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(54) Sandbag

(57) A sandbag (10,10A,10B,10C,10D,10E,10F) is made of synthetic fibers, is an integral, woven, hollow and elongated element and has an upper cloth (11,11A), a lower cloth (12,12A), two lateral strengthened strips (13,13A,13B,13D,13E,13F), a stuffing space (15) and an inlet (16). The lower cloth (12,12A) is woven with the upper cloth (11,11A). The lateral strengthened strips (13,13A,13B,13D,13E,13F) are respectively formed on two opposite sides of the sandbag (10,10A,10B,10C,10D,10E,10F) and are integrally woven with where long sides of the upper cloth (11,11A) and the lower cloth (12,12A) are connected. The sandbag (10,10A,10B,10C,10D,10E,10F) is produced as an integral element and has the lateral strengthened strips (13,13A,13B,13D,13E,13F), so the structural strength of the sandbag (10,10A,10B,10C,10D,10E,10F) is greatly enhanced and a lifespan of the sandbag (10,10A,10B,10C,10D,10E,10F) is prolonged.

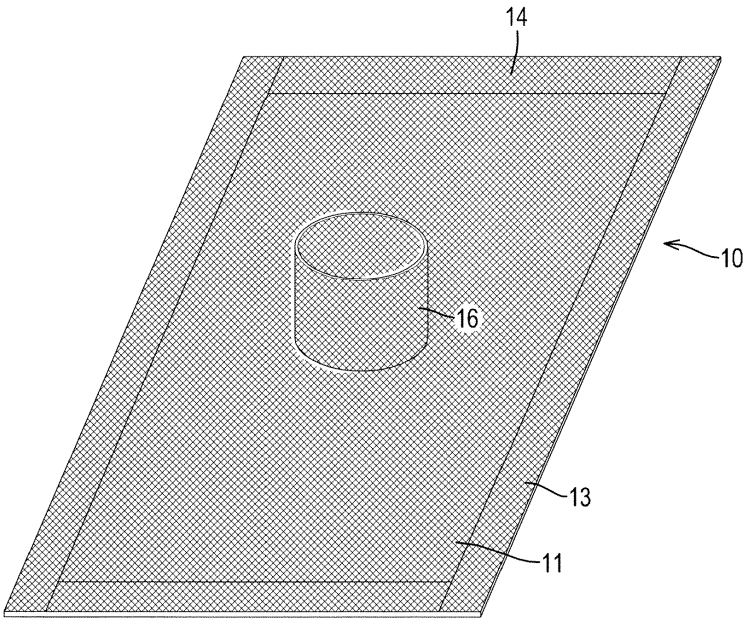

FIG.1

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Description

1. Field of the Invention

[0001] The present invention relates to a sandbag, and more particularly to a sandbag having lateral strengthened strips to enhance structural strength of the sandbag.

2. Description of Related Art

[0002] A conventional sandbag has been widely applied to different fields, such as breakwaters, seawalls, cofferdams, or water purification for heavy industry, husbandry, mining industry or reservoir silts. Structures and an assembling method of the conventional sandbags may be further referred to TW Patent No. 494928 and TW Patent No. 517129,etc.

[0003] A conventional sandbag has two rectangular clothes. Each cloth has four sides respectively stitched with those of the other cloth by threads. Accordingly, a stuffing space is formed between the clothes and sands or stones can be filled into the stuffing space by a hopper or a pump.

[0004] However, threads are easily tightened and broken because a pressure in the stuffing space increases as the sands or stones are stuffed in the stuffing space.

[0005] Moreover, the sands or stones will escape from gaps formed between the threads and the clothes due to the environmental changes or forces applied to the conventional sandbag.

[0006] Additionally, formulas or tensile strengths of filaments of the clothes may differ from those of the threads and the sandbag is easily broken when external forces are applied to the sandbag.

[0007] TW Patent No. 494928 has disclosed a conventional sandbag that is an integral element woven by filaments made of PP (Polypropylene) or PE (Polyethylene). Accordingly, gaps between the threads and the clothes do not exist. Nevertheless, the sandbag in TW patent 494928 does not have a laterally strengthened structure. When the sandbag is filled with sands or stones, the sandbag swells and has an elliptic cross section. Consequently, the sandbag is easily broken because forces concentrate on the lateral and opposite sides of the sandbag. Furthermore, multiple piled sandbags are easily deformed and moved because each sandbag lacks a connecting structure that can connect two adjacent sandbags.

[0008] To overcome the shortcomings, the present invention tends to provide a sandbag to mitigate the aforementioned problems.

[0009] The main objective of the invention is to provide a sandbag having lateral strengthened strips to enhance structural strength of the sandbag.

[0010] The sandbag is made of synthetic fibers, is an integral, woven, hollow and elongated element and has an upper cloth, a lower cloth, two lateral strengthened strips, a stuffing space and an inlet. The lower cloth is woven with the upper cloth. The lateral strengthened strips are respectively formed on two opposite sides of the sandbag and are integrally woven with where long sides of the upper cloth and the lower cloth are connected. The sandbag is produced as an integral element and has the lateral strengthened strips, so the structural strength of the sandbag is greatly enhanced and a lifespan of the sandbag is prolonged.

[0011] Other objects, advantages and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

IN THE DRAWINGS

[0012]

Fig. 1 is a perspective view of a first embodiment of a sandbag in accordance with the present invention;
Fig. 2 is a perspective view of a second embodiment of the sandbag in accordance with the present invention;
Fig. 3 is an operational side view of multiple assembled sandbags in Fig. 1;
Fig. 4 is an enlarged cross sectional perspective view of a first embodiment of the assembled sandbags in accordance with the present invention combined by threads;
Fig. 5 is an enlarged cross sectional perspective view of a second embodiment of the assembled sandbags in accordance with the present invention combined by adhesives;
Fig. 6 is an enlarged cross sectional perspective view of a third embodiment of the assembled sandbags in accordance with the present invention combined by zippers;
Fig. 7 is an enlarged cross sectional perspective view of a fourth embodiment of the assembled sandbags in accordance with the present invention combined by ropes; and
Fig. 8 is an enlarged cross sectional perspective view of a fifth embodiment of the assembled sandbags in accordance with the present invention combined by connecting strips and ropes.

[0013] With reference to Figs. 1 and 3, a sandbag 10 in accordance with the present invention is made of synthetic fibers, such as PE(Polyethylene), PP(Polypropylene), PA(Polyamide) or PET(Polyethylenephthalate), and is an integral, woven, hollow and elongated element. The sandbag 10 has an upper cloth 11, a lower cloth 12, two lateral strengthened strips 13, two distal strengthened strips 14, a stuffing space 15 and an inlet 16.

[0014] The upper cloth 11 is rectangular and has two opposite long sides and two opposite short sides. The lower cloth 12 is rectangular, is located below the upper cloth 11 and has two opposite long sides and two oppo-

site short sides. The long sides of the lower cloth 12 are respectively and integrally woven with those of the upper cloth 11. The short sides of the lower cloth 12 are respectively and integrally woven with those of the upper cloth 11.

[0015] The lateral strengthened strips 13 are respectively formed on two opposite sides of the sandbag 10, radially protrude from and are integrally woven with where the long sides of the upper cloth 11 and the lower cloth 12 are connected. Each later strengthened strip 13 extends along a line parallel to an axis of the sandbag 10.

[0016] The distal strengthened strips 14 are respectively formed on two opposite sides of the sandbag 10, axially protrude from and are integrally woven with where the short sides of the upper cloth 11 and the lower cloth 12 are connected. Each distal strengthened strip 14 extends along a line perpendicular to the axis of the sandbag 10.

[0017] Widths of the lateral strengthened strips 13 and the distal strengthened strips 14 can be widened or shortened based on different required structural strengths of the sandbag 10.

[0018] The stuffing space 15 is formed between the upper cloth 11 and the lower cloth 12 to receive sands or stones.

[0019] The inlet 16 is tubular, is connected with the upper cloth 11 and communicates with the stuffing space 15. Preferably, the inlet 16 is connected with the upper cloth 11 by stitches. A diameter, a length and a position of the inlet 16 can be adjusted dependent on a length of the sandbag 10 and construction requirement.

[0020] With reference to Fig. 2, a second embodiment of the sandbag 10A is substantially the same as the first embodiment.

[0021] During manufacture, two openings are respectively formed at the opposite two sides of the sandbag 10A where the short sides of the upper cloth 11A and the lower cloth 12A are located.

[0022] After that, the sandbag 10A is cut to a required length. The openings of the sandbag 10A are then sealed by stitches 17A, adhesives or heat fusion. Consequently, the length of the sandbag 10A can be adjusted during manufacture.

[0023] With reference to Figs. 3 and 4, multiple sandbags 10 in accordance with the present invention are piled to form an assembled construction that can be applied to a breakwater, a seawall, a submerged breakwater or a cofferdam for reclamation lands.

[0024] Because each sandbag 10,10A has two lateral strengthened strips 13,13A, two adjacent lateral strengthened strips 13,13A can be connected with each other by various combining members 20 and a structural strength of the assembled construction is greatly enhanced.

[0025] With reference to Fig. 4, a first embodiment of the assembled construction comprises multiple sandbags 10B assembled by multiple combining members, preferably threads 20B. Each thread 20B is stitched with two adjacent lateral strengthened strips 13B to secure two adjacent sandbags 10B. Moreover, the sandbags 10B can be assembled at factories in advance and then are conveyed to a construction site.

[0026] With reference to Fig. 5, a second embodiment of the assembled construction comprises multiple sandbags 10C assembled by multiple combining members, preferably adhesives 20C.

[0027] With reference to Fig. 6, a third embodiment of the assembled construction comprises multiple sandbags 10D assembled by multiple combining members, preferably zippers 20D. With the zippers 20D, the assembling of the strengthened strips 13D is very easy in the construction site.

[0028] With reference to Fig. 7, a fourth embodiment of the assembled construction comprises multiple sandbags 10E assembled by multiple combining members, preferably ropes 20E. Each lateral strengthened strip 13E has multiple through holes 132E formed through the lateral strengthened strip 13E and each rope 20E is mounted through the through holes 132E of two adjacent sandbags 10E.

[0029] With reference to Fig. 8, a fifth embodiment of the assembled construction comprises multiple sandbags 10F assembled by multiple combining members, preferably ropes 20F. Each sandbag 1 0F has two connecting strips 18F respectively stitched with the lateral strengthened strips 13F. Each connecting strip 18F has multiple through holes 181F formed through the connecting strip 18F and each rope 20F is mounted through the through holes 181F of two connecting strips 18F.

[0030] From the above description, it is noted that the present invention has the following advantages:

1. Enhanced structural strength:

   The sandbag 10,10A,10B,10C,10D,10E,10F is produced as an integral element and has the lateral strengthened strips 13,13A,13B,13D, 13E,13F, so the structural strength of the sandbag 10,10A,10B,10C,10D,10E,10F is greatly enhanced and a lifespan of the sandbag 10,10A, 10B,10C,10D,10E,10F is prolonged.

2. Excellent stability of the assembled construction:

   Because each sandbag 10,10A,10B,10C,10D, 10E,10F has two lateral strengthened strips 13,13A,13B,13D,13E,13F, two adjacent lateral strengthened strips 13,13A,13B,13D,13E,13F can be connected with each other by various combining members 20, such as the threads 20B, the adhesives 20C, the zippers 20D, the ropes 20E,20F and by heat fusion. Consequently, a structural strength of the assembled construction is greatly increased.

[0031] Even though numerous characteristics and ad-

vantages of the present invention have been set forth in the foregoing description, together with details of the structure and function of the invention, the disclosure is illustrative only, and changes may be made in detail, especially in matters of shape, size, and arrangement of parts within the principles of the invention to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.

Claims

1. A sandbag (10,10A,10B,10C,10D,10E,10F) made of synthetic fibers, being an integral, woven, hollow and elongated element and comprising, **characterized in that**:

an upper cloth (11) having two opposite long sides and two opposite short sides;
a lower cloth (12) located below the upper cloth (11) and having
two opposite long sides respectively and integrally woven with those of the upper cloth (11); and
two opposite short sides respectively connected with those of the upper cloth (11);
two lateral strengthened strips (13,13A,13B, 13D,13E,13F) respectively formed on two opposite sides of the sandbag (10,10A,10B,10C, 10D,10E,10F), radially protruding from and integrally woven with where the long sides of the upper cloth (11) and the lower cloth (12) are connected;
a stuffing space (15) formed between the upper cloth (11) and the lower cloth (12); and
an inlet (16) connected with the upper cloth (11) and communicating with the stuffing space (15).

2. The sandbag as claimed in claim 1, wherein
the opposite short sides of the lower cloth (12) are respectively and integrally woven with those of the upper cloth (11); and
the sandbag (10) further has two distal strengthened strips (14) respectively formed on two opposite sides of the sandbag (10), axially protruding from and integrally woven with where the short sides of the upper cloth (11) and the lower cloth (12) are connected.

3. The sandbag as claimed in claim 2, wherein
the inlet (16) is connected with the upper cloth (11) by stitches.

4. The sandbag as claimed in claim 1, wherein
the short sides of the upper cloth (11) and the lower cloth (12) are connected by stitches (17A).

5. The sandbag as claimed in claim 4, wherein
the inlet (16) is connected with the upper cloth (11) by stitches.

6. The sandbag as claimed in any one of claims 1 to 5, wherein
two zippers (20D) are respectively connected with the lateral strengthened strips (13D).

7. The sandbag as claimed in any one of claims 1 to 5, wherein each lateral strengthened strip (13E) has multiple through holes (132E) formed through the lateral strengthened strip (13E).

8. The sandbag as claimed in any one of claims 1 to 5, wherein
two connecting strips (18F) are respectively stitched with the lateral strengthened strips (13F) by stitches and each connecting strip (18F) has multiple through holes (181F) formed through the connecting strip (18F).

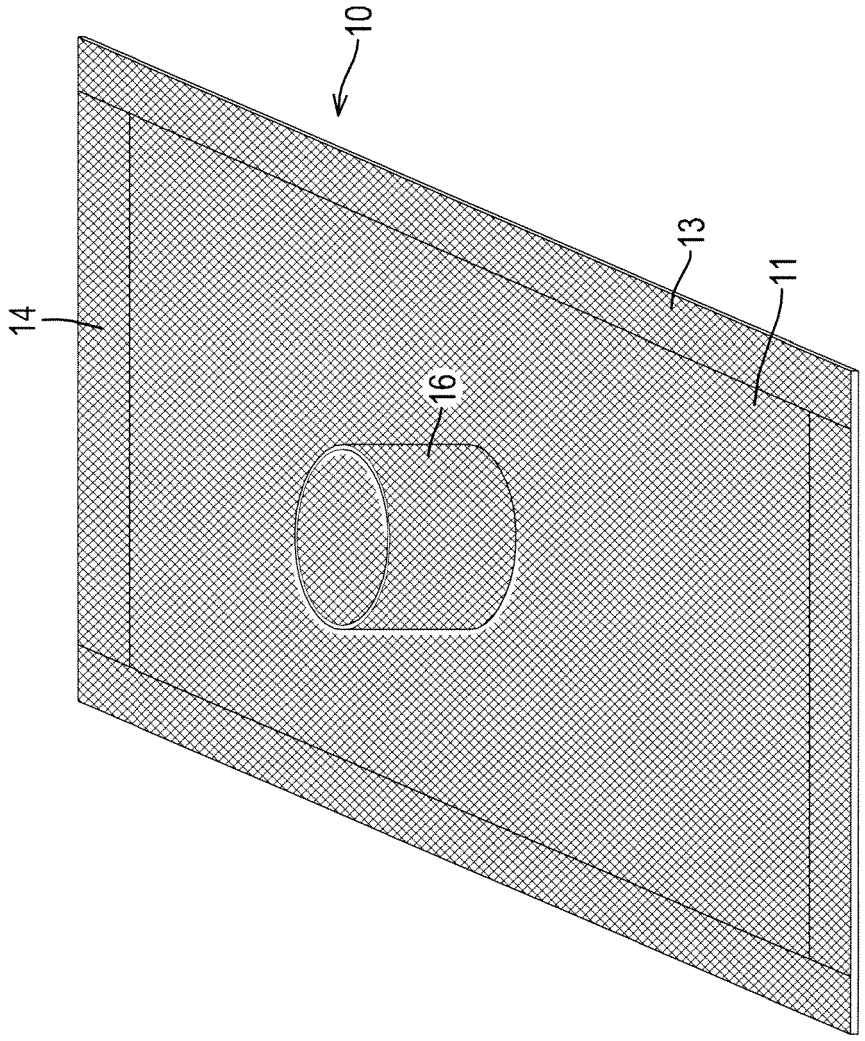

FIG.1

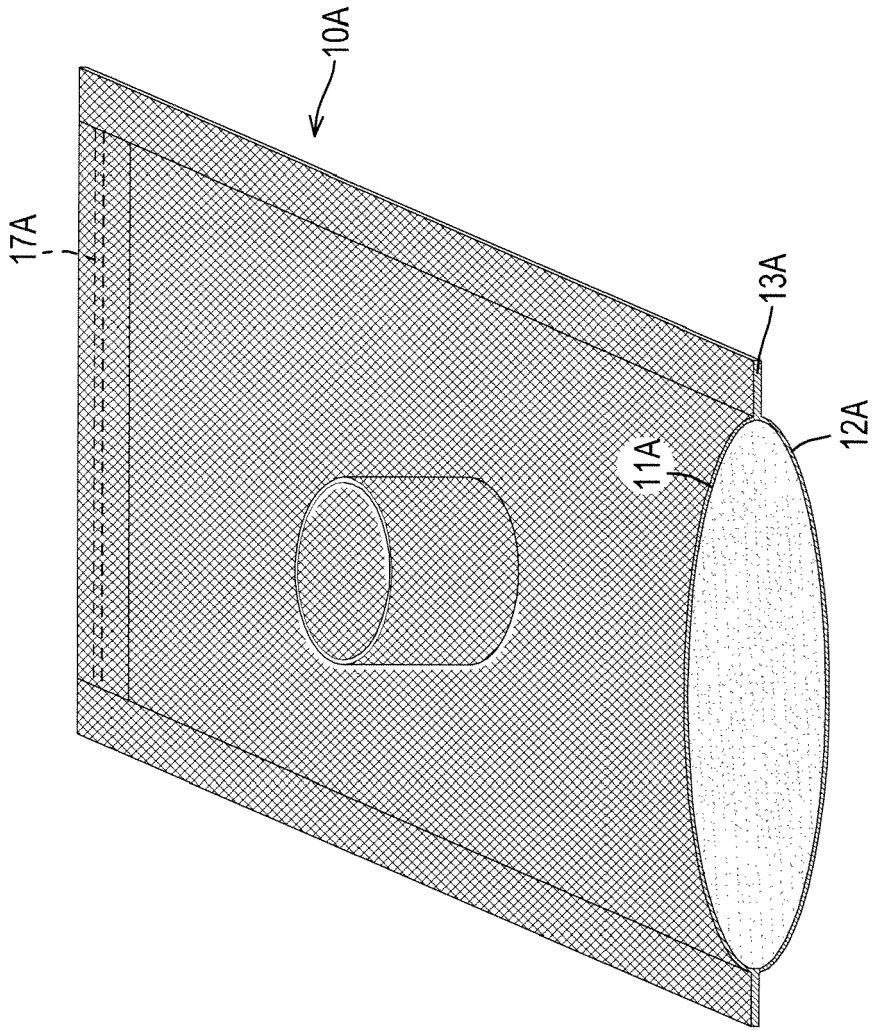

FIG.2

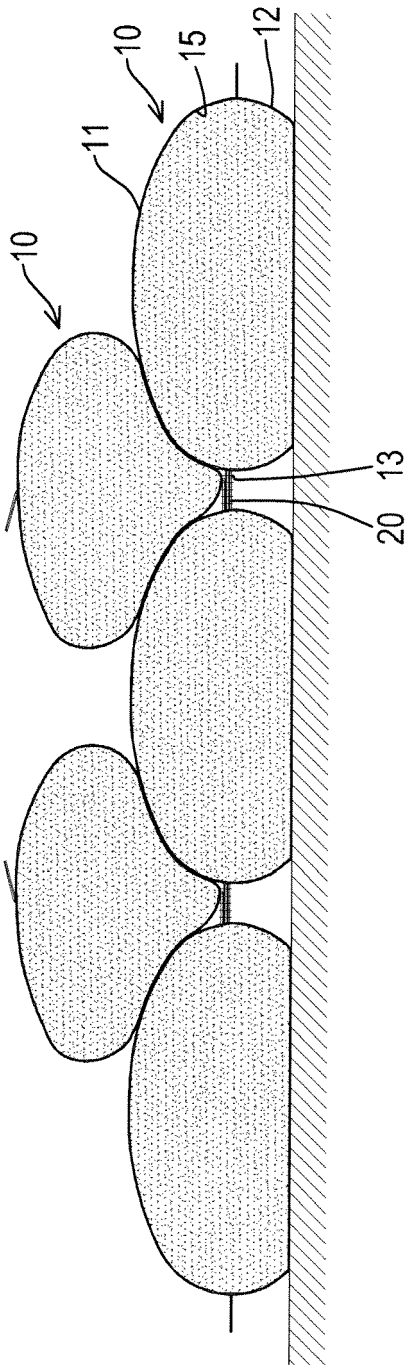

FIG.3

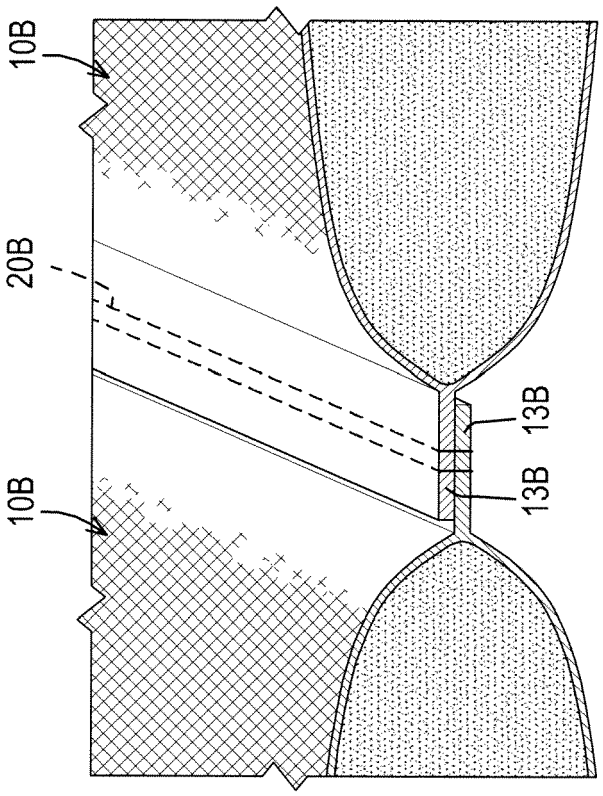

FIG.4

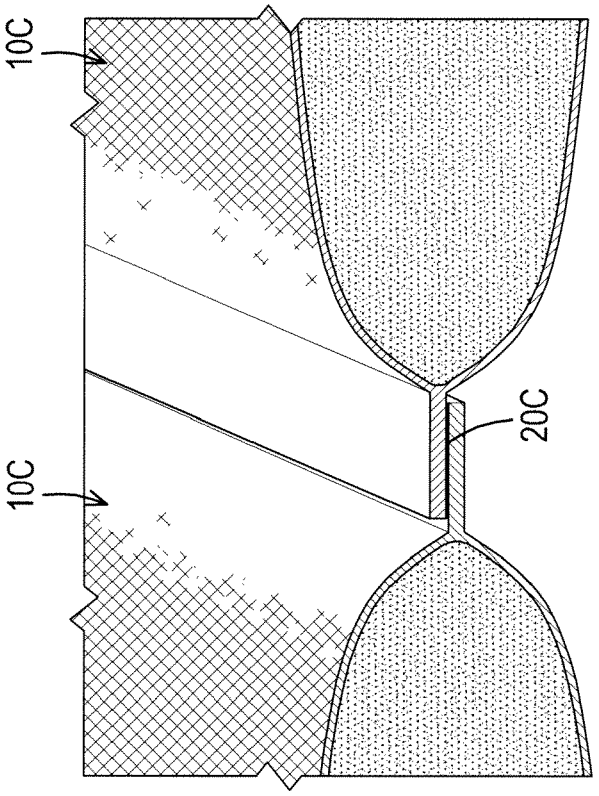

FIG.5

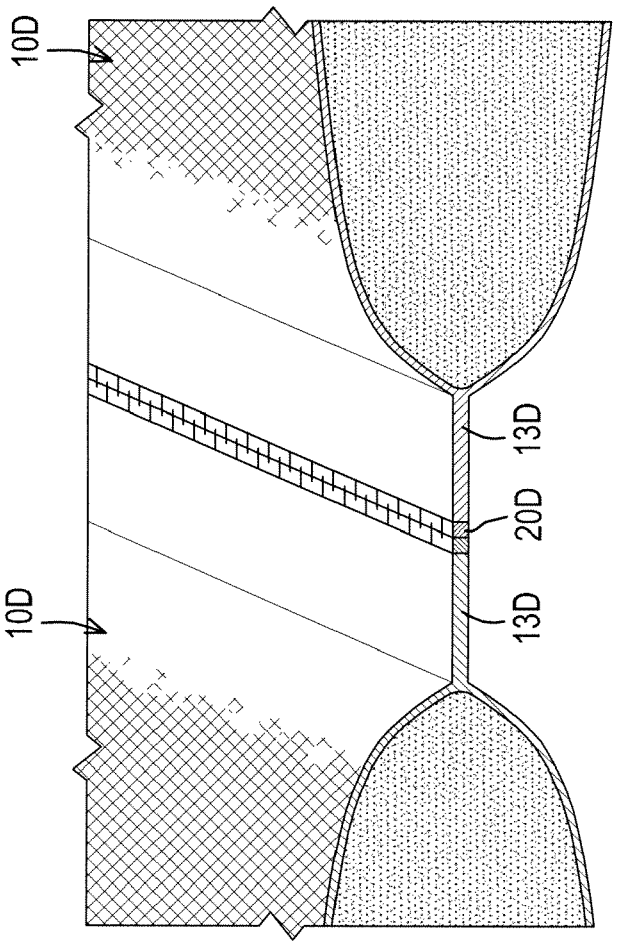

FIG.6

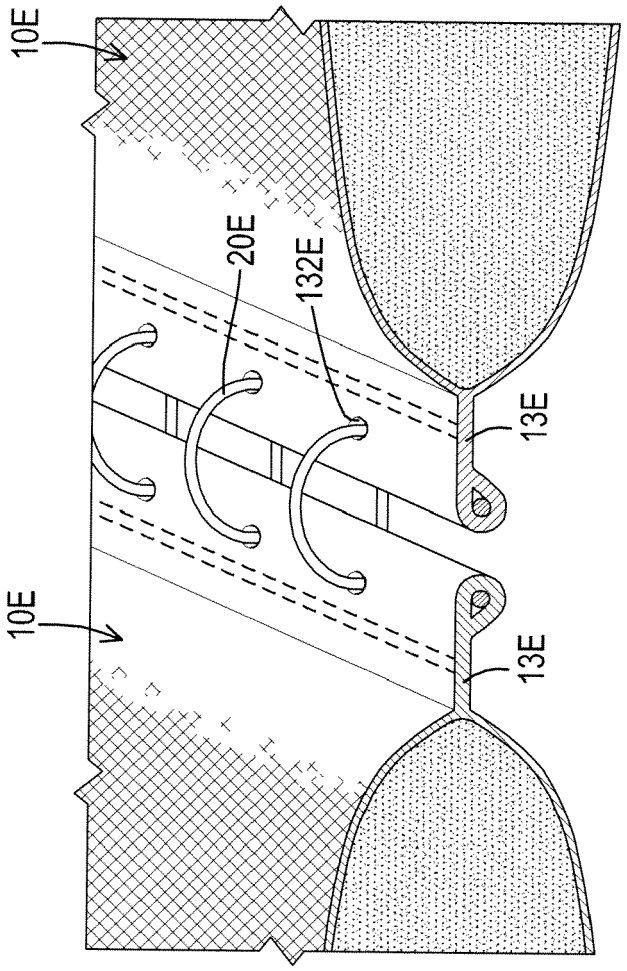

FIG.7

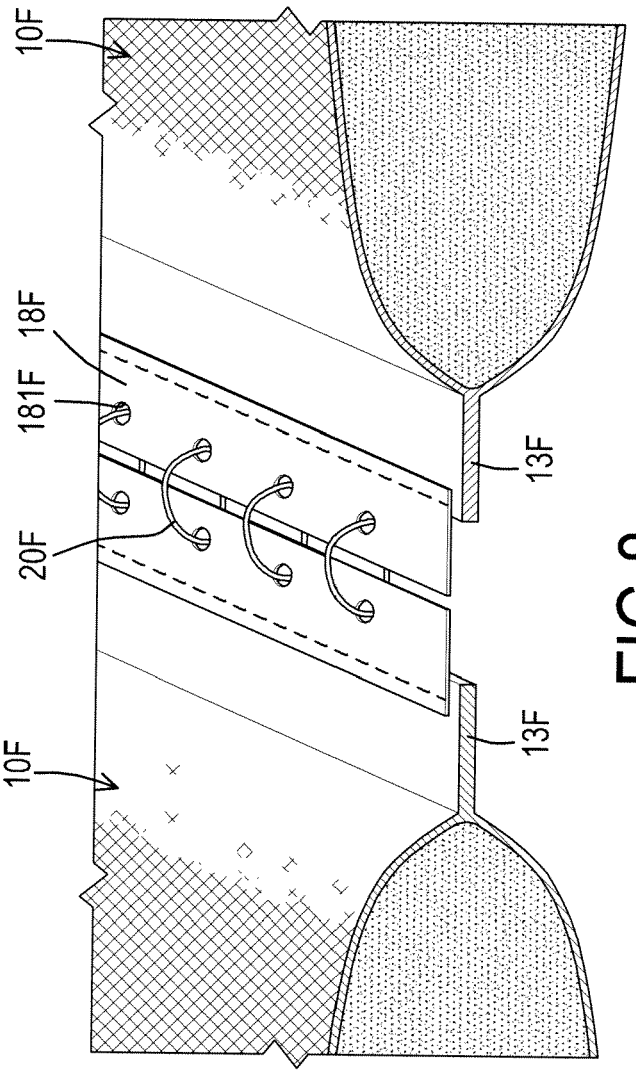

FIG.8

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EUROPEAN SEARCH REPORT

Application Number
EP 11 17 8234

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 6 056 438 A (BRADLEY ANTHONY S [US]) 2 May 2000 (2000-05-02) * column 6, line 7 - line 11; figures 1-2 * * column 6, line 31 - line 33 * * column 8 * * column 9, line 11 - line 19 * -----	1	INV. E02B3/12
X	US 2009/129866 A1 (SMALLWOOD JOE L [US] ET AL SMALLWOOD JOE LAMON [US] ET AL) 21 May 2009 (2009-05-21) * paragraph [0031]; figures 1-8 * * paragraph [0047] * -----	1-5,7,8	

TECHNICAL FIELDS SEARCHED (IPC)

E02B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	4 January 2012	Flygare, Esa

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 11 17 8234

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04-01-2012

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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