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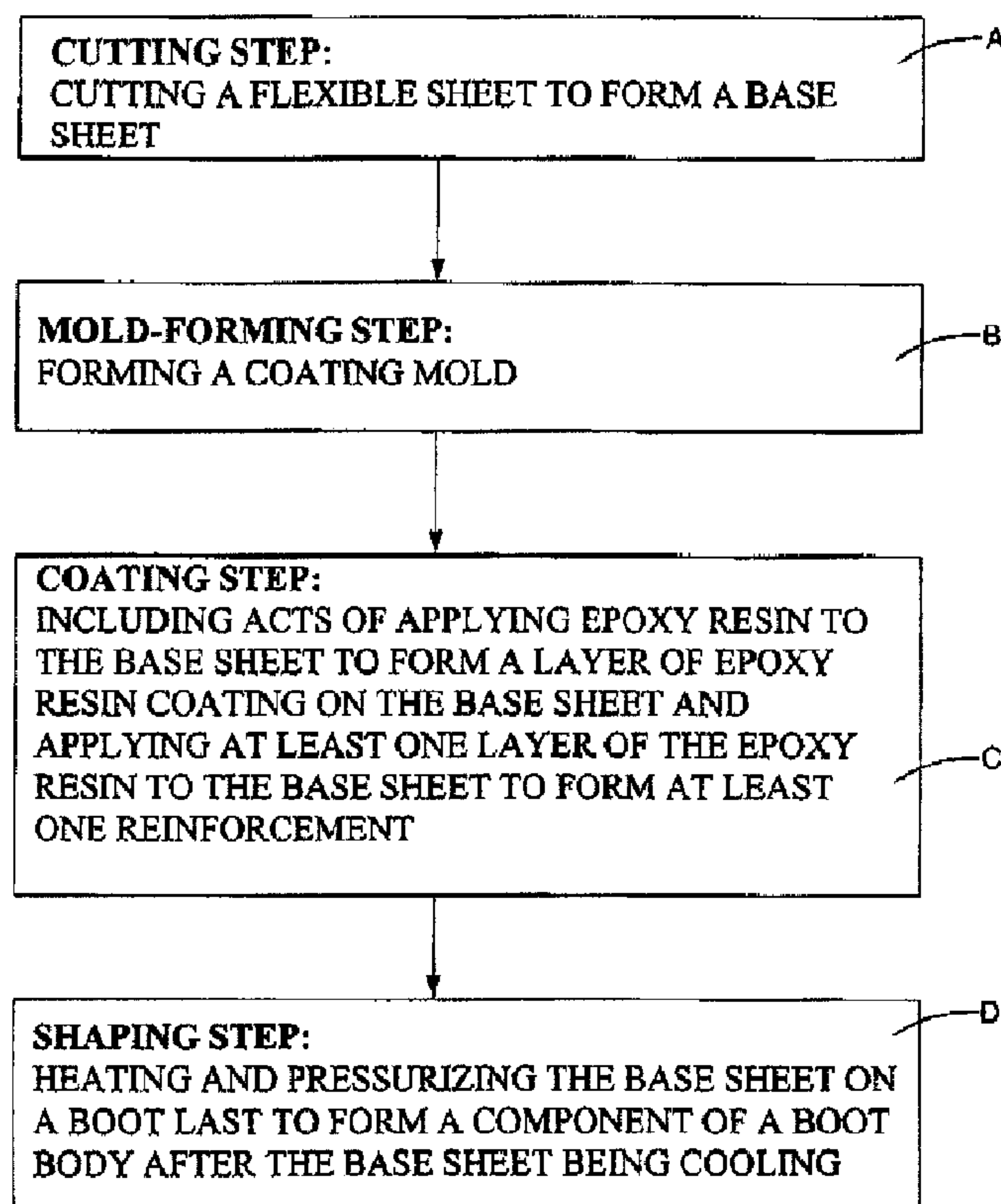
(72) Inventeur/Inventor:  
YANG, HSIN-CHIH, TW

(73) Propriétaire/Owner:  
SAKURAI SPORTS MFG. CO., LTD., TW

(74) Agent: BATTISON WILLIAMS DUPUIS

(54) Titre : METHODE DE FABRICATION D'UN ELEMENT DE CORPS DE BOTTINE A PATIN

(54) Title: METHOD FOR MAKING A COMPONENT OF A BOOT BODY FOR A SKATING SHOE



(57) Abrégé/Abstract:

A method for making a component of boot body for a skating shoe includes a cutting step (A) of cutting a flexible sheet to form a base sheet (10), a mold-making step (B) of forming a coating mold (40) with at least one coating slot (41), a coating step (C) of applying epoxy resin to the base sheet (10) to form a layer of epoxy resin coating (23) and applying the epoxy resin to the base sheet (10) through the at least one coating slot (41) to integrally form at least one reinforcement (20) on the base sheet (10) and a shaping step (D) of heating and pressurizing the base sheet (10) to form a component of a boot body. The at least one reinforcement (20) provides improved hardness and impact strength to the boot body.

1     **METHOD FOR MAKING A COMPONENT OF A BOOT BODY FOR A**  
2                                   **SKATING SHOE**

3     **ABSTRACT**

4             A method for making a component of boot body for a skating shoe  
5 includes a cutting step (A) of cutting a flexible sheet to form a base sheet (10), a  
6 mold-making step (B) of forming a coating mold (40) with at least one coating  
7 slot (41), a coating step (C) of applying epoxy resin to the base sheet (10) to form  
8 a layer of epoxy resin coating (23) and applying the epoxy resin to the base sheet  
9 (10) through the at least one coating slot (41) to integrally form at least one  
10 reinforcement (20) on the base sheet (10) and a shaping step (D) of heating and  
11 pressurizing the base sheet (10) to form a component of a boot body. The at least  
12 one reinforcement (20) provides improved hardness and impact strength to the  
13 boot body.

1 BACKGROUND OF THE INVENTION

2 1. Field of the Invention

3 The present invention relates to a method for making a component of a  
4 boot body for a skating shoe, and more particularly to a method for making a  
5 component of a boot body for a skating shoe to reinforce the hardness and impact  
6 strength of the boot body and to lighten the weight of the boot body.

7 2. Description of Related Art

8 At present, a conventional method of making a boot body of a skating  
9 shoe, such as a roller skate, an ice skate or the like, uses leather, polyvinyl  
10 chloride (PVC), hard polyurethane elastomer (PU) or textile cloth to  
11 substantially form the boot body with stitches. To reinforce the hardness of the  
12 boot body, reinforcements, such as chemical sheets, cabretas or leathers are  
13 attached to a lining that is put inside the boot body. Then, a tongue is joined to the  
14 boot body with stitches and a sole is adhered to the boot body. Further, wheels or  
15 a blade is mounted on the sole to form a skating shoe.

16 Another conventional method of making a boot body uses injection  
17 molding to form the boot body. Likewise, reinforcements, such as chemical  
18 sheets, cabretas or leathers are attached to a lining that is put inside the boot body  
19 to reinforce the hardness of the boot body. Then, wheels or a blade is mounted on  
20 the boot body to form a skating shoe.

21 The skating shoe is used in speed skating, figure skating or hockey  
22 games so the skating shoe must have a light weight, a high hardness and a high  
23 impact strength to protect a foot of a user from injury and to help the user to have  
24 an excellent performance. However, the reinforcements attached to the lining do

1 not join with the boot body, so the reinforcements directly press the foot to make  
2 the user uncomfortable. Further, the reinforcements increase the weight of the  
3 skating shoe and influence the performance of the user.

#### 4 SUMMARY OF THE INVENTION

5 The primary objective of the present invention is to provide a method for  
6 making a component of a boot body of a skating shoe to overcome the  
7 aforementioned problems.

8 The method for making a component of a boot body of a skating shoe  
9 comprises a cutting step, a mold-making step, a coating step and a shaping step.

10 The cutting step cuts a flexible sheet to form a base sheet with at least  
11 one predetermined coating area. The mold-making step forms a coating mold  
12 with at least one coating slot corresponding to the at least one predetermined  
13 coating area of the base sheet.

14 The coating step applies epoxy resin to the base sheet to form a layer of  
15 epoxy resin coating on the base sheet, aligns the at least one coating slot of the  
16 coating mold with the at least one predetermined coating area of the base sheet  
17 after the layer of epoxy resin coating is solidified and then applies at least one  
18 layer of the epoxy resin to the at least one predetermined coating area through the  
19 at least one coating slot to form at least one reinforcement.

20 When the epoxy resin is solidified, the at least one reinforcement  
21 provides an improved hardness and impact strength to the boot body to keep a  
22 user's foot from injury. Further, the at least one reinforcement is formed  
23 integrally on the base sheet to avoid directly pressing the foot and makes the user  
24 comfortably.

1           The shaping step heats and pressurizes the base sheet on a boot last to  
2 form a boot body after the base sheet is cooling.

3           Other objectives, advantages and novel features of the present invention  
4 will become more apparent from the following detailed description when taken  
5 in conjunction with the accompanying drawings.

#### 6 BRIEF DESCRIPTION OF THE DRAWINGS

7           Fig. 1 is a block diagram of steps of a first embodiment of a method for  
8 making a component of a boot body of a skating shoe in accordance with the  
9 present invention;

10           Fig. 2 is an exploded perspective view of a coating mold with a side  
11 sheet made by the method in Fig. 1;

12           Fig. 3 is a front view of a side-plus-heel sheet made by the method in Fig.  
13 1;

14           Fig. 4 is a cross-sectional side plane view of reinforcements made by the  
15 method in Fig. 1;

16           Fig. 5 is a cross-sectional side plane view of the reinforcements made by  
17 the method in Fig. 1 with fiber textiles being added to the reinforcements;

18           Fig. 6 an exploded perspective view of multiple base sheets made by the  
19 method in Fig. 1,

20           Fig. 7 an exploded perspective view of multiple base sheets made by the  
21 method in Fig. 1 with a side sheet and a sole sheet being joined together;

22           Fig. 8 an exploded perspective view of multiple base sheets made by the  
23 method in Fig. 1 with a heel sheet and the sole sheet being joined together;

24           Fig. 9 an exploded perspective view of multiple base sheets made by the

1 method in Fig. 1 with two side sheets and the sole sheet being joined together;

2 Fig. 10 is a perspective view of a sole mold fitting with the method in Fig.  
3 1; and

4 Fig. 11 is a block diagram of steps of a second embodiment of the  
5 method for making a component of a boot body of a skating shoe in accordance  
6 with the present invention

#### 7 DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

8 A boot body of a skating shoe comprises multiple sections including a  
9 sole section, two side sections and a heel section. The sole section has two  
10 opposite side edges and a rear edge. The side sections are mounted respectively  
11 on the opposite side edges of the sole section. The heel section is mounted on the  
12 rear edge of the sole section and joins with the side sections.

13 With reference to Fig. 1, a method for making a component of a boot  
14 body in accordance with the present invention comprises a cutting step (A), a  
15 mold-making step (B), a coating step (C) and a shaping step (D).

16 With further reference to Figs. 2, 3 and 6-10, the cutting step (A) is  
17 cutting a flexible sheet to form a base sheet (10) with at least one predetermined  
18 coating area. The flexible sheets may be made of hard polyurethane elastomer  
19 (PU) or fiber-textile pre-preg. The base sheet (10) may be a one-piece side sheet  
20 (1a, 1b) corresponding to one of the side sections of the boot body, may be a  
21 one-piece heel sheet (2) corresponding to the heel section of the boot body or  
22 may be a side-plus-heel sheet (11) having multiple optional ventilating holes (12)  
23 and two side sections and a heel section formed in an integral piece. The side  
24 sections of the side-plus-heel sheet (11) correspond respectively to the side

1 sections of the boot body. The heel section of the side-plus-heel sheet (11)  
2 corresponds to the heel sections of the boot body.

3 The mold-making step (B) is forming a coating mold (40) with at least  
4 one coating slot (41) and an optional sole mold (50) with a sole recess (51). The  
5 at least one coating slot (41) corresponds to the at least one predetermined  
6 coating area of the base sheet (10). The sole recess (51) corresponds to the sole  
7 section of the boot body and has two opposite side edges and a rear edge.

8 With further reference to Figs. 4 and 5, the coating step (C) is applying  
9 epoxy resin to the base sheet (10) and comprises acts of forming a layer of epoxy  
10 resin coating (23) on the base sheet (10), aligning the at least one coating slot (41)  
11 of the coating mold (40) with the at least one predetermined coating area of the  
12 base sheet (10) after the layer of epoxy resin coating (23) is solidified and  
13 applying at least one layer of epoxy resin to the at least one predetermined  
14 coating area through the at least one coating slot (41) to form at least one  
15 reinforcement (20). The coating step (C) may be implemented in several ways.  
16 The at least one reinforcement (20) becomes hardened when the epoxy resin is  
17 solidified, is formed integrally on the base sheet (10) and has at least one layer  
18 (21) to form an enough thickness. So the at least one reinforcements (20)  
19 provides enhanced hardness and impact strength to the boot body and effectively  
20 protects a user's foot from injury. In addition, the at least one reinforcement can  
21 avoid directly pressing the foot and makes the user comfortable. Further, the at  
22 least one reinforcement (20) do not impose additional weight to the skating shoe  
23 to influence a performance of the user.

24 With further reference to Fig. 10, in a first embodiment of the coating

1 step (C), the coating step (C) applies the epoxy resin to the sole recess (51) of the  
2 sole mold (50) to form a sole sheet (30).

3 With further reference to Fig. 7, in a second embodiment of the coating  
4 step (C), the side sheet (1a, 1b) is placed adjacent to one of the side edges of the  
5 sole recess (51) of the sole mold (50) and the epoxy resin is applied to the side  
6 sheet (1a, 1b) and the sole recess (51) to form the layer of epoxy resin coating (23)  
7 on the side sheet (1a, 1b) and a sole sheet (30) integrally joined with the layer of  
8 epoxy resin coating (23) on the side sheet (1a, 1b).

9 With further reference to Fig. 8, in a third embodiment of the coating  
10 step (C), the heel sheet (2) is placed adjacent to the rear edge of the sole recess  
11 (51) of the sole mold (50) and then the epoxy resin is applied to the heel sheet (2)  
12 and the sole recess (51) to form the layer of epoxy resin coating (23) and a sole  
13 sheet (30) integrally joined with the layer of epoxy resin coating (23) on the heel  
14 sheet (2).

15 With further reference to Fig. 5, in a fourth embodiment of the coating  
16 step (C), fiber textiles (22) or reinforced material such as injection-molded piece,  
17 metal piece and the like can be added to the at least one reinforcement (20)  
18 during applying the epoxy resin to the at least one predetermined coating area of  
19 the base sheet (10) through the at least one coating slot (41) in the coating mold  
20 (40) to form the at least one reinforcement (20) with an improved structural  
21 strength.

22 The shaping step (D) is heating and pressurizing the base sheet (10) on a  
23 boot last to form a component of a boot body after the base sheet (10) is cooling.

24 The method for making a component of a boot body for a skating shoe

1 can be performed to form a heel section and a sole section of the boot body as an  
2 integral piece or to form a side section and a sole section of the boot body as an  
3 integral piece. It is easy to be derived that how to form two side sections and a  
4 sole section of the boot body as an integral piece.

5 With further reference to Fig. 11, another implementation of the method  
6 for making a component of a boot body for a skating shoe comprises a cutting  
7 step (A1), a mold-making step (B1), a coating step (C1) and a shaping step (D1).

8 The cutting step (A1) is cutting two flexible sheets to form two base  
9 sheets (10) with multiple predetermined coating areas. The base sheets (10) are  
10 respectively correspond to the side sections of the boot body.

11 The mold-making step (B1) is forming at least one coating mold (40)  
12 with multiple coating slots (41) and a sole mold (50) with a sole recess (51) and  
13 may be implemented in several ways. The coating slots (41) correspond to the  
14 multiple predetermined coating areas of the base sheets (10). The sole recess (51)  
15 has two opposite side edges.

16 In a first embodiment of the mold-making step (B1), the mold-making  
17 step (B1) forms a single coating mold. The single coating mold can cover both  
18 the base sheets (10) in a plane and all the coating slots (41) are located in the  
19 single coating mold.

20 In a second embodiment of the mold-making step (B1), the mold-  
21 making step (B1) forms two coating molds (40). The coating molds (40)  
22 correspond respectively to the base sheets (10) and the coating slots (41) may be  
23 distributed in both coating molds (40).

24 The coating step (C1) includes acts of placing the base sheets (10)

1 respectively adjacent to the opposite side edges of the sole recess (51) of the sole  
2 mold (50), applying epoxy resin to the base sheets (10) and the sole recess (51) to  
3 form a layer of epoxy resin coating (23) on each base sheet (10) and a sole sheet  
4 (30) integrally joined with the layer of epoxy resin coatings (23) on the base  
5 sheets (10), aligning the coating slots (41) of the at least one coating mold (40)  
6 with the predetermined coating areas of the base sheets (10) after the layer of  
7 epoxy resin coatings (23) being solidified and applying at least one layer of the  
8 epoxy resin to the predetermined coating areas through the coating slots (41) to  
9 form reinforcements (20). The reinforcements (20) are formed integrally on the  
10 base sheets (10) and each having at least one layer.

11 The shaping step (D1) is heating and pressurizing the base sheets (10)  
12 and the sole sheet (50) on a boot last to form a component of a boot body after the  
13 base sheets (10) and the sole sheet (50) being cooling. The component formed in  
14 the shaping step (D1) forms the side sections and the sole section of the boot  
15 body in an integral piece.

16 Even though numerous characteristics and advantages of the present  
17 invention have been set forth in the foregoing description, together with details  
18 of the structure and function of the invention, the disclosure is illustrative only.  
19 Changes may be made in detail, especially in matters of shape, size, and  
20 arrangement of parts within the principles of the invention to the full extent  
21 indicated by the broad general meaning of the terms in which the appended  
22 claims are expressed.

1 **WHAT IS CLAIMED IS:**

2 1. A method for making a component of a boot body for a skating shoe

3 comprising:

4 a cutting step of cutting a flexible sheet to form a base sheet with at least  
5 one predetermined coating area;

6 a mold-making step of forming a coating mold with at least one coating  
7 slot corresponding to the at least one predetermined coating area of the base  
8 sheet;

9 a coating step including acts of

10 applying epoxy resin to the base sheet to form a layer of epoxy  
11 resin coating on the base sheet;

12 aligning the at least one coating slot of the coating mold with  
13 the at least one predetermined coating area of the base sheet after the layer of  
14 epoxy resin coating being solidified; and

15 applying at least one layer of the epoxy resin to the at least one  
16 predetermined coating area through the at least one coating slot to form  
17 at least one reinforcement formed integrally on the  
18 base sheet and each having at least one layer; and

19 a shaping step of heating and pressurizing the base sheet on a boot last to  
20 form a component of a boot body after the base sheet being cooling.

21 2. The method as claimed in claim 1, wherein the base sheet is a one-  
22 piece side sheet to form a side section of the boot body.

23 3. The method as claimed in claim 1, wherein the base sheet is a one-  
24 piece heel sheet to form a heel section of the boot body.

1           4. The method as claimed in claim 1, wherein  
2                     the mold-making step further forms a sole mold with  
3                     a sole recess having two opposite side edges and a rear edge;

4     and

5           the coating step further applies the epoxy resin to the sole recess of the  
6     sole mold to form a sole sheet.

7           5. The method as claimed in claim 1, wherein

8                     the mold-making step further forms a sole mold with  
9                     a sole recess having two opposite side edges and a rear edge;

10           the act of applying epoxy resin to the base sheet to form a layer of epoxy  
11     resin coating on the base sheet in the coating step comprises

12                     placing the base sheet adjacent to one of the opposite side  
13     edges of the sole recess of the sole mold; and

14                     applying the epoxy resin to the base sheet and the sole recess  
15     to form the layer of epoxy resin coating on the base sheet and a sole sheet

16     integrally joined with the epoxy resin coating on the base sheet; and

17           the sole sheet is heated and pressurized on the boot last together with the  
18     base sheet.

19           6. The method as claimed in claim 1, wherein

20                     the mold-making step further forms a sole mold with

21                     a sole recess having two opposite side edges and a rear edge;

22           the act of applying epoxy resin to the base sheet to form a layer of epoxy  
23     resin coating on the base sheet in the coating step comprises

24                     placing the base sheet adjacent to the rear edge of the sole

1 recess of the sole mold; and  
2                   applying the epoxy resin to the base sheet and the sole recess  
3 to form the layer of epoxy resin coating on the base sheet and a sole sheet  
4 integrally joined with the epoxy resin coating on the base sheet; and  
5                   the sole sheet is heated and pressurized on the boot last together with the  
6 base sheet.

7                   7. A method for making a component of a boot body for a skating shoe  
8 comprising:

9                   a cutting step of cutting two flexible sheets to form two base sheets with  
10 multiple predetermined coating areas;

11                   a mold-making step of forming

12                                   at least one coating mold with multiple coating slots

13 corresponding to the multiple predetermined coating areas of the base sheets;

14 and

15                   a sole mold with a sole recess having two opposite side edges;

16                   a coating step including acts of

17                                   placing the base sheets respectively adjacent to the opposite  
18 side edges of the sole recess of the sole mold;

19                                   applying epoxy resin to the base sheets and the sole recess to  
20 form a layer of epoxy resin coating on each base sheet and a sole sheet integrally  
21 joined with the layer of epoxy resin coatings on the base sheets;

22                                   aligning the coating slots of the at least one coating mold with  
23 the predetermined coating areas of the base sheets after the layer of epoxy resin  
24 coatings being solidified; and

1                    applying at least one layer of the epoxy resin to the  
2   predetermined coating areas through the coating slots to form  
3                    reinforcements formed integrally on the base sheets  
4   and each having at least one layer; and  
5                    a shaping step of heating and pressurizing the base sheets and the sole  
6   sheet on a boot last to form a component of a boot body after the base sheets and  
7   the sole sheet being cooling.

8                    8. The method as claimed in claim 1, wherein fiber textiles are added to  
9   the at least one reinforcement during applying the epoxy resin to the at least one  
10   predetermined coating area of the base sheet through the at least one coating slot  
11   of the coating mold.

12                    9. The method as claimed in claim 7, wherein fiber textiles are added to  
13   the reinforcements during applying the epoxy resin to the predetermined coating  
14   areas of the base sheets through the coating slots of the at least one coating mold.

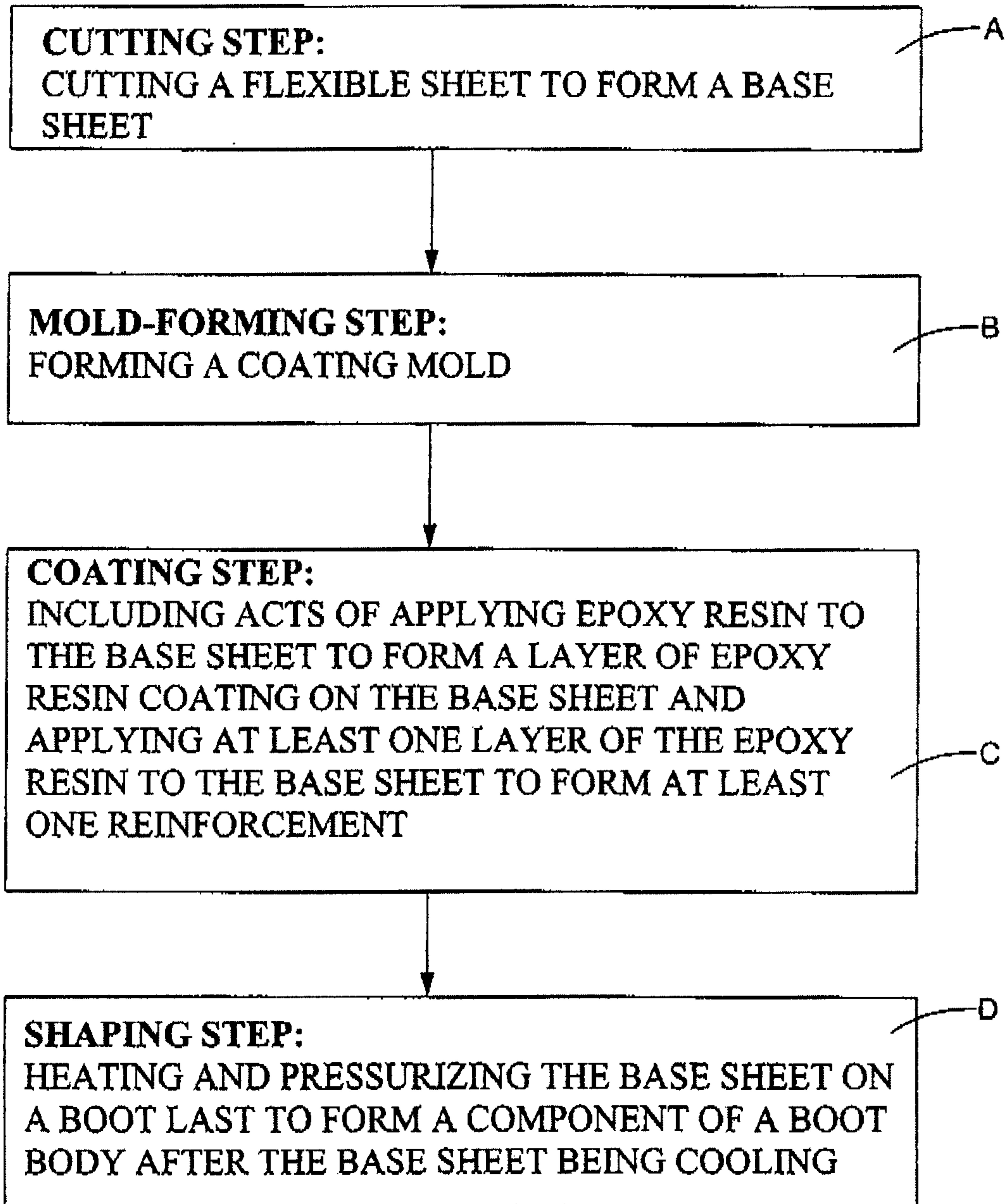


FIG.1

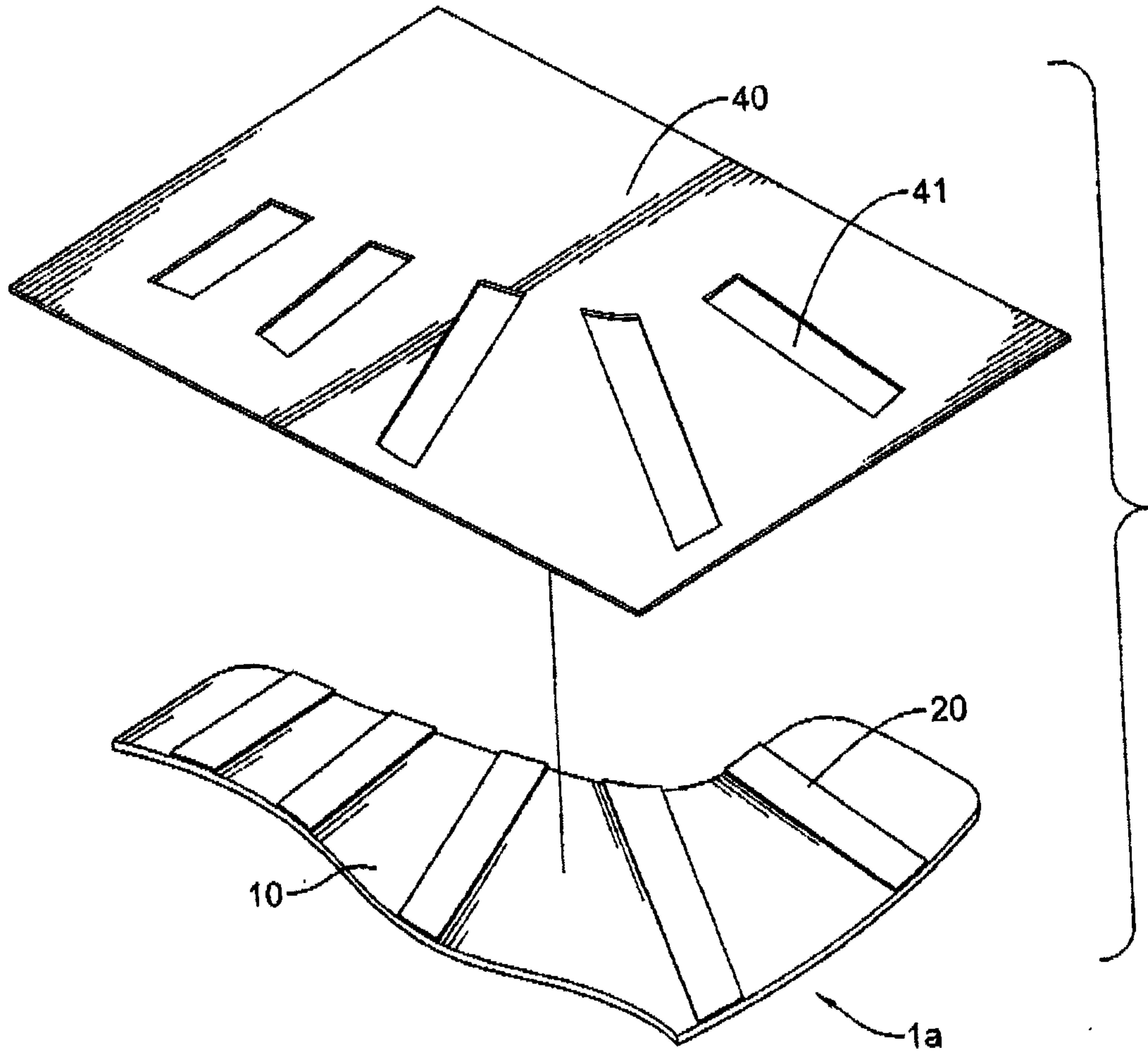


FIG.2

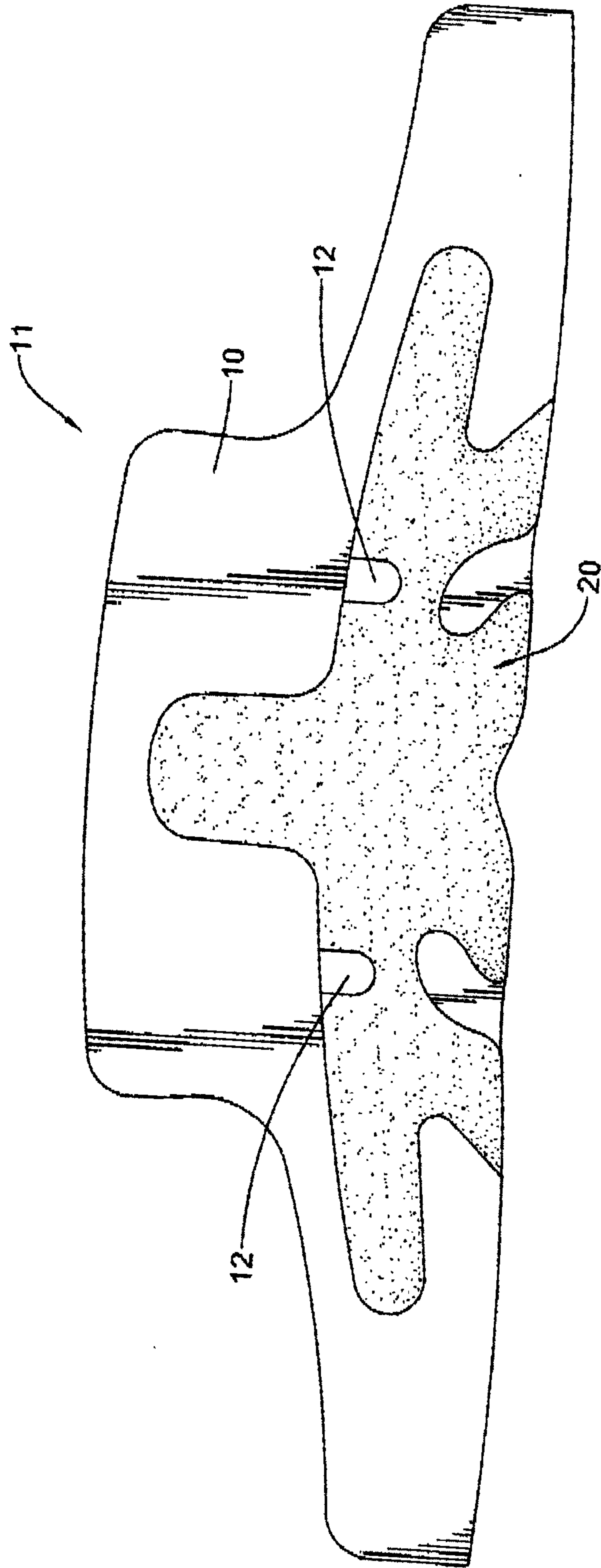


FIG.3

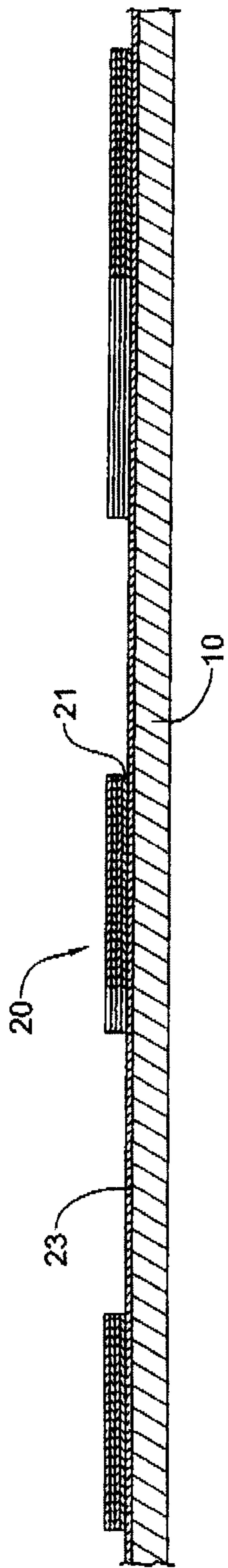


FIG. 4

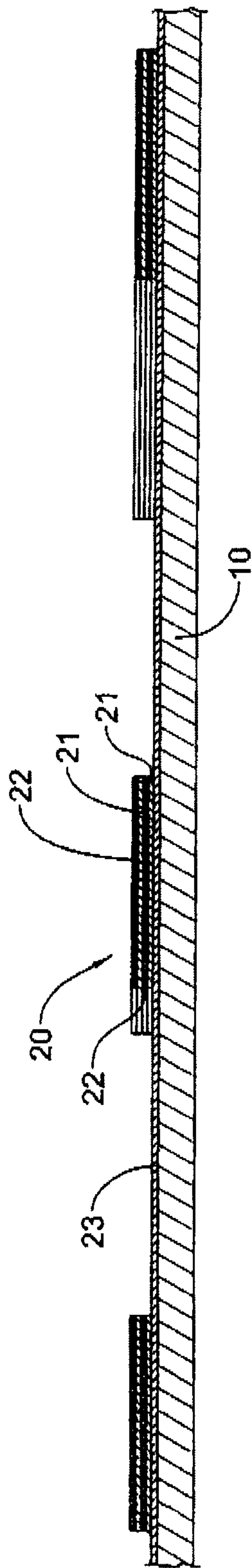


FIG. 5

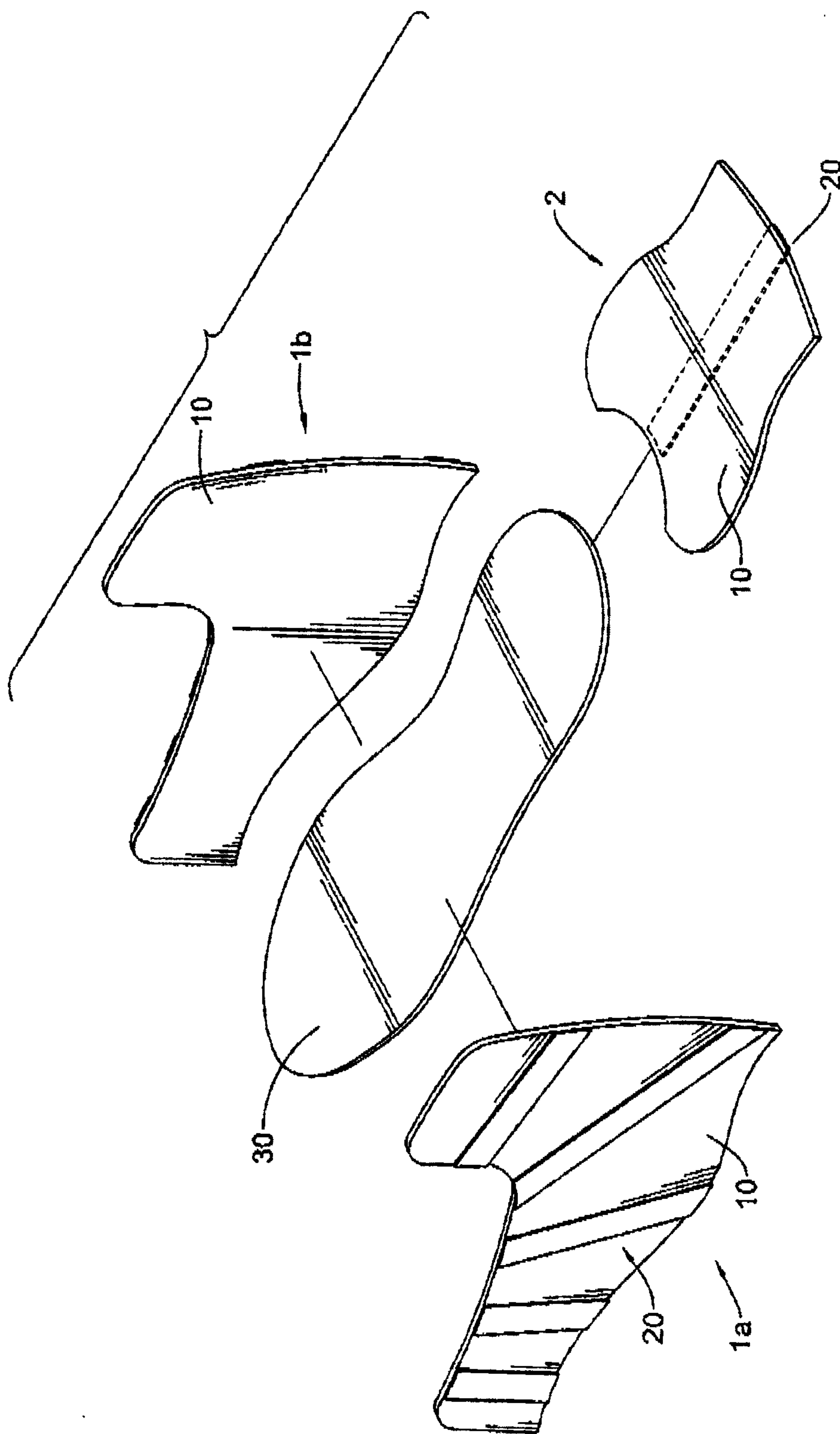


FIG.6

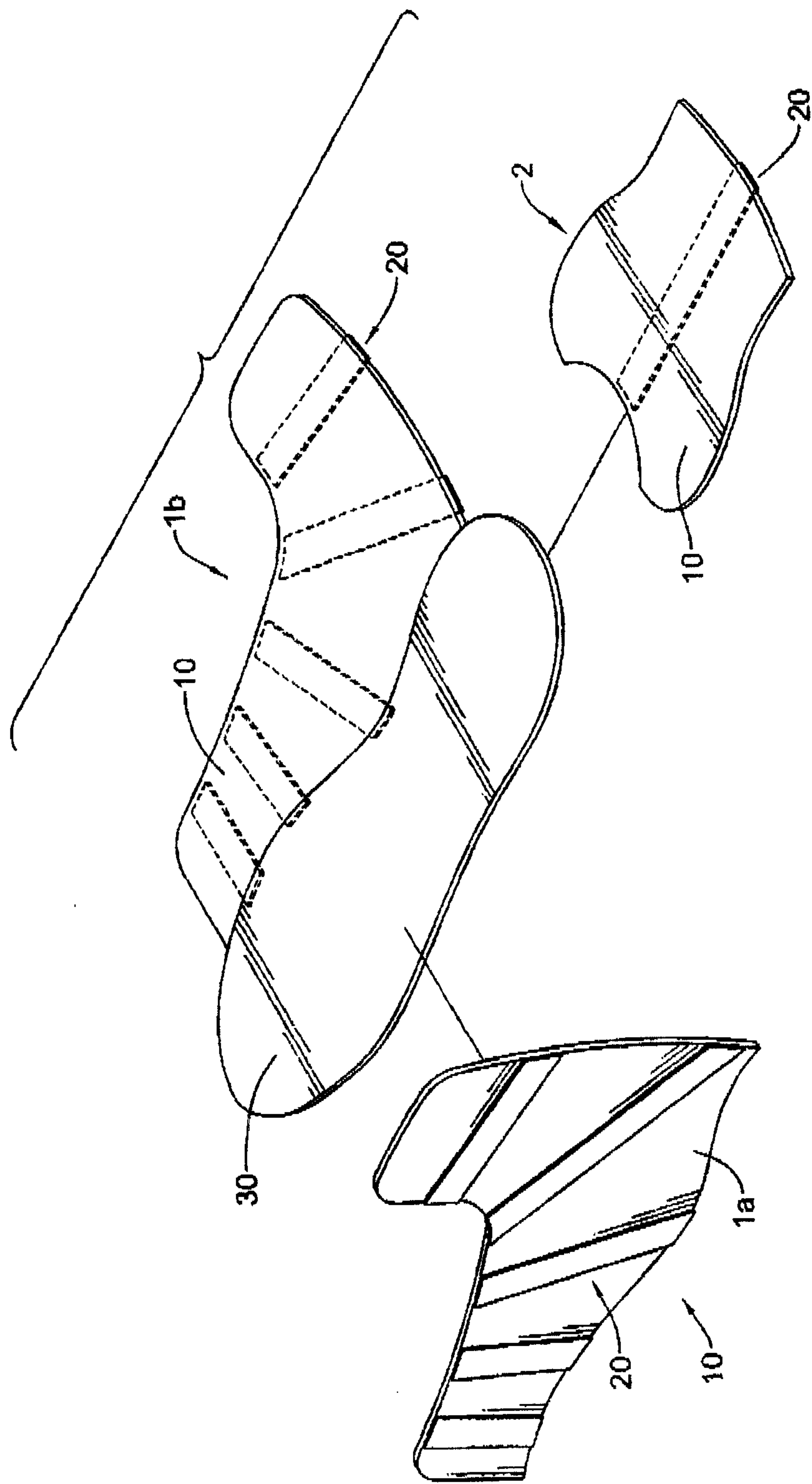


FIG.7

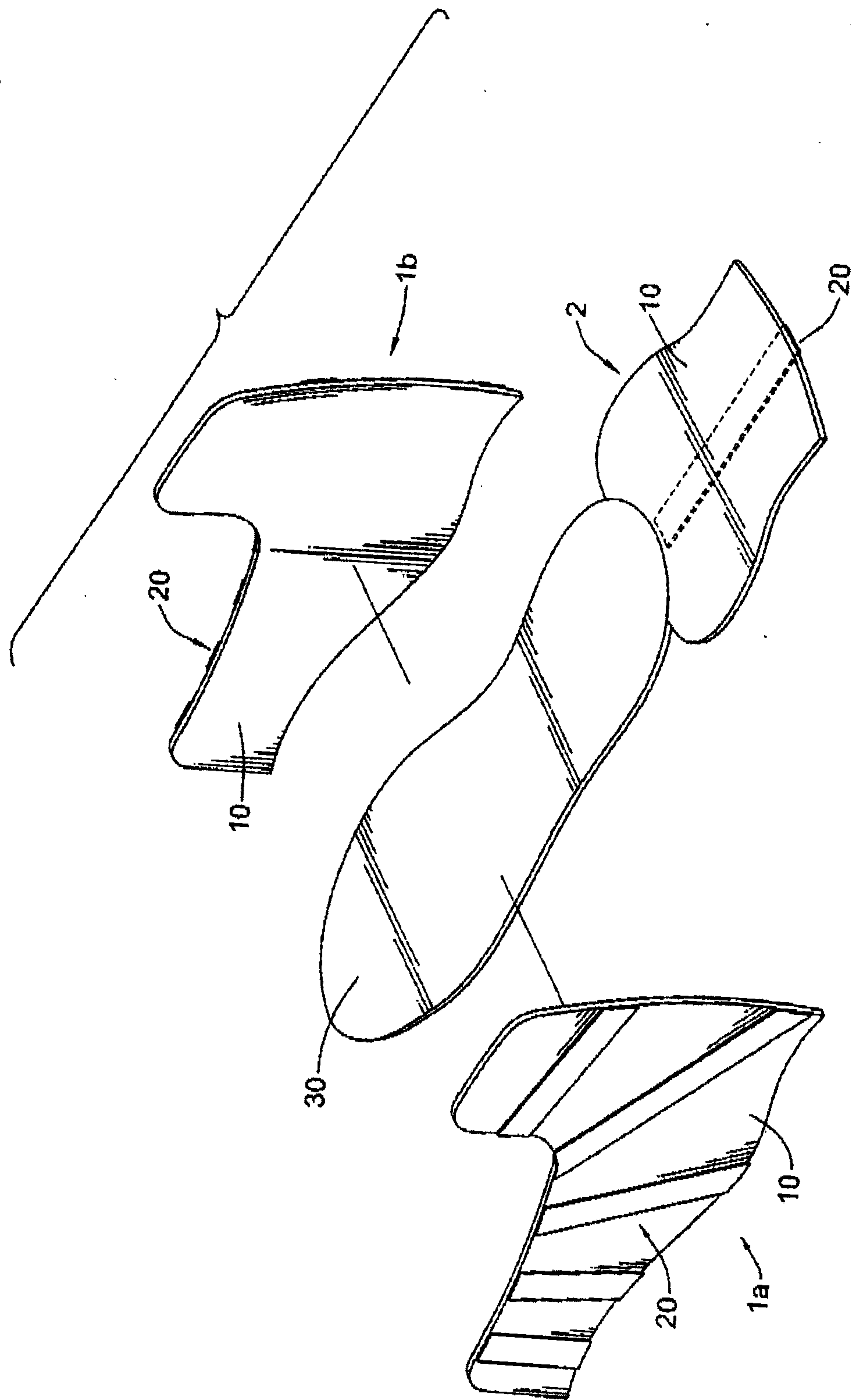


FIG.8

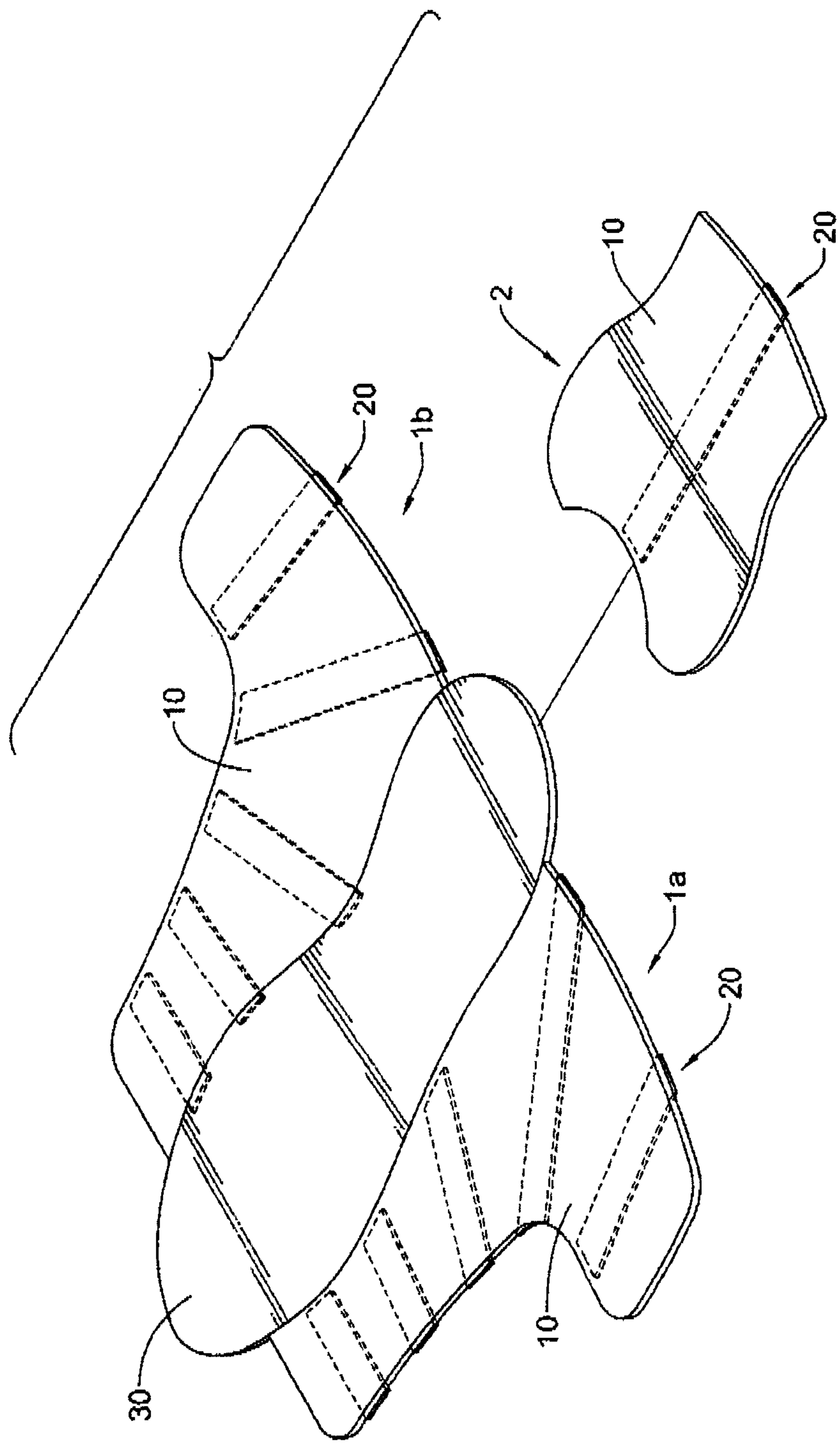


FIG.9

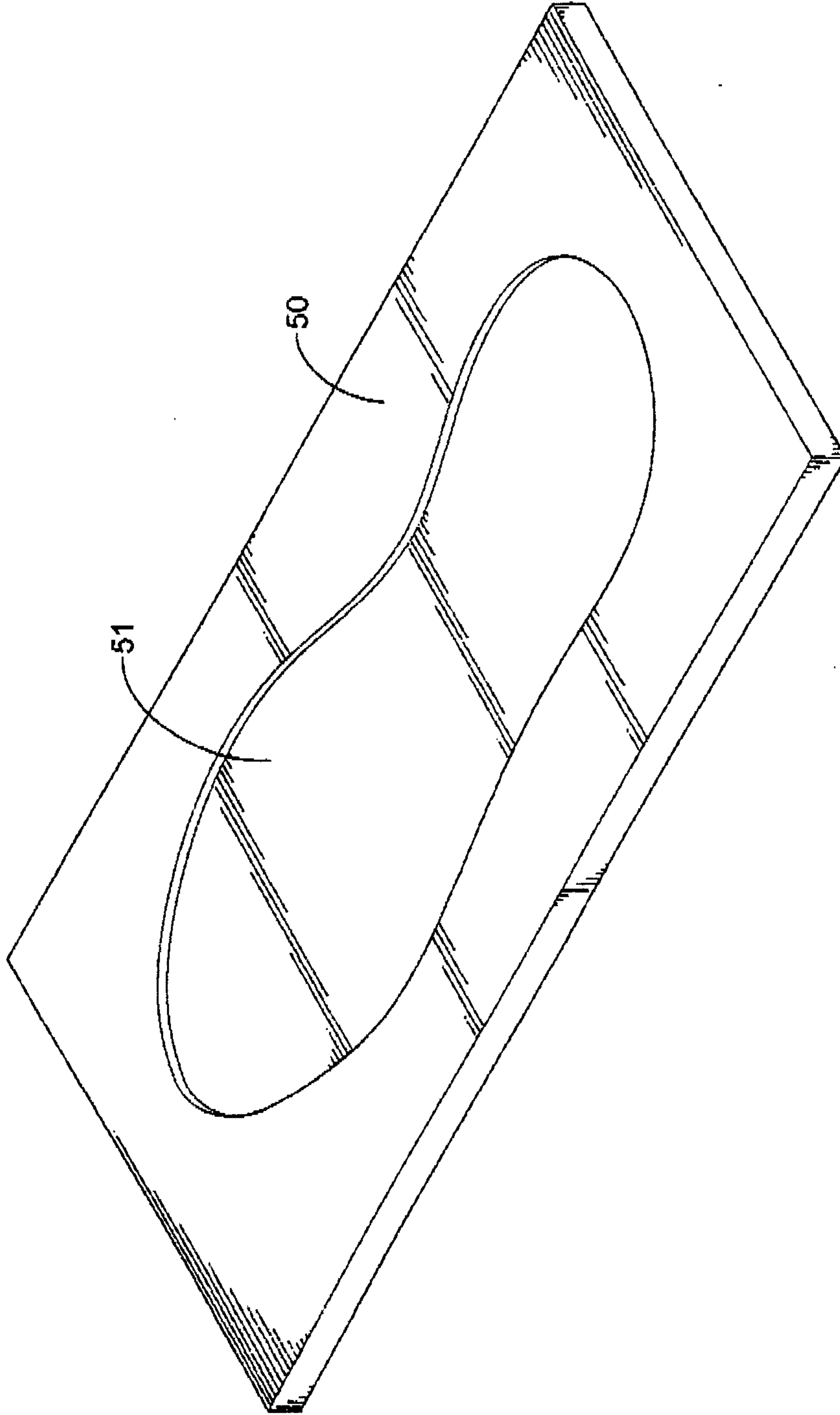


FIG.10

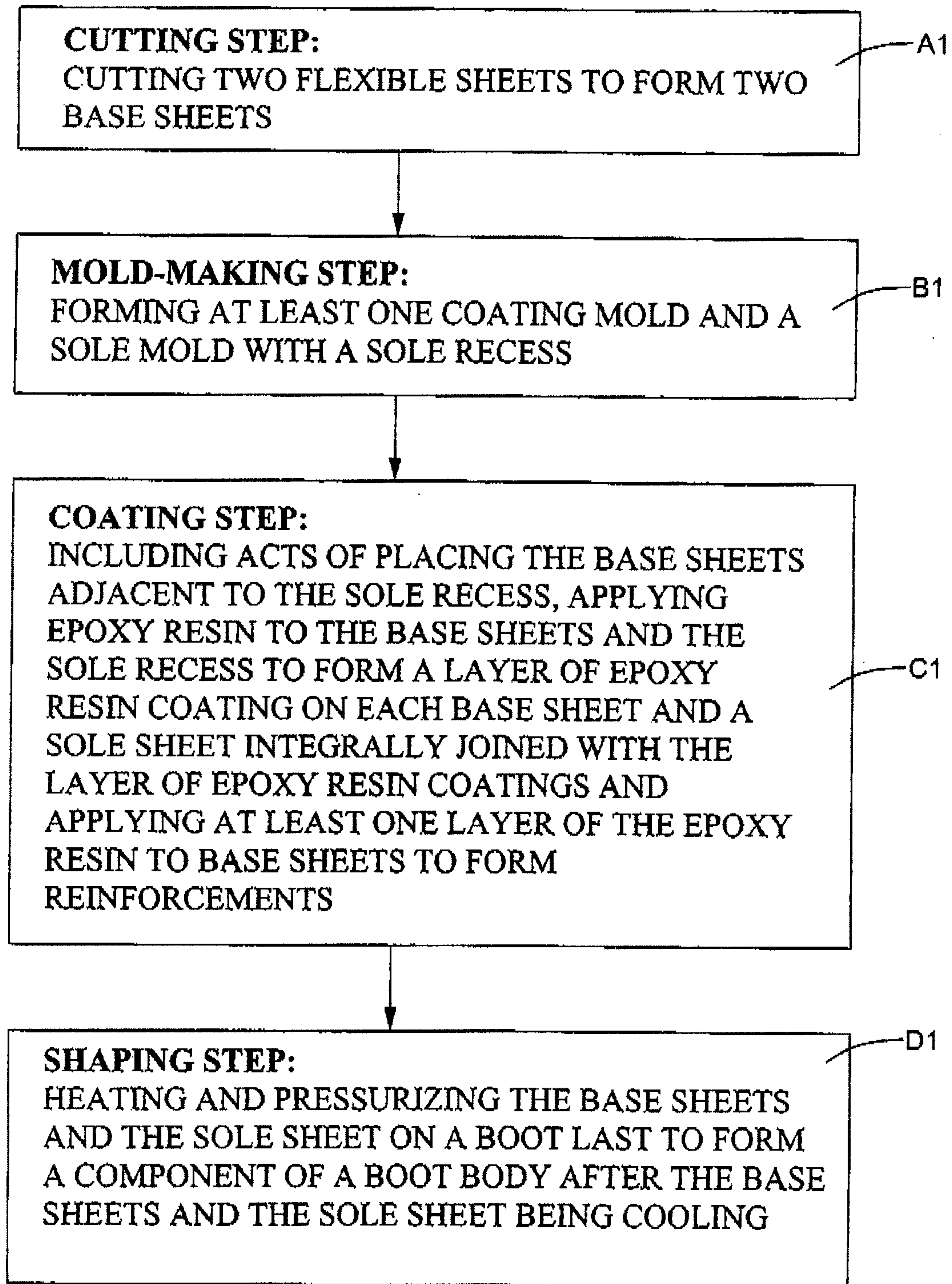


FIG.11

**CUTTING STEP:**  
CUTTING A FLEXIBLE SHEET TO FORM A BASE SHEET

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graph TD; A[CUTTING STEP: CUTTING A FLEXIBLE SHEET TO FORM A BASE SHEET] --> B[MOLD-FORMING STEP: FORMING A COATING MOLD]; B --> C[COATING STEP: INCLUDING ACTS OF APPLYING EPOXY RESIN TO THE BASE SHEET TO FORM A LAYER OF EPOXY RESIN COATING ON THE BASE SHEET AND APPLYING AT LEAST ONE LAYER OF THE EPOXY RESIN TO THE BASE SHEET TO FORM AT LEAST ONE REINFORCEMENT]; C --> D[SHAPING STEP: HEATING AND PRESSURIZING THE BASE SHEET ON A BOOT LAST TO FORM A COMPONENT OF A BOOT BODY AFTER THE BASE SHEET BEING COOLING];
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**MOLD-FORMING STEP:**  
FORMING A COATING MOLD

**COATING STEP:**  
INCLUDING ACTS OF APPLYING EPOXY RESIN TO THE BASE SHEET TO FORM A LAYER OF EPOXY RESIN COATING ON THE BASE SHEET AND APPLYING AT LEAST ONE LAYER OF THE EPOXY RESIN TO THE BASE SHEET TO FORM AT LEAST ONE REINFORCEMENT

**SHAPING STEP:**  
HEATING AND PRESSURIZING THE BASE SHEET ON A BOOT LAST TO FORM A COMPONENT OF A BOOT BODY AFTER THE BASE SHEET BEING COOLING