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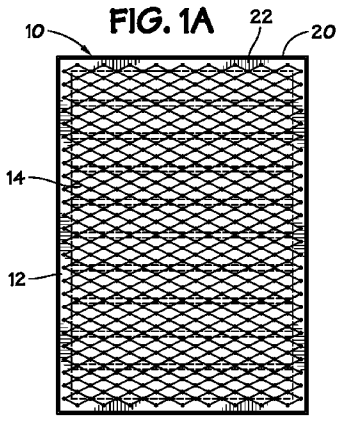
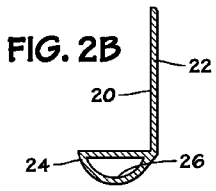




(57) Abstract: A screen assembly for a vibratory separator, the screen assembly comprising a screen support (12) having at least one side forming a perimeter, a t least one layer of screening material (14) supported thereby, and a seal member (20) characterised in that said seal member (20) comprises a side portion (22) encompassing said perimeter of said sup port (12), and a sealing portion (24,26) extending underneath said screen support (12).

WO 2009/074831 A2

VIBRATORY SEPARATOR AND SCREEN ASSEMBLIES THEREFOR

The present invention relates to a vibratory separator and screen assemblies therefor and a method of sealing an interface between a screen assembly and an adjacent screen assembly or a vibratory separator.

Vibratory separators are used in a wide variety of industries to separate materials such as liquids from solids or solids from solids. Typically such separators have a basket or other screen holding or mounting apparatus mounted in or over a receiving receptacle or tank and vibrating apparatus for vibrating the basket and thus the screen. One or more screens are mounted in the basket. Material to be treated is introduced to the screen(s) from above either by flowing it directly onto the screen(s) or by flowing it into a container, tank, or "possum belly" from which it then flows on to the screen(s). Also in some multi-screen apparatuses material flows generally horizontally or uphill from one screen to another and, in certain systems, from an upper screen onto a lower screen which may have the same grade screen or of a finer grade.

In the drilling of a borehole in the construction of an oil or gas well, a drill bit is arranged on the end of a drill string and is rotated to bore the borehole. A drilling fluid known as "drilling mud" is pumped through the drill string to the drill bit to lubricate the drill bit. The drilling mud is also used to carry the cuttings produced by the drill bit and other solids to the surface through an annulus formed between the drill string and the borehole. The drilling mud contains expensive synthetic oil-based lubricants and it is normal therefore to recover and re-use the used drilling mud, but this requires the solids to be removed from the drilling mud.

This is achieved by processing the drilling fluid. The first part of the process is to separate the solids from the solids laden drilling mud. This is at least partly achieved with a vibratory separator, such as those shale shakers disclosed in US 5,265,730, WO 96/33792 and WO 98/16328.

Shale shakers generally comprise an open bottomed basket having one open discharge end and a solid walled feed end. A number of rectangular screens are arranged in the basket held in C-channel rails located on the basket walls, such as those disclosed in GB-A-2,176,424. The basket is arranged on springs above a receptor for receiving recovered drilling mud. A skip or ditch is provided beneath the open discharge end of the basket. A motor is fixed to the basket, which has a drive rotor provided with an offset clump weight. In use, the motor rotates the rotor and the offset clump weight, which causes the basket and the screens fixed thereto to shake. Solids laden mud is introduced at the feed end of the basket on to the screens. The shaking motion induces the solids to move along the screens towards the open discharge end. Drilling mud passes through the screens. The recovered drilling mud is received in the receptor for further processing and the solids pass over the discharge end of the basket into the ditch or skip. In some shale shakers material flows generally horizontally or uphill from one screen to another and, in certain shale shakers, from an upper screen onto a lower screen.

The screens are generally of one of two types: hook-strip; and pre-tensioned.

The hook-strip type of screen comprises several rectangular layers of mesh in a sandwich, usually comprising one or two layers of fine grade mesh and a

supporting mesh having larger mesh holes and heavier gauge wire. The layers of mesh are joined at each side edge by a strip which is in the form of an elongate hook. In use, the elongate hook is hooked on to a tensioning device arranged along each side of a shale shaker. The shale shaker further comprises a crowned set of supporting members, which run along the length of the basket of the shaker, over which the layers of mesh are tensioned. An example of this type of screen is disclosed in GB-A-1,526,663. The supporting mesh may be provided with or replaced by a panel having apertures therein.

The pre-tensioned type of screen comprises several rectangular layers of mesh, usually comprising one or two layers of fine grade mesh and a supporting mesh having larger mesh holes and heavier gauge wire. The layers of mesh are pre-tensioned on a rigid support comprising a rectangular angle iron frame and adhered thereto. The screen is then inserted into C-channel rails arranged in a basket of a shale shaker. An example of this type of screen is disclosed in GB-A-1,578,948.

A further example of a known rigid support is disclosed in PCT Publication No. WO 01/76719, which discloses, amongst other things, a flat panel like portion having apertures therein and wing portions which are folded to form a support structure, which may be made from a single sheet of material. This rigid support has been assigned the Trade Mark "UNIBODY" by the applicants.

The layers of mesh in the screens wear out frequently and therefore need to be easily replaceable. Shale shakers are generally in the order of 5ft wide and 10ft long. A screen of dimensions 5ft wide by 10ft long is difficult to handle, replace and transport. It is known to use two, three, four or more screens in a single

shale shaker. A standard size of screen currently used is of the order of 4ft by 3ft.

There are a wide variety of patents disclosing screen assemblies for shale shakers and vibratory separators, including, but not limited to, those in U.S. Patents 7,175,028; 6,892,888; 6,543,621; 6,439,392; 6,202,856; 5,967,336; 5,690,826; 5,392,925; 4,909,929; 4,861,462; and in U.S. Application Ser. No. 10/473,262 filed Nov. 12, 2002. The prior art discloses a variety of gaskets, seals and seal systems for use with screen of a shale shaker or vibratory separator; including, but not limited to, the disclosures of U.S. Patents 7,040,488 (co-owned with the present invention); 6,955,252 (co-owned with the present invention); 6,672,460; 6,543,621; 6,269,954; and U.S. Patent Applications (both co-owned with the present invention and both disclosing bottom seals or space maintainers that are hollow and, in one aspect, D-shaped) U.S. Ser. No. 10/923,252 filed Aug. 20, 2004 and U.S. Ser. No. 11/063,667 filed Feb. 22, 2005 - all incorporated fully herein for all purposes.

In accordance with the present invention, there is provided a screen assembly for a vibratory separator, the screen assembly comprising a screen support having at least one side forming a perimeter, at least one layer of screening material supported thereby, and a seal member characterised in that the seal member comprises a side portion encompassing the perimeter of the support, and a sealing portion extending underneath the screen support.

Preferably, the sealing portion seals against a surface in the vibratory separator to inhibit solids and fluid from passing therebetween, so that substantially all of the solids laden drilling fluid passes over the at least one layer of screening material. Advantageously,

the sealing portion extends around all of the perimeter, preferably as a single piece, but may be formed from several abutting pieces. Preferably, the side portion seals against an abutting frame or portion of the vibratory separator, alternatively, the side portion need not seal, and thus having a small gap between an abutting screen or part of the vibratory separator, which allows small particles of solids to build up therein but are inhibited from passing between a deck of the vibratory separator and into the sump by the sealing portion arranged on an underside of the screen support.

Preferably, the sealing portion comprises a D-shaped portion. Advantageously, the D comprises a flat side and a curved side, the flat side abutting the underneath of the screen support and the curved side projecting therefrom. Advantageously, the D-shaped portion is one of: solid; or hollow.

Preferably, the side portion is substantially planar and advantageously, parallel to the perimeter of the sides of the screen support.

Advantageously, the seal member further comprises a top portion extending from the side portion over a portion of the screen support. Preferably, the top portion extends over at least a portion of the at least one layer of screening material. Advantageously, the top portion extends all the way around the perimeter of the screen support. Preferably, the top portion abuts an edge of the at least one layer of screening material and does not extend over the at least one layer of screening material. Advantageously, the frame comprises a pair of spaced apart ends and a pair of spaced apart sides forming a rectangle, the screen assembly having the top portion extending over a portion of each of the pair of

ends. Preferably, the top portion and advantageously, sealing portion each have a slit at each intersection of two ends with the two sides.

Preferably, the frame comprises a pair of spaced apart ends and a pair of spaced apart sides forming a rectangle, the screen assembly having the top portion extending over a portion of each of the pair of ends and a portion of the length of each of the pair of spaced apart sides. Advantageously, screen assembly further comprises at least one hole in the top portion to receive a projection of a screen supporting structure of a vibratory separator.

Preferably, the seal member is made of a resilient material, the seal member stretched around the screen support and released in place around the screen support. Advantageously, the seal member is fixed to the screen support by at least one of the following: welding, soldering, epoxy, glue, adhering, sintering and sewn.

Preferably, the screen assembly is at least one of: a solid frame, tubular frame, hollow frame, perforated plate and strip support.

Advantageously, the screen assembly further comprises at least one hole in the sealing portion to receive a projection of a screen supporting structure of a vibratory separator.

The present invention also provides a method for making a screen assembly for use on a vibratory separator, the screen assembly comprising a screen support having at least one side forming a perimeter, at least one layer of screening material supported thereby, and a seal member the method characterised by the steps of fitting a side portion of the seal member around the perimeter of the support, such that the seal member

encompasses the perimeter, the seal member further comprising a sealing portion extending underneath the screen support.

The present invention also provides a method for screening solids laden drilling mud with a vibratory separator, the vibratory separator comprising a vibratory mechanism, a screen mounting structure and a screen assembly of the invention mounted on the screen mounting structure, and a receptacle for receiving or guiding screened solids laden drilling fluid the method comprising the steps of feeding solids laden drilling mud into the vibratory separator, and activating the vibratory mechanism to induce screening of the solids laden drilling mud, the solids laden drilling mud inhibited from passing into the receptacle by the sealing member.

The present invention also provides a vibratory separator comprising a vibratory mechanism, a screen mounting structure and a screen assembly as of the invention mounted on said screen mounting structure.

The screen mounting structure may be a deck, a basket, a deck in a basket or any other suitable means for fixing a screen assembly in a vibratory separator.

In certain particular aspects, such a seal member is a single, integral piece with sides corresponding to sides of a screen support, the single piece stretchable to fit snugly around a screen support and provide sealing for all of its sides.

In other certain particular aspects, one or both ends of such a seal member include side and top portions to receive, hold, and/or protect part of a screen or screen support.

For a better understanding of the present invention, reference will now be made, by way of example, to the accompanying drawings, in which:

Figure 1A is a top plan view of a screen assembly in accordance with the present invention;

Figure 1B is an underneath view of the screen assembly shown in Figure 1A;

Figure 2A is a bottom view of a seal member of the screen assembly shown in Figure 1A;

Figure 2B is a cross-sectional view of the seal member shown in Figure 2A taken along line 2B-2B of Figure 2A;

Figure 2C is a partial perspective view of the seal member shown in Figure 2B;

Figure 2D is a cross-sectional view taken along line 2D-2D of Figure 1A;

Figure 3 is a cross-sectional view of a seal member in accordance with the present invention;

Figure 4A is a top plan view of a screen assembly in accordance with the present invention;

Figure 4B is an underneath view of the screen assembly shown in Figure 1A;

Figure 5A is a top plan view of a seal member in accordance with the present invention of the screen assembly shown in Figure 4A;

Figure 5B is a cross-sectional view of the seal member of the screen assembly shown in Figure 4A taken along line 5B-5B of Figure 5A;

Figure 5C is an partial perspective view of the seal member as shown in Figure 5B;

Figure 5D is a cross-sectional view of the seal member of the screen assembly shown in Figure 5A taken along line 5D-5D of Figure 5A.;

Figure 6 is a top plan view of a screen assembly in accordance with the present invention;

Figure 7A is a top plan view of a seal member of the screen assembly shown in Figure 6;

Figure 7B is a cross-sectional view of the seal member of the screen assembly shown in Figure 7A taken along line 7B-7B of Figure 7A;

Figure 7C is a cross-sectional view of the seal member of the screen assembly shown in Figure 7A taken along line 7C-7C of Figure 7A;

Figure 7D is a cross-sectional view of the seal member of the screen assembly shown in Figure 7A taken along line 7D-7D of Figure 7A;

Figure 8A is a top view of a screen assembly in accordance with the present invention, with dashed lines indicating hidden features;

Figure 8B is a cross-sectional view taken along line 8B-8B of Figure 8A of part of the screen assembly of Figure 8A showing a cross-section view of part of a seal member in accordance with the present invention;

Figure 8C is a cross-sectional view of the screen assembly shown in Figure 8A having an alternative embodiment of part of the seal member;

Figure 8D is a cross-sectional view of a seal member in accordance with the present invention;

Figure 9A is a perspective view of a screen assembly in accordance with the present invention;

Figure 9B is a top plan view of the screen assembly shown in Figure 9A;

Figure 9C is a side view of the screen assembly shown in Figure 9A;

Figure 9D is an end view of the screen assembly shown in Figure 9A;

Figure 9E is a cross-sectional view of part of the screen assembly taken along line 9E-9E of Figure 9D; and

Figure 9F is a cross-sectional view of part of the screen assembly shown in Figure 9A.

Figures 1A and 1B show a screen assembly 10 in accordance with the present invention which has a screen support in the form of a frame 12; screening material 14 on the frame 12; and a seal member 20 in accordance with the present invention around the frame 12. As is true for any embodiment of the present invention, including, but not limited to those described in detail below, the screening material 14 (and any screening material described herein) can be any known layer or layers of screening material, mesh, wire, or cloth; connected together or not (welded, epoxied, glued, adhered, sintered, sewn) over some or all of a screen surface; with any known screen support - frame (solid, tubular, hollow, etc) perforated plate, strip support, etc.; with the screening material secured to the support in any known way. As is true for any embodiment of the present invention, a known material may be used for the screening material (for example but not limited to, stainless steel) and for the frame (for example, but not limited to, steel); and any known sealing material may be used for the seal member 20 (and for any seal member in accordance with the present invention), for example, but not limited to, rubber, nitrile rubber, polyurethane, fiberglass, and stainless steel.

The frame 12 has four sides 12a, 12b, 12c, 12d forming a perimeter and a plurality of spaced-apart crossmembers or strips 12s.

The seal member 20 has four sides 20a, 20b, 20c, 20d which correspond to the sides 12a-12d of the frame 12 and

the sides 20a-20d of the seal member 20 are formed, located, and sized for a tight fit around the frame 12. The seal member 20 (as is true of any seal member in accordance with the present invention) is secured to the frame 12 with a snug friction fit (the seal member 20 may be a continuous seal which runs as one piece around the perimeter of the frame 12) and/or with an adhesive such as epoxy, glue, acrylic glue or super glue. As is true for any seal member in accordance with the present invention, the seal member 20 may be adhered to a screen's support and/or connected with a press fit.

As shown in Figures 2B and 2C, the seal member 20 has a side part 22 which extends all the way around and abuts the sides 12a-12d of the frame 12. Integral with the side part 22 is a lower seal 24 which, in this embodiment, is hollow with an interior space 26. In certain particular embodiments the seal member 20 is made of (nitrile rubber) and is flexible, with the seal 24 deformable by slight pressure thereon. The seal 24 extends all around the bottom of the frame 12 and, in certain aspects, is adhered to the bottom of the frame 12 with for example, super glue. The interior space 26 is completely within the seal 24. As is true for any seal member in accordance with the present invention, the seal like the seal 24 may be any desired shape with a space therein, and, in one particular embodiment, is generally "D" shaped as shown in Figure 2B.

As shown in Figure 2D (and as may be true for any embodiment herein), the side part 22 of the seal member 20 extends up to the top of the frame 12. It is to be understood it is within the scope of the present invention for the side part 22 (and for the side part of any embodiment herein) to extend only up to a certain

point on a frame, for example, but not limited to half-way up a frame side, a fourth of the way up, or three-fourths of the way up. The frame 12, shown in Figure 2D as made of hollow tubulars, may, in accordance with the present invention, be made of solid members.

As shown in Figure 3, a seal member 20s, like the seal member 20, with a side part 22s, may, in accordance with the present invention, have a solid seal 24s.

Figures 4A and 4B show a screen assembly 40 in accordance with the present invention which has a frame 42, with a plurality of spaced-apart crossmembers or strips 42s, sides 42a, 42b, 42c, 42d, and a seal member 50. Screening material 44 is on the frame 42.

The seal member 50 has four sides, 50a, 50b, 50c, 50d, corresponding to and fitting around the four sides 42a-42d of the frame 42. As viewed from above in Figures 4A and 5A, the seal member 50 has a top part 58 which extends around the seal member 50 and which covers a portion of the top areas of the frame sides 42a-42d as well as parts of the screening material 44 (shown in dotted lines, Figure 4A).

As shown in Figures 5A and 5D, the seal member, optionally, has parts 58a which are wider than parts 58. Optionally, and as may be true for any seal member in accordance with the present invention, the seal member 50, as shown in Figure 5C, can have one or more hole combinations 50h, 50k or only a single hole 50k to receive a pin projecting up from a screen deck or screen support.

The seal member 50 has a lower seal 54 with a hollow interior space 56. The sides 42a-42d of the frame 42 are received between the parts 58 (and 58a) and the seal 54, with a side part 52 of the seal member 50 abutting the

exteriors of the sides 42a-42d.

Figure 6 shows a screen assembly 60 in accordance with the present invention which has a frame 62 with sides 62a, 62b, 62c, 62d and spaced-apart crossmembers or strips 62s and screening material 64 thereon. A seal member 70 in accordance with the present invention encompasses the frame 62.

The seal member 70 has sides 72a, 72b, 72c, and 72d. A substantial portion of the sides 72b and 72d has no top part that extends from a side part 74 over part of the frame 62, as shown in the cross-section view of Figure 7B. The sides 72a and 72c of the seal member 70 do have a top part 78 which extends from the seal member 70 and covers part of the top surface of the sides 62d and 62c of the frame 62. Small portions 78p of the top parts 78 extend over portions of the sides 72b and 72d; and thus sides 62a and 62c of the frame 62 are received with and abut the seal member's parts 74, 77 and 78. It is within the scope of the present invention, as is true for any embodiment herein, for the top parts 78 to cover wires of the screening material 64, or not. The portions 78p are optional. Optionally, slits 70t are cut in the corners of the seal member 70. As may be true for any seal member in accordance with the present invention, the seal member 70 has holes 70h through the seal member to accommodate pins projecting up from a screen deck or screen support.

Figure 8A shows a screen assembly 80 in accordance with the present invention which has a hollow tubular frame 82 with sides 82a, 82b, 82c, 82d and crossmembers 82s and 82t. Screening material 84 covers the frame 82 (although shown partially in Figure 8A).

A seal member 90 encompasses the frame 82. A dotted

line (Figure 8A) shows the outer edge of the frame 82. Any seal member in accordance with the present invention may be used with the screen 80.

The seal member 90 has a top part 98 which extends over a portion of the top surfaces of the sides 82a-82d and a side part 92 which extends around and abuts the side surfaces of the sides 82a-82d. The entire top surface of the tubular part shown in Figure 8B may be covered by the seal member 90. Optionally, as shown in Figure 8C (and as may be true for any seal member in accordance with the present invention) the top part may be a top part 98a that extends past the frame 82 (beyond an inner surface of all frame ends and frame sides) and covers a portion of screening material SM on the frame 82. A lower seal 94 abuts lower surfaces of the sides 82a-82d. The lower seal, optionally, has a hollow interior space 96.

An optional embodiment of 90a of a seal member, in accordance with the present invention, has a top part 98a which can extend over a portion of a top surface of sides of a frame and a side part 92a which can extend around and abut side surfaces of frame sides. A bottom member 95a can abut a bottom of a frame. A lower seal 94a can abut a lower surface of sides of a frame.

Figures 9A and 9B show a screen 100 in accordance with the present invention which has a frame 102 with holes 104 therethrough and spaced-apart cross members 106. Screening material 110 (for example any screening material disclosed herein; shown partially and cut-away) covers the surface of the frame 102. The frame 102 has ends 111, 112 and sides 113, 114.

A seal member 120 in accordance with the present invention encompasses the frame 102. The seal member 120

has sides 121, 122 which do not project above the top of the frame 102 and ends 123, 124 which are generally "C" shaped and receive and cover the ends 111, 112 of the frame 102.

The present invention, therefore, provides in at least certain embodiments, a screen for a vibratory separator, the screen including: a support, the support having a support top, a support bottom, two spaced-apart support ends, and two spaced-apart support sides; screening material on the support; a seal member encompassing the support; the seal member having two spaced-apart seal ends, each of the seal member's two spaced-apart seal ends in contact with one of the support's spaced apart support ends and the seal member having two spaced-apart seal sides, each of the seal member's two spaced-apart seal sides in contact with one of the support's two spaced-apart support sides; the seal member having a bottom part connected to the seal member's two spaced-apart seal ends and the two spaced-apart seal sides; the bottom part including a hollow seal portion for sealingly contacting a screen supporting structure of the vibratory separator for supporting the screen; and, in one aspect, the bottom part of the seal member in contact with the support bottom of the support. Such a screen may have one or some, in any possible combination, of the following: the seal member having a top part connected to each of the seal member's seal ends and seal sides, and the top part on the support top of the support; the bottom part having a bottom hole for receiving a projection of a screen supporting structure of a vibratory separator; the seal member having a top part connected to each of the seal member's seal ends and seal sides, the top part on the support top of the

support, and the top part has a top hole for receiving a projection of a screen supporting structure of a vibratory separator that is projecting through the bottom hole; the hollow seal portion is generally "D" shaped; the top part covers portions of the screening material; the top part extends inwardly of the screen beyond an inner surface of each of the support ends and support sides; the vibratory separator is a shale shaker and the screen is for mounting on the shale shaker to screen solids from a drilling fluid mixture fed to the shale shaker; and/or the seal member having a plurality of sides, and a slit at each intersection of two sides of the plurality of sides.

The present invention, therefore, provides in at least certain embodiments, a method for making a screen for use on a vibratory separator, the method including: connecting screening material to a support, the support having an outer periphery; placing a seal member on the support encompassing the support's outer periphery, the seal member as any described herein in accordance with the present invention; and locating a bottom part of the seal member in contact with a support bottom of the support. Such a method may have one or some, in any possible combination, of the following: the seal member having a plurality of sides, and a plurality of slits, a slit at each intersection of two sides of the plurality of sides; the seal member having a top part connected to each of the seal member's seal ends and seal sides, and the top part on the support top of the support; the bottom part has a bottom hole for receiving a projection of a screen supporting structure of a vibratory separator; the seal member having a top part connected to each of the seal member's seal ends and seal sides, the

top part on the support top of the support, and the top part having a top hole for receiving a projection of a screen supporting structure of a vibratory separator that is projecting through the bottom hole; wherein the top part covers portions of the screening material; wherein the top part extends inwardly of the screen beyond an inner surface of each of the support ends and support sides.

The present invention, therefore, provides in at least certain embodiments, a method for screening material fed to a vibratory separator, the material including liquid and solids, the method including feeding material to a screen of a vibratory separator, the screen as any described herein in accordance with the present invention; and with the screen, screening the material to separate solids from the liquid. Such a method may have one or some, in any possible combination, of the following: wherein the vibratory separator has at least one projection projecting upwardly beneath the screen, the screen bottom part having at least one hole for receiving the at least one projection, the method further including positioning the screen with the at least one projection in the at least one hole; and/or wherein the vibratory separator is a shale shaker and the screen is for mounting on the shale shaker to screen solids from a drilling fluid mixture fed to the shale shaker.

The present invention, therefore, provides in at least certain embodiments, a screen for a vibratory separator, the screen including: a support, the support having a support top, a support bottom, two spaced-apart support ends, and two spaced-apart support sides; screening material on the support; a seal member encompassing the support; the seal member having two

spaced-apart seal ends, each of the seal member's two spaced-apart seal ends in contact with one of the support's spaced apart support ends and the seal member having two spaced-apart seal sides, each of the seal member's two spaced-apart seal sides in contact with one of the support's two spaced-apart support sides; the seal member having a bottom part connected to the seal member's two spaced-apart seal ends and the two spaced-apart seal sides; and the bottom member having a seal portion projecting therefrom for sealingly contacting a screen supporting structure of the vibratory separator for supporting the screen.

CLAIMS:

1. A screen assembly for a vibratory separator, the screen assembly comprising a screen support (12) having at least one side forming a perimeter, at least one layer of screening material (14) supported thereby, and a seal member (20) characterised in that said seal member (20) comprises a side portion (22) encompassing said perimeter of said support (12), and a sealing portion (24,26) extending underneath said screen support (12).

2. A screen assembly as claimed in Claim 1, wherein said sealing portion (24,26) comprises a D-shaped portion.

3. A screen assembly as claimed in Claim 2, wherein said D-shaped portion is one of: solid; or hollow.

4. A screen assembly as claimed in any preceding claim, wherein said side portion (22) is substantially planar.

5. A screen assembly as claimed in any preceding claim, wherein the seal member (20) further comprises a top portion (58,78) extending from said side portion (22) over a portion of said screen support (12).

6. A screen assembly as claimed in Claim 5, wherein said top portion extends over at least a portion of said at least one layer of screening material.

7. A screen assembly as claimed in Claim 5 or 6, wherein the frame (12) comprises a pair of spaced apart ends (72a,72c) and a pair of spaced apart sides (72b,72d) forming a rectangle, the screen assembly having said top portion (78) extending over a portion of each of said pair of ends (72a,72c).

8. A screen assembly as claimed in Claim 5 or 6, wherein the frame (12) comprises a pair of spaced apart ends (72a,72c) and a pair of spaced apart sides (72b,72d) forming a rectangle, the screen assembly having said top

portion (78) extending over a portion of each of said pair of ends (72a,72c) and a portion of the length of each of said pair of spaced apart sides (72b,72d).

9. A screen assembly as claimed in any of Claims 5 to 8, further comprising at least one hole (70h) in said top portion (58,78) to receive a projection of a screen supporting structure of a vibratory separator.

10. A screen assembly as claimed in any preceding claim, wherein said seal member (20) is made of a resilient material, the seal member (20) stretched around said screen support (12) and released in place around said screen support.

11. A screen assembly as claimed in any preceding claim, wherein said seal member (20) is fixed to said screen support (12) by at least one of the following: welding, soldering, epoxy, glue, adhering, sintering and sewn.

12. A screen assembly as claimed in any preceding claim, wherein said screen assembly (12) is at least one of: a solid frame, tubular frame, hollow frame, perforated plate and strip support.

13. A screen assembly as claimed in any preceding claim, further comprising at least one hole in said sealing portion (24,26) to receive a projection of a screen supporting structure of a vibratory separator.

14. A method for making a screen assembly for use on a vibratory separator, the screen assembly comprising a screen support (12) having at least one side forming a perimeter, at least one layer of screening material (14) supported thereby, and a seal member (20) the method characterised by the steps of fitting a side portion (22) of said seal member (20) around said perimeter of said support (12), such that said seal member (20) encompasses

said perimeter, the seal member (20) further comprising a sealing portion (24,26) extending underneath said screen support (12).

15. A method for screening solids laden drilling mud with a vibratory separator, the vibratory separator comprising a vibratory mechanism, a screen mounting structure and a screen assembly as claimed in any of Claims 1 to 12 mounted on said screen mounting structure, and a receptacle for receiving or guiding screened solids laden drilling fluid the method comprising the steps of feeding solids laden drilling mud into the vibratory separator, and activating the vibratory mechanism to induce screening of the solids laden drilling mud, said solids laden drilling mud inhibited from passing into said receptacle by said sealing member (20).

16. A vibratory separator comprising a vibratory mechanism, a deck and a screen assembly as claimed in any of Claims 1 to 13 mounted on said screen mounting structure.

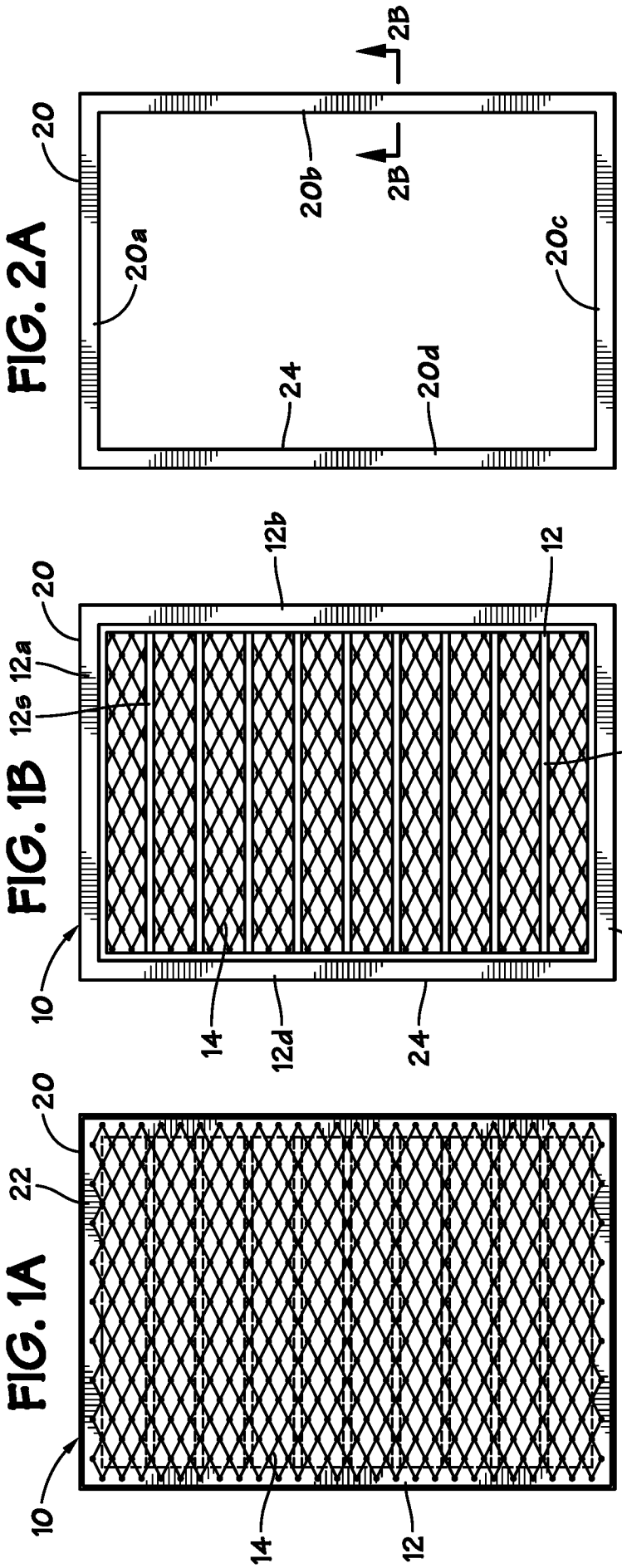


FIG. 1A
20
22
10
14
12
FIG. 1B
20
12b
12
12a
12s
12s
10
14
12d
24
12c
FIG. 2A
20
2B
2B
20b
20a
20c
24
20d
FIG. 2B
22
20
26
24
FIG. 2C
22
20
24
26
FIG. 2D
22
26
14
12
24
FIG. 3
22s
20s
24s

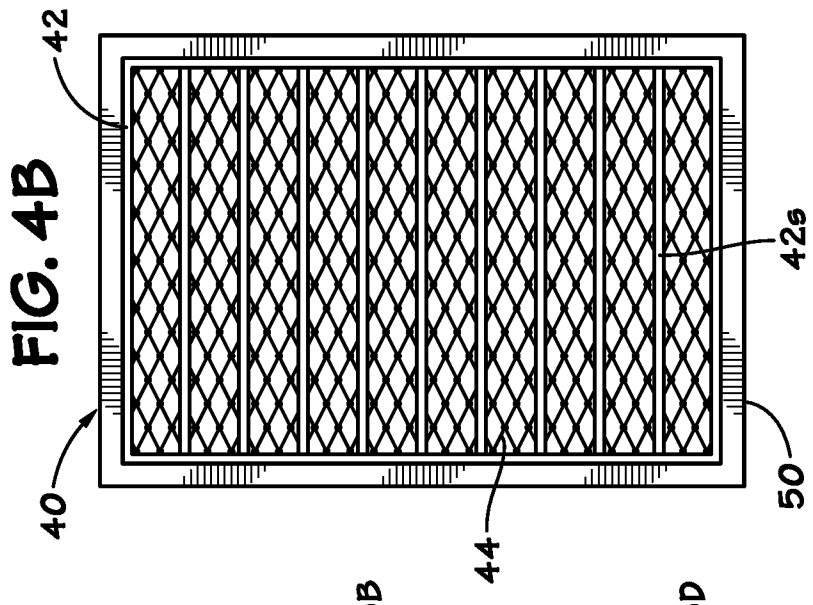


FIG. 4B

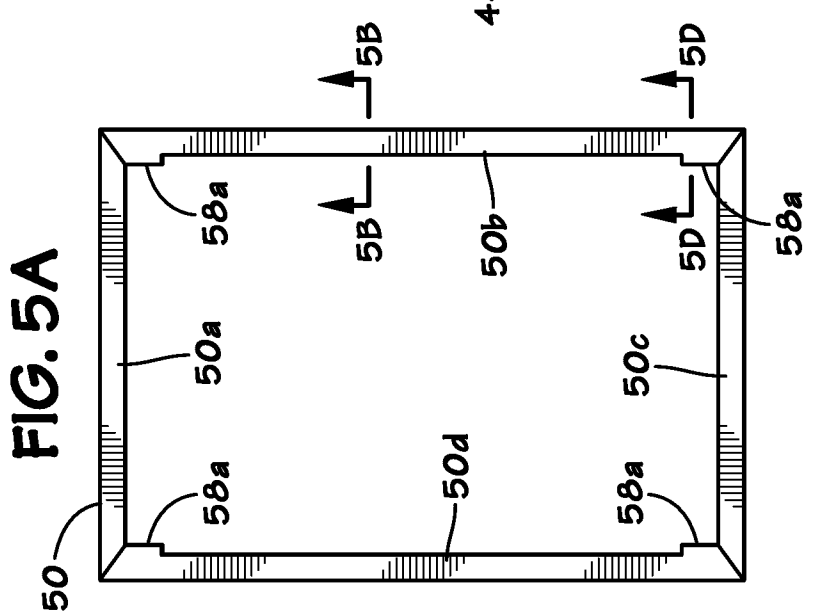


FIG. 5A

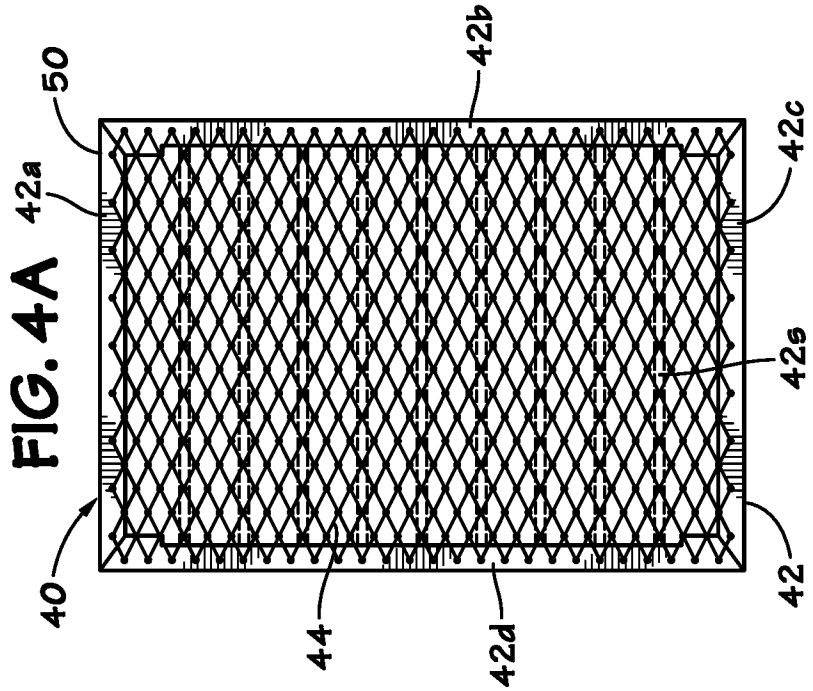


FIG. 4A

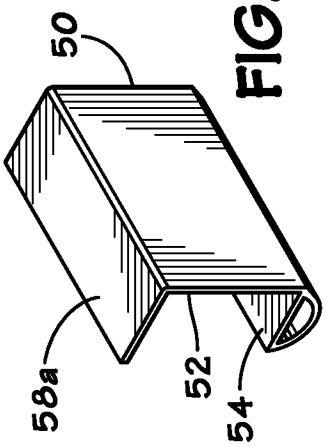


FIG. 5D

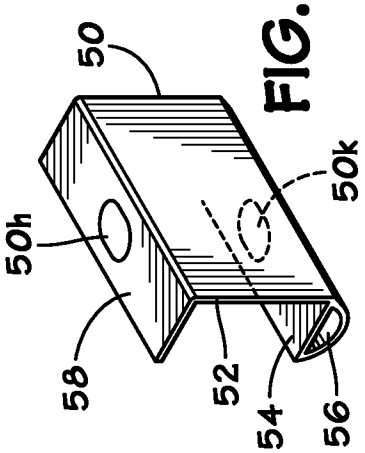


FIG. 5C

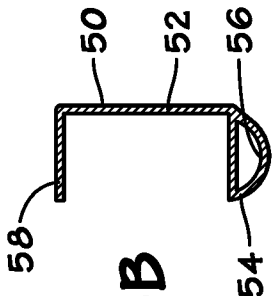


FIG. 5B

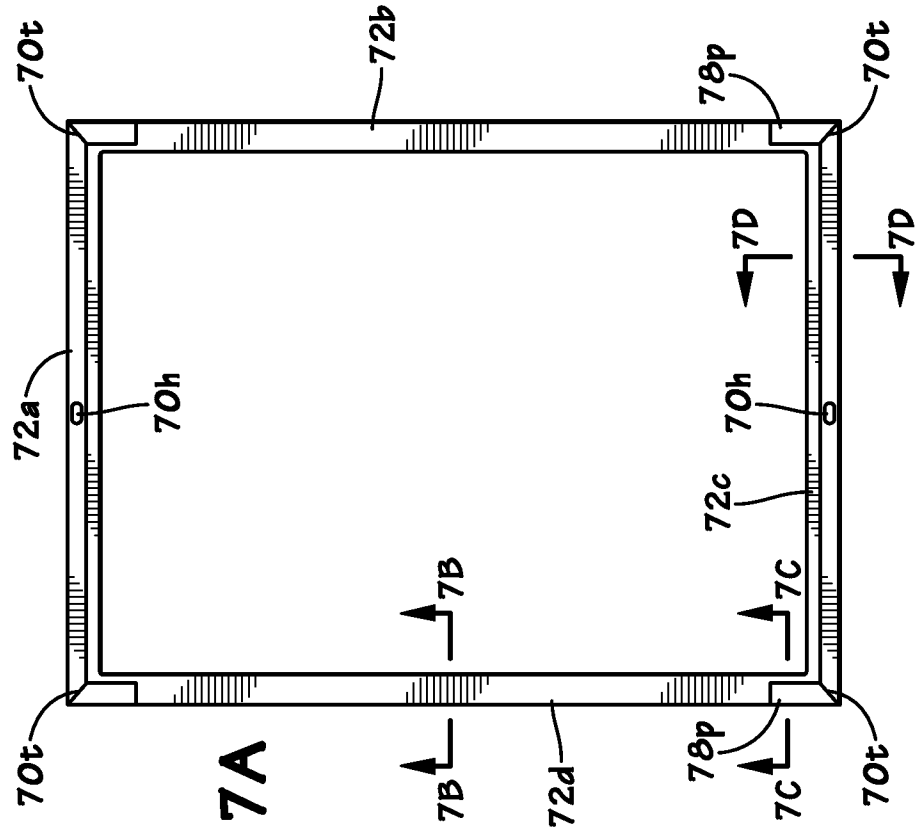


FIG. 7A

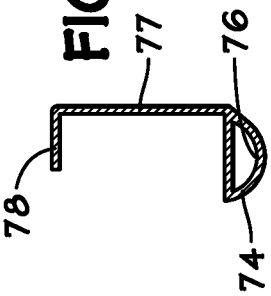


FIG. 7D

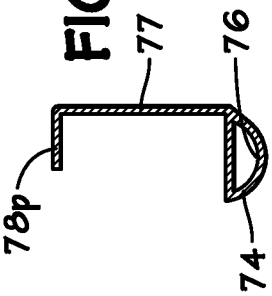


FIG. 7C

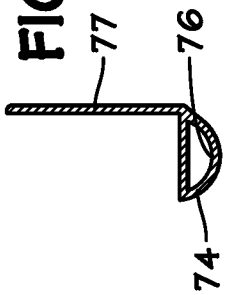


FIG. 7B

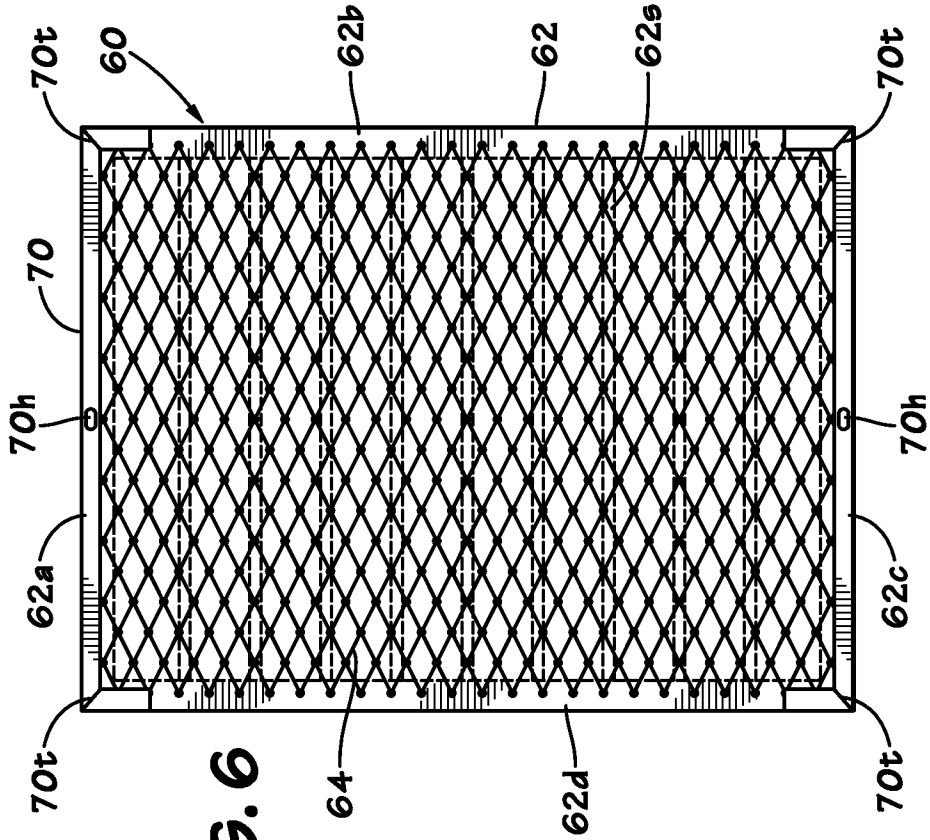


FIG. 6

FIG. 8A

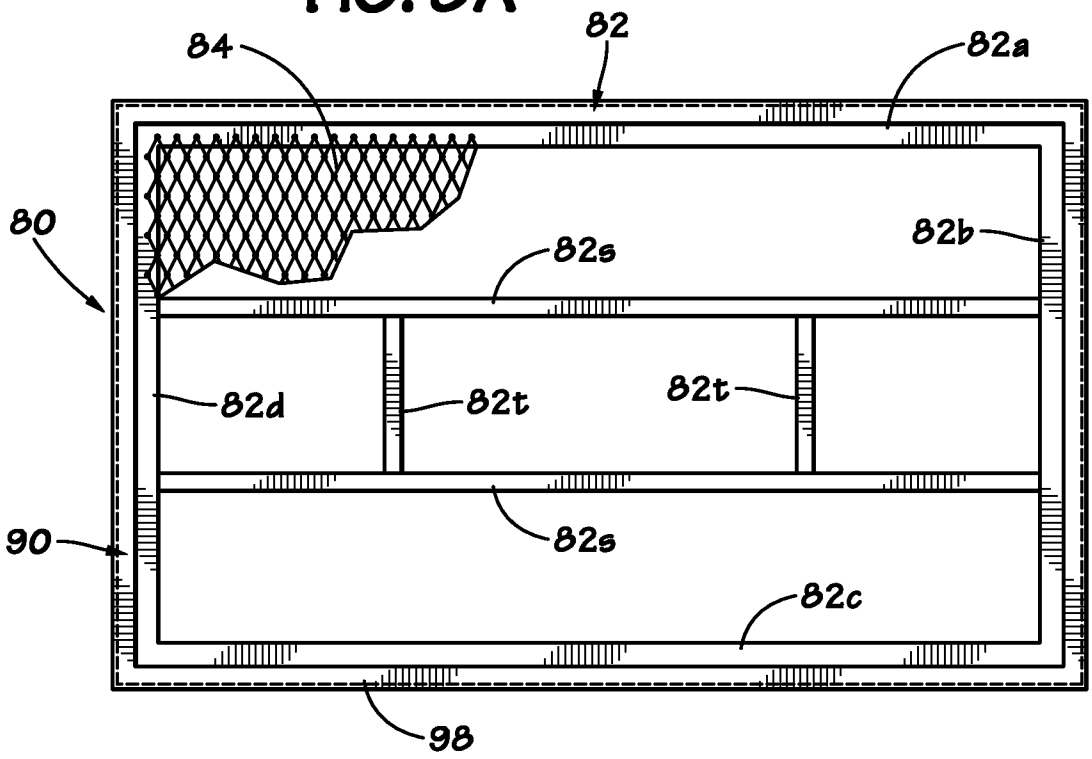


FIG. 8B

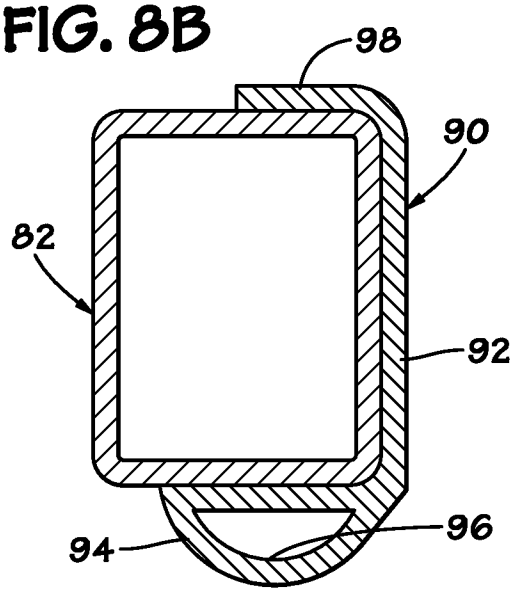


FIG. 8D

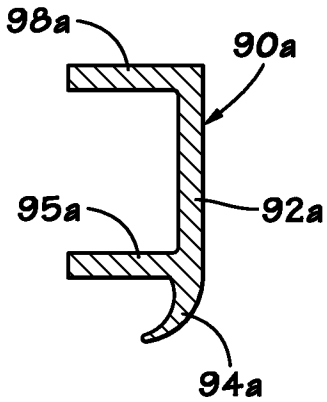
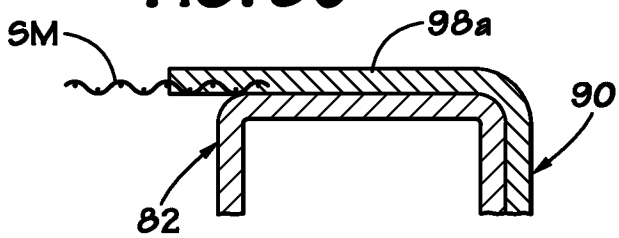


FIG. 8C



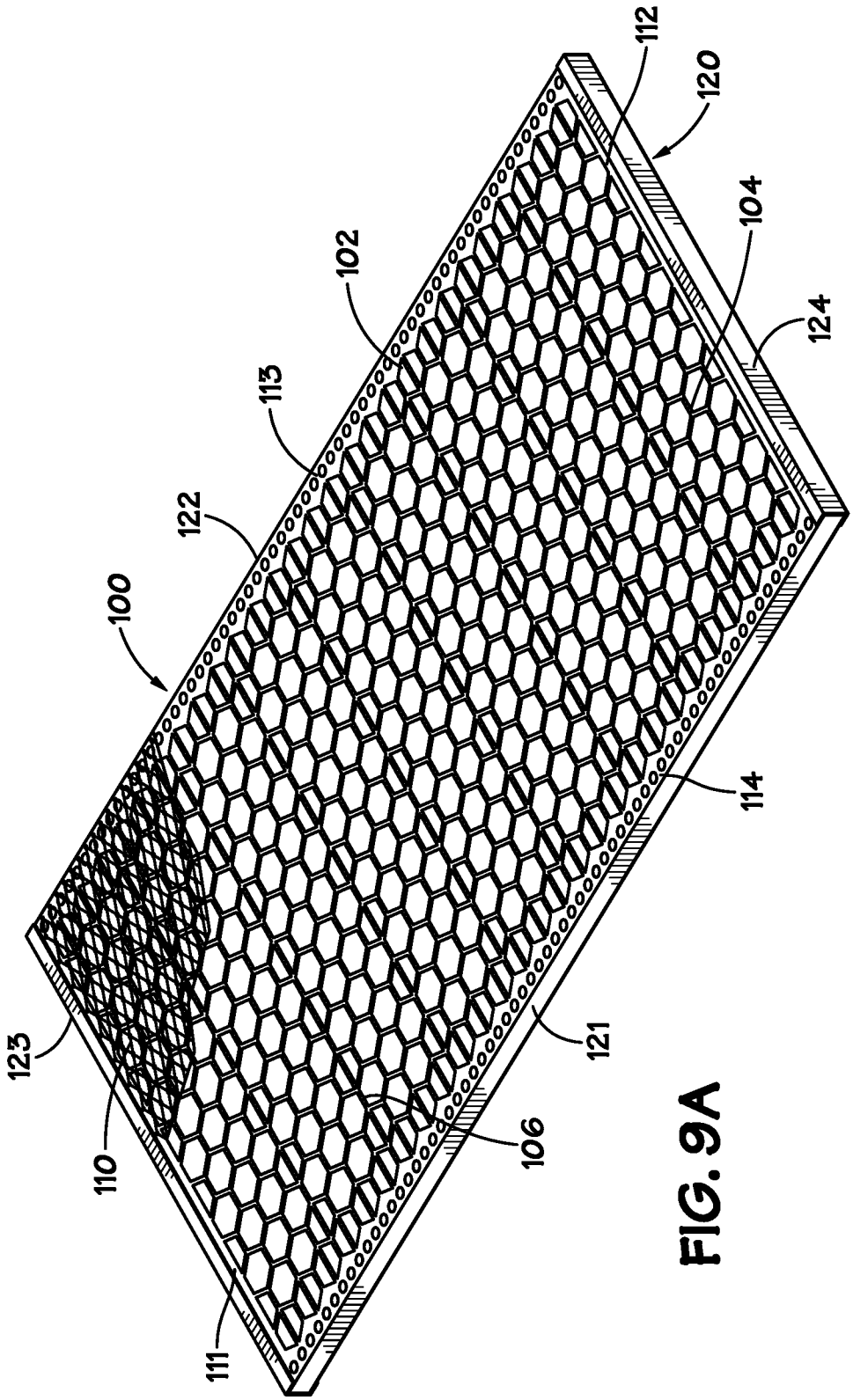


FIG. 9A

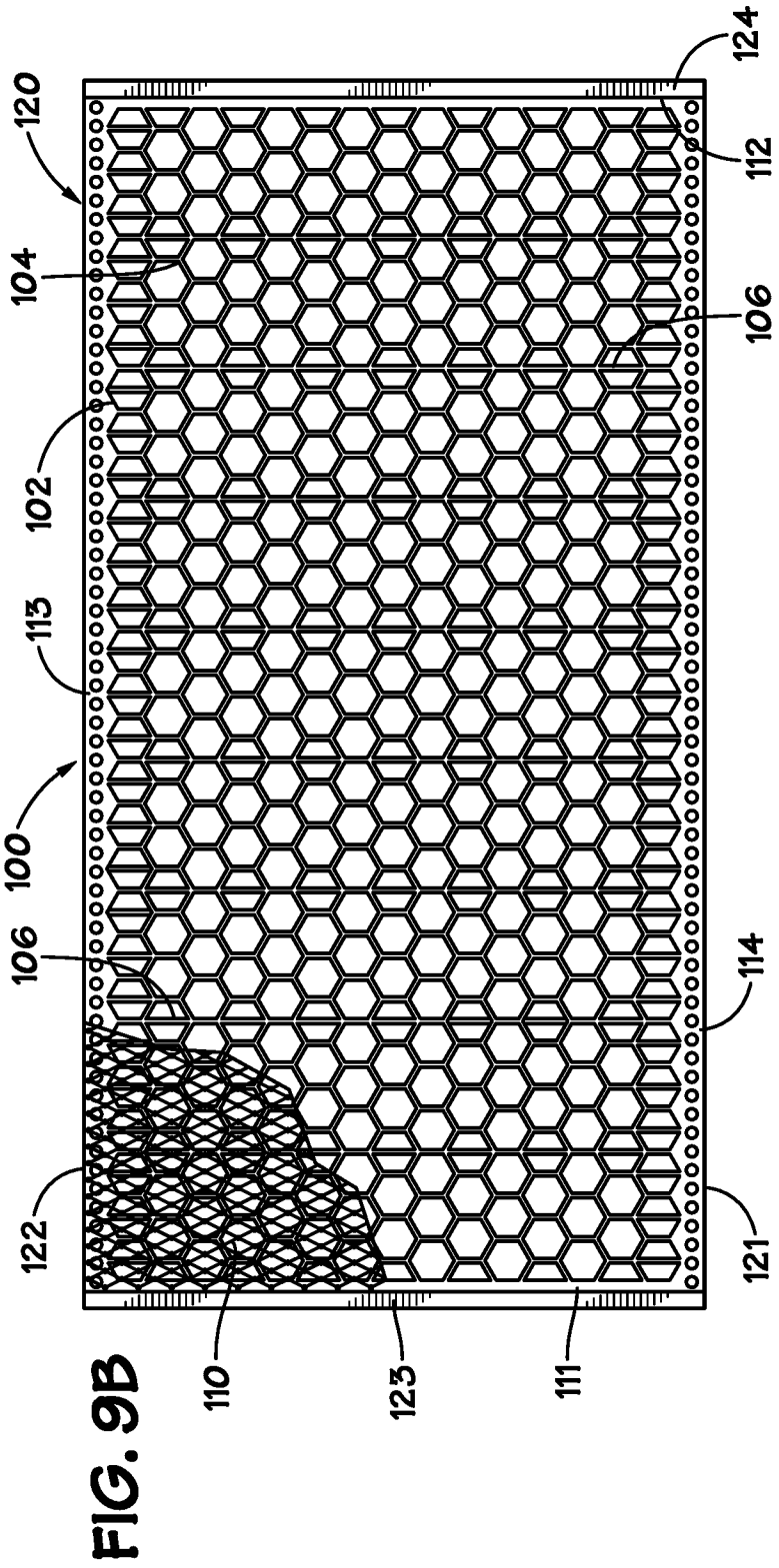


FIG. 9B

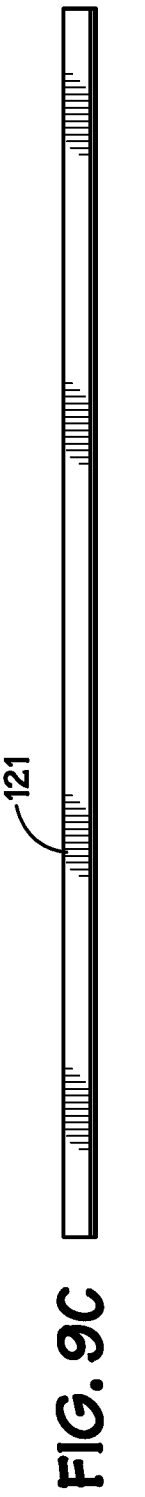


FIG. 9C

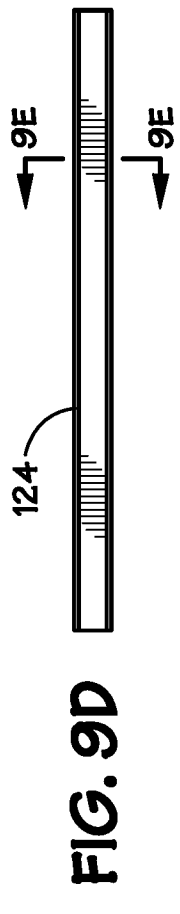


FIG. 9D

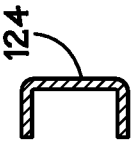


FIG. 9E

FIG. 9F