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(54) **WASHABLE MATTRESS ASSEMBLY**

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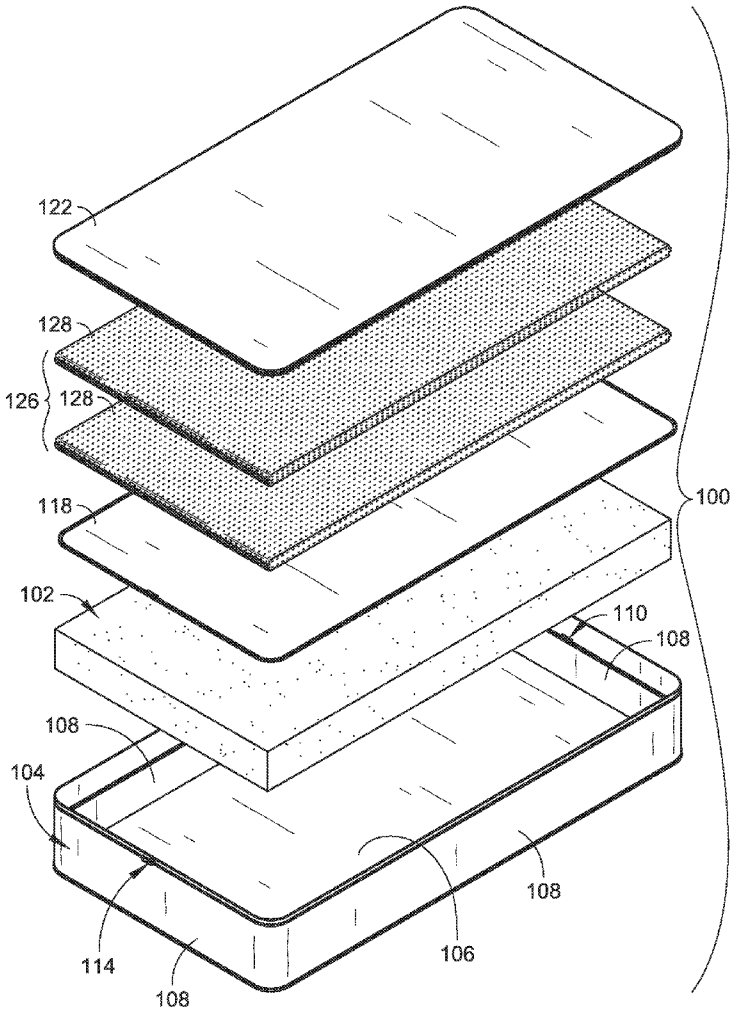
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(57) **ABSTRACT**

An encasement to enclose a mattress base includes a base panel with side panels extendable from the base panel. A first fastener extends around the side panels, and a first panel is fastenable to the side panels by the first fastener to define a first enclosure. The encasement also includes absorbent foam (e.g., resilient or viscoelastic foam, which may be reticulated and/or attached to a substrate). A second fastener also extends around the side panels, and a second panel is fastenable to the side panels by the second fastener to define a second enclosure to enclose the absorbent foam. The second panel can be constructed from a breathable and at least substantially waterproof material. The absorbent foam can be configured to be received in a front-loading washing machine (e.g., including multiple foam panels arranged in layers).



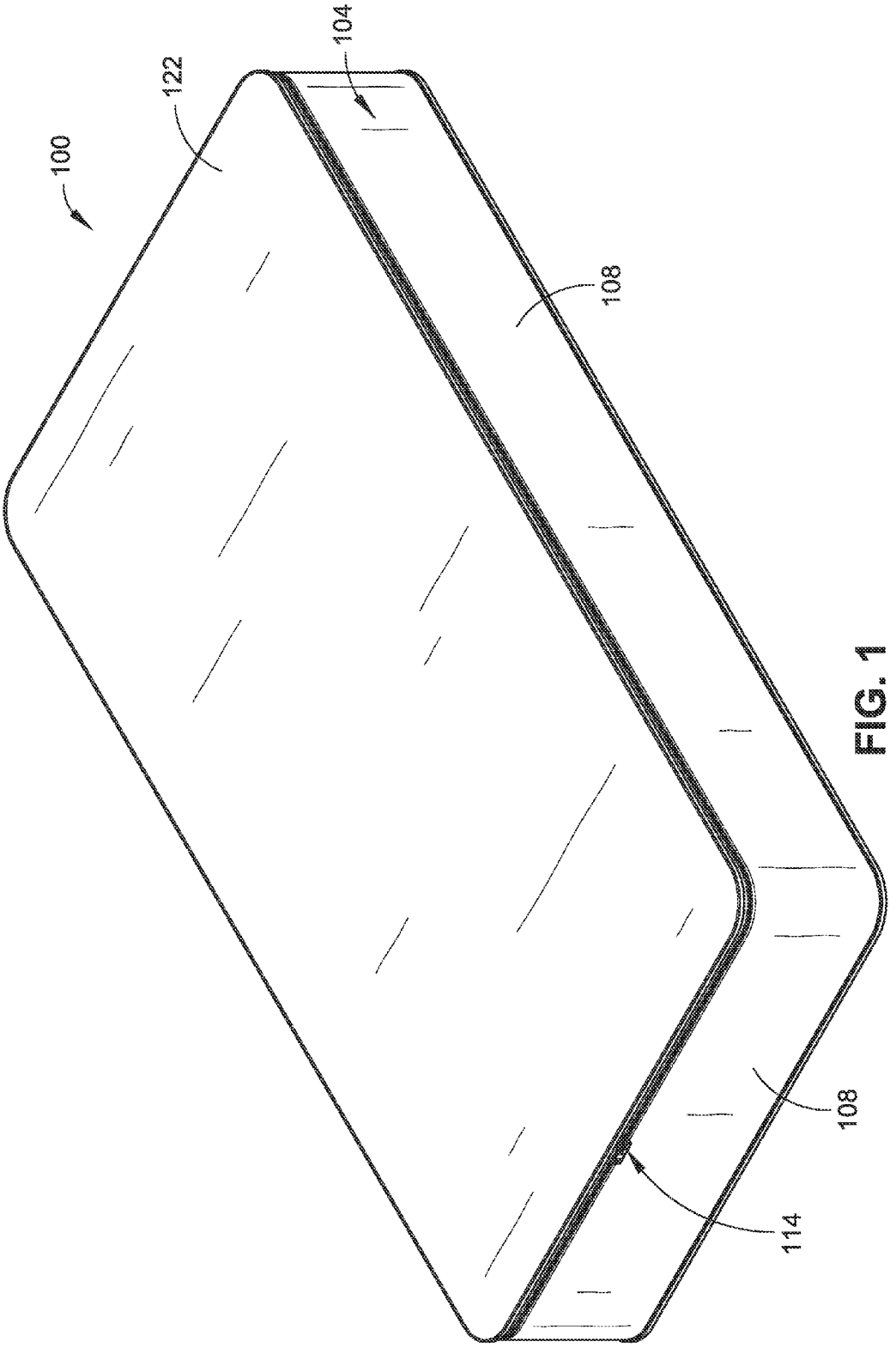


FIG. 1

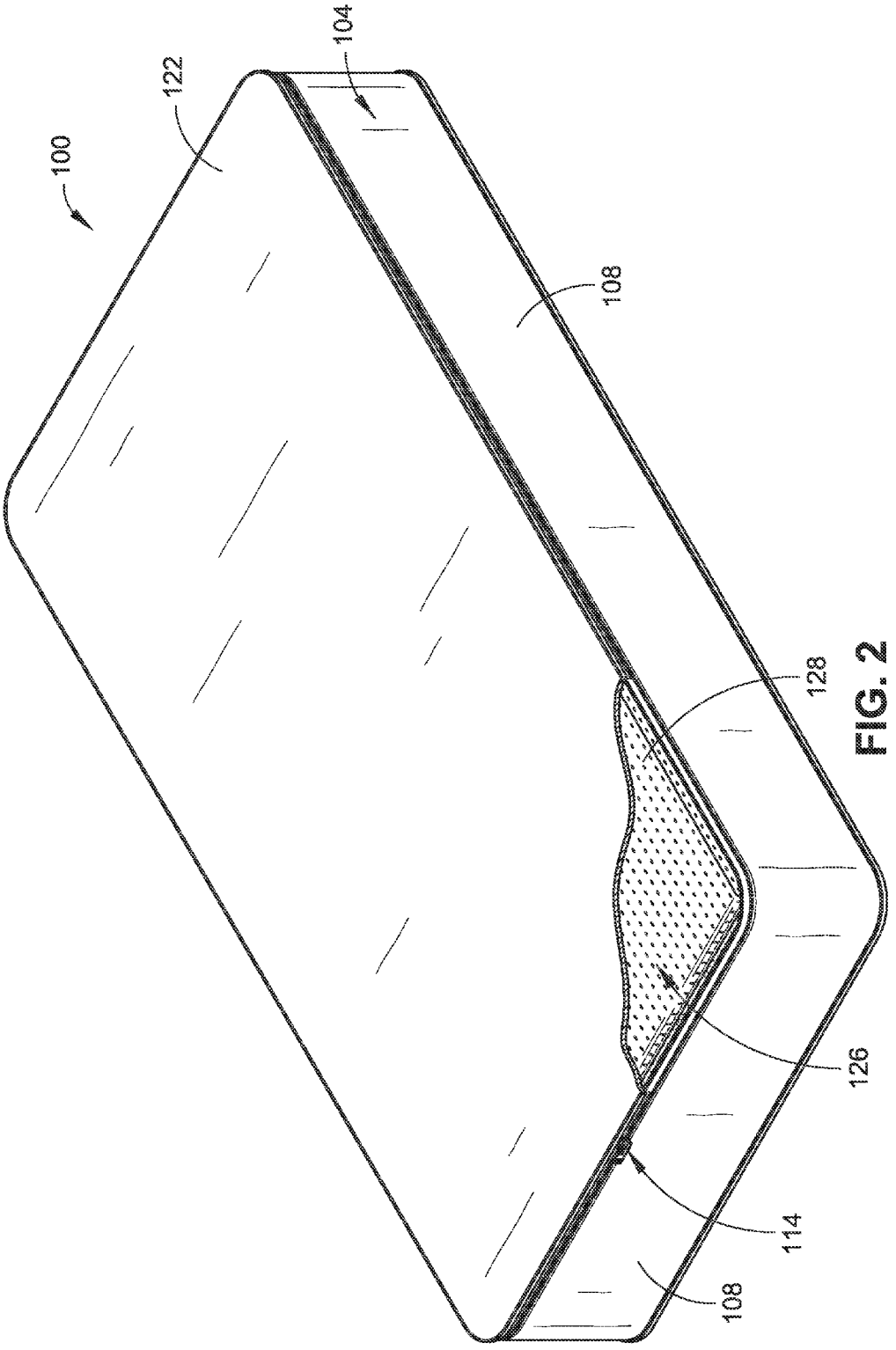


FIG. 2

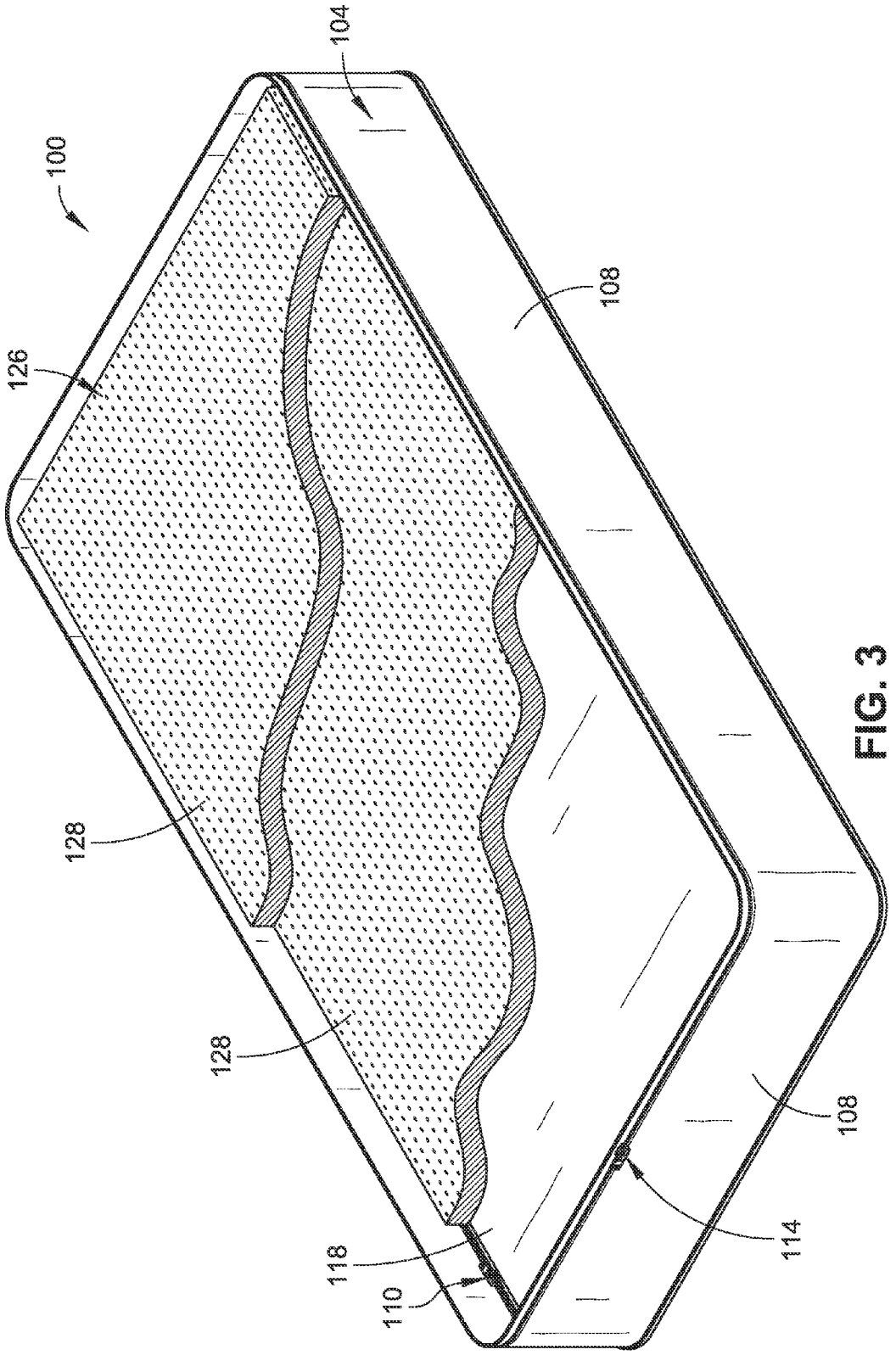


FIG. 3

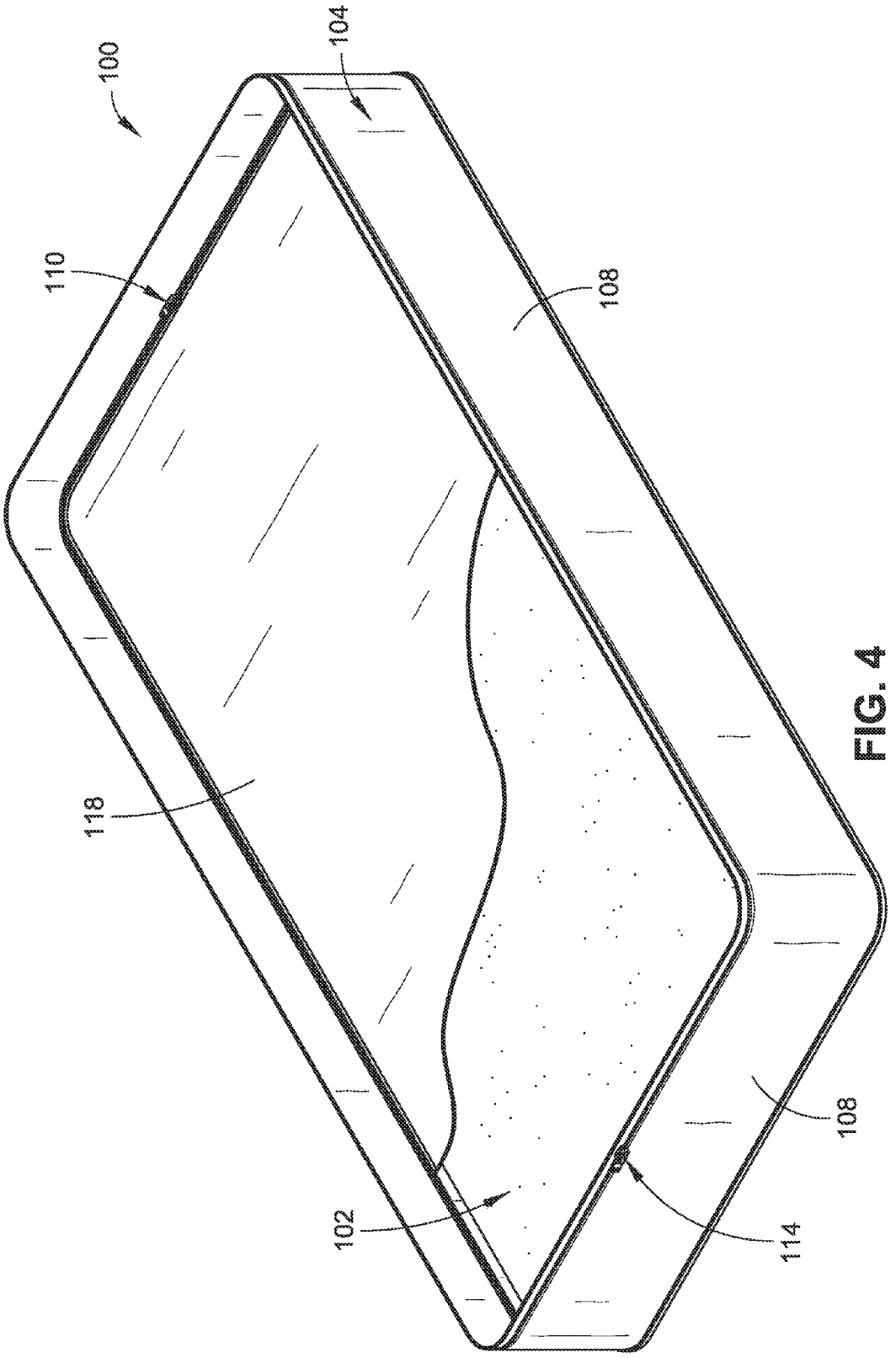


FIG. 4

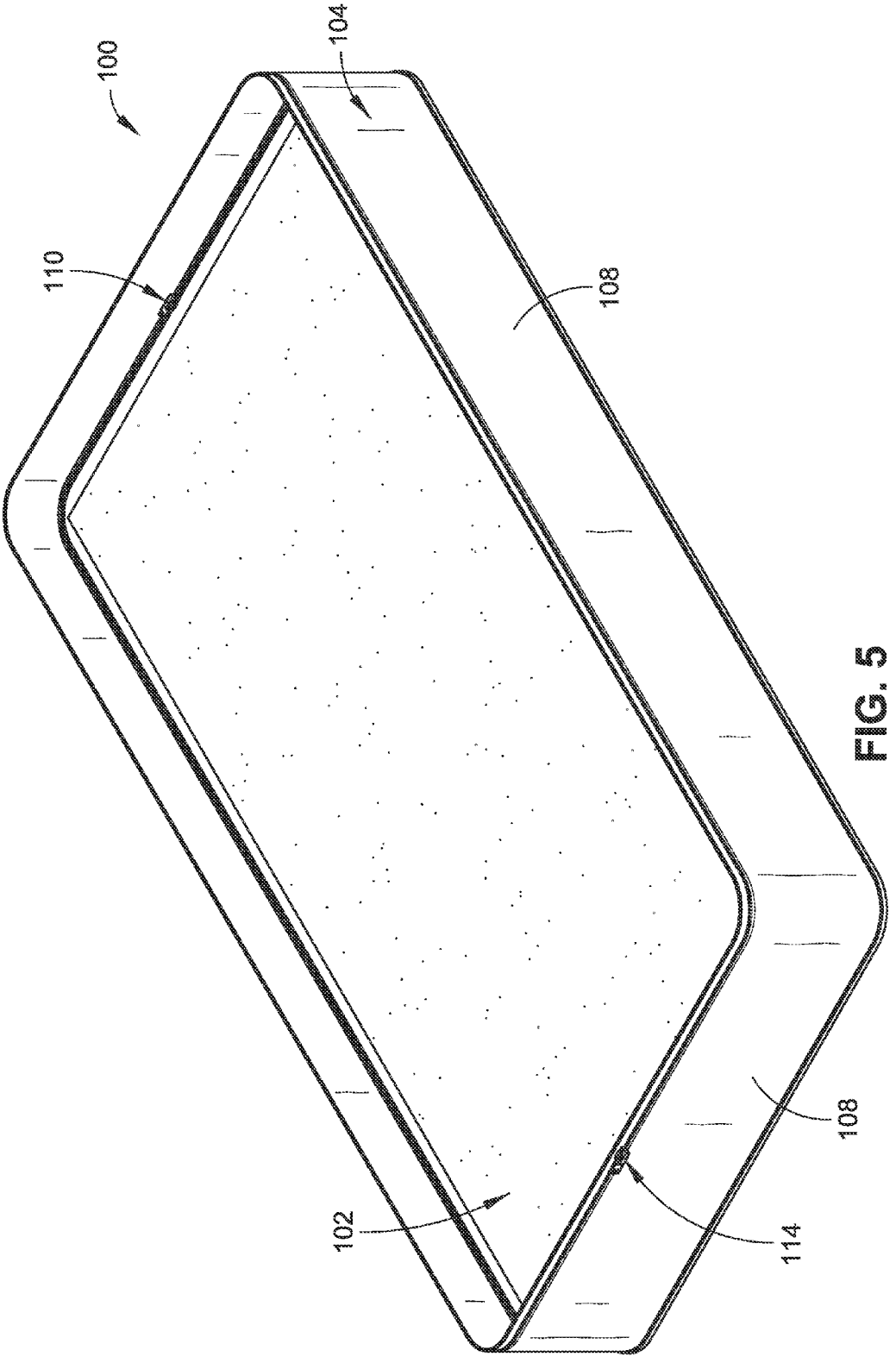


FIG. 5

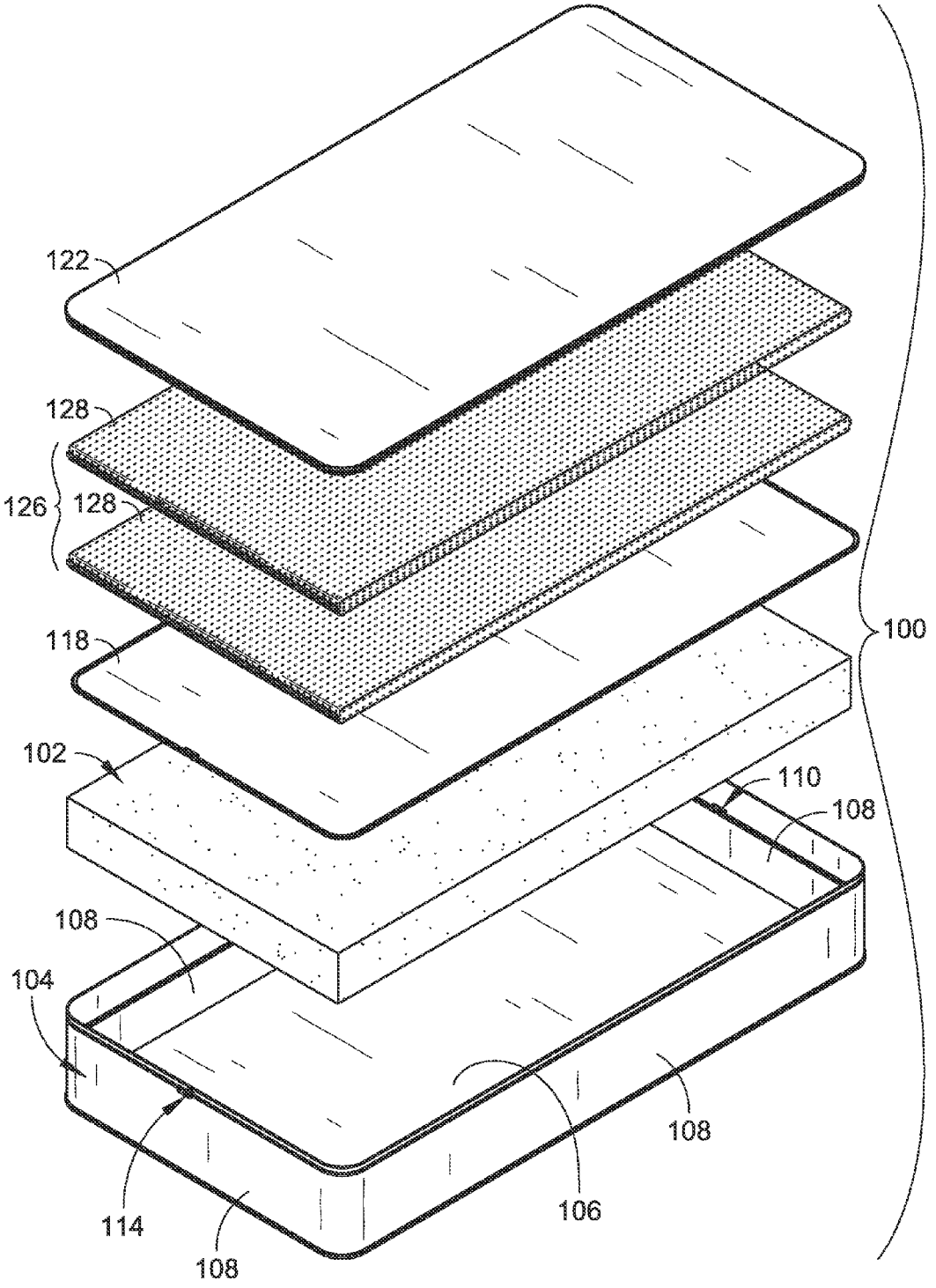


FIG. 6

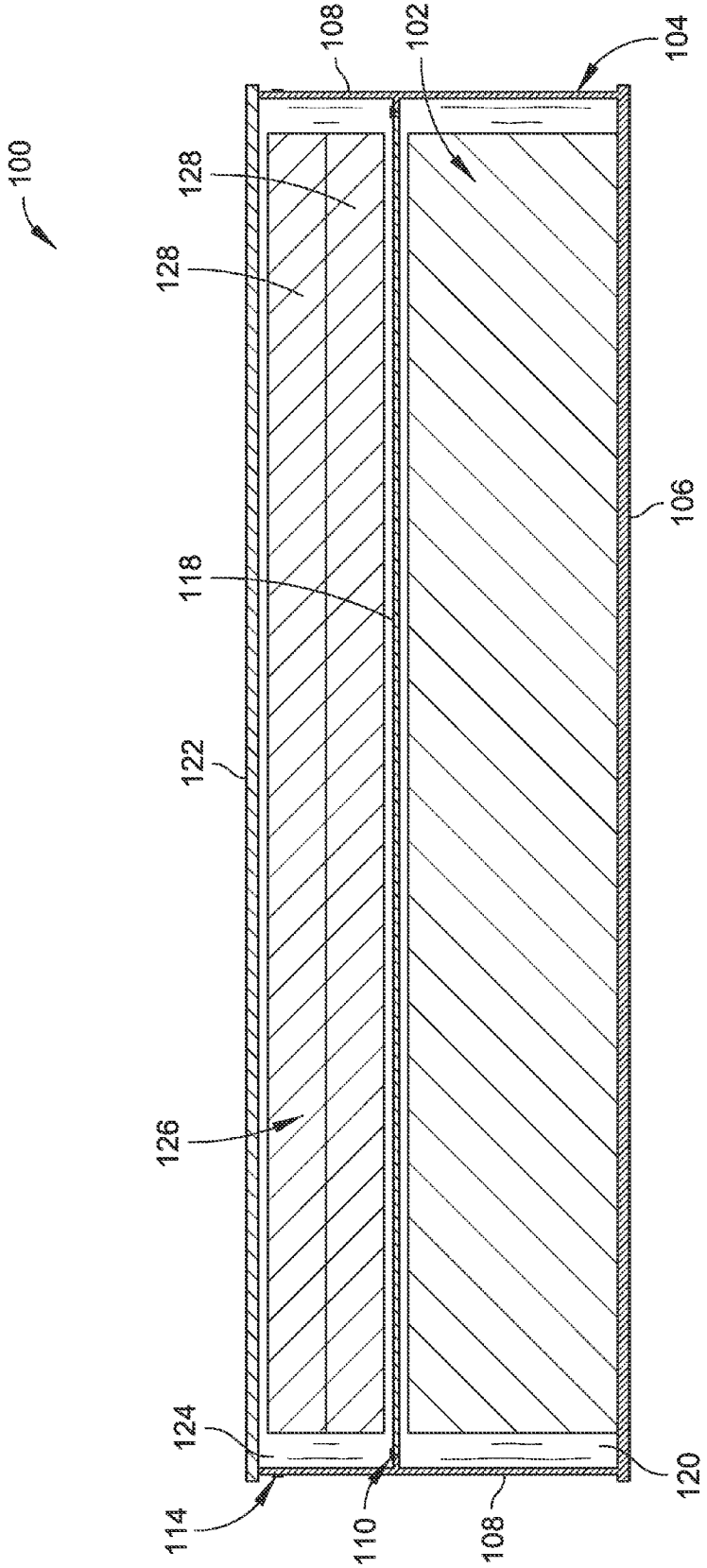


FIG. 7

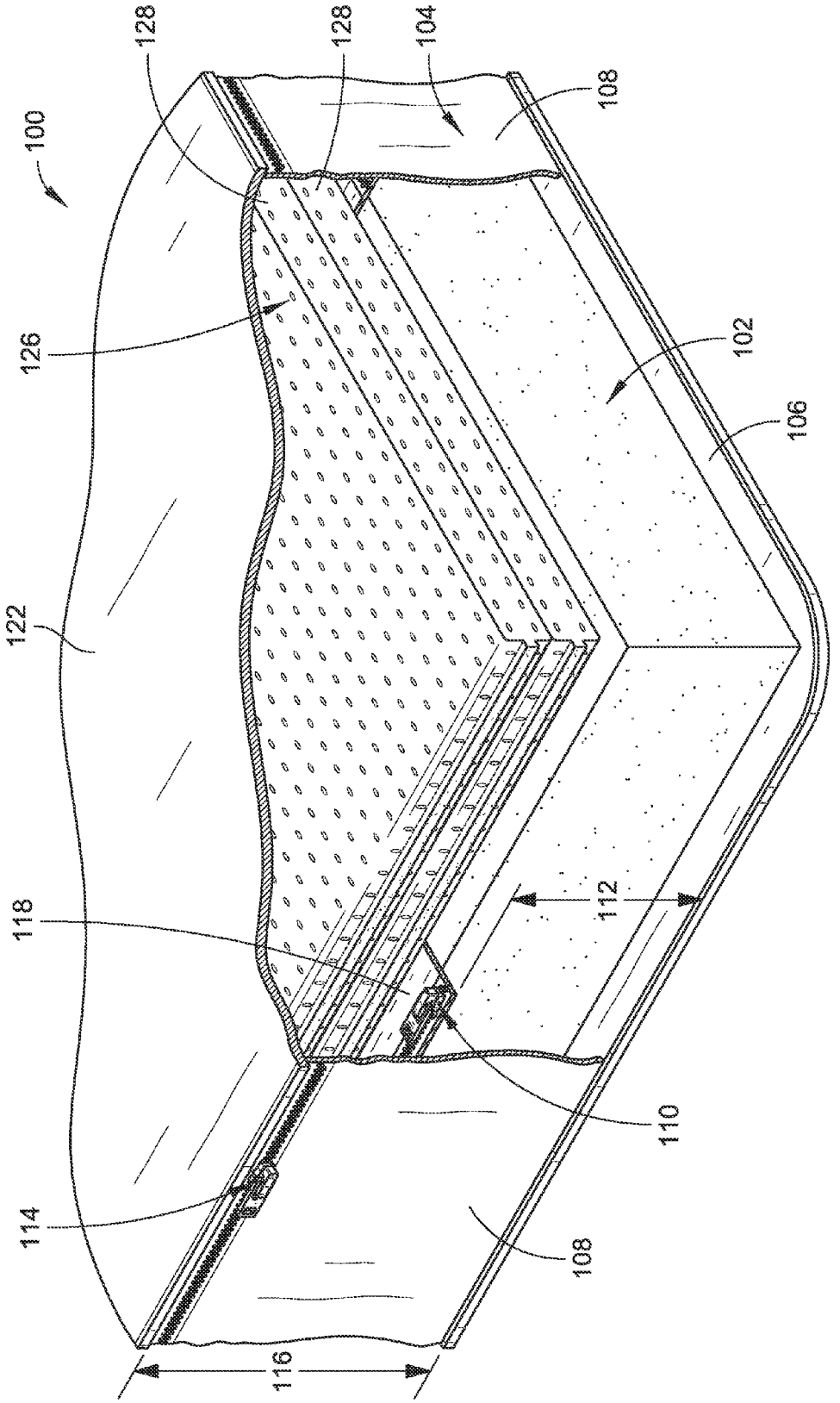


FIG. 8

WASHABLE MATTRESS ASSEMBLY

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application claims the benefit under 35 U.S.C. §119(e) of U.S. Provisional Application Ser. No. 62/087,936, filed Dec. 5, 2014, and titled "WASHABLE MATTRESS ASSEMBLY," which is herein incorporated by reference in its entirety.

BACKGROUND

[0002] A mattress is a large pad for supporting a reclining body, such as a fabric case filled with deformable or resilient material, used for sleeping on. For example, a mattress can be used as a bed or on a bed. Typically, mattresses are formed using a quilted or similarly fastened case, usually of heavy cloth or other covering material, and may contain hair, straw, cotton, flexible polyurethane foam, latex foam, etc. A mattress can also include a framework of metal springs. In some instances, mattresses may contain bladders, which are filled using air, water, or other materials.

SUMMARY

[0003] An encasement to enclose a mattress base includes a base panel with side panels extendable from the base panel. A first fastener extends around the side panels, and a first panel is fastenable to the side panels by the first fastener to define a first enclosure. The encasement also includes absorbent foam (e.g., resilient or viscoelastic foam, which may be reticulated and/or attached to a substrate). A second fastener also extends around the side panels, and a second panel is fastenable to the side panels by the second fastener to define a second enclosure to enclose the absorbent foam. The second panel can be constructed from a breathable and at least substantially waterproof material. The absorbent foam can be configured to be received in a residential and/or commercial front-loading washing machine, which may have a wash capacity of about eighty-eight one-hundredths (0.088) cubic meters or three and one-tenth (3.1) cubic feet (e.g., including multiple foam panels arranged in layers).

[0004] This Summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used as an aid in determining the scope of the claimed subject matter.

DRAWINGS

[0005] The Detailed Description is described with reference to the accompanying figures. The use of the same reference numbers in different instances in the description and the figures may indicate similar or identical items.

[0006] FIG. **1** is an isometric view of a mattress assembly in accordance with example embodiments of the present disclosure.

[0007] FIG. **2** is a partial cross-sectional isometric view of the mattress assembly illustrated in FIG. **1**.

[0008] FIG. **3** is another partial cross-sectional isometric view of the mattress assembly illustrated in FIG. **1**.

[0009] FIG. **4** is a further partial cross-sectional isometric view of the mattress assembly illustrated in FIG. **1**.

[0010] FIG. **5** is another partial cross-sectional isometric view of the mattress assembly illustrated in FIG. **1**.

[0011] FIG. **6** is an exploded isometric view of the mattress assembly illustrated in FIG. **1**.

[0012] FIG. **7** is a cross-sectional side elevation view of the mattress assembly illustrated in FIG. **1**.

[0013] FIG. **8** is a partial cross-sectional isometric view of the mattress assembly illustrated in FIG. **1**.

DETAILED DESCRIPTION

[0014] Referring generally to FIGS. **1** through **8**, a mattress assembly **100** is described. The mattress assembly **100** includes a mattress base **102**. In some embodiments, the mattress base **102** can be configured as a foam base. For example, the mattress base **102** can include one or more pieces and/or combinations of polyurethane foam, including, but not necessarily limited to: viscoelastic foam, resilient polyurethane foam, high resilience polyether foam, high resilience polyester foam, etc. In some embodiments, the mattress base **102** is formed using polyurethane foam in various forms using variations in formulation to modify its physical properties, such as firmness, density, resilience, airflow, strength, recovery time, etc. Further, a foam mattress base **102** may be reticulated. However, it should be noted that a foam mattress base **102** is provided by way of example and is not meant to limit the present disclosure. In other embodiments, the mattress base **102** can be another base and/or can be a mattress itself, including, but not necessarily limited to: a latex foam mattress, a bladder mattress, an air mattress, an innerspring mattress (e.g., a Bonnell coil mattress, an offset coil mattress, a continuous coil mattress, a wrapped coil mattress, an encased coil mattress, a pocket spring mattress), and so on.

[0015] The mattress assembly **100** also includes an encasement **104** to at least partially enclose the mattress base **102**. In embodiments of the disclosure, the encasement **104** is formed using upholstery (which may also be referred to as a tick or ticking), which includes a base panel **106** with side panels **108** extendable from the base panel **106**. The encasement **104** includes one fastener **110** (e.g., a first zipper and/or another fastener) that extends around the side panels **108** at a first distance **112** (FIG. **8**) away from the base panel **106** when the side panels **108** are extended from the base panel **106**, and another fastener **114** (e.g., another zipper and and/or another fastener) that extends around the side panels **108** at a second distance **116** (FIG. **8**) away from the base panel **106** when the side panels **108** are extended from the base panel **106**. In embodiments of the disclosure, the second distance **116** is greater than the first distance **112** (e.g., so the fastener **114** is positioned above the fastener **110**).

[0016] The encasement **104** can be a natural (e.g., cotton, linen) and/or synthetic (e.g., polyester) textile that is woven and/or knitted. In some embodiments, the encasement **104** can be an encasement containing breathable natural fibers, such as wool, bamboo, silk, etc. and/or synthetic fibers, such as polyester, rayon, etc. In some embodiments, the encasement **104** can be configured to reduce or eliminate a user's exposure to allergens (e.g., dust mites, etc.). In some embodiments, the encasement **104** can be formed using chemically treated fibers and/or inherently fire retardant fibers. For example, the encasement **104** can be a washable material, and the mattress assembly **100** may meet one or more standards for flammability (e.g., open flame) of mattress sets, including, but not necessarily limited to, a 16 CFR 1633 standard. Further, the encasement **104** may be quilted.

[0017] In embodiments of the disclosure, the mattress assembly **100** includes an upholstery panel **118** fastenable (e.g., removably securable) to the side panels **108** by the fastener **110**. For example, a zipper or another fastener is used to removably secure the panel **118** to the side panels **108** by binding flexible edges of the panel **118** and the side panels **108** together. In this manner, the panel **118**, the side panels **108**, and the base panel **106** can define an enclosure **120** (FIG. **7**) when the panel **118** is fastened to the side panels **108**. The enclosure **120** can be used to enclose the mattress base **102**.

[0018] The mattress assembly **100** also includes another upholstery panel **122** fastenable (e.g., removably securable) to the side panels **108** by the fastener **114**. For example, another zipper or another fastener is used to removably secure the panel **122** to the side panels **108** by binding flexible edges of the panel **122** and the side panels **108** together. In this manner, the panel **122**, the side panels **108**, and the panel **118** can define another enclosure **124** (FIG. **7**) when the panel **122** and the panel **118** are fastened to the side panels **108**. In embodiments of the disclosure, the enclosure **120** can be used to enclose absorbent foam **126**. The absorbent foam **126** may collect moisture (e.g., liquid) that penetrates through the upper panel **122**. However, the panel **118** can be constructed from a breathable and/or at least substantially waterproof material, and can prevent the moisture from penetrating through to the mattress base **102**. For instance, the panel **118** can be a waterproof, stretchable fabric membrane (e.g., polyethylene material, polytetrafluoroethylene (PTFE) material, etc.). In this manner, the mattress base **102** and the absorbent foam **126** can form a mattress core with the panel **118** forming a breathable waterproof barrier between the absorbent foam **126** and the mattress base **102** within the core.

[0019] In some embodiments, the absorbent foam **126** can be machine washable and/or machine dryable. For example, the absorbent foam **126** can be sized appropriately for a residential and/or commercial front-loading washing machine or a similar washing machine (e.g., with limited interior volume). The absorbent foam **126** may also be sized appropriately for a residential and/or commercial dryer or a similar drying machine. In embodiments of the disclosure, the absorbent foam **126** can include one or more (e.g., one (1), two (2), three (3), more than (3), etc.) foam panels **128**. One or more of the foam panels **128** can be constructed using a viscoelastic memory foam, which can be reticulated. For instance, in some embodiments, a foam panel **128** includes a foam pad constructed of a viscoelastic or resilient gel foam that has been reticulated to make the viscoelastic or resilient gel foam washable.

[0020] In embodiments of the disclosure, the reticulated foam of a foam panel **128** can have between at least approximately eleven (11) and twenty-four (24) cells (holes) per centimeter (e.g., 11.0 cells per centimeter, 11.5 cells per centimeter, 12.0 cells per centimeter, 12.5 cells per centimeter, 13.0 cells per centimeter, 13.5 cells per centimeter, 14.0 cells per centimeter, 14.5 cells per centimeter, 15.0 cells per centimeter, 15.5 cells per centimeter, 16.0 cells per centimeter, 16.5 cells per centimeter, 17.0 cells per centimeter, 17.5 cells per centimeter, 18.0 cells per centimeter, 18.5 cells per centimeter, 19.0 cells per centimeter, 19.5 cells per centimeter, 20.0 cells per centimeter, 20.5 cells per centimeter, 21.0 cells per centimeter, 21.5 cells per centimeter, 22.0 cells per centimeter, 22.5 cells per centimeter, 23.0 cells per centimeter, 23.5 cells per centimeter, 24.0 cells per centimeter) or between at least approximately thirty (30) and sixty (60) cells per inch (e.g., 30 cells per inch, 31 cells per inch, 32 cells per inch, 33 cells per inch, 34 cells per inch, 35 cells per inch, 36 cells per inch, 37 cells per inch, 38 cells per inch, 39 cells per inch, 40 cells per inch, 41 cells per inch, 42 cells per inch, 43 cells per inch, 44 cells per inch, 45 cells per inch, 46 cells per inch, 47 cells per inch, 48 cells per inch, 49 cells per inch, 50 cells per inch, 51 cells per inch, 52 cells per inch, 53 cells per inch, 54 cells per inch, 55 cells per inch, 56 cells per inch, 57 cells per inch, 58 cells per inch, 59 cells per inch, 60 cells per inch, etc.). However, it should be noted that this range is provided by way of example and is not meant to limit the present disclosure. In other embodiments, a foam panel **128** can have less than eleven (11) cells per centimeter, more than twenty-four (24) cells per centimeter, and so forth.

[0021] A foam panel **128** can also include a substrate (e.g., a fabric cover) attached to the foam material (e.g., to hold the foam material together during washing). In some embodiments, an overlock stitch (e.g., formed using a serging machine) can be used to fasten a fabric cover to a foam panel **128**, which may also include a welt. In other embodiments, a foam panel **128** can include foam flame-laminated to fabric. However, these examples are not meant to limit the present disclosure. In other embodiments, the foam panel **128** can include foam material glued to fabric, covered by fabric, quilted to fabric, and so forth. It should be noted that the fabric coating the foam of a foam panel **128** can be perforated (e.g., in the manner of a mesh) to allow moisture to penetrate into the foam. In this manner, a foam panel **128** can be removed, washed (e.g., machine washed), dried (e.g., machine dried), and reinserted into a mattress assembly **100**.

[0022] In some embodiments, the foam panels **128** can be attached to a panel **118**, a panel **122**, and/or to one another (e.g., to hold the foam panels **128** in place with respect to the mattress base **102**). For example, in some embodiments, the foam panels **128** can be attached to a panel **118**, a panel **122**, and/or to one another using one or more fasteners, including, but not necessarily limited to: hook-and-loop fasteners (e.g., VELCRO hook-and-loop fasteners), button fasteners, snap fasteners, clip fasteners, and so forth.

[0023] In some embodiments, the foam panels **128** can be arranged one on top of another (e.g., in two (2) layers, each at least approximately three and eight-tenths centimeters (3.8 cm) or one and one-half inches (1.5") thick as shown in the accompanying figures). However, this configuration is provided by way of example only and is not meant to limit the present disclosure. In other embodiments, foam panels may be arranged side-by-side. Further, the absorbent foam **126** may be a single foam panel **128** (e.g., at least approximately seven and six-tenths centimeters (7.6 cm) or three inches (3") thick). In some embodiments, foam panels may be arranged side-by-side and on top of one another. In any of these configurations, one or more fasteners can be used to connect the foam panels to a panel **118**, a panel **122**, and/or to one another. For example, in a side-by-side configuration, a flap may be included at an edge of a foam panel that has a hook fastener pattern, while a corresponding area of an adjacent foam panel can include a loop fastener pattern designed to interface with the hook fastener pattern.

[0024] In some embodiments, a mattress assembly can be configured to include one or more mattress inserts. For instance, a mattress assembly includes a mattress that defines a recess for receiving one or more mattress inserts. In some embodiments, a mattress base includes a dense foam base material with a casing around the base material. In embodi-

ments of the disclosure, the casing extends above a top surface of the base material to form a recess for receiving one or more mattress inserts. A mattress insert is configured to be inserted into the recess formed in the mattress and can be constructed of foam material (e.g., as previously described).

[0025] In some embodiments, the mattress inserts can be attached to the mattress (e.g., to hold the mattress inserts in place with respect to the mattress). For example, in some embodiments, the mattress inserts can be attached to the mattress using one or more fasteners, including, but not necessarily limited to: hook-and-loop fasteners (e.g., VELCRO hook-and-loop fasteners), button fasteners, snap fasteners, clip fasteners, and so forth. Further, a mattress assembly can include a removable mattress cover, including, but not necessarily limited to, a washable material that meets a 16 CFR 1633 standard, as a machine-washable mattress cover. In some embodiments, the mattress assembly can include fabric material constructed from a waterproof fabric membrane (e.g., polyethylene material). The waterproof material can be positioned between, for example, a mattress insert and the base material of the mattress.

[0026] By way of example, the following table provides sizes and numbers for various mattress inserts. However, these sizes and numbers are not meant to limit the present disclosure. Mattress insert sizes may be configured for machine washing in an eighty-eight one-hundredths (0.088) cubic meter or three and one-tenth (3.1) cubic feet or larger front loading washing machine. Thus, other various sizes and/or numbers of inserts can be used in accordance with the present disclosure.

Mattress Type	Mattress Size (cm or inches)	Insert Size Options (inches)
Twin	99 cm × 191 cm or 39" × 75" (3 inserts per mattress)	84 cm × 58 cm × 5 cm or 33" × 23" × 2" 84 cm × 58 cm × 8 cm or 33" × 23" × 3" 84 cm × 58 cm × 10 cm or 33" × 23" × 4"
Twin XL	99 cm × 203 cm or 39" × 80" (3 inserts per mattress)	84 cm × 69 cm × 5 cm or 33" × 27" × 2" 84 cm × 69 cm × 8 cm or 33" × 27" × 3" 84 cm × 69 cm × 10 cm or 33" × 27" × 4"
Full	137 cm × 191 cm or 54" × 75" (3 inserts per mattress)	122 cm × 58 cm × 5 cm or 48" × 23" × 2" 122 cm × 58 cm × 8 cm or 48" × 23" × 3" 122 cm × 58 cm × 10 cm or 48" × 23" × 4"
Queen	152 cm × 203 cm or 60" × 80" (3 inserts per mattress)	137 cm × 64 cm × 5 cm or 54" × 25" × 2" 137 cm × 64 cm × 8 cm or 54" × 25" × 3" 137 cm × 64 cm × 10 cm or 54" × 25" × 4"
King	193 cm × 203 cm or 76" × 80" (6 inserts per mattress)	84 cm × 64 cm × 5 cm or 33" × 25" × 2" 84 cm × 64 cm × 8 cm or 33" × 25" × 3" 84 cm × 64 cm × 10 cm or 33" × 25" × 4"

[0027] It is contemplated that the foam (e.g., mattress) inserts can be utilized within a bedding for animals, such as dogs, cats, and the like.

[0028] The mattress insert can be made in a variety of different firmness levels. This allows for different firmness configurations within the mattress. For example, in the case of the King size mattress, the mattress inserts may be configured with firm inserts on one side of the mattress and soft inserts on the other side of the mattress.

[0029] In some embodiments, the washable mattress may comprise a reticulated machine washable memory foam mattress. For example, the removable top cover of the mattress may be composed of a two and one-half centimeter (2.5 cm) or one-inch (1") reticulated memory gel foam that has been strengthened to hold up when machine washed and/or machine dried. This foam has been formulated so that it can be flame laminated to fabric. For instance, the foam is fastened by serging or flame laminated to a machine washable/dryable cotton fabric panel that may prevent the foam from shifting in the cover when washed and dried. The reticulation process eliminates the windows and reinforces the microscopic struts which form the high strength memory foam cells. For example, reticulation opens the structure of the foam so that water may easily flow through the foam greatly enhancing its "washability" and can enhance air flow in the foam providing cooling/drying benefits. Additionally, reticulation does not substantially change the resilience and/or viscoelastic properties of the foam.

[0030] In some embodiments, the washable mattress comprises a microencapsulated phase change material. For instance, a second eight and one-quarter centimeter (8.25 cm) or three and one-quarter inch (3.25") removable layer of memory foam can be coated with a layer of phase change gel material. This phase change gel material may be similar to the phase change gel material described in International Patent Application Number WO2011/107849, which is incorporated herein by reference. The phase change gel comprises extremely small capsules (typically five (5) to forty (40) microns for use in foam production) that permanently contain phase change materials (PCMs) and allow the PCM to absorb thermal energy when exposed to heat. Test results demonstrate the ability of Phase Change Gel to provide significant cooling benefits when applied to flexible polyurethane foam.

[0031] The phase change gel comprises non-porous characteristics and this coating may provide a waterproof barrier between the top washable cover and the underlying layers of foam. Additionally, the second eight and one-quarter centimeter (8.25 cm) or three and one-quarter inch (3.25") phase change gel/memory foam layer is configured to be removable so that the foam can be wiped down in place or removed and sprayed down. The second layer can be T-shaped to provide a flat uninterrupted sleeping surface on top with recessed foam underneath that substantially locks into the tub construction of the mattress.

[0032] Although the subject matter has been described in language specific to structural features and/or process operations, it is to be understood that the subject matter defined in the appended claims is not necessarily limited to the specific features or acts described above. Rather, the specific features and acts described above are disclosed as example forms of implementing the claims.

What is claimed is:

1. A mattress assembly comprising:

a mattress base; and

an encasement to enclose the mattress base, the encasement including

a first fastener extending around the side panels at a first distance away from the base panel when the side panels are extended from the base panel,

a first panel fastenable to the side panels by the first fastener, the first panel, the side panels, and the base panel defining a first enclosure when the first panel is fastened to the side panels, the first enclosure to enclose the mattress base,

an absorbent foam,

a second fastener extending around the side panels at a second distance away from the base panel when the side panels are extended from the base panel, the second distance greater than the first distance, and

a second panel fastenable to the side panels by the second fastener, the second panel, the side panels, and the first panel defining a second enclosure when the second panel and the first panel are fastened to the side panels, the second enclosure to enclose the absorbent foam, the second panel constructed from a breathable and at least substantially waterproof material.

2. The mattress assembly as recited in claim **1**, wherein the absorbent foam is configured to be received in at least one of a residential or commercial washing machine.

3. The mattress assembly as recited in claim **1**, wherein the absorbent foam comprises a plurality of foam panels.

4. The mattress assembly as recited in claim **1**, wherein the absorbent foam comprises a viscoelastic foam.

5. The mattress assembly as recited in claim **1**, wherein the absorbent foam is reticulated.

6. The mattress assembly as recited in claim **1**, wherein the absorbent foam comprises between eleven (11) and twenty-four (24) cells per centimeter.

7. The mattress assembly as recited in claim **1**, wherein the absorbent foam is fastened to a substrate.

8. An encasement to enclose a mattress base, the encasement comprising:

upholstery including a base panel with side panels extendable from the base panel;

a first fastener extending around the side panels at a first distance away from the base panel when the side panels are extended from the base panel;

a first panel fastenable to the side panels by the first fastener, the first panel, the side panels, and the base panel defining a first enclosure when the first panel is fastened to the side panels, the first enclosure to enclose the mattress base;

an absorbent foam;

a second fastener extending around the side panels at a second distance away from the base panel when the side panels are extended from the base panel, the second distance greater than the first distance; and

a second panel fastenable to the side panels by the second fastener, the second panel, the side panels, and the first panel defining a second enclosure when the second panel and the first panel are fastened to the side panels, the second enclosure to enclose the absorbent foam, the second panel constructed from a breathable and at least substantially waterproof material.

9. The encasement as recited in claim **8**, wherein the absorbent foam is configured to be received in at least one of a residential or commercial washing machine.

10. The encasement as recited in claim **8**, wherein the absorbent foam comprises a plurality of foam panels.

11. The encasement as recited in claim **8**, wherein the absorbent foam comprises a viscoelastic foam.

12. The encasement as recited in claim **8**, wherein the absorbent foam is reticulated.

13. The encasement as recited in claim **8**, wherein the absorbent foam comprises between eleven (11) and twenty-four (24) cells per centimeter.

14. The encasement as recited in claim **8**, wherein the absorbent foam is fastened to a substrate.

15. An encasement to enclose a mattress base, the encasement comprising:

upholstery including a base panel with side panels extendable from the base panel;

a first fastener extending around the side panels at a first distance away from the base panel when the side panels are extended from the base panel;

a first panel fastenable to the side panels by the first fastener, the first panel, the side panels, and the base panel defining a first enclosure when the first panel is fastened to the side panels, the first enclosure to enclose the mattress base;

a viscoelastic foam;

a second fastener extending around the side panels at a second distance away from the base panel when the side panels are extended from the base panel, the second distance greater than the first distance; and

a second panel fastenable to the side panels by the second fastener, the second panel, the side panels, and the first panel defining a second enclosure when the second panel and the first panel are fastened to the side panels, the second enclosure to enclose the viscoelastic foam, the second panel constructed from a breathable and at least substantially waterproof material.

16. The encasement as recited in claim **15**, wherein the viscoelastic foam is configured to be received in at least one of a residential or commercial washing machine.

17. The encasement as recited in claim **15**, wherein the viscoelastic foam comprises a plurality of foam panels.

18. The encasement as recited in claim **15**, wherein the viscoelastic foam is reticulated.

19. The encasement as recited in claim **15**, wherein the viscoelastic foam comprises between eleven (11) and twenty-four (24) cells per centimeter.

20. The encasement as recited in claim **15**, wherein the viscoelastic foam is fastened to a substrate.

* * * * *