

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 8,672,583 B1
APPLICATION NO. : 12/802483
DATED : March 18, 2014
INVENTOR(S) : David J. Mailhot et al.

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the Claims:

Claim 1, col. 13, lines 35-36, "parallel to the chamber length axis;" should read --parallel to the chamber length;--.

Claim 16, col. 15, line 5, "termination points of plurality" should read --termination points of the first plurality--.

Signed and Sealed this
Twelfth Day of August, 2014



Michelle K. Lee
Deputy Director of the United States Patent and Trademark Office

PATENT
Customer No. 22,852
Attorney Docket No. 07965.0150-00000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re U.S. Patent No.: 8,672,583 B1)
Inventor: David J. MAILHOT et al.)
Issue Date.: March 18, 2014)
For: CORRUGATED STORMWATER)
CHAMBER HAVING SUB-)
CORRUGATIONS)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

REQUEST FOR CERTIFICATE OF CORRECTION

Pursuant to 35 U.S.C. § 254, and 37 C.F.R. § 1.322, this is a request for a Certificate of Correction in the above-identified patent. The mistake identified in the appended Form occurred through the fault of the Patent Office, as clearly disclosed by the records of the application which matured into this patent.

Two (2) copies of PTO Form 1050 are appended. The complete Certificate of Correction involves three (3) pages. Issuance of the Certificate of Correction containing the correction is earnestly requested.

Please charge any required fees not included herewith to Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: June 12, 2014

By: /Daniel G. Chung/
Daniel G. Chung
Reg. No. 63,553
(202) 408-4000

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. 8,672,583 B1
APPLICATION NO.: 12/802,483
ISSUE DATE: March 18, 2014
INVENTOR(S): David J. MAILHOT

It is hereby certified that errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Claim 1, col. 13, lines 35-36, "parallel to the chamber length axis;" should read --parallel to the chamber length;--.

Claim 16, col. 15, line 5, "termination points of plurality" should read --termination points of the first plurality--.

MAILING ADDRESS OF SENDER

Finnegan, Henderson, Farabow,
Garrett & Dunner, L.L.P.
901 New York Avenue, N.W.
Washington, D.C. 20001-4413

UNITED STATES PATENT AND TRADEMARK OFFICE
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PATENT NO. 8,672,583 B1
APPLICATION NO.: 12/802,483
ISSUE DATE: March 18, 2014
INVENTOR(S): David J. MAILHOT

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Claim 1, col. 13, lines 35-36, "parallel to the chamber length axis;" should read --parallel to the chamber length;--.

Claim 16, col. 15, line 5, "termination points of plurality" should read --termination points of the first plurality--.

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901 New York Avenue, N.W.
Washington, D.C. 20001-4413

| Electronic Acknowledgement Receipt | |
|---|---|
| EFS ID: | 19283848 |
| Application Number: | 12802483 |
| International Application Number: | |
| Confirmation Number: | 9389 |
| Title of Invention: | CORRUGATED STORMWATER CHAMBER HAVING SUB-CORRUGATIONS |
| First Named Inventor/Applicant Name: | David J. Mailhot |
| Customer Number: | 22852 |
| Filer: | Daniel Geewon Chung/dorne dottin |
| Filer Authorized By: | Daniel Geewon Chung |
| Attorney Docket Number: | 07965.0150-00000 |
| Receipt Date: | 12-JUN-2014 |
| Filing Date: | 07-JUN-2010 |
| Time Stamp: | 12:02:37 |
| Application Type: | Utility under 35 USC 111(a) |

Payment information:

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|------------------------|----|
| Submitted with Payment | no |
|------------------------|----|

File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|-----------------|---------------------------------------|--|--|------------------|------------------|
| 1 | Request for Certificate of Correction | 07965_0150_00000_Request_f or_Certificate_of_Correction. pdf | 41408 36afe18e7bd7076e1d4e9ff2559726b52a7f 2b8 | no | 1 |

Warnings:

Information:

CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC

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|--|-------------------------------|--|--|--------|---|
| 2 | Miscellaneous Incoming Letter | 07965_0150_00000_Certificate _of_Correction.pdf | 70675 <small>6f7b01b3798e37a0f986172e056f5dfdb270f4d5</small> | no | 2 |
| Warnings: | | | | | |
| Information: | | | | | |
| Total Files Size (in bytes): | | | | 112083 | |
| <p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p> | | | | | |



UNITED STATES PATENT AND TRADEMARK OFFICE

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| APPLICATION NO. | ISSUE DATE | PATENT NO. | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|------------|------------|---------------------|------------------|
| 12/802,483 | 03/18/2014 | 8672583 | 07965.0150-00000 | 9389 |

22852 7590 02/26/2014
FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER
LLP
901 NEW YORK AVENUE, NW
WASHINGTON, DC 20001-4413

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment is 446 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

David J. Mailhot, Coventry, CT;
Nimish Gandhi, Wethersfield, CT;
Timothy J. McGrath, Arlington, MA;

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AMENDMENTS TO THE SPECIFICATION:

Please amend the specification on page 6, line 15 as follows:

Changes applied to document,
Fig. 5 comprises Fig 5(a) through Fig. 5(e) Fig. 5(f) and shows portions of sidewall cross sections at different chamber elevations, as points illustrated in Fig. 3.

B.S.H. Please amend the specification on page 11, line ~~17~~¹⁴ as follows:
11/6/2013

As may be seen in Fig. 1 and Fig. 2, a second set of sub-corrugations 36 runs along the respective centers of valley corrugations 30. The sub-corrugations 36 taper to nothingness in depth and width as they run downwardly and approach the base flange. Each exemplary valley sub-corrugation ~~[[34]]~~ 36 runs along virtually the whole of the arch curve length of the associated valley. The direction of taper of a valley sub-corrugations corresponds in sense with the taper of the valley corrugation, i.e., each gets narrower as it approaches the elevation of the base. The width of a crest or valley sub-corrugation may alternatively be constant along part or all of the associated corrugation.

Please amend the specification on page 12, line ~~6~~⁴ as follows:

Again with reference to Fig. 4: Each crest corrugation has a height d which is measured relative to an adjacent valley corrugation. Each crest sub-corrugation 32 has a height d_p and each valley sub-corrugation ~~[[34]]~~ 36 has a height d_v , as such are measured relative to the adjacent outer surface of the crest or valley, as applies. The maximum height d_p of a crest sub-corrugation 32 is less than the locally associated height d_c of the crest corrugation 28 on which it is positioned. The maximum height d_v of a valley sub-corrugation 36 is less than locally associated depth d_d of the valley corrugation 30 on which it is positioned. (As mentioned above, the terms height and depth are used interchangeably for the same dimension on a corrugation or sub-corrugation.)

Receipt date: 05/08/2013

12802483 - GAU: 3672

| | | | |
|---|---|--------------------------|-----------------------|
| IDS Form PTO/SB/08: Substitute for form 1449A/PTO | | Complete if Known | |
| INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary) | | Application Number | 12/802,483 |
| | | Filing Date | June 7, 2010 |
| | | First Named Inventor | David J. MAILHOT |
| | | Art Unit | 3672 |
| | | Examiner Name | Fiorello, Benjamin F. |
| | | Attorney Docket Number | 07965.0150-00000 |
| Sheet | 3 | of | 5 |

| U.S. PATENTS AND PUBLISHED U.S. PATENT APPLICATIONS | | | | | |
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Change(s) applied
to document,
/L.A.S./
11/8/2013

| | | | |
|-----------------------|---------------------|--------------------|------------|
| Examiner Signature | /Benjamin Fiorello/ | Date Considered | 05/16/2013 |
|-----------------------|---------------------|--------------------|------------|

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /B.F./

Receipt date: 05/08/2013

12802483 - GAU: 3672

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| | | | | Examiner Name | Fiorello, Benjamin F. |
| Sheet | 2 | of | 5 | Attorney Docket Number | 07965.0150-00000 |

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Change(s) applied
to document,
/L.A.S./
11/8/2013

| | | | |
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| Examiner Signature | /Benjamin Fiorello/ | Date Considered | 05/16/2013 |
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| | | | | First Named Inventor | David J. MAILHOT |
| | | | | Art Unit | 3672 |
| | | | | Examiner Name | Fiorello, Benjamin F. |
| Sheet | 5 | of | 5 | Attorney Docket Number | 07965.0150-00000 |

Change(s) applied
to document,
/LAS/
11/18/2013

| FOREIGN PATENT DOCUMENTS | | | | | | |
|--------------------------|-----------------------|---|------------------------------------|---|---|--------------------------|
| Examiner Initials | Cite No. ¹ | Foreign Patent Document | Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document | Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear | Translation ⁶ |
| | | Country Code ³ Number ⁴ Kind Code ⁵ (if known) | | | | |
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| NONPATENT LITERATURE DOCUMENTS | | | |
|--------------------------------|-----------------------|---|--------------------------|
| Examiner Initials | Cite No. ¹ | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. | Translation ⁶ |
| | | James L. Beaver et al., <i>Structural Design of Stormwater Chambers</i> , Transportation Research Board Annual Meeting, 22 pages (2003). | |
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12802483 - GAU: 3672

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|---|---|----|---|---|--|
| IDS Form PTO/SB/06: Substitute for form 1449A/PTO | | | | Complete if Known Application Number 12/802,483 Filing Date June 7, 2010 First Named Inventor David J. MAILHOT Art Unit 3672 Examiner Name Fiorello, Benjamin F. Attorney Docket Number 07965.0150-00000 | |
| INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary) | | | | | |
| Sheet | 4 | of | 5 | | |

[illegible]

Change(s) applied
to document.

L.A.S.

11/20/2013

| | | | |
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| Examiner Signature | /Benjamin Fiorello/ | Date Considered | 05/16/2013 |
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| | | | | Filing Date | June 7, 2010 |
| | | | | First Named Inventor | David J. MAILHOT |
| | | | | Art Unit | 3672 |
| | | | | Examiner Name | Fiorello, Benjamin F. |
| Sheet | 1 | of | 5 | Attorney Docket Number | 07985.0150-00000 |

| U.S. PATENTS AND PUBLISHED U.S. PATENT APPLICATIONS | | | | | |
|---|----------|---|---|---|---|
| Examiner Initials | Cite No. | Document Number Number-Kind Code ² (if known) | Issue or Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document | Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear |
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Change(s) applied
to document,
/B.S.H./
11/6/2013

Change(s) applied
to document,
/L.A.S./
11/20/2013

| | | | |
|--------------------|---------------------|-----------------|------------|
| Examiner Signature | /Benjamin Fiorello/ | Date Considered | 05/16/2013 |
|--------------------|---------------------|-----------------|------------|

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PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or **Fax** (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

22852 7590 10/25/2013
FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER
LLP
901 NEW YORK AVENUE, NW
WASHINGTON, DC 20001-4413

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

| |
|--------------------|
| (Depositor's name) |
| (Signature) |
| (Date) |

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 12/802,483 | 06/07/2010 | David J. Mailhot | 07965.0150-00000 | 9389 |

TITLE OF INVENTION: CORRUGATED STORMWATER CHAMBER HAVING SUB-CORRUGATIONS

| APPLN. TYPE | ENTITY STATUS | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE |
|----------------|---------------|-----------------------|---------------------|----------------------|-----------------------|------------|
| nonprovisional | UNDISCOUNTED | XXXX \$960 | \$0 | \$0 | XXXX \$960 | 01/27/2014 |

| EXAMINER | ART UNIT | CLASS-SUBCLASS |
|-----------------------|----------|----------------|
| FIORIELLO, BENJAMIN F | 3672 | 405-042000 |

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☒ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list
(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Finnegan, Henderson
2 Farabow, Garrett &
3 Dunner, L.L.P.

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

StormTech LLC

Wethersfield, CT

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☒ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
☒ Payment by credit card. Form PTO-2050 is attached. XXXXXXXXXXXXXXXX
☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number 06-0916 (enclose an extra copy of this form).

CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC

5. Change in Entity Status (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
- ☐ Applicant asserting small entity status. See 37 CFR 1.27
- ☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see form PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature

Date January 27, 2014

Typed or printed name

Daniel G. Chung

Registration No. 63,553

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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PATENT
Customer No. 22,852
Attorney Docket No. 07965.0150-00000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)
)
David J. MAILHOT et al.) Group Art Unit: 3672
)
Application No.: 12/802,483) Examiner: Benjamin F. FIORELLO
)
Filed: June 7, 2010)
)
For: CORRUGATED STORMWATER) Confirmation No.: 9389
)
CHAMBER HAVING SUB-)
CORRUGATIONS)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

**FEE ADDRESS FOR MAINTENANCE FEE PURPOSES
IN ACCORDANCE WITH 37 C.F.R. § 1.363**

In accordance with the provisions of 37 C.F.R. § 1.363, the fee address set forth below
is being supplied for purposes of receiving notices, receipts, and other correspondence relating
to the payment of maintenance fees:

CPI (Computer Packages, Inc.)
414 Hungerford Drive, Third Floor
Rockville, Maryland 20850
Phone: 301-424-8890
Fax: 301-762-8663
Payor No.: 00204

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, LLP

Dated: January 27, 2014

By: 
Daniel G. Chung
Reg. No. 63,553
(202) 408-4000

| Electronic Patent Application Fee Transmittal | | | | |
|--|---|-----------------|---------------|-----------------------------|
| Application Number: | 12802483 | | | |
| Filing Date: | 07-Jun-2010 | | | |
| Title of Invention: | CORRUGATED STORMWATER CHAMBER HAVING SUB-CORRUGATIONS | | | |
| First Named Inventor/Applicant Name: | David J. Mailhot | | | |
| Filer: | Daniel Geewon Chung/Donna Beckford-Harris | | | |
| Attorney Docket Number: | 07965.0150-00000 | | | |
| Filed as Small Entity | | | | |
| Utility under 35 USC 111(a) Filing Fees | | | | |
| Description | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
| Basic Filing: | | | | |
| Pages: | | | | |
| Claims: | | | | |
| Miscellaneous-Filing: | | | | |
| Petition: | | | | |
| Patent-Appeals-and-Interference: | | | | |
| Post-Allowance-and-Post-Issuance: | | | | |
| Utility Appl Issue Fee | 2501 | 1 | 480 | 480 |
| Plant Issue Fee | 2503 | 1 | 380 | 380 |

CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC

| Description | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
|--------------------|----------|----------|--------|-------------------------|
| Extension-of-Time: | | | | |
| Miscellaneous: | | | | |
| Total in USD (\$) | | | | 860 |

| Electronic Acknowledgement Receipt | |
|---|---|
| EFS ID: | 18038796 |
| Application Number: | 12802483 |
| International Application Number: | |
| Confirmation Number: | 9389 |
| Title of Invention: | CORRUGATED STORMWATER CHAMBER HAVING SUB-CORRUGATIONS |
| First Named Inventor/Applicant Name: | David J. Mailhot |
| Customer Number: | 22852 |
| Filer: | Daniel Geewon Chung/Donna Beckford-Harris |
| Filer Authorized By: | Daniel Geewon Chung |
| Attorney Docket Number: | 07965.0150-00000 |
| Receipt Date: | 27-JAN-2014 |
| Filing Date: | 07-JUN-2010 |
| Time Stamp: | 18:45:08 |
| Application Type: | Utility under 35 USC 111(a) |

Payment information:

| | |
|--|-------------|
| Submitted with Payment | yes |
| Payment Type | Credit Card |
| Payment was successfully received in RAM | \$860 |
| RAM confirmation Number | 6391 |
| Deposit Account | |
| Authorized User | |

File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|-----------------|----------------------|-----------|-------------------------------------|------------------|------------------|
|-----------------|----------------------|-----------|-------------------------------------|------------------|------------------|

CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC

| | | | | | |
|--|-------------------------------|---------------------------------------|--|----|---|
| 1 | Issue Fee Payment (PTO-85B) | 07965_0150_00000_issue_fee.pdf | 116031 af4b74253a5a9b94d6427b52c2c3eb17b23a25d2 | no | 2 |
| Warnings: | | | | | |
| Information: | | | | | |
| 2 | Miscellaneous Incoming Letter | 07965_0150_00000_Fee_Address_Form.pdf | 30932 16ffc21b79a6a77dc5e31e3b80182eecefd82a88 | no | 1 |
| Warnings: | | | | | |
| Information: | | | | | |
| 3 | Fee Worksheet (SB06) | fee-info.pdf | 32347 846526427021d4f76018a5d22e1fb5815d0dd401 | no | 2 |
| Warnings: | | | | | |
| Information: | | | | | |
| Total Files Size (in bytes): | | | 179310 | | |
| <p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p> | | | | | |

CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC

Document code: WFEE

United States Patent and Trademark Office
Sales Receipt for Accounting Date: 01/30/2014

| | | | |
|--------|---------------|----------------------------|----------|
| DTERRY | ADJ #00000003 | Mailroom Dt: 01/27/2014 | |
| | Seq No: 6391 | Sales Acctg Dt: 01/28/2014 | 12802483 |
| | 01 FC : 2501 | -480.00 | OP |
| | 02 FC : 2503 | -380.00 | OP |

CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC

Document code: WFEE

United States Patent and Trademark Office
Sales Receipt for Accounting Date: 01/30/2014

| | | | | | | |
|--------|------|-----------|--------------|------------|--------|----------|
| DTERRY | SALE | #00000001 | Mailroom Dt: | 01/27/2014 | 060916 | 12802483 |
| | | 01 | FC : 1501 | 860.00 | OP | |
| | | 01 | FC : 1501 | 100.00 | DA | |



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NOTICE OF ALLOWANCE AND FEE(S) DUE

22852 7590 10/25/2013
FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER
LLP
901 NEW YORK AVENUE, NW
WASHINGTON, DC 20001-4413

EXAMINER

FIGIELLO, BENJAMIN F

ART UNIT

PAPER NUMBER

3672

DATE MAILED: 10/25/2013

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 12/802,483 | 06/07/2010 | David J. Mailhot | 07965.0150-00000 | 9389 |

TITLE OF INVENTION: CORRUGATED STORMWATER CHAMBER HAVING SUB-CORRUGATIONS

| APPLN. TYPE | ENTITY STATUS | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE |
|----------------|---------------|---------------|---------------------|----------------------|------------------|------------|
| nonprovisional | UNDISCOUNTED | \$1780 | \$0 | \$0 | \$1780 | 01/27/2014 |

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or **Fax** (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

22852 7590 10/25/2013

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNE
LLP
901 NEW YORK AVENUE, NW
WASHINGTON, DC 20001-4413

Certificate of Mailing or Transmission

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| |
|--------------------|
| (Depositor's name) |
| (Signature) |
| (Date) |

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 12/802,483 | 06/07/2010 | David J. Mailhot | 07965.0150-00000 | 9389 |

TITLE OF INVENTION: CORRUGATED STORMWATER CHAMBER HAVING SUB-CORRUGATIONS

| APPLN. TYPE | ENTITY STATUS | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE |
|----------------|---------------|---------------|---------------------|----------------------|------------------|------------|
| nonprovisional | UNDISCOUNTED | \$1780 | \$0 | \$0 | \$1780 | 01/27/2014 |

| EXAMINER | ART UNIT | CLASS-SUBCLASS |
|----------------------|----------|----------------|
| FIGIELLO, BENJAMIN F | 3672 | 405-042000 |

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC

5. **Change in Entity Status** (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see form PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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P.O. Box 1450
Alexandria, Virginia 22313-1450
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| | | | | |
|--|-------------|----------------------|----------------------------------|------------------|
| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
| 12/802,483 | 06/07/2010 | David J. Mailhot | 07965.0150-00000 | 9389 |
| 22852 7590 10/25/2013 FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP 901 NEW YORK AVENUE, NW WASHINGTON, DC 20001-4413 | | | EXAMINER FIORELLO, BENJAMIN F | |
| | | | ART UNIT 3672 | PAPER NUMBER |

DATE MAILED: 10/25/2013

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)

(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 164 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 164 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

**Notices of Allowance and Fee(s) Due mailed between October 1, 2013 and
December 31, 2013**

(Addendum to PTOL-85)

If the “Notice of Allowance and Fee(s) Due” has a mailing date on or after October 1, 2013 and before January 1, 2014, the following information is applicable to this application.

If the issue fee is being timely paid on or after January 1, 2014, the amount due is the issue fee and publication fee in effect January 1, 2014. On January 1, 2014, the issue fees set forth in 37 CFR 1.18 decrease significantly and the publication fee set forth in 37 CFR 1.18(d)(1) decreases to \$0.

If an issue fee or publication fee has been previously paid in this application, applicant is not entitled to a refund of the difference between the amount paid and the amount in effect on January 1, 2014.

CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC

| | | | |
|-------------------------------|--------------------------------------|---------------------------------------|--|
| Notice of Allowability | Application No. 12/802,483 | Applicant(s) MAILHOT ET AL. | |
| | Examiner BENJAMIN FIORELLO | Art Unit 3672 | AIA (First Inventor to File) Status No |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to after final filed 10/15/2013.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on ____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are 1,3-14,18 and 25-31. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a) ☐ All b) ☐ Some *c) ☐ None of the:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: ____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

| | |
|--|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) 2. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date ____ 3. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material 4. <input type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date ____ . | 5. <input type="checkbox"/> Examiner's Amendment/Comment 6. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance 7. <input type="checkbox"/> Other ____ . |
|--|---|

| | |
|--|--|
| /BENJAMIN FIORELLO/ Examiner, Art Unit 3672 | |
|--|--|

OK TO ENTER: /B.F./

**RESPONSE UNDER 37 C.F.R. § 1.116
EXPEDITED PROCEDURE REQUESTED
EXAMINING GROUP 3672
PATENT**

Customer No. 22,852
Attorney Docket No. 07965.0150-00000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | |
|-----------------------------|---|---------------------------------|
| In re Application of: |) | |
| |) | |
| David J. MAILHOT et al. |) | Group Art Unit: 3672 |
| |) | |
| Application No.: 12/802,483 |) | Examiner: Fiorello, Benjamin F. |
| |) | |
| Filed: June 7, 2010 |) | Confirmation No.: 9389 |
| |) | |
| For: CORRUGATED STORMWATER |) | |
| CHAMBER HAVING SUB- |) | |
| CORRUGATIONS |) | |

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:


AMENDMENT AFTER FINAL

In reply to the final Office Action mailed on May 17, 2013, the period for response extending through October 17, 2013, by a Petition for Extension of Time of Two Months and fee payment filed concurrently herewith, and pursuant to 37 C.F.R. § 1.116, Applicant proposes that this application be amended as follows.

Amendments to the Specification begin on page 2 of this amendment.

Amendments to the Claims begin on page 3 of this amendment.

Remarks begin on page 12 of this amendment.

| | | |
|--|--|--|
| Search Notes  | Application/Control No. 12802483 | Applicant(s)/Patent Under Reexamination MAILHOT ET AL. |
| | Examiner BENJAMIN FIORELLO | Art Unit 3672 |

| CPC- SEARCHED | | |
|---------------|------|----------|
| Symbol | Date | Examiner |
| | | |

| CPC COMBINATION SETS - SEARCHED | | |
|---------------------------------|------|----------|
| Symbol | Date | Examiner |
| | | |

| US CLASSIFICATION SEARCHED | | | |
|----------------------------|------------------------------|------------|----------|
| Class | Subclass | Date | Examiner |
| 405 | 42, 43, 46, 49, 50, 124, 126 | 06/05/2012 | BF |
| 52 | 220.4 | 06/05/2012 | BF |

| SEARCH NOTES | | |
|--------------------------|------------|----------|
| Search Notes | Date | Examiner |
| East Text Search | 06/05/2012 | BF |
| Inventor/Assignee Search | 06/05/2012 | BF |
| Updated Search | 05/16/2013 | BF |
| Updated Search | 10/21/2013 | BF |

| INTERFERENCE SEARCH | | | |
|-------------------------|-------------------------|------------|----------|
| US Class/ CPC Symbol | US Subclass / CPC Group | Date | Examiner |
| | USPGPub Text Search | 10/21/2013 | BF |

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CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC

EAST Search History

EAST Search History

EAST Search History (Prior Art)

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
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| L1 | 1174 | 405/42,43,46,49.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2013/10/21 00:51 |
| L2 | 842 | 405/50,124,126.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2013/10/21 00:51 |
| L3 | 138 | 52/220.4.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2013/10/21 00:51 |
| L4 | 2018 | L1 L2 L3 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2013/10/21 00:51 |
| S1 | 1109 | 405/42,43,46,49.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 10:16 |
| S2 | 9 | "5716163".pn. "5017041".pn. "5511903".pn. "7052209".pn. "7118306".pn. "7500805".pn. "7306399".pn. "7237981".pn. "7491015".pn. | US-PGPUB; USPAT | OR | OFF | 2012/06/05 12:01 |
| S3 | 807 | 405/50,124,126.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 12:05 |
| S4 | 683 | S3 not S1 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 12:05 |
| S5 | 1068313 | (david near2 mailhot).inv. (nimish near2 gandhi).inv. (timothy near2 McGrath).inv. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 12:33 |
| S6 | 53 | (david near2 mailhot).inv. (nimish near2 gandhi).inv. (timothy near2 McGrath).inv. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 12:33 |

CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC

EAST Search History

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|-----|---------|---|---|----|-----|---------------------|
| S7 | 3 | ("5072972" "D538882").PN. | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 12:35 |
| S8 | 4 | (stormtech).as. | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 12:36 |
| S9 | 104 | (advanced near2 drainage near2 systems).as. | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 12:37 |
| S10 | 2358952 | (culvert chamber) | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 14:12 |
| S11 | 216891 | (corrugat\$4) | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 14:12 |
| S12 | 6038772 | (sidewalls base flange) | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 14:12 |
| S13 | 675 | ((sub secondary) with (corrugation\$4)) | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 14:13 |
| S14 | 76 | S10 and S11 and S12 and S13 | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 14:13 |
| S15 | 134 | 52/220.4.ccls. | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 14:16 |
| S16 | 141 | ("405" "52").clas. and ((crest peak with corrugat\$4) and (valley with corrugat\$4) | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 14:24 |
| S17 | 1124 | 405/42,43,46,49.ccls. | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2013/05/16 14:01 |
| S18 | 816 | 405/50,124,126.ccls. | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2013/05/16 14:01 |

CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC

EAST Search History

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|-----|------|---|---|----|-----|---------------------|
| S19 | 135 | 52/220.4.ccls. | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2013/05/16 14:01 |
| S20 | 1950 | S17 S18 S19 | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2013/05/16 14:01 |
| S21 | 7 | "3559692".pn. "6719490".pn. "4690174".pn. | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | ON | 2013/05/16 14:52 |
| S22 | 3 | "3559692".pn. "6719490".pn. "4690174".pn. | US- PGPUB; USPAT | OR | ON | 2013/05/16 14:52 |
| S23 | 3 | ("3559692" "6719490" "4690174").pn. | US- PGPUB; USPAT | OR | ON | 2013/05/16 14:52 |
| S24 | 96 | ("6131616" "4144369" "4689261" "20090117302" "0414767" "3104681" "3363799" "3440823" "4360042" "4487232" "4950103" "5007462" "5191916" "5498104" "5573038" "6129482" "6322288" "6698975" "6941972" "20110150574" "3111788" "3151947" "3427767" "3863415" "4382435" "4776139" "4862652" "4932184" "4962622" "5060444" "5336017" "6079451" "7147007" "7306264" "7306399" "7517172" "7611306" "7870700" "7914231" "20100059430" "20100126616" "20090295153" "20090232600" "20090127853" "20060289075" "20030095838" "7758282" "7707786" "7637691" "7628566" "7517172" "7484535" "7470085" "7451784" "7357600" "7314066" "7165914" "7156580" "7144506" "7025532" "6941972" "6860518" "6773206" "6644357" "6270287" "6126209" "5720577" "5707088" "5556231" "5326191" "5071173" "4950103" "4930936" "4865362" "4523874" "4523613" "4490072" "4451172" "4113816" "4360042" "4359167" "4322179" "4140422" "4006599" "3958425" "3855799" "3820340" "3789615" "3699684" "3658097" "2259335" "1989950" "1948619" "0980442" D566852 D498815 "20060162799" "20020025226" "5716163" "20090020320").pn. | US- PGPUB; USPAT | OR | ON | 2013/05/16 14:59 |
| S25 | 1124 | 405/42,43,46,49.ccls. | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2013/05/17 17:15 |

CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC

EAST Search History

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|-----|------|-----------------------|---|----|-----|---------------------|
| S26 | 816 | 405/ 50,124,126.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2013/05/17 17:15 |
| S27 | 135 | 52/220.4.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2013/05/17 17:15 |
| S28 | 1950 | S25 S26 S27 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2013/05/17 17:15 |
| S29 | 2 | "6938689".pn. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | ON | 2013/05/17 17:16 |

EAST Search History (Interference)

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
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| L5 | 1 | ((chamber) and (corrugat\$5) and (crest) and (valley) and (height) and (width)).clm. | US-PGPUB | OR | OFF | 2013/10/21 00:57 |
| L6 | 1 | ((chamber) and (corrugat\$5) and (crest) and (valley) and (sub)).clm. | US-PGPUB | OR | OFF | 2013/10/21 00:58 |
| L7 | 1 | ((chamber) (end near2 cap)) and (corrugat\$5) and (crest) and (valley) and (sub)).clm. | US-PGPUB | OR | OFF | 2013/10/21 00:59 |
| L8 | 3 | ((chamber) (end near2 cap)) and (corrugat\$5) and (crest) and (valley)).clm. | US-PGPUB | OR | OFF | 2013/10/21 00:59 |
| S30 | 2 | ((switch) and (microprocessor processor) and (uplink) and (current) and (wellbore bore borehole) and (explos\$4) and (perforat\$3)).clm. | US-PGPUB | OR | ON | 2013/05/17 17:29 |
| S31 | 3 | ((switch) and (microprocessor processor) and (uplink) and (current) and (wellbore bore borehole) and (second multiple plurality)).clm. | US-PGPUB | OR | ON | 2013/05/17 17:30 |
| S32 | 3 | ((switch) and (microprocessor processor) and (uplink) and (current) and (wellbore bore borehole) and (downlink)).clm. | US-PGPUB | OR | ON | 2013/05/17 17:30 |

10/ 21/ 2013 1:00:32 AM

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| | | |
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| Issue Classification  | Application/Control No. 12802483 | Applicant(s)/Patent Under Reexamination MAILHOT ET AL. |
| | Examiner BENJAMIN FIORELLO | Art Unit 3672 |

[illegible]


| CPC Combination Sets | | | | | |
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| Symbol | | Type | Set | Ranking | Version |
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|---|------------|------------------------------|-------------------|
| | | Total Claims Allowed: | |
| | | 21 | |
| (Assistant Examiner) | (Date) | | |
| /BENJAMIN FIORELLO/ Examiner.Art Unit 3672 | 10/21/2013 | O.G. Print Claim(s) | O.G. Print Figure |
| (Primary Examiner) | (Date) | 1 | 1 |

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|---|------------|------------------------------|-------------------|
| | | Total Claims Allowed: | |
| | | 21 | |
| (Assistant Examiner) | (Date) | | |
| /BENJAMIN FIORELLO/ Examiner.Art Unit 3672 | 10/21/2013 | O.G. Print Claim(s) | O.G. Print Figure |
| (Primary Examiner) | (Date) | 1 | 1 |

CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC

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| Issue Classification  | Application/Control No. 12802483 | Applicant(s)/Patent Under Reexamination MAILHOT ET AL. |
| | Examiner BENJAMIN FIORELLO | Art Unit 3672 |

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|---|----------|-------|----------|-------|----------|-------|----------|-------|----------|-------|----------|-------|----------|-------|----------|
| <input type="checkbox"/> Claims renumbered in the same order as presented by applicant <input type="checkbox"/> CPA <input type="checkbox"/> T.D. <input type="checkbox"/> R.1.47 | | | | | | | | | | | | | | | |
| Final | Original | Final | Original | Final | Original | Final | Original | Final | Original | Final | Original | Final | Original | Final | Original |
| 1 | 1 | | 17 | | | | | | | | | | | | |
| | 2 | 16 | 18 | | | | | | | | | | | | |
| 2 | 3 | | 19 | | | | | | | | | | | | |
| 3 | 4 | | 20 | | | | | | | | | | | | |
| 4 | 5 | | 21 | | | | | | | | | | | | |
| 5 | 6 | | 22 | | | | | | | | | | | | |
| 6 | 7 | | 23 | | | | | | | | | | | | |
| 8 | 8 | | 24 | | | | | | | | | | | | |
| 7 | 9 | 12 | 25 | | | | | | | | | | | | |
| 9 | 10 | 13 | 26 | | | | | | | | | | | | |
| 10 | 11 | 17 | 27 | | | | | | | | | | | | |
| 11 | 12 | 18 | 28 | | | | | | | | | | | | |
| 14 | 13 | 19 | 29 | | | | | | | | | | | | |
| 15 | 14 | 20 | 30 | | | | | | | | | | | | |
| | 15 | 21 | 31 | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | | |

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|--|--|---|---|
| <div style="display: flex; justify-content: space-between;"> (Assistant Examiner) (Date) </div> <div style="display: flex; justify-content: space-between;"> /BENJAMIN FIORELLO/ Examiner. Art Unit 3672 10/21/2013 </div> <div style="display: flex; justify-content: space-between;"> (Primary Examiner) (Date) </div> | | Total Claims Allowed: <div style="text-align: center; margin-top: 10px;">21</div> | |
| | | O.G. Print Claim(s) <div style="text-align: center;">1</div> | O.G. Print Figure <div style="text-align: center;">1</div> |

RESPONSE UNDER 37 C.F.R. § 1.116
EXPEDITED PROCEDURE REQUESTED
EXAMINING GROUP 3672

PATENT

Customer No. 22,852

Attorney Docket No. 07965.0150-00000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)
)
David J. MAILHOT et al.) Group Art Unit: 3672
)
Application No.: 12/802,483) Examiner: Fiorello, Benjamin F.
)
Filed: June 7, 2010) Confirmation No.: 9389
)
For: CORRUGATED STORMWATER)
CHAMBER HAVING SUB-)
CORRUGATIONS)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

AMENDMENT AFTER FINAL

In reply to the final Office Action mailed on May 17, 2013, the period for response extending through October 17, 2013, by a Petition for Extension of Time of Two Months and fee payment filed concurrently herewith, and pursuant to 37 C.F.R. § 1.116, Applicant proposes that this application be amended as follows.

Amendments to the Specification begin on page 2 of this amendment.

Amendments to the Claims begin on page 3 of this amendment.

Remarks begin on page 12 of this amendment.

Application No. 12/802,483
Attorney Docket No. 07965.0150-00000

AMENDMENTS TO THE SPECIFICATION:

Please amend the specification on page 6, line 15 as follows:

Fig. 5 comprises Fig 5(a) through Fig. 5(e) Fig. 5(f) and shows portions of sidewall cross sections at different chamber elevations, as points illustrated in Fig. 3.

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application.

1. (Currently Amended) A ~~molded arch shape cross section plastic chamber, for receiving and dispersing water when buried in soil,~~ comprising:

opposing side bases running generally parallel to a chamber length axis, for supporting the chamber ~~on soil during use;~~

a chamber top;

sidewalls running ~~upwardly and inwardly from the~~ opposing side bases to the chamber top, wherein the ~~combination of sidewalls and top form an arch curve which defines an arch shape cross section~~ arch-curve;

a plurality of alternating crest corrugations and valley corrugations running transverse to the length of the chamber along the ~~arch curve~~ arch-curve of the chamber, wherein the crest corrugations decrease in width with elevation from the ~~base~~ opposing side bases, and the valley corrugations increase in width with elevation from the ~~base~~ opposing side bases, as width is measured in a direction parallel to the chamber length axis; and[[,]]

a plurality of crest sub-corrugations, each crest sub-corrugation running upwardly from the an opposing side base and along a portion of the arch-curve of a crest corrugation, each crest sub-corrugation having a height less than [[the]] a local height of the crest corrugation with which the crest sub-corrugation is associated[[;]], each crest sub-corrugation terminating at an elevation lower than the top of the chamber, wherein the height of each crest sub-corrugation diminishes with increasing elevation.

2. (Canceled)
3. (Currently Amended) The chamber of claim ~~[[2]]~~ 1, wherein each crest sub-corrugation has a width which diminishes with increasing elevation.
4. (Currently Amended) The chamber of claim 1, wherein the crest sub-corrugations extend about one quarter to two-thirds of ~~[[the]]~~ a height of the chamber.
5. (Currently Amended) The chamber of claim 1, wherein ~~[[the]]~~ a maximum width of each crest sub-corrugation is no more than one-third of ~~[[the]]~~ a local width of the associated crest corrugation.
6. (Currently Amended) The chamber of claim 1, further comprising~~[[:]]~~ a plurality of valley sub-corrugations, each valley sub-corrugation running downwardly from the top of the chamber and along part or all of ~~the length of~~ a valley corrugation; ~~and~~, each valley sub-corrugation having a height less than ~~[[the]]~~ a depth of the valley corrugation with which the valley sub-corrugation is associated~~[[:]]~~, each valley sub-corrugation terminating at an elevation lower than the top of the chamber.
7. (Currently Amended) The chamber of claim 6, wherein each valley sub-corrugation terminates at an elevation above ~~the elevation of the base~~ opposing side bases.

8. (Currently Amended) The chamber of claim 6, wherein each valley sub-corrugation runs downwardly from the top of the chamber and terminates at a point on each opposing side that ~~which is above the elevation of each opposing side base; and,~~ wherein each crest sub-corrugation runs upwardly from ~~the base~~ an opposing side base and terminates at an elevation which is higher than the ~~elevation of the~~ termination points of the valley sub-corrugations.

9. (Currently Amended) The chamber of claim 7, wherein each valley sub-corrugation diminishes in both height and width in proximity to the ~~base~~ opposing side bases, as width is measured in a direction which is parallel to the length axis of the chamber.

10. (Currently Amended) The chamber of claim 6, wherein ~~[[the]]~~ a maximum width of each valley sub-corrugation is no more than one-third of ~~[[the]]~~ a local width of the associated valley corrugation, as width is measured in a direction ~~which~~ parallel to the length ~~axis~~ of the chamber.

11. (Currently Amended) The chamber of claim 6, wherein the valley sub-corrugations have lower termination ends on the ~~sidewall~~ sidewalls of the chamber~~[[;]]~~, wherein the crest ~~sub-corrugation~~ sub-corrugations have upper termination ends on the ~~sidewall; and~~ sidewalls of the chamber, wherein the crest sub-corrugation termination ends are higher in elevation than ~~[[the]]~~ elevations of the valley sub-corrugation terminal ends.

12. (Currently Amended) The chamber of claim ~~[[7]]~~ 1, further comprising a first plurality of valley sub-corrugations and a second plurality of valley sub-corrugations, each of the first plurality of valley sub-corrugations running downwardly from the top of the chamber and along part or all of a valley corrugation and terminating at terminal ends above the elevation of the opposing side bases, each of the second plurality of valley sub-corrugations running within a valley corrugation upwardly from each an opposing side base in the direction of said terminal ends of the first plurality of valley sub-corrugation sub-corrugations.

13. (Currently Amended) ~~In a A molded arch-shape cross-section chamber, for receiving and dispersing water when buried in soil, comprising:~~

opposing side bases;

sidewalls running from the opposing side bases and forming an arch-curve of the chamber;

~~wherein the chamber is supported by flanges associated with the opposing side bases during use and configured to support the chamber;~~

~~wherein the chamber has a plurality of alternating crest corrugations and valley corrugations running transverse to [[the]] a length of the chamber[[,]] along the arch-curve arch-curve of the chamber[[,]], wherein the crest corrugations decrease in width with elevation [[for]] from the base opposing side bases, and the valley corrugations increase in width with elevation from the base opposing side bases, as width is measured in a direction parallel to the chamber length axis; the improvement which comprises: a plurality of sub-corrugations running along at least a portion of the lengths of a plurality of one or both of the crest corrugations and valley corrugations~~

Application No. 12/802,483
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a first plurality of sub-corrugations running upwardly from the opposing side bases on crest corrugations to termination points which are at an elevation less than an elevation of a top of the chamber; and

a second plurality of sub-corrugations running in valley corrugations at the top of the chamber and downwardly toward the opposing side bases to an elevation which is less than the elevation of said termination points of the first plurality of sub-corrugations.

14. (Currently Amended) The improved chamber of claim 13, wherein ~~[[the]]~~ a width and a depth of each sub-corrugation change along part or all of ~~the length of the sub-corrugation as the width of the crest corrugation or valley corrugation~~ with which the sub-corrugation is associated changes.

15 – 17. (Canceled)

18. (Currently Amended) The improved chamber of claim ~~[[15]]~~ 13, wherein ~~[[all]]~~ the elevations of the termination points of ~~all of at least one of the first or second set~~ plurality of [[the]] sub-corrugations are the same.

19 – 24. (Canceled)

25. (New) The chamber of claim 1, further comprising a plurality of valley sub-corrugations, each valley sub-corrugation running downwardly from the top of the chamber along a valley corrugation, wherein a width of each valley sub-corrugation is constant.

26. (New) The chamber of claim 1, further comprising a plurality of valley sub-corrugations, each valley sub-corrugation running along a valley corrugation, downwardly from the top of the chamber towards the opposing side bases, wherein a height of each valley sub-corrugation decreases as the valley sub-corrugation approaches the opposing side bases.
27. (New) The chamber of claim 13, wherein a width of each of the second plurality of sub-corrugations running in a valley corrugation is constant.
28. (New) The chamber of claim 13, wherein a height of each of the second plurality of sub-corrugations running in a valley corrugation decreases as the sub-corrugation approaches the opposing side bases.
29. (New) A chamber, comprising:
- opposing side bases running generally parallel to a chamber length for supporting the chamber;
 - a chamber top;
 - sidewalls running from the opposing side bases to the chamber top, wherein the sidewalls and top form an arch-curve;
 - a plurality of alternating crest corrugations and valley corrugations running transverse to the length of the chamber along the arch curve of the chamber, wherein the crest corrugations decrease in width with elevation from the opposing side bases,

and the valley corrugations increase in width with elevation from the opposing side bases, as width is measured in a direction parallel to the chamber length; and

a plurality of crest sub-corrugations, each sub-corrugation running upwardly from an opposing side base and along a portion of the arch-curve of a crest corrugation, each sub-corrugation having a height less than a local height of the crest corrugation with which the sub-corrugation is associated, each crest sub-corrugation terminating at an elevation lower than the top of the chamber, wherein the crest sub-corrugations extend about one quarter to two-thirds of a height of the chamber.

30. (New) A chamber, comprising:

opposing side bases running generally parallel to a chamber length for supporting the chamber;

a chamber top;

sidewalls running from the opposing side bases to the chamber top, wherein the sidewalls and top form an arch-curve;

a plurality of alternating crest corrugations and valley corrugations running transverse to the length of the chamber along the arch curve of the chamber, wherein the crest corrugations decrease in width with elevation from the opposing side bases, and the valley corrugations increase in width with elevation from the opposing side bases, as width is measured in a direction parallel to the chamber length; and

a plurality of crest sub-corrugations, each sub-corrugation running upwardly from an opposing side base and along a portion of the arch-curve of a crest corrugation, each sub-corrugation having a height less than a local height of the crest corrugation with which the sub-corrugation is associated, each crest sub-corrugation terminating at

an elevation lower than the top of the chamber, wherein a maximum width of each crest sub-corrugation is no more than one-third of a local width of the associated crest corrugation.

31. (New) A chamber, comprising:

opposing side bases running generally parallel to a chamber length for supporting the chamber;

a chamber top;

sidewalls running from the opposing side bases to the chamber top, wherein the sidewalls and top form an arch-curve;

a plurality of alternating crest corrugations and valley corrugations running transverse to the length of the chamber along the arch curve of the chamber, wherein the crest corrugations decrease in width with elevation from the opposing side bases, and the valley corrugations increase in width with elevation from the opposing side bases, as width is measured in a direction parallel to the chamber length;

a plurality of crest sub-corrugations, each crest sub-corrugation running upwardly from an opposing side base and along a portion of the arch-curve of a crest corrugation, each crest sub-corrugation having a height less than a local height of the crest corrugation with which the crest sub-corrugation is associated, each crest sub-corrugation terminating at an elevation lower than the top of the chamber; and

a plurality of valley sub-corrugations, each valley sub-corrugation running downwardly from the top of the chamber and along part or all of a valley corrugation, each valley sub-corrugation having a height less than a depth of the valley corrugation

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Attorney Docket No. 07965.0150-00000

with which the valley sub-corrugation is associated, each valley sub-corrugation
terminating at an elevation lower than the top of the chamber.

REMARKS

I. Status of the Claims

Applicant respectfully submits this Amendment After Final in response to the final Office Action mailed on May 17, 2013 (the "Office Action"). By this amendment, Applicant amends the specification to correct an informality. In addition, Applicant amends claims 1, 3-14, and 17; cancels claims 2, 15-17, and 19-24, without prejudice or disclaimer; and adds new claims 25-31.¹ Accordingly, claims 1, 3-14, 18, and 25-31 are pending, with claims 1, 13, and 29-31 being independent. No new matter has been added.

In the Office Action, the specification is objected to due to an informality. Moreover, claims 1, 13, 14, and 19 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 4,360,042 to Fouss et al. in view of U.S. Publication No. 2005/0111915 to Moore, Jr. et al. Furthermore, claims 2-12, 15, 17, and 18 are indicated as allowable if rewritten in independent form.

Applicant thanks the Examiner for the identification of allowable subject matter and respectfully traverses the pending objection and rejections for at least the reasons set forth below.

¹ Applicant notes that the previous listings of claims were not correctly numbered. In particular, the listing of claims skipped from claim 15 to claim 17; there was no claim 16. In order to avoid confusion relating to the rejections and objection in the final Office Action, Applicant has not renumbered the claims. Any potential further confusion regarding the omission of claim 16 and the numbering of claims 15 and 17 has been rendered moot, however, due to Applicant's cancellation of claims 15-17.

II. The Specification Objection

The Office Action objects to the specification due to a minor informality. (See Office Action at 2.) Applicant has amended the specification to address the objection and accordingly requests the objection be vacated.

III. The § 103(a) Rejection

A. Independent Claim 1

Applicant has amended independent claim 1 to include the features of allowable dependent claim 2, and consequently canceled that dependent claim. The amendments to independent claim 1 also address certain informalities. Accordingly, independent claim 1 is in condition for allowance.

B. Independent Claim 13

Applicant has amended independent claim 13 to include the features of allowable dependent claim 15, and consequently canceled that dependent claim. The amendments to independent claim 13 also address certain informalities. Accordingly, independent claim 13 is in condition for allowance.

C. Dependent Claims 3-12, 14, and 18

Claims 3-12, 14, and 18 depend from either independent claim 1 or 13 and accordingly are allowable at least due to their dependence.

IV. The New Claims

A. New Dependent Claims 25-28

Support for new dependent claims 25-28 may be found in, for example, page 11, lines 14-21 of the originally-filed specification. Claims 25-28 depend from either

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Attorney Docket No. 07965.0150-00000

independent claim 1 or 13 and accordingly are allowable at least due to their dependence. Similarly, based on their dependence from allowable independent claim 1 or 13, a further search to determine allowability of new dependent claims 25-28 is unnecessary and these claims should be allowed.

B. New Independent Claims 28-30

New independent claim 29 places allowable dependent claim 4 into independent form, new independent claim 30 places allowable dependent claim 5 into independent form, and new independent claim 31 places allowable dependent claim 6 into independent form. Accordingly, independent claims 29-31 are in condition for allowance.

IV. Conclusion

Applicant respectfully requests that this amendment under 37 C.F.R. § 1.116 be entered, placing claims 1, 3-14, 18, and 25-31 in condition for allowance. It is respectfully submitted that entering the amendment would allow the Applicant to reply to the final rejections and place the application in condition for allowance. Furthermore, Applicant respectfully points out that the Office Action presented some new arguments as to the application of the cited references against Applicant's claims. Finally, Applicant submits that the entry of the amendment would place the application in better form for appeal, should the patentability of the pending claims be disputed.

The Office Action contains characterizations of the claims and the related art with which Applicant does not necessarily agree. Unless expressly noted otherwise, Applicant declines to subscribe to any statement or characterization in the Office Action.

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Attorney Docket No. 07965.0150-00000

In discussing the specification, claims, and/or drawings in this amendment, it is to be understood that Applicant is in no way intending to limit the scope of the claims to any exemplary embodiments described in the specification or abstract and/or shown in the drawings. Rather, Applicant is entitled to have the claims interpreted broadly to the maximum extent permitted by statute, regulation, and applicable case law.

Please grant any extensions of time required to enter this amendment and charge any additional required fees to Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: October 15, 2013

By: 
Daniel G. Chung
Reg. No. 63,553
(202) 408-4000

PATENT
Customer No. 22,852
Attorney Docket No. 07965.0150-00000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)
)
David J. MAILHOT et al.) Group Art Unit: 3672
)
Application No.: 12/802,483) Examiner: Fiorello, Benjamin F.
)
Filed: June 7, 2010) Confirmation No.: 9389
)
For: CORRUGATED STORMWATER)
)
CHAMBER HAVING SUB-)
)
CORRUGATIONS)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

PETITION FOR EXTENSION OF TIME

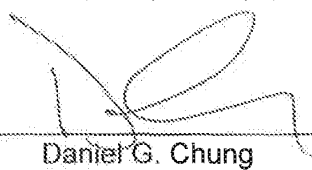
Applicant petitions for a two-month extension of time to respond to the final Office
Action mailed on May 17, 2013. A fee of \$600.00 is submitted electronically herewith.

Please grant any additional extensions of time required to enter the attached
paper and charge any additional required fees to Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: October 15, 2013

By: 
Daniel G. Chung
Reg. No. 63,553
(202) 408-4000

| Electronic Patent Application Fee Transmittal | | | | |
|--|-----------------|---|---------------|-----------------------------|
| Application Number: | | 12802483 | | |
| Filing Date: | | 07-Jun-2010 | | |
| Title of Invention: | | Corrugated Stormwater chamber having sub-corrugations | | |
| First Named Inventor/Applicant Name: | | David J. Mailhot | | |
| Filer: | | Daniel Geewon Chung/dorne dottin | | |
| Attorney Docket Number: | | 07965.0150-00000 | | |
| Filed as Large Entity | | | | |
| Utility under 35 USC 111(a) Filing Fees | | | | |
| Description | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
| Basic Filing: | | | | |
| Pages: | | | | |
| Claims: | | | | |
| Miscellaneous-Filing: | | | | |
| Petition: | | | | |
| Patent-Appeals-and-Interference: | | | | |
| Post-Allowance-and-Post-Issuance: | | | | |
| Extension-of-Time: | | | | |
| Extension - 2 months with \$0 paid | 1252 | 1 | 600 | 600 |

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CULTEC, INC. v. STORMTECH LLC

| Description | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
|-------------------|----------|----------|--------|----------------------|
| Miscellaneous: | | | | |
| Total in USD (\$) | | | | 600 |

| Electronic Acknowledgement Receipt | |
|---|---|
| EFS ID: | 17130508 |
| Application Number: | 12802483 |
| International Application Number: | |
| Confirmation Number: | 9389 |
| Title of Invention: | Corrugated Stormwater chamber having sub-corrugations |
| First Named Inventor/Applicant Name: | David J. Mailhot |
| Customer Number: | 22852 |
| Filer: | Daniel Geewon Chung/dorne dottin |
| Filer Authorized By: | Daniel Geewon Chung |
| Attorney Docket Number: | 07965.0150-00000 |
| Receipt Date: | 15-OCT-2013 |
| Filing Date: | 07-JUN-2010 |
| Time Stamp: | 15:23:07 |
| Application Type: | Utility under 35 USC 111(a) |

Payment information:

| | |
|--|-------------|
| Submitted with Payment | yes |
| Payment Type | Credit Card |
| Payment was successfully received in RAM | \$600 |
| RAM confirmation Number | 2317 |
| Deposit Account | |
| Authorized User | |

File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|-----------------|----------------------|-----------|----------------------------------|------------------|------------------|
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CULTEC, INC. v. STORMTECH LLC

| | | | | | |
|--|---|--|--|-----|----|
| 1 | | 07965_0150_00000_Amendme nt_After_Final.pdf | 640328 fb7f5e1eb985c54e690f1435192924a6bc35f061 | yes | 15 |
| | Multipart Description/PDF files in .zip description | | | | |
| | Document Description | | Start | End | |
| | Response After Final Action | | 1 | 1 | |
| | Specification | | 2 | 2 | |
| | Amendment Copy Claims/Response to Suggested Claims | | 3 | 11 | |
| | Applicant Arguments/Remarks Made in an Amendment | | 12 | 15 | |
| Warnings: | | | | | |
| Information: | | | | | |
| 2 | Extension of Time | 07965_0150_00000_Extension _of_Time.pdf | 47013 e8f7d7cf2c621a241e359d5b45a871d2458b72e | no | 1 |
| Warnings: | | | | | |
| Information: | | | | | |
| 3 | Fee Worksheet (SB06) | fee-info.pdf | 30125 3a72eb4c550e834991c36bd1a7bfc46065cea869 | no | 2 |
| Warnings: | | | | | |
| Information: | | | | | |
| Total Files Size (in bytes): | | | 717466 | | |
| <p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p> | | | | | |

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CULTEC, INC. v. STORMTECH LLC

PTO/SB/06 (09-11)
 Approved for use through 1/31/2014. OMB 0651-0032
 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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| | | | | | | | | | |
|--|--|---|-------|---|---------------|----------------------------------|--|---------------------------------------|--|
| PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875 | | | | Application or Docket Number 12/802,483 | | Filing Date 06/07/2010 | | <input type="checkbox"/> To be Mailed | |
| ENTITY: <input checked="" type="checkbox"/> LARGE <input type="checkbox"/> SMALL <input type="checkbox"/> MICRO | | | | | | | | | |
| APPLICATION AS FILED – PART I | | | | | | | | | |
| (Column 1) | | (Column 2) | | | | | | | |
| FOR | | NUMBER FILED | | NUMBER EXTRA | | RATE (\$) | | FEE (\$) | |
| <input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), or (c)) | | N/A | | N/A | | N/A | | | |
| <input type="checkbox"/> SEARCH FEE (37 CFR 1.16(k), (j), or (m)) | | N/A | | N/A | | N/A | | | |
| <input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(o), (p), or (q)) | | N/A | | N/A | | N/A | | | |
| TOTAL CLAIMS (37 CFR 1.16(i)) | | minus 20 = | | * | | X \$ = | | | |
| INDEPENDENT CLAIMS (37 CFR 1.16(h)) | | minus 3 = | | * | | X \$ = | | | |
| <input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s)) | | If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s). | | | | | | | |
| <input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j)) | | | | | | | | | |
| * If the difference in column 1 is less than zero, enter "0" in column 2. | | | | | | TOTAL | | | |
| APPLICATION AS AMENDED – PART II | | | | | | | | | |
| (Column 1) | | (Column 2) | | (Column 3) | | | | | |
| AMENDMENT | 10/15/2013 | CLAIMS REMAINING AFTER AMENDMENT | | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA | RATE (\$) | | ADDITIONAL FEE (\$) | |
| | Total (37 CFR 1.16(i)) | * 21 | Minus | ** 23 | = 0 | X \$80 = | | 0 | |
| | Independent (37 CFR 1.16(h)) | * 5 | Minus | ***4 | = 1 | X \$420 = | | 420 | |
| | <input type="checkbox"/> Application Size Fee (37 CFR 1.16(s)) | | | | | | | | |
| | <input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | | | | | |
| | | | | | | TOTAL ADD'L FEE | | 420 | |
| (Column 1) | | (Column 2) | | (Column 3) | | | | | |
| AMENDMENT | | CLAIMS REMAINING AFTER AMENDMENT | | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA | RATE (\$) | | ADDITIONAL FEE (\$) | |
| | Total (37 CFR 1.16(i)) | * | Minus | ** | = | X \$ = | | | |
| | Independent (37 CFR 1.16(h)) | * | Minus | *** | = | X \$ = | | | |
| | <input type="checkbox"/> Application Size Fee (37 CFR 1.16(s)) | | | | | | | | |
| | <input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | | | | | |
| | | | | | | TOTAL ADD'L FEE | | | |
| <p>* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.</p> <p>** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".</p> <p>*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".</p> <p>The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.</p> | | | | | | | | | |

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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CULTEC, INC. v. STORMTECH LLC

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CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC



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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|----------------------------------|------------------------|
| 12/802,483 | 06/07/2010 | David J. Mailhot | 07965.0150-00000 | 9389 |
| 22852 7590 05/17/2013 FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP 901 NEW YORK AVENUE, NW WASHINGTON, DC 20001-4413 | | | EXAMINER FIORELLO, BENJAMIN F | |
| | | | ART UNIT 3672 | PAPER NUMBER |
| | | | MAIL DATE 05/17/2013 | DELIVERY MODE PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|---------------------------------------|--|
| Office Action Summary | Application No. 12/802,483 | Applicant(s) MAILHOT ET AL. | |
| | Examiner BENJAMIN FIORELLO | Art Unit 3672 | AIA (First Inventor to File) Status No |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 2 May 2013.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.

3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5) ☒ Claim(s) 1-15 and 17-24 is/are pending in the application.
 5a) Of the above claim(s) 20-24 is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☒ Claim(s) 1,13,14 and 19 is/are rejected.

8) ☒ Claim(s) 2-12,15,17 and 18 is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10) ☒ The specification is objected to by the Examiner.

11) ☒ The drawing(s) filed on 07 June 2010 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a) ☐ All b) ☐ Some * c) ☐ None of the:

 1. ☐ Certified copies of the priority documents have been received.

 2. ☐ Certified copies of the priority documents have been received in Application No. _____.

 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Interim copies:

a) ☐ All b) ☐ Some c) ☐ None of the: Interim copies of the priority documents have been received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08)
 Paper No(s)/Mail Date 05/08/2013.

3) ☐ Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____.

4) ☐ Other: _____.

Application/Control Number: 12/802,483
Art Unit: 3672

Page 2

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 05/08/2013 was filed after the mailing date of the non-final office action on 11/02/2012. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Specification

2. The disclosure is objected to because of the following informalities: the amendment to the specification dated 05/02/2013 has added "Fig. 5(f)", however the amendment has not deleted "Fig. 5(e)".

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

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under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1, 13-14, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fouss et al. (4,360,042) in view of Moore, Jr. et al. (2005/0111915).

With regard to claims 1, 13, and 19, Fouss discloses a chamber comprising:
opposing side bases (14,16) running generally parallel to a chamber length axis (fig. 1), for supporting the chamber on soil during use;

a chamber top (fig. 1);

sidewalls (10,12) running upwardly and inwardly from opposing side bases to the chamber top (fig. 1), wherein the combination of sidewalls and top form an arch curve which defines an arch shape cross section (fig. 1);

a plurality of alternating crest (26) corrugations and valley (28) corrugations running transverse to the length of the chamber along the arch curve of the chamber (figs. 1-2 and 4-5);

and a plurality of crest sub-corrugations (40, see figs. 4-5), running upwardly from the base and along a portion of the arch-curve of a crest corrugation (figs. 1-2, 4-5), each sub-corrugation having a height less than the local height of the crest corrugation with which it is associated (fig. 4-5); each crest sub-corrugation terminating at an elevation lower than the top of the chamber (fig. 1).

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Fouss fails to disclose wherein the crest corrugations decrease in width with elevation from the base and the valley corrugations increase in width with elevation from the base, as width is measured in a direction parallel to the chamber length axis.

Moore discloses a chamber wherein the crest corrugations (24) decrease in width with elevation from the base (fig. 1) and the valley corrugations (22) increase in width with elevation from the base, as width is measured in a direction parallel to the chamber length axis (fig. 1).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Fouss and have the crest decrease width with elevation from the base and the valleys increase in width as taught by Moore in order to further strengthen the chamber at the base of the chamber.

With regard to claim 14, Fouss further discloses the width and depth of each sub-corrugation change along part or all of the length of the sub-corrugation in as the width of the corrugation with which the sub-corrugation is associated changes (fig. 1).

Allowable Subject Matter

6. Claims 2-12, 15, and 17-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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Response to Arguments

7. Applicant's arguments filed 05/02/2013 have been fully considered but they are not persuasive.

In response to applicant's argument that Fouss and Moore fail to teach each and every recited limitation, the examiner disagrees. Applicant has not set forth which limitations are believed to not be taught by Fouss and Moore, however the examiner contends each limitation is taught as discussed above.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BENJAMIN FIORELLO whose telephone number is

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(571)270-7012. The examiner can normally be reached on Monday to Friday from 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bagnell can be reached on (571)272-6999. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BENJAMIN FIORELLO/
Examiner, Art Unit 3672

BF
05/16/2013

| | | |
|--|--|--|
| Search Notes  | Application/Control No. 12802483 | Applicant(s)/Patent Under Reexamination MAILHOT ET AL. |
| | Examiner BENJAMIN FIORELLO | Art Unit 3672 |

| CPC- SEARCHED | | |
|---------------|------|----------|
| Symbol | Date | Examiner |
| | | |

| CPC COMBINATION SETS - SEARCHED | | |
|---------------------------------|------|----------|
| Symbol | Date | Examiner |
| | | |

| US CLASSIFICATION SEARCHED | | | |
|----------------------------|------------------------------|------------|----------|
| Class | Subclass | Date | Examiner |
| 405 | 42, 43, 46, 49, 50, 124, 126 | 06/05/2012 | BF |
| 52 | 220.4 | 06/05/2012 | BF |

| SEARCH NOTES | | |
|--------------------------|------------|----------|
| Search Notes | Date | Examiner |
| East Text Search | 06/05/2012 | BF |
| Inventor/Assignee Search | 06/05/2012 | BF |
| Updated Search | 05/16/2013 | BF |

| INTERFERENCE SEARCH | | | |
|-------------------------|-------------------------|------|----------|
| US Class/ CPC Symbol | US Subclass / CPC Group | Date | Examiner |
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EAST Search History

EAST Search History

EAST Search History (Prior Art)

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|-------|------|--|---|------------------|---------|---------------------|
| L1 | 1124 | 405/42,43,46,49.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2013/05/16 14:01 |
| L2 | 816 | 405/50,124,126.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2013/05/16 14:01 |
| L3 | 135 | 52/220.4.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2013/05/16 14:01 |
| L4 | 1950 | L1 L2 L3 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2013/05/16 14:01 |
| L5 | 7 | "3559692".pn. "6719490".pn. "4690174".pn. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | ON | 2013/05/16 14:52 |
| L6 | 3 | "3559692".pn. "6719490".pn. "4690174".pn. | US-PGPUB; USPAT | OR | ON | 2013/05/16 14:52 |
| L7 | 3 | ("3559692" "6719490" "4690174").pn. | US-PGPUB; USPAT | OR | ON | 2013/05/16 14:52 |
| L8 | 96 | ("6131616" "4144369" "4689261" "20090117302" "0414767" "3104681" "3363799" "3440823" "4360042" "4487232" "4950103" "5007462" "5191916" "5498104" "5573038" "6129482" "6322288" "6698975" "6941972" "20110150574" "3111788" "3151947" "3427767" "3863415" "4382435" "4776139" "4862652" "4932184" "4962622" "5060444" "5336017" "6079451" "7147007" "7306264" "7306399" "7517172" "7611306" "7870700" "7914231" "20100059430" "20100126616" "20090295153" "20090232600" "20090127853" "20060289075" "20030095838" "7758282" "7707786" "7637691" "7628566" "7517172" "7484535" "7470085" "7451784" | US-PGPUB; USPAT | OR | ON | 2013/05/16 14:59 |

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CULTEC, INC. v. STORMTECH LLC

EAST Search History

| | | | | | | |
|----|---------|---|---|----|-----|---------------------|
| | | "7357600" "7314066" "7165914" "7156580" "7144506" "7025532" "6941972" "6860518" "6773206" "6644357" "6270287" "6126209" "5720577" "5707088" "5556231" "5326191" "5071173" "4950103" "4930936" "4865362" "4523874" "4523613" "4490072" "4451172" "4113816" "4360042" "4359167" "4322179" "4140422" "4006599" "3958425" "3855799" "3820340" "3789615" "3699684" "3658097" "2259335" "1989950" "1948619" "0980442" D566852 D498815 "20060162799" "20020025226" "5716163" "20090020320").pn. | | | | |
| S1 | 1109 | 405/42,43,46,49.ccls. | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 10:16 |
| S2 | 9 | "5716163".pn. "5017041".pn. "5511903".pn. "7052209".pn. "7118306".pn. "7500805".pn. "7306399".pn. "7237981".pn. "7491015".pn. | US- PGPUB; USPAT | OR | OFF | 2012/06/05 12:01 |
| S3 | 807 | 405/50,124,126.ccls. | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 12:05 |
| S4 | 683 | S3 not S1 | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 12:05 |
| S5 | 1068313 | (david near2 mailhot).inv. (nimish near2 gandhi).inv" (timothy near2 McGrath).inv. | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 12:33 |
| S6 | 53 | (david near2 mailhot).inv. (nimish near2 gandhi).inv. (timothy near2 McGrath).inv. | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 12:33 |
| S7 | 3 | ("5072972" "D538882").PN. | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 12:35 |
| S8 | 4 | (stormtech).as. | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 12:36 |
| S9 | 104 | (advanced near2 drainage near2 systems).as. | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 12:37 |

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CULTEC, INC. v. STORMTECH LLC

EAST Search History

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|-----|---------|--|---|----|-----|---------------------|
| S10 | 2358952 | (culvert chamber) | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 14:12 |
| S11 | 216891 | (corrugat\$4) | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 14:12 |
| S12 | 6038772 | (sidewalls base flange) | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 14:12 |
| S13 | 675 | ((sub secondary) with (corrugation\$4)) | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 14:13 |
| S14 | 76 | S10 and S11 and S12 and S13 | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 14:13 |
| S15 | 134 | 52/220.4.ccls. | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 14:16 |
| S16 | 141 | ("405" "52").clas. and ((crest peak) with corrugat\$4) and (valley with corrugat\$4) | US- PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 14:24 |

EAST Search History (Interference)

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CULTEC, INC. v. STORMTECH LLC

| | | |
|--|--|--|
| <i>Index of Claims</i>  | Application/Control No. 12802483 | Applicant(s)/Patent Under Reexamination MAILHOT ET AL. |
| | Examiner BENJAMIN FIORELLO | Art Unit 3672 |

| | | | | | | | |
|----------|-----------------|----------|-------------------|----------|---------------------|----------|-----------------|
| ✓ | Rejected | - | Cancelled | N | Non-Elected | A | Appeal |
| = | Allowed | ÷ | Restricted | I | Interference | O | Objected |

☐ Claims renumbered in the same order as presented by applicant
 ☐ CPA
 ☐ T.D.
 ☐ R.1.47

| CLAIM | | DATE | | | | | | | |
|-------|----------|------------|------------|--|--|--|--|--|--|
| Final | Original | 10/31/2012 | 05/16/2013 | | | | | | |
| | 1 | ✓ | ✓ | | | | | | |
| | 2 | ✓ | ○ | | | | | | |
| | 3 | ✓ | ○ | | | | | | |
| | 4 | ✓ | ○ | | | | | | |
| | 5 | ✓ | ○ | | | | | | |
| | 6 | ✓ | ○ | | | | | | |
| | 7 | ✓ | ○ | | | | | | |
| | 8 | ✓ | ○ | | | | | | |
| | 9 | ✓ | ○ | | | | | | |
| | 10 | ✓ | ○ | | | | | | |
| | 11 | ✓ | ○ | | | | | | |
| | 12 | ✓ | ○ | | | | | | |
| | 13 | ✓ | ✓ | | | | | | |
| | 14 | ✓ | ✓ | | | | | | |
| | 15 | ○ | ○ | | | | | | |
| | 16 | - | - | | | | | | |
| | 17 | ✓ | ○ | | | | | | |
| | 18 | ○ | ○ | | | | | | |
| | 19 | ✓ | ✓ | | | | | | |
| | 20 | N | N | | | | | | |
| | 21 | N | N | | | | | | |
| | 22 | N | N | | | | | | |
| | 23 | N | N | | | | | | |
| | 24 | N | N | | | | | | |

Receipt date: 05/08/2013

12802483 - GAU: 3672

PATENT
Customer No. 22,852
Attorney Docket No. 07965.0150-00000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | |
|-----------------------------|---|---------------------------------|
| In re Application of: |) | |
| |) | |
| David J. MAILHOT et al. |) | Group Art Unit: 3672 |
| |) | |
| Application No.: 12/802,483 |) | |
| |) | Examiner: Fiorello, Benjamin F. |
| Filed: June 7, 2010 |) | |
| |) | |
| For: CORRUGATED STORMWATER |) | Confirmation No.: 9389 |
| CHAMBER HAVING SUB- |) | |
| CORRUGATIONS |) | |

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

**INFORMATION DISCLOSURE STATEMENT
UNDER 37 C.F.R. § 1.97(c)**

Pursuant to 37 C.F.R. §§ 1.56 and 1.97(c), Applicant brings to the attention of the Examiner the documents listed on the attached IDS Form PTO/SB/08. This Information Disclosure Statement is being filed after the events recited in Section 1.97(b) but, to the undersigned's knowledge, before the mailing date of either a Final action, a Quayle action, or a Notice of Allowance. Under the provisions of 37 C.F.R. § 1.97(c), this Information Disclosure Statement is accompanied by a fee of \$180.00 as specified by Section 1.17(p).

Copies of the listed U.S. Patents and U.S. Patent Application Publications are not enclosed. The listed foreign patent and nonpatent literature documents are enclosed.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /B.F./

Receipt date: 05/08/2013

12802483 - GAU: 3672
Application No. 12/802,483
Attorney Docket No. 07965.0150-00000

English language Abstracts for WO 2007138780, DE 10139897, DE 202005005056, JP 09235828, JP 2005042538, JP 2003176564, JP 2002294850, JP 2002294849, JP 2002302995, JP 2003176565, and JP 2005213854 and an English language translation of DE 1282562 are submitted herewith to satisfy the requirement for a concise explanation of relevance.

This submission does not represent that a search has been made or that no better art exists and does not constitute an admission that each or all of the listed documents are material or constitute "prior art." If the Examiner applies any of the documents as prior art against any claim in the application and Applicants determine that the cited documents do not constitute "prior art" under United States law, Applicants reserve the right to present to the Office the relevant facts and law regarding the appropriate status of such documents.

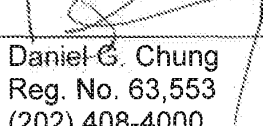
Applicants further reserve the right to take appropriate action to establish the patentability of the disclosed invention over the listed documents, should one or more of the documents be applied against the claims of the present application.

If there is any fee due in connection with the filing of this Statement, please charge the fee to Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: May 8, 2013

By: 
Daniel G. Chung
Reg. No. 63,553
(202) 408-4000

-2-

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /B.F./

CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC

Receipt date: 05/08/2013

12802483 - GAU: 3672

| | | | | | |
|--|---|----|---|--------------------------|--|
| IDS Form PTO/SB/08: Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary) | | | | Complete if Known | |
| | | | | Application Number | |
| | | | | 12/802,483 | |
| | | | | Filing Date | |
| | | | | June 7, 2010 | |
| | | | | First Named Inventor | |
| | | | | David J. MAILHOT | |
| | | | | Art Unit | |
| | | | | 3672 | |
| | | | | Examiner Name | |
| | | | | Fiorello, Benjamin F. | |
| | | | | Attorney Docket Number | |
| | | | | 07985.0150-00000 | |
| Sheet | 1 | of | 5 | | |

| U.S. PATENTS AND PUBLISHED U.S. PATENT APPLICATIONS | | | | | |
|---|-------------|--|--|--|---|
| Examiner Initials | Cite No. | Document Number | Issue or Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document | Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear |
| | | Number-Kind Code ² (if known) | | | |
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| | | | |
|-----------------------|---------------------|--------------------|------------|
| Examiner Signature | /Benjamin Fiorello/ | Date Considered | 05/16/2013 |
|-----------------------|---------------------|--------------------|------------|

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /B.F./

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CULTEC, INC. v. STORMTECH LLC

Receipt date: 05/08/2013

12802483 - GAU: 3672

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|--|---|----|---|--------------------------|-----------------------|
| IDS Form PTO/SB/08: Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary) | | | | Complete if Known | |
| | | | | Application Number | 12/802,483 |
| | | | | Filing Date | June 7, 2010 |
| | | | | First Named Inventor | David J. MAILHOT |
| | | | | Art Unit | 3672 |
| | | | | Examiner Name | Fiorello, Benjamin F. |
| | | | | Attorney Docket Number | 07965.0150-00000 |
| Sheet | 2 | of | 5 | | |

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| | | 7,165,914 | 01-23-2007 | Suazo | |

| | | | |
|--------------------|---------------------|-----------------|------------|
| Examiner Signature | /Benjamin Fiorello/ | Date Considered | 05/16/2013 |
|--------------------|---------------------|-----------------|------------|

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Receipt date: 05/08/2013

12802483 - GAU: 3672

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| INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary) | | Application Number | 12/802,483 |
| | | Filing Date | June 7, 2010 |
| | | First Named Inventor | David J. MAILHOT |
| | | Art Unit | 3672 |
| | | Examiner Name | Fiorello, Benjamin F. |
| | | Attorney Docket Number | 07965.0150-00000 |
| Sheet | 3 | of | 5 |

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| Filing Date | | June 7, 2010 | | | |
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| Examiner Name | | Fiorello, Benjamin F. | | | |
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| FOREIGN PATENT DOCUMENTS | | | | | | |
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| Examiner Initials ¹ | Cite No. ¹ | Foreign Patent Document | Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document | Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear | Translation ⁶ |
| | | Country Code ³ Number ⁴ Kind Code ⁵ (if known) | | | | |
| | | WO 2007021715 | 02-22-2007 | Goddard et al. | | |
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| | | EP 1122481 | 08-08-2001 | Tamborini et al. | | |
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| | | JP 2002294849 | 10-09-2002 | Kamata Toshio | | Abstract |
| | | JP 2002302995 | 10-18-2002 | Kamata Toshio | | Abstract |
| | | JP 2003176565 | 06-24-2003 | Kamata Toshio | | Abstract |
| | | JP 2005213854 | 08-11-2005 | Terasawa Takae | | Abstract |
| | | GB 2016639 | 09-26-1979 | Jakobsen | | |

| NONPATENT LITERATURE DOCUMENTS | | | |
|--------------------------------|-----------------------|---|--------------------------|
| Examiner Initials ¹ | Cite No. ¹ | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. | Translation ⁶ |
| | | James L. Beaver et al., <i>Structural Design of Stormwater Chambers</i> , Transportation Research Board Annual Meeting, 22 pages (2003). | |
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| Examiner Signature | /Benjamin Fiorello/ | Date Considered | 05/16/2013 |
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PATENT
Customer No. 22,852
Attorney Docket No. 07965.0150-00000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | |
|-----------------------------|---|---------------------------------|
| In re Application of: |) | |
| |) | |
| David J. MAILHOT et al. |) | Group Art Unit: 3672 |
| |) | |
| Application No.: 12/802,483 |) | |
| |) | Examiner: Fiorello, Benjamin F. |
| Filed: June 7, 2010 |) | |
| |) | |
| For: CORRUGATED STORMWATER |) | Confirmation No.: 9389 |
| CHAMBER HAVING SUB- |) | |
| CORRUGATIONS |) | |

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

**INFORMATION DISCLOSURE STATEMENT
UNDER 37 C.F.R. § 1.97(c)**

Pursuant to 37 C.F.R. §§ 1.56 and 1.97(c), Applicant brings to the attention of the Examiner the documents listed on the attached IDS Form PTO/SB/08. This Information Disclosure Statement is being filed after the events recited in Section 1.97(b) but, to the undersigned's knowledge, before the mailing date of either a Final action, a Quayle action, or a Notice of Allowance. Under the provisions of 37 C.F.R. § 1.97(c), this Information Disclosure Statement is accompanied by a fee of \$180.00 as specified by Section 1.17(p).

Copies of the listed U.S. Patents and U.S. Patent Application Publications are not enclosed. The listed foreign patent and nonpatent literature documents are enclosed.

Application No. 12/802,483
Attorney Docket No. 07965.0150-00000

English language Abstracts for WO 2007138780, DE 10139897, DE 202005005056, JP 09235828, JP 2005042538, JP 2003176564, JP 2002294850, JP 2002294849, JP 2002302995, JP 2003176565, and JP 2005213854 and an English language translation of DE 1282562 are submitted herewith to satisfy the requirement for a concise explanation of relevance.

This submission does not represent that a search has been made or that no better art exists and does not constitute an admission that each or all of the listed documents are material or constitute "prior art." If the Examiner applies any of the documents as prior art against any claim in the application and Applicants determine that the cited documents do not constitute "prior art" under United States law, Applicants reserve the right to present to the Office the relevant facts and law regarding the appropriate status of such documents.

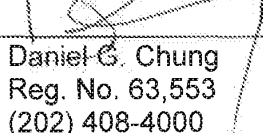
Applicants further reserve the right to take appropriate action to establish the patentability of the disclosed invention over the listed documents, should one or more of the documents be applied against the claims of the present application.

If there is any fee due in connection with the filing of this Statement, please charge the fee to Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: May 8, 2013

By: 
Daniel G. Chung
Reg. No. 63,553
(202) 408-4000

CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC

| | | | | | |
|---|---|----|---|--------------------------|-----------------------|
| IDS Form PTO/SB/08: Substitute for form 1449A/PTO <div style="text-align: center;">INFORMATION DISCLOSURE STATEMENT BY APPLICANT</div> <div style="text-align: center; font-size: small;">(Use as many sheets as necessary)</div> | | | | Complete if Known | |
| | | | | Application Number | 12/802,483 |
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| | | | | First Named Inventor | David J. MAILHOT |
| | | | | Art Unit | 3672 |
| | | | | Examiner Name | Fiorello, Benjamin F. |
| | | | | Attorney Docket Number | 07985.0150-00000 |
| Sheet | 1 | of | 5 | | |

| U.S. PATENTS AND PUBLISHED U.S. PATENT APPLICATIONS | | | | | |
|---|-------------|--|--|--|---|
| Examiner Initials | Cite No. | Document Number | Issue or Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document | Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear |
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|-----------------------|--------------------|
| Examiner Signature | Date Considered |
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| | | James L. Beaver et al., <i>Structural Design of Stormwater Chambers</i> , Transportation Research Board Annual Meeting, 22 pages (2003). | |
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(25) Filing Language: English
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61/028,304 13 February 2008 (13.02.2008) US
(71) Applicant (for all designated States except US): CON-
TECH STORMWATER SOLUTIONS INC. [US/US];
9025 Centre Pointe Drive, Suite 400, West Chester, OH
45069 (US).
(72) Inventors; and
(75) Inventors/Applicants (for US only): COBB, Daniel, P.
[US/US]; 784 Ocean Avenue, Portland, ME 04103 (US).
STONE, Michael, P. [US/US]; 8 Johnson Road, Fal-
mouth, ME 04105 (US). SCHLUTER, James, C.
[US/US]; 4355 Salisbury Court, Franklin, OH 45005
(US). KATONA, Michael, G. [US/US]; 2019 14th Ave-
nue Nw, Apartment F-154, Gig Harbor, WA 98335
(US). BROCKENBROUGH, Roger, L. [US/US]; 17
Carleton Drive, Pittsburgh, PA 15243 (US).
(74) Agents: NIEBERDING, Michael, J. et al.; Thompson
Hine LLP, Post Office Box 8801, Dayton, OH
45401-8801 (US).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ,
CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ,
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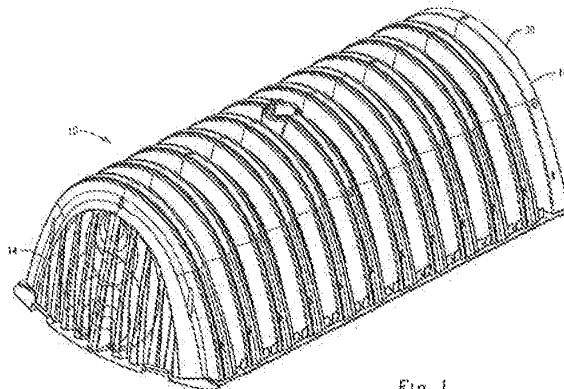


Fig. 1

(57) Abstract: A plastic, corrugated open bottom chamber includes features such as one or more of (i) sub-corrugation features on corrugation crests and/or corrugation valleys, (ii) stiffening fingers on the bottom of chamber foot portions, (iii) a viewport configuration that intersects only a single corrugation crest and (iv) a unitary end wall. A method of producing chambers with or without a unitary end wall using a common mold tool is also provided. A method of interconnecting chambers to form a chamber rows is also provided.

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**PLASTIC DETENTION CHAMBER FOR STORMWATER RUNOFF AND
RELATED SYSTEM AND METHODS**

CROSS-REFERENCES

[0001] This application claims the benefit of U.S. Provisional Application Serial No. 61/028,304, filed February 13, 2008, the entirety of which is incorporated herein by reference.

TECHNICAL FIELD

[0002] This application relates generally to molded chambers for water detention and, more particularly to molded plastic chambers that are buried in the ground and receive stormwater runoff from developed sites.

BACKGROUND

[0003] Molded plastic detention chambers for burial in the earth for use in temporary stormwater detention are known. It would be desirable to provide an improved chamber and related system and method.

SUMMARY

[0004] In one aspect, an apparatus for receiving and dispersing water includes a plastic arch-shaped corrugated chamber having a generally open bottom and a plurality of corrugation crests and valleys distributed along a length of the chamber. The corrugation crests and valleys extend transverse to a lengthwise axis of the chamber. Each one of a multiplicity of the corrugation crests includes a respective crest sub-corrugation feature thereon.

[0005] Each one of a multiplicity of the corrugation valleys may include a valley sub-corrugation feature thereon.

[0006] Each crest sub-corrugation feature may be an external raised sub-corrugation feature and each valley sub-corrugation feature may be an external raised sub-corrugation feature.

[0007] Each crest sub-corrugation feature may be substantially centered along a width of its respective corrugation crest, and each valley sub-corrugation feature may be substantially centered along a width of its respective corrugation valley.

[0008] The chamber may include a first end corrugation crest at one chamber end and second end corrugation crest at an opposite chamber end, each of the first and second end corrugation crests lacking any sub-corrugation feature, and a first end corrugation valley adjacent the first end corrugation crest and a second end corrugation valley adjacent

the second end corrugation crest, each of the first and second end corrugation valleys lacking any sub-corrugation feature.

[0009] Each crest sub-corrugation feature may be located along at least a top portion of its respective crest, and each crest sub-corrugation feature may have a crest sub-corrugation height, relative to its corrugation crest, that is less than 10% of a height of the corrugation crest relative to its adjacent corrugation valley. Each valley sub-corrugation feature located along at least a top portion of its respective valley, and each valley sub-corrugation feature may have a valley sub-corrugation height, relative to its corrugation valley, that is less than 10% of a height of the adjacent corrugation crest relative to the corrugation valley.

[0010] A width of each of the multiplicity of corrugation crests may be greater toward the bottom of the chamber than at a top of the chamber. A width of each crest sub-corrugation feature may be greater toward the bottom of the chamber than at the top of the chamber. A width of each of the multiplicity of corrugation valleys may be less toward the bottom of the chamber than at the top of the chamber. A width of each valley sub-corrugation feature may be less toward the bottom of the chamber than at the top of the chamber.

[0011] Each crest sub-corrugation feature may be located along at least a top portion of its respective corrugation crest, and each crest sub-corrugation feature may have a crest sub-corrugation height, relative to its corrugation crest, that is no more than about three times a thickness of the plastic defining the corrugation crest. Each valley sub-corrugation feature may located along at least a top portion of its respective corrugation valley, and each valley sub-corrugation feature may have a valley sub-corrugation height, relative to its corrugation valley, that is no more than about three times a thickness of the plastic defining the corrugation valley.

[0012] Each crest sub-corrugation feature may be located along at least a top portion of its respective crest, and each crest sub-corrugation feature may have a crest sub-corrugation height, relative to its corrugation crest, that is less than 10% of a height of the corrugation crest relative to its adjacent corrugation valley.

[0013] A width of each of the multiplicity of corrugation crests may be greater toward the bottom of the chamber than at a top of the chamber, and a width of each crest sub-corrugation feature may be greater toward the bottom of the chamber than at the top of the chamber.

[0014] Each crest sub-corrugation feature may be located along at least a top portion of its respective corrugation crest, and each crest sub-corrugation feature may have a crest sub-corrugation height, relative to its corrugation crest, that is no more than about three times a thickness of the plastic defining the corrugation crest.

[0015] Each crest sub-corrugation feature may have at least one opening therein, the opening located toward the bottom of the chamber and offset toward one side of the sub-corrugation feature.

[0016] The corrugation crests and valleys may extend from side to side of the chamber between spaced apart lengthwise extending foot portions of the chamber, wherein each foot portion includes a bottom portion with a plurality of downwardly facing stiffening fingers.

[0017] Each foot portion may include first and second end parts at opposite lengthwise ends of the chamber, and an intermediate part between the first and second end parts, the stiffening fingers located on the intermediate part, bottom surfaces of the first and second end parts being substantially planar.

[0018] At least one viewport structure may be provided on the chamber, the viewport structure configured to intersect only a single corrugation crest.

[0019] The single corrugation crest may connect to adjacent corrugation valleys via respective opposed webs, and the viewport structure may includes outer curved wall portions, each outer curved wall portion intersects and provides structural continuity between respective portions of one of the opposed webs.

[0020] At least one end of the chamber may include an inwardly domed end wall.

[0021] In another aspect, a method is provided for producing plastic arch-shaped corrugated chambers having generally open bottoms, including an end wall chamber type having at least one closed end with a unitary end wall, and a open chamber type having opposite ends that are both open. The method includes: providing a mold tool including a mold core part and a mold cavity part, when located in respective mold positions the mold core part and mold cavity part define a chamber end wall formation space at one end of a chamber body formation space; when producing the end wall chamber type, placing the mold core part and mold cavity part in the respective mold positions such that the chamber body formation space is in communication with the end wall formation space and injecting plastic into the mold tool such that plastic in the end wall formation space forms unitary with plastic in the chamber body formation space; and when producing the open chamber

type, placing the mold core part and mold cavity part in the respective mold positions and injecting plastic into the mold tool, and providing a shutoff to prevent plastic flow from the chamber body formation space to the end wall formation space.

[0022] Providing the shutoff may involve placing at least one open chamber insert member within the mold tool, the at least one open chamber insert member blocking plastic flow from the chamber body formation space to the end wall formation space.

[0023] When producing the end wall chamber type, the method may include placing at least one end wall chamber insert member within the mold tool, the end wall chamber insert member sized to permit communication between the chamber body formation space and the end wall formation space.

[0024] When producing the end wall chamber type, the injecting may include injecting plastic directly into the end wall formation space, and the at least one end wall chamber insert member includes at least one sprue formation structure for producing a sprue on the end wall of the end wall chamber type.

[0025] When producing the open chamber type, the at least one open chamber insert member may include structure to block direct injection of plastic into the end wall formation space.

[0026] The at least one open chamber insert member may be secured to the mold core part.

[0027] The at least one open chamber insert member may be positioned along an intersection location of an end wall portion of the mold core part and a chamber body portion of the mold core part.

[0028] The end wall formation space may define a plurality of generally vertically extending end wall corrugation formation spaces and/or at least two end wall hand-hold formation spaces.

[0029] In another aspect, an apparatus for receiving and dispersing water includes plastic arch-shaped corrugated chamber having a generally open bottom and including a plurality of corrugation crests and valleys distributed along a length of the chamber, the corrugation crests and valleys extending from side to side of the chamber between spaced apart lengthwise extending foot portions of the chamber and transverse to a lengthwise axis of the chamber. Each foot portion includes a bottom portion with a plurality of downwardly facing stiffening fingers.

[0030] Each foot portion may extend laterally outward from lower ends of the

corrugation crests and valleys, and the stiffening fingers of each foot portion may have lengthwise axes that extend from a lateral side edge of the foot portion toward the corrugation crests and valleys.

[0031] The stiffening fingers of each foot portion may terminate short of the corrugation valleys, and the bottom of each foot portion may be substantially planar in a valley region located between the corrugation crests. The top surface of the foot portion in the valley region may be recessed relative to the top surface of at least an intermediate lateral part the foot portion.

[0032] The stiffening fingers of each foot portion have thicknesses that extend downward from a continuous upper part of the foot portion.

[0033] The bottom surfaces of the stiffening fingers of each foot portion may lie in substantially the same plane.

[0034] Each foot portion may include first and second end parts at opposite lengthwise ends of the chamber, and an intermediate part between the first and second end parts, the stiffening fingers are located on the intermediate part, bottom surfaces of the first and second end parts are substantially planar.

[0035] The bottom surface of the first end part of each foot portion may be substantially co-planar with bottom surfaces of the stiffening fingers, and the bottom surface of the second end part of each foot portion may be elevated relative to the bottom surfaces of the stiffening fingers.

[0036] A top surface of the first end part of each foot portion may be recessed relative to a top surface of the intermediate part to facilitate overlap by the bottom surface of the second end part of another chamber.

[0037] When the spaced apart foot portions of the chamber support the chamber on a gravel or stone sub-base material, a spacing between the stiffening fingers of each foot portion may be smaller than a size of the gravel or stone so as to prevent the sub-base material from entering the spacing between the stiffening fingers, thereby providing a projected bearing surface for the foot portion that is substantially the same as if the bottom of the foot portion were planar.

[0038] The stiffening fingers of each foot portion may have a varying width that is narrower at lateral side edge of the foot portion than at the finger end located toward the corrugation crests and valleys.

[0039] Each foot portion may include first and second end parts at opposite

lengthwise ends of the chamber, and an intermediate part between the first and second end parts, the stiffening fingers located on the intermediate part. The stiffening fingers of the intermediate part of each foot portion may have thicknesses that extend downward, the thickness of each stiffening finger being substantially the same as a thickness of the first and second end parts.

[0040] Each foot portion may include multiple lengthwise extending stacking blocks thereon.

[0041] Each stacking block may extend from one side of a corrugation crest toward an adjacent corrugation crest and may have a terminal end that stops short of the adjacent corrugation crest.

[0042] In a further aspect, an apparatus for receiving and dispersing water includes a plastic arch-shaped corrugated chamber having a generally open bottom and including a plurality of corrugation crests and valleys distributed along a length of the chamber, the corrugation crests and valleys extending transverse to a lengthwise axis of the chamber, wherein at least one viewport structure is provided on the chamber, the viewport structure configured to intersect only a single corrugation crest.

[0043] The single corrugation crest may connect to adjacent corrugation valleys via respective opposed webs, and the viewport structure may include outer curved wall portions, each outer curved wall portion intersects and provides structural continuity between respective portions of one of the opposed webs.

[0044] Each curved wall portion may include a top surface that connects with the single corrugation crest at each end of the curved wall portion, each end of the curved wall portion further including a raised stiffening ridge that extends onto the adjacent portion of the single corrugation crest.

[0045] In yet another aspect, a method is provided for interconnecting a series of a plastic arch-shaped corrugated chambers end to end to form an elongated chamber row. The method involves the steps of:

[0046] (a) providing first and second end wall chambers each having a closed end with a unitary end wall and an opposite open end having a small end corrugation;

[0047] (b) providing multiple open end chambers each having first and second open ends, the first end having a small end corrugation and the second end having a end corrugation that is larger than the small end corrugation;

[0048] (c) placing the first end wall chamber in a first lengthwise orientation;

[0049] (d) connecting a first open end chamber to the first end wall chamber by overlapping the small end corrugation of the first end wall chamber with the end corrugation at the second end of the first open end chamber;

[0050] (e) connecting one or more additional open end chambers in the chamber row by overlapping the small end corrugation of each open end chamber with the end corrugation at the second end of a next open end chamber;

[0051] (f) connecting the second end wall chamber to a last open end chamber of the chamber row by either:

[0052] (i) cutting the last open end chamber of the chamber row to remove at least its small end corrugation, and placing the second end wall chamber in a lengthwise orientation that is opposite the lengthwise orientation of the first end wall chamber, and overlapping the small end corrugation of the second end wall chamber with an intermediate corrugation of the last open end chamber; or

[0053] (ii) cutting the second end wall chamber to remove at least its small end corrugation, and placing the second end wall chamber in a lengthwise orientation that is opposite the lengthwise orientation of the first end wall chamber, and overlapping the small end corrugation of the last open end chamber of the chamber row with an intermediate corrugation of the second end wall chamber.

[0054] The cutting step of either (f)(i) or (f)(ii) may involve cutting to achieve a specified chamber row length.

[0055] In another aspect, an apparatus for receiving and dispersing water includes a plastic arch-shaped corrugated chamber having a generally open bottom and including a plurality of corrugation crests and valleys distributed along a length of the chamber, the corrugation crests and valleys extending transverse to a lengthwise axis of the chamber, wherein at least one end of the chamber includes an inwardly domed end wall.

[0056] When the chamber is buried and the inwardly domed end wall acts in membrane tension.

[0057] The inwardly domed end wall may be unitary with or formed separate from the chamber.

[0058] When formed separate from the chamber the unitary end wall may include a perimeter structure that externally overlaps with at least a portion of an end corrugation of

the chamber.

[0059] The inwardly domed end wall may lack any ribs or corrugations.

BRIEF DESCRIPTION OF THE DRAWINGS

[0060] Fig. 1 shows a perspective of one embodiment of a chamber with a unitary end wall at one end;

[0061] Fig. 2 shows a perspective of one embodiment of a chamber with two open ends;

[0062] Fig. 3 shows a top plan view of the chamber of Fig. 1;

[0063] Fig. 4 shows a top plan view of the chamber of Fig. 2;

[0064] Figs. 5 and 6 show schematic depictions for two possible chamber connecting configuration techniques;

[0065] Figs. 7-9 show mold tool insert embodiments for production of chambers having end walls;

[0066] Fig. 10 shows a partial perspective of a mold tool cavity part having inserts from Figs. 8 and 9 located therein;

[0067] Fig. 11 shows a partial perspective of a mold tool core part having inserts from fig. 7 located therein;

[0068] Fig. 12 shows a partial perspective view of the inside of a unitary end wall;

[0069] Fig. 13 shows a partial perspective view of the end wall end of a chamber;

[0070] Figs. 14-16 show mold tool insert embodiments for production of chambers without a unitary end wall;

[0071] Fig. 17 shows a partial perspective view of the mold tool cavity part with inserts from Figs. 15 and 16 located therein;

[0072] Fig. 18 shows a partial perspective view of the mold too core part with inserts from Fig. 14 located therein;

[0073] Fig. 19 shows a partial corrugation cross-section illustrating sub-corrugation features;

[0074] Fig. 20 shows a partial side elevation of a chamber with sub-corrugation features;

[0075] Fig. 21 shows a partial perspective of one side of a chamber and associated foot portion;

[0076] Figs. 22-24 illustrate certain foot portion features according to one embodiment;

[0077] Fig. 25 shows a partial perspective of one embodiment of a chamber viewport;

[0078] Fig. 26 shows a cross-section of the view port of Fig. 25 taken along line A-A;

[0079] Figs. 27 and 28 show an alternative chamber arrangement and associated inwardly domed end wall.

DETAILED DESCRIPTION

[0080] Referring to Figs. 1-4, perspective views and top plan views of two arch-shaped, corrugated plastic detention chambers 10 and 12 useful in connection with a buried stormwater detention system are shown. Chamber 10 is formed with an integral and unitary end wall 14 at one end and an opposite, open end 16. Chamber 12 is formed with two open ends 18 and 20. Each chamber includes respective spaced apart foot portions 22 and 24 (labeled only in Figs. 2 and 4) and a plurality of arch-shaped corrugations 26 distributed along the length of the chamber and running substantially perpendicular to the lengthwise axis 28. As will be described in greater detail below, end corrugations 30, 32 are of a smaller size to allow overlap by, for example, the opposite end corrugation 34 of an adjacent chamber when a system of chambers is linked together. End corrugation 34 may also be different than the corrugations 26 extending between the ends.

[0081] Referring to the schematics of Figs. 5 and 6, different installation options are described. In both cases, a given row of chambers are connected together end to end to form a continuous, elongated chamber row. The row is formed by respective unitary end wall chambers 10 at the ends, but facing opposite directions, with any number of open-ended chambers 12 positioned therebetween. However, a row might also be formed by just two unitary end wall chambers without any intervening open-ended chambers. Moving from left to right, the smaller end corrugation of 30 of the left end chamber is overlapped by a end corrugation 34 of the following chamber 12. The small end corrugation of each intermediate chamber is overlapped by the end corrugation of the next following chamber 12 until the right end chamber 10 is reached. In the case of Fig. 5, the chamber 12 adjacent to the right end chamber 10 may be cut at a desired location 40 so that the end corrugation 30 of the right end chamber can be fitted under one of the intermediate corrugations 26 of the adjacent chamber 12. In the case of Fig. 6, the right end chamber 10 can be cut at a desired location 42 so that the end corrugation 30 of the rightmost chamber 12 can be fitted under the intermediate corrugation 26 of the right end chamber 10. In

either manner, a continuous row of overlapping chambers of almost any desired length may be formed.

[0082] Advantageously, the two different chamber configurations 10 and 12 can be produced by the same mold tool. Specifically, the mold tool is configured to utilize a flow shut off feature within the tooling mold to prevent plastic flow from reaching the end wall space/gap within the closed tool. During molding of an integral end wall chamber 10, plastic is injected into the tool in a manner that facilitates flow into the end wall formation space. During molding of an open-ended chamber 12, the mold is fitted with structure that prevents flow into the end wall formation space and plastic and gas injection may also be modified. In one example, different mold core and mold cavity inserts are used for formation of the integral end wall chamber 10 verses the open-ended chamber 12.

[0083] In this regard, referring to Figs. 7-11, the inserts, cavity and core are shown for formation of an integral end wall chamber 10. The core includes two mirror image inserts 50, 50' that are secured (e.g., using fasteners) to the core along the region of the core that defines where chamber body and end wall will meet. Each insert 50, 50' includes a corresponding sprue flow formation structure 52, 52'. The upper ends of the inserts 50, 50' are structured such that the location where they are positioned adjacent each other is also adapted to provide a sprue formation structure 54. A central insert 60 and side inserts 62, 62' (which are mirror images of each other) are provided for the cavity. The central cavity insert 60 includes a generally frusto-conical recess or cutout 64 which fits over the sprue formation structure 54 when the mold is closed for molding, providing a sprue formation space and flow path there between. The insert 60 also includes an injection opening 66 and flow path 68 leading to the cutout 64 for flowing plastic (or gas) into the mold during molding. The side inserts 62 include respective recesses or cutouts 70 that are configured to align with and be spaced around the sprue formation structure 52 when the mold is closed for molding, providing a sprue formation space and flow path there between. The side insert also includes an opening 72 and flow path 74 leading to the cutout 70 for flowing plastic into the mold during molding. The thickness of the inserts 50, 50' is set such that when the mold is closed, a continuous flow space or gap from the main body side 76 to the end wall side 78 is provided, such that the end wall will be unitary with the main chamber body.

[0084] Referring to Figs. 12 and 13, the resulting end wall structure is generally shown from inside and outside views respectively, with central sprue 80 and side sprues 82,

82' shown. As shown, the end wall also includes bottom sprues 84, 84', which result from additional plastic injection locations from the mold structure. The end wall 14 also includes vertically extending corrugations 86 for increased end wall strength. Lift handles 88, 88' at the base of the end wall are also provided.

[0085] Referring to Figs. 14-18, the inserts, cavity and core are shown for formation of the open-ended chamber 12. The core includes two mirror image side inserts 90, 90' and the cavity includes a central insert 92 and mirror image side inserts 94, 94'. Inserts 92 and 94, 94' are configured to block or prevent flow from entering through the cavity injection points. The thickness of the inserts 90, 90' is set such that when the mold is closed, the inserts engage with the internal surface of the cavity so that there is no flow space or gap from the main body side 76 to the end wall side 78. Additionally, the mold injection process may be modified to avoid any attempt to inject plastic at end wall locations. In this manner, a chamber without the end wall can be produced.

[0086] Referring to Fig. 19, an advantageous corrugation crest and valley profile is shown, with cross-section taken along a plane that runs parallel to the longitudinal axis of the chamber. Specifically, the corrugation crest 100, valleys 102 and webs 104 are illustrated. The corrugation crest 100 includes a central raised sub-corrugation feature 106 and the valleys 102 include a central raised sub-corrugation feature 108. The sub-corrugation features can be used to increase the effective wall properties (area, moment of inertia and section modulus) that in turn increases the chamber wall's load carrying strength, stiffness and moment strength. The sub-corrugations keep more wall material, that otherwise would have been wide flat areas on the crests and in the valleys, structurally functional. Otherwise such areas, being wide and flat, would have a greater tendency to buckle locally under compression strain. It is recognized that the sub-corrugations could alternatively be recessed regions, as opposed to the illustrated raised regions. Moreover, a sub-corrugation feature including one or more raised portions and/or one or more recessed portions could be provided.

[0087] In one embodiment, (i) all corrugations crests, with the exception of the crest of smaller end corrugations 30 and 32, include the sub-corrugation feature 106 and (ii) all corrugation valleys, with the exception of the valley immediately adjacent end corrugations 30 and 32 and the valleys immediately adjacent end corrugation 34 include the sub-corrugation feature 108. The illustrated sub-corrugation features are centered on the respective corrugation crests and valleys.

[0088] The height, thickness and width of the sub-corrugation features may be established so that the sub-corrugations are stiff enough (e.g., high enough moment of inertia about their horizontal axis) to keep as much of the reaming of the corrugation crest/valley stable in local buckling as practicable when considered in view of added material cost etc. For a substantially fixed sidewall thickness, as a general rule the sub-corrugations can be less deep (shorter height H_{SCC} or H_{SCV}) as the crest/valley gets more narrow. The sub-corrugations could also stay the same depth and get more narrow.

[0089] With respect to crest sub-corrugation feature 106, in one example the height H_{SCC} of the sub-corrugation feature is less than 10% of the overall height H_C of the corrugation crest (e.g., within a range of about 3 – 7%), at least along portions of the corrugation crest that extend from the top of the chamber downward to side locations that are at elevations of about 1/3 of the overall chamber height H . The sub-corrugation feature 106 may have a height H_{SCC} that is no more than about three times the thickness T of the plastic defining the corrugation crest (e.g., no more than twice the thickness T or less than 1.25 times the thickness T).

[0090] With respect to valley sub-corrugation feature 108, in one example the height H_{SCV} of the sub-corrugation feature is less than 10% of the overall height H_C of the corrugation crest (e.g., within a range of about 3 – 7%), at least along portions of the corrugation crest that extend from the top of the chamber downward to side locations that are at elevations of about 2/3 of the overall chamber height H . In this regard, and referring to the partial side elevation of Fig. 20, the valley sub-corrugation feature 108 may remain relatively uniform when moving from the top of the chamber downward in elevation until a valley transition height H_{TV} is reached, at which elevation the sub-corrugation feature 108 begins to gradually fade out (e.g., width (relative to side elevation view, where width of the sub-corrugation is measured in the lengthwise axis of direction of the chamber) of the feature decreases and cross-sectional height of the feature decreases) when moving further downward along the chamber sidewall. In one example, the transition height H_{TV} is about 2/3 the overall chamber height H (e.g., between about 55% and 70% of the overall chamber height H). The sub-corrugation feature 108 may have a height H_{SCV} that is no more than about three times the thickness T of the plastic defining the corrugation crest (e.g., no more than twice the thickness T or less than 1.25 times the thickness T).

[0091] As an alternative to the sub-corrugation features, an intermediate rib could be provided on the crest and/or in the valley. Placement of suitable gas channels on the

crest or in the valley could also provide suitable stability and resistance to global buckling.

[0092] As suggested in Fig. 20, the overall width of the corrugation crest may be relatively uniform when moving from the top of the chamber downward to a transition height H_{TC} . From that elevation downward the corrugation crest width may increase as shown. This results in a corresponding decrease in the width of the corrugation valley as is also shown. In one example, the transition height H_{TC} is about 2/3 the overall chamber height H (e.g., between about 55% and 75% of the overall chamber height H). A vertically elongated slot 120 is shown on each corrugation crest and valley. A single row of such slots may be provided on each side of the chamber. In another implementation, the width of the corrugation crest may change when moving from the top of the chamber to the bottom of the chamber so as to provide a side elevation view in which the crest width changes constantly with elevation (i.e., for each unit change in elevation there is a constant unit change in crest width). Likewise, the corrugation width where the web meets the valley may also be established so as to provide a side elevation view in which the corrugation base width changes constantly with elevation.

[0093] Referring to Fig. 21, a partial perspective shows a sprue ledge configuration 130, particularly suited for injection locations that intersect with the webs, and facilitate ease of sprue trimming. Sprue locations that are on corrugation crests can be more easily trimmed to the near flush configurations 132 and 134 as shown.

[0094] Also shown in Fig. 21 are stacking blocks or plates 140 that extend outward from the sides of each corrugation crest (with the exception of the small end corrugation 30 or 32 and the opposite end corrugation 34) where the crest meets the foot portion 22. Each stacking plate 140 may extend generally parallel to the longitudinal axis of the chamber. As shown the stacking plate extending from one side of a given corrugation crest extends toward, but does not meet the plate extending from the opposite side of the adjacent corrugation crest, resulting in a gap between the two plates. The stacking plates assist in proper stacking of chambers atop each other in a nested and stable manner for the purpose of chamber transport, with the foot portion of an upper chamber resting on the stacking plate of the chamber immediately below it.

[0095] Referring to the foot portion 22 as shown in Figs. 22 and 23, in the illustrated embodiment the foot portion 22 includes an end part 150 proximate the small end corrugation 30, 32, followed by an intermediate part 152 that extends along the length of the chamber to an opposite end part 154. The end part 150 is generally planar and of

uniform thickness and its upper surface is recessed relative to the upper surface of intermediate part 152. The intermediate part has increased thickness with a series of bottom stiffening fingers 156, each of which may extend generally perpendicular to the longitudinal axis of the chamber (though other directions are possible). The end part 154 is generally planar and of uniform thickness and has its bottom surface raised relative to the bottom of intermediate part 152 and end part 150. In this manner, end part 154 will easily accommodate end part 150 beneath it when two chambers are connected by overlapping opposite ends. Referring again to intermediate part 152, the vertical thickness of the stiffening fingers 156 may generally be about the same vertical thickness as the end parts 150 and 154 (though variations are possible). The lateral thickness of the stiffening fingers may be about the same as the vertical thickness (though variations are possible). The spacing between the stiffening fingers can vary, but should generally be selected to provide a projected bearing surface the same as if the bottom surface were planar. This thickness may vary depending upon the sub-base material (e.g., the size of the gravel or stone) upon which the chamber foot portion will rest when installed. By selecting the stiffening finger spacing small enough to prevent the sub-base material from fitting within the spacing, such a projected bearing surface can be maintained. The width and spacing of the fingers also provides stiffness to the foot portion while facilitating efficient moldability by reducing cooling time as compared to a chamber having a foot portion in which the vertical thickness of portion 152 is uniform along its length and the same as the vertical thickness in the region of a finger of the illustrated embodiment.

[0096] In one embodiment, the stiffening fingers extend only from the side edges of the side portion toward the corrugation crests and stiffening plates 140, and do not extend into the foot portions 160 (see Fig. 21) that are located between the corrugation crests. In these foot portions 160, the foot material is generally planar on top and bottom, and has a top surface that is recessed relative to the top surface of intermediate part 152 (e.g., similar to the end part 150). Thus, the overall bearing surface of each foot portion is made up of both continuously planar bottom surface portions (e.g., the bottom of end part 150 and foot portions 160) and bottom surface portions that are not continuously planar (e.g., the bottom stiffening fingers of intermediate part 152). Notably however, the bottom surface portions of the stiffening fingers 156 all lie in generally the same plane.

[0097] In one implementation, in order to reduce plastic in the chamber, the thickness of each foot portion may be reduced slightly when moving from the corrugation

crests outward to the lateral side edge of the foot portion, resulting in a foot portion upper surface that tapers downward slightly when moving from the corrugation crests outward to the lateral side edge of the foot portion.

[0098] Referring to Figs. 2, 25 and 26, the chamber may include one or more viewports (or cleanouts) 170 located atop one or more corrugations. In the illustrated embodiment, a single viewport is provided in one of the corrugations near the longitudinal mid-portion of the chamber. As best seen in Figs. 25 and 26, where Fig. 26 is a cross-section along line A-A of Fig. 25, the viewport is formed in the corrugation in a manner to maintain cross-sectional properties of the chamber. Specifically, the viewport intersects only a single corrugation crest and its associated webs. Moreover, the outer curved walls 172 and 174 forming the viewport intersect with and provide structural continuity between the webs portions 176, 178 and 180, 182 on opposite sides of the viewport. Raised stiffening ridges 186 may also be provided atop the crest and viewport walls for increased structural integrity, and to establish planar contact with a horizontal flat surface positioned tangent to adjacent corrugation crests, which facilitates distribution of forces into the corrugation with the cutout under parallel plate load testing. Vent holes 188 in the top of the corrugation crests are also shown.

[0099] Referring now to the schematic side elevation of another chamber embodiment in Fig. 27 and the end cap view of Fig. 28, an inverted domed end cap could be used to close off the ends of chambers. Such an inverted dome-shaped end cap would operate in membrane tension (instead of bending) in response to forces F exerted on the outwardly facing surface of the cap by the bury material (e.g., soil or gravel). The end cap can therefore be formed thinner, without the need for ribs etc., reducing material usage. Moreover, such an end cap configuration would not be subjected to any direct soil pressure from above. The end cap could be formed with a perimeter structure configured to overlap with part or all of the end corrugation of a chamber.

[00100] Referring to Figs. 1 and 13, the end wall may be formed with circular indicants for facilitating cutting of holes in the end wall to receive multiple specific pipe sizes. In this regard, the indicants may be formed by external raised areas of plastic on the wall. Moreover, upper and lower cutout starting holes could be provided in the end wall to facilitate insertion of a cutting tool in the field for cutting along the indicants. The starting holes could be formed by providing a mold tool in which the mold core part and mold cavity part engage each other in the region where the cutout starting hole is to be provided.

In an alternative implementation, the circular indicants could be applied after the fact, as by a printing, painting or screening operation.

[00101] It is to be clearly understood that the above description is intended by way of illustration and example only, is not intended to be taken by way of limitation, and that other changes and modifications are possible. Where specific or relative dimensions are provided, such dimensions are not considered limiting unless specifically set forth in any claims.

[00102] What is claimed is:

Claims

1. An apparatus for receiving and dispersing water, the apparatus comprising:
a plastic arch-shaped corrugated chamber having a generally open bottom and including a plurality of corrugation crests and valleys distributed along a length of the chamber, the corrugation crests and valleys extending transverse to a lengthwise axis of the chamber, wherein each one of a multiplicity of the corrugation crests includes a respective crest sub-corrugation feature thereon.
2. The apparatus of claim 1 wherein each one of a multiplicity of the corrugation valleys includes a valley sub-corrugation feature thereon.
3. The apparatus of claim 2 wherein each crest sub-corrugation feature comprises an external raised sub-corrugation feature and each valley sub-corrugation feature comprises an external raised sub-corrugation feature.
4. The apparatus of claim 2 wherein each crest sub-corrugation feature is substantially centered along a width of its respective corrugation crest, each valley sub-corrugation feature is substantially centered along a width of its respective corrugation valley.
5. The apparatus of claim 2 wherein:
the chamber includes a first end corrugation crest at one chamber end and second end corrugation crest at an opposite chamber end, each of the first and second end corrugation crests lacks any sub-corrugation feature,
the chamber includes a first end corrugation valley adjacent the first end corrugation crest and a second end corrugation valley adjacent the second end corrugation crest, each of the first and second end corrugation valleys lacks any sub-corrugation feature.
6. The apparatus of claim 4 wherein:
each crest sub-corrugation feature is located along at least a top portion of its respective crest,
each crest sub-corrugation feature has a crest sub-corrugation height, relative to its

corrugation crest, that is less than 10% of a height of the corrugation crest relative to its adjacent corrugation valley,

each valley sub-corrugation feature is located along at least a top portion of its respective valley,

each valley sub-corrugation feature has a valley sub-corrugation height, relative to its corrugation valley, that is less than 10% of a height of the adjacent corrugation crest relative to the corrugation valley.

7. The apparatus of claim 6 wherein:

a width of each of the multiplicity of corrugation crests is greater toward the bottom of the chamber than at a top of the chamber,

a width of each crest sub-corrugation feature is greater toward the bottom of the chamber than at the top of the chamber,

a width of each of the multiplicity of corrugation valleys is less toward the bottom of the chamber than at the top of the chamber,

a width of each valley sub-corrugation feature is less toward the bottom of the chamber than at the top of the chamber.

8. The apparatus of claim 2 wherein:

each crest sub-corrugation feature is located along at least a top portion of its respective corrugation crest,

each crest sub-corrugation feature has a crest sub-corrugation height, relative to its corrugation crest, that is no more than about three times a thickness of the plastic defining the corrugation crest,

each valley sub-corrugation feature is located along at least a top portion of its respective corrugation valley,

each valley sub-corrugation feature has a valley sub-corrugation height, relative to its corrugation valley, that is no more than about three times a thickness of the plastic defining the corrugation valley.

9. The apparatus of claim 1 wherein:

each crest sub-corrugation feature is located along at least a top portion of its respective crest,

each crest sub-corrugation feature has a crest sub-corrugation height, relative to its corrugation crest, that is less than 10% of a height of the corrugation crest relative to its adjacent corrugation valley.

10. The apparatus of claim 9 wherein:

a width of each of the multiplicity of corrugation crests is greater toward the bottom of the chamber than at a top of the chamber,

a width of each crest sub-corrugation feature is greater toward the bottom of the chamber than at the top of the chamber.

11. The apparatus of claim 1 wherein:

each crest sub-corrugation feature is located along at least a top portion of its respective corrugation crest,

each crest sub-corrugation feature has a crest sub-corrugation height, relative to its corrugation crest, that is no more than about three times a thickness of the plastic defining the corrugation crest.

12. The apparatus of claim 1 wherein:

each crest sub-corrugation feature has at least one opening therein, the opening located toward the bottom of the chamber and offset toward one side of the sub-corrugation feature.

13. The apparatus of claim 3 wherein:

the corrugation crests and valleys extend from side to side of the chamber between spaced apart lengthwise extending foot portions of the chamber, wherein each foot portion includes a bottom portion with a plurality of downwardly facing stiffening fingers.

14. The apparatus of claim 13 wherein:

each foot portion includes first and second end parts at opposite lengthwise ends of the chamber, and an intermediate part between the first and second end parts, the stiffening fingers are located on the intermediate part, bottom surfaces of the first and second end parts are substantially planar.

15. The apparatus of claim 14 wherein:
at least one viewport structure is provided on the chamber, the viewport structure configured to intersect only a single corrugation crest.
16. The apparatus of claim 15 wherein:
the single corrugation crest connects to adjacent corrugation valleys via respective opposed webs,
the viewport structure includes outer curved wall portions, each outer curved wall portion intersects and provides structural continuity between respective portions of one of the opposed webs.
17. The apparatus of claim 16 wherein:
at least one end of the chamber includes an inwardly domed end wall.
18. A method of producing plastic arch-shaped corrugated chambers having generally open bottoms, including an end wall chamber type having at least one closed end with a unitary end wall, and a open chamber type having opposite ends that are both open, the method comprising:
providing a mold tool including a mold core part and a mold cavity part, when located in respective mold positions the mold core part and mold cavity part define a chamber end wall formation space at one end of a chamber body formation space;
when producing the end wall chamber type, placing the mold core part and mold cavity part in the respective mold positions such that the chamber body formation space is in communication with the end wall formation space and injecting plastic into the mold tool such that plastic in the end wall formation space forms unitary with plastic in the chamber body formation space;
when producing the open chamber type, placing the mold core part and mold cavity part in the respective mold positions and injecting plastic into the mold tool, and providing a shutoff to prevent plastic flow from the chamber body formation space to the end wall formation space.
19. The method of claim 18 wherein providing the shutoff involves placing at least one open chamber insert member within the mold tool, the at least one open chamber insert

member blocking plastic flow from the chamber body formation space to the end wall formation space.

20. The method of claim 19 wherein:

when producing the end wall chamber type, the method includes placing at least one end wall chamber insert member within the mold tool, the end wall chamber insert member sized to permit communication between the chamber body formation space and the end wall formation space.

21. The method of claim 20 wherein the injecting includes injecting plastic directly into the end wall formation space, and the at least one end wall chamber insert member includes at least one sprue formation structure for producing a sprue on the end wall of the end wall chamber type.

22. The method of claim 21 wherein:

when producing the open chamber type, the at least one open chamber insert member includes structure to block direct injection of plastic into the end wall formation space.

23. The method of claim 19 wherein the at least one open chamber insert member is secured to the mold core part.

24. The method of claim 23 wherein the at least one open chamber insert member is positioned along an intersection location of an end wall portion of the mold core part and a chamber body portion of the mold core part.

25. The method of claim 19 wherein the end wall formation space defines a plurality of generally vertically extending end wall corrugation formation spaces.

26. The method of claim 25 wherein the end wall formation space defines at least two end wall hand-hold formation spaces.

27. An apparatus for receiving and dispersing water, the apparatus comprising:

a plastic arch-shaped corrugated chamber having a generally open bottom and including a plurality of corrugation crests and valleys distributed along a length of the chamber, the corrugation crests and valleys extending from side to side of the chamber between spaced apart lengthwise extending foot portions of the chamber and transverse to a lengthwise axis of the chamber, wherein each foot portion includes a bottom portion with a plurality of downwardly facing stiffening fingers.

28. The apparatus of claim 27 wherein:

each foot portion extends laterally outward from lower ends of the corrugation crests and valleys,

the stiffening fingers of each foot portion have lengthwise axes that extend from a lateral side edge of the foot portion toward the corrugation crests and valleys.

29. The apparatus of claim 28 wherein:

the stiffening fingers of each foot portion terminate short of the corrugation valleys, the bottom of each foot portion is substantially planar in a valley region located between the corrugation crests, the top surface of the foot portion in the valley region is recessed relative to the top surface of at least an intermediate lateral part the foot portion.

30. The apparatus of claim 29 wherein:

the stiffening fingers of each foot portion have thicknesses that extend downward from a continuous upper part of the foot portion.

31. The apparatus of claim 30 wherein:

bottom surfaces of the stiffening fingers of each foot portion lie in substantially the same plane.

32. The apparatus of claim 28 wherein:

each foot portion includes first and second end parts at opposite lengthwise ends of the chamber, and an intermediate part between the first and second end parts, the stiffening fingers are located on the intermediate part, bottom surfaces of the first and second end parts are substantially planar.

33. The apparatus of claim 32 wherein:
the bottom surface of the first end part of each foot portion is substantially coplanar with bottom surfaces of the stiffening fingers,
the bottom surface of the second end part of each foot portion is elevated relative to the bottom surfaces of the stiffening fingers.
34. The apparatus of claim 33 wherein:
a top surface of the first end part of each foot portion is recessed relative to a top surface of the intermediate part to facilitate overlap by the bottom surface of the second end part of another chamber.
35. The apparatus of claim 28 wherein:
the spaced apart foot portions of the chamber support the chamber on a gravel or stone sub-base material, a spacing between the stiffening fingers of each foot portion is smaller than a size of the gravel or stone so as to prevent the sub-base material from entering the spacing between the stiffening fingers, thereby providing a projected bearing surface for the foot portion that is substantially the same as if the bottom of the foot portion were planar.
36. The apparatus of claim 28 wherein:
the stiffening fingers of each foot portion have a varying width that is narrower at lateral side edge of the foot portion than at the finger end located toward the corrugation crests and valleys.
37. The apparatus of claim 28 wherein:
each foot portion includes first and second end parts at opposite lengthwise ends of the chamber, and an intermediate part between the first and second end parts, the stiffening fingers are located on the intermediate part,
the stiffening fingers of the intermediate part of each foot portion have thicknesses that extend downward, the thickness of each stiffening finger is substantially the same as a thickness of the first and second end parts.
38. The apparatus of claim 27 wherein:

each foot portion includes multiple lengthwise extending stacking blocks thereon.

39. The apparatus of claim 38 wherein:

each stacking block extends from one side of a corrugation crest toward an adjacent corrugation crest and has a terminal end that stops short of the adjacent corrugation crest.

40. An apparatus for receiving and dispersing water, the apparatus comprising:

a plastic arch-shaped corrugated chamber having a generally open bottom and including a plurality of corrugation crests and valleys distributed along a length of the chamber, the corrugation crests and valleys extending transverse to a lengthwise axis of the chamber, wherein at least one viewport structure is provided on the chamber, the viewport structure configured to intersect only a single corrugation crest.

41. The apparatus of claim 40 wherein:

the single corrugation crest connects to adjacent corrugation valleys via respective opposed webs,

the viewport structure includes outer curved wall portions, each outer curved wall portion intersects and provides structural continuity between respective portions of one of the opposed webs.

42. The apparatus of claim 41 wherein:

each curved wall portion includes a top surface that connects with the single corrugation crest at each end of the curved wall portion, each end of the curved wall portion further includes a raised stiffening ridge that extends onto the adjacent portion of the single corrugation crest.

43. A method of interconnecting a series of a plastic arch-shaped corrugated chambers end to end to form an elongated chamber row, the method comprising the steps of:

(a) providing first and second end wall chambers each having a closed end with a unitary end wall and an opposite open end having a small end corrugation;

(b) providing multiple open end chambers each having first and second open ends, the first end having a small end corrugation and the second end having a end corrugation that is larger than the small end corrugation;

- (c) placing the first end wall chamber in a first lengthwise orientation;
- (d) connecting a first open end chamber to the first end wall chamber by overlapping the small end corrugation of the first end wall chamber with the end corrugation at the second end of the first open end chamber;
- (e) connecting one or more additional open end chambers in the chamber row by overlapping the small end corrugation of each open end chamber with the end corrugation at the second end of a next open end chamber;
- (f) connecting the second end wall chamber to a last open end chamber of the chamber row by either:
 - (i) cutting the last open end chamber of the chamber row to remove at least its small end corrugation, and placing the second end wall chamber in a lengthwise orientation that is opposite the lengthwise orientation of the first end wall chamber, and overlapping the small end corrugation of the second end wall chamber with an intermediate corrugation of the last open end chamber; or
 - (ii) cutting the second end wall chamber to remove at least its small end corrugation, and placing the second end wall chamber in a lengthwise orientation that is opposite the lengthwise orientation of the first end wall chamber, and overlapping the small end corrugation of the last open end chamber of the chamber row with an intermediate corrugation of the second end wall chamber.

44. The method of claim 43 wherein the cutting step of either (f)(i) or (f)(ii) involves cutting to achieve a specified chamber row length.

45. An apparatus for receiving and dispersing water, the apparatus comprising:
a plastic arch-shaped corrugated chamber having a generally open bottom and including a plurality of corrugation crests and valleys distributed along a length of the chamber, the corrugation crests and valleys extending transverse to a lengthwise axis of the chamber, wherein at least one end of the chamber includes an inwardly domed end wall.

46. The apparatus of claim 45 wherein the chamber is buried and the inwardly domed end wall acts in membrane tension.

47. The apparatus of claim 45 wherein the inwardly domed end wall is unitary with

chamber.

48. The apparatus of claim 45 wherein the inwardly domed end wall is formed separate from the chamber and includes a perimeter structure that externally overlaps with at least a portion of an end corrugation of the chamber.

49. The apparatus of claim 45 wherein the inwardly domed end wall lacks any ribs or corrugations.

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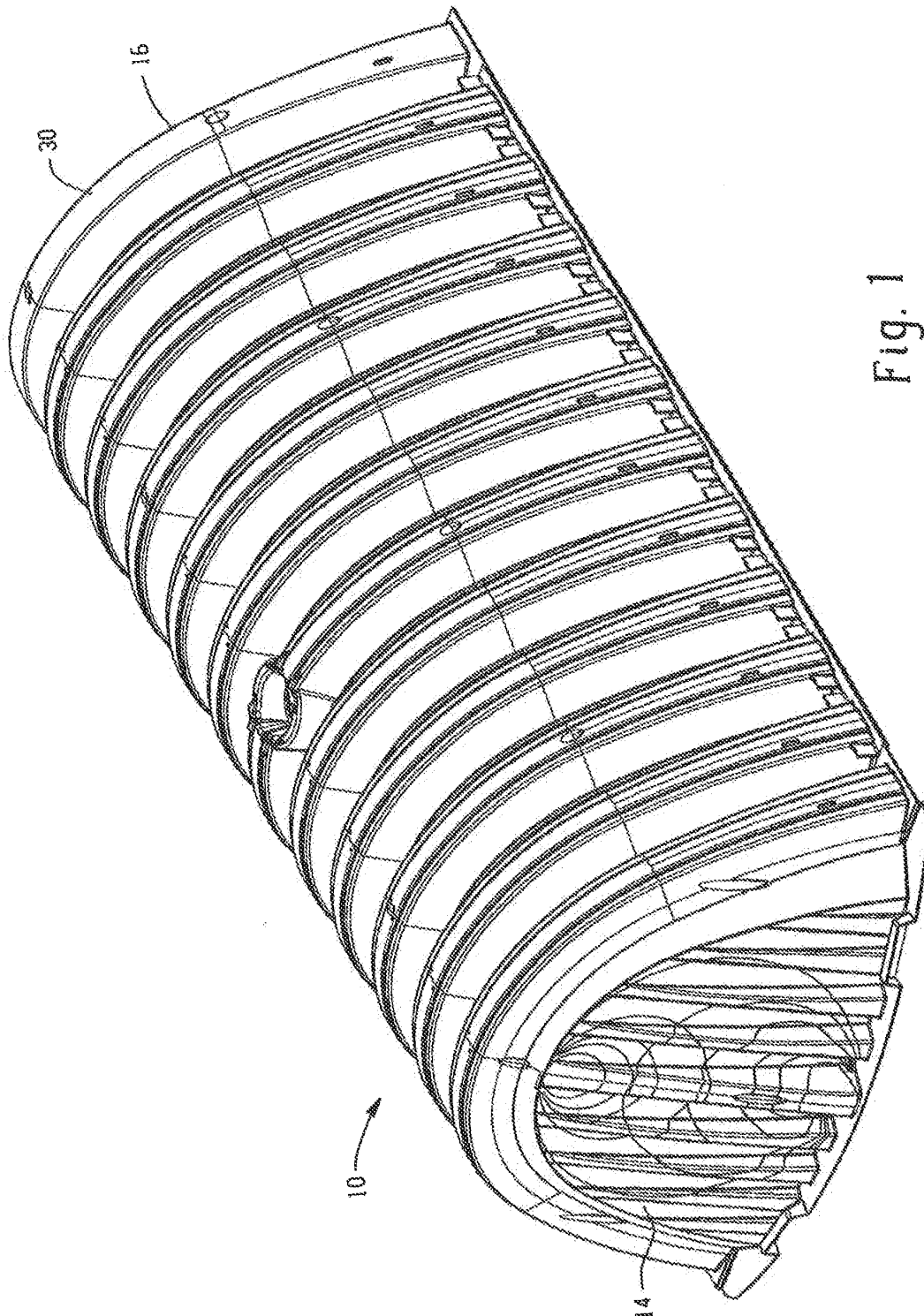


Fig. 1

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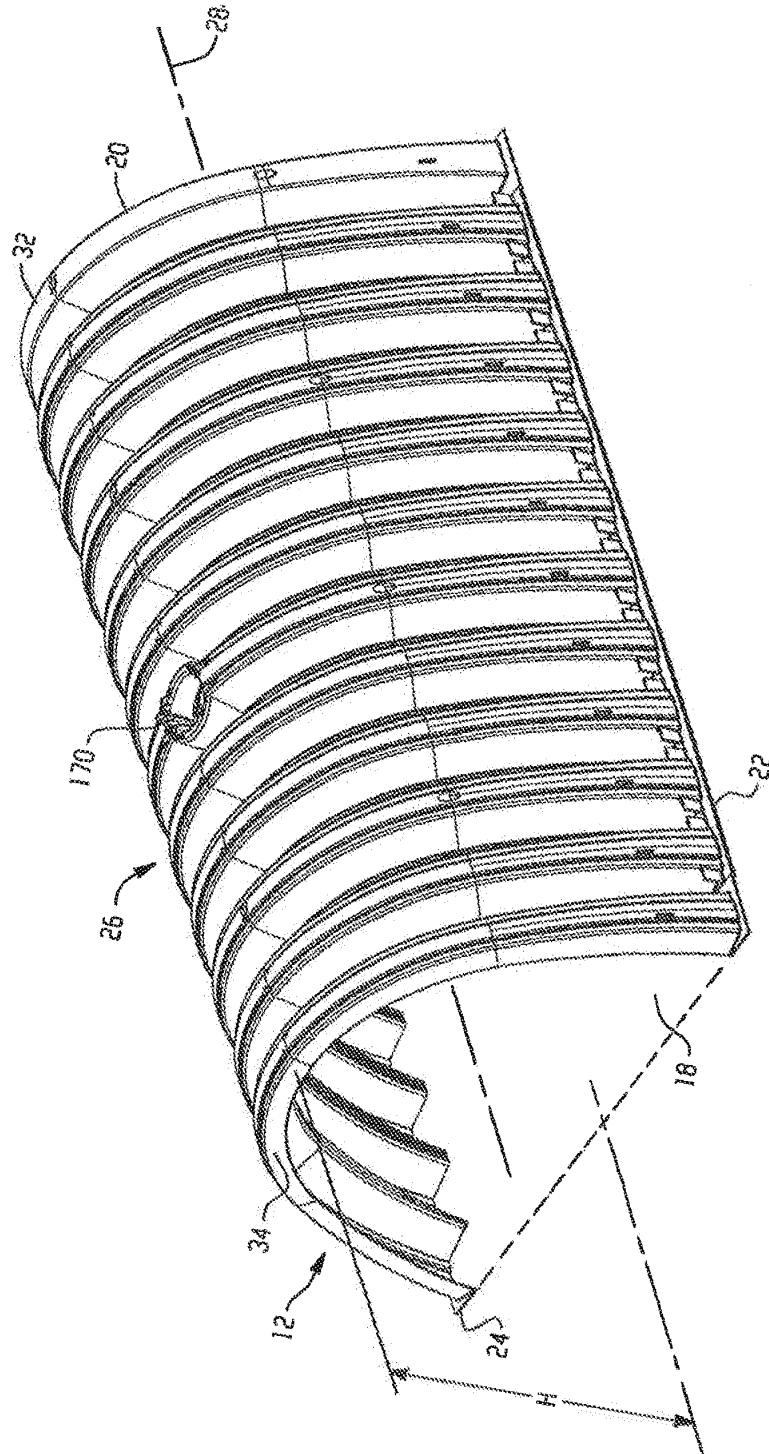


Fig. 2

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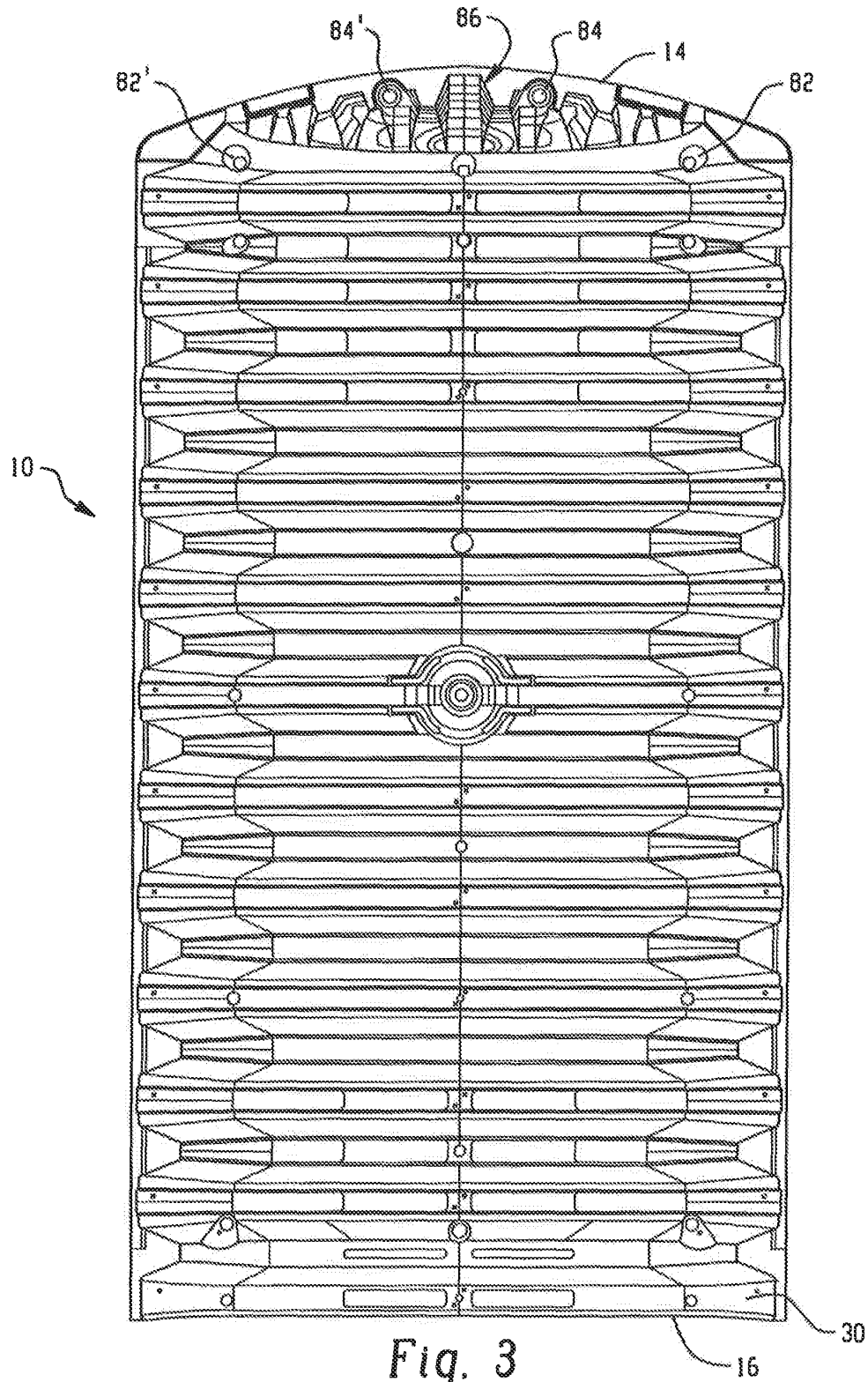


Fig. 3

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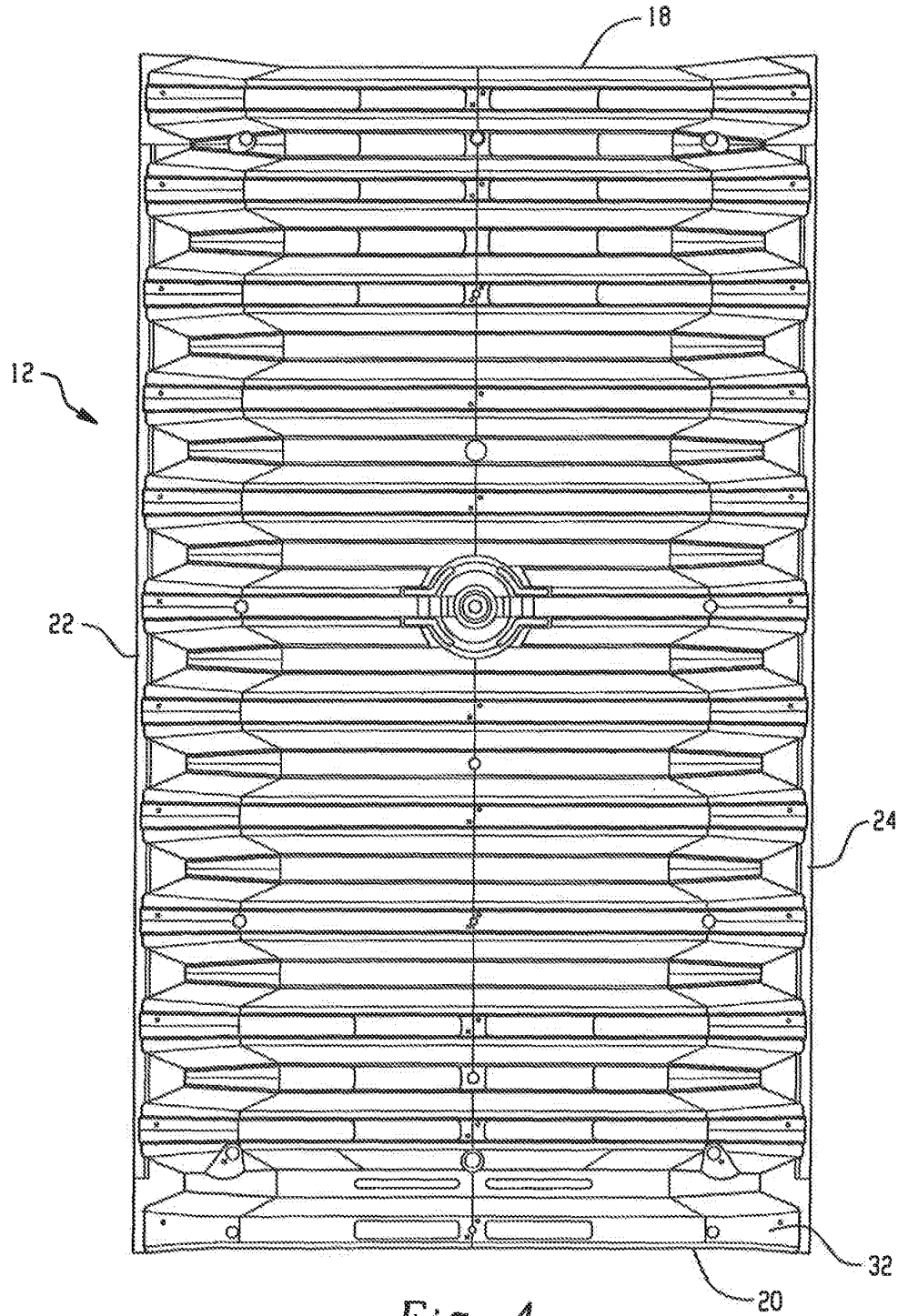


Fig. 4

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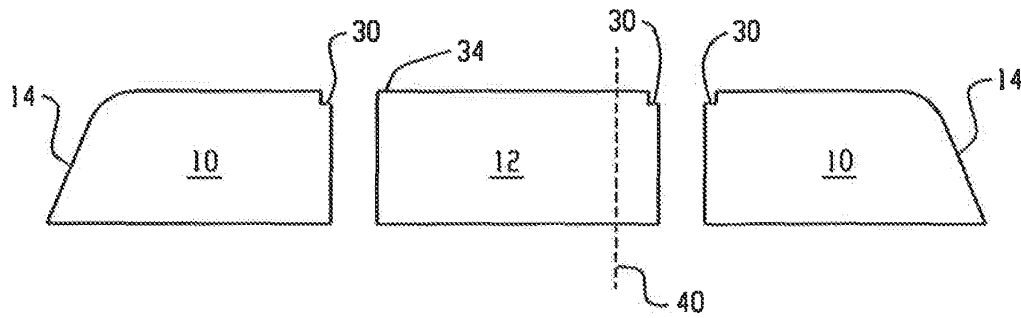


Fig. 5

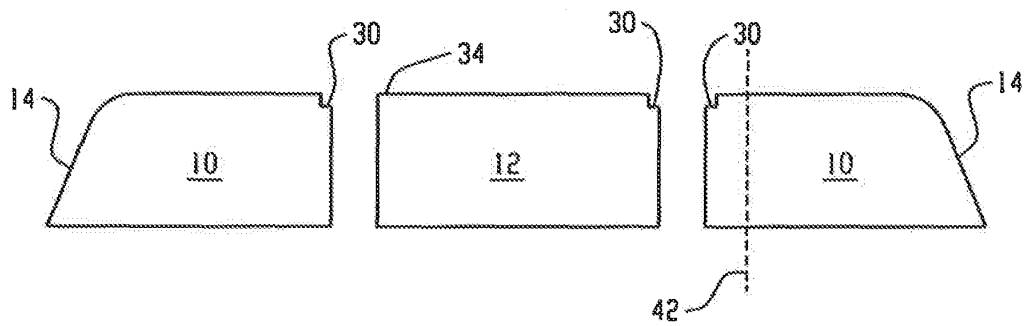


Fig. 6

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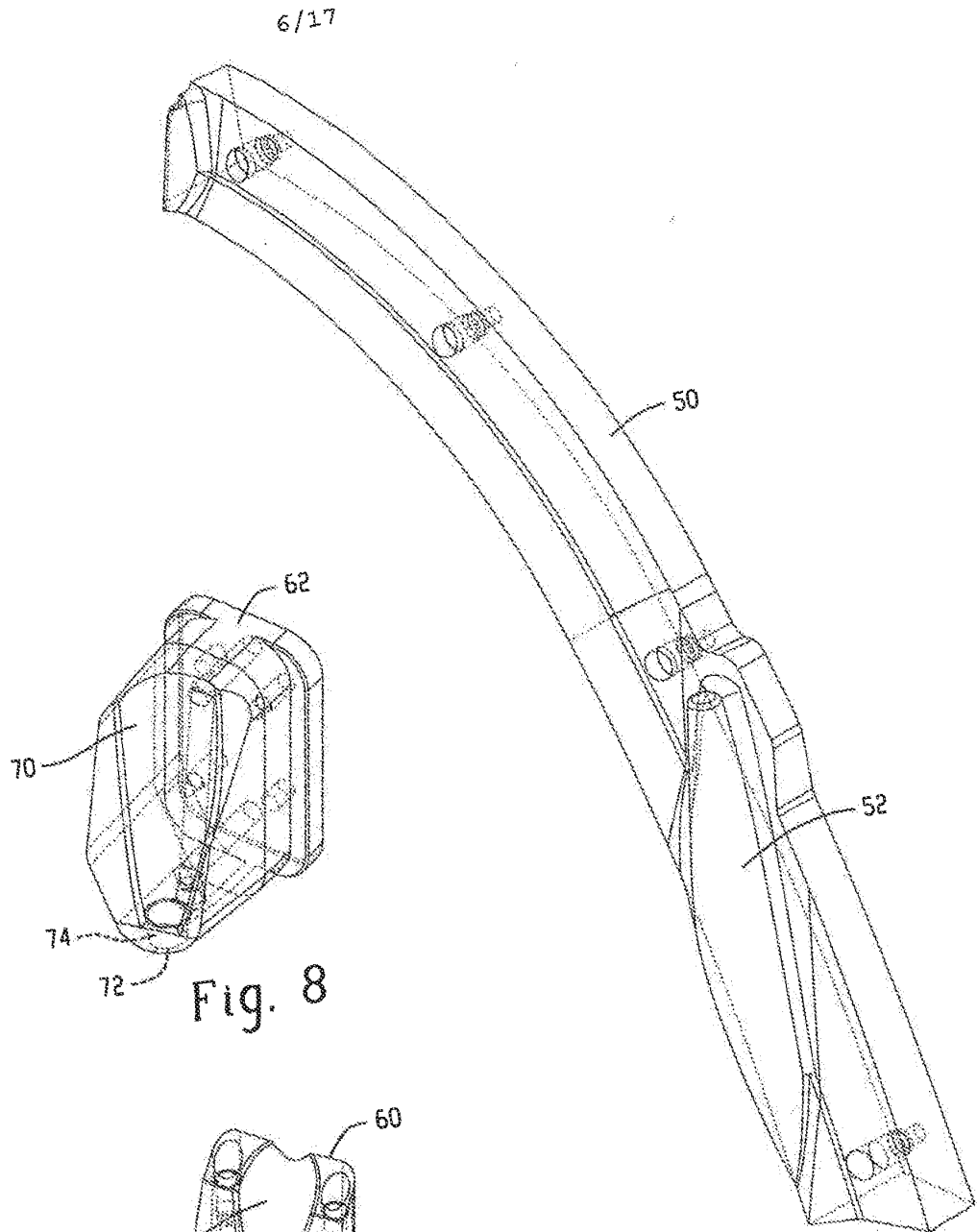


Fig. 7

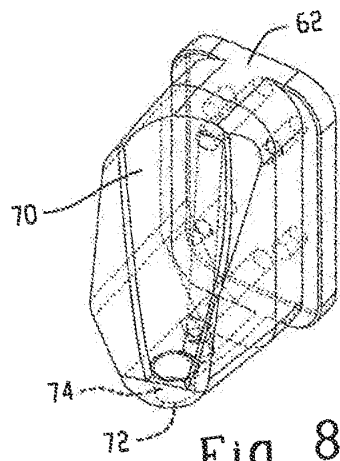


Fig. 8

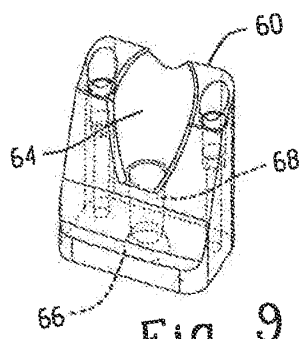


Fig. 9

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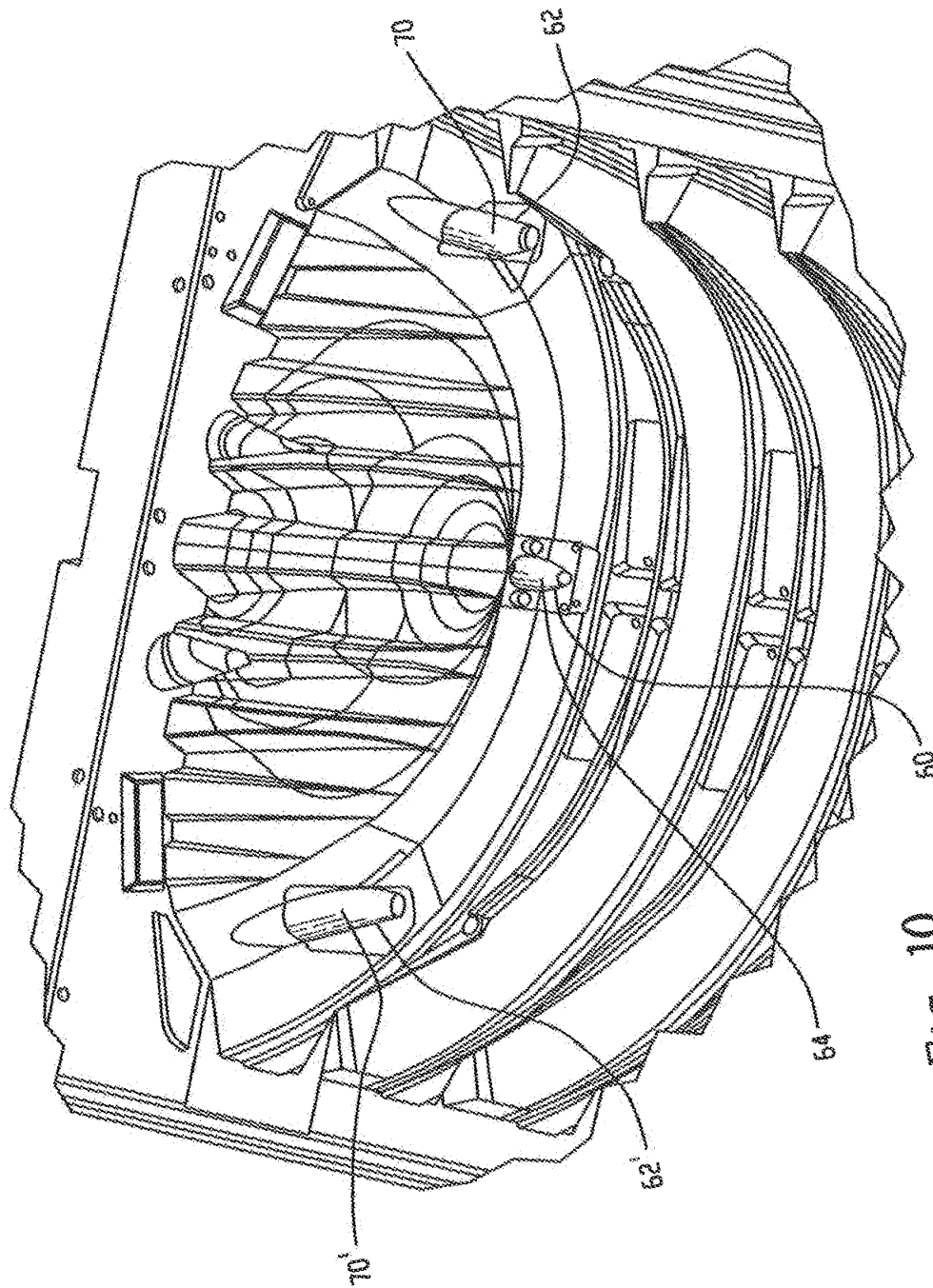


Fig. 10

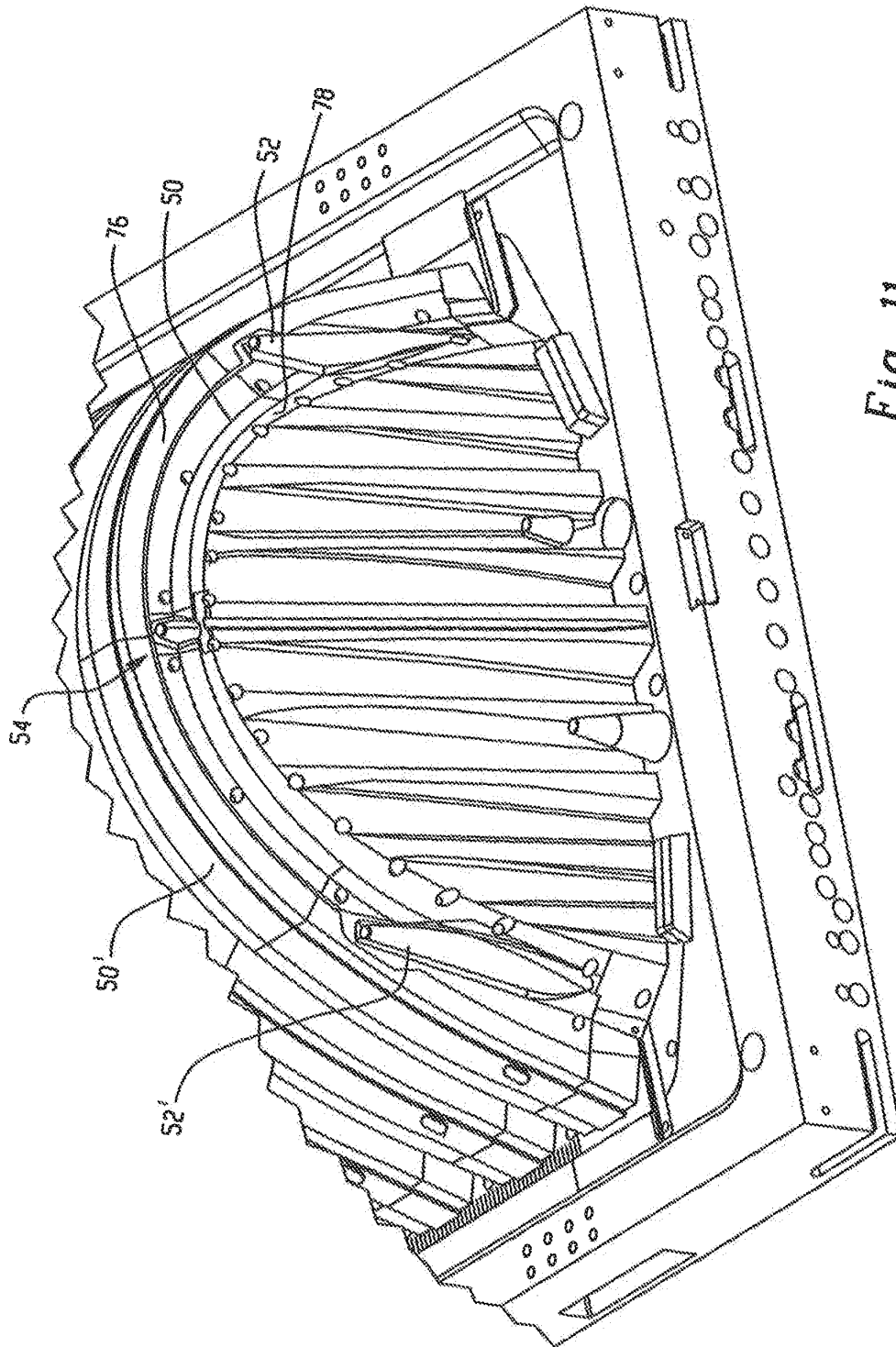
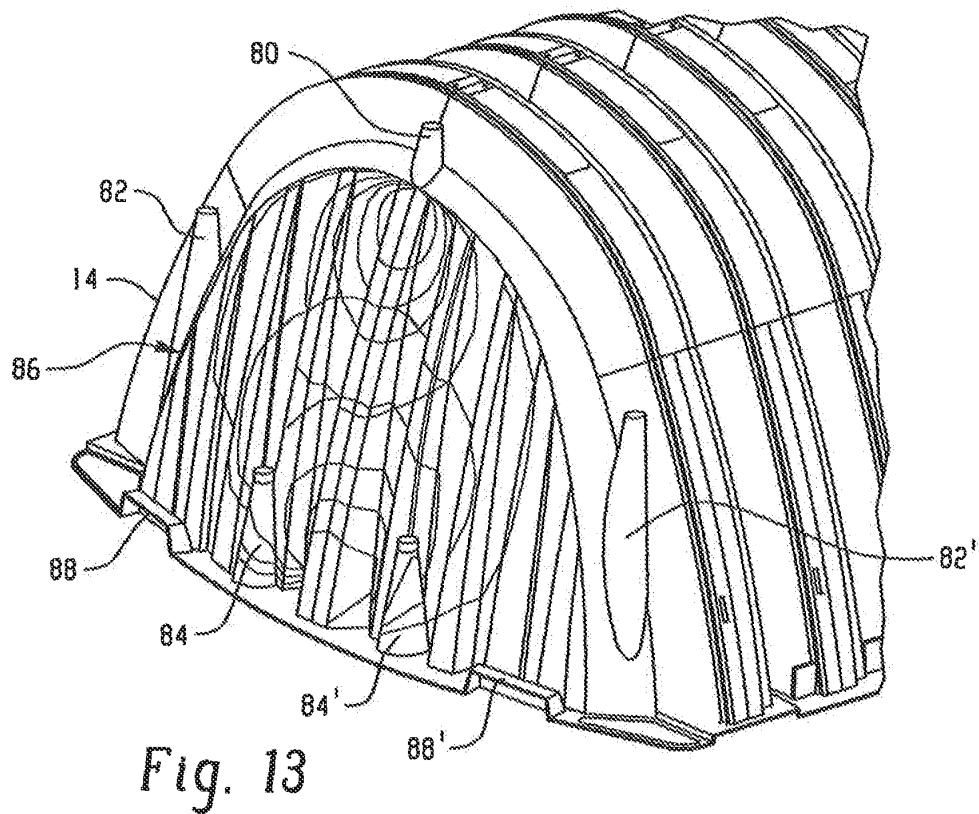
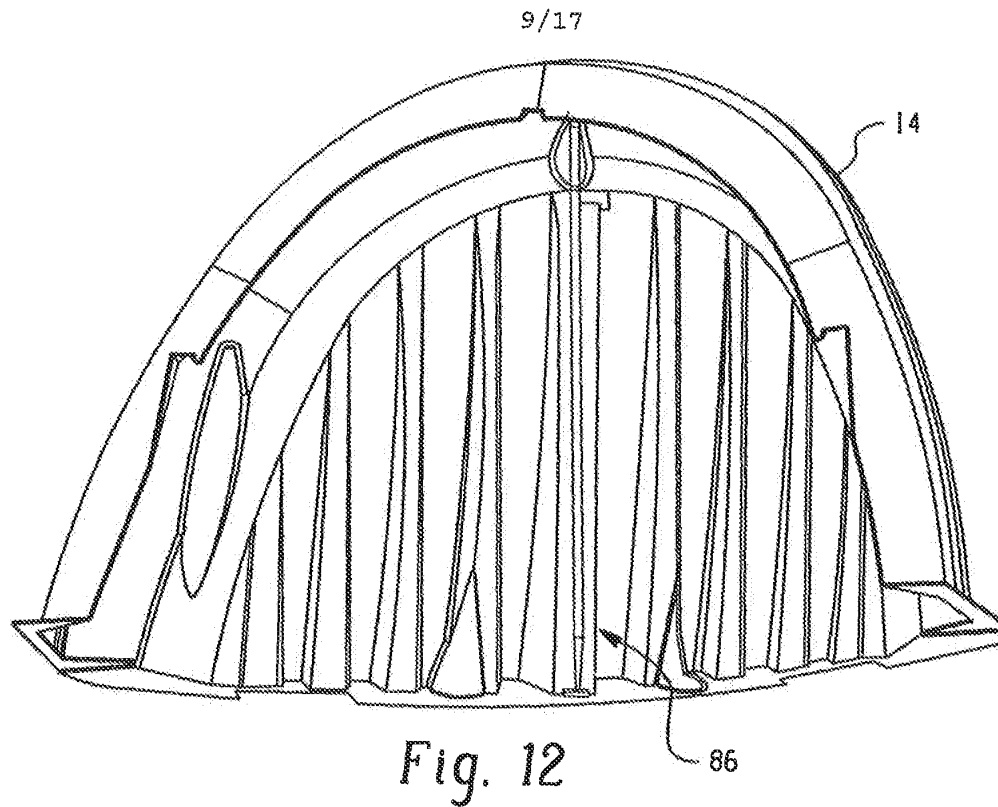


Fig. 11



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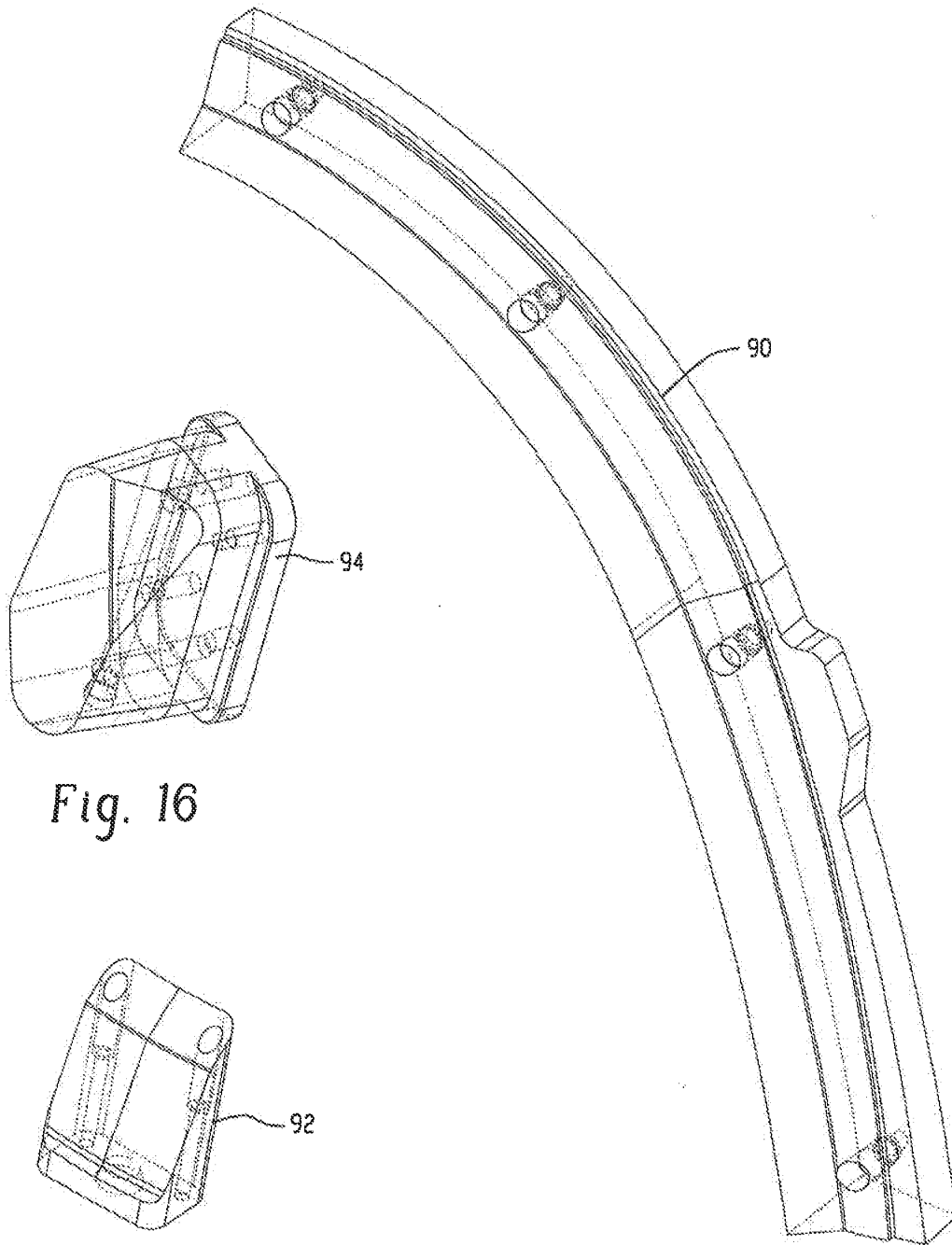


Fig. 16

Fig. 15

Fig. 14

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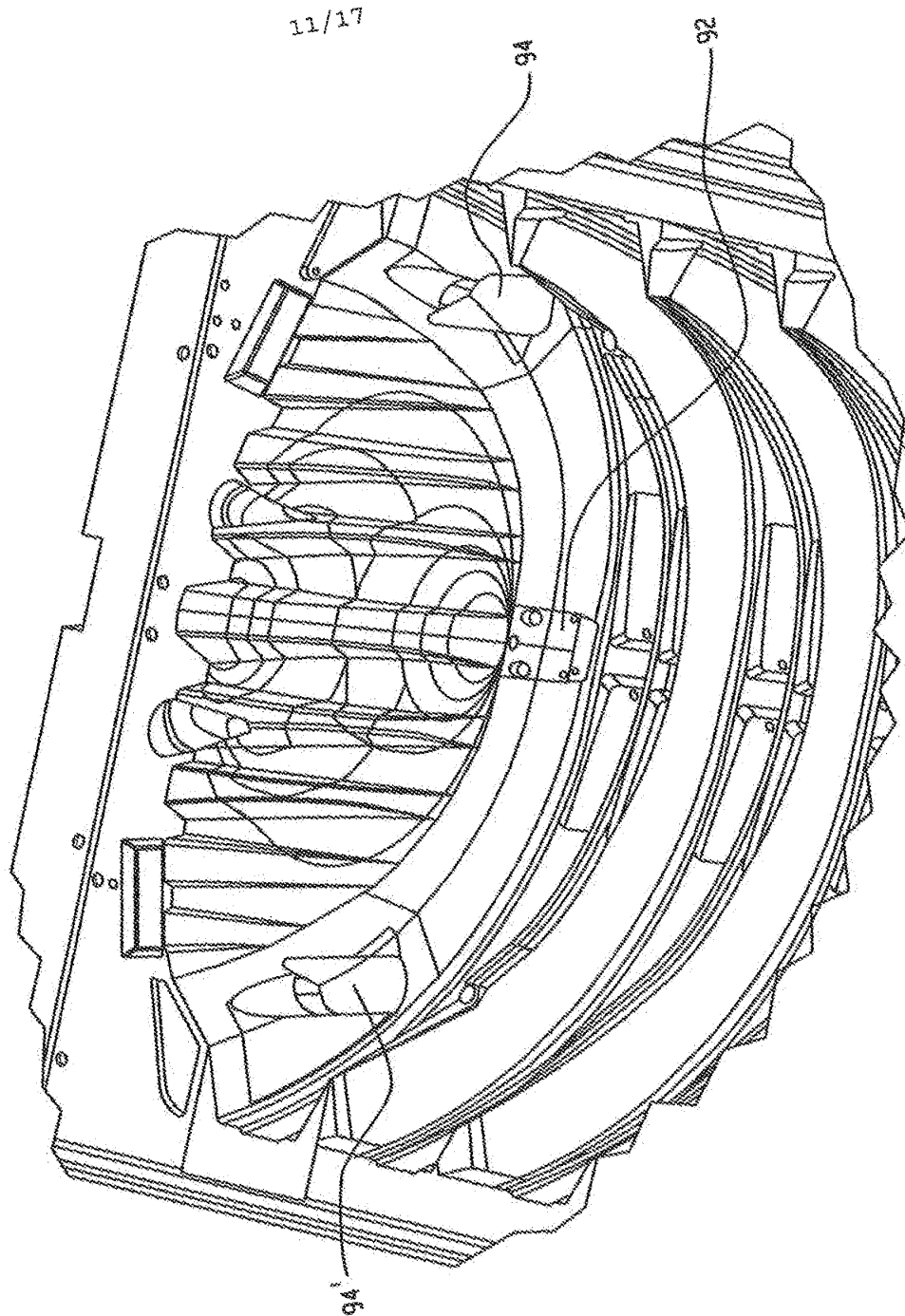


Fig. 17

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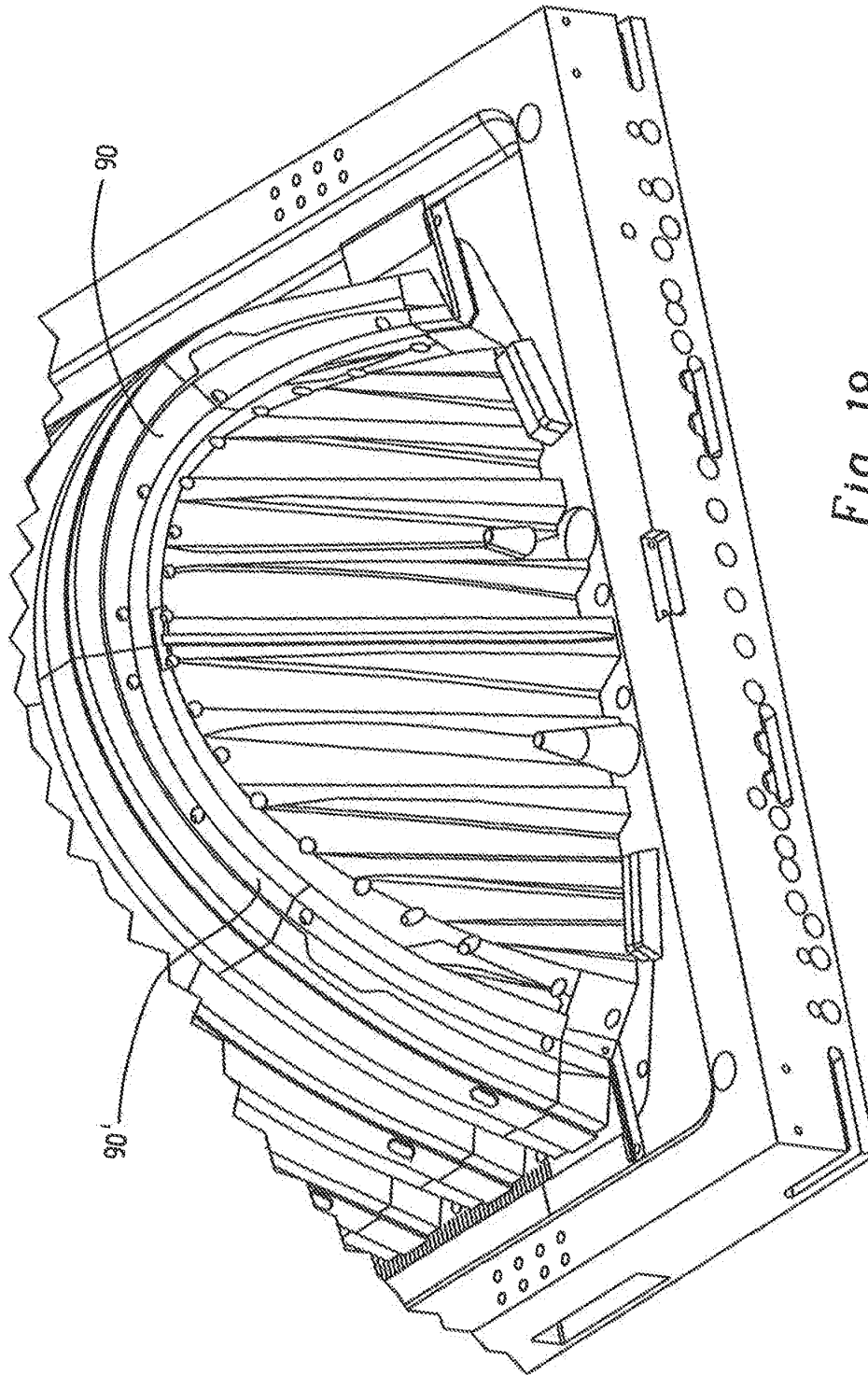


Fig. 18

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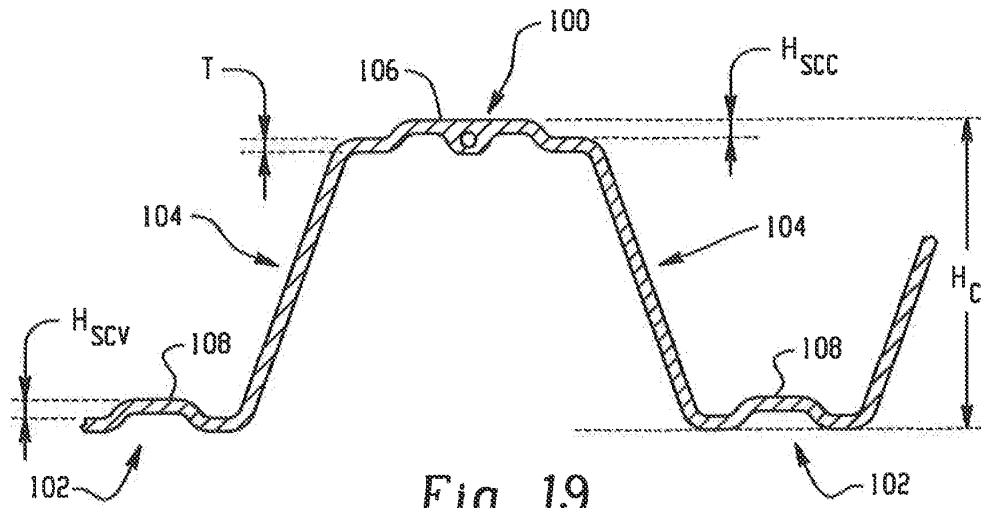


Fig. 19

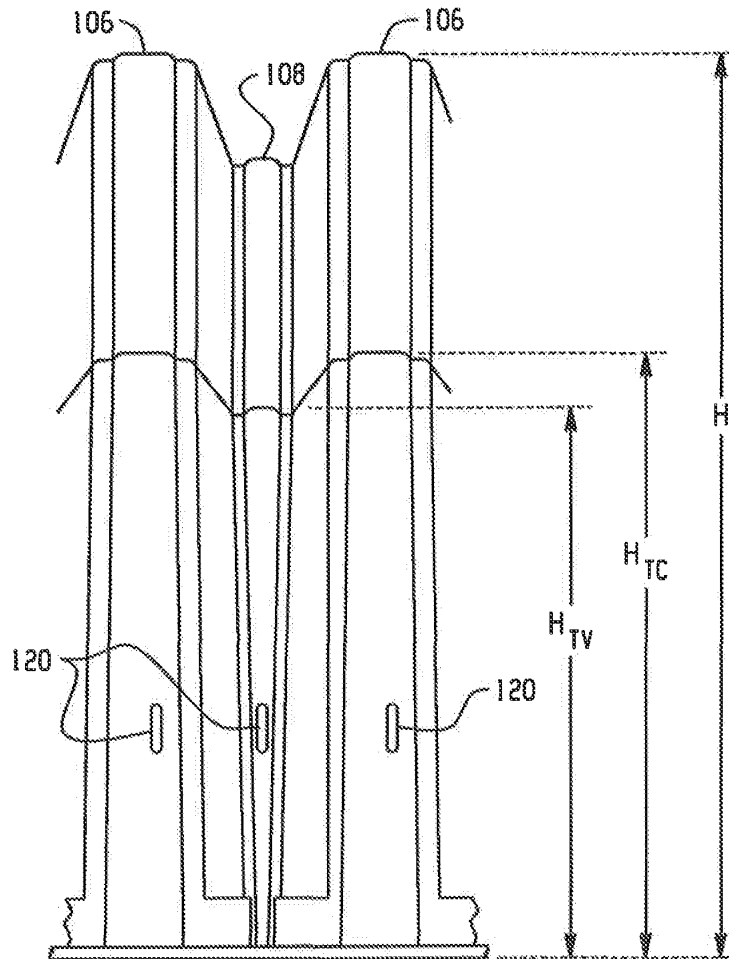


Fig. 20

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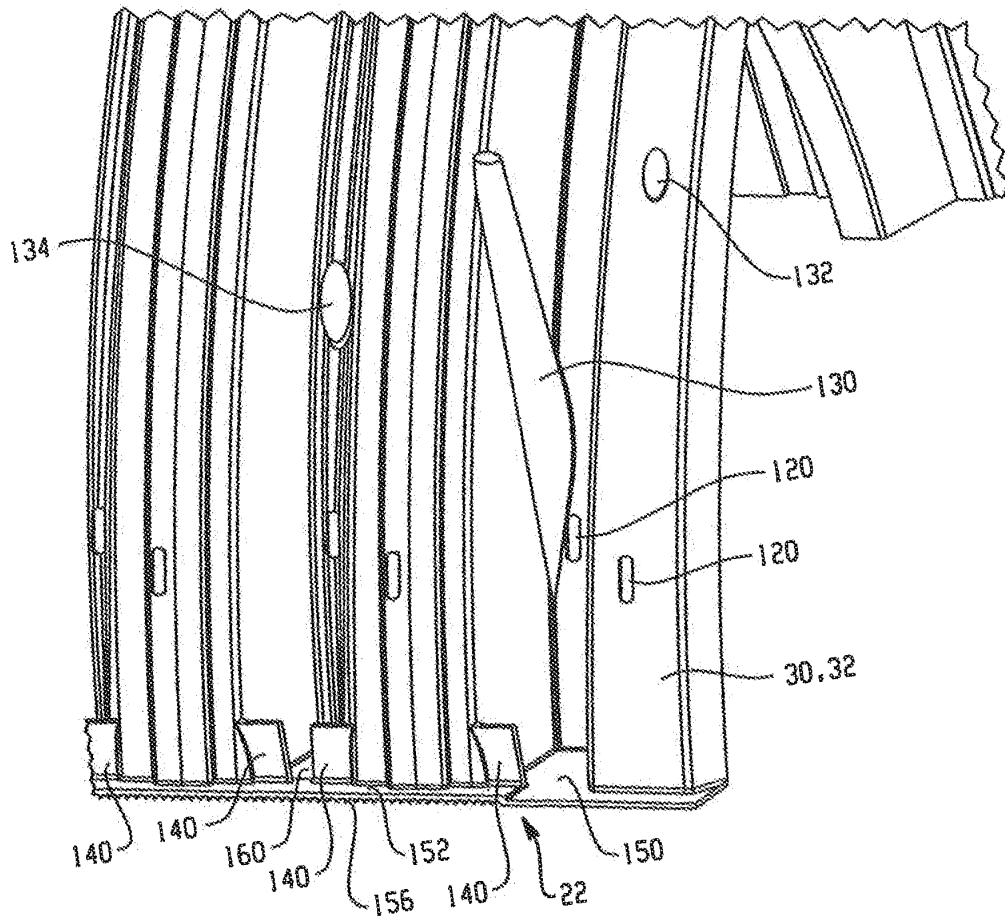


Fig. 21

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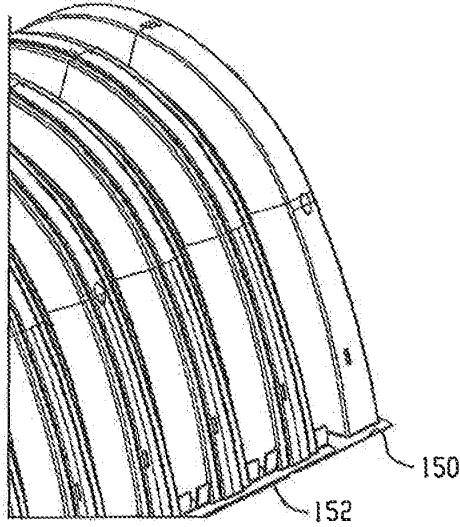


Fig. 22

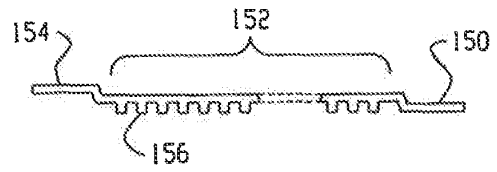


Fig. 24A

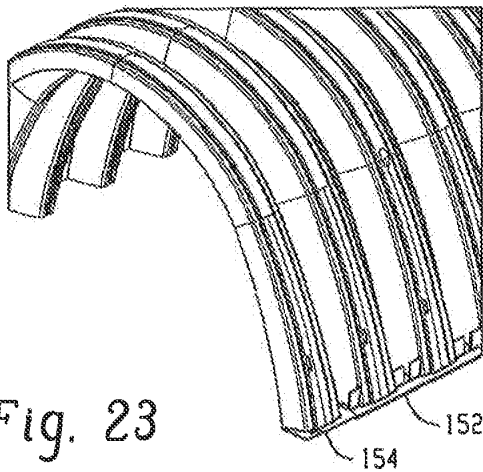


Fig. 23

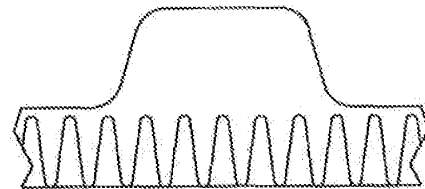


Fig. 24B

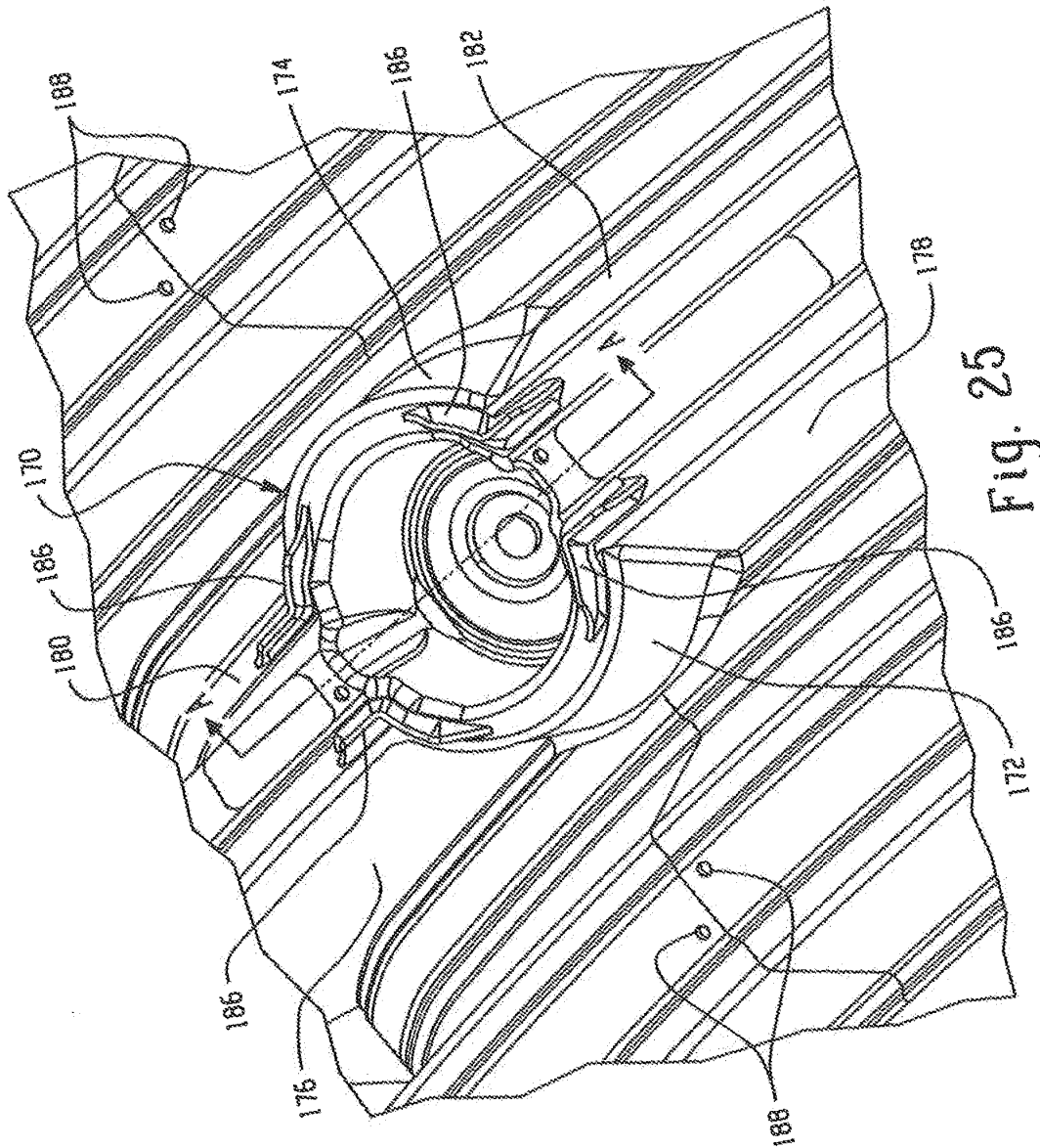


Fig. 25

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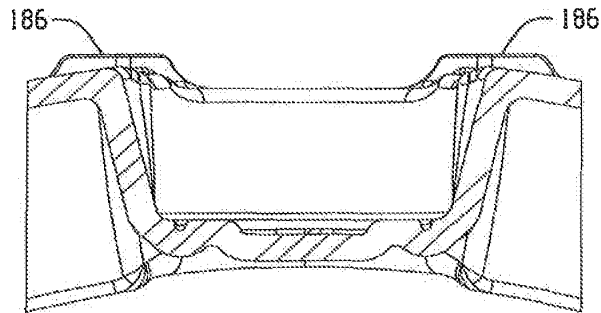


Fig. 26

Fig. 27

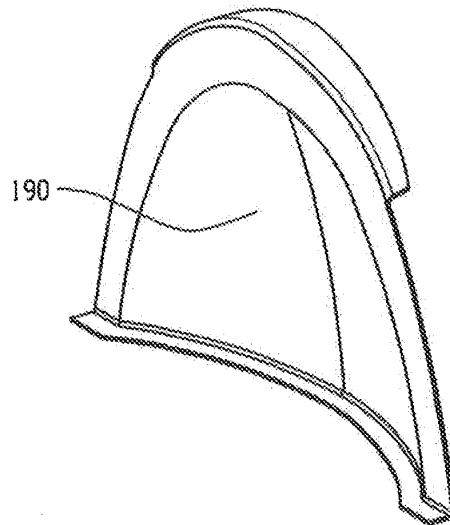
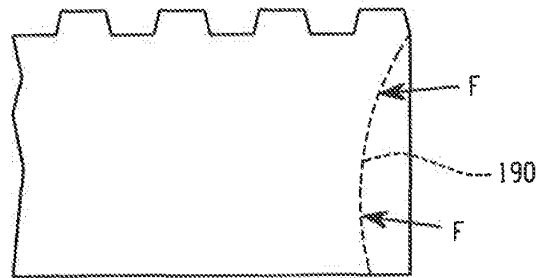


Fig. 28

| Electronic Patent Application Fee Transmittal | | | | |
|--|-----------------|---|---------------|-----------------------------|
| Application Number: | | 12802483 | | |
| Filing Date: | | 07-Jun-2010 | | |
| Title of Invention: | | Corrugated Stormwater chamber having sub-corrugations | | |
| First Named Inventor/Applicant Name: | | David J. Mailhot | | |
| Filer: | | Daniel Geewon Chung/dorne dottin | | |
| Attorney Docket Number: | | 07965.0150-00000 | | |
| Filed as Large Entity | | | | |
| Utility under 35 USC 111(a) Filing Fees | | | | |
| Description | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
| Basic Filing: | | | | |
| Pages: | | | | |
| Claims: | | | | |
| Miscellaneous-Filing: | | | | |
| Petition: | | | | |
| Patent-Appeals-and-Interference: | | | | |
| Post-Allowance-and-Post-Issuance: | | | | |
| Extension-of-Time: | | | | |

CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC

| Description | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
|---|----------|----------|--------|----------------------|
| Miscellaneous: | | | | |
| Submission- Information Disclosure Stmt | 1806 | 1 | 180 | 180 |
| Total in USD (\$) | | | | 180 |

| Electronic Acknowledgement Receipt | |
|---|---|
| EFS ID: | 15720743 |
| Application Number: | 12802483 |
| International Application Number: | |
| Confirmation Number: | 9389 |
| Title of Invention: | Corrugated Stormwater chamber having sub-corrugations |
| First Named Inventor/Applicant Name: | David J. Mailhot |
| Customer Number: | 22852 |
| Filer: | Daniel Geewon Chung/dorne dottin |
| Filer Authorized By: | Daniel Geewon Chung |
| Attorney Docket Number: | 07965.0150-00000 |
| Receipt Date: | 08-MAY-2013 |
| Filing Date: | 07-JUN-2010 |
| Time Stamp: | 11:44:47 |
| Application Type: | Utility under 35 USC 111(a) |

Payment information:

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| Submitted with Payment | yes |
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| Authorized User | |

File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
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CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC

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| 1 | Information Disclosure Statement (IDS) Form (SB08) | 07965_0150_00000_Information_Disclosure_Statement.pdf | 558211 15f12fd50842ca1d98e899374594d78c2121bb4e | no | 7 |
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| This is not an USPTO supplied IDS fillable form | | | | | |
| 2 | Foreign Reference | 07965_0150_00000_WO_2007021715.pdf | 2669739 97bfae276fd02c64796fc3642578c010db2c43bd | no | 41 |
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| 3 | Foreign Reference | 07965_0150_00000_WO_2004061249.pdf | 628035 e1393b41b8cec90ce4f05e44c696b4b5532b11fc | no | 13 |
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| 4 | Foreign Reference | 07965_0150_00000_WO_2007138780.pdf | 1487578 b248151a3adca5d6a2660e8098b432d8a2b90527 | no | 26 |
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| 5 | Foreign Reference | 07965_0150_00000_WO2009102855.pdf | 2836369 fb07fb4ec0b2a442514a470533cccd04431f0fbf | no | 44 |
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| 6 | Foreign Reference | 07965_0150_00000_DE_10139897.pdf | 962574 efb638f348fb220a93cd1e40508ac3e77b99acf1 | no | 14 |
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| 7 | Foreign Reference | 07965_0150_00000_DE_1282562.pdf | 321928 8e6c1013622fdclcf8e76628cf52479131daeca | no | 5 |
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| 8 | Foreign Reference | 07965_0150_000000_DE_202005005056.pdf | 679252 c272058bc53ea22cbb60e592d44ff487a85c513ca | no | 9 |
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| 9 | Foreign Reference | 07965_0150_00000_JP_09235828.pdf | 637415 dcd46e1ae4e390431d6e0dfb48eb8b7750d3da28 | no | 8 |

CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC

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| 10 | Foreign Reference | 07965_0150_00000_EP_1122481.pdf | 424540 557e409892de2d3bf3cd077e2d9c02ad7b9ac724 | no | 7 |
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| 12 | Foreign Reference | 07965_0150_00000_JP_2003176564.pdf | 921222 a6adc4617b218e9f22b31b186e553f8f90f54b | no | 12 |
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| 15 | Foreign Reference | 07965_0150_00000_JP_2002302995.pdf | 1351435 a10df9025cc441aee2939fecb9eba607d058f3fe | no | 15 |
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| 16 | Foreign Reference | 07965_0150_00000_2003176565.pdf | 1040238 1c3ac23803019da0fe2707b00e698e6bfaa37130 | no | 12 |
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| 17 | Foreign Reference | 07965_0150_00000_JP_2005213854.pdf | 1305902 7fbc16d25506808a58e9609e95892f6b84e3be09 | no | 18 |
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| 18 | Foreign Reference | 07965_0150_00000_GB_2016639.pdf | 713138 079c51e9d087d8f488cb0becb4950f6a9d6ae7c3 | no | 7 |

CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC

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| 19 | Non Patent Literature | 07965_0150_00000_NPL_Reference1.pdf | 1125328 <small>2a8f6cd7d5a6ff7a2fbc0c52e0299cacca6d4a6</small> | no | 22 |
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| 20 | Non Patent Literature | 07965_0150_00000_NPL_Reference2.pdf | 443789 <small>4f3d382d53047b9ecb0b28d38817068292004125</small> | no | 4 |
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| 21 | Fee Worksheet (SB06) | fee-info.pdf | 29931 <small>bb6d6f2995e7cb617c7121847cb1e0fde5fb4f3</small> | no | 2 |
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| <p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p> | | | | | |

PATENT
Customer No. 22,852
Attorney Docket No. 07965.0150-00000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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| In re Application of: |) | |
| |) | |
| David J. MAILHOT et al. |) | Group Art Unit: 3672 |
| |) | |
| Application No.: 12/802,483 |) | Examiner: Fiorello, Benjamin F. |
| |) | |
| Filed: June 7, 2010 |) | Confirmation No.: 9389 |
| |) | |
| For: CORRUGATED STORMWATER |) | |
| CHAMBER HAVING SUB- |) | |
| CORRUGATIONS |) | |

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

REPLY TO OFFICE ACTION

In reply to the Office Action mailed on November 2, 2012, the period for response extending through May 2, 2013, by a petition for a three-month extension of time and fee payment submitted concurrently herewith, Applicant requests that this application be amended as follows.

Amendments to the Specification begin on page 2 of this reply.

Amendments to the Claims begin on page 3 of this reply.

Remarks/Arguments begin on page 10 of this reply.

AMENDMENTS TO THE SPECIFICATION:

Please amend the specification on page 6, line 15 as follows:

Fig. 5 comprises Fig 5(a) through Fig. 5(e) Fig. 5(f) and shows portions of sidewall cross sections at different chamber elevations, as points illustrated in Fig. 3.

Please amend the specification on page 11, line 17 as follows:

As may be seen in Fig. 1 and Fig. 2, a second set of sub-corrugations 36 runs along the respective centers of valley corrugations 30. The sub-corrugations 36 taper to nothingness in depth and width as they run downwardly and approach the base flange. Each exemplary valley sub-corrugation ~~[[34]]~~ 36 runs along virtually the whole of the arch curve length of the associated valley. The direction of taper of a valley sub-corrugations corresponds in sense with the taper of the valley corrugation, i.e., each gets narrower as it approaches the elevation of the base. The width of a crest or valley sub-corrugation may alternatively be constant along part or all of the associated corrugation.

Please amend the specification on page 12, line 6 as follows:

Again with reference to Fig. 4: Each crest corrugation has a height d which is measured relative to an adjacent valley corrugation. Each crest sub-corrugation 32 has a height d_p and each valley sub-corrugation ~~[[34]]~~ 36 has a height d_v , as such are measured relative to the adjacent outer surface of the crest or valley, as applies. The maximum height d_p of a crest sub-corrugation 32 is less than the locally associated height d_c of the crest corrugation 28 on which it is positioned. The maximum height d_v of a valley sub-corrugation 36 is less than locally associated depth d_d of the valley corrugation 30 on which it is positioned. (As mentioned above, the terms height and depth are used interchangeably for the same dimension on a corrugation or sub-corrugation.)

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application.

1. (Currently Amended) A molded arch shape cross section plastic chamber, for receiving and dispersing water when buried in soil, comprising:

opposing side bases running generally parallel to a chamber length axis, for supporting the chamber on soil during use;

a chamber top;

sidewalls running upwardly and inwardly from opposing side bases to the chamber top, wherein the combination of sidewalls and top form an arch curve which defines an arch shape cross section;

a plurality of alternating crest corrugations and valley corrugations running transverse to the length of the chamber along the arch curve of the chamber, wherein the crest corrugations decrease in width with elevation from the base and the valley corrugations increase in width with elevation from the base, as width is measured in a direction parallel to the chamber length axis; and,

a plurality of crest sub-corrugations, running upwardly from the base and along a portion of the arch-curve of a crest corrugation, each sub-corrugation having a height less than the local height of the crest corrugation with which [[it]] the sub-corrugation is associated; each crest sub-corrugation terminating at an elevation lower than the top of the chamber.

2. (Original) The chamber of claim 1 wherein each crest sub-corrugation has a height which diminishes with increasing elevation.
3. (Original) The chamber of claim 2 wherein each crest sub-corrugation has a width which diminishes with increasing elevation.
4. (Original) The chamber of claim 1 wherein the crest sub-corrugations extend about one quarter to two-thirds of the height of the chamber.
5. (Original) The chamber of claim 1 wherein the maximum width of each crest sub-corrugation is no more than one-third of the local width of the associated crest corrugation.
6. (Currently Amended) The chamber of claim 1 further comprising: a plurality of valley sub-corrugations, each valley sub-corrugation running downwardly from the top of the chamber and along part or all of the length of a valley corrugation; and, each valley sub-corrugation having a height less than the depth of the valley corrugation with which ~~[[it]]~~ the valley sub-corrugation is associated; each ~~[[crest]]~~ valley sub-corrugation terminating at an elevation lower than the top of the chamber.
7. (Currently Amended) The chamber of claim 6 wherein each valley sub-corrugation terminates at an elevation ~~[[aboe]]~~ above the elevation of the base.

8. (Original) The chamber of claim 6 wherein each valley sub-corrugation runs downwardly from the top of the chamber and terminates at a point which is above the elevation of each opposing side base; and, wherein each crest sub-corrugation runs upwardly from the base and terminates at an elevation which is higher than the elevation of the termination points of the valley sub-corrugations.
9. (Original) The chamber of claim 7 wherein each valley sub-corrugation diminishes in both height and width in proximity to the base, as width is measured in a direction which is parallel to the length axis of the chamber.
10. (Original) The chamber of claim 6 wherein the maximum width of each valley sub-corrugation is no more than one-third of the local width of the associated valley corrugation, as width is measured in a direction which parallel to the length axis of the chamber.
11. (Original) The chamber of claim 6 wherein the valley sub-corrugations have lower termination ends on the sidewall of the chamber; wherein the crest sub-corrugation have upper termination ends on the sidewall; and, wherein the crest sub-corrugation termination ends are higher in elevation than the elevations of the valley sub-corrugation terminal ends.
12. (Original) The chamber of claim 7 further comprising a second plurality of valley sub-corrugations, each running within a valley corrugation upwardly from each opposing

side base in the direction of said terminal ends of the first plurality of valley sub-corrugation.

13. (Original) In a molded arch shape cross section chamber, for receiving and dispersing water when buried in soil; wherein the chamber is supported by flanges associated with opposing side bases during use; wherein the chamber has alternating crest corrugations and valley corrugations running transverse to the length of the chamber, along the arch curve of the chamber; wherein the crest corrugations decrease in width with elevation for the base and the valley corrugations increase in width with elevation from the base, as width is measured in a direction parallel to the chamber length axis; the improvement which comprises: a plurality of sub-corrugations running along at least a portion of the lengths of a plurality of one or both of the crest corrugations and valley corrugations.

14. (Currently Amended) The improved chamber of claim 13 wherein the width and depth of each sub-corrugation change along part or all of the length of the sub-corrugation ~~in the same sense as does~~ as the width of the corrugation with which the sub-corrugation is associated changes.

15. (Original) The improved chamber of claim 13 having one or both of a first set of sub-corrugations running upwardly from the opposing side bases on crest corrugations to termination points which are at an elevation which less than the elevation of the top of the chamber, and a second set of sub-corrugations running in valley corrugations at the top of the chamber and downwardly toward the opposing side bases to an elevation

which is less than the elevation of said termination points of the first set of sub-corrugations.

17. (Currently Amended) The improved chamber of claim 15 wherein the width and depth of each sub-corrugation changes along part or all of the length of the sub-corrugation ~~in the same sense as does~~ as the width of the corrugation with which the sub-corrugation is associated changes.

18. (Original) The improved chamber of claim 15 wherein all the elevations of the termination points of all of at least one of the first or second set of the sub-corrugations are the same.

19. (Currently Amended) The method of increasing the strength of a corrugated molded chamber adapted for receiving and dispersing water when buried in soil, wherein the chamber comprises opposing side bases running generally parallel to a chamber length axis, for supporting the chamber on soil during use; a top; opposing sidewalls which run upwardly from opposing side bases to the chamber top, wherein the combination of sidewalls and top form an arch curve which defines an arch shape cross section; a plurality of alternating crest corrugations and valley corrugations running transverse to the length of the chamber along the arch curve of the chamber, wherein the crest corrugations decrease in width and the valley corrugations increase in width with elevation from the base, as width is measured in a direction parallel to the chamber length axis; which comprises: providing a plurality of sub-corrugations which run along part or all of the arch curve of the chamber on either or both the crest corrugations and

the valley corrugations, wherein each sub-corrugation has a depth less than the depth of the corrugation with which ~~[[it]]~~ the sub-corrugation is associated.

20. (Withdrawn) An end cap for closing off the end of an arch shape cross section chamber adapted to receive and disperse water when buried in soil, comprising:

an attachment end, defining an arch shape opening, for mating with the end of an arch shape cross section chamber, the end having downwardly extending terminal ends;

an arch shape base for supporting the end cap on soil, having horizontally extending terminal ends connected to the terminal ends of said attachment end;

a compound convex shape wall connecting the said attachment end and said base;

a plurality of alternating crest corrugations and valley corrugations running upwardly along the convex shape wall from the points along said arch shape base to points along said arch shape attachment end, wherein the corrugations run along approximately vertical paths, when the paths are projected into a vertical plane which runs through the points at which said terminal ends are connected.

21. (Withdrawn) The end cap of claim 20 further comprising a plurality of sub-corrugations, each sub-corrugation running upwardly from the elevation of the base on a plurality of crest corrugations or valley corrugations or both, each sub-corrugation having a depth less than the depth of the corrugation with which it is associated.

22. (Withdrawn) The end cap of claim 21 wherein each sub-corrugation terminates at an elevation which is less than the elevation of the said attachment end at the location of the corrugation with which the sub-corrugation is associated.

23. (Withdrawn) The end cap of claim 21 wherein the sub-corrugations terminate at an elevation which is no more than about 60 percent of the overall height of the end cap.

24. (Withdrawn) The end cap of claim 21 wherein each sub-corrugation of said plurality diminishes in width and depth with elevation.

REMARKS

I. Status of the Claims

Applicant submits this reply in response to the Office Action mailed on November 2, 2012 (the "Office Action"). By this reply, Applicant has amended the specification to correct certain informalities. In addition, Applicant has amended claims 1, 6, 7, 14, 17, and 19. Claims 1-15 and 17-19 are pending (and not withdrawn), with claims 1, 13, and 19 being independent. No new matter has been added.

In the Office Action, the drawings were objected to as allegedly failing to comply with 37 C.F.R. § 1.84(p)(5). In addition, the specification and claim 7 were objected to due to informalities. Moreover, claims 1-12 were rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. Furthermore, claims 1, 13, 14, and 19 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 4,360,042 to Fouss et al. ("Fouss") in view of U.S. Publication No. 2005/0111915 to Moore, Jr. et al. ("Moore"); and claims 2-12, 15, 17 and 18 were indicated as including allowable subject matter.

Applicant respectfully traverses the above objections and rejections for at least the following reasons.

II. The Drawings Objection

The Office Action objected to the drawings for failing to include the reference sign "34" disclosed in the specification. (See Office Action at 2.) Applicant has amended the specification to address the drawings objection and accordingly respectfully requests the drawings objection be vacated.

II. The Specification Objection

The Office Action objected to the specification due to a minor informality. (See id. at 3.) Applicant has amended the specification to address the specification objection and accordingly respectfully requests the specification objection be vacated.

III. The Claim Objection

The Office Action objected to claim 7 due to a minor informality. (See id.) Applicant has amended the specification to address the claim objection and accordingly respectfully requests the claim objection be vacated.

IV. The § 112, Second Paragraph, Rejections

The Office Action rejected claims 1-12, 14, and 17 as allegedly being indefinite under § 112, second paragraph. (See id. at 3-4.) Without necessarily acquiescing to the Office Action's assertions and characterizations, and solely in the interest of expediting the prosecution of this application, Applicant has made certain amendments to claims 1, 6, 14, and 17 to address the § 112, second paragraph, rejections. Accordingly, Applicant respectfully requests that the § 112, second paragraph, rejections be vacated.

V. The § 103(a) Rejections

A. The independent claims

The Office Action rejected independent claims 1, 13, and 19 based on a combination of alleged teachings of Fouss and Moore. The proposed combination of Fouss and Moore, however, does not teach each and every element recited in each of

independent claims 1, 13, and 19. Accordingly, for at least these reasons, independent claims 1, 13, and 19 are allowable over Fouss and Moore.

B. The dependent claims

Claims 2-12, 14, 15, 17, and 18 depend from either independent claim 1 or 13 and accordingly are allowable at least due to their dependence.

VI. Conclusion

In view of the foregoing remarks, Applicant respectfully requests reconsideration and reexamination of the application, and the timely allowance of the pending claims.

The Office Action contains characterizations of the claims and the related art, with which Applicant does not necessarily agree. Unless expressly noted otherwise, Applicant declines to subscribe to any statement or characterization in the Office Action.

In discussing the specification, claims, and/or drawings, it is to be understood that Applicant is in no way intending to limit the scope of the claims to an exemplary embodiment described in the specification or abstract and/or shown in the drawings. Rather, Applicant is entitled to have the claims interpreted broadly to the maximum extent permitted by statute, regulation, and applicable case law.


Application No. 12/802,483
Attorney Docket No. 07965.0150-00000

Please grant any extensions of time required to enter this reply and charge any additional required fees to Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: May 2, 2013

By: 
Daniel G. Chung
Reg. No. 63,553
(202) 408-4000

PATENT
Customer No. 22,852
Attorney Docket No. 07965.0150-00000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)
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David J. MAILHOT et al.) Group Art Unit: 3672
)
Application No.: 12/802,483) Examiner: Fiorello, Benjamin F.
)
Filed: June 7, 2010) Confirmation No.: 9389
)
For: CORRUGATED STORMWATER)
CHAMBER HAVING SUB-)
CORRUGATIONS)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

PETITION FOR EXTENSION OF TIME

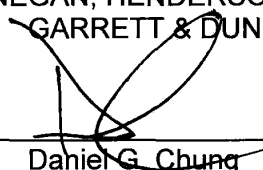
Applicant petitions for a three-month extension of time to reply to the Office
Action mailed on November 2, 2012. A fee of \$1,400.00 is submitted electronically
herewith.

Please grant any additional extensions of time required to enter the attached
reply and charge any additional required fees to Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: May 2, 2013

By: 
Daniel G. Chung
Reg. No. 63,553
(202) 408-4000

| Electronic Patent Application Fee Transmittal | | | | |
|--|-----------------|---|---------------|-----------------------------|
| Application Number: | | 12802483 | | |
| Filing Date: | | 07-Jun-2010 | | |
| Title of Invention: | | Corrugated Stormwater chamber having sub-corrugations | | |
| First Named Inventor/Applicant Name: | | David J. Mailhot | | |
| Filer: | | Daniel Geewon Chung/dorne dottin | | |
| Attorney Docket Number: | | 07965.0150-00000 | | |
| Filed as Large Entity | | | | |
| Utility under 35 USC 111(a) Filing Fees | | | | |
| Description | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
| Basic Filing: | | | | |
| Pages: | | | | |
| Claims: | | | | |
| Miscellaneous-Filing: | | | | |
| Petition: | | | | |
| Patent-Appeals-and-Interference: | | | | |
| Post-Allowance-and-Post-Issuance: | | | | |
| Extension-of-Time: | | | | |
| Extension - 3 months with \$0 paid | 1253 | 1 | 1400 | 1400 |

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CULTEC, INC. v. STORMTECH LLC

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| Total in USD (\$) | | | | 1400 |

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| EFS ID: | 15676662 |
| Application Number: | 12802483 |
| International Application Number: | |
| Confirmation Number: | 9389 |
| Title of Invention: | Corrugated Stormwater chamber having sub-corrugations |
| First Named Inventor/Applicant Name: | David J. Mailhot |
| Customer Number: | 22852 |
| Filer: | Daniel Geewon Chung/dorne dottin |
| Filer Authorized By: | Daniel Geewon Chung |
| Attorney Docket Number: | 07965.0150-00000 |
| Receipt Date: | 02-MAY-2013 |
| Filing Date: | 07-JUN-2010 |
| Time Stamp: | 15:53:40 |
| Application Type: | Utility under 35 USC 111(a) |

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CULTEC, INC. v. STORMTECH LLC

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| | Multipart Description/PDF files in .zip description | | | | |
| | Document Description | | Start | End | |
| | Amendment/Req. Reconsideration-After Non-Final Reject | | 1 | 1 | |
| | Specification | | 2 | 2 | |
| | Amendment Copy Claims/Response to Suggested Claims | | 3 | 9 | |
| | Applicant Arguments/Remarks Made in an Amendment | | 10 | 13 | |
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| 2 | Extension of Time | 07965_0150_00000_Extension_of_Time.pdf | 26593 09a587c2133e07f4b0deea5e487d94f8a59be6e4 | no | 1 |
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| 3 | Fee Worksheet (SB06) | fee-info.pdf | 30076 8b9377386045f1eb4874e5767774d60e693a1cc8 | no | 2 |
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| Total Files Size (in bytes): | | | 481958 | | |
| <p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p> | | | | | |

CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC

PTO/SB/06 (07-06)

Approved for use through 1/31/2007. OMB 0651-0032

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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|---|--|--|--|--|---|--|----------------------------------|--|---------------------------------------|--|
| PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875 | | | | | Application or Docket Number 12/802,483 | | Filing Date 06/07/2010 | | <input type="checkbox"/> To be Mailed | |
|---|--|--|--|--|---|--|----------------------------------|--|---------------------------------------|--|

| APPLICATION AS FILED – PART I | | | | | OTHER THAN SMALL ENTITY | | | | |
|--|--------------|--------------|---|---------------------------------------|-------------------------|----------|-----------|--------------|--|
| (Column 1) | | (Column 2) | | SMALL ENTITY <input type="checkbox"/> | | OR | | SMALL ENTITY | |
| FOR | NUMBER FILED | NUMBER EXTRA | RATE (\$) | FEE (\$) | RATE (\$) | FEE (\$) | RATE (\$) | FEE (\$) | |
| <input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), or (c)) | N/A | N/A | N/A | | N/A | | N/A | | |
| <input type="checkbox"/> SEARCH FEE (37 CFR 1.16(k), (l), or (m)) | N/A | N/A | N/A | | N/A | | N/A | | |
| <input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(o), (p), or (q)) | N/A | N/A | N/A | | N/A | | N/A | | |
| TOTAL CLAIMS (37 CFR 1.16(i)) | minus 20 = | * | X \$ | = | OR | X \$ | = | | |
| INDEPENDENT CLAIMS (37 CFR 1.16(h)) | minus 3 = | * | X \$ | = | OR | X \$ | = | | |
| <input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s)) | | | If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s). | | | | | | |
| <input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j)) | | | | | | | | | |
| * If the difference in column 1 is less than zero, enter "0" in column 2. | | | TOTAL | | | TOTAL | | | |

| APPLICATION AS AMENDED – PART II | | | | | OTHER THAN SMALL ENTITY | | | | | | |
|--|------------|----------------------------------|------------------------------------|---------------|-------------------------|---------------------|-----------|---------------------|---|--------------|--|
| (Column 1) | | (Column 2) | | (Column 3) | | SMALL ENTITY | | OR | | SMALL ENTITY | |
| AMENDMENT | 05/02/2013 | CLAIMS REMAINING AFTER AMENDMENT | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA | RATE (\$) | ADDITIONAL FEE (\$) | RATE (\$) | ADDITIONAL FEE (\$) | | | |
| Total (37 CFR 1.16(i)) | * | 23 | Minus | ** 23 | = | 0 | OR | X \$80= | 0 | | |
| Independent (37 CFR 1.16(h)) | * | 4 | Minus | ***4 | = | 0 | OR | X \$420= | 0 | | |
| <input type="checkbox"/> Application Size Fee (37 CFR 1.16(s)) | | | | | | | | | | | |
| <input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | | | | | | | | |
| | | | | | TOTAL ADD'L FEE | | OR | TOTAL ADD'L FEE | 0 | | |

| (Column 1) | | (Column 2) | | (Column 3) | | SMALL ENTITY | | OR | | SMALL ENTITY | |
|--|---|----------------------------------|------------------------------------|---------------|-----------------|---------------------|-----------|---------------------|---|--------------|--|
| AMENDMENT | | CLAIMS REMAINING AFTER AMENDMENT | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA | RATE (\$) | ADDITIONAL FEE (\$) | RATE (\$) | ADDITIONAL FEE (\$) | | | |
| Total (37 CFR 1.16(i)) | * | | Minus | ** | = | | OR | X \$ | = | | |
| Independent (37 CFR 1.16(h)) | * | | Minus | *** | = | | OR | X \$ | = | | |
| <input type="checkbox"/> Application Size Fee (37 CFR 1.16(s)) | | | | | | | | | | | |
| <input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | | | | | | | | |
| | | | | | TOTAL ADD'L FEE | | OR | TOTAL ADD'L FEE | | | |

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Legal Instrument Examiner:
/JAMES ELLIOTT/

CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC



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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|----------------------------------|------------------------|
| 12/802,483 | 06/07/2010 | David J. Mailhot | 07965.0150-00000 | 9389 |
| 22852 7590 11/02/2012 FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP 901 NEW YORK AVENUE, NW WASHINGTON, DC 20001-4413 | | | EXAMINER FIORELLO, BENJAMIN F | |
| | | | ART UNIT 3672 | PAPER NUMBER |
| | | | MAIL DATE 11/02/2012 | DELIVERY MODE PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 12/802,483 | MAILHOT ET AL. | |
| | Examiner | Art Unit | |
| | BENJAMIN FIORELLO | 3672 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 20 August 2010.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.

4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5) ☒ Claim(s) 1-15 and 17-24 is/are pending in the application.

5a) Of the above claim(s) 20-24 is/are withdrawn from consideration.

6) ☐ Claim(s) ____ is/are allowed.

7) ☒ Claim(s) 1-14, 17, 19 is/are rejected.

8) ☒ Claim(s) 15 and 18 is/are objected to.

9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

10) ☒ The specification is objected to by the Examiner.

11) ☒ The drawing(s) filed on 07 June 2010 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date ____ | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____ 5) <input type="checkbox"/> Notice of Informal Patent Application 6) <input type="checkbox"/> Other: ____ |
|--|--|

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DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-15 and 17-19 in the reply filed on 08/20/2012 is acknowledged.

Information Disclosure Statement

2. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: "34". Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top

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margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities: the brief description of drawings states "Fig 5(a) through 5(e)", however the drawings portray drawings 5(a) through 5(f).

Appropriate correction is required.

Claim Objections

5. Claim 7 is objected to because of the following informalities: it appears "aboe" should state "above". Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-12 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard to claim 1, in line 16, it is unclear what "it" is referring to.

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With regard to claim 6, line 3, it is unclear what applicant is intending to claim by “each sub-corrugation”. It is unclear if applicant is referring to the valley sub-corrugations or crest sub-corrugations. Furthermore, in line 4, it is unclear what applicant is referring to by the term “it”.

With regard to claims 14 and 17, it is unclear what applicant is attempting to claim by the phrase “in the same sense”.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 1, 13-14, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fouss et al. (4,360,042) in view of Moore, Jr. et al. (2005/0111915).

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With regard to claims 1, 13, and 19, Fouss discloses a chamber comprising:
opposing side bases (14,16) running generally parallel to a chamber length axis
(fig. 1), for supporting the chamber on soil during use;
a chamber top (fig. 1);
sidewalls (10,12) running upwardly and inwardly from opposing side bases to the
chamber top (fig. 1), wherein the combination of sidewalls and top form an arch curve
which defines an arch shape cross section (fig. 1);
a plurality of alternating crest (26) corrugations and valley (28) corrugations
running transverse to the length of the chamber along the arch curve of the chamber
(figs. 1-2 and 4-5);
and a plurality of crest sub-corrugations (40, see figs. 4-5), running upwardly
from the base and along a portion of the arch-curve of a crest corrugation (figs. 1-2, 4-
5), each sub-corrugation having a height less than the local height of the crest
corrugation with which it is associated (fig. 4-5); each crest sub-corrugation terminating
at an elevation lower than the top of the chamber (fig. 1).

Fouss fails to disclose wherein the crest corrugations decrease in width with
elevation from the base and the valley corrugations increase in width with elevation from
the base, as width is measured in a direction parallel to the chamber length axis.

Moore discloses a chamber wherein the crest corrugations (24) decrease in
width with elevation from the base (fig. 1) and the valley corrugations (22) increase in
width with elevation from the base, as width is measured in a direction parallel to the
chamber length axis (fig. 1).

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It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Fouss and have the crest decrease width with elevation from the base and the valleys increase in width as taught by Moore in order to further strengthen the chamber at the base of the chamber.

With regard to claim 14, Fouss further discloses the width and depth of each sub-corrugation change along part or all of the length of the sub-corrugation in the same sense as does the width of the corrugation with which the sub-corrugation is associated (fig. 1).

Allowable Subject Matter

11. Claims 2-12 and 17 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

12. Claims 15 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTO-892.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to BENJAMIN FIORELLO whose telephone number is (571)270-7012. The examiner can normally be reached on Monday to Friday from 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bagnell can be reached on (571)272-6999. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BENJAMIN FIORELLO/
Examiner, Art Unit 3672

BF
10/31/2012

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CULTEC, INC. v. STORMTECH LLC

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|-----------------------------------|---------------------------------------|--|--|-------------|
| Notice of References Cited | Application/Control No. 12/802,483 | | Applicant(s)/Patent Under Reexamination MAILHOT ET AL. | |
| | Examiner BENJAMIN FIORELLO | | Art Unit 3672 | Page 1 of 1 |

U.S. PATENT DOCUMENTS

| * | | Document Number Country Code-Number-Kind Code | Date MM-YYYY | Name | Classification |
|---|---|--|-----------------|----------------------|----------------|
| * | A | US-3,789,615 A | 02-1974 | Maroschak, Ernest J. | 405/49 |
| * | B | US-4,360,042 A | 11-1982 | Fouss et al. | 138/119 |
| * | C | US-4,523,613 A | 06-1985 | Fouss et al. | 138/121 |
| * | D | US-4,962,622 A | 10-1990 | Albrecht et al. | 52/630 |
| * | E | US-5,375,943 A | 12-1994 | McCavour et al. | 405/126 |
| * | F | US-2005/0111915 A1 | 05-2005 | Moore et al. | 405/046 |
| * | G | US-2008/0240859 A1 | 10-2008 | Sipaila, Jonas Z. | 405/46 |
| * | H | US-2009/0067929 A1 | 03-2009 | Brochu et al. | 405/49 |
| * | I | US-2011/0200391 A1 | 08-2011 | Mailhot et al. | 405/42 |
| | J | US- | | | |
| | K | US- | | | |
| | L | US- | | | |
| | M | US- | | | |

FOREIGN PATENT DOCUMENTS

| * | | Document Number Country Code-Number-Kind Code | Date MM-YYYY | Country | Name | Classification |
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NON-PATENT DOCUMENTS

| * | | Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages) |
|---|---|---|
| | U | |
| | V | |
| | W | |
| | X | |

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

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CULTEC, INC. v. STORMTECH LLC

EAST Search History

EAST Search History

EAST Search History (Prior Art)

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|-------|---------|---|---|------------------|---------|---------------------|
| S1 | 1109 | 405/42,43,46,49.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 10:16 |
| S2 | 9 | "5716163".pn. "5017041".pn. "5511903".pn. "7052209".pn. "7118306".pn. "7500805".pn. "7306399".pn. "7237981".pn. "7491015".pn. | US-PGPUB; USPAT | OR | OFF | 2012/06/05 12:01 |
| S3 | 807 | 405/50,124,126.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 12:05 |
| S4 | 683 | S3 not S1 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 12:05 |
| S5 | 1068313 | (david near2 mailhot).inv. (nimish near2 gandhi)".inv. (timothy near2 McGrath).inv. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 12:33 |
| S6 | 53 | (david near2 mailhot).inv. (nimish near2 gandhi).inv. (timothy near2 McGrath).inv. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 12:33 |
| S7 | 3 | ("5072972" "D538882").PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 12:35 |
| S8 | 4 | (stormtech).as. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 12:36 |
| S9 | 104 | (advanced near2 drainage near2 systems).as. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 12:37 |
| S10 | 2358952 | (culvert chamber) | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 14:12 |
| S11 | 216891 | (corrugat\$4) | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 14:12 |
| S12 | 6038772 | (sidewalls base flange) | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 14:12 |

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CULTEC, INC. v. STORMTECH LLC

EAST Search History


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|-----|-----|--|---|----|-----|---------------------|
| S13 | 675 | ((sub secondary) with (corrugation\$4)) | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 14:13 |
| S14 | 76 | S10 and S11 and S12 and S13 | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 14:13 |
| S15 | 134 | 52/220.4.ccls. | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 14:16 |
| S16 | 141 | ("405" "52").clas. and ((crest peak) with corrugat\$4) and (valley with corrugat\$4) | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2012/06/05 14:24 |

EAST Search History (Interference)

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| | | |
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| <i>Search Notes</i>  | Application/Control No. 12802483 | Applicant(s)/Patent Under Reexamination MAILHOT ET AL. |
| | Examiner BENJAMIN FIORELLO | Art Unit 3672 |

| SEARCHED | | | |
|----------|------------------------------|------------|----------|
| Class | Subclass | Date | Examiner |
| 405 | 42, 43, 46, 49, 50, 124, 126 | 06/05/2012 | BF |
| 52 | 220.4 | 06/05/2012 | BF |

| SEARCH NOTES | | | |
|--------------------------|--|------------|----------|
| Search Notes | | Date | Examiner |
| East Text Search | | 06/05/2012 | BF |
| Inventor/Assignee Search | | 06/05/2012 | BF |

| INTERFERENCE SEARCH | | | |
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| SERIAL NUMBER | FILING or 371(c) DATE | CLASS | GROUP ART UNIT | ATTORNEY DOCKET NO. | | |
|--|---|--|-----------------------------------|---|-------------------------------|------------------------------------|
| 12/802,483 | 06/07/2010 | 405 | 3672 | 07965.0150-00000 | | |
| RULE | | | | | | |
| APPLICANTS David J. Mailhot, Coventry, CT; Nimish Gandhi, Wethersfield, CT; Timothy J. McGrath, Arlington, MA; | | | | | | |
| ** CONTINUING DATA ***** This appln claims benefit of 61/217,905 06/05/2009 | | | | | | |
| ** FOREIGN APPLICATIONS ***** | | | | | | |
| ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 06/21/2010 | | | | | | |
| Foreign Priority claimed <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No 35 USC 119(a-d) conditions met <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Verified and /BENJAMIN F FIORELLO/ Acknowledged Examiner's Signature | | <input type="checkbox"/> Met after Allowance BF Initials | STATE OR COUNTRY CT | SHEETS DRAWINGS 7 | TOTAL CLAIMS 23 | INDEPENDENT CLAIMS 4 |
| ADDRESS FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP 901 NEW YORK AVENUE, NW WASHINGTON, DC 20001-4413 UNITED STATES | | | | | | |
| TITLE Corrugated Stormwater chamber having sub-corrugations | | | | | | |
| FILING FEE RECEIVED 1596 | FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following: | | | <input type="checkbox"/> All Fees <input type="checkbox"/> 1.16 Fees (Filing) <input type="checkbox"/> 1.17 Fees (Processing Ext. of time) <input type="checkbox"/> 1.18 Fees (Issue) <input type="checkbox"/> Other _____ <input type="checkbox"/> Credit | | |

CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC

| | | |
|--|--|--|
| <i>Index of Claims</i>  | Application/Control No. 12802483 | Applicant(s)/Patent Under Reexamination MAILHOT ET AL. |
| | Examiner BENJAMIN FIORELLO | Art Unit 3672 |

| | | | | | | | |
|----------|-----------------|----------|-------------------|----------|---------------------|----------|-----------------|
| ✓ | Rejected | - | Cancelled | N | Non-Elected | A | Appeal |
| = | Allowed | ÷ | Restricted | I | Interference | O | Objected |

☐ Claims renumbered in the same order as presented by applicant
 ☐ CPA
 ☐ T.D.
 ☐ R.1.47

| CLAIM | | DATE | | | | | | | | |
|-------|----------|------------|--|--|--|--|--|--|--|--|
| Final | Original | 10/31/2012 | | | | | | | | |
| | 1 | ✓ | | | | | | | | |
| | 2 | ✓ | | | | | | | | |
| | 3 | ✓ | | | | | | | | |
| | 4 | ✓ | | | | | | | | |
| | 5 | ✓ | | | | | | | | |
| | 6 | ✓ | | | | | | | | |
| | 7 | ✓ | | | | | | | | |
| | 8 | ✓ | | | | | | | | |
| | 9 | ✓ | | | | | | | | |
| | 10 | ✓ | | | | | | | | |
| | 11 | ✓ | | | | | | | | |
| | 12 | ✓ | | | | | | | | |
| | 13 | ✓ | | | | | | | | |
| | 14 | ✓ | | | | | | | | |
| | 15 | O | | | | | | | | |
| | 16 | - | | | | | | | | |
| | 17 | ✓ | | | | | | | | |
| | 18 | O | | | | | | | | |
| | 19 | ✓ | | | | | | | | |
| | 20 | N | | | | | | | | |
| | 21 | N | | | | | | | | |
| | 22 | N | | | | | | | | |
| | 23 | N | | | | | | | | |
| | 24 | N | | | | | | | | |

PATENT
Customer No. 22,852
Attorney Docket No. 07965.0150-00000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)
)
David J. MAILHOT *et al.*) Group Art Unit: 3672
)
Application No.: 12/802,483) Examiner: Fiorello, Benjamin F.
)
Filed: June 7, 2010) Confirmation No.: 9389
)
For: CORRUGATED STORMWATER)
CHAMBER HAVING SUB-)
CORRUGATIONS)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

RESPONSE TO RESTRICTION REQUIREMENT

In a restriction requirement dated June 20, 2012, the Examiner required restriction under 35 U.S.C. § 121 between the claims covering a first species (claims 1-15 and 17-19) and an allegedly distinct species (claims 20-24). Applicant provisionally elects to prosecute the first species, including claims 1-15 and 17-19, covering a molded chamber. Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: August 20, 2012

By: /Christopher K. Agrawal/
Christopher K. Agrawal
Reg. No. 63,482

PATENT
Attorney Docket No. 07965.0150-00000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | |
|--------------------------------|---|---------------------------------|
| In re Application of: |) | |
| |) | |
| David J. MAILHOT <i>et al.</i> |) | Group Art Unit: 3672 |
| |) | |
| Application No.: 12/802,483 |) | Examiner: Fiorello, Benjamin F. |
| |) | |
| Filed: June 7, 2010 |) | Confirmation No.: 9389 |
| |) | |
| For: CORRUGATED STORMWATER |) | |
| CHAMBER HAVING SUB- |) | |
| CORRUGATIONS |) | |

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

PETITION FOR EXTENSION OF TIME

Applicant petitions for a one month extension of time to file a reply to the Office
Action of June 20, 2012. The required fee of \$150.00 is submitted electronically
herewith.

Please grant any additional extensions of time required to enter the attached
reply and charge any additional required fees to Deposit Account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: August 20, 2012

By: /Christopher K. Agrawal/
Christopher K. Agrawal
Reg. No. 63,482
(202) 408-4000

| Electronic Patent Application Fee Transmittal | | | | |
|---|---|----------|--------|----------------------|
| Application Number: | 12802483 | | | |
| Filing Date: | 07-Jun-2010 | | | |
| Title of Invention: | Corrugated Stormwater chamber having sub-corrugations | | | |
| First Named Inventor/Applicant Name: | David J. Mailhot | | | |
| Filer: | Christopher K. Agrawal/LaVonnia Brown | | | |
| Attorney Docket Number: | 07965.0150-00000 | | | |
| Filed as Large Entity | | | | |
| Utility under 35 USC 111(a) Filing Fees | | | | |
| Description | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
| Basic Filing: | | | | |
| Pages: | | | | |
| Claims: | | | | |
| Miscellaneous-Filing: | | | | |
| Petition: | | | | |
| Patent-Appeals-and-Interference: | | | | |
| Post-Allowance-and-Post-Issuance: | | | | |
| Extension-of-Time: | | | | |
| Extension - 1 month with \$0 paid | 1251 | 1 | 150 | 150 |

CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC

| Description | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
|-------------------|----------|----------|--------|----------------------|
| Miscellaneous: | | | | |
| Total in USD (\$) | | | | 150 |

| Electronic Acknowledgement Receipt | |
|---|---|
| EFS ID: | 13537516 |
| Application Number: | 12802483 |
| International Application Number: | |
| Confirmation Number: | 9389 |
| Title of Invention: | Corrugated Stormwater chamber having sub-corrugations |
| First Named Inventor/Applicant Name: | David J. Mailhot |
| Customer Number: | 22852 |
| Filer: | Christopher K. Agrawal/LaVonnia Brown |
| Filer Authorized By: | Christopher K. Agrawal |
| Attorney Docket Number: | 07965.0150-00000 |
| Receipt Date: | 20-AUG-2012 |
| Filing Date: | 07-JUN-2010 |
| Time Stamp: | 16:39:29 |
| Application Type: | Utility under 35 USC 111(a) |

Payment information:

| | |
|--|-------------|
| Submitted with Payment | yes |
| Payment Type | Credit Card |
| Payment was successfully received in RAM | \$ 150 |
| RAM confirmation Number | 3261 |
| Deposit Account | |
| Authorized User | |

File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|-----------------|----------------------|-----------|----------------------------------|------------------|------------------|
|-----------------|----------------------|-----------|----------------------------------|------------------|------------------|

CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC

| | | | | | |
|--|--|---|--|----|---|
| 1 | Response to Election / Restriction Filed | Response_To_Restriction_Requ irement.pdf | 34008 3dc7887a3107fa9f6557dc7384f9d6e69f26a3fb | no | 1 |
| Warnings: | | | | | |
| Information: | | | | | |
| 2 | Extension of Time | Petition_For_Extension_Of_Ti me.pdf | 29426 8c8f50d2bac12e80dff6f634cbe32b7d7bd6d7569 | no | 1 |
| Warnings: | | | | | |
| Information: | | | | | |
| 3 | Fee Worksheet (SB06) | fee-info.pdf | 30214 b20cd7ba390b736761d09fd78f2fb06dc350269d | no | 2 |
| Warnings: | | | | | |
| Information: | | | | | |
| Total Files Size (in bytes): | | | 93648 | | |
| <p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p> | | | | | |

CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|----------------------------------|------------------------|
| 12/802,483 | 06/07/2010 | David J. Mailhot | 07965.0150-00000 | 9389 |
| 22852 7590 06/20/2012 FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP 901 NEW YORK AVENUE, NW WASHINGTON, DC 20001-4413 | | | EXAMINER FIORELLO, BENJAMIN F | |
| | | | ART UNIT 3672 | PAPER NUMBER |
| | | | MAIL DATE 06/20/2012 | DELIVERY MODE PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | | |
|------------------------------|------------------------|--|---------------------|--|
| Office Action Summary | Application No. | | Applicant(s) | |
| | 12/802,483 | | MAILHOT ET AL. | |
| | Examiner | | Art Unit | |
| | BENJAMIN FIORELLO | | 3672 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 07 June 2010.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.

4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5) ☒ Claim(s) 1-15 and 17-24 is/are pending in the application.

5a) Of the above claim(s) ____ is/are withdrawn from consideration.

6) ☐ Claim(s) ____ is/are allowed.

7) ☐ Claim(s) ____ is/are rejected.

8) ☐ Claim(s) ____ is/are objected to.

9) ☒ Claim(s) 1-15 and 17-24 are subject to restriction and/or election requirement.

Application Papers

10) ☐ The specification is objected to by the Examiner.

11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|---|--|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date ____ | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____ 5) <input type="checkbox"/> Notice of Informal Patent Application 6) <input type="checkbox"/> Other: ____ |
|---|--|

Application/Control Number: 12/802,483
Art Unit: 3672

Page 2

DETAILED ACTION

Election/Restrictions

1. This application contains claims directed to the following patentably distinct species: A molded chamber (claims 1-15 and 17-19) and an end cap (claims 20-24). It should be noted that claim 16 appears to have been mistakenly skipped. The species are independent or distinct because the chambers claims limitations of opposing bases running generally parallel not required by the end cap while the end cap claims limitations of an attachment end not required by the molded chamber. In addition, these species are not obvious variants of each other based on the current record.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species, or a single grouping of patentably indistinct species, for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, no claims appear to be generic.

There is a search and/or examination burden for the patentably distinct species as set forth above because at least the following reason(s) apply:

The species are classified in different subclasses.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or a grouping of patentably indistinct species to be examined even though the requirement may be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected species or grouping of patentably indistinct species, including any claims subsequently added. An argument

Application/Control Number: 12/802,483
Art Unit: 3672

Page 3

that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

The election may be made with or without traverse. To preserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the election of species requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected species or grouping of patentably indistinct species.

Should applicant traverse on the ground that the species, or groupings of patentably indistinct species from which election is required, are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing them to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the species unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other species.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141.

Application/Control Number: 12/802,483
Art Unit: 3672

Page 4

2. A telephone call was made to Christopher Agrawal on 06/13/2012 to request an oral election to the above restriction requirement, but did not result in an election being made.

3. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BENJAMIN FIORELLO whose telephone number is (571)270-7012. The examiner can normally be reached on Monday to Friday from 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bagnell can be reached on (571)272-6999. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Application/Control Number: 12/802,483
Art Unit: 3672

Page 5

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BENJAMIN FIORELLO/
Examiner, Art Unit 3672

BF
06/18/2012

CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC



UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NUMBER | FILING OR 371(C) DATE | FIRST NAMED APPLICANT | ATTY. DOCKET NO./TITLE |
|--------------------|-----------------------|-----------------------|------------------------|
| 12/802,483 | 06/07/2010 | David J. Mailhot | 07965.0150-00000 |

CONFIRMATION NO. 9389

POA ACCEPTANCE LETTER

22852
FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER
LLP
901 NEW YORK AVENUE, NW
WASHINGTON, DC 20001-4413



Date Mailed: 05/17/2011

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 05/06/2011.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/mnguyen/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

PATENT
Customer No. 22,852
Attorney Docket No. 07965.0150-00000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | |
|-----------------------------|---|----------------------------|
| In re Application of: |) | |
| |) | |
| David MAILHOT et al. |) | Group Art Unit: 3672 |
| |) | |
| Application No.: 12/802,483 |) | Examiner: Not yet assigned |
| |) | |
| Filed: June 7, 2010 |) | Confirmation No.: 9389 |
| |) | |
| For: CORRUGATED STORMWATER |) | |
| CHAMBER HAVING SUB- |) | |
| CORRUGATIONS |) | |

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

**REVOCATION OF POWER OF ATTORNEY
STATEMENT UNDER 37 C.F.R. § 3.73(b)
AND GRANT OF NEW POWER OF ATTORNEY**

The undersigned, a representative authorized to sign on behalf of the assignee owning all of the interest in this patent application, hereby revokes all previous powers of attorney or authorization of agent granted in this application before the date of execution hereof.

As required by 37 C.F.R. § 3.73(b), the undersigned verifies that Stormtech LLC is the assignee of the entire right, title, and interest in the patent application identified above by virtue of an assignment from the inventor recorded in the U.S. Patent and Trademark Office at Reel 024802, Frame 0653.

The undersigned representative of the Assignee hereby grants its power of attorney to the patent practitioners associated with **FINNEGAN, HENDERSON,**

FARABOW, GARRETT & DUNNER, L.L.P., Customer Number 22,852, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith, and to receive the Letters Patent.

Please send all future correspondence concerning this application to Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P., Customer No. 22,852.

The undersigned representative is authorized to act on behalf of Stormtech LLC.

Dated: 4/26/11

By: 
Jeffrey J. Bresenberger
Director of New Product and Process Development
Advanced Drainage Systems, Inc., on behalf of
Stormtech LLC

| Electronic Acknowledgement Receipt | |
|---|---|
| EFS ID: | 10037496 |
| Application Number: | 12802483 |
| International Application Number: | |
| Confirmation Number: | 9389 |
| Title of Invention: | Corrugated Stormwater chamber having sub-corrugations |
| First Named Inventor/Applicant Name: | David J. Mailhot |
| Customer Number: | 28152 |
| Filer: | Christopher K. Agrawal/LaVonnia Brown |
| Filer Authorized By: | Christopher K. Agrawal |
| Attorney Docket Number: | NN2 |
| Receipt Date: | 06-MAY-2011 |
| Filing Date: | 07-JUN-2010 |
| Time Stamp: | 14:25:04 |
| Application Type: | Utility under 35 USC 111(a) |

Payment information:

| | |
|------------------------|----|
| Submitted with Payment | no |
|------------------------|----|

File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|-----------------|----------------------|--|--|------------------|------------------|
| 1 | Power of Attorney | Revocation_Of_POA_And_Grant_Of_New_POA.pdf | 54834 0b00422112a9cacf2b8a98d66e43145f1d99dfa | no | 2 |

Warnings:

Information:

| | |
|--|-------|
| Total Files Size (in bytes): | 54834 |
| <p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p> | |

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| APPLICATION NUMBER | FILING or 371(c) DATE | GRP ART UNIT | FIL FEE REC'D | ATTY. DOCKET NO | TOT CLAIMS | IND CLAIMS |
|-----------------------|--------------------------|-----------------|---------------|-----------------|------------|------------|
| 12/802,483 | 06/07/2010 | 3672 | 1596 | NN2 | 23 | 4 |

CONFIRMATION NO. 9389

UPDATED FILING RECEIPT



OC00000043417941

28152
CHARLES G. NESSLER
P.O. BOX H
CHESTER, CT 06412

Date Mailed: 09/14/2010

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

David J. Mailhot, Coventry, CT;
Nimish Gandhi, Wethersfield, CT;
Timothy J. McGrath, Arlington, MA;

Assignment For Published Patent Application

Stormtech, LLC, Wethersfield, CT

Power of Attorney: None

Domestic Priority data as claimed by applicant

This appln claims benefit of 61/217,905 06/05/2009

Foreign Applications

If Required, Foreign Filing License Granted: 06/21/2010

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/802,483**

Projected Publication Date: Request for Non-Publication Acknowledged

Non-Publication Request: Yes

Early Publication Request: No

Title

Corrugated Stormwater chamber having sub-corrugations

Preliminary Class

405

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as

set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

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NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).



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| APPLICATION NUMBER | FILING OR 371(C) DATE | FIRST NAMED APPLICANT | ATTY. DOCKET NO./TITLE |
|--------------------|-----------------------|-----------------------|------------------------|
| 12/802,483 | 06/07/2010 | David Mailhot | 2834 |

CONFIRMATION NO. 9389

FORMALITIES LETTER

28152
CHARLES G. NESSLER
P.O. BOX H
CHESTER, CT 06412



Date Mailed: 06/22/2010

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The oath or declaration is missing.

A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.

Note: If a petition under 37 CFR 1.47 is being filed, an oath or declaration in compliance with 37 CFR 1.63 signed by all available joint inventors, or if no inventor is available by a party with sufficient proprietary interest, is required.

The application is informal since it does not comply with the regulations for the reason(s) indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- Replacement drawings in compliance with 37 CFR 1.84 and 37 CFR 1.121(d) are required. The drawings submitted are not acceptable because:
 - The drawings must be reasonably free from erasures and must be free from alterations, overwriting, interlineations, folds, and copy marks. See Figure(s) 1-12.

Applicant is cautioned that correction of the above items may cause the specification and drawings page count to exceed 100 pages. If the specification and drawings exceed 100 pages, applicant will need to submit the required application size fee.

The applicant needs to satisfy supplemental fees problems indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.16(f) of **\$130** for a non-small entity, must be submitted with the missing items identified in this notice.

page 1 of 2

08/25/2010 CCHAU1 00000025 12802483

01 FC:1051

130.00 0P

SUMMARY OF FEES DUE:

Total additional fee(s) required for this application is \$130 for a non-small entity
• \$130 Surcharge.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
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Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web.
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For more information about EFS-Web please call the USPTO Electronic Business Center at 1-866-217-9197 or
visit our website at <http://www.uspto.gov/ebc>.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

/jmilani/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Re: Application of David Mailhot et al.

Date: August 23, 2010

Serial No. 12/802,483

Examiner:

Filed: June 7, 2010

Art Group: 3672

For: Stormwater chamber having strengthened corrugations

Atty Docket No. NN2

RESPONSE TO NOTICE OF MISSING PARTS
&
TRANSMITTAL OF DECLARATION

Response to the notice dated June 22, 2010, applicants enclose

- (a) the signed declaration, comprising four sheets;
- (b) seven sheets of replacement drawing; and
- (c) a check for \$130.

Please charge any deficiency to deposit account No. 14 0711 with a reference number of 2834

In the drawings, applicants have made the following change: In Fig. 2, an artifact number 4 at the top right has been removed.

Respectfully submitted,
DAVID MAILHOT ET AL.

By C. G. Nessler
Their Attorney

Charles G. Nessler Reg. No. 27825
Box H
Chester, CT 06412
(860) 526 9149 Fax (860) 526 9149

I hereby certify that this correspondence is being deposited with the
United States Postal Service as first class mail in an envelope
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C. G. Nessler
C. G. Nessler

CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC

Doc Code: Oath

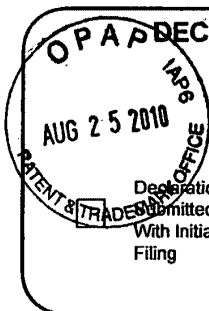
Document Description: Oath or declaration filed

PTO/SB/01 (04-09)

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| | | |
|--|------------------------|----------------|
|  Declaration Submitted With Initial Filing OR <input checked="" type="checkbox"/> Declaration Submitted After Initial Filing (surcharge (37 CFR 1.16(f) required)) | Attorney Docket Number | 2834 |
| | First Named Inventor | MAILHOT, DAVID |
| | COMPLETE IF KNOWN | |
| | Application Number | 12/802483 |
| | Filing Date | 06/07/2010 |
| Art Unit | | |
| Examiner Name | | |

I hereby declare that: (1) Each inventor's residence, mailing address, and citizenship are as stated below next to their name; and (2) I believe the inventor(s) named below to be the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought on the invention titled:

CORRUGATED STORMWATER CHAMBER HAVING
SUB-CORRUGATIONS

(Title of the Invention)

the application of which

☐ is attached hereto

OR

☒ was filed on (MM/DD/YYYY) 06/07/2010 as United States Application Number or PCT International

Application Number 12-802483 and was amended on (MM/DD/YYYY) (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified application, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

Authorization To Permit Access To Application by Participating Offices

☐ If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the above-identified patent application is filed access to the above-identified patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the above-identified patent application is filed to have access to the above-identified patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the above-identified patent application with respect to: 1) the above-identified patent application-as-filed; 2) any foreign application to which the above-identified patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the above-identified patent application; and 3) any U.S. application-as-filed from which benefit is sought in the above-identified patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing the Authorization to Permit Access to Application by Participating Offices.

[Page 1 of 4]

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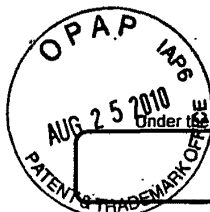
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DECLARATION — Utility or Design Patent Application

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| Name | | | | |
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| <p>WARNING:</p> <p>Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available. Petitioner/applicant is advised that documents which form the record of a patent application (such as the PTO/SB/01) are placed into the Privacy Act system of records DEPARTMENT OF COMMERCE, COMMERCE-PAT-7, System name: <i>Patent Application Files</i>. Documents not retained in an application file (such as the PTO-2038) are placed into the Privacy Act system of COMMERCE/PAT-TM-10, System name: <i>Deposit Accounts and Electronic Funds Transfer Profiles</i>.</p> <p>I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.</p> | | | | |
| NAME OF SOLE OR FIRST INVENTOR: | | <input type="checkbox"/> A petition has been filed for this unsigned inventor | | |
| Given Name (first and middle (if any)) | | Family Name or Surname | | |
| DAVID J. | | MAILHOT | | |
| Inventor's Signature | | Date | | |
| <i>David J. Mailhot</i> | | July 6, 2010 | | |
| Residence: City | State | Country | Citizenship | |
| COVENTRY | CT | US | US | |
| Mailing Address | | | | |
| 120 GRANT HILL RD. | | | | |
| City | State | Zip | Country | |
| COVENTRY | CT | 06238 | US | |
| <input checked="" type="checkbox"/> Additional inventors or a legal representative are being named on the <u>2</u> supplemental sheet(s) PTO/SB/02A or 02LR attached hereto | | | | |

(Page 3 of 3) 2/4



PTO/SB/02A (07-07)

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| DECLARATION | ADDITIONAL INVENTOR(S) Supplemental Sheet |
| | Page <u>1</u> of <u>2</u> |

| | | | |
|--|-------------|---|-------------------|
| Name of Additional Joint Inventor, if any: | | <input type="checkbox"/> A petition has been filed for this unsigned inventor | |
| Given Name (first and middle (if any)) | | Family Name or Surname | |
| NIMISH | | GANDHI | |
| Inventor's Signature <i>[Signature]</i> | | Date | |
| Residence: City WETHERSFIELD | State CT | Country US | Citizenship US |
| Mailing Address 67 VILLAGE LA. | | | |
| City WETHERSFIELD | State CT | Zip 06109 | Country U.S |
| Name of Additional Joint Inventor, if any: | | <input type="checkbox"/> A petition has been filed for this unsigned inventor | |
| Given Name (first and middle (if any)) | | Family Name or Surname | |
| TIMOTHY J. | | MCGRATH | |
| Inventor's Signature | | Date | |
| Residence: City ARLINGTON | State MA | Country US | Citizenship US |
| Mailing Address 99 BEVERLY RD | | | |
| City ARLINGTON | State MA | Zip 02474 | Country US |
| Name of Additional Joint Inventor, if any: | | <input type="checkbox"/> A petition has been filed for this unsigned inventor | |
| Given Name (first and middle (if any)) | | Family Name or Surname | |
| | | | |
| Inventor's Signature | | Date | |
| Residence: City | State | Country | Citizenship |
| Mailing Address | | | |
| City | State | Zip | Country |

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| Page <u>2</u> of <u>2</u> | |

| | | | |
|--|-------------|---|-------------------|
| Name of Additional Joint Inventor, if any: | | <input type="checkbox"/> A petition has been filed for this unsigned inventor | |
| Given Name (first and middle (if any)) | | Family Name or Surname | |
| NIMISH | | GANDHI | |
| Inventor's Signature | | Date | |
| Residence: City WETHERSFIELD | State CT | Country US | Citizenship US |
| Mailing Address 67 PHILLIPS LA. | | | |
| City WETHERSFIELD | State CT | Zip 06109 | Country US |
| Name of Additional Joint Inventor, if any: | | <input type="checkbox"/> A petition has been filed for this unsigned inventor | |
| Given Name (first and middle (if any)) | | Family Name or Surname | |
| TIMOTHY J. | | MCGRATH | |
| Inventor's Signature  | | Date 19 July '10 | |
| Residence: City ARLINGTON | State MA | Country 0 | Citizenship US |
| Mailing Address 99 BEVERLY RD. | | | |
| City ARLINGTON | State MA | Zip 02474 | Country US |
| Name of Additional Joint Inventor, if any: | | <input type="checkbox"/> A petition has been filed for this unsigned inventor | |
| Given Name (first and middle (if any)) | | Family Name or Surname | |
| | | | |
| Inventor's Signature | | Date | |
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| Mailing Address | | | |
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1/7

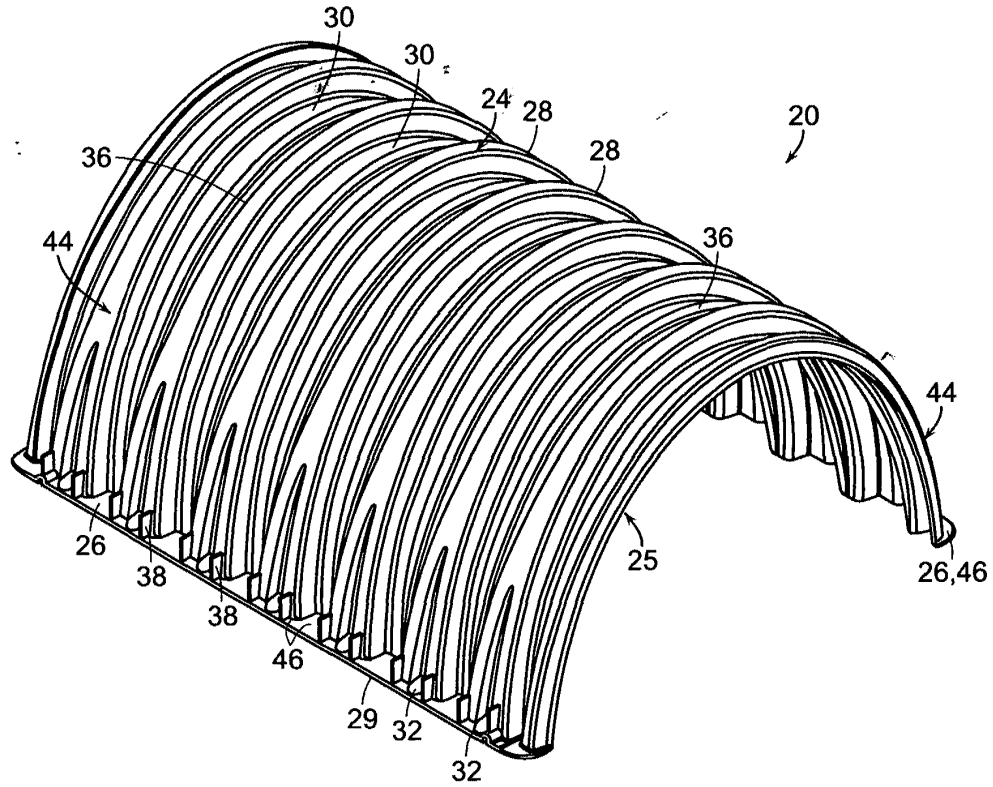


FIG. 1

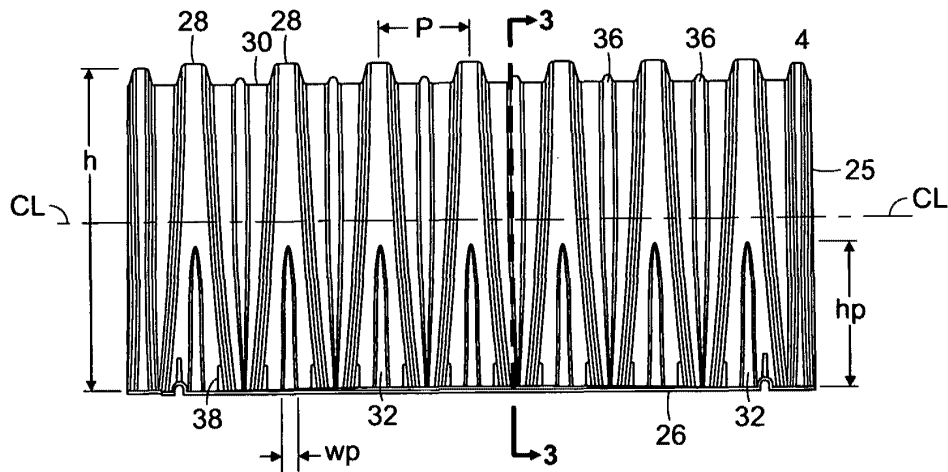


FIG. 2

2/7

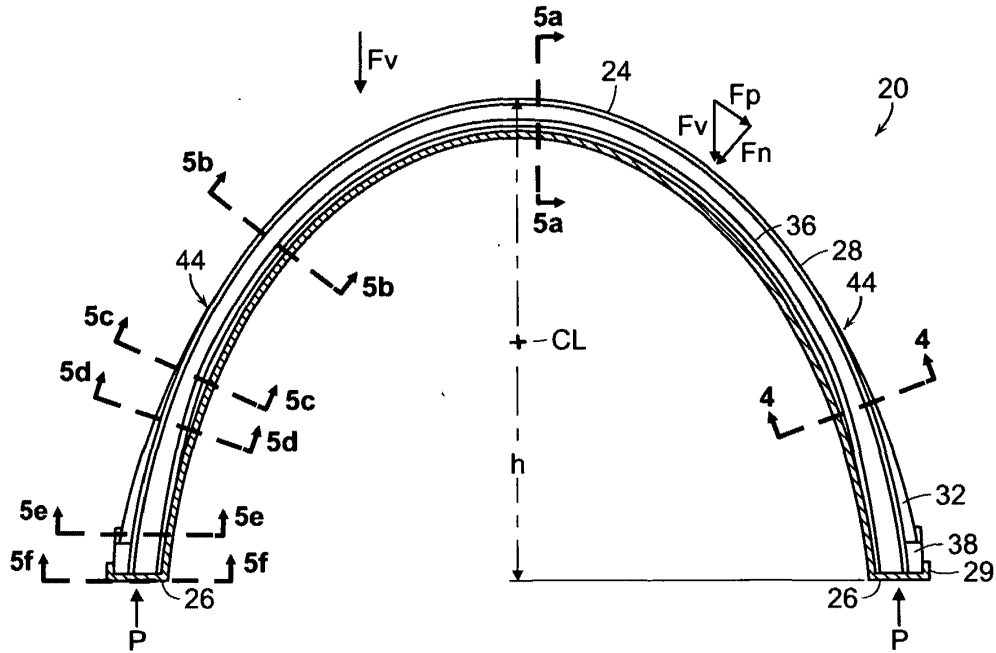


FIG. 3

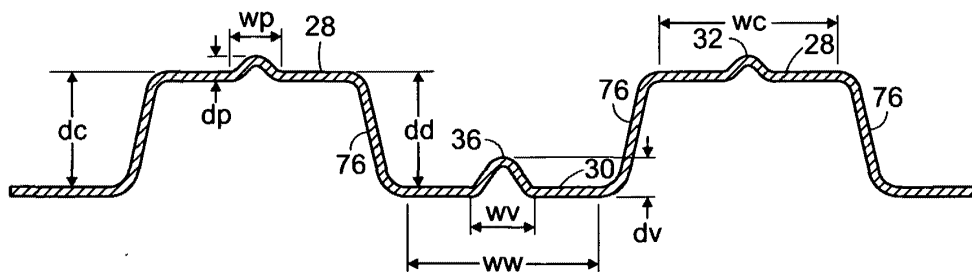
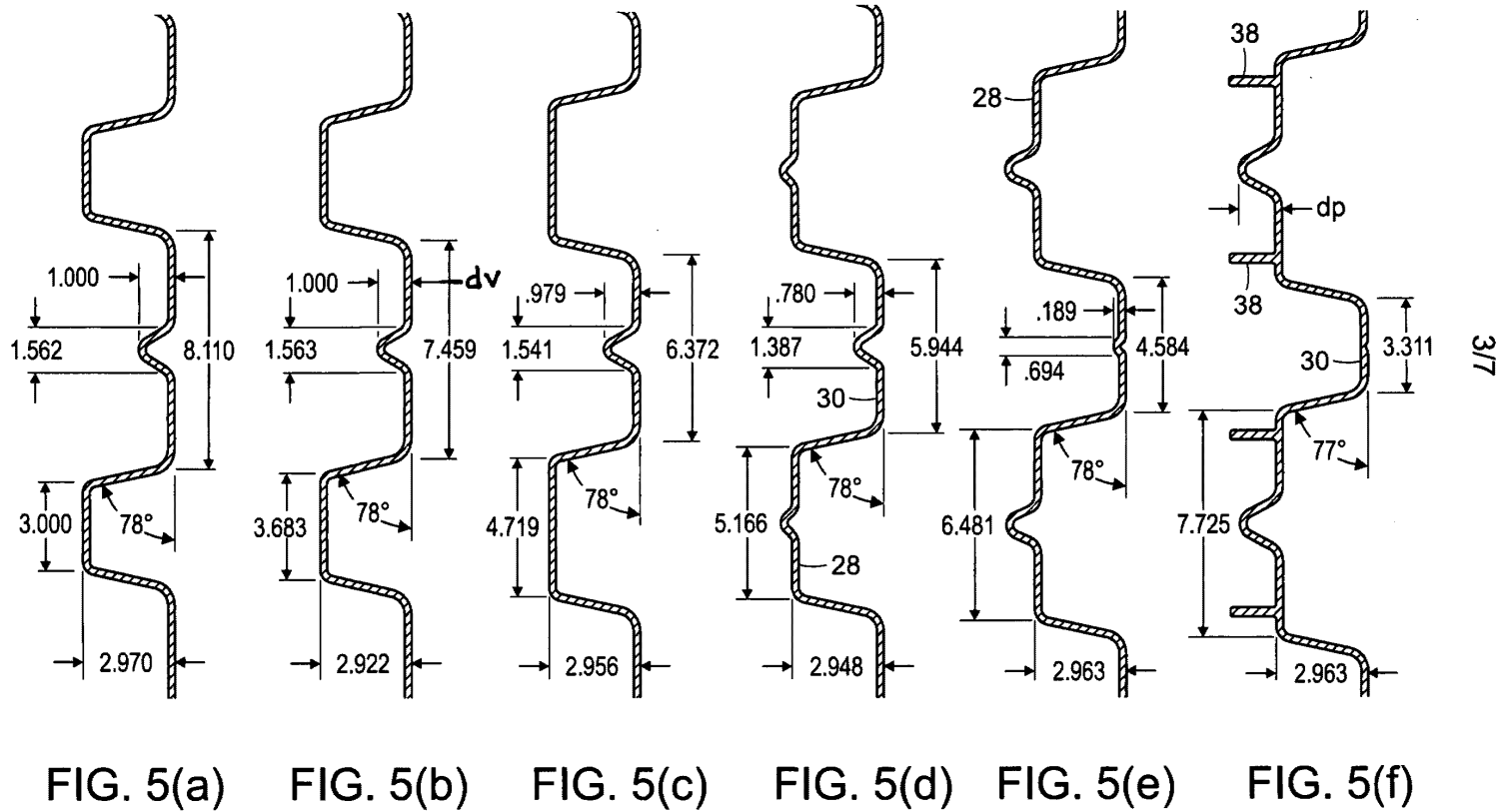


FIG. 4



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REPLACEMENT SHEET SN 12/802/483 MAILHOT ET AL

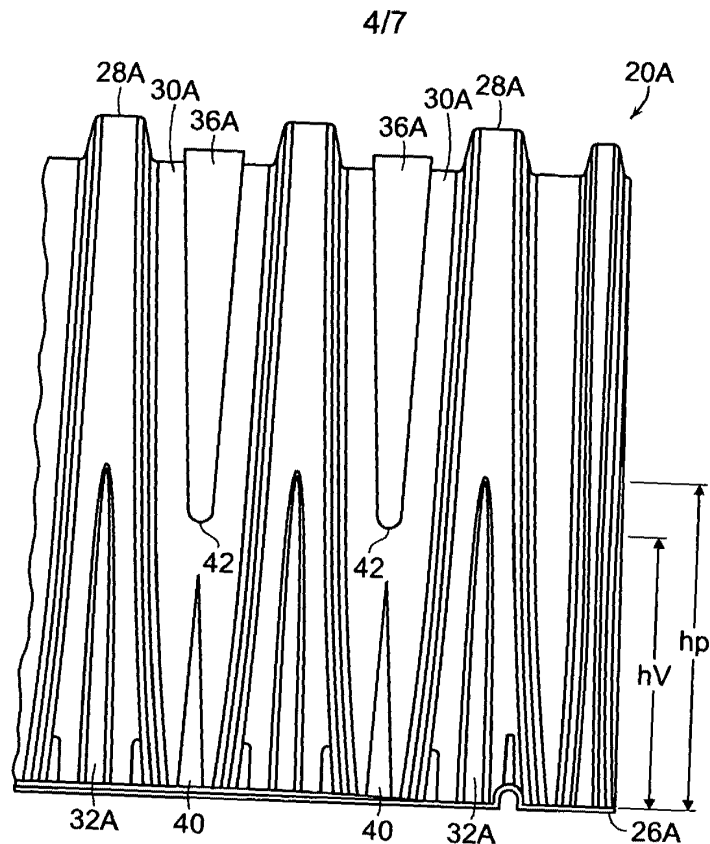


FIG. 6

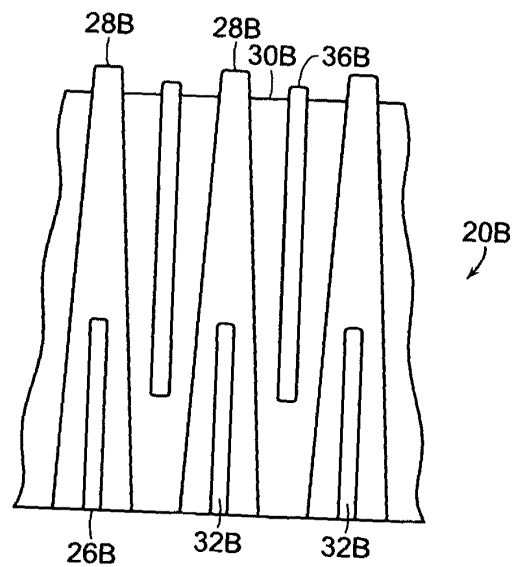


FIG. 7

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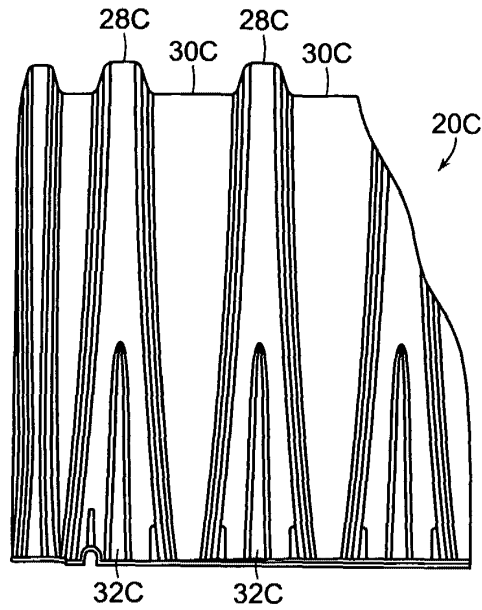


FIG. 8

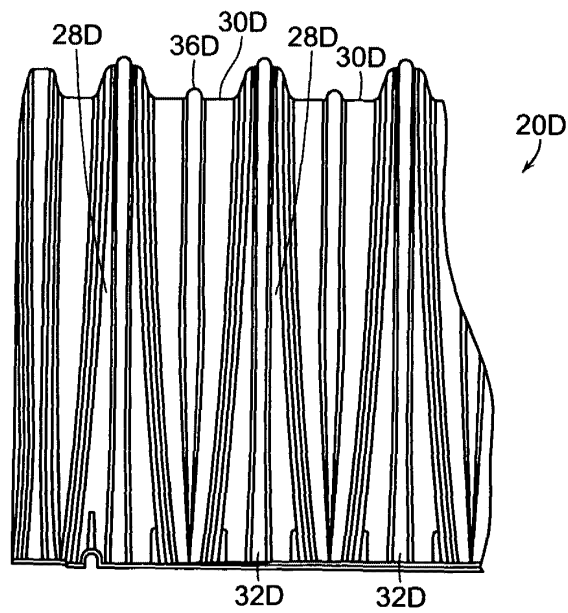


FIG. 9

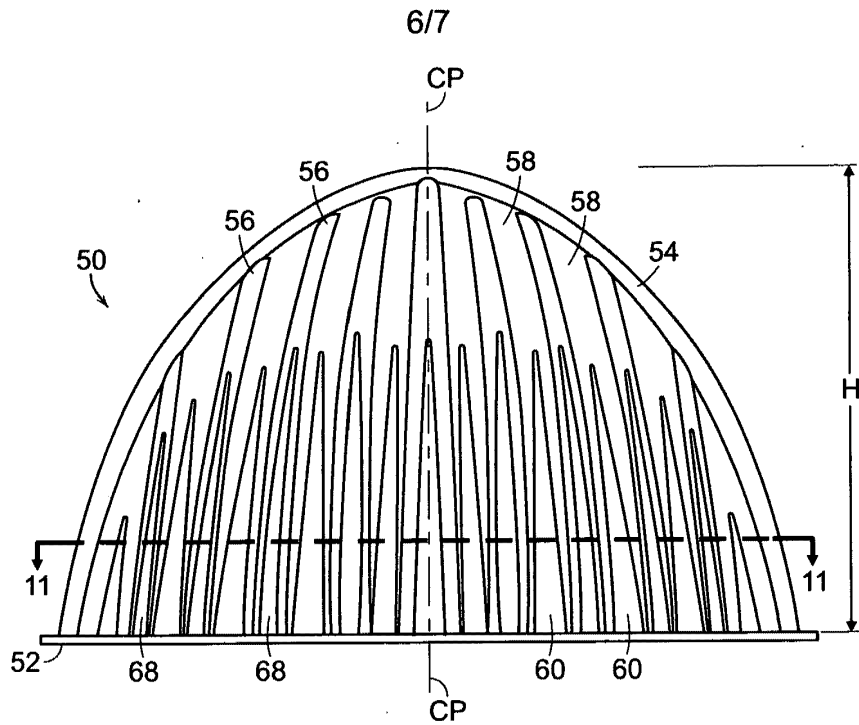


FIG. 10

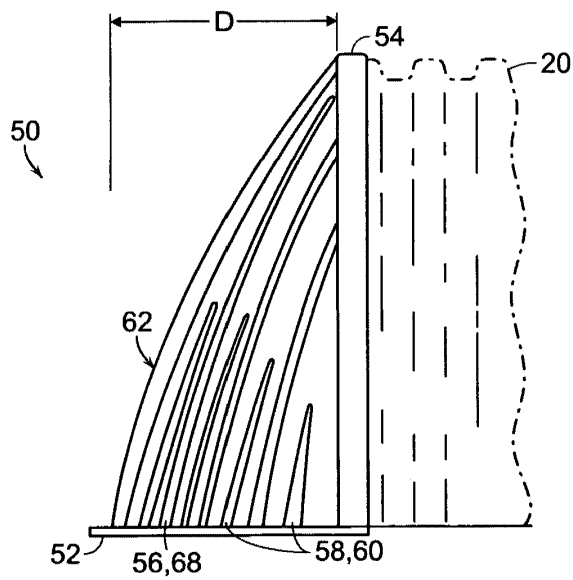


FIG. 11

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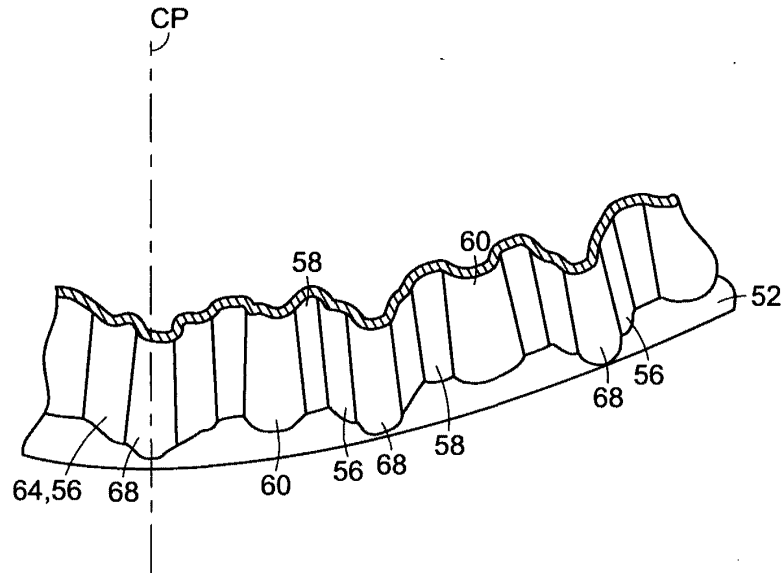


FIG. 12

CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC



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| 12/802,483 | 06/07/2010 | 3672 | 1466 | 2834 | 23 | 4 |

CONFIRMATION NO. 9389

28152
CHARLES G. NESSLER
P.O. BOX H
CHESTER, CT 06412

FILING RECEIPT



OC00000042221516

Date Mailed: 06/22/2010

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

David Mailhot, Coventry, CT;
Nimesh Gandhi, Wethersfield, CT;
Timothy McGrath, Arlington, MA;

Assignment For Published Patent Application

Stormtech, LLC, Wethersfield, CT

Power of Attorney: None

Domestic Priority data as claimed by applicant

This appln claims benefit of 61/217,905 06/05/2009

Foreign Applications

If Required, Foreign Filing License Granted: 06/21/2010

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/802,483**

Projected Publication Date: Request for Non-Publication Acknowledged

Non-Publication Request: Yes

Early Publication Request: No

Title

Corrugated Stormwater chamber having sub-corrugations

Preliminary Class

405

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as

set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NUMBER | FILING OR 371(C) DATE | FIRST NAMED APPLICANT | ATTY. DOCKET NO./TITLE |
|--------------------|-----------------------|-----------------------|------------------------|
| 12/802,483 | 06/07/2010 | David Mailhot | 2834 |

CONFIRMATION NO. 9389

FORMALITIES LETTER



OC000000042221517

28152
CHARLES G. NESSLER
P.O. BOX H
CHESTER, CT 06412

Date Mailed: 06/22/2010

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The oath or declaration is missing.

A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.

Note: If a petition under 37 CFR 1.47 is being filed, an oath or declaration in compliance with 37 CFR 1.63 signed by all available joint inventors, or if no inventor is available by a party with sufficient proprietary interest, is required.

The application is informal since it does not comply with the regulations for the reason(s) indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- Replacement drawings in compliance with 37 CFR 1.84 and 37 CFR 1.121(d) are required. The drawings submitted are not acceptable because:
 - The drawings must be reasonably free from erasures and must be free from alterations, overwriting, interlineations, folds, and copy marks. See Figure(s) 1-12.

Applicant is cautioned that correction of the above items may cause the specification and drawings page count to exceed 100 pages. If the specification and drawings exceed 100 pages, applicant will need to submit the required application size fee.

The applicant needs to satisfy supplemental fees problems indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.16(f) of \$130 for a non-small entity, must be submitted with the missing items identified in this notice.

SUMMARY OF FEES DUE:

Total additional fee(s) required for this application is **\$130** for a non-small entity
• **\$130** Surcharge.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web.
<https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html>

For more information about EFS-Web please call the USPTO Electronic Business Center at **1-866-217-9197** or visit our website at <http://www.uspto.gov/ebc>.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

/jmilani/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

PTO/SB/17 (01-06)

Approved for use through 07/31/2006. OMB 0851-0032

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL

Complete if Known

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$) 1,568

Application Number

Filing Date

First Named Inventor

MAI, HOT, D.

Examiner Name

Art Unit

Attorney Docket No.

2834

METHOD OF PAYMENT (check all that apply)

☒ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify):

☒ Deposit Account Deposit Account Number: 140711

Deposit Account Name: CHARLES G. NESSLER

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☐ Charge fee(s) indicated below

☐ Charge fee(s) indicated below, except for the filing fee

☒ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17

☒ Credit any overpayments

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

FEE CALCULATION (All the fees below are due upon filing or may be subject to a surcharge.)

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

| Application Type | FILING FEES | | SEARCH FEES | | EXAMINATION FEES | | Fees Paid (\$) |
|------------------|-------------|-----------------------|-------------|-----------------------|------------------|-----------------------|----------------|
| | Fee (\$) | Small Entity Fee (\$) | Fee (\$) | Small Entity Fee (\$) | Fee (\$) | Small Entity Fee (\$) | |
| Utility | 330 | 150 | 540 | 250 | 220 | 100 | 1040 |
| Design | 200 | 100 | 100 | 50 | 130 | 65 | |
| Plant | 200 | 100 | 300 | 150 | 160 | 80 | |
| Reissue | 300 | 150 | 500 | 250 | 600 | 300 | |
| Provisional | 200 | 100 | 0 | 0 | 0 | 0 | |

2. EXCESS CLAIM FEES

Fee Description

Each claim over 20 (including Reissues)

Each independent claim over 3 (including Reissues)

Multiple dependent claims

Total Claims 24 - 20 or HP = 4 x 52 = 208

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims 4 - 3 or HP = 1 x 220 = 220

HP = highest number of independent claims paid for, if greater than 3.

Small Entity Fee (\$)
5052 25
200 220 100
360 180

Multiple Dependent Claims Fee (\$)
Fee Paid (\$)

Repln. Ref: 06/22/2010 MNGUYEN 0007130400
DAH:140711 Name/Number:12802483
FC: 9204 \$52.00 CR

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets Extra Sheets Number of each additional 50 or fraction thereof Fee (\$)
- 100 = / 50 = (round up to a whole number) x =

4. OTHER FEE(S)

Non-English Specification, \$130 fee (no small entity discount)

Other (e.g., late filing surcharge):

SUBMITTED BY

Signature

Charles G. Nessler

Registration No. 27825

(Attorney/Agent)

Telephone

8605269149

Name (Print/Type)

CHARLES G. NESSLER

Date

7 June 2010

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Adjustment date: 06/22/2010 MNGUYEN
06/10/2010 EEKUBAY1 00000004 12802483

04 FC:1202

-208.00 DP

06/22/2010 MNGUYEN 00000012 12802483

156.00 DP

01 FC:1202

U.S. PTO
12/802483
06/07/2010

6

060710

0250 U.S. PTO

PTO/SB/05 (05-05)
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U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE
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UTILITY
PATENT APPLICATION
TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

| | |
|------------------------|-----------------------|
| Attorney Docket No. | 2834 |
| First Inventor | MAILHOT, D. |
| Title | CORRUGATED STORMWATER |
| Express Mail Label No. | E H990978113 US |

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. ☒ Fee Transmittal Form (e.g., PTO/SB/17)
(Submit an original and a duplicate for fee processing)
2. ☐ Applicant claims small entity status.
See 37 CFR 1.27.
3. ☒ Specification [Total Pages 26]
Both the claims and abstract must start on a new page
(For information on the preferred arrangement, see MPEP 608.01(a))
4. ☒ Drawing(s) (35 U.S.C. 113) [Total Sheets 7]
5. Oath or Declaration [Total Sheets _____]
 - a. ☐ Newly executed (original or copy)
 - b. ☐ A copy from a prior application (37 CFR 1.63(d))
(for continuation/divisional with Box 18 completed)
 - i. ☐ DELETION OF INVENTOR(S)
Signed statement attached deleting inventor(s)
name in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).
6. ☒ Application Data Sheet. See 37 CFR 1.76
7. ☐ CD-ROM or CD-R in duplicate, large table or
Computer Program (Appendix)
☐ Landscape Table on CD
8. Nucleotide and/or Amino Acid Sequence Submission
(if applicable, items a. - c. are required)
 - a. Computer Readable Form (CRF)
 - i. ☐ Computer Readable Form (CRF)
 - ii. ☐ Transfer Request (37 CFR 1.821(e))
 - b. Specification Sequence Listing on:
 - i. ☐ CD-ROM or CD-R (2 copies); or
 - ii. ☐ Paper
 - c. ☐ Statements verifying identity of above copies

ADDRESS TO: Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

ACCOMPANYING APPLICATION PARTS

9. ☐ Assignment Papers (cover sheet & document(s))
Name of Assignee _____
10. ☐ 37 CFR 3.73(b) Statement (when there is an assignee) ☐ Power of Attorney
11. ☐ English Translation Document (if applicable)
12. ☐ Information Disclosure Statement (PTO/SB/08 or PTO-1449)
☐ Copies of foreign patent documents, publications, & other information
13. ☐ Preliminary Amendment
14. ☒ Return Receipt Postcard (MPEP 503)
(Should be specifically itemized)
15. ☐ Certified Copy of Priority Document(s)
(if foreign priority is claimed)
16. ☒ Nonpublication Request under 35 U.S.C. 122(b)(2)(B)(i).
Applicant must attach form PTO/SB/35 or equivalent.
17. ☒ Other: _____

18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.76:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: _____
Prior application information: Examiner _____ Art Unit: _____

19. CORRESPONDENCE ADDRESS

☒ The address associated with Customer Number: 28152 OR ☐ Correspondence address below

| | | | | | |
|---------|-----------|---------------|--|--|--|
| Name | | | | | |
| Address | | | | | |
| City | State | Zip Code | | | |
| Country | Telephone | Email Address | | | |

| | | | |
|-------------------|---------------------------|-----------------------------------|--------------------|
| Signature | <u>cghester</u> | Date | <u>7 June 2010</u> |
| Name (Print/Type) | <u>CHARLES G. NESSLER</u> | Registration No. (Attorney/Agent) | <u>29825</u> |

This collection of information is required by 37 CFR 1.53(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PTO/SB/17 (01-06)

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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$) 1,568

Complete if Known

Application Number _____
Filing Date _____
First Named Inventor MAJLHOT, D.
Examiner Name _____
Art Unit _____
Attorney Docket No. 2834

METHOD OF PAYMENT (check all that apply)

☒ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____
☒ Deposit Account Deposit Account Number: 140711 Deposit Account Name: CHARLES G. NESSLER

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, except for the filing fee
☒ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17 ☒ Credit any overpayments

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

FEE CALCULATION (All the fees below are due upon filing or may be subject to a surcharge.)

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

| Application Type | FILING FEES | | SEARCH FEES | | EXAMINATION FEES | | Fees Paid (\$) |
|------------------|-------------|-----------------------|-------------|-----------------------|------------------|-----------------------|----------------|
| | Fee (\$) | Small Entity Fee (\$) | Fee (\$) | Small Entity Fee (\$) | Fee (\$) | Small Entity Fee (\$) | |
| Utility | 330 | 150 | 540 | 250 | 220 | 100 | 1040 |
| Design | 200 | 100 | 100 | 50 | 130 | 65 | |
| Plant | 200 | 100 | 300 | 150 | 160 | 80 | |
| Reissue | 300 | 150 | 500 | 250 | 600 | 300 | |
| Provisional | 200 | 100 | 0 | 0 | 0 | 0 | |

2. EXCESS CLAIM FEES

Fee Description

Each claim over 20 (including Reissues)

Each independent claim over 3 (including Reissues)

Multiple dependent claims

Total Claims 24 - 20 or HP = 4 x 52 = 208

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims 4 - 3 or HP = 1 x 220 = 220

HP = highest number of independent claims paid for, if greater than 3.

Small Entity

Fee (\$)

5052 25

200220 100

360 180

Multiple Dependent Claims

Fee (\$)

Fee Paid (\$)

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets Extra Sheets Number of each additional 50 or fraction thereof Fee (\$)

 - 100 = / 50 = (round up to a whole number) x = Fee Paid (\$)

4. OTHER FEE(S)

Non-English Specification, \$130 fee (no small entity discount)

Other (e.g., late filing surcharge):

SUBMITTED BY

Signature C. Nessler Registration No. 27825 Telephone 8605269149
Name (Print/Type) CHARLES G. NESSLER Date 7 June 2010

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

U.S. PTO
12/802483
06/07/2010

6

060710

0250 U.S. PTO

PTO/SB/05 (05-05)
Approved for use through 07/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

| | | |
|--|------------------------|-----------------------|
| UTILITY PATENT APPLICATION TRANSMITTAL (Only for new nonprovisional applications under 37 CFR 1.53(b)) | Attorney Docket No. | 2834 |
| | First Inventor | MAILHOT, D. |
| | Title | CORRUGATED STORMWATER |
| | Express Mail Label No. | E H990978113 US |

| | |
|---|--|
| APPLICATION ELEMENTS See MPEP chapter 600 concerning utility patent application contents. | ADDRESS TO: Commissioner for Patents P.O. Box 1450 Alexandria VA 22313-1450 |
| 1. <input checked="" type="checkbox"/> Fee Transmittal Form (e.g., PTO/SB/17) (Submit an original and a duplicate for fee processing) 2. <input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. 3. <input checked="" type="checkbox"/> Specification [Total Pages <u>26</u>] Both the claims and abstract must start on a new page (For information on the preferred arrangement, see MPEP 608.01(a)) 4. <input checked="" type="checkbox"/> Drawing(s) (35 U.S.C. 113) [Total Sheets <u>7</u>] 5. Oath or Declaration [Total Sheets _____] a. <input type="checkbox"/> Newly executed (original or copy) b. <input type="checkbox"/> A copy from a prior application (37 CFR 1.63(d)) (for continuation/divisional with Box 18 completed) i. <input type="checkbox"/> DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) name in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b). 6. <input checked="" type="checkbox"/> Application Data Sheet. See 37 CFR 1.76 7. <input type="checkbox"/> CD-ROM or CD-R in duplicate, large table or Computer Program (Appendix) <input type="checkbox"/> Landscape Table on CD 8. Nucleotide and/or Amino Acid Sequence Submission (if applicable, items a. - c. are required) a. Computer Readable Form (CRF) i. <input type="checkbox"/> Computer Readable Form (CRF) ii. <input type="checkbox"/> Transfer Request (37 CFR 1.821(e)) b. Specification Sequence Listing on: i. <input type="checkbox"/> CD-ROM or CD-R (2 copies); or ii. <input type="checkbox"/> Paper c. <input type="checkbox"/> Statements verifying identity of above copies 18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.76: <input type="checkbox"/> Continuation <input type="checkbox"/> Divisional <input type="checkbox"/> Continuation-in-part (CIP) of prior application No.: _____ Prior application information: Examiner _____ Art Unit: _____ | ACCOMPANYING APPLICATION PARTS 9. <input type="checkbox"/> Assignment Papers (cover sheet & document(s)) Name of Assignee _____ 10. <input type="checkbox"/> 37 CFR 3.73(b) Statement <input type="checkbox"/> Power of Attorney (when there is an assignee) 11. <input type="checkbox"/> English Translation Document (if applicable) 12. <input type="checkbox"/> Information Disclosure Statement (PTO/SB/08 or PTO-1449) <input type="checkbox"/> Copies of foreign patent documents, publications, & other information 13. <input type="checkbox"/> Preliminary Amendment 14. <input checked="" type="checkbox"/> Return Receipt Postcard (MPEP 503) (Should be specifically itemized) 15. <input type="checkbox"/> Certified Copy of Priority Document(s) (if foreign priority is claimed) 16. <input checked="" type="checkbox"/> Nonpublication Request under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent. 17. <input checked="" type="checkbox"/> Other: _____ |

| | | | | | |
|---|--------------------|---------------|-----------------------------------|--------------------|--|
| 19. CORRESPONDENCE ADDRESS <input checked="" type="checkbox"/> The address associated with Customer Number: <u>28152</u> OR <input type="checkbox"/> Correspondence address below | | | | | |
| Name | | | | | |
| Address | | | | | |
| City | State | Zip Code | | | |
| Country | Telephone | Email Address | | | |
| Signature | <u>cghealer</u> | | Date | <u>7 June 2010</u> | |
| Name (Print/Type) | CHARLES G. NESSLER | | Registration No. (Attorney/Agent) | 29825 | |

This collection of information is required by 37 CFR 1.53(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.
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FEE TRANSMITTAL

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$) 1,568

Complete if Known

Application Number _____
Filing Date _____
First Named Inventor MAJLHOT, D.
Examiner Name _____
Art Unit _____
Attorney Docket No. 2834

METHOD OF PAYMENT (check all that apply)

☒ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____
☒ Deposit Account Deposit Account Number: 140711 Deposit Account Name: CHARLES G. NESSLER

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, except for the filing fee
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FEE CALCULATION (All the fees below are due upon filing or may be subject to a surcharge.)

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

| Application Type | FILING FEES | | SEARCH FEES | | EXAMINATION FEES | | Fees Paid (\$) |
|------------------|-------------|-----------------------|-------------|-----------------------|------------------|-----------------------|----------------|
| | Fee (\$) | Small Entity Fee (\$) | Fee (\$) | Small Entity Fee (\$) | Fee (\$) | Small Entity Fee (\$) | |
| Utility | 330 | 150 | 540 | 250 | 220 | 100 | 1040 |
| Design | 200 | 100 | 100 | 50 | 130 | 65 | |
| Plant | 200 | 100 | 300 | 150 | 160 | 80 | |
| Reissue | 300 | 150 | 500 | 250 | 600 | 300 | |
| Provisional | 200 | 100 | 0 | 0 | 0 | 0 | |

2. EXCESS CLAIM FEES

Fee Description

Each claim over 20 (including Reissues)
Each independent claim over 3 (including Reissues)
Multiple dependent claims

| Fee (\$) | Small Entity Fee (\$) |
|----------|-----------------------|
| 5052 | 25 |
| 200220 | 100 |
| 360 | 180 |

Total Claims 24 - 20 or HP = 4 x 52 = 208

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims 4 - 3 or HP = 1 x 220 = 220

HP = highest number of independent claims paid for, if greater than 3.

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets Extra Sheets Number of each additional 50 or fraction thereof Fee (\$) Fee Paid (\$)

 - 100 = / 50 = (round up to a whole number) x =

4. OTHER FEE(S)

Non-English Specification, \$130 fee (no small entity discount)

Other (e.g., late filing surcharge):

SUBMITTED BY

Signature Charles G. Nessler Registration No. 27825 Telephone 8605269149
Name (Print/Type) CHARLES G. NESSLER Date 7 June 2010

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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**REQUEST AND CERTIFICATION
UNDER
35 U.S.C. 122(b)(2)(B)(i)**

| | |
|----------------------|--|
| First Named Inventor | MAIC HOT, DAVID |
| Title | CO-INVENTOR STORMWATER CHAMBER |
| Atty Docket Number | 2834 |

I hereby certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral agreement, that requires publication at eighteen months after filing. I hereby request that the attached application not be published under 35 U.S.C. 122(b).

7 JUNE 2010

Date



Signature

CHARLES G. NESSLER

Typed or printed name

REG NO 21825

This request must be signed in compliance with 37 CFR 1.33(b) and submitted with the application **upon filing**.

Applicant may rescind this nonpublication request at any time. If applicant rescinds a request that an application not be published under 35 U.S.C. 122(b), the application will be scheduled for publication at eighteen months from the earliest claimed filing date for which a benefit is claimed.

If applicant subsequently files an application directed to the invention disclosed in the attached application in another country, or under a multilateral international agreement, that requires publication of applications eighteen months after filing, the applicant **must** notify the United States Patent and Trademark Office of such filing within forty-five (45) days after the date of the filing of such foreign or international application. **Failure to do so will result in abandonment of this application (35 U.S.C. 122(b)(2)(B)(iii)).**

Burden Hour Statement: This collection of information is required by 37 CFR 1.213(a). The information is used by the public to request that an application not be published under 35 U.S.C. 122(b) (and the PTO to process that request). Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This form is estimated to take 6 minutes to complete. This time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

APPLICATION DATA SHEET

Title of Application: Corrugated Stormwater chamber having sub-corrugations

Atty Docket No. 2834

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Priority Information

This application claims benefit of Provisional Patent Application No. 61/217905 filed June 5, 2009.

Parent Application Information: None

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APPLICATION DATA SHEET - CONTINUED

Charge any deficiency in fee now and in future to: Deposit account 14 0711 in name of undersigned attorney, Charles G. Nessler

Enclosures

Utility application transmittal
Fee transmittal *with check*
Utility application
Non-publication request
Return post card

Respectfully submitted,

C Gessler

Charles G. Nessler, Attorney/Representative
Reg # 29825 Date 6/7/2010

CORRUGATED STORMWATER CHAMBER HAVING SUB-CORRUGATIONS

This application claims benefit of Provisional Patent Application No. 61/217905 filed June 5, 2009.

TECHNICAL FIELD

The present invention relates to systems for receiving and dispersing water beneath the surface of the earth, in particular to molded plastic chambers having arch shape cross section and corrugations.

BACKGROUND

Arch shape cross section commercial thermoplastic storm chambers are familiar in commerce. They have been made by injection molding and thermoforming. Before more tailored products were developed, wastewater leaching chambers had been used as storm chambers. Typically, an interconnected array of chambers is buried within permeable soil to create large void spaces. Stormwater, such as results from rainfall on a paved parking lot, is flowed to the chambers. The water is detained, and over time either controllably flowed to a discharge point, and or allowed to dissipate through the earth.

A type of chamber relevant to the present invention has a curved arch shape cross section and spaced apart crest corrugations and valley corrugations running transverse to the length. (Crest corrugations have been referred to as peak corrugations in numerous patents relating to chambers.) The corrugations strengthen the chamber and are differentiated from what is called ribs or ribbing, which is the name given to relatively narrow plastic structures, also used for strengthening, and often found running lengthwise. See U.S. Pat. No. 5,716,163 of Nichols et al. for information about ribbing.

Prior art commercial storm chambers have had various sizes. Smaller chambers have been about 3 feet wide and 8-10 feet long. The SC-310 chamber and SC-740 chamber of

Stormtech LLC, Wethersfield, Connecticut, exemplify current chambers. As an example, the SC-740 chamber is about 85 inches long, 51 inches wide and 30 inches high, and weighs about 74 pounds.

There has been market place opportunity for larger dimension chambers in the belief they would provide more favorable cost per unit volume of water contained within the chamber, and a smaller footprint for a given capacity stormwater system. Any new large chamber desirably will not have such weight as to prevent installers from handling it manually during installation. It is essential that a new chamber be sufficiently strong, in resisting the weight of overlying soil (typically largely crushed stone), any pavement surfacing and any motor vehicles or the like which traverse the pavement.

Buried corrugated plastic pipe has been used for a longer time than storm chambers and there is a developed technology for engineering design and analysis of such. See Section 12.12 "Thermoplastic Pipes" in "AASHTO LRFD Bridge Design Specifications - U.S. Units, 2003 Interim Revisions," published by Amer. Assoc. of State Highway and Transportation Officials (AASHTO), Washington, D.C., Code LRFDUS 2-15 (April 2003). See also NCHRP Report 438 "Recommended LRFD Specification for Plastic Pipe and Culverts" published by Transportation Research Board of National Research Council, National Academy Press, Washington, D.C. (2000). However, whereas pipes have circumferentially continuous cross sections, chambers have open bottoms and free opposing side bases. Thus, chambers behave differently and the specifications, design criteria and modes of evaluating behavior which have been developed for pipe have to be adapted to chambers. An objective of the present invention is to provide large stormwater chambers which have performance and safety factors consistent with those achieved with corrugated plastic pipe.

Another criterion that is important for old and new chambers relates to economical shipping and storage. For that, chambers must nest well one within the other. Thus, for example, a desire for certain strengthening features, such as ribs or such as corrugations which are closely spaced with steep sides, can conflict with the need for good nesting.

As is well known, engineers have to be careful when scaling up the size of products, since what previously might have been minor design factors can become critical factors. Obviously, if chamber width is increased, more overlying weight is supported by the chamber, and strength must be sufficient. One way of increasing strength in a chamber is to increase the thickness of the chamber sidewalls, sufficient to reduce stress so it is within design criteria. But doing that has substantial disadvantages, as follows.

Commercially feasible chambers have to be fabricable by economic mass production means. Injection molding is the only practical way to fabricate a chamber with carefully controlled thickness dimensions. However, if an injected molded chamber is made with substantially varying wall thickness, problems arise with respect to mold filling and distortion of the part during cooling after removal from the mold. Thus, experience has shown that a practically-manufactured chamber should have substantially uniform wall thickness. But if wall thickness is uniformly increased to provide sufficient capability to the strength-limited regions of the chamber, the resultant chamber may have an undesirably increased weight and attendant material cost. Furthermore, the injection capacity limits of commercially available injection molding machines may be reached, limiting choice of vendors or making injection molding impossible. Thermoforming is an alternative way for forming chambers, but the nature of the process is such that unwanted thin areas will be present in the product, due to the stretching of the sheet being formed into the chamber. That can mean that, in order to achieve a minimum required dimension at a particular point, a larger than needed thickness has to be accepted in other less-stretched areas, with resultant uneconomic use of material.

In the alternative, internal or external ribbing can provide good strength. However, such ribbing tends to increase the stacking height, that is, the vertical spacing between two nested chambers. Ribbing can also introduce molding problems. In recent years, commercial favor has been given to stormwater and leaching chamber designs have smooth curve cross sections and which avoid significant ribbing.

Thus, there can be complicated tradeoffs in the design of a chamber, necessary to best attain all the competing aims. Any new larger chamber must be economical to make in terms of the amount and cost of plastic, the cost of manufacturing, and cost of shipping. In such context,

there is a need for chambers which are larger than heretofore, which are practically fabricated, transported, and stored, and which in use have good strength on a short term and long term basis. Chambers are typically interconnected as strings. The ends of the strings must be closed off by end caps to prevent the surrounding crushed stone aggregate or other medium from entering the concave space under the chamber. Heretofore caps used with storm chambers and with leaching chambers have comprised flat plate and dome shape closures, typically with heavy ribbing. There is a need for improvements in end caps in the same general way as there is need for improved chambers.

SUMMARY

An object of the invention is to provide strength to molded plastic continuous curve arch shape cross section chambers, in particular stormwater chambers having large dimensions. A further object is to improve the strength without using features which compromise the injection moldability of a chamber. Another objective is to provide chambers which perform comparably to corrugated plastic pipe, in accord with the aforementioned AASHTO related specifications.

In accord with the invention, a chamber has an arch shape cross section and corrugations comprised of alternating crests and valleys which run along the arch curve of the chamber, transverse to the length of the chamber and across the arch-curve of the chamber.

Corrugations run from one opposing side base, up over the top of the chamber and down to the other opposing side base of the chamber. With increasing elevation, the crest corrugations diminish in width, and the valley corrugations increase in width.

In embodiments of the invention, either or both of the crest corrugations and valley corrugations have sub-corrugations. That is, there are smaller or secondary corrugations which are superimposed on the corrugations. Sub-corrugations may run along part or all of the arch-curve length of a corrugation. Exemplary sub-corrugations have widths which are substantially less than the widths of the associated corrugations, for instance, the sub-corrugation width is one-third of the local width of the associated corrugation. A sub-corrugation may desirably have a tapered width along part or all of the sub-corrugation length,

and the taper or change in width and or depth is in the same sense as the width of the associated corrugation. Alternately, sub-corrugations may have constant width.

In some embodiments, sub-corrugations run upwardly from the base of the chamber along the crest corrugations and terminate at an elevation which is lower than the height of the top of the chamber. For instance, they may terminate at a height which is between one-quarter and two-thirds of the chamber height. Sub-corrugations may terminate by dying out, that is, the width and or depth of the corrugation may decrease gradually to nothingness at the terminal end of the sub-corrugations. Alternately, the terminal ends may be abrupt.

In other embodiments, a chamber may have sub-corrugations in the valley corrugations, with or without the presence of crest sub-corrugations. Valley sub-corrugations may run over the top of the chamber and downwardly toward the opposing side bases. In some embodiments, the valley sub-corrugations terminate, by ending bluntly or tapering into nothingness, at or just above the elevation of the base of the chamber; alternately, at a higher elevation.

In other embodiments, there are both crest and valley sub-corrugations, and the terminal lower ends of the valley sub-corrugations are at an elevation which is less than the elevation at which are the terminal ends of the upward-running crest sub-corrugations. In still other embodiments, the terminal ends of sub-corrugations may terminate abruptly, rather than tapering to nothing.

The presence of the sub-corrugations improves to a surprising degree the strength of a chamber side wall. The load bearing capacity per unit length of side wall, and thus the capacity of the chamber to resist failure, is increased by as much as 45 percent compared to the same wall thickness corrugated chamber having no sub-corrugations. Yet the weight increase attributable to the sub-corrugations may be as a little as one percent.

Thus, a chamber of the present invention having sub-corrugations may have good strength without the disadvantages of having wholly greater chamber wall thickness, or of having selectively thickened walls, or having ribbing, which alternatives diminish in varying extents manufacturability, nesting and cost effectiveness. The invention may be applied to chambers

made of thermoplastics such a polypropylene or polyethylene, which are injection molded. rotationally molded, thermoformed, laid up, or made by any commercial plastic forming process.

The foregoing and other objects, and the features and advantages of the present invention will become more apparent from the following description of preferred embodiments and accompanying drawings. This summary states in simplified form things which are described more fully in the Description which follows, and it is not intended to identify all key features of the invention, or to be a limitation on the scope of the claimed subject matter.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is perspective view of a stormwater chamber having crest and valley corrugations with associated sub-corrugations.

Fig. 2 a side elevation view of a portion of the chamber shown in Fig. 1.

Fig. 3 is a vertical plane transverse cross section of the chamber shown in Fig. 1.

Fig. 4 is a cross section through a portion of the sidewall of the chamber shown in Fig. 1.

Fig. 5 comprises Fig 5(a) through Fig. 5(e) and shows portions of sidewall cross sections at different chamber elevations, as points illustrated in Fig. 3.

Fig. 6 is a partial side view of a chamber having three different styles of sub-corrugations.

Fig. 7 is a partial side view of a chamber having sub-corrugations with terminal ends which are blunt.

Fig. 8 is a partial side view of a chamber having sub-corrugations only on crest corrugations.

Fig. 9 is a fragmentary side view of a chamber having crest and valley sub-corrugations which run over the top of the chamber, from one base flange to the other.

Fig 10, is an end view of an end cap suited for closing the open end of a chamber.

Fig. 11 is a side view of the end cap of Fig. 10.

Fig. 12 is a portion of a horizontal plane cross section view of the end cap of Fig. 11.

DESCRIPTION

An embodiment of stormwater chamber 20, shown in Fig. 1, 2 and 3, has a curved arch shape cross section. The opposing side walls 44 rise upwardly from opposing side bases 26 and curve inwardly to top 24. The opposing side bases 26 comprise horizontal flanges 46 which provide bearing area upon the soil upon which the chamber rests. The base of a chamber is sometimes referred to as the foot. In the chamber embodiments which are detailed below, the arch curve of the chamber cross section is smooth and continuously curving. Chambers within the invention may have other arch shape cross sections. For example, the arch curve may comprise interconnected flat portions; or the cross section may be nominally trapezoidal, as shown for instance in U.S. Pats. No. 5,017,041 and 5,511,903. Thus, the term “arch curve” and analogous verbiage of the description and claims which follows shall encompass the contour of the chamber arch as seen in a chamber end view, regardless the shape is not truly a curve.

Chambers of the present invention may have cross sections which preferably are truncated semi-ellipses as described in U.S. Pat. No. 7,052,209 of Kruger et al. Alternately, the cross section may have the shape of a parabola, a truncated semi-circle, or approximations those and other regular geometric shapes, as well as irregular and asymmetrical shapes.

For strength chamber 20 has alternating crest corrugations 28 and valley corrugations 30 which run over the arc shape cross section. More information about the design and shape and use of corrugated chambers of the present invention is disclosed in U.S. Pat. No. 7,052,209 and Pat. No. 7,118,306 both of Kruger et al., the disclosures of which are hereby incorporated

by reference. The disclosure of provisional patent application No. 61/217905 filed June 5, 2009, from which this application claims benefit, is also hereby incorporated by reference.

Stormwater chambers are typically buried within crushed stone aggregate or other water permeable granular medium that typically has 20-40 percent or more void space. The medium which overlies, underlies or surrounds a chamber may vary in character according to its location, and according to the material which extends to the surface of the earth. The medium within which a chamber is buried during use is generally referred to here as soil. That term should be understood to comprehend the commonly used crushed stone aggregate, as well as other manufactured media.

A simple description of some of the complex load-related phenomena associated with a chamber buried in soil is as follows: With reference to the transverse cross section of chamber 20 shown in Fig. 3, there is a vertical unit area load F_v , as a result of the weight of overlying soil and any transient load (e.g., a motor vehicles). The load is applied to the upper surface of the chamber by the soil which is in contact with the chamber. There is a resultant upward reaction force P at the opposing side bases 26 of the chamber, according to the total downward force on the chamber. The applied vertical load creates in the curved chamber sidewalls 44 compressive stresses F_p and shear stresses F_n . The compressive stress direction in a stable chamber is nominally in a direction which is tangent to the local mean curve of the chamber wall. The shear stresses are nominally perpendicular to the local mean curve of the wall. The soil load also creates bending stresses in the chamber sidewall. The stresses in the chamber wall vary with elevation from the chamber base. For example, compressive stress increases with proximity to the base.

When the load bearing capacity of a chamber is exceeded, the chamber sidewall can fail on a short term or long term basis. Typically, failure occurs when the chamber wall is crushed under soil load. Prior to failure by wall crushing, elements of the corrugation wall may buckle in a local manner thus reducing the load capacity of the buckled elements and causing the stable elements of the corrugation to be more highly stressed. As mentioned in the Background, stresses can be reduced, and the strength and stability of a chamber can be

increased, by increasing wall thickness. But that is undesirable; and the invention provides an effective alternative way of strengthening the chamber.

With reference again to Fig. 1 through Fig. 3, an exemplary embodiment chamber 20 has a curved top 24 (also referred to as the crown) and sidewalls 44 which run upwardly to the top from opposing side bases 26. The bases comprise horizontal flange portions 46 bearing on soil during use. Extending upwardly from the base flanges are a multiplicity of spaced apart fins 38, commonly called stacking lugs, the use of which is well known. The lugs 38 support the base flange of an overlying nested chamber, to stop nested chambers from jamming during shipment or storage. Generally, the height of the stacking lugs is chosen so that the corrugations of nested chambers may come very close, or into light contact with each other, without wedging together. See Brochu et al. U.S. Pat. No. 7,500,805 for information about how chambers nest, the disclosure of which is hereby incorporated by reference. An outer fin 29 runs lengthwise along the outer end of each base flange, to add lengthwise bending strength to the flange.

Chamber 20 has a multiplicity of corrugations which run transverse to the chamber length axis CL. The corrugations are comprised of crest corrugations 28 and valley corrugations 30; they are spaced apart along the length axis CL of the chamber with a period (also called pitch) P.

Each corrugation and sub-corrugation (i.e., the corrugations generally) has a width which is measured in a first plane which is parallel to the length axis of the chamber. Each corrugation has a depth which is measured a plane perpendicular to the length axis, typically normal to a tangent to the surface of the chamber/corrugation at the point of measurement. The depth of a corrugation is sometimes also referred to as the height of the corrugation. The length of a corrugation is a reference to the dimension of the corrugation as it runs along the arch-curve of the chamber. For brevity, crest corrugations are sometimes referred to as crests, and valley corrugations are sometimes referred to valleys. In prior patents, crest corrugations have been referred to as peak corrugations.

As seen from Fig. 2, each crest corrugation becomes narrow in width with elevation; and each valley corrugation increases in width with elevation. That shaping facilitates compact nesting. See Brochu et al. U.S. Pat. No. 7,306,399 the disclosure of which is hereby incorporated by reference. The corrugation dimensions and associated sub-corrugation dimensions are selected to provide a desired chamber strength, in context of the properties of the plastic material and the basic wall thickness of the chamber. Basic wall thickness is the nominal thickness of the chamber wall and top, as distinguished for example from possible locally thicker regions involving flow channels, bosses, openings, etc.

In chamber 20 and other embodiments the corrugations may comprise smaller corrugations 36, 32 which run lengthwise of along the corrugations. The smaller corrugations are called here sub-corrugations. In embodiments of the invention, a sub-corrugation has a height which is substantially less than the local height/depth of the corrugation with which the sub-corrugation is associated. Sub-corrugations alternately may be referred to as secondary corrugations or mini-corrugations. Preferably, a sub-corrugation is centered within or on its associated corrugation. Sub-corrugations of the present invention are contours of the wall of the chamber; that is, both the inner and outer surfaces of the chamber are contoured and the wall thickness across the width of the sub-corrugation typically does not change greatly.

Sub-corrugations are distinguished from flow channels that aid injection molding. Flow channels are relatively small thickened bands on the chamber wall that aid the flow of plastic during injection molding. They may project inwardly, outwardly, or both inwardly and outwardly from the wall on which they are positioned. See U.S. Pat. No. 7,500,805 of Brochu et al. Sub-corrugations are also distinguished from ribs, which in the lexicon used here are upstanding solid or hollow fin-like members which project inwardly or outwardly from the chamber wall.

In a chamber of the present invention, a sub-corrugation is present on one or more of the crest corrugations or valley corrugations. Typically, a plurality, and most often all, crest corrugations will have sub-corrugations. Likewise, when valley sub-corrugations are present they will be present in a plurality, most often all, of valley corrugations along the length of the

chamber. In the generality of the invention, sub-corrugations may be present in only some of the valley corrugations or crest corrugations.

In embodiments of the invention, a sub-corrugation runs along at least a portion of the length of an associated corrugation; and it may run along the entire length. With reference to Fig. 1 and Fig. 2, a first set of sub-corrugations 32 runs upwardly in the center of the crest corrugations 28 from the elevation of the base. The sub-corrugations 32 taper in depth and width, and approach nothingness, as they reach an elevation h_p , which in some embodiments of the invention, is between one-third and half of the height h of the chamber. In some other embodiments, the crest sub-corrugations may reach a height h_p which is from one-quarter to two-thirds of the chamber height h . The direction of taper of a sub-corrugations 32 corresponds in sense with the taper of the crest corrugation, i.e., they both get narrower in width as they run upwardly. Dimensions of exemplary corrugations and sub-corrugations are given in Fig. 5 and are discussed below.

As may be seen in Fig. 1 and Fig. 2, a second set of sub-corrugations 36 runs along the respective centers of valley corrugations 30. The sub-corrugations 36 taper to nothingness in depth and width as they run downwardly and approach the base flange. Each exemplary valley sub-corrugation 34 runs along virtually the whole of the arch curve length of the associated valley. The direction of taper of a valley sub-corrugations corresponds in sense with the taper of the valley corrugation, i.e., each gets narrower as it approaches the elevation of the base. The width of a crest or valley sub-corrugation may alternatively be constant along part or all of the associated corrugation.

Fig. 4 is a cross section of a portion of the sidewall 44 chamber 20. As illustrated, crests and valleys share webs 76. Each crest corrugation 28 has a portion, running between the webs, with a width w_c , and each crest sub-corrugation 32 has a width w_p . The maximum dimension of w_p is about one-quarter of the locally associated dimension w_c . Each valley has a portion between webs with a width w_v , and each valley sub-corrugation 36 has a width w_v . The maximum dimension of w_v is about one-fifth of locally associated valley dimension w_v . The portion of a crest corrugation or valley corrugation which lies between the opposing side webs is sometimes referred to as the "flat" (portion) of the corrugation. Of course, in

other embodiments of the invention, the corrugation cross section shape may vary. For example, the outermost part of the crest corrugation may bulge outwardly. In such instance, the portion referred to as the flat will be curved.

Again with reference to Fig. 4: Each crest corrugation has a height d which is measured relative to an adjacent valley corrugation. Each crest sub-corrugation 32 has a height d_p and each valley sub-corrugation 34 has a height d_v , as such are measured relative to the adjacent outer surface of the crest or valley, as applies. The maximum height d_p of a crest sub-corrugation 32 is less than the locally associated height d_c of the crest corrugation 28 on which it is positioned. The maximum height d_v of a valley sub-corrugation 36 is less than locally associated depth d_d of the valley corrugation 30 on which it is positioned. (As mentioned above, the terms height and depth are used interchangeably for the same dimension on a corrugation or sub-corrugation.)

The cross sections of Fig. 5(a) through (f) show how the shape of the sidewall varies, in particular the shapes of corrugations and sub-corrugations, with elevation from the base. As reference to Fig. 3 will show, the Fig. 5 cross sections are as follows: Fig. 5(a) is at the peak of the chamber; Fig. 5(b) is at about two thirds elevation, from the base; Fig. 5(c) is at a point just above the crest sub-corrugation terminal end; Fig. 5(d) is at about one third elevation (and is the same section which is pictured in Fig. 4); Fig. 5(e) is near the base and the point where the valley sub-corrugation is diminishing to nothingness; and Fig. 5(f) is just above the upper surface of the base flange and thus the cross sections of stacking lugs 38 are present.

The cross section shapes of sub-corrugations may be vary from those which are pictured here. For instance, they may be characterized by greater or lesser included angle in cross-section, or they may have flattened tops or bottoms, etc. In embodiments of the invention, the shape of the sub-corrugations are preferably chosen so that the stacking height, or vertical separation between nested chambers, is not adversely affected, compared to a chamber having the same configuration but lacking sub-corrugations.

In an injection molded chamber, the precision of the process means that wall thickness of the chamber at the location of a sub-corrugation may be made substantially the same as the

thickness of the adjacent corrugation portions, as visually evident in Fig. 5. When the invention is applied to products made by thermoforming or another comparatively less precise dimension-producing process the thickness of a sub-corrugation may be somewhat thinner (or thicker) than the adjacent corrugation wall.

Despite the small increase in cross sectional area, a surprisingly large benefit in strength is realized through use of sub-corrugations, despite the sidewall weight being increased by a very modest amount. This is shown by the test data in Table 1. Short, straight polyethylene segments representative of portions of the chamber wall were subjected to compressive loading. The specimen behavior was measured to determine load bearing capacity up to the point of failure. Each segment comprised a valley with two adjacent crests.

Table 1. Corrugated specimen test data

| Specimen | Description | Wall area per unit width of specimen (inch ² /inch) | Load capacity per unit width of specimen (lb/inch) | Relative weight | Relative Strength |
|----------|--|--|--|-----------------|-------------------|
| A | 0.25 inch thick wall | 0.255 | 240 | 1 | 1 |
| D | 0.375 inch thick wall | 0.413 | 579 | 1.62 | 2.41 |
| B | 0.25 inch thick wall with sub-corrugations | 0.258 | 349 | 1.01 | 1.45 |

With reference to the table, Specimen A represented a baseline chamber wall which was nominally 0.250 inch thick and had no sub-corrugations. Specimen D was similarly shaped but had a nominal 0.375 inch thickness. Specimen B was nominally 0.250 inch thick; it had the same shape as Specimen A, with the addition of a sub-corrugation at each of the valley corrugation and the two crest corrugations.

The first data column shows the cross sectional area per unit width of the specimen, in a plane perpendicular to the direction of the applied load. (The width of the specimen corresponds with the lengthwise direction of a chamber wall.) The weight of plastic material in the

specimen is of course proportional to the cross sectional area of the specimen. The third data column gives the normalized relative weight of the specimen. The second data column shows the load capacity of the specimen; those data are normalized as relative strength, in the last data column.

As might be expected, the thicker 0.375 inch thick Specimen D has a substantially greater load bearing capacity than does the baseline specimen A. However, the weight is increased by somewhat more than 50 percent; and, the disadvantages mentioned in the Background arise -- namely increased material cost, reduced injection molding manufacturability, and reduced ability for installers to manually handle.

The performance of Specimen B is surprising. The addition of sub-corrugations provides about 45 percent increase in load capacity with only about one percent increase in weight. The behavior of the specimens is qualitatively reflective of the behavior of walls in actual chambers, where the mechanics are more complex.

Specimens having the same configurations as the specimens A and B were subjected to beam flexure testing based on ASTM D 6272 Procedure B. The result was that the specimens B, with sub-corrugations, were somewhat stiffer, but were not substantially stronger at flexure failure, than were the comparable thickness specimens A, which lacked sub-corrugations.

Referring again to the chamber 20 shown in Fig. 1 through Fig. 5, it is both feasible and desirable to reduce the size of a crest sub-corrugation, as by the tapering down to nothingness, with increasing elevation. Generally, a sub-corrugation can be diminished or reduced to nothingness in chamber regions where structural analysis and or testing show that a sub-corrugation would not be of much value. Simply put, if the "flat" portion of the crest becomes sufficiently small, so that the local buckling resistance is good, then the sub-corrugation need not be present. The same approach and rationale apply to the tapering in size and or presence of sub-corrugations in valleys. When a sub-corrugation is reduced in size, or not present, less plastic is used in making the chamber. Nonetheless, in the generality of the invention, a crest sub-corrugation, or a valley sub-corrugation, may run along the whole arch curve of a chamber.

Typically a chamber of the present invention will be made of commercial grade polyethylene or polypropylene, virgin or recycled, or some other polyolefin or combination thereof. Alternatively, the chamber may be made of any of a variety of other plastics, including fiberglass reinforced plastic, or other materials. The invention chambers are preferably made by injection molding but may be also made by rotational molding, thermoforming, by layering or lay-up (as with certain fiberglass reinforced plastics), and by other plastic molding methods.

An exemplary polypropylene chamber like chamber 20 may be about 90 inches long, about 77 inches wide at the base, about 45 inches high at the top, and will weigh about 120-130 pounds. It will have a typical wall thickness of about one-quarter inch. The depth of corrugation (i.e., the difference in elevation between a crest and adjacent valley) is about three inches. The period P of the crest corrugations is about 12 inches.

Another exemplary chamber may be about 52 inches long, about 100 inches wide at the base, about 60 inches high at the top, and will weigh about 120 to 130 pounds. It will have a typical wall thickness of about 0.25 to 0.30 inches. The depth of corrugation (difference in elevation between a crest and adjacent valley) is about 5 inches. The period P of the crest corrugations is about 15 inches.

Another exemplary chamber may be about 90 inches long, about 51 inches wide at the base, about 30 inches high at the top, and will weigh about 75 to 80 pounds. It will have a typical wall thickness of about 0.175 to 0.20 inches. The depth of corrugation (difference in elevation between a crest and adjacent valley) is about 2.5 inches. The period P of the crest corrugations is about 7 inches. The sub-corrugations are along the lines of those shown in Fig. 8, discussed below. In this chamber embodiment, the calculated load bearing capacity of the chamber is increased by about 30 percent through the use of sub-corrugations, while the weight is only increased by about one percent.

Sometimes, for providing increased strength to a chamber design, the wall thickness of a corrugated chamber will be increased somewhat in combination with adding sub-corrugations,

notwithstanding the disadvantages which have been mentioned in connection with using more weight of plastic. The dimensions of the chamber corrugations, and the period of the corrugations, may vary substantially in other embodiments of the invention. The invention may be used with chamber designs known in the prior art. Exemplary chambers meet performance requirements related to the AASHTO specifications and NCHRP Report mentioned in the Background.

Fig. 6 shows in chamber 20A in side elevation. The numbered features of chamber 20A, and chamber 20B, etc., correspond with those of chamber 20, with addition of the suffix. The overall shape and corrugations of exemplary chambers 20A and 20B are like those of chamber 20. In chamber 20A of Fig. 6, the sub-corrugations 32A on the crest corrugations are nominally the same as previously described. But the valley corrugations are different. Valley corrugations 36A run downwardly in the valleys to somewhat blunt-end termination points 42, which points are at an elevation h_v that is lower than the elevation h_p at which the upper ends of the crest corrugations 32A terminate. Thus the crest and valley sub-corrugations complement each other in strengthening the chamber. In addition, there is an optional second set of valley corrugations 40 which run upwardly from the base.

Fig. 7 shows chamber 20B in side elevation. The sub-corrugations 32B and 36B have approximately constant width and approximately constant depth. Instead of tapering down to nothingness, they have blunt ends.

Fig. 8 is a fragmentary side view of exemplary chamber 20C which has crest corrugations 28C that have sub-corrugations 32C which taper to nothingness part way up the chamber, and valley corrugations 30C which are free of sub-corrugations.

Fig. 9 is a fragmentary side view of exemplary chamber 20D which has crest corrugations 28D that have sub-corrugations 32D, and valley corrugations 30C which have sub-corrugations 36D. Both of the sub-corrugations run up and over the top of the chamber and down to about the elevation of the flange on the opposing side of the chamber.

Thus, in the embodiments shown and in the invention in general, the sub-corrugations may alternately have tapered ends or blunt ends; or they may run all the way along the arch curve. Sub-corrugations which taper or diminish to nothingness, may do that by way of the height only diminishing or the width only diminishing, or both dimensions diminishing simultaneously. Sub-corrugations may alternately have taper along their lengths, or they may have constant widths. When the sub-corrugations do not go the whole length of associated valleys or crests, the elevations at which sub-corrugations terminate may be the same for all sub-corrugations; or the elevations may differ. A chamber may have a combination constant dimension sections and tapering dimension sections.

Other chamber embodiments of the invention may have sub-corrugations only in crest corrugations or only in valley corrugations. As mentioned, a chamber may have sub-corrugations in only some of the crests and or in only some of the valleys or in only some both crests and valleys.

Use of sub-corrugations compares favorably with other alternatives for obtaining better strength in a chamber, including increasing wall thickness or applying ribs to the interior or exterior. An associated benefit of sub-corrugations is that there is a small but desirable increase in interior volume of the chamber, thus increasing its capacity to store stormwater.

In use, chambers of the present invention are placed on a graded surface, and connected end to end to form a string of chambers. After suitable end caps or closures are placed at the ends of the strings, and desired piping is installed, the chambers are back-filled with soil. Sometimes chambers are set on a geotextile covered surface and sometimes they are covered in geotextile. Chambers of the present invention may have features like those associated with prior art chambers, including that they may have a multiplicity of relatively small sidewall ports, spaced apart along the sidewalls, to allow lateral water flow out of the chambers, providing strength is not unacceptably compromised by the ports.

While the invention has been presented primarily in terms of chambers for receiving stormwater, the invention will also be useful in arch shape cross section corrugated chambers

which are useful for other purposes, such as receiving wastewater, or for providing arch shape cross section enclosures for creating spaces in soils and storing or protecting things.

End Caps

Typically, end caps are placed on the outermost ends of strings of interconnected chambers, to keep the surrounding medium, e.g., stone aggregate, from intruding into the interiors of the chambers. End caps which have outwardly bulging dome shape contours. Those shapes may also be referred to as presenting as compoundly concave shapes. Prior art end caps of such type are described in U.S. Pat. No. 7, 237,981 of Vitarelli et al., 7,118,306 of Kruger et al., and 7,491,015 of Coppes et al., the disclosures of all of which are hereby incorporated by reference. As reference to the foregoing patents will show, typical prior art end caps have had a multiplicity of ribs on the concave interior side.

In embodiments of the present invention, an end cap has a plurality of upward running crest corrugations and valley corrugations. In one embodiment there are sub-corrugations in the valleys and crests, and there is an absence of interior ribbing. Fig. 10 is an end view and Fig. 11 is a side view of and an exemplary end cap 50 of the present invention. In Fig. 10, the end cap is illustrated a portion of a chamber 20, shown in phantom, to indicate how it is used to close off the end of the chamber. Fig. 13 is a partial horizontal cross section view of the cap, at an elevation somewhat above the elevation of the base. The line CP in the Figures indicates the vertical axis of the cap. The cap body has a nominal maximum height H and a nominal maximum depth D, as indicated in Fig. 10 and Fig. 11.

End cap 50 an attachment end 54 which defines an arch shape opening for mating with the arch shape cross section of a chamber. Preferably, the end 54 comprises a flange as pictured, for overlapping or underlapping the end of a chamber. End cap 50 has an arch shape base 52. The base preferably comprises a flange as shown, to provide bearing area for better supporting the cap on soil. End 54 has downwardly extending terminal ends; and base 52 has horizontally extending terminal ends. The terminal ends are connected to each other at points 72.

End cap 50 comprises a compound convex shape wall 62, which connects the arc of the attachment end 54 with the arch of the base 52. In prior patents the wall may have been referred to as an outward bulging dome or a dome-shape body. End cap wall 62 is comprised of a plurality of alternating crest corrugations 56 and valley corrugations 58 which run upwardly from the base flange. The corrugations curve inwardly along the contour of wall 62. As seen in Fig. 10, the corrugations may be characterized as running substantially vertically, as may be seen when they are projected into a vertical plane which runs through the connection points 72 of the terminal ends and parallel to vertical axis CP. Within the meaning of substantially vertical, the corrugations may have a tilt or curve, for instance as appears in Fig. 10.

Sub-corrugations 60 run upwardly within each valley corrugation 58. Crest corrugations 56 have corresponding sub-corrugations 68. In the center portion of the body, the sub-corrugations run up to a maximum height of about 60 percent of the total or maximum height H of the peak of the end cap, as such heights are projected into an aforesaid vertical plane. Near the left-right outer edges, as seen in Fig. 10, the sub-corrugations run up to about 25 percent of the peak height.

The principles of the chamber inventions which involve sub-corrugations, described above, can be applied in end caps; and the foregoing disclosure with respect to chamber corrugations and sub-corrugations is hereby incorporated by reference. In brief, the corrugations provide stiffness and structural strength to the body of the end cap, and the sub-corrugations increase the strength and buckling resistance of the end cap body structure. The benefit is that a strong end cap can be made in an efficient way with less weight of material than would otherwise be required.

An embodiment of end cap comprises corrugations having a plurality of sub-corrugations, where each sub-corrugation runs upwardly from the elevation of the base on a plurality of either or both crest corrugations or valley corrugations. Each sub-corrugation has a depth less than the depth of the corrugation with which it is associated. Preferably, in an exemplary cap, each sub-corrugation diminishes in width and depth with elevation. In another exemplary end cap, each sub-corrugation terminates at an elevation which is less than the elevation of

attachment end at the location of the particular corrugation with which the sub-corrugation is associated. In another embodiment exemplary cap, the sub-corrugations terminate at an elevation which is no more than about 60 percent of the overall height of the end cap.

In alternate embodiments of the cap invention, some valley corrugations and or some crest corrugations may not have sub-corrugations; or some or all of the sub-corrugations may run all the way up the respective crests or valleys, from the base to the attachment end.

End caps may be fabricated of materials and in ways which are described above for the chambers. An exemplary end cap for a large chamber may have a height of about 57 inches, a base flange width of about 98 inches, and a depth D of about 33 inches, as measured at about the elevation of the base flange. Such a chamber may be made of polyethylene or polypropylene by rotational molding, and it may have a basic wall thickness of about 0.35 inches. Rotational molding materials as a class have lower strength than comparable composition injection molding or thermoforming materials. They are also less reliable in producing uniform thickness or repeatable dimension. Thus, the use of sub-corrugations can be advantageous beyond the reasons already given. In another alternative, it may be practical to form from sheet metal an end cap of the present invention.

Although the inventions have been described and illustrated with respect to several embodiments, those embodiments should be considered illustrative and not restrictive. Any use of words, such as “preferred” and variations thereof, is intended to suggest a combination of features which is desirable but which is not necessarily mandatory; and, embodiments lacking any such preferred features or combination may be within the scope of the claims which follow. Persons skilled in the art may make various changes in form and detail without departing from the spirit and scope of the claimed invention.

Attorney No. 2834

What is claimed is:

1. A molded arch shape cross section plastic chamber, for receiving and dispersing water when buried in soil, comprising:

opposing side bases running generally parallel to a chamber length axis, for supporting the chamber on soil during use;

a chamber top;

sidewalls running upwardly and inwardly from opposing side bases to the chamber top, wherein the combination of sidewalls and top form an arch curve which defines an arch shape cross section;

a plurality of alternating crest corrugations and valley corrugations running transverse to the length of the chamber along the arch curve of the chamber, wherein the crest corrugations decrease in width with elevation from the base and the valley corrugations increase in width with elevation from the base, as width is measured in a direction parallel to the chamber length axis; and,

a plurality of crest sub-corrugations, running upwardly from the base and along a portion of the arch-curve of a crest corrugation, each sub-corrugation having a height less than the local height of the crest corrugation with which it is associated; each crest sub-corrugation terminating at an elevation lower than the top of the chamber.

2. The chamber of claim 1 wherein each crest sub-corrugation has a height which diminishes with increasing elevation.

3. The chamber of claim 2 wherein each crest sub-corrugation has a width which diminishes with increasing elevation.

4. The chamber of claim 1 wherein the crest sub-corrugations extend about one quarter to two-thirds of the height of the chamber.
5. The chamber of claim 1 wherein the maximum width of each crest sub-corrugation is no more than one-third of the local width of the associated crest corrugation.
6. The chamber of claim 1 further comprising: a plurality of valley sub-corrugations, each sub-corrugation running downwardly from the top of the chamber and along part or all of the length of a valley corrugation; and, each sub-corrugation having a height less than the depth of the valley corrugation with which it is associated; each crest sub-corrugation terminating at an elevation lower than the top of the chamber.
7. The chamber of claim 6 wherein each valley sub-corrugation terminates at an elevation above the elevation of the base.
8. The chamber of claim 6 wherein each valley sub-corrugation runs downwardly from the top of the chamber and terminates at a point which is above the elevation of each opposing side base; and, wherein each crest sub-corrugation runs upwardly from the base and terminates at an elevation which is higher than the elevation of the termination points of the valley sub-corrugations.
9. The chamber of claim 7 wherein each valley sub-corrugation diminishes in both height and width in proximity to the base, as width is measured in a direction which is parallel to the length axis of the chamber.
10. The chamber of claim 6 wherein the maximum width of each valley sub-corrugation is no more than one-third of the local width of the associated valley corrugation, as width is measured in a direction which parallel to the length axis of the chamber.
11. The chamber of claim 6 wherein the valley sub-corrugations have lower termination ends on the sidewall of the chamber; wherein the crest sub-corrugation have upper termination ends

on the sidewall; and, wherein the crest sub-corrugation termination ends are higher in elevation than the elevations of the valley sub-corrugation terminal ends.

12. The chamber of claim 7 further comprising a second plurality of valley sub-corrugations, each running within a valley corrugation upwardly from each opposing side base in the direction of said terminal ends of the first plurality of valley sub-corrugation.

13. In a molded arch shape cross section chamber, for receiving and dispersing water when buried in soil; wherein the chamber is supported by flanges associated with opposing side bases during use; wherein the chamber has alternating crest corrugations and valley corrugations running transverse to the length of the chamber, along the arch curve of the chamber; wherein the crest corrugations decrease in width with elevation for the base and the valley corrugations increase in width with elevation from the base, as width is measured in a direction parallel to the chamber length axis; the improvement which comprises: a plurality of sub-corrugations running along at least a portion of the lengths of a plurality of one or both of the crest corrugations and valley corrugations.

14. The improved chamber of claim 13 wherein the width and depth of each sub-corrugation change along part or all of the length of the sub-corrugation in the same sense as does the width of the corrugation with which the sub-corrugation is associated.

15. The improved chamber of claim 13 having one or both of a first set of sub-corrugations running upwardly from the opposing side bases on crest corrugations to termination points which are at an elevation which less than the elevation of the top of the chamber, and a second set of sub-corrugations running in valley corrugations at the top of the chamber and downwardly toward the opposing side bases to an elevation which is less than the elevation of said termination points of the first set of sub-corrugations.

17. The improved chamber of claim 15 wherein the width and depth of each sub-corrugation changes along part or all of the length of the sub-corrugation in the same sense as does the width of the corrugation with which the sub-corrugation is associated.

18. The improved chamber of claim 15 wherein all the elevations of the termination points of all of at least one of the first or second set of the sub-corrugations are the same.

19. The method of increasing the strength of a corrugated molded chamber adapted for receiving and dispersing water when buried in soil, wherein the chamber comprises opposing side bases running generally parallel to a chamber length axis, for supporting the chamber on soil during use; a top; opposing sidewalls which run upwardly from opposing side bases to the chamber top, wherein the combination of sidewalls and top form an arch curve which defines an arch shape cross section; a plurality of alternating crest corrugations and valley corrugations running transverse to the length of the chamber along the arch curve of the chamber, wherein the crest corrugations decrease in width and the valley corrugations increase in width with elevation from the base, as width is measured in a direction parallel to the chamber length axis; which comprises: providing a plurality of sub-corrugations which run along part or all of the arch curve of the chamber on either or both the crest corrugations and the valley corrugations, wherein each sub-corrugation has a depth less than the depth of the corrugation with which it is associated.

20. An end cap for closing off the end of an arch shape cross section chamber adapted to receive and disperse water when buried in soil, comprising:

an attachment end, defining an arch shape opening, for mating with the end of an arch shape cross section chamber, the end having downwardly extending terminal ends;

an arch shape base for supporting the end cap on soil, having horizontally extending terminal ends connected to the terminal ends of said attachment end;

a compound convex shape wall connecting the said attachment end and said base ;

a plurality of alternating crest corrugations and valley corrugations running upwardly along the convex shape wall from the points along said arch shape base to points along said arch shape attachment end, wherein the corrugations run along approximately vertical paths, when the

paths are projected into a vertical plane which runs through the points at which said terminal ends are connected.

21. The end cap of claim 20 further comprising a plurality of sub-corrugations, each sub-corrugation running upwardly from the elevation of the base on a plurality of crest corrugations or valley corrugations or both, each sub-corrugation having a depth less than the depth of the corrugation with which it is associated.

22. The end cap of claim 21 wherein each sub-corrugation terminates at an elevation which is less than the elevation of the said attachment end at the location of the corrugation with which the sub-corrugation is associated.

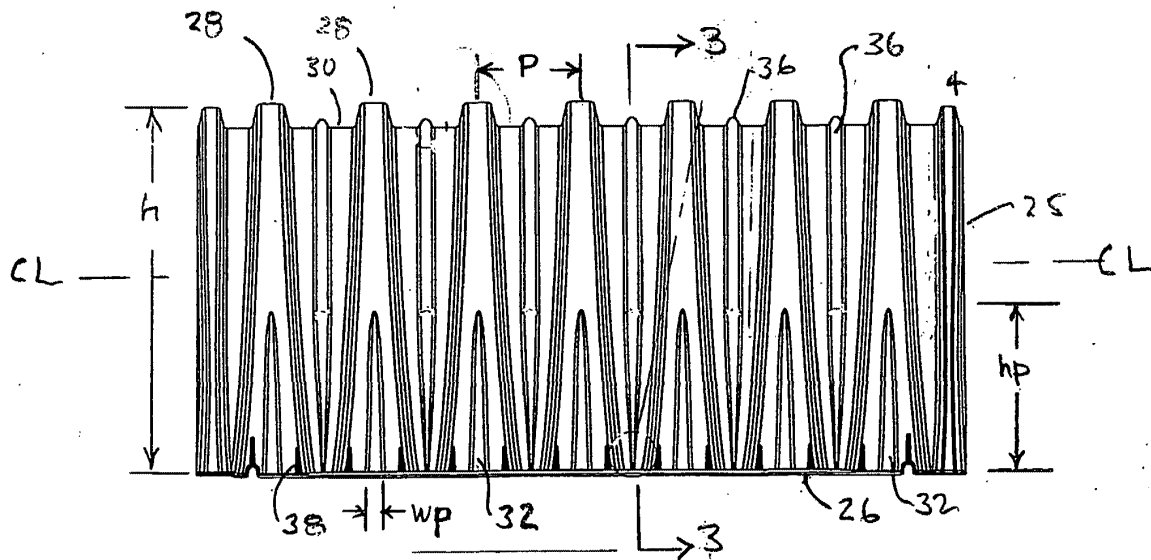
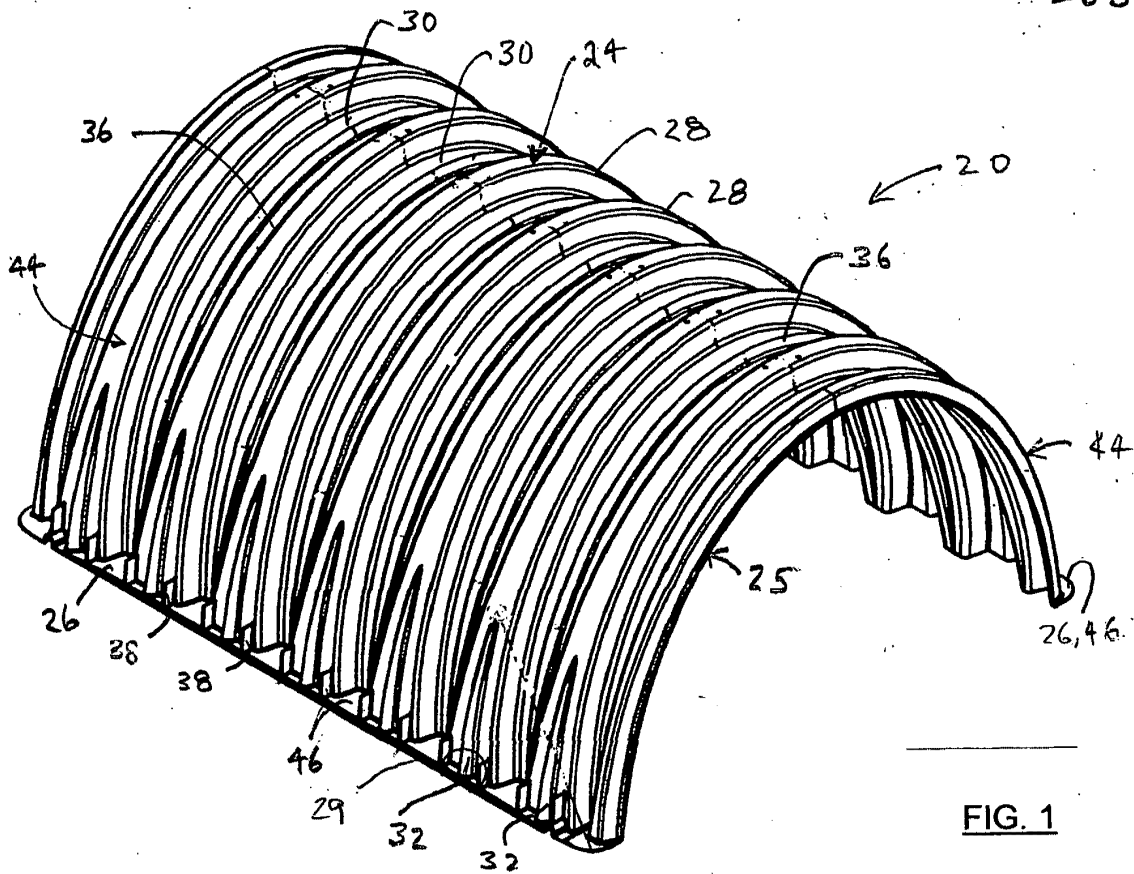
23. The end cap of claim 21 wherein the sub-corrugations terminate at an elevation which is no more than about 60 percent of the overall height of the end cap.

24. The end cap of claim 21 wherein each sub-corrugation of said plurality diminishes in width and depth with elevation.

ABSTRACT

A plastic arch-shape cross section corrugated stormwater chamber has a multiplicity of crest corrugations and valley corrugations which run transverse to its length. Sub-corrugations run along part or all of the arch-curve lengths of either crest corrugations or valley corrugations, or along both of them. A sub-corrugations are smaller in dimension than an associated crest corrugation or valley corrugation. Sub-corrugations may taper in width and depth and may taper to nothingness. A compound convex shape end cap, useful for closing off the ends of stormwater chambers, has substantially vertical corrugations with analogous sub-corrugations.

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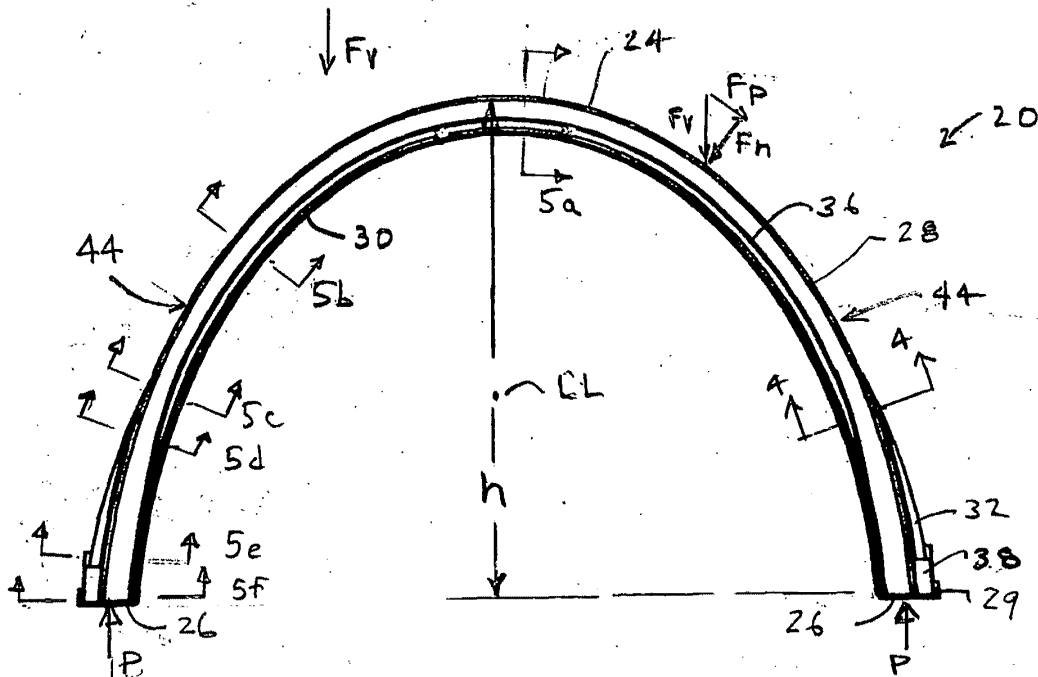


FIG. 3

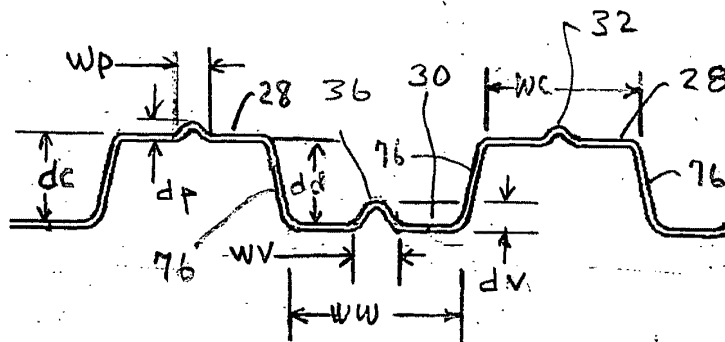


FIG. 4

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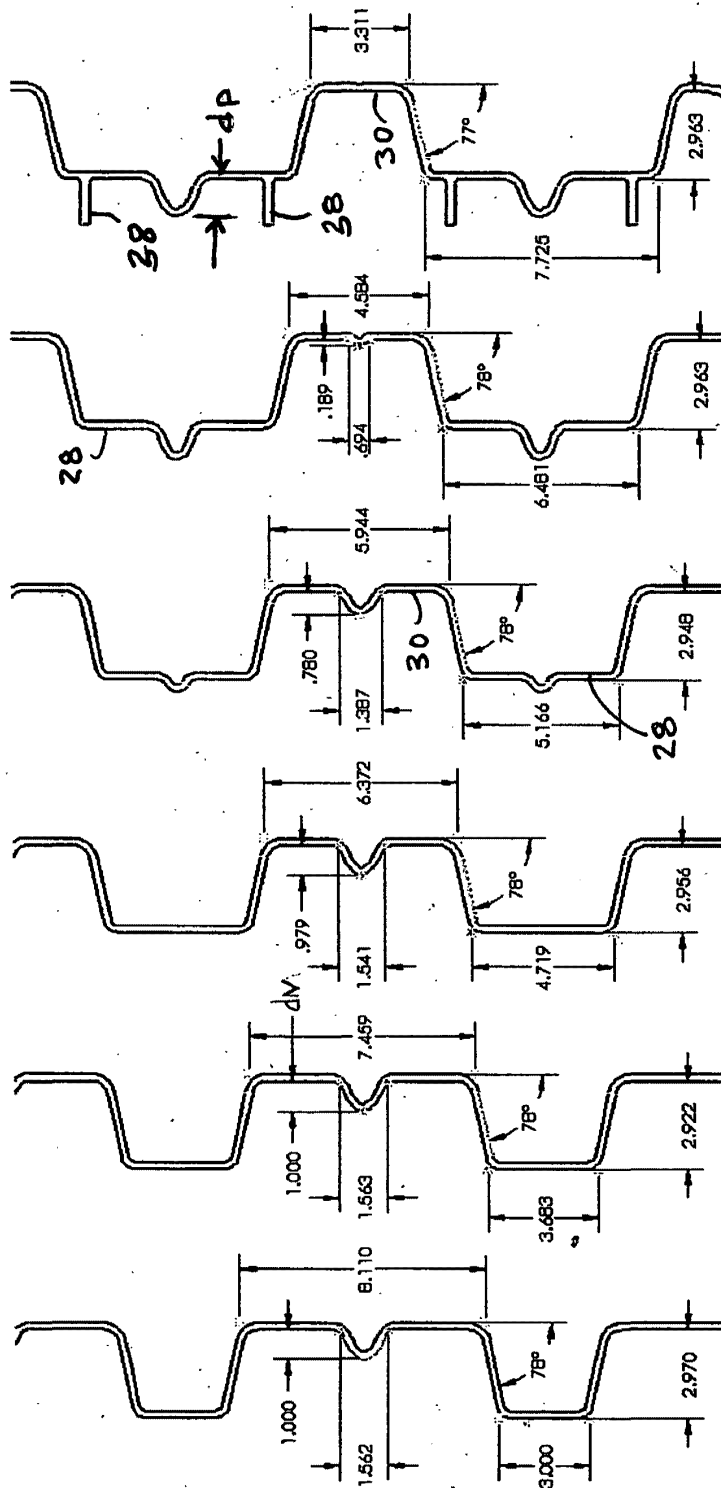


FIG. 5(a)

FIG. 5(b)

FIG. 5(c)

FIG. 5(d)

FIG. 5(e)

FIG. 5(f)

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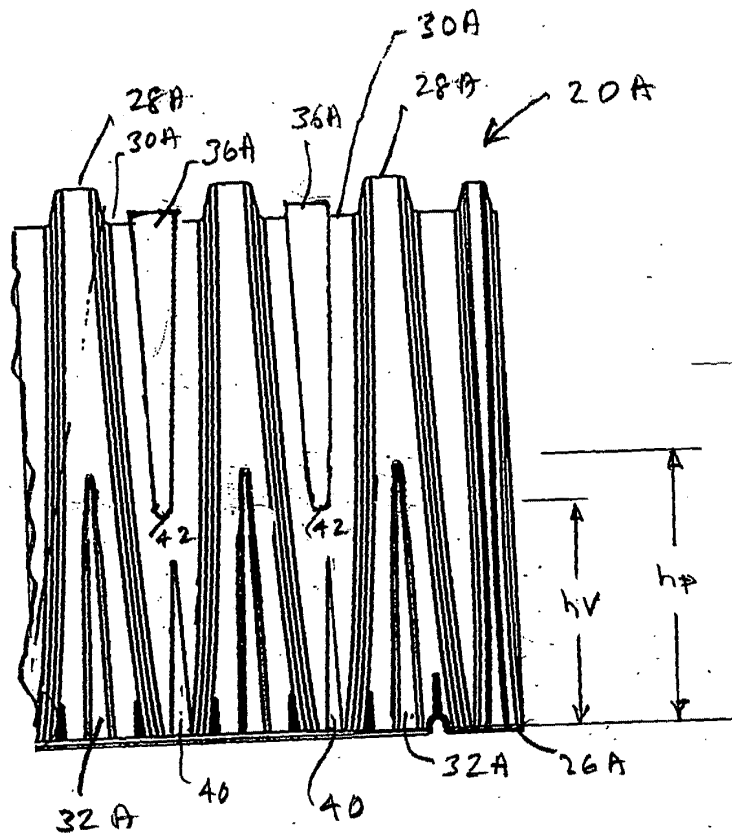


FIG. 6

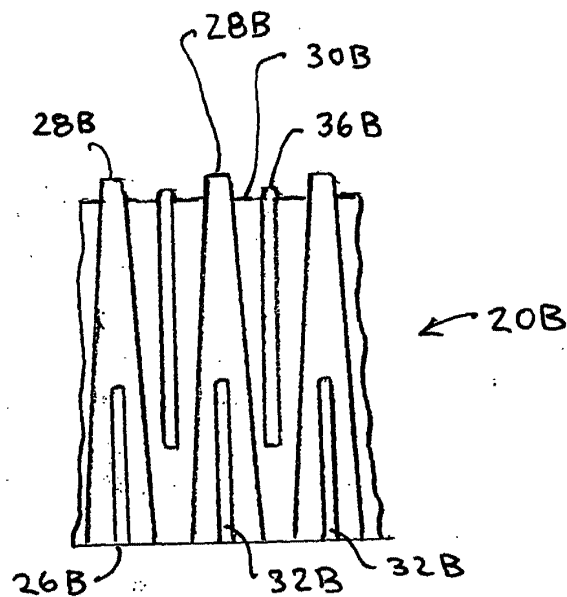
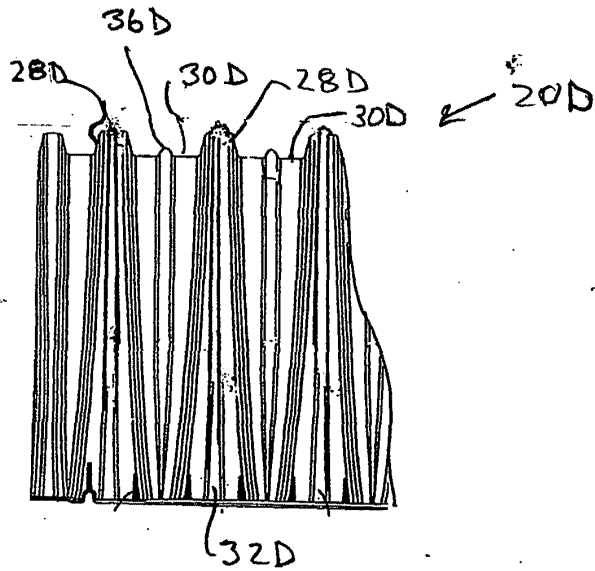
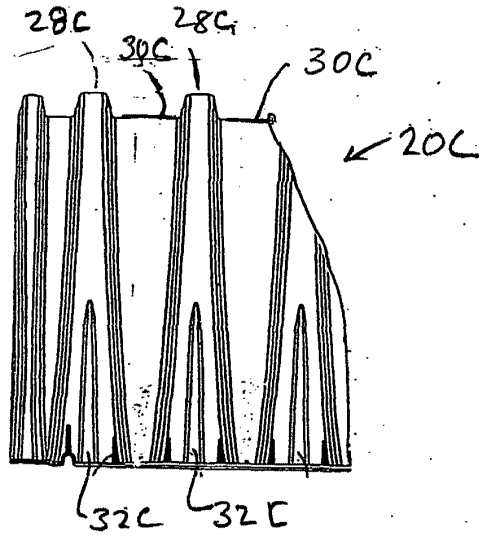


FIG. 7

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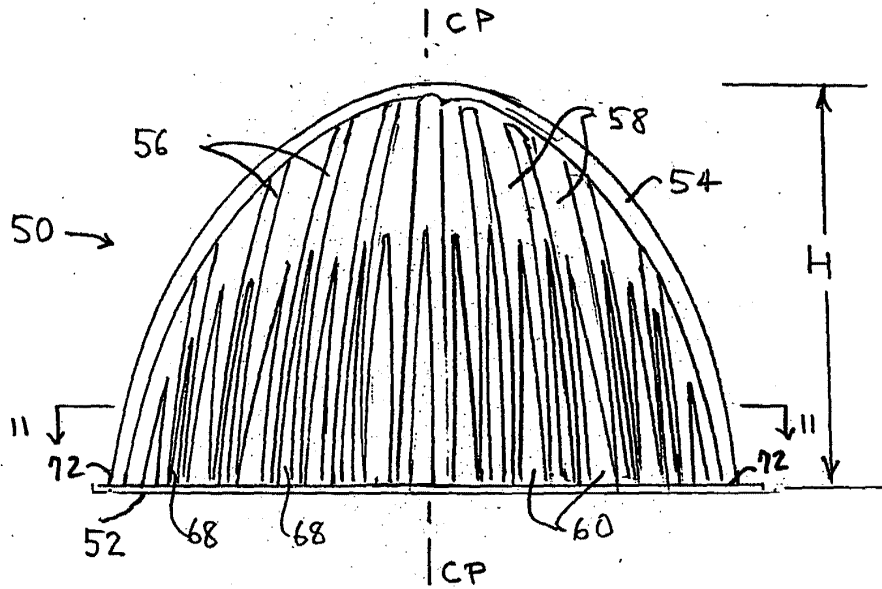


FIG. 10

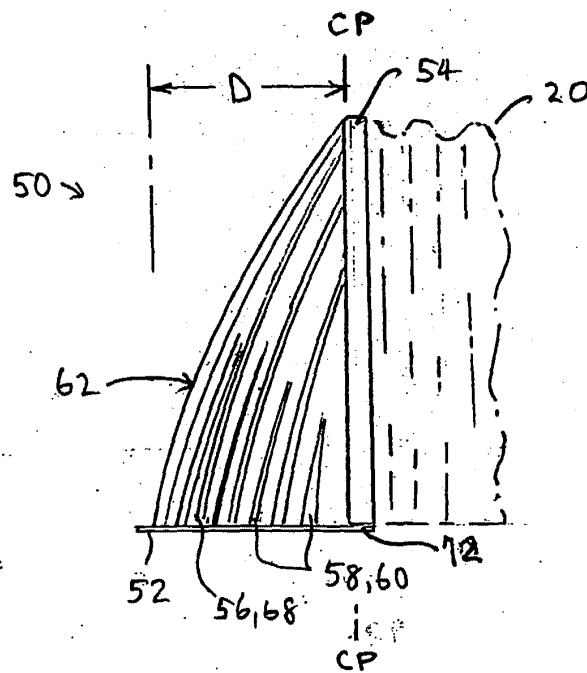


FIG. 11

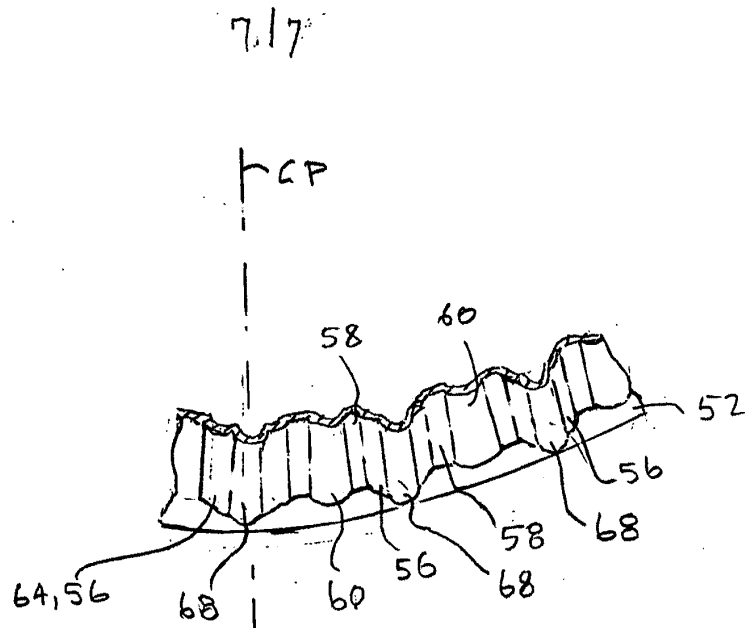


FIG. 12

PATENT APPLICATION SERIAL NO. _____

**U.S. DEPARTMENT OF COMMERCE
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FEE RECORD SHEET**

06/10/2010 EEKUBAY1 00000004 12802483

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| 02 FC:1111 | 540.00 OP |
| 03 FC:1311 | 220.00 OP |
| 04 FC:1202 | 208.00 OP |
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**CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC**

PTO/SB/06 (12-04)

Filing Date: 060710

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| PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875 | | | | | 12/802,483 | |
|--|---|------------------------------------|---|--------------|-----------------|----------------------------|
| APPLICATION AS FILED – PART I | | | | | | |
| (Column 1) | | (Column 2) | | SMALL ENTITY | | OTHER THAN SMALL ENTITY |
| FOR | NUMBER FILED | NUMBER EXTRA | | RATE (\$) | FEE (\$) | |
| BASIC FEE (37 CFR 1.16(a), (b), or (c)) | | | | | | 330 |
| SEARCH FEE (37 CFR 1.16(k), (l), or (m)) | | | | | | 540 |
| EXAMINATION FEE (37 CFR 1.16(o), (p), or (q)) | | | | | | 220 |
| TOTAL CLAIMS (37 CFR 1.16(i)) | | | 24 minus 20 = | X 26 = | | X 52 = 208 |
| INDEPENDENT CLAIMS (37 CFR 1.16(h)) | | | 4 minus 3 = | X 110 = | | X 220 = 220 |
| APPLICATION SIZE FEE (37 CFR 1.16(s)) | | | If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$270 (\$135 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s). | | | |
| MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j)) | | | | | | |
| | | | | N/A | | N/A |
| | | | | TOTAL | | TOTAL 1518 |
| * If the difference in column 1 is less than zero, enter "0" in column 2. | | | | | | |
| APPLICATION AS AMENDED – PART II | | | | | | |
| (Column 1) | | (Column 2) | | (Column 3) | | |
| AMENDMENT A | CLAIMS REMAINING AFTER AMENDMENT | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA | | RATE (\$) | ADDITIONAL FEE (\$) |
| | Total (37 CFR 1.16(i)) | Minus ** | = | | X = | |
| | Independent (37 CFR 1.16(h)) | Minus *** | = | | X = | |
| | Application Size Fee (37 CFR 1.16(s)) | | | | N/A | |
| | FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | TOTAL ADD'T FEE | |
| (Column 1) | | (Column 2) | | (Column 3) | | |
| AMENDMENT B | CLAIMS REMAINING AFTER AMENDMENT | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA | | RATE (\$) | ADDITIONAL FEE (\$) |
| | Total (37 CFR 1.16(i)) | Minus ** | = | | X = | |
| | Independent (37 CFR 1.16(h)) | Minus *** | = | | X = | |
| | Application Size Fee (37 CFR 1.16(s)) | | | | N/A | |
| | FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | TOTAL ADD'T FEE | |
| <p>* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.</p> <p>** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".</p> <p>*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".</p> <p>The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.</p> | | | | | | |

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

CASE IPR2017-00526
CULTEC, INC. v. STORMTECH LLC

PTO/SB/06 (12-04)

Date: 06/07/10

Approved for use through 7/31/2006. OMB 0651-0032

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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| PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875 | | | | | Application or Docket Number 12/802,483 | |
|--|--|------------------------------------|---------------|--------------|---|-------------|
| APPLICATION AS FILED – PART I | | | | | | |
| (Column 1) | | (Column 2) | | SMALL ENTITY | | OR |
| FOR | NUMBER FILED | NUMBER EXTRA | RATE (\$) | FEE (\$) | RATE (\$) | FEE (\$) |
| BASIC FEE (37 CFR 1.16(a), (b), or (c)) | N/A | N/A | N/A | | N/A | 330 |
| SEARCH FEE (37 CFR 1.16(k), (l), or (m)) | N/A | N/A | N/A | | N/A | 540 |
| EXAMINATION FEE (37 CFR 1.16(o), (p), or (q)) | N/A | N/A | N/A | | N/A | 220 |
| TOTAL CLAIMS (37 CFR 1.16(i)) | 23 | minus 20 = 3 | x\$26 | | x\$52 | 156 |
| INDEPENDENT CLAIMS (37 CFR 1.16(h)) | 4 | minus 3 = 1 | x\$110 | | x\$220 | 220 |
| APPLICATION SIZE FEE (37 CFR 1.16(s)) | If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$270 (\$135 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR | | | | | |
| MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j)) | | | 195 | | 390 | |
| | | | TOTAL | | TOTAL | 1466 |
| * If the difference in column 1 is less than zero, enter "0" in column 2. | | | | | | |
| APPLICATION AS AMENDED – PART II | | | | | | |
| (Column 1) | | (Column 2) | | SMALL ENTITY | | OR |
| AMENDMENT A | CLAIMS REMAINING AFTER AMENDMENT | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA | RATE (\$) | ADDITIONAL FEE (\$) | RATE (\$) |
| Total (37 CFR 1.16(i)) | * | Minus ** | = | X = | | X = |
| Independent (37 CFR 1.16(h)) | * | Minus *** | = | X = | | X = |
| Application Size Fee (37 CFR 1.16(s)) | | | | | | |
| FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | N/A | | N/A |
| | | | | TOTAL | | TOTAL |
| | | | | ADD'T FEE | | ADD'T FEE |
| (Column 1) | | (Column 2) | | SMALL ENTITY | | OR |
| AMENDMENT B | CLAIMS REMAINING AFTER AMENDMENT | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA | RATE (\$) | ADDITIONAL FEE (\$) | RATE (\$) |
| Total (37 CFR 1.16(i)) | * | Minus ** | = | X = | | X = |
| Independent (37 CFR 1.16(h)) | * | Minus *** | = | X = | | X = |
| Application Size Fee (37 CFR 1.16(s)) | | | | | | |
| FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | N/A | | N/A |
| | | | | TOTAL | | TOTAL |
| | | | | ADD'T FEE | | ADD'T FEE |
| <p>* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.</p> <p>** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".</p> <p>*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".</p> <p>The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.</p> | | | | | | |

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