any other method may be utilized.

In some embodiments, the exercise mat 100 can also be made by preparing a top layer and a bottom layer. The top layer is made by pouring a liquid form of polyurethane into a mold. The bottom layer may be made by passing a thermoplastic elastomer through a calendaring process (e.g., to be mixed and/or flattened) and/or a vulcanization process. The top layer and the bottom layer may then be passed through an oven so the thermoplastic elastomer laminates to the polyurethane to make the mat material. The mat material may then be rolled and/or cut into desired shape(s). The mat material and/or exercise mat 100 may be aired for a certain time period (e.g., to remove the rubber smell).

In some embodiments, the liquid form of polyurethane may be poured onto a middle layer comprising fabric (e.g., woven, non-woven), and the top layer, the middle layer, and the bottom layer may be passed through the oven so the thermoplastic elastomer laminates to the fabric.

Various Embodiments

The following embodiments are some of many embodiments that can be utilized.

In some embodiments, the exercise mat can comprise: at least one top layer, the at least one top layer comprising polyurethane; and at least one bottom layer adjacent to the at

2012201690 22 Mar 2012

least one top layer, the at least one bottom layer comprising at least one thermoplastic elastomer. The exercise mat can also further comprise at least one middle layer disposed between the at least one top layer and the at least one bottom layer. Additionally, the at least one top layer of the exercise mat can also comprise: polyurethane; texture; at least one antimicrobial agent; or at least one open cell structure; or any combination thereof. The at least one middle layer of the exercise mat can also comprise: polyurethane; polyester nano fibers; polyester microfibers; non-woven fabric; at least one open cell structure; rubber foam material; woven fabric; cotton material; polyester material; at least one thermoplastic elastomer; polyvinyl chloride material; perforations; or at least one antimicrobial agent; or any combination thereof. The at least one bottom layer of the exercise mat can also comprise: texture; perforations; synthetic rubber; natural rubber; a polynivyl chloride, plyurethane, or at least one antimicrobial agent; or any combination thereof. Additionally, the at least top one layer is operable as an exercise surface and as a floor contact surface; and/or the at least one bottom layer is operable as an exercise surface and as a floor contact surface.

In other embodiments, the exercise mat can comprise: at least one top layer made of polyurethane and having at least one open cell structure, wherein the at least one top layer comprises at least one antimicrobial agent; at least one perforated bottom layer comprising at least one thermoplastic elastomer; and at least one middle layer comprising at least one woven polyester cotton blended fabric disposed between the at least one top layer and the at least one bottom layer. The at least one middle layer can also comprise: polyurethane; polyester nano fibers; polyester microfibers; non-woven fabric; woven fabric; at least one open cell structure; rubber foam material; cotton material; polyester material; cotton polyester blend material; at least one thermoplastic elastomer; polyvinyl chloride material; perforations; or at least one antimicrobial agent; or any combination thereof. The at least one

2012201690 22 Mar 2012

bottom layer can comprises: texture; synthetic rubber; natural rubber; at least one antimicrobial agent; or any combination thereof. Additionally, the at least top one layer can be operable as an exercise surface and as a floor contact surface; and/or the at least one bottom layer can be operable as an exercise surface and as a floor contact surface.

In other embodiments, the exercise mat can comprise: at least one top layer, the at least one top layer comprising polyurethane; and at least one bottom layer adjacent to the at least one top layer, the at least one bottom layer comprising at least one synthetic rubber and at least one natural rubber. The exercise mat can further comprise at least one middle layer disposed between the at least one top layer and the at least one bottom layer. The at least one top layer can also comprise: at least one antimicrobial agent; or at least one open cell structure; or any combination thereof. The at least one middle layer can also comprise: polyurethane; polyester nano fibers; polyester microfibers; non-woven fabric; at least one open cell structure; rubber foam material; woven fabric; cotton material; polyester material; at least one thermoplastic elastomer; polyvinyl chloride material; perforations; or at least one antimicrobial agent; or any combination thereof. The at least one bottom layer can also comprise: texture; perforations; synthetic rubber; natural rubber; or at least one antimicrobial agent; or any combination thereof. The at least one top layer can be operable as an exercise surface and as a floor contact surface; and/or the at least one bottom layer can be operable as an exercise surface and as a floor contact surface.

In other embodiments, the exercise mat can comprise: at least one top layer having at least one open cell structure, wherein the at least one top layer comprises at least one antimicrobial agent; at least one perforated bottom layer comprising at least one thermoplastic elastomer; and at least one middle layer comprising at least one woven polyester cotton blended fabric disposed between the at least one top layer and the at least one bottom layer. The at least one middle layer can also comprise: polyurethane; polyester

nano fibers; polyester microfibers; non-woven fabric; at least one open cell structure; rubber foam material; at least one thermoplastic elastomer; polyvinyl chloride material; perforations; or at least one antimicrobial agent; or any combination thereof. The at least one bottom layer can also comprise: texture; synthetic rubber; natural rubber; at least one antimicrobial agent; or any combination thereof. The at least top one layer can be operable as an exercise surface and as a floor contact surface; and/or the at least one bottom layer can be operable as an exercise surface and as a floor contact surface.

In some embodiments, a method for making an exercise mat can comprise: pouring at least one polyurethane layer; pouring at least one layer comprising synthetic rubber and natural rubber; and utilizing heat bonding to connect the at least one polyurethane layer and the at least one layer comprising synthetic rubber and natural rubber. The heat bonding can be done utilizing a continuous laminating process. Glue may not need to be utilized to connect the at least one polyurethane layer and the at least one layer comprising synthetic rubber and natural rubber. The at least one polyurethane layer can be cured on one side of non-woven fabric and the at least one layer comprising synthetic rubber and natural rubber can be vulcanized on an opposite side of the non-woven fabric. The vulcanization can be done at or near 180 Celsius.

In other embodiments, a method for making an exercise mat can comprise: pouring at least one polyurethane layer; pouring at least one thermoplastic layer; and utilizing at least one laminate to connect the at least one polyurethane layer and the at least one thermoplastic layer. The at least one laminate can be at least one non-toluene lamination adhesive. The at least one polyurethane layer can be cured on one side of non-woven fabric and the at least one thermoplastic layer can be laminated on an opposite side of the non-woven fabric.

While various embodiments have been described above, it should be understood that they have been presented by way of example, and not limitation. It will be apparent to

2012201690 22 Mar 2012

persons skilled in the relevant art(s) that various changes in form and detail can be made therein without departing from the spirit and scope. In fact, after reading the above description, it will be apparent to one skilled in the relevant art(s) how to implement alternative embodiments. Thus, the present embodiments should not be limited by any of the above-described embodiments.

In addition, it should be understood that any figures which highlight the functionality and advantages, are presented for example purposes only. The disclosed methodology and system are each sufficiently flexible and configurable, such that it may be utilized in ways other than that shown.

Although the term "at least one" may often be used in the specification, claims and drawings, Applicant notes that the terms "a", "an", "the", "said", etc. also signify "at least one" or "the at least one" in the specification, claims and drawings.

It is the applicant's intent that only claims that include the express language "means for" or "step for" be interpreted under 35 U.S.C. 112, paragraph 6. Claims that do not expressly include the phrase "means for" or "step for" are not to be interpreted under 35 U.S.C. 112, paragraph 6.

The term "comprising" as used in this specification and claims means "consisting at least in part of". When interpreting statements in this specification and claims which include "comprising", other features besides the features prefaced by this term in each statement can also be present. Related terms such as "comprise" and "comprised" are to be interpreted in a similar manner.

In this specification, where reference has been made to patent specifications, other external documents, or other sources of information, this is generally for the purpose of providing a context for discussing the features of the invention. Unless specifically stated otherwise, reference to such external documents is not to be construed as an

2012201690 22 Mar 2012

admission that such documents, or such sources of information, in any jurisdiction, are prior art, or form any part of the common general knowledge in the art.

22 Mar 2012
2012201690

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. An exercise mat comprising:

at least one top layer, the at least one top layer comprising polyurethane; and

at least one bottom layer adjacent to the at least one top layer, the at least one bottom layer comprising at least one thermoplastic elastomer.

2. The exercise mat of claim 1, further comprising at least one middle layer disposed between the at least one top layer and the at least one bottom layer.

3. The exercise mat of claim 1, wherein the at least one top layer also comprises:

polyurethane;

texture;

at least one antimicrobial agent; or

at least one open cell structure; or

any combination thereof.

4. The exercise mat of claim 2, wherein the at least one middle layer comprises:

polyurethane;

polyester nano fibers;

polyester microfibers;

non-woven fabric;

at least one open cell structure;

rubber foam material;

woven fabric;

cotton material;

polyester material;

at least one thermoplastic elastomer;

polyvinyl chloride material;

2012201690 22 Mar 2012

perforations; or

at least one antimicrobial agent; or

any combination thereof.

5. The exercise mat of claim 1, wherein the at least one bottom layer comprises:

texture;

perforations;

synthetic rubber;

natural rubber; or

at least one antimicrobial agent; or

any combination thereof.

6. The exercise mat of claim 1, wherein:

the at least top one layer is operable as an exercise surface and as a floor contact surface; and/or

the at least one bottom layer is operable as an exercise surface and as a floor contact surface.

7. An exercise mat comprising:

at least one top layer made of polyurethane and having at least one open cell structure, wherein the at least one top layer comprises at least one antimicrobial agent;

at least one perforated bottom layer comprising at least one thermoplastic elastomer; and

at least one middle layer comprising at least one woven polyester cotton blended fabric disposed between the at least one top layer and the at least one bottom layer.

8. The exercise mat of claim 7, wherein the at least one middle layer comprises:

polyurethane;

polyester nano fibers;

2012201690 22 Mar 2012

polyester microfibers;

non-woven fabric;

woven fabric;

at least one open cell structure;

rubber foam material;

cotton material;

polyester material;

cotton polyester blend material;

at least one thermoplastic elastomer;

polyvinyl chloride material;

perforations; or

at least one antimicrobial agent; or

any combination thereof.

9. The exercise mat of claim 7, wherein the at least one bottom layer comprises:

texture;

synthetic rubber;

natural rubber;

at least one antimicrobial agent; or

any combination thereof.

10. The exercise mat of claim 7, wherein:

the at least top one layer is operable as an exercise surface and as a floor contact surface; and/or

the at least one bottom layer is operable as an exercise surface and as a floor contact surface.

11. An exercise mat comprising:

2012201690 22 Mar 2012

at least one top layer, the at least one top layer comprising polyurethane; and

at least one bottom layer adjacent to the at least one top layer, the at least one bottom layer comprising at least one synthetic rubber and at least one natural rubber.

12. The exercise mat of claim 11, further comprising at least one middle layer disposed between the at least one top layer and the at least one bottom layer.

13. The exercise mat of claim 1, wherein the at least one top layer also comprises:

at least one antimicrobial agent; or

at least one open cell structure; or

any combination thereof.

14. The exercise mat of claim 12, wherein the at least one middle layer comprises:

polyurethane;

polyester nano fibers;

polyester microfibers;

non-woven fabric;

at least one open cell structure;

rubber foam material;

woven fabric;

cotton material;

polyester material;

at least one thermoplastic elastomer;

polyvinyl chloride material;

perforations; or

at least one antimicrobial agent; or

any combination thereof.

15. The exercise mat of claim 1, wherein the at least one bottom layer comprises:

2012201690 22 Mar 2012

texture;

perforations;

synthetic rubber;

natural rubber; or

at least one antimicrobial agent; or

any combination thereof.

16. The exercise mat of claim 1, wherein:

the at least top one layer is operable as an exercise surface and as a floor contact surface; and/or

the at least one bottom layer is operable as an exercise surface and as a floor contact surface.

17. An exercise mat comprising:

at least one top layer having at least one open cell structure, wherein the at least one top layer comprises at least one antimicrobial agent;

at least one perforated bottom layer comprising at least one thermoplastic elastomer; and

at least one middle layer comprising at least one woven polyester cotton blended fabric disposed between the at least one top layer and the at least one bottom layer.

18. The exercise mat of claim 17, wherein the at least one middle layer comprises:

polyurethane;

polyester nano fibers;

polyester microfibers;

non-woven fabric;

at least one open cell structure;

rubber foam material;

2012201690 22 Mar 2012

at least one thermoplastic elastomer;

polyvinyl chloride material;

perforations; or

at least one antimicrobial agent; or

any combination thereof.

19. The exercise mat of claim 17, wherein the at least one bottom layer comprises:

texture;

synthetic rubber;

natural rubber;

at least one antimicrobial agent; or

any combination thereof.

20. The exercise mat of claim 17, wherein:

the at least top one layer is operable as an exercise surface and as a floor contact surface; and/or

the at least one bottom layer is operable as an exercise surface and as a floor contact surface.

21. A method for making an exercise mat, comprising:

pouring at least one polyurethane layer;

pouring at least one layer comprising synthetic rubber and natural rubber; and

utilizing heat bonding to connect the at least one polyurethane layer and the at least one layer comprising synthetic rubber and natural rubber.

22. The method of Claim 21, wherein the heat bonding is done utilizing a continuous laminating process.

23. The method of Claim 21, wherein glue is not utilized to connect the at least one polyurethane layer and the at least one layer comprising synthetic rubber and natural rubber.

24. The method of Claim 21, wherein the at least one polyurethane layer is cured on one side of non-woven fabric and the at least one layer comprising synthetic rubber and natural rubber is vulcanized on an opposite side of the non-woven fabric.

25. The method of Claim 24, wherein the vulcanization is done at or near 180 Celsius.

26. A method for making an exercise mat, comprising:

pouring at least one polyurethane layer;

pouring at least one thermoplastic layer; and

utilizing at least one laminate to connect the at least one polyurethane layer and the at least one thermoplastic layer.

27. The method of Claim 26, wherein the at least one laminate is at least one non-toluene lamination adhesive.

28. The method of Claim 26, wherein the at least one polyurethane layer is cured on one side of non-woven fabric and the at least one thermoplastic layer is laminated on an opposite side of the non-woven fabric.

29. A method of making mat material, comprising:

preparing at least one top layer comprising `at least one liquid form of polyurethane, the at least one liquid form of polyurethane being poured into at least one mold;

preparing at least one bottom layer comprising at least one thermoplastic elastomer, the at least one thermoplastic elastomer being passed through at least one calendaring process; and

preparing the mat material by passing the at least one top layer and the at least one bottom layer through at least one oven so the at least one thermoplastic elastomer laminates to the at least one polyurethane.

30. The method of Claim 29, wherein the at least one liquid form of polyurethane is poured onto at least one middle layer comprising fabric, and wherein the at least one top

2012201690 22 Mar 2012

layer, the at least one middle layer, and the at least one bottom layer are passed through the at least one oven so the at least one thermoplastic elastomer laminate to the fabric to make the mat material.

31. The method of Claim 29, wherein the fabric is woven or non-woven.

32. The method of Claim 29, wherein the at least one thermoplastic elastomer is passed through the at least one calendaring process in order to be mixed and/or flattened.

33. The method of Claim 29, wherein the thermoplastic elastomer vulcanizes.

2012201690 22 Mar 2012

FIGURE 1A

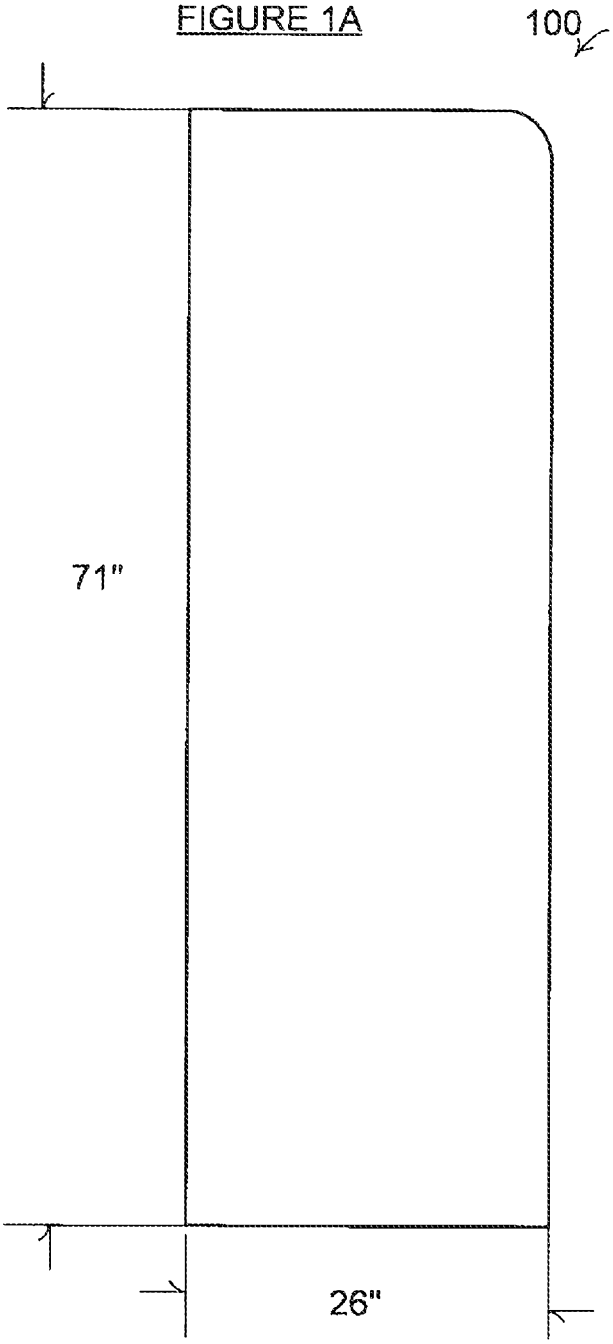
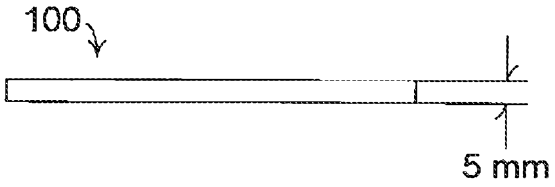
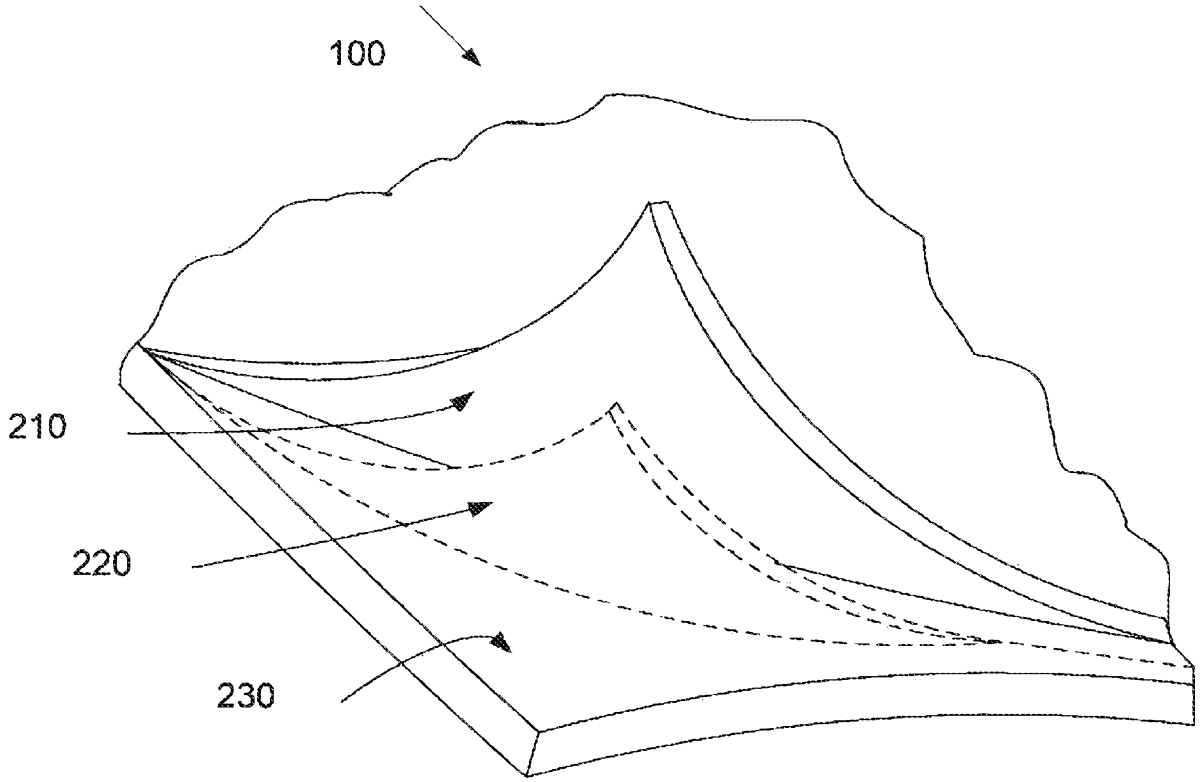


FIGURE 1B



2012201690 22 Mar 2012

FIGURE 2



2012201690 22 Mar 2012

FIGURE 3