



(51) International Patent Classification:

F16L 3/12 (2006.01) F16L 3/24 (2006.01)
F16L 3/14 (2006.01) F16L 3/26 (2006.01)
F16L 3/22 (2006.01)

(21) International Application Number:

PCT/US2017/024959

(22) International Filing Date:

30 March 2017 (30.03.2017)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

62/315,047 30 March 2016 (30.03.2016) US
62/379,286 25 August 2016 (25.08.2016) US

(71) Applicant: **HYRDA-ZORB** [US/US]; 1751 Summit Dr., Auburn Hills, MI 48326 (US).

(72) Inventors: **DODGE, Robert**; 1370 W Lincoln St., Birmingham, MI 48009 (US). **SCHWAGER, Mark**; 55150 Hagen Dr., Shelby Township, MI 48315 (US).

(74) Agent: **ASHER, Robin, W.**; Miller, Canfield, Paddock and Stone, P.L.C., 150 West Jefferson, Suite 2500, Detroit, MI 48226 (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, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

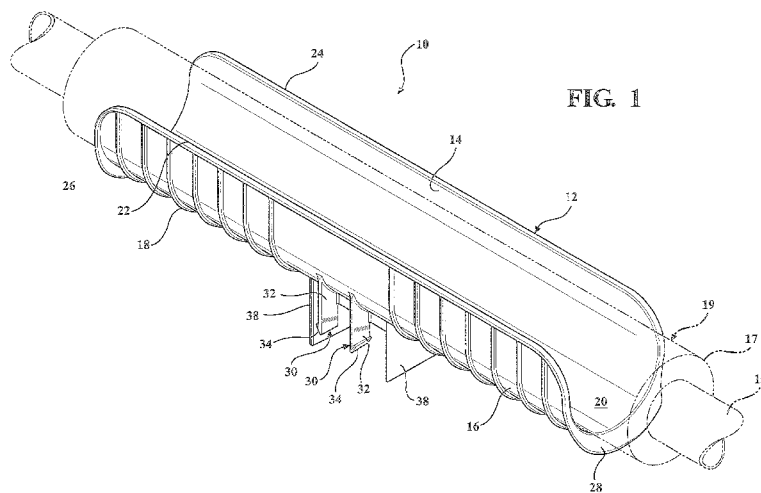
Declarations under Rule 4.17:

— of inventorship (Rule 4.17(iv))

Published:

— with international search report (Art. 21(3))

(54) Title: SADDLE PIPE SUPPORT



(57) Abstract: A pipe support is coupled to an elongated channel for receiving and supporting a pipe. The channel includes a base and a pair of spaced apart sidewalls extending from the base to a top plate. A flange projects downwardly from each top plate towards the base and defines a slot therebetween. The pipe support includes a body portion extending axially between opposite ends and having an inner surface and an outer surface. The body portion includes a generally arcuate bottom floor and a pair of spaced apart sidewalls projecting generally upwardly from the bottom floor. A plurality of axially spaced apart channel clips project downwardly from the outer surface of the body portion opposite the side walls. The channel clips have a leg portion and an outwardly projecting barb portion wherein the channel clips extend through the slot in the channel and the barb portions engage the respective spaced apart flanges to operatively couple the pipe support to the channel.



SADDLE PIPE SUPPORT

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to and all the benefits of United States Provisional Application Nos. 62/315,047, filed on March 30, 2016 and 62/379,286, filed on August 25, 2016.

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0002] The present invention relates to a pipe support. More particularly, the invention relates to a saddle pipe support adapted for connection to a channel for receiving and supporting a pipe.

2. Description of Related Art

[0003] Conventional pipes are used to convey or transfer fluids in various commercial and industrial application and buildings, such as water and sprinkler systems, refrigeration systems, and heating/cooling systems. The pipes are commonly encased in a cellular foam insulation tubing, which maintains the fluid within the pipes at a desired temperature. The pipe insulation tubing is commonly provided in predetermined lengths that are aligned end-to-end to cover an entire length of pipe.

[0004] In a typical application and installation, the insulated pipe, that is, the pipe encased by the insulation tubing, is disposed along a support structure, such as a ceiling of the building. The insulated pipe is commonly supported along the support structure by a plurality of spaced apart clevis hangers or straps. An elongated metal U-shaped channel is typically fixedly secured to the support structure or ceiling for supporting the clevis hangers. The clevis hanger typically includes an upper member mounted to the channel and a generally U-shaped lower member coupled to the upper member for supporting the insulated pipe spaced below the channel. The shape of the lower member complements that of the outer periphery of the insulated pipe, thereby allowing the clevis hanger to support and retain the insulated pipe along the channel. Examples of common clevis hangers for supporting insulated pipes are shown in U.S. Patents 7,207,527 and 7,520,475.

[0005] It is also known to provide a saddle shaped pipe support adapted to be connected to the U-shaped channel and shaped complementary to the insulated pipe to support a longitudinal length of the insulated pipe. The saddle pipe support includes a body portion having a curved bottom and arcuate upwardly extending walls for receiving and supporting the insulated pipe. A pair of spaced apart members having inwardly extending hooks or barbs extend downwardly from the body portion for receiving the outer walls of the channel therebetween to secure the saddle pipe support to the channel. A saddle pipe support known in the prior art is shown in U.S. Patent 8,074,943.

[0006] However, it remains desirable to provide a more secure and stable connection between the saddle pipe support and the channel for supporting the insulated pipe.

SUMMARY OF THE INVENTION

[0007] A pipe support is provided for receiving and supporting a pipe. The pipe support comprises a body portion extending axially between opposite ends and having an inner surface and an outer surface. The body portion includes a generally arcuate bottom floor and a pair of spaced apart sidewalls projecting generally upwardly from the bottom floor. A plurality of axially spaced apart channel clips project downwardly from the outer surface of the body portion opposite the side walls. The channel clips comprise a leg portion and an outwardly projecting barb portion adapted for operatively coupling the pipe support to a support structure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] Advantages of the present invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

[0009] Figure 1 is a top perspective view of the saddle pipe support according to one embodiment of the invention supporting an insulated pipe;

[0010] Figure 2 is a bottom perspective view of the saddle pipe support;

[0011] Figure 3 is a side view of the saddle pipe support connected to a U-shaped channel; and

[0012] Figure 4 is an end view of the saddle pipe support.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0013] Referring to the Figures, wherein like numerals indicate like or corresponding parts throughout the several views, a saddle pipe support 10, preferably fabricated by molded plastic is shown in Figure 1, for supporting an elongated pipe 15. The pipe 15 is generally a fluid pipe used in commercial or industrial buildings for transferring fluid in water, refrigeration, or heating/cooling systems. Further, the pipe 15 is typically encased in a cellular foam insulation tubing 17 for maintaining the temperature of the fluid in the pipe 15, collectively referred to herein as an insulated pipe and shown at 19.

[0014] The saddle pipe support 10 is adapted to be removeably coupled to a support structure commonly known as an elongated metal U-shaped channel 40 which is typically fixedly secured to a wall or ceiling of the building. The channel 40, which is commonly known in the art, includes a flat base 42 extending between a pair of spaced apart upright sidewalls 44. A top plate 46 projects inwardly from each of the respective sidewalls 44 and is generally parallel to the base 42. Each top plate 46 terminates with a downwardly turned flange 48 projecting toward but spaced above the base 42. An elongated slot 50 is defined between the spaced apart and opposite facing flanges 48.

[0015] The pipe support 10 includes an elongated semi-cylindrical or generally U-shaped body portion 12 having an inner support surface 14 for supporting the insulated pipe 19 and an outer surface 16 reinforced by a plurality of transverse structural ribs 18. More specifically, the body portion 12 includes an arcuate bottom floor 20 and a pair of spaced apart upwardly or vertically extending sidewalls 22, 24. The body portion 12 extends axially, or longitudinally, between opposite ends terminating with downwardly curved or tapered lips 26, 28 projecting from the bottom floor 20. The structural ribs 18 are spaced apart transverse to the axial length of the body portion 12 and extend around the outer surface 16 of the bottom floor 20 and each sidewall 22, 24 to provide structural rigidity and strength to the pipe support 10.

[0016] A plurality of spaced apart channel clips 30 project downwardly from the outer surface 16 of the body portion 12 for connection to the elongated channel 40, as shown in Figure 3. More specifically, each channel clip 30 includes vertical leg portion 32 extending downwardly from the body portion 12 to an outwardly projecting distal barb

portion 34 for engaging the edge of the opposing flanges 48 on the channel 40 to lockingly secure the saddle pipe support 10 to the channel 40. In the embodiment shown in Figures 1-4, the pipe support 10 includes a first pair of spaced apart channel clips 30 spaced laterally opposite a second pair of spaced apart channel clips 30 defining an axial gap 36 therebetween. However, it should be appreciated that the pipe support 10 may include a single pair of opposite facing and spaced apart channel clips 30 defining the axial gap 36 without varying from the scope of the invention.

[0017] Finally, the saddle pipe support 10 further includes a pair of spaced apart stabilizing flanges 38 projecting downwardly from the outer surface 16 of the body portion 12 adjacent and spaced parallel to the channel clips 30 for engaging the sidewalls 44 of the channel 40 to laterally support and stabilize the pipe support 10. As shown in the drawings, the channel clips 30 and stabilizing flanges 38 are arranged transverse to the longitudinal axis of the body portion 12 in order to align with the elongated channel 40.

[0018] In operation, the longitudinal axis of the saddle pipe support 10 is arranged transverse to the longitudinal axis of the channel 40 as shown in Figure 3. The channel clips 30 are inserted downwardly through the slot 50 in the channel 40 defined between the flanges 48 until the barb portions 34 hook under the bottom edge of the flanges 48 locking the clips 30 into the channel 40. It should be appreciated that the outwardly projecting barb portions 34 may engage the side face of the flanges 48 and flex the clips 30 slightly inwardly until the barb portions 34 extend past the distal edge of the flange 48 to lock the clips 30 to the channel 40. Additionally, the sidewalls 44 of the channel 40 are received between the spaced apart stabilizing flanges 38 such that the stabilizing flanges 38 engage the outer surface of the sidewalls 44 and provide lateral stability to the saddle pipe support 10 along the channel 40. As shown in Figure 3, when the pipe support 10 is coupled to the channel 40, the sidewalls 44 and top plate 46 of the channel 40 are seated in the space formed between the channel clips 30 and the stabilizing flanges 38. Once the saddle pipe support 10 is coupled to the channel 40, a length of insulated pipe 19 may be inserted between the sidewalls 22, 24 and supported by the bottom floor of the body portion 12. It should be appreciated that the saddle pipe support 10 is configured to receive and support a pipe 15 whether encased in the insulation tubing 17 or not. Also, the flared or downwardly curved lips 26, 28 on the opposite distal ends of the body portion 12 allow the insulated pipe 19 to be moved axially along the saddle pipe support 10 without damage to the insulation tubing 17.

[0019] If it desirable to disconnect the saddle pipe support 10 from the channel 40, the channel clips 30 may simply be flexed inwardly to release the barb portions 34 from engagement with the flanges 48 and allow the saddle pipe support 10 to be removed from the channel 40.

[0020] The invention has been described in an illustrative manner, and it is to be understood that the terminology, which has been used, is intended to be in the nature of words of description rather than of limitation. Many modifications and variations of the present invention are possible in light of the above teachings. It is, therefore, to be understood that within the scope of the appended claims, the invention may be practiced other than as specifically described.

What is claimed is:

1. A pipe support adapted for receiving and supporting a pipe, said pipe support comprising:

a body portion extending axially between opposite ends and having an inner surface and an outer surface, said body portion including a generally arcuate bottom floor and a pair of spaced apart sidewalls projecting generally upwardly from said bottom floor; and

a plurality of axially spaced apart channel clips projecting downwardly from said outer surface of said body portion opposite said side walls, said channel clips comprising a leg portion and an outwardly projecting barb portion adapted for operatively coupling said pipe support to a support structure.

2. The pipe support as set forth in claim 1 further including a pair of axial spaced apart stabilizing flanges projecting downwardly from said outer surface of said body portion and arranged parallel and spaced axial from said channel clips.

3. The pipe support as set forth in claim 2 wherein said body portion extends longitudinally between opposing ends defined by downwardly curved lips.

4. The pipe support as set forth in claim 3 further including a plurality of axial spaced apart structural ribs formed on said outer surface of said body portion along said bottom floor and said sidewalls.

5. In combination, a pipe support adapted to be operatively coupled to an elongated channel for receiving and supporting a pipe, wherein

said channel includes a base and a pair of spaced apart sidewalls extending from said base to a top plate, wherein a flange projects downwardly from each top plate towards said base and defines a slot therebetween; and

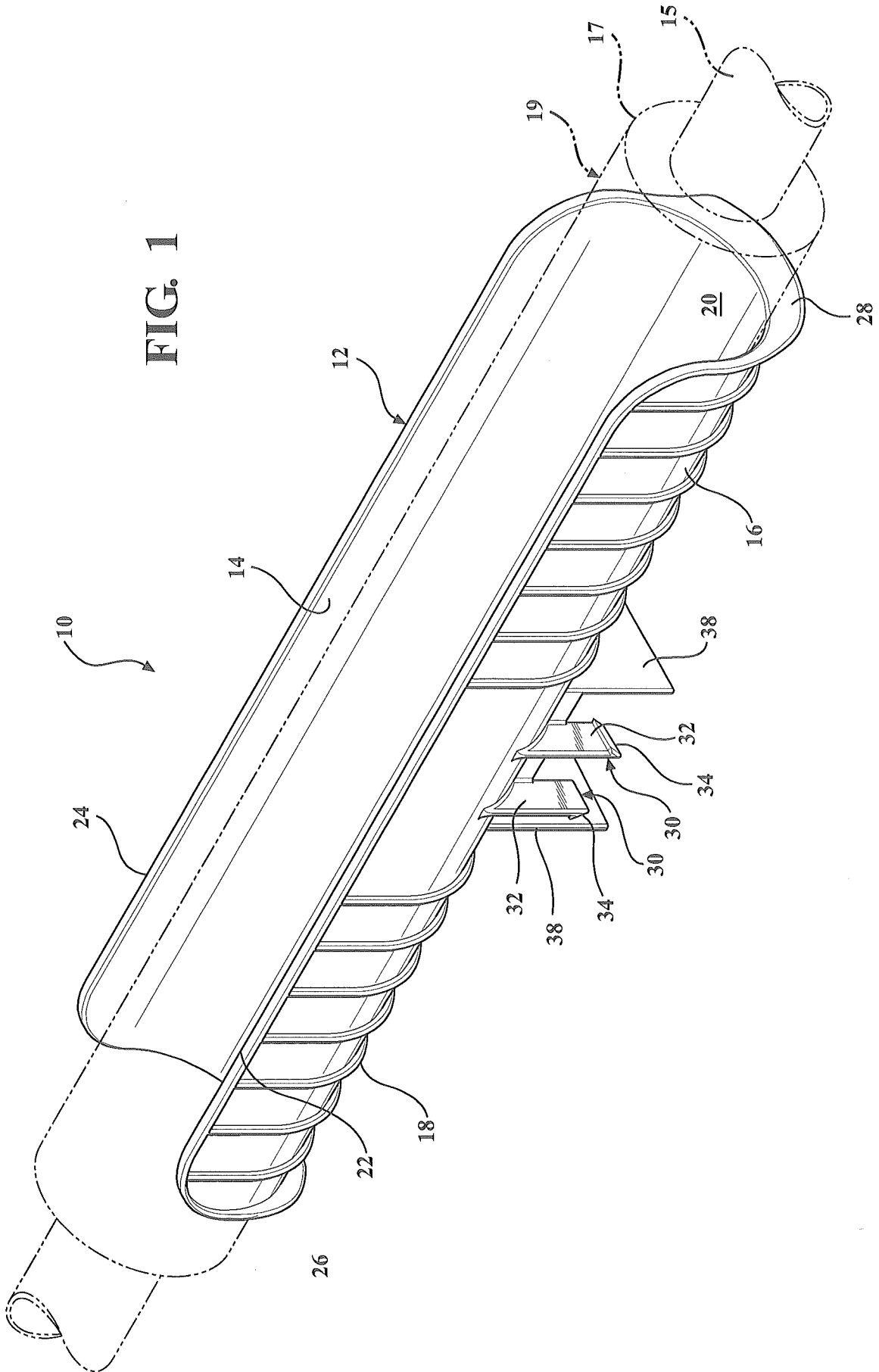
said pipe support includes a body portion extending axially between opposite ends and having an inner surface and an outer surface, said body portion including a generally arcuate bottom floor and a pair of spaced apart sidewalls projecting generally upwardly from said bottom floor; and a plurality of axially spaced apart channel clips projecting downwardly from said outer surface of said body portion opposite said side walls, said channel clips comprising a leg portion and an outwardly projecting barb portion wherein said channel clips

extend through said slot in said channel and said barb portions engage said respective spaced apart flanges to operatively couple said pipe support to a channel.

6. The combination as set forth in claim 5 wherein said pipe support further includes a pair of axial spaced apart stabilizing flanges projecting downwardly from said outer surface of said body portion and arranged parallel and spaced axial from said channel clips for receiving said sidewalls of said channel therebetween to laterally support said pipe support.

7. The combination as set forth in claim 6 wherein said body portion of said pipe support extends longitudinally between opposing ends defined by downwardly curved lips.

8. The combination as set forth in claim 7 wherein said pipe support further includes a plurality of axial spaced apart structural ribs formed on said outer surface of said body portion along said bottom floor and said sidewalls.



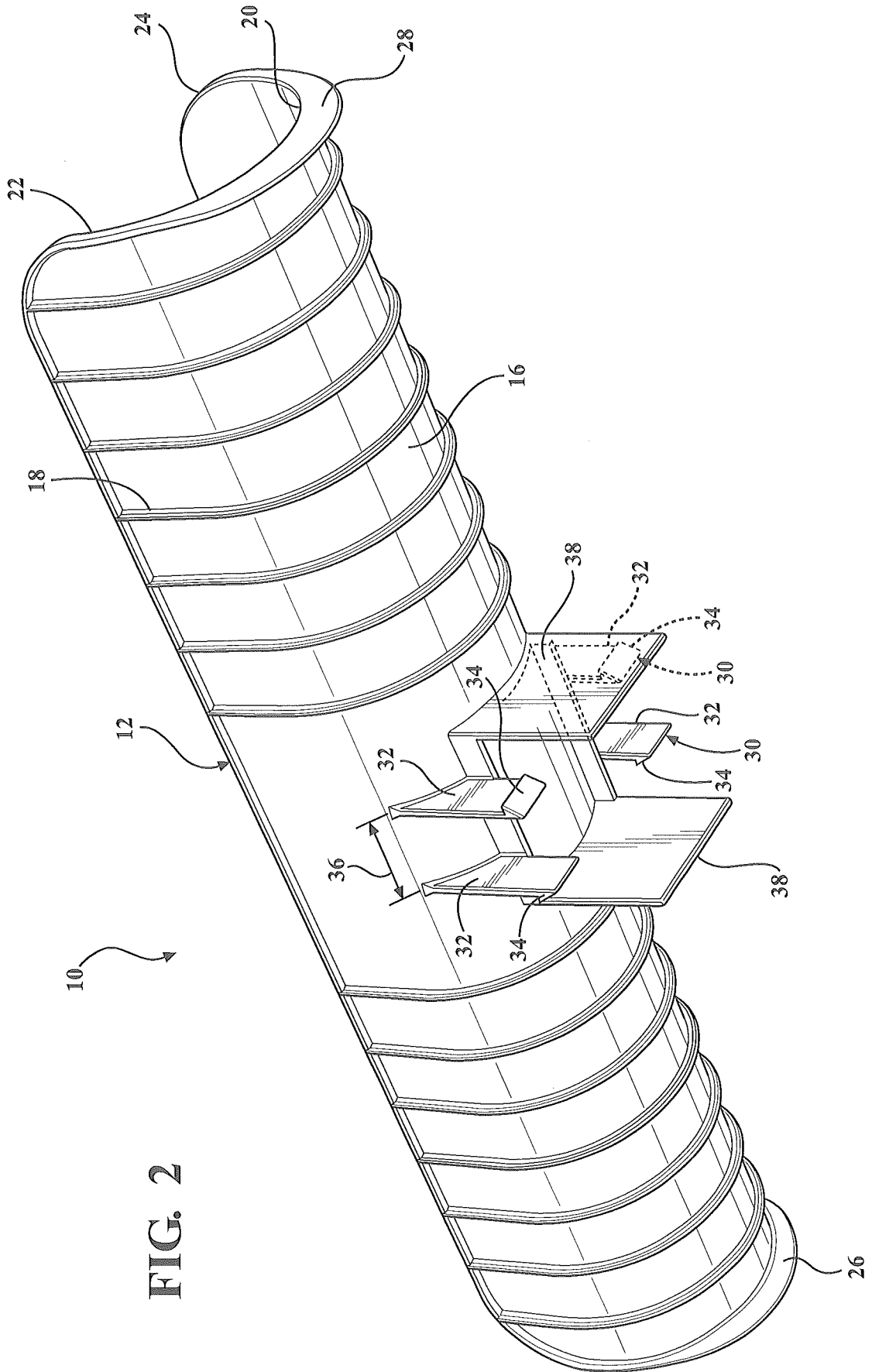


FIG. 2

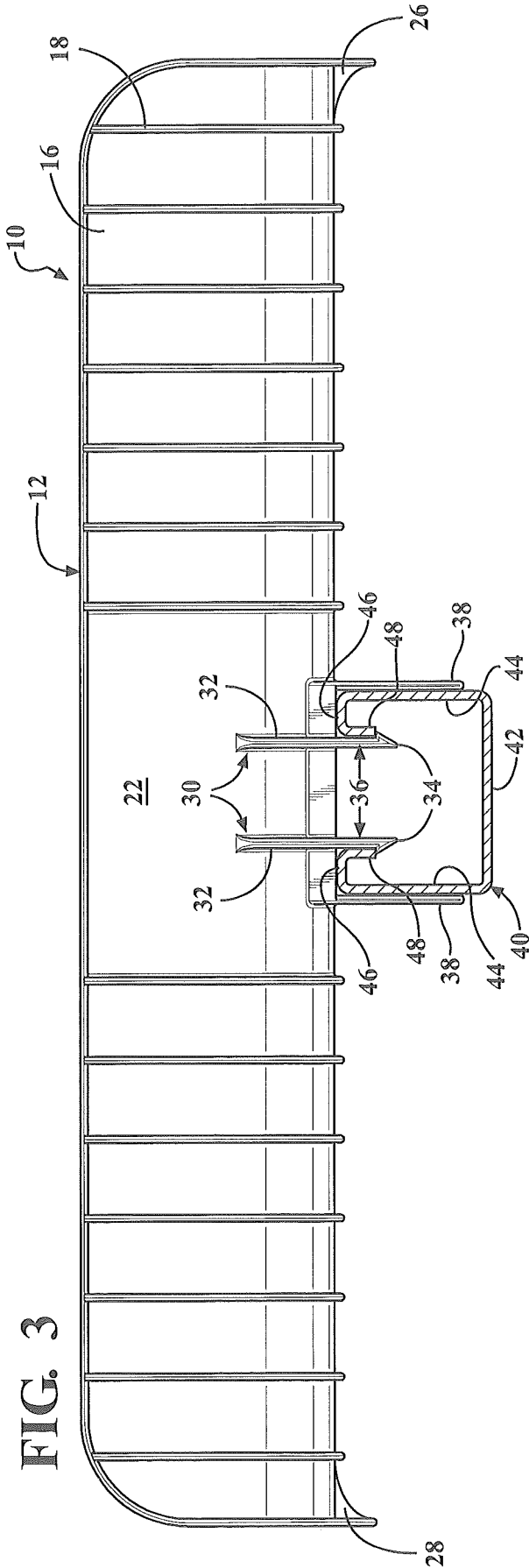


FIG. 3

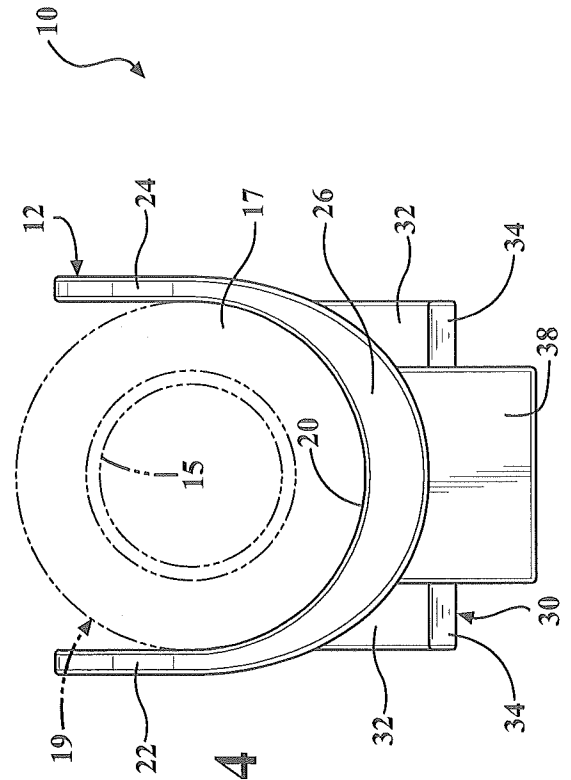


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US17/24959

A. CLASSIFICATION OF SUBJECT MATTER
 IPC - F16L 3/12, 3/14, 3/22, 3/24, 3/26 (2017.01)
 CPC - F16L 3/12, 3/14, 3/22, 3/221, 3/24, 3/26

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

See Search History document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

See Search History document

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 2009/0294600 A1 (DODGE R.) December 3, 2009; figures 1-6; paragraphs [00017], [0023], [0028]	1, 2, 5 --- 1-8
Y	US 2008/0265106 A1 (BOUDREAU M. et al.) October 30, 2008; figures 1-8; paragraphs [0024], [0025], [0028], [0032]	1-8
P, X	'BRONCO Support for Insulated Lines' (HYDRA ZORB CO) January 27, 2017. Retrieved from the Internet on June 1, 2017. URL: <https://www.youtube.com/watch?v=gfSKRLLcgKg>	1-8
A	US 3,370,815 A (OPPERTHAUSER O. A.) February 27, 1968; entire document	1-8
A	US 4,061,299 A (KUROSAKI M.) December 6, 1977; entire document	1-8
A	US 6,105,216 A (OPPERTHAUSER O. A.) August 22, 2000; entire document	1-8

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

01 June 2017 (01.06.2017)

Date of mailing of the international search report

19 JUN 2017

Name and mailing address of the ISA/

Mail Stop PCT, Attn: ISA/US, Commissioner for Patents
 P.O. Box 1450, Alexandria, Virginia 22313-1450
 Facsimile No. 571-273-8300

Authorized officer

Shane Thomas

PCT Helpdesk: 571-272-4300
 PCT OSP: 571-272-7774