



- (51) **International Patent Classification:**
H02G 15/013 (2006.01)
- (21) **International Application Number:**
PCT/EP2014/059587
- (22) **International Filing Date:**
9 May 2014 (09.05.2014)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
61/821,324 9 May 2013 (09.05.2013) US
- (72) **Inventors; and**
(71) **Applicants** (for all designated States except US): **TYCO ELECTRONICS RAYCHEM BVBA** [BE/BE]; Diestsesteenweg 692, B-3010 Kessel-Lo (BE). **ADC CZECH REPUBLIC, S.R.O.** [CZ/CZ]; Turanka 856/98B, 627 00 Brno (CZ).
- (72) **Inventors; and**
(71) **Applicants** (for AL, AM, AT, AZ, BE, BG, BY, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT,

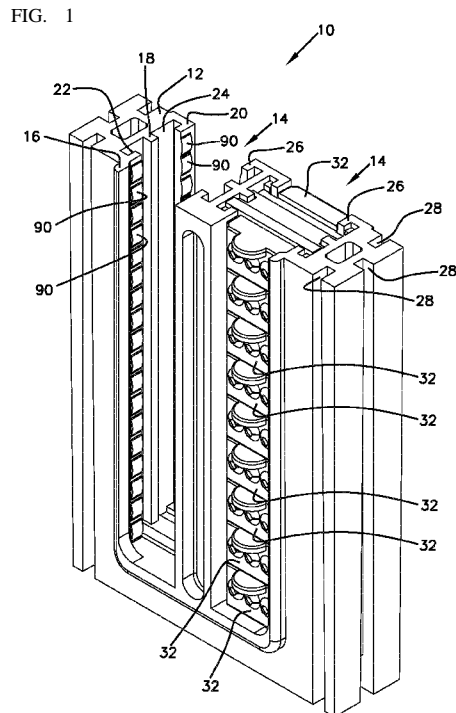
KG, KZ, LT, LU, LV, MC, MD, MK, MT, NL, NO, PL, PT, RO, RS, RU, SE, SI, SK, SM, TJ, TM, TR, US only): **SCHURMANS, Eric** [BE/BE]; Hogenstraat 53, B-3450 Geetbets (BE). **SMISEK, Ales** [CZ/CZ]; Obrancu mirt 518, 57201 Policka (CZ).

(74) **Agent: PATENTANWÄLTE BRESSEL UND PARTNER MBB**; Dr. Bernhard Obst, Potsdamer Platz 10, 10785 Berlin (DE).

(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, 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, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, 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.

[Continued on nextpage]

(54) **Title:** SEALING BLOCK WITH STACKABLE SEALING ELEMENT



(57) **Abstract:** A seal block assembly (10) includes a housing (12) defining one or more slots (14). Seal block assembly seals a port of a telecommunications box or enclosure. Each seal block element (32) includes a seal block body (34) having first and second body portions (36, 38), and first and second seal portions (40, 42) for sealing around a cable. A sealing system is provided between each seal block element and an adjacent seal block element. A sealing arrangement is also provided between the seal block elements and the slot.

(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, 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))*

SEALING BLOCK WITH STACKABLE SEALING ELEMENT**Cross-Reference to Related Application(s)**

This application claims priority to U.S. Patent Application Serial No.
5 61/821,324 filed on 09 May 2013, the disclosure of which is incorporated herein by
reference in its entirety.

Background of the Invention

10 In telecommunications applications often a box or enclosure is used to
house telecommunications equipment. It is necessary to feed fiber optic cables through a
wall of the box or enclosure. The fiber optic cables are preferably sealed relative to an
exterior of the box or enclosure. Similar arrangements are also possible for electric
cables.

Summary of the Invention

15 The present invention includes a seal block assembly including a housing
which defines one or more slots. Each slot receives one or more seal block elements
which seal against cables passing through the seal block assembly. The seal block
assembly can be positioned at a port of a box or enclosure.

20 The seal block element may include a seal block body having first and
second mating portions which surround first and second seal portions. The cable or
cables are positioned between the first and second portions of the seal block body, and
between the first and second seal portions.

The seal block elements are stackable in the one or more slots. Mating
25 elements are provided for sealing between the seal block elements and the housing, and
for sealing between each of the seal block elements.

A method of use for sealing a cable is disclosed.

30

Brief Description of the Figures

FIG. 1 shows one embodiment of a seal block assembly in accordance with the disclosure of the present invention, with one of the slots being filled with seal block elements, and one of the slots shown prior to being filled with seal block elements;

5 FIG. 2 is a perspective view of a seal block element;

FIG. 3 is a perspective view of a first portion of a seal block element including a first seal portion, the second portion and the second seal portion of the seal block element being identical;

FIG. 4 is a perspective view of the seal block assembly of FIG. 1;

10 FIG. 5 is a perspective view of an enclosure with the seal block assembly shown in FIG. 1.

Detailed Description of the Preferred Embodiments

Referring now to FIGS. 1-5, a seal block assembly 10 is shown. Seal
15 block assembly 10 is used with a telecommunications box or enclosure 100 at a cable entry or exit port 102. Seal block assembly 10 is useful for sealing the interior of the box or enclosure from the external environment, such as to protect interior telecommunications equipment. Seal block assembly 10 includes a housing 12 which holds a plurality of seal block elements 32. Seal block assembly 10 is used to seal cables
20 104 entering or exiting enclosure 100.

Housing 12 includes one or more slots 14 which define a U-shape. A top 26 of the U-shape is closed off by a cover 106 of the telecommunications box or enclosure.

Slot 14 includes a front tab 16, a middle tab 18, and a rear tab 20 on each
25 side of slot 14. Each side of slot 14 includes a first slot 22 and a second slot 24. The various tabs and slots mate with features on seal block elements 32 to seal and hold the seal block elements in position.

Housing 12 includes end slots 28 which are useful for mounting seal block assembly 10 to a box or enclosure having a mating structure.

30 Seal block element 32 includes a seal block body 34 which includes first and second body portions 36, 38 which are mated together to enclose an inner seal.

Preferably, first and second body portions 36, 38 are identical in configuration.

Contained within each of first body portion 36 and second body portion 38 is a first seal portion 40 and a second seal portion 42, respectively. Each of first and second body portions 36, 38 includes a recess 44 for receiving one of the first and second seal portions 40, 42. First and second seal portions 40, 42 are made from a soft material such as foam or gel to seal between each other and around each cable.

Seal block element 32 includes one or more ports in the form of front ports 46 and rear ports 48. Cables pass through seal block element 32 in a direction of cable axis 50 between front and rear ports 46, 48. During use, seal block element 32 compresses first and second seal portions 40, 42 to seal any cables positioned there between. If desired, seal block element 32 can be utilized without any cables. Alternatively, seal block element 32 can be used with fewer cables than there are ports 46, 48.

Positioned between first and second body portions 36, 38 is a pin 52 and a hole 54 for an interlocking arrangement for alignment and securement of the two elements together. The pin 52 and the hole 54 of one body portion 36, 38 mates with the respective hole 54 and pin 52 of the other body portion 36, 38.

Each of the first and second body portions 36, 38 includes a middle slot 60, a first end slot 62, and a second end slot 64. The first and second body portions 36, 38 also include a first tab 66 and a second tab 68. The slots 60, 62, 64 and the tabs 66, 68 mate with the slots 22, 24 and tabs 16, 18, 20 of slot 14. Such engagement between the various elements provide a sealing effect for sealing between the seal block elements 32 and housing 12. Each of the first and second body portions 36, 38 includes an end surface 76 defining both an end slot 78 and an end tab 80 which extend in a cross-direction relative to cable axis 50. Such arrangement facilitates sealing between the seal block elements 32 in a stacked arrangement within slot 14.

Each of first and second body portions 36, 38 includes a side tab 86 useful for lifting or positioning seal block element 32 in slot 14. Side tab 86 is also useful for moving first body portion 36 relative to second body portion 38 so as to expose an interior of a seal block body 34 for receipt of a cable, or removal of a cable.

Seal block body 34 includes a plurality of recesses 92 which engage bumps 90 on slot 14 to allow for positioning of the seal block elements 32 in a more secure stack. Bumps 90 and recesses 92 form a registration system.

Parts List

	10	Seal block assembly
	12	Housing
	14	Slot
5	16	Front tab
	18	Middle tab
	20	Rear tab
	22	First slot
	24	Second slot
10	26	Top
	28	End slots
	32	Seal block element
	34	Seal block body
	36	First body portion
15	38	Second body portion
	40	First seal portion
	42	Second seal portion
	44	Recess
	46	Front port
20	48	Rear port
	50	Cable axis
	52	Pin
	54	Hole
	60	Middle slot
25	62	First end slot
	64	Second end slot
	66	First tab
	68	Second tab
	76	End surface
30	78	End slot
	80	End tab

	86	Side tab
	90	Bumps
	92	Recesses
	100	Enclosure
5	102	Port
	104	Cable
	106	Cover

What is Claimed is:

1. A seal block assembly (10) comprising:
a housing (12) defining at least one slot (14);
a seal block element (32) positioned in slot (14), the seal block element (32) including a seal block body (34) having a first body portion (36) mated to a second body portion (38), and a first seal portion (40) mated with a second seal portion (42) for sealing cables.
2. The seal block assembly (10) of claim 1, comprising a plurality of the seal block assemblies (32) in the at least one slot (14) positioned in a column.
3. The seal block assembly (10) of claims 1 and 2, comprising two slots (14) side by side in the housing (12).
4. The seal block assembly (10) of claims 1-3, wherein a tab and slot arrangement is positioned between each seal block element (32) and the slot (14).
5. The seal block assembly (10) of claims 1-4, wherein the tab and slot arrangement is positioned between each of the seal block elements.
6. The seal block assembly (10) of claims 1-5, wherein the first and second body portions (36, 38) are identical.
7. The seal block assembly (10) of claims 1-6, wherein the seal block element (32) and the slot (14) include a registration system which positions the seal block elements (32) in discrete positions in slot (14).
8. The seal block assembly (10) of claim 7, wherein the registration system includes a plurality of bumps and a plurality of mating recesses.

9. The seal block assembly (10) of claims 1-8, further comprising an enclosure (100) with a port (102), wherein the seal block assembly (10) is positioned in the port (102) for sealing at least one cable (104).

10. A seal block element (32) comprising:
a seal block body (34) having a first body portion (36) mated to a second body portion (38), and a first seal portion (40) mated with a second seal portion (42) for sealing cables.

11. The seal block element of claim 10, further comprising a tab and slot arrangement for sealing the seal block element (32) in a slot (14).

12. The seal block element of claims 10 and 11, further comprising a tab and slot arrangement to seal with an adjacent seal block element.

13. The seal block element of claims 10-12, wherein the first and second body portions (36, 38) are identical.

14. The seal block element of claims 10-13, wherein the seal block element (32) and the mating slot (14) include a registration system which positions the seal block element (32) in discrete positions in slot (14).

15. The seal block element of claim 14, wherein the registration system includes a plurality of bumps and a plurality of mating recesses.

16. A method of sealing a cable (104) for entry and exit from an enclosure (100), comprising:
providing a seal block assembly (10) including a housing (12) positioned in a port (102) of enclosure (100);
wherein the housing (12) defines at least one slot (14);

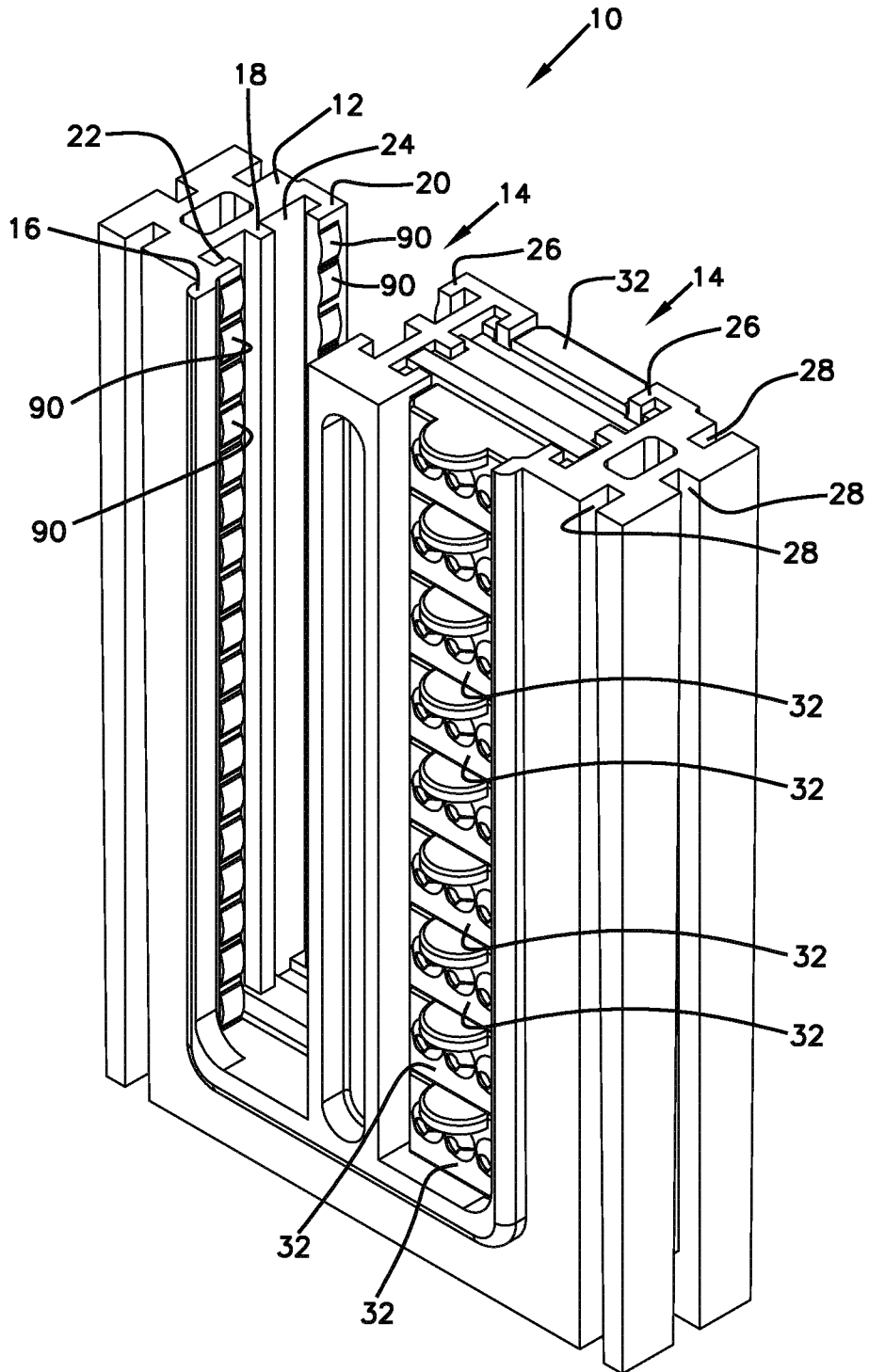
positioning a cable in a seal block element (32) positioned in the slot (14), wherein each seal block assembly (32) includes a seal block body (34) having a first body portion (36) mated to a second body portion (38), and a first seal portion (40) mated with a second seal portion (42) for sealing a cable (104).

17. The method of claim 16, further comprising positioning a plurality of seal block elements (32) in the slot (14).

18. The method of claims 16 and 17, wherein a plurality of slots (14) are provided.

19. The method of claims 16-18, wherein each seal block element (32) includes a plurality of cables (104).

FIG. 1



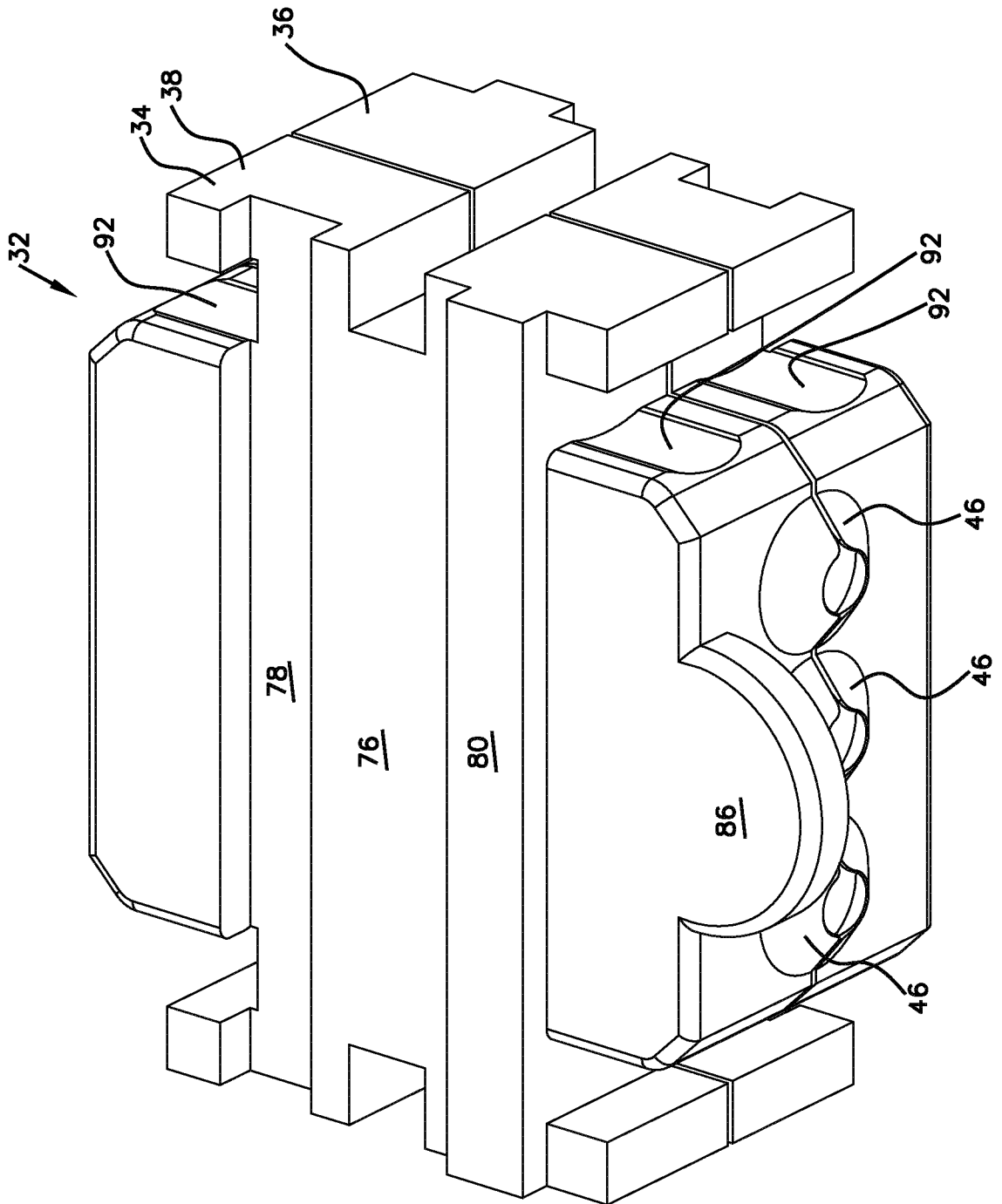


FIG. 2

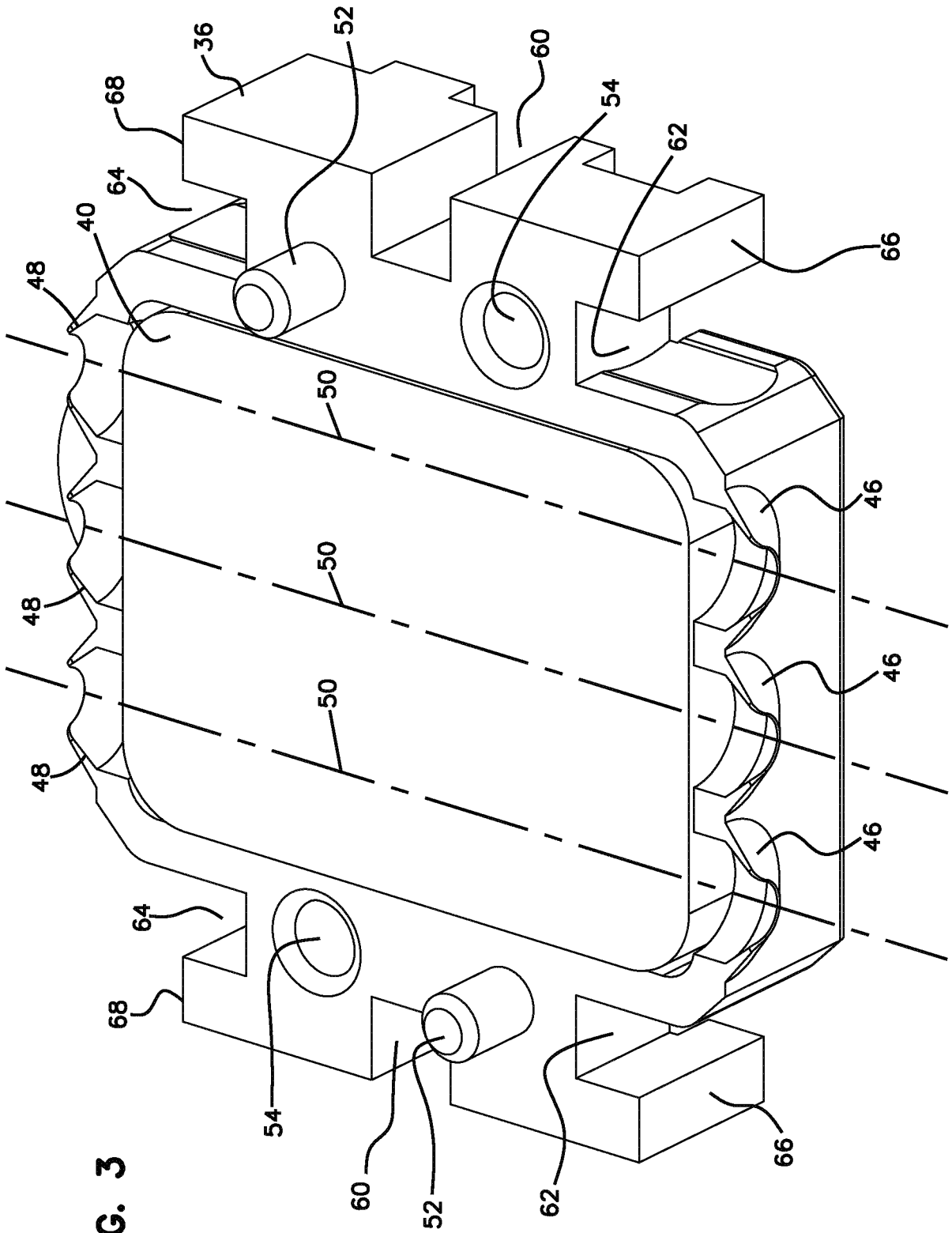
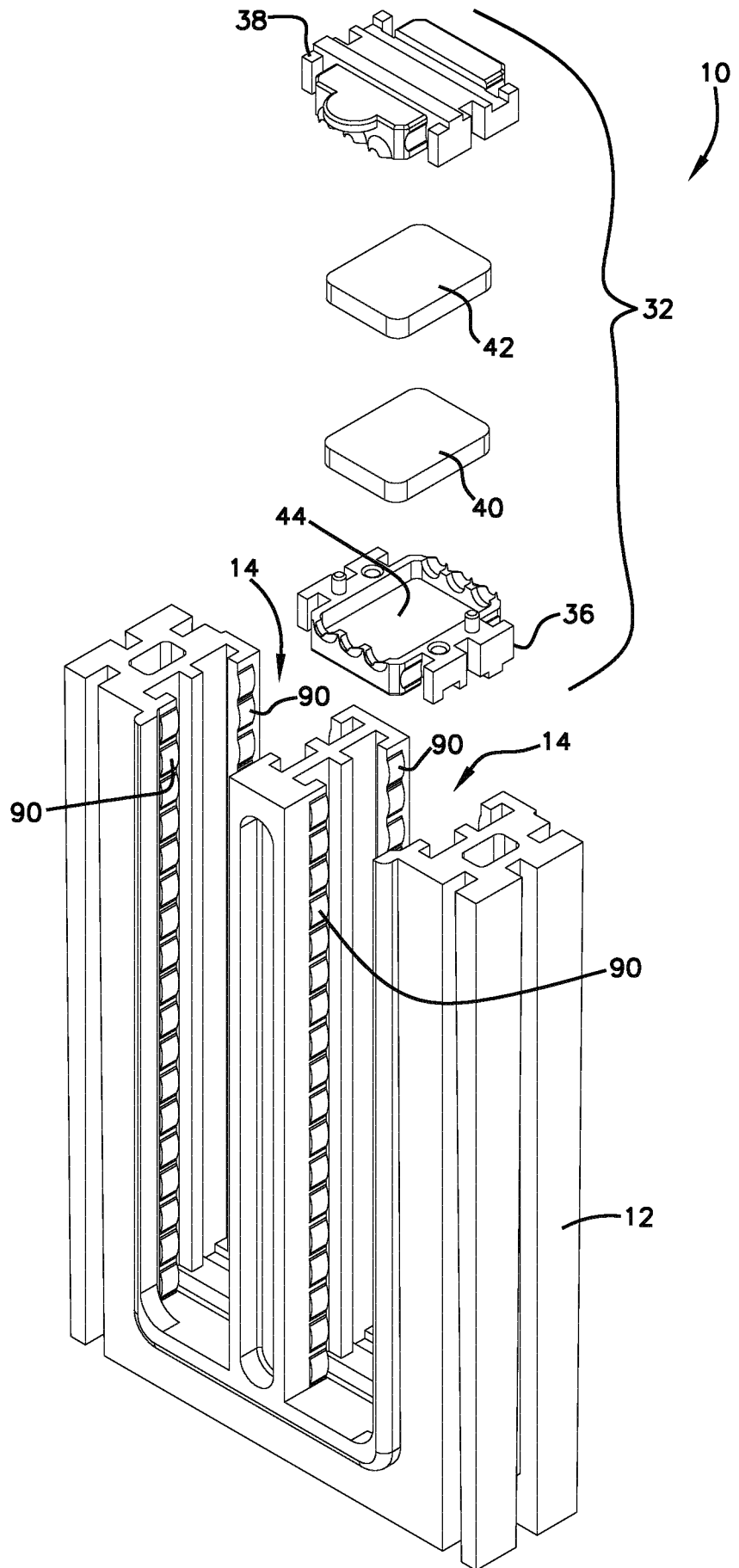


FIG. 3

FIG. 4



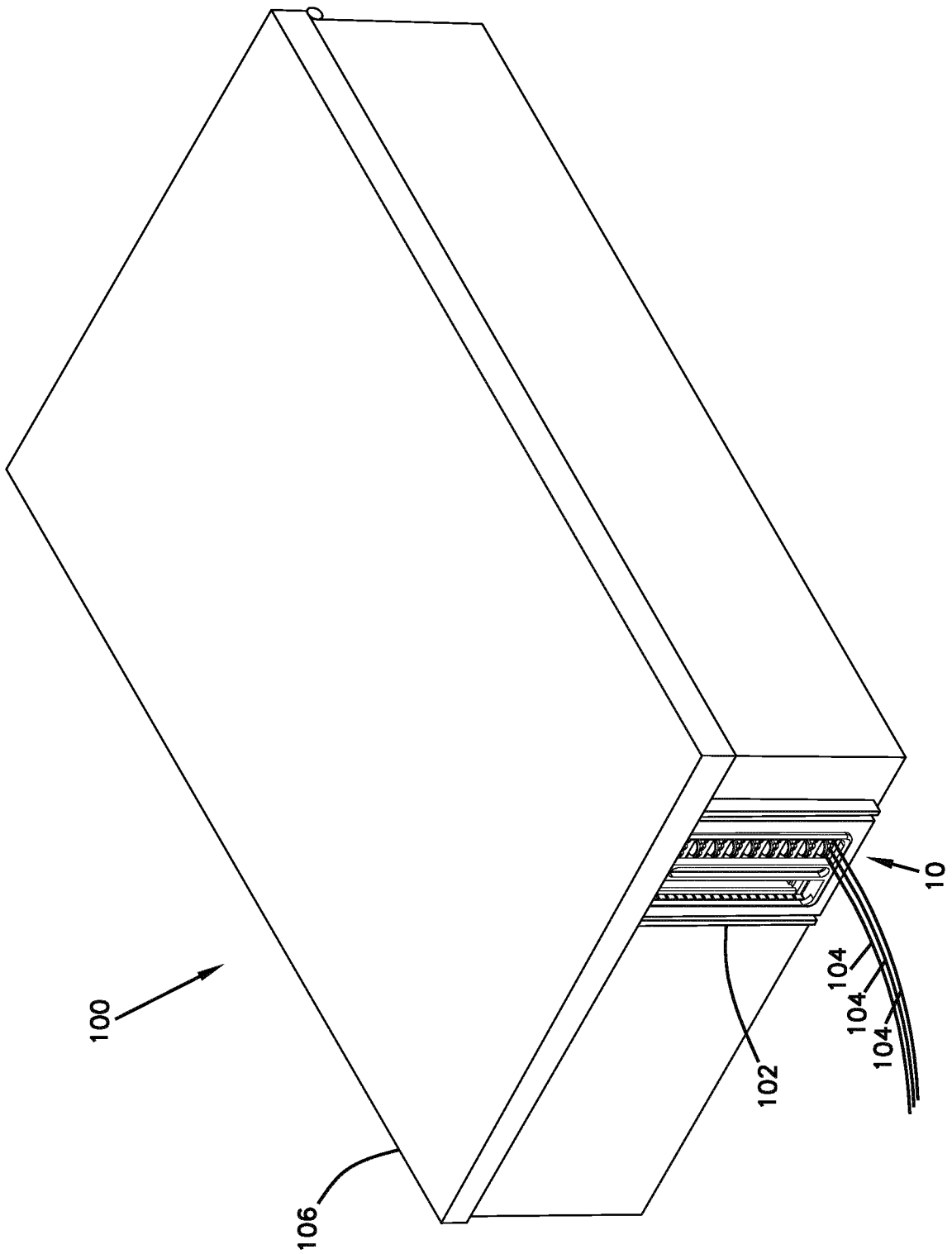


FIG. 5

INTERNATIONAL SEARCH REPORT

International application No PCT/EP2014/059587

A. CLASSIFICATION OF SUBJECT MATTER
 INV. H02G15/013
 ADD.

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)
 G02B H02G H02B H04Q

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
 EPO-Internal , WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/167147 A1 (MARSAC YVONNICK [FR] ET AL) 4 August 2005 (2005-08-04)	10
Y	paragraph [0024] paragraph [0027] - paragraph [0028] -----	I-9 , II-19
Y	EP 2 538 508 A1 (TYCO ELECTRONICS RAYCHEM BVBA [BE]) 26 December 2012 (2012-12-26) paragraph [0022] paragraph [0033] - paragraph [0034] figure 6 -----	I-9 , II-19
A	EP 0 695 900 A1 (FRANCE TELECOM [FR]) 7 February 1996 (1996-02-07) figure 1 -----	1-19
A	FR 2 664 103 A1 (LOH RITTAL WERK GMBH CO [DE]) 3 January 1992 (1992-01-03) figure 3 -----	2

Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents :

<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"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</p> <p>"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</p> <p>"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</p> <p>"&" document member of the same patent family</p>
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Date of the actual completion of the international search 13 August 2014	Date of mailing of the international search report 21/08/2014
---------------------------------------------------------------------------------	----------------------------------------------------------------------

Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Bernardini , Andrea
----------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/EP2014/059587

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2005167147	AI	04-08-2005	AT 395739 T 15-05 -2008
			AU 2005211099 AI 18-08 -2005
			BR PI0507368 A 10-07 -2007
			CA 2554960 AI 18-08 -2005
			CN 1926738 A 07-03 -2007
			DK 1711989 T3 01-09 -2008
			EG 24471 A 03-08 -2009
			EP 1711989 AI 18-10 -2006
			JP 4749342 B2 17-08 -2011
			JP 2007520990 A 26-07 -2007
			MY 139820 A 30-10 -2009
			RU 2361347 C2 10-07 -2009
			US 2005167147 AI 04-08 -2005
			Wo 2005076427 AI 18-08 -2005
EP 2538508	AI	26-12 -2012	CO 6781521 A2 31-10-2013
			EP 2538508 AI 26-12-2012
			US 2014166342 AI 19-06-2014
			Wo 2012175527 AI 27-12-2012
EP 0695900	AI	07-02 -1996	DE 69503195 D1 06-08-1998
			DE 69503195 T2 26-11-1998
			EP 0695900 AI 07-02-1996
			ES 2117367 T3 01-08-1998
			FR 2723419 AI 09-02-1996
FR 2664103	AI	03-01 -1992	DE 4020180 C1 04-07-1991
			FR 2664103 AI 03-01-1992
			IT 1252115 B 05-06-1995