US 20250261768A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2025/0261768 A1**

Dilworth (43) **Pub. Date: Aug. 21, 2025**

(54) **MATTRESS AND ASSOCIATED METHODS**

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(21) Appl. No.: **18/583,484**

(22) Filed: **Feb. 21, 2024**

Publication Classification

(51) **Int. Cl.**

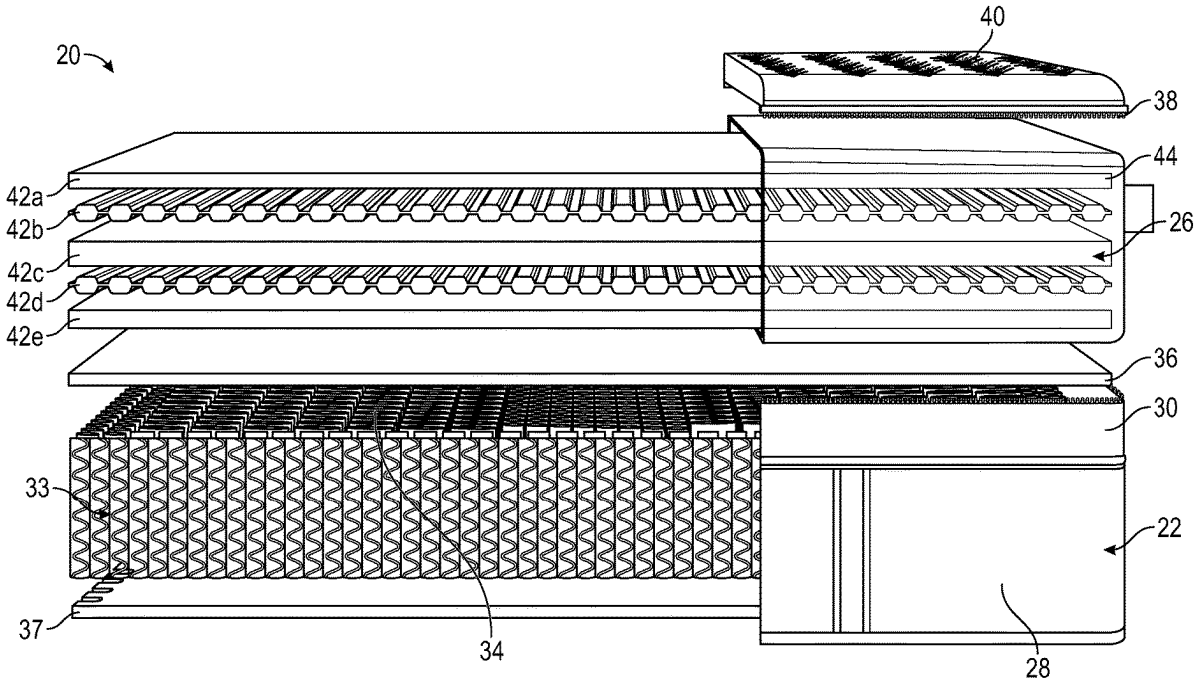
A47C 27/14	(2006.01)
A47C 27/06	(2006.01)
A47C 27/15	(2006.01)
A47C 31/02	(2006.01)

(52) **U.S. Cl.**

CPC ***A47C 27/146*** (2013.01); ***A47C 27/064*** (2013.01); ***A47C 27/15*** (2013.01); ***A47C 31/02*** (2013.01)

(57) **ABSTRACT**

A mattress may include a support base. The support base may include four adjoining border walls, a support portion enclosed within the border walls, and a transition panel above the support portion. An enclosure may be above the support base and include four adjoining enclosure walls each attached to one of the border walls, a fastener disposed on one or more of the enclosure walls, a cover, and a cavity bound by the enclosure walls, the cover, and the transition panel. A cartridge may be removably receivable within the cavity, the cartridge including layers encased within an encasement sleeve, the encasement sleeve abutting inner surfaces of at least three of the enclosure walls when received within the enclosure.



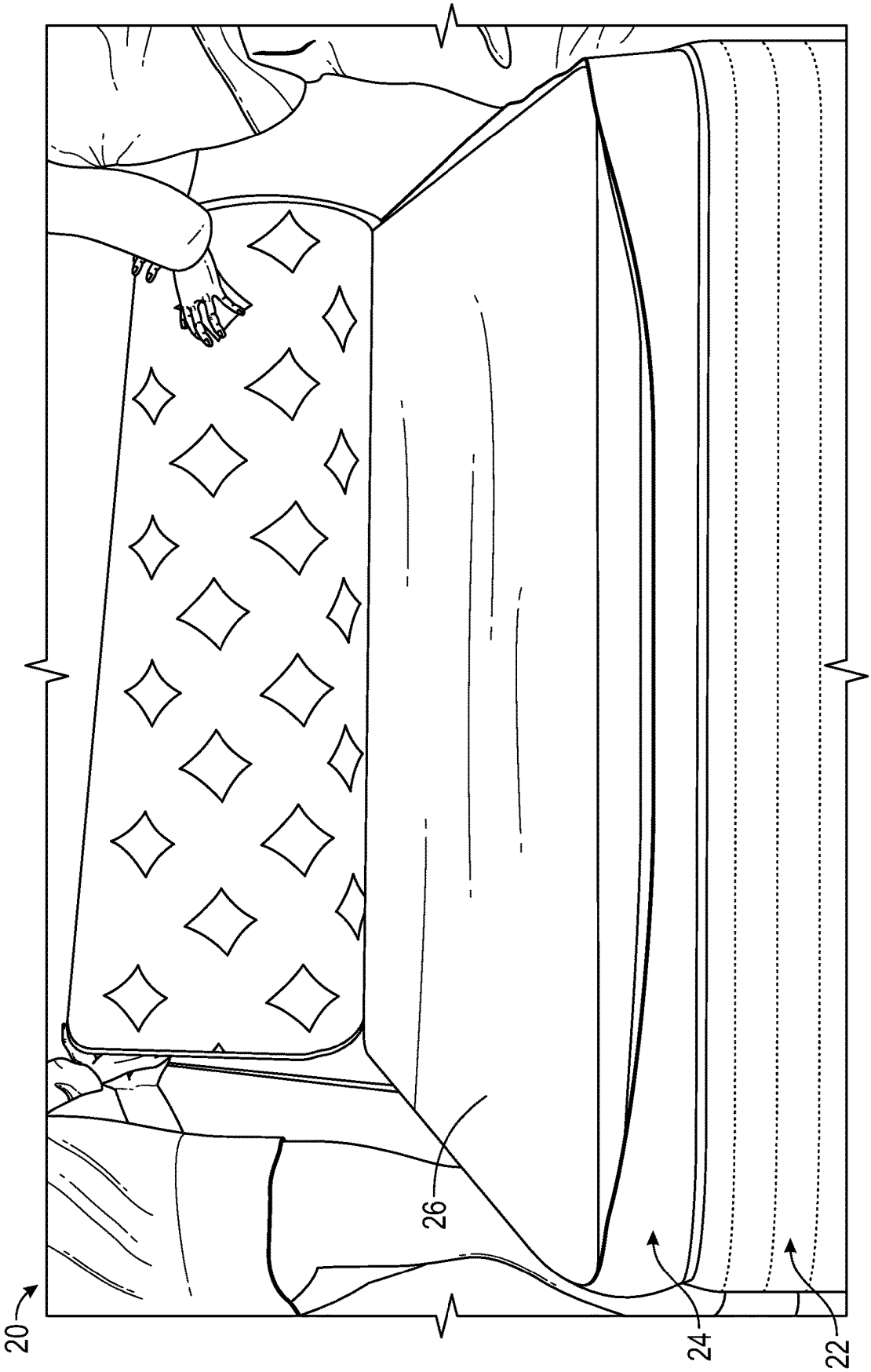


FIG. 1

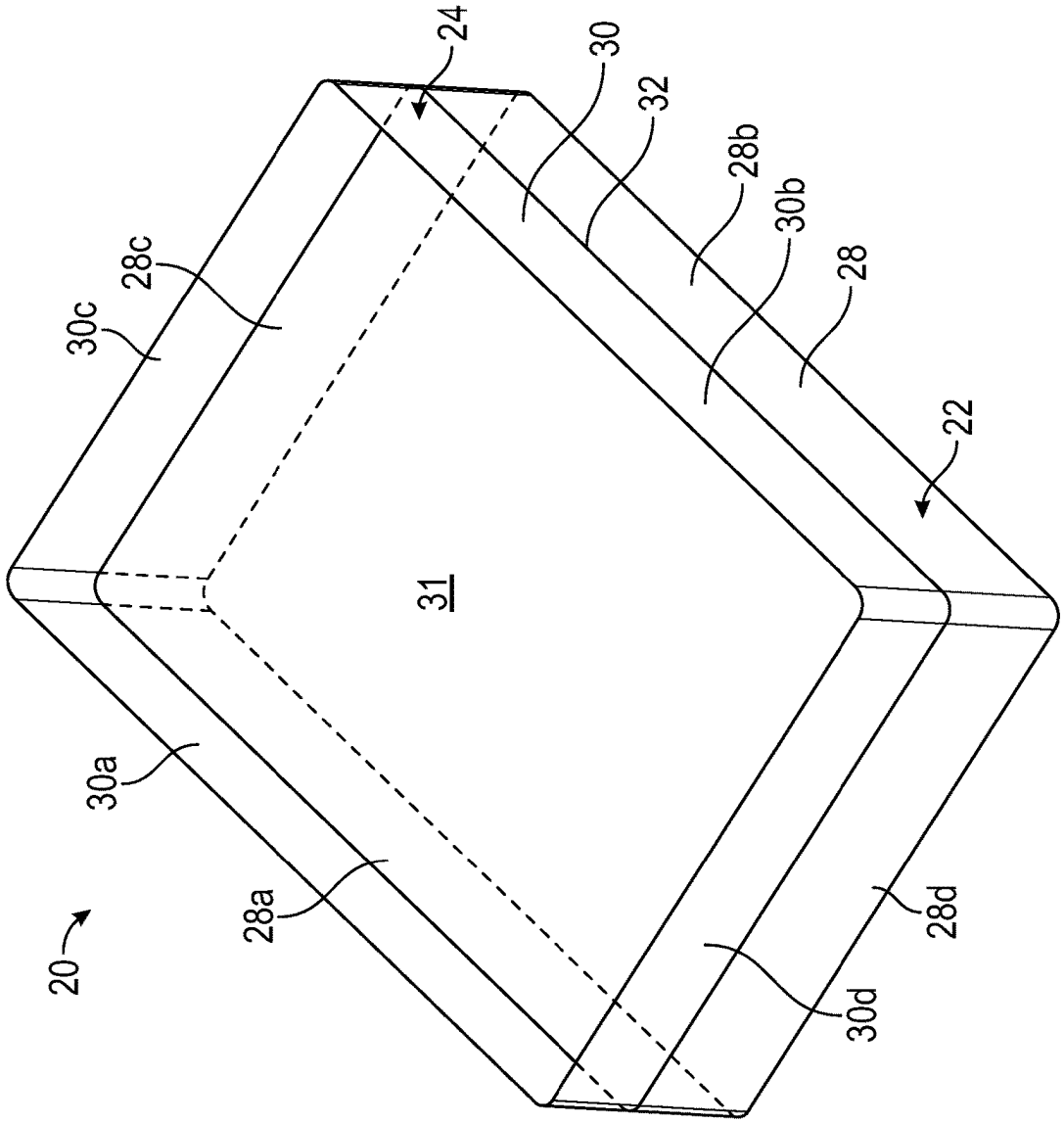


FIG. 2

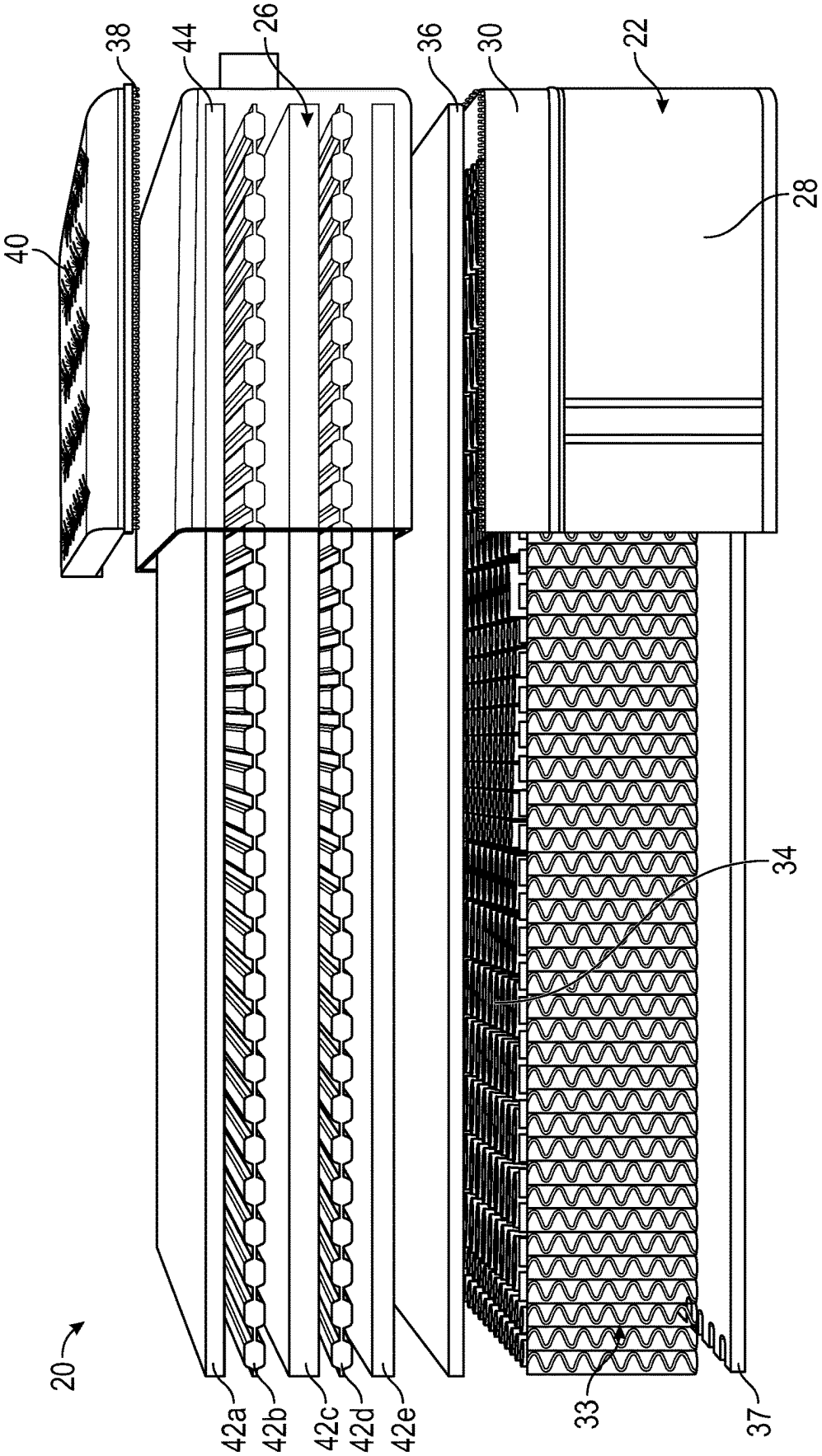


FIG. 3

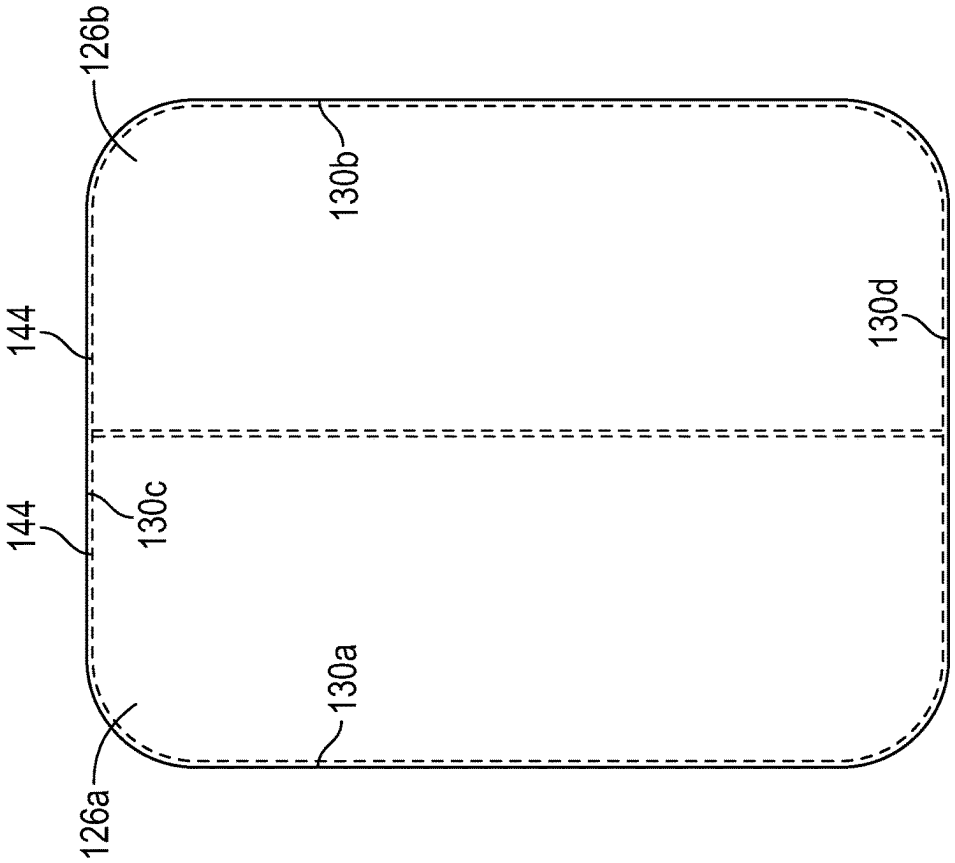

126b
130b
144
130d
144
130c
130a
126a

FIG. 4B

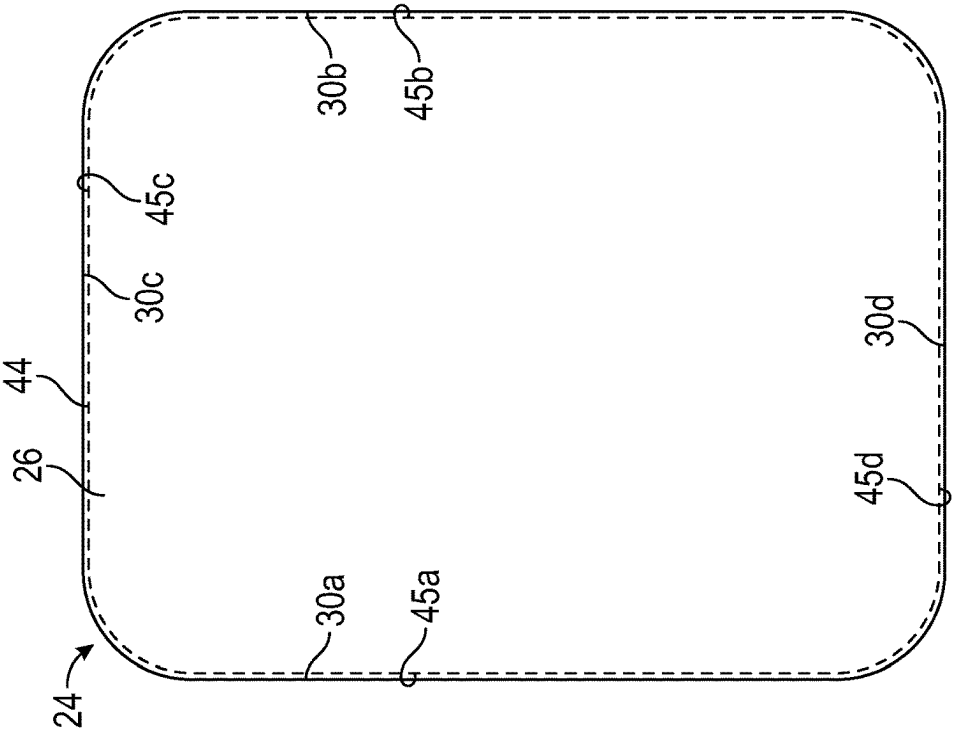

30b
45b
45c
30c
44
30d
26
45d
30a
45a
24

FIG. 4A

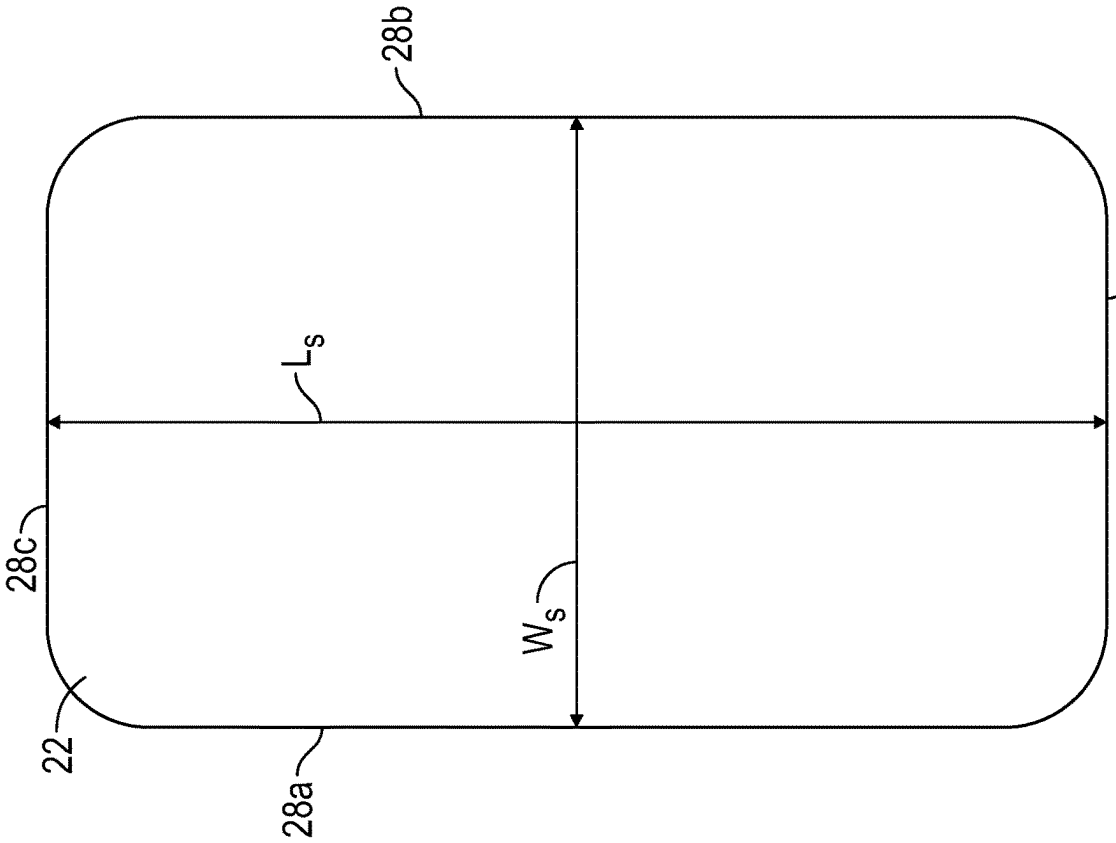


FIG. 5B

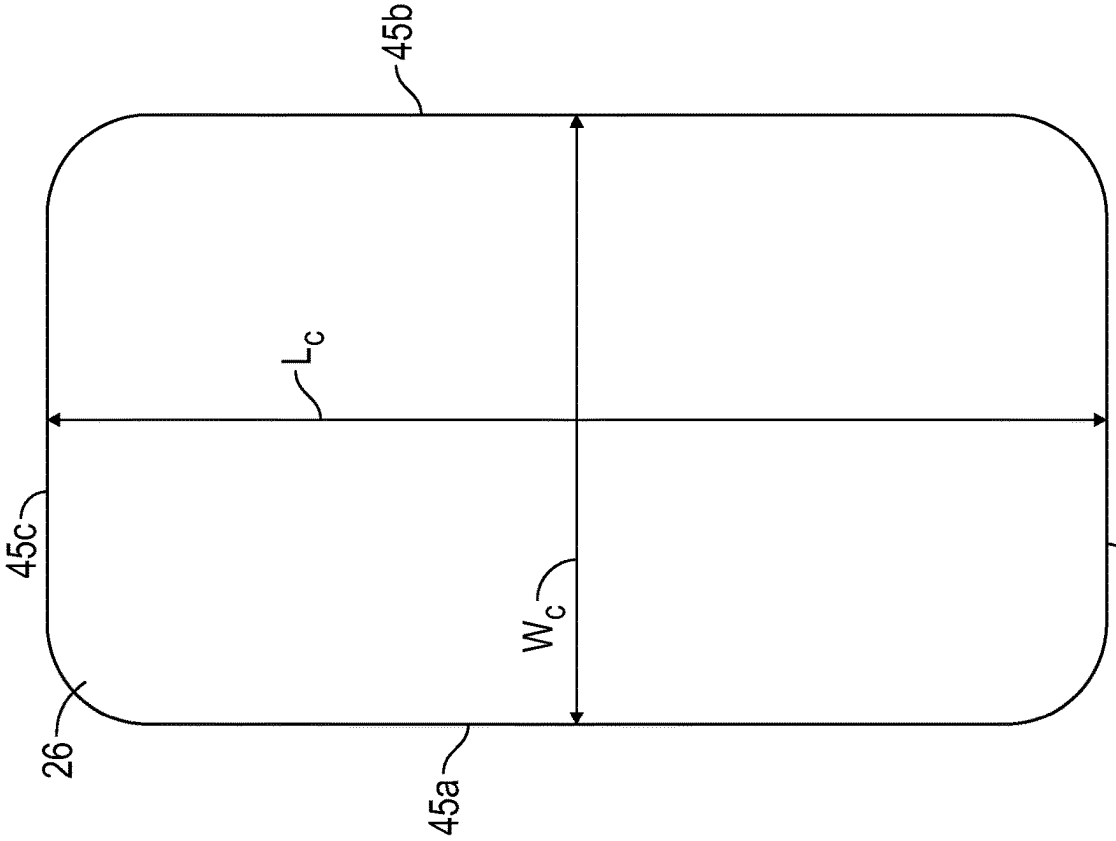


FIG. 5A

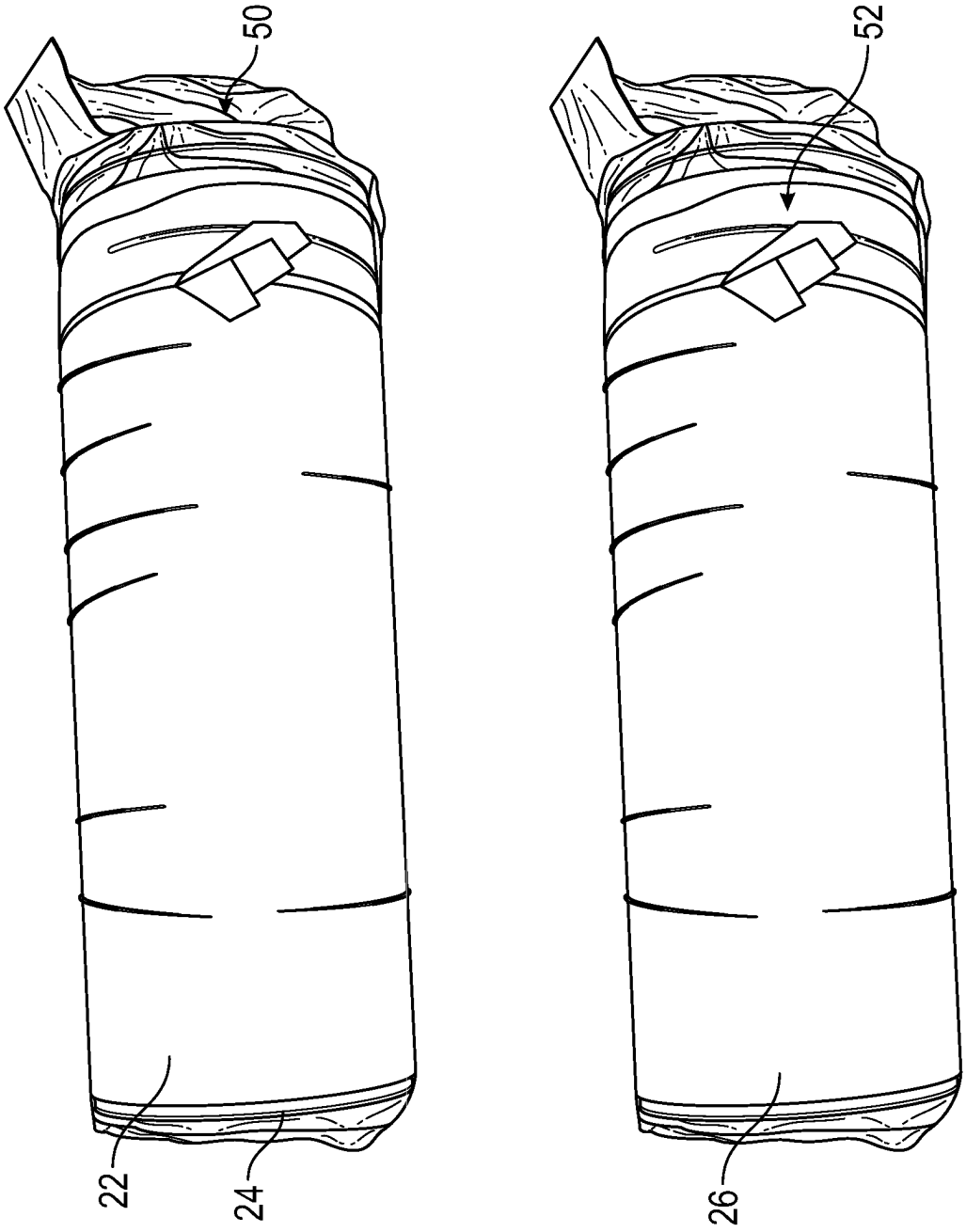


FIG. 6

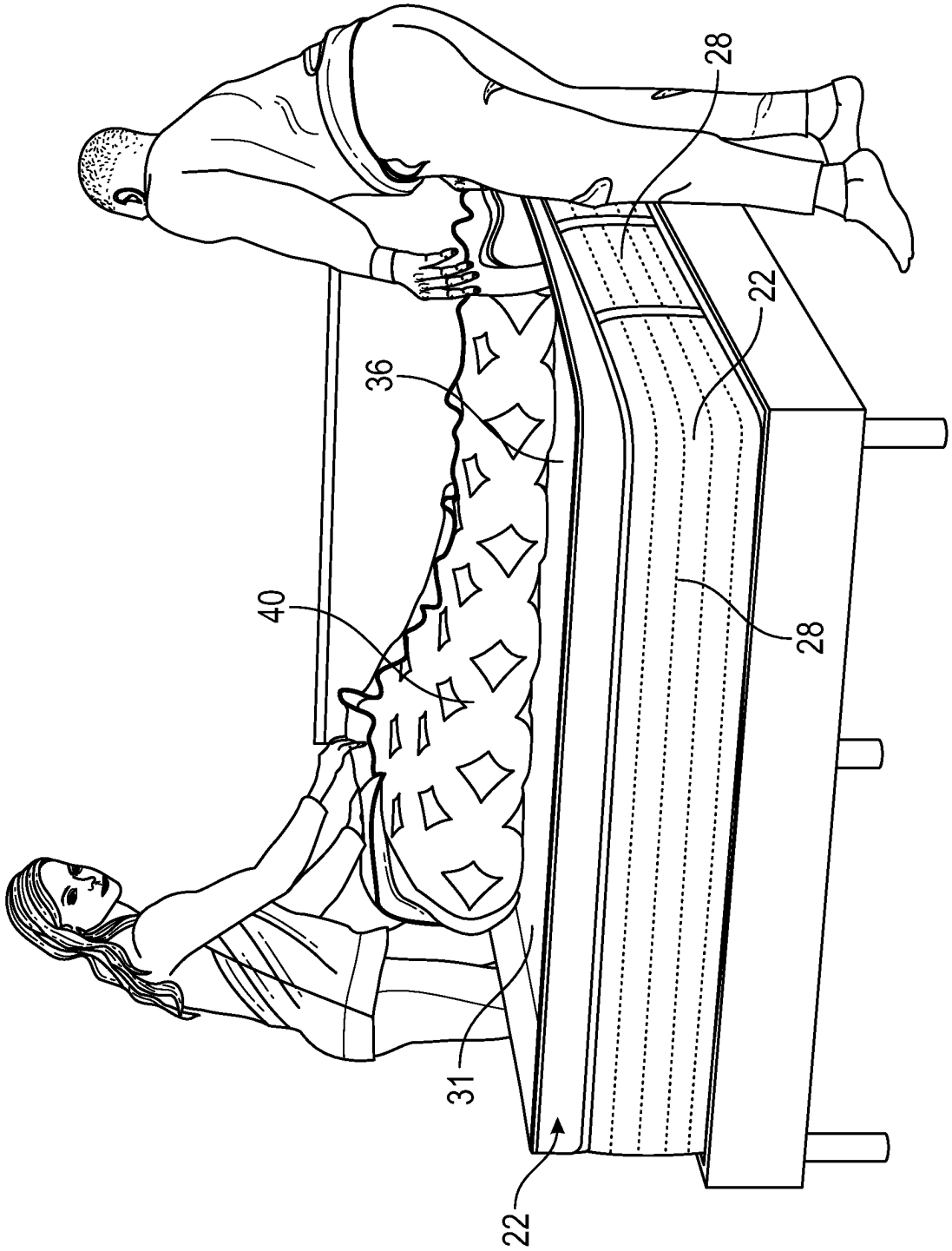


FIG. 7

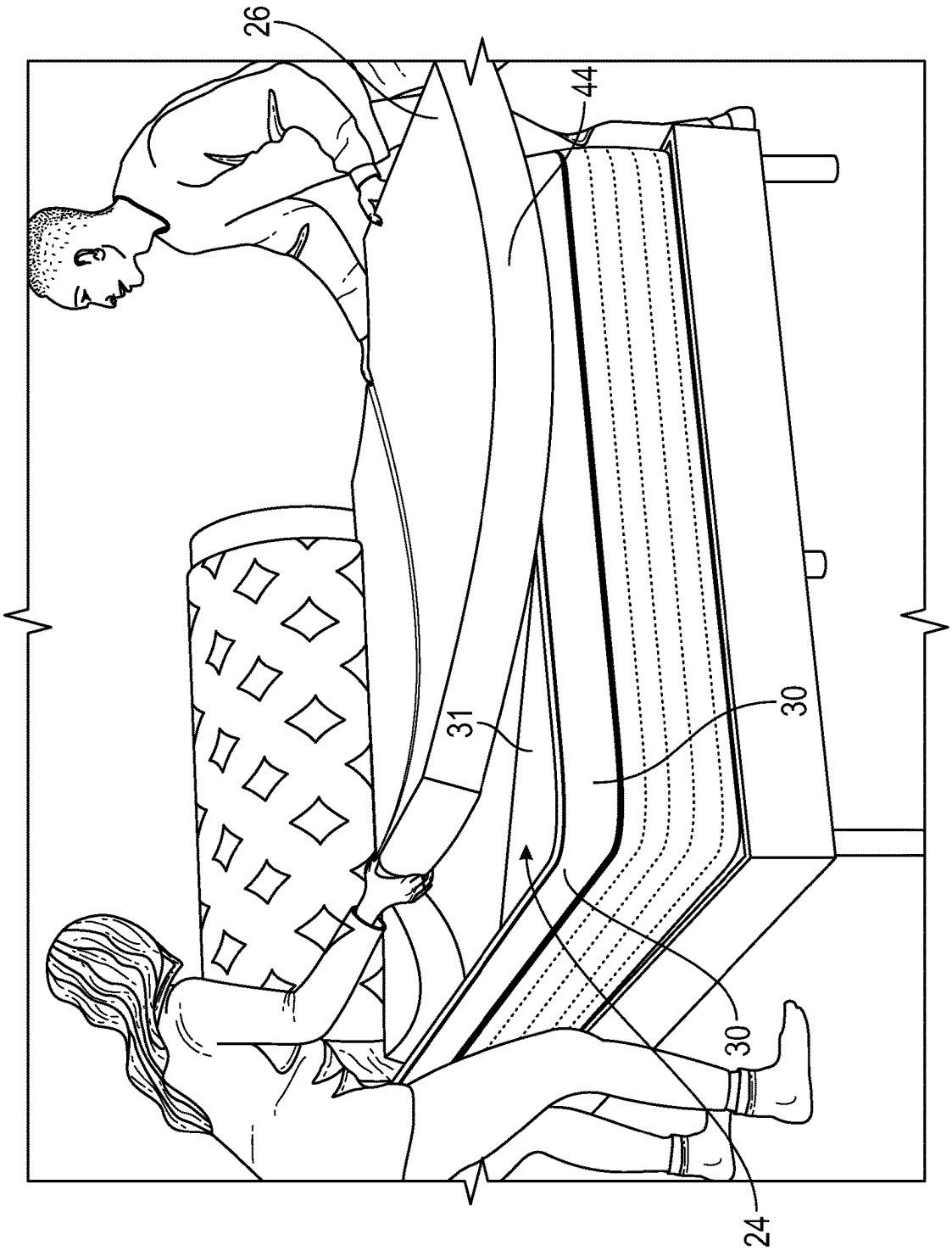


FIG. 8

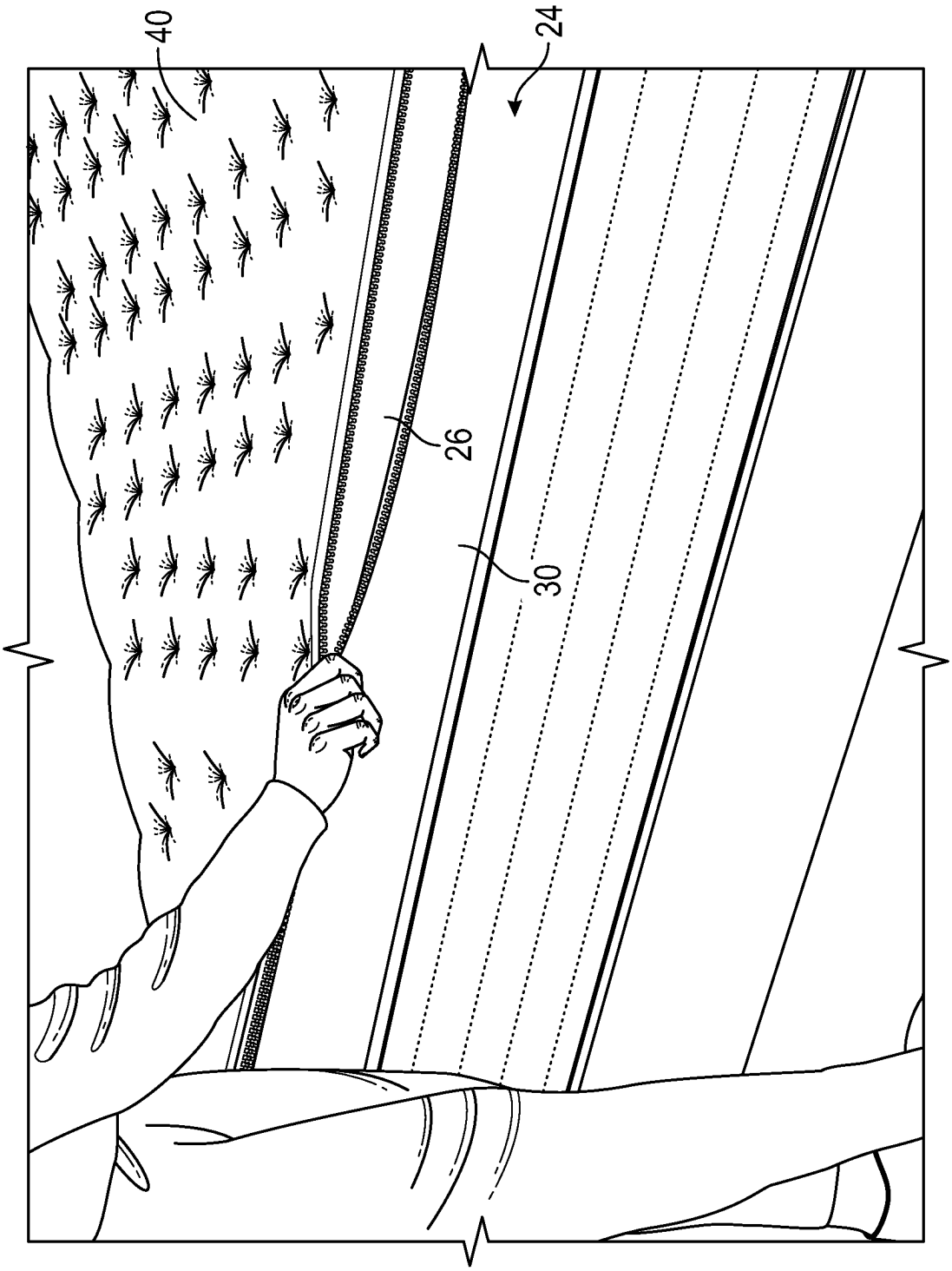


FIG. 9

MATTRESS AND ASSOCIATED METHODS

BACKGROUND

[0001] Mattresses are pads that come in various sizes and shapes, which may be used to support a lying person. A mattress is often designed to be used as a bed, or on a bed frame as part of a bed. Mattresses can be used on their own or in combination with other bedding accessories like box springs, slats, or adjustable bed bases to create a desired level of comfort and support.

SUMMARY

[0002] A mattress according to an example of this disclosure may include a support base. The support base may include four adjoining border walls, a support portion enclosed within the border walls, and a transition panel above the support portion. An enclosure may be above the support base and include four adjoining enclosure walls each attached to one of the border walls, a fastener disposed on one or more of the enclosure walls, a cover, and a cavity bound by the enclosure walls, the cover, and the transition panel. A cartridge may be removably receivable within the cavity, the cartridge including layers encased within an encasement sleeve, the encasement sleeve abutting inner surfaces of at least three of the enclosure walls when received within the enclosure.

[0003] In any examples, the cartridge layers may include foam layers.

[0004] In any examples, the cartridge layers may include one or more layers of foam and one or more layers of microcoils.

[0005] In any examples, a foam encasement may not be included in the cartridge.

[0006] In any examples, the fastener may be a zipper, and the zipper is near an upper edge of three or four of the enclosure walls.

[0007] In any examples, the encasement sleeve may abut inner surfaces of four enclosure walls when received within the enclosure.

[0008] In any examples, the cover may include a pillow top.

[0009] In any examples, the transition panel may include foam.

[0010] In any examples, the support base may include a base panel including foam below the support portion.

[0011] In any examples, the cartridge may be roll packed.

[0012] In any examples, the cartridge may have a cartridge length from a first wall provided by the encasement sleeve to a second wall provided by the encasement sleeve and a cartridge width from a third wall provided by the encasement sleeve to a fourth wall provided by the encasement sleeve, and the support base may have a support base width from a first border wall to a second border wall and a support base length from a third border wall to a fourth border wall, the cartridge width is substantially the same as the support base width, and the cartridge length is substantially the same as the support base length.

[0013] In any examples, the cartridge may be roll packed.

[0014] In any examples, the cartridge layers may include one or more layers of foam and one or more layers of microcoils.

[0015] In any examples, the fastener may be a zipper, and the zipper may be near an upper edge of at three or four of the enclosure walls.

[0016] A method according to an example of this disclosure may include arranging a support base such that a transition panel is above a support portion within adjoining border walls. The method may include positioning a cartridge within a cavity of an enclosure above the transition panel, the enclosure including adjoining enclosure walls bounding the cavity and each attached to one of the border walls, the cartridge including layers encased within an encasement sleeve, the encasement sleeve abutting inner surfaces of at least three enclosure walls of the enclosure when positioned within the enclosure. The method may include fastening the enclosure to a closed position with the cartridge within the cavity.

[0017] In any examples, a method may include, before the positioning step, unrolling the cartridge from a first roll packed configuration.

[0018] In any examples, a method may include, before the arranging step, unrolling the support base and enclosure from a second roll packed configuration separate from the first roll packed configuration.

[0019] In any examples, the fastening step may include zipping a cover to one or more of the enclosure walls.

[0020] In any examples, a method may include, before the arranging step, unrolling the support base and enclosure from a roll packed configuration.

[0021] In any examples, the fastening step may include zipping a cover to one or more of the enclosure walls.

[0022] These and other features may be best understood from the following specification and drawings, the following of which is a brief description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] FIG. **1** illustrates an example mattress.

[0024] FIG. **2** illustrates another view of a portion of the example mattress.

[0025] FIG. **3** illustrates an exploded view of the example mattress.

[0026] FIG. **4**A illustrates an example cartridge within an enclosure of the example mattress.

[0027] FIG. **4**B illustrates two example cartridges within an enclosure of another example mattress.

[0028] FIG. **5**A illustrates a top view of an example cartridge of the example mattress.

[0029] FIG. **5**B illustrates a top view of an example support base of the example mattress.

[0030] FIG. **6** illustrates an example roll packed cartridge and an example roll packed support base.

[0031] FIG. **7** illustrates a step of an example method.

[0032] FIG. **8** illustrates another step of the example method.

[0033] FIG. **9** illustrates another step of the example method.

DETAILED DESCRIPTION

[0034] FIG. **1** illustrates an example mattress **20** including a support base **22**, an enclosure **24** above the support base **22**, and a cartridge **26** removably receivable within the enclosure **24**. The enclosure **24** is shown in an opened position, during which the cartridge **26** can be inserted into, or removed from, the enclosure **24**. It should be understood

that terms such as "above," "below," "upper," and "lower" are used above with reference to the normal orientation of a mattress.

[0035] As illustrated in FIG. **2**, the example support base **22** includes four adjoining border walls **28**, including walls **28***a*, **28***b* at opposing lateral sides of the mattress, a wall **28***c* at the head of the mattress, and a wall **28***d* at the foot of the mattress. The example enclosure **24** includes four adjoining enclosure walls **30**, each attached to one of the border walls **28** at a tape edge **32**. A cavity **31** is bound by the walls **28**. The enclosure walls **30** include walls **30***a*, **30***b* at opposing lateral sides of the mattress **20**, a wall **30***c* at the head of the mattress, and a wall **30***d* at the foot of the mattress **20**. The border walls **28** may be made from fabric, which may be quilted with foam. The enclosure walls **30** may be made from fabric, which may be quilted with foam.

[0036] Two or more adjoining walls **28** or **30** as described herein may be formed of a continuous piece of fabric. The walls **28***a*, **28***b* may be substantially parallel) (+10° to one another, and the walls **28***c*, **28***d* may be substantially parallel) (+10° to one another. The walls **28***a*, **28***b* may be substantially perpendicular) (+10° to the walls **28***c*, **28***d*. Similarly, the walls **30***a*, **30***b* may be substantially parallel) (+10° to one another, and the walls **30***c*, **30***d* may be substantially parallel) (+10° to one another. The walls **30***a*, **30***b* may be substantially perpendicular) (+10° to the walls **30***c*, **30***d*.

[0037] FIG. **3** illustrates an exploded view of the example mattress **20**. Within the support base **22**, a support portion **33** includes coils **34** that may be arranged in various patterns and enclosed within the border walls **28** (partially removed for ease of viewing). Although the illustrative example support portion **33** includes coils **34**, other example support portions may include foam, or a combination of coils and foam. A transition panel **36** including one or more layers may be provided above the support portion **33**. In some examples, the coils **34** are steel coils. In some examples, the coils **34** are pocketed coils, although other coil types, including Bonnell coils, offset coils, continuous wire coils, or combinations of the disclosed coil types may be utilized. The example transition panel **36** may include foam. A base panel **37** may be provided below the coils **34**, opposite the transition panel **36**, and may include foam or padding. As used herein, in some examples, foam may include polyurethane foam, memory foam, latex foam, gel-infused foam, or combinations thereof. Although an example support base **22** is disclosed, mattresses with other support base types, including those without coils, may benefit from this disclosure.

[0038] In some examples, a fastener **38**, the illustrative example being a zipper, is provided near an upper edge of one or more of the enclosure walls **30**, and a cover **40** (partially shown) is in zippered engagement with one or more enclosure walls **30**. The example upper edge adjoins the cover **40**. The example cover **40** forms the top surface of the mattress **20** with respect to the normal orientation of the mattress **20**. In some examples, the cover **40** could be a single layer of fabric. In some examples, the cover **40** could be one or more layers of fabric quilted with foam. In some examples, the cover may be quilted with up to 4 inches of foam. With reference to FIG. **2**, the cavity **31** is bound by the walls **30**, the cover **40**, and the transition panel **36**. In some examples, the zipper **38** is near an upper edge of three or more of the enclosure walls **30**. In some examples, other fastening types may be utilized for opening and closing the enclosure **24**, including snaps, buttons, buckles, hook and loop, hook and eye, magnets, or other similar fasteners. The cover **40** may include a pillow top, which may include multiple layers. The fastener **38** may be provided at other locations on the enclosure walls **30** in some examples.

[0039] The example cartridge **26** is received within the cavity **31** above the transition panel **36**. The cartridge **26** may include layers **42***a*-**42***e* encased within an encasement sleeve **44**. The example sleeve **44** is tightly wrapped against the edges of the layers **42***a*-**42***e*. When received within the enclosure **24**, the encasement sleeve **44** abuts inner surfaces of at least three of the enclosure walls **30**. The enclosure **24** thus tightly surrounds the cartridge **26** so as to prevent the cartridge **26** from shifting, such as while the mattress **20** is in use. In some examples, with reference to FIG. **2**, when received within the enclosure **24**, the encasement sleeve **44** abuts inner surfaces of enclosure walls **30***c*, **30***d*, and one or both of the enclosure walls **30***a*, **30***b*. The example encasement sleeve **44** also abuts the inner surface of the cover **40**.

[0040] The example layers **42***a*-**42***e* may include one or more foam layers. The example layers **42***a*-**42***e* may additionally or alternatively include microcoils. In some examples, the microcoils discussed herein may be 0.25-4 inches in height. In some examples, the example layers **42***a*-**42***e* include one or more layers of foam and one or more layers of microcoils. In some examples, the example layers **42***a*-**42***e* includes alternating layers of foam and microcoils. As an example, layers **42***a*, **42***c*, and **42***e* may be foam layers, and layers **42***b* and **42***d* may be microcoils. Other configurations are contemplated. Although five layers **42***a*-**42***e* are shown in the illustrative example, more or fewer layers may be utilized. Layers within the cartridge **26** may be customized to achieve desired firmness or support profiles.

[0041] As shown in FIG. **4**A, in examples in which a single cartridge **26** is utilized, the encasement sleeve **44** abuts inner surfaces of all four enclosure walls **30***a*-**30***d* when received within the enclosure **24**. Although there is a slight gap between the surfaces in the Figure for illustrative purposes, the Figure is intended to show that the surfaces are in abutment. Specifically, in some examples, a first lateral wall **45***a* provided by the sleeve **44** abuts enclosure wall **30***a*, a second lateral wall **45***b* provided by the sleeve **44** abuts enclosure wall **30***b*, a wall **45***c* provided by the sleeve **44** at the head of the cartridge **26** abuts enclosure wall **30***c*, and a wall **45***d* provided by the sleeve **44** at the foot of the cartridge **26** abuts enclosure wall **30***d*.

[0042] As shown in FIG. **4**B, in other examples, such as for larger-sized mattresses, two cartridges **126***a*, **126***b* are provided side by side within the enclosure **124**, and the encasement sleeve **144** of each cartridge **126***a*, **126***b* abuts inner surfaces of at least three of the enclosure walls **130***a*-**130***d*. It should be understood that like reference numerals identify corresponding or similar elements throughout the several drawings. As shown, the cartridge **126***a* may abut enclosure walls **130***a*, **130***c*, and **130***d*, and cartridge **126***b* may abut enclosure walls **130***b*, **130***c*, and **130***d*. The cartridges **126***a* and **126***b* abut each other at their remaining surfaces.

[0043] FIG. **5**A illustrates a top view of the cartridge **26**. The cartridge **26** has a length l_c from the wall **45***c* to the wall **45***d* and a width w_c from the wall **45***a* to the wall **45***b*. FIG. **5**B illustrates a top view of the support base **22**. The support base **22** has a length l_s from the wall **28***c* to the wall **28***d* and

a width w_s from the wall **28***a* to the wall **28***b*. In some examples, the length l_c is substantially the same (+5%) as the length l_s, such that the cartridge **26** extends from the head end to the foot end of the mattress. The width We may also be substantially the same (+5%) as the width w_s, such that the cartridge **26** extends from one side to the other side of the mattress. The cartridge **26** therefore provides edge to edge support relative to the mattress **20**. With reference back to FIG. **4**B, in a two cartridge **126***a*, **126***b* example, the width of both cartridges **126***a*, **126***b* may be the same as the width of the support base (not shown).

[0044] As shown in FIG. **6**, the example support base **22** and attached enclosure **24** may be roll packed into a first roll package **50**. The example cartridge **26** may also be separately roll packed into a second roll package **52**. In some examples, separately roll packing the support base **22** and attached enclosure **24** and the cartridge **26** allows mattress to be shipped to consumers in two packages, one including roll package **50** and a second package including roll package **52**. This allows the mattress **20** to be shipped direct to consumer while keeping the packages under a courier's weight limits and still providing a high-quality mattress to the consumer. In some examples, each roll package **50**, **52** is under a weight threshold, such as 150 lbs. In examples in which more than one cartridge is utilized, each cartridge may be roll-packed into a separate roll package.

[0045] In some examples, a foam encasement, a known rectangular foam frame around the perimeter of some prior art mattresses, is not included in the cartridge **26** or elsewhere in the enclosure **24**. A foam encasement may not be included so that all components of the mattress **20** can be roll packed.

[0046] As illustrated in FIG. **7**, example methods associated with the mattress examples disclosed herein may include arranging a support base **22** such that a transition panel **36** is above a support portion within adjoining border walls. An enclosure **24** is provided above the transition panel **36**. As shown, a cover **40** may be pulled back to allow access to the cavity **31**.

[0047] As illustrated in FIG. **8**, example methods may include positioning a cartridge **26** within the cavity **31** of the enclosure **24**. The enclosure **24** includes four adjoining enclosure walls **30** each attached to one of the four border walls **28**. The cartridge **26** includes layers (not shown; see FIG. **3**) encased within an encasement sleeve **44**. The encasement sleeve **44** abutting inner surfaces of at least three enclosure walls **30** when positioned within the enclosure **24**.

[0048] As illustrated in FIG. **9**, example methods include fastening the enclosure **24** to a closed position with the cartridge **26** within the enclosure **24**. This may include zipping the enclosure **24** to the closed position with the cartridge **26** within the enclosure **24** in some examples. Alternative fastening mechanisms may be utilized. In some examples, the fastening includes fastening a cover **40** to one or more of the enclosure walls **30**.

[0049] In some examples, with reference to FIGS. **5**A and **5**B, before positioning the cartridge **26**, the cartridge **26** may be unrolled from a roll packed configuration. In some examples, before arranging the support base **22**, the support base **22** and enclosure **24** may be unrolled from a second roll packed configuration.

[0050] Although the different examples are illustrated as having specific components, the examples of this disclosure are not limited to those particular combinations. It is possible to use some of the components or features from any of the embodiments in combination with features or components from any of the other embodiments.

[0051] The foregoing description shall be interpreted as illustrative and not in any limiting sense. A worker of ordinary skill in the art would understand that certain modifications could come within the scope of this disclosure. For these reasons, the following claims should be studied to determine the true scope and content of this disclosure.

What is claimed is:

1. A mattress, comprising:
- a support base, including:
  - four adjoining border walls,
  - a support portion enclosed within the border walls, and
  - a transition panel above the support portion;
- an enclosure above the support base, including:
  - four adjoining enclosure walls each attached to one of the border walls,
  - a fastener disposed on one or more of the enclosure walls,
  - a cover, and
  - a cavity bound by the enclosure walls, the cover, and the transition panel; and
  - a cartridge removably receivable within the cavity, the cartridge including layers encased within an encasement sleeve, the encasement sleeve abutting inner surfaces of at least three of the enclosure walls when received within the enclosure.

2. The mattress of claim **1**, wherein the cartridge layers comprise foam layers.

3. The mattress of claim **1**, wherein the cartridge layers comprise one or more layers of foam and one or more layers of microcoils.

4. The mattress of claim **1**, wherein a foam encasement is not included in the cartridge.

5. The mattress of claim **1**, wherein the fastener is a zipper, and the zipper is near an upper edge of three or four of the enclosure walls.

6. The mattress of claim **1**, wherein the encasement sleeve abuts inner surfaces of four enclosure walls when received within the enclosure.

7. The mattress of claim **1**, wherein the cover includes a pillow top.

8. The mattress of claim **1**, wherein the transition panel comprises foam.

9. The mattress of claim **1**, wherein the support base comprises a base panel comprising foam below the support portion.

10. The mattress of claim **1**, wherein the cartridge is configured to be roll packed.

11. The mattress of claim **1**, wherein the cartridge has a cartridge length from a first wall provided by the encasement sleeve to a second wall provided by the encasement sleeve and a cartridge width from a third wall provided by the encasement sleeve to a fourth wall provided by the encasement sleeve, and the support base has a support base width from a first border wall to a second border wall and a support base length from a third border wall to a fourth border wall, the cartridge width is substantially the same as the support base width, and the cartridge length is substantially the same as the support base length.

12. The mattress of claim **11**, wherein the cartridge is configured to be roll packed.

13. The mattress of claim **11**, wherein the cartridge layers comprise one or more layers of foam and one or more layers of microcoils.

14. The mattress of claim **1**, wherein the support portion comprises coils.

15. A method, comprising:

arranging a support base such that a transition panel is above a support portion within adjoining border walls;

positioning a cartridge within a cavity of an enclosure above the transition panel, the enclosure including adjoining enclosure walls bounding the cavity and each attached to one of the border walls, the cartridge including layers encased within an encasement sleeve, the encasement sleeve abutting inner surfaces of at least three enclosure walls of the enclosure when positioned within the enclosure; and

fastening the enclosure to a closed position with the cartridge within the cavity.

16. The method of claim **15**, comprising:

before the positioning step, unrolling the cartridge from a first roll packed configuration.

17. The method of claim **16**, comprising:

before the arranging step, unrolling the support base and enclosure from a second roll packed configuration separate from the first roll packed configuration.

18. The method of claim **17**, wherein the fastening step includes zipping a cover to one or more of the enclosure walls.

19. The method of claim **15**, comprising:

before the arranging step, unrolling the support base and enclosure from a roll packed configuration.

20. The method of claim **15**, wherein the fastening step includes zipping a cover to one or more of the enclosure walls.

* * * * *