



- (51) **International Patent Classification:**
B62D 21/17 (2006.01) *H02G 3/04* (2006.01)
F16L 3/10 (2006.01)
- (21) **International Application Number:**
PCT/SE2012/050395
- (22) **International Filing Date:**
12 April 2012 (12.04.2012)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
1150327-3 15 April 2011 (15.04.2011) SE
- (71) **Applicant (for all designated States except US):** SCANIA
CV AB [SE/SE]; S-151 87 Södertälje (SE).
- (72) **Inventor; and**
- (75) **Inventor/Applicant (for US only):** ISENBERG, Lars
[SE/SE]; Karpstigen 56, S-151 39 Södertälje (SE).
- (74) **Agent:** AHLING, Annika; SCANIA CV AB, S-151 87
Södertälje (SE).

(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, 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, IS, JP, KE, KG, KM, 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, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, 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, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, 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, ML, MR, NE, SN, TD, TG).

Published:

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

(54) **Title:** HOLDING DEVICE FOR CABLING

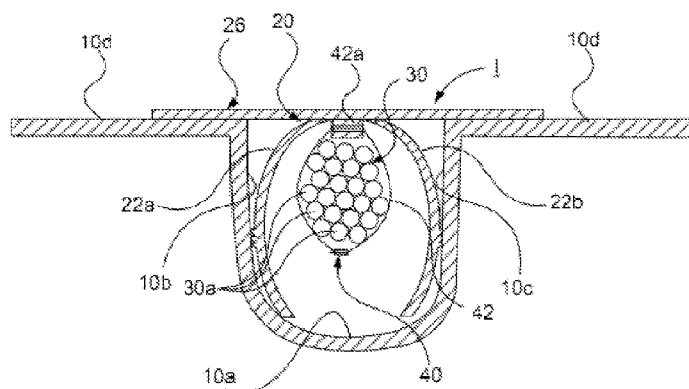


Fig. 6

(57) **Abstract:** The invention relates to a cable-holding device (I; II; III; IV) for cabling (30), such that the cabling (30) is intended to run in a channel configuration (10) and the cable-holding device comprises opposite resilient means (22) forming part of a holder portion (20) and intended to be inserted into said channel configuration (10), bear resiliently against opposite sides (10b, 10c) of said channel configuration (10) and retain the holder portion (20) in said channel configuration (10). The invention also relates to a motor vehicle.

HOLDING DEVICE FOR CABLING

TECHNICAL FIELD

The invention relates to a holding device for cabling according to the
5 preamble of claim 1. The invention also relates to a motor vehicle.

BACKGROUND

Cabling for supplying electricity to floor and wall-mounted electrical
components in motor vehicles such as trucks is usually fitted on the floor in
10 the cab. The cables are often placed in a thick PVC tube designed to protect
the cabling, such that the cabling is fastened to weld screws by means of
clips in the floor panels. This entails the insulation in the floor mats having to
be cut away where the cables are to be fitted. This means that the cabling is
expensive to manufacture and the protection is not optimal.

15

According to one alternative variant, fixed ducts are provided by cutting
recesses in the insulation on the floor mat. This means that each duct for the
cabling must be unique to its specific fitted position. Cutting away the
insulation results in extra noise and poor thermal insulation.

20

DE 19922323 C1 refers to a U-shaped channel in the floor panel for cabling
and a cover plate placed over the channel to form an even surface in relation
to upper parts.

25 OBJECT OF THE INVENTION

One object of the present invention is to propose a cost-effective holding
device for cabling which is easy to manufacture, provides good protection
and enables easy and flexible application and fitted of cabling.

30 SUMMARY OF THE INVENTION

These and other objects, indicated by the description below are achieved by
means of a holding device for cabling and a motor vehicle of the kind

indicated in the introduction which further have the features indicated in the characterising parts of the attached independent claims 1 and 13. Preferred embodiments of the holding device are defined in the attached dependent claims 2-12.

5

According to the invention, the objects are achieved with a holding device for cabling, which cabling is intended to run in a channel configuration comprising opposite resilient means comprising a holder portion and intended to be inserted into said channel configuration such that they bear
10 against opposite sides of said channel configuration and thereby retain the holder portion in said channel configuration. This facilitates manufacture, provides good protection, enables simple and flexible application and fitting of cabling and increases cost-effectiveness.

15 According to one embodiment of the holding device, said holder portion comprises a plurality of pairs of opposite resilient means, resulting in effective retention of the holder portion in the channel configuration.

According to one embodiment of the holding device, said holder portion
20 comprises a spine portion adapted to supporting said resilient means. This facilitates fitting the holding device in the channel configuration. The spine portion also makes it possible to provide levelling of the channel configuration and thereby reduce the unevenness caused by the channel configuration.

25 According to one embodiment of the holding device, said holder portion is flexible and thus bendable transversely to the holding device's longitudinal direction. The result is a holding device which is easy to adapt to different channel configurations and means that the same holding device can be used for channel configurations with different curvatures in their longitudinal
30 direction, e.g. channel configurations in floors such as cab floors in vehicles.

According to one embodiment of the holding device, said holder portion is flexible and thus bendable in the holding device's longitudinal direction. The result is a holding device which is easy to adapt to different channel configurations and means that the same holding device can be used for
5 channel configurations with different angles of inclination which extend between different levels, e.g. channel configurations in floors such as cab floors in vehicles.

According to one embodiment of the holding device, said resilient means
10 comprise arm elements. This results in simple construction and enables effective retention of the holder portion in the channel configuration.

According to one embodiment of the holding device, said spine portion's configuration is substantially planar, making it easier, when laying a mat on
15 top of the channel configuration, to achieve planarity of the mat and consequently the floor surface.

According to one embodiment, the holding device further comprises wing portions which project from said spine portion and are intended to protrude
20 on opposite sides of said channel configuration and support said holder portion. The result is a levelling in the channel configuration, thereby reducing unevenness caused by the channel configuration.

According to one embodiment of the holding device, the holding device is
25 positioned to keep said cabling away from said channel configuration's bottom portion, thereby reducing wear on the cabling.

According to one embodiment, the holding device further comprises at least one fastening element for attaching the cabling to said holder portion. This
30 enables effective assembly of the cabling and separation of the cabling from the channel configuration's bottom portion.

According to one embodiment of the holding device, said fastening element is arranged to form a fastening loop which surrounds said cabling. This enables simple assembly of the cabling, such that the circumference of the cabling can be easily adjusted.

5

According to one embodiment of the holding device, said fastening loop is positioned to run through apertures in the holder portion. This facilitates adjustment of the loop to the circumference of the cabling.

- 10 According to one embodiment of the holding device, said channel configuration is situated in a floor section of a vehicle. Using the holding device in the channel configuration on the floor section of a vehicle provides good protection and enables simple and flexible application and fitting of cabling. Using the holding device when fitting cabling in the floor section of a
- 15 cab of a truck facilitates fitting in that when the cab is tilted during cab assembly, the holding device retains the cabling.

According to one embodiment of the holding device, said holder portion is made of plastic material. Using plastic enables simple and cost-effective

20 manufacturing of the holding device and makes the holding device more flexible.

DESCRIPTION OF THE DRAWINGS

The present invention will be better understood by reading the following

25 detailed description in conjunction with the attached drawings, in which the same reference notations denote similar items throughout the various views, and in which:

Fig. 1 schematically illustrates a side view of a motor vehicle;

- 30 Fig. 2 schematically illustrates a plan view of a cab floor with channel configurations in a motor vehicle;

Figs. 3a and 3b schematically illustrate a plan view, and Fig. 3c a side view, of a holding device for cabling according to one embodiment of the present invention;

Fig. 4 schematically illustrates a cross-section A-A of the holding device in
5 Fig. 3a;

Fig. 5 schematically illustrates a cross-sectional view B-B of a channel configuration in Fig. 2;

Fig. 6 schematically illustrates a holding device according to one embodiment of the present invention, placed in position in a channel configuration;

10 Fig. 7 schematically illustrates a holding device according to one embodiment of the present invention, placed in position in a channel configuration;

Fig. 8 schematically illustrates a holding device according to one embodiment of the present invention; and

15 Fig. 9 schematically illustrates a holding device according to one embodiment of the present invention.

DESCRIPTION OF EMBODIMENTS

Fig. 1 illustrates schematically a side view of a motor vehicle 1 according to the present invention. The exemplified vehicle 1 comprises a heavy vehicle in
20 the form of a truck. The vehicle 1 has a driver's cab 2 and a tractor unit 3. The vehicle 1 can be a bus or a car. The motor vehicle 1 comprises a holding device for cabling according to the present invention.

Fig. 2 illustrates schematically a plan view of a cab 2 of a motor vehicle such
25 as a truck with a front section 2a and a cab floor 2b with channel configurations 10, 12, comprising a first channel configuration 10 in the form of a channel which runs along the left side and is curved to avoid beams or other obstacles, and a second configuration 12 in the form of a channel which runs along the right side.

30

The first and second channel configurations 10, 12 are positioned to accommodate and house a respective holding device I; II; III; IV according to

the present invention, as described in the embodiments below. The channel configurations 10, 12 are therefore dimensioned with depth and width appropriate to accommodating the holding devices according to the present invention, as described in the embodiments below, and are therefore suitable
5 for cabling.

Figs. 3a and 3b illustrate schematically a plan view, Fig. 3c a side view and Fig. 4 a cross-sectional view A-A of a holding device I for cabling according to one embodiment of the present invention. Fig. 5 illustrates schematically a
10 cross-sectional view B-B of a channel configuration in Fig. 2. Fig. 6 illustrates schematically a holding device I according to one embodiment of the present invention placed in position in a channel configuration 10.

Said channel configuration 10 has a bottom portion 10a and opposite side portions 10b, 10c. A floor section 10d extends from either side of and along the upper part of the channel configuration 10. According to this variant, the channel configuration 10 has a U-shaped cross-section. According to this variant, the channel configuration 10 takes the form of a channel configuration situated in a floor section.

20

The holding device I for cabling 30 comprises a holder portion 20 arranged to retain cabling 30 which runs in the channel configuration 10. The holder portion 20 comprises a plurality of pairs of opposite resilient means 22. Said resilient means 22 are intended to be inserted into said channel configuration
25 10 such that they bear against opposite sides 10b, 10c of said channel configuration 10 and thereby retain the holder portion 20 in said channel configuration 10.

Said resilient means 22 comprise arm elements intended to be inserted into
30 said channel configuration 10. Said arm elements comprise a first arm portion 22a and a second opposite arm portion 22b. Said first and second

arm portions 22a, 22b are resilient so that when they are pressed together they endeavour to spring apart.

5 The holder portion 20 of the holding device I comprises a spine portion 24 arranged to support said resilient means 22. The configuration of said spine portion 24 is substantially planar. Said spine portion 24 is elongate. Each arm portion 22a, 22b is positioned to protrude obliquely out downwards from said spine portion 24. Said arm portions 22a, 22b have a horseshoe-like profile.

10 The first arm portion 22a and the opposite second arm portion 22b of each arm element are at such a distance from each other, and configured in such a way, that, when they are pushed down into the channel configuration 10 they are pressed together such that, when the holding device I is housed in the channel configuration 10, they spring out against the opposite side
15 sections 10b, 10c and thereby retain the holding device I in the channel configuration. Each resilient means 22 is configured so that the respective arm portions 22a, 22b apply a force against the respective sides 10b, 10c of the channel configuration 10.

20 According to one embodiment, each arm portion 22a, 22b has an external stop portion 23a, 23b configured to act against the respective side wall 10b, 10c and thereby retain the holder portion 20 in the channel configuration 10. Each stop portion 23a, 23b has in each arm portion 22a, 22b a bulge with acute-angled spikelike corners so that the stop portions form barbs. There
25 may be one or more spikelike corners/barbs, and more will result in better retaining capacity.

As illustrated in Fig. 3b, said holder portion 20 is flexible and is thus bendable transversely to the holding device's longitudinal direction.

30

As illustrated in Fig. 3b, said holder portion 20 is flexible and is thus bendable in the holding device's longitudinal direction.

The holding device I further comprises wing elements 26 having wing portions 26a, 26b which project from said spine portion 24 and are intended to protrude on opposite sides of said channel configuration 10 and thereby support said holder portion 20. The configuration of said wing portions 26a, 26b is substantially planar. Said wing portions 26a, 26b are arranged to project from the spine portion 24 and run substantially in the same plane as the spine portion 24 and substantially transversely to the spine portion's longitudinal direction. The distance between the end portions of the opposite wing portions 26a, 26b is greater than the width of the channel configuration 10. The wing portions 26a, 26b provide levelling over the channel configuration 10 and thereby reduce unevenness caused by the channel configuration 10.

The holding device I comprises a set of wing portions 26a, 26b arranged along the spine portion 24 at a distance from one another such that said holder portion 20 is allowed to flex transversely to the holding device's longitudinal direction so that the holder portion 20 can be adapted to bends in the channel configuration 10 and at the same time provide effective levelling over the channel configuration 10.

According to this embodiment, the resilient means 22 is arranged close to the wing element 26. The number of resilient means 22 may be the same as the number of pairs of wing portions 26a, 26b or may be or smaller. According to this variant, resilient means 22 are positioned close to every second pair of wing portions 26a, 26b.

The holding device further comprises at least one fastening element 40 which attaches the cabling to said holder portion 20. Said fastening element forms a fastening loop 42 which surrounds said cabling 30. According to one variant, said fastening element is in the form of a so-called strap, i.e. a double-ended strip, such that one end can be inserted into an aperture in the region of the

opposite end, the fastening loop 42 thereby formed can be reduced to desired size by inserting the strip through the aperture, and a set of transverse raised stops along one side of the strip are arranged to cooperate with corresponding recesses in the aperture and thereby prevent the loop
5 formed from being enlarged, i.e. the strip from sliding out of the aperture. In this way the strip can be tightened round cabling and the fastening loop can be adjusted to the cabling's circumference. The holding device I is positioned accordingly to support said cabling 30 and keep it away from said channel configuration's bottom portion 10a.

10

Said fastening loop 42 is arranged to run through apertures in the holder portion 20. According to the embodiment illustrated in Fig. 6, the fastening loop is arranged to run through apertures in a portion 42a positioned under the spine portion 24 of the holding device I.

15

Fig. 7 illustrates schematically a holding device II according to an alternative embodiment of the present invention, placed in position in a channel configuration 10. According to Fig. 7, the holding device II differs from the holding device I according to Fig. 6 in that said fastening loop 42 is arranged
20 to run through apertures in the spine portion 24. In this case, the fastening element 40 is in the form of a strip, as described above, arranged to run such that a portion 42b of the strip is exposed above the spine portion 24, one end of the strip protrudes downwards from an aperture in the spine portion 24 and the other end protrudes downwards from a second adjacent aperture in the
25 spine portion 24. Said strip is then brought together as above to form said fastening loop 42 for cabling 30. Positioning the apertures in the spine portion 24 in this way makes it possible for the strip to be inserted from above, which simplifies fitting.

30 The fastening loop 42 may be positioned anywhere below the spine portion 24 and not necessarily close to the resilient means 22. The holding device I;

It may comprise any number of fastening loops 42, which may differ from the number of resilient means 22 and/or the number of wing portions 26.

Fig. 8a illustrates schematically a plan view and Fig. 8b an end view of a holding device III according to one embodiment of the present invention. The holding device III according to Figs. 8a and 8b differs from the holding devices I; II described above in that it has no wing portions. In this case, the spine portion 124 is in the form of an elongate part which is flexible and is thus bendable transversely to the holding device's longitudinal direction. This means that the flexibility transversely to the holding device's longitudinal direction can be further increased. The manufacture of the holding device III is further simplified.

Fig. 9 illustrates schematically a holding device IV according to one embodiment of the present invention. It differs from the holding device I according to Figs. 3a-c in that the opposite wing portions 226a, 226b are staggered. In this patent application "opposite" means directly opposite, i.e. mutually aligned transversely to and on opposite sides of the longitudinal extent of the spine portion 224, as described in the embodiments I and II above, or transversely opposite, i.e. on opposite sides of the spine portion 224 and mutually displaced, as in this embodiment.

According to an alternative embodiment not depicted, the resilient means may be arranged in such a way that opposite arm portions are mutually displaced and not mutually aligned transversely to the spine portion's longitudinal extent.

According to the present invention as described in different embodiments above, the holding device I; II; III; IV is, according to one embodiment, intended to be manufactured to a specific length and, according to one variant, be configured such that it can be manufactured as a roll. According to one variant, the holding device I; II; III; IV is manufactured by extrusion.

According to one variant, the holding device is made of appropriate plastic material.

According to one variant, the holding device I; II; III; IV is made long enough
5 to be subsequently cut to desired length. The result is a very flexible holding device for cabling which can be adjusted to any desired length. Manufacturing the holding device to only one length further reduces manufacturing costs. Where the channel configuration 10 comprises branches, one holding device I; II; III; IV can be easily connected to another
10 holding device by cutting it to the appropriate length at the appropriate location.

Fitting the holding device I; II; III; IV, involves cutting it to a length appropriate to the channel configuration 10 in which the cabling 30 is intended to run.
15 One fitting step requires the holding device I; II; III; IV; to be turned upside down such that the cabling 30 comprising a set of cables 30a of the same or different thicknesses is placed in the holding device, the cabling is fastened by means of the fastening loop 42 and is surrounded by the fastening loop 42 which is tightened round it. The holding device I; II; III; IV is then turned over
20 and pushed down into the channel configuration 10, whereupon the arm portions 22a, 22b are pushed together and press against the walls 10b, 10c in the channel configuration 10 and thereby, in conjunction with the spikelike stop portions 23a, 23b, retain the holding device I; II; III; IV in the channel configuration 10. When the channel configuration 10 is in position in a floor
25 section of a vehicle cab, the cabling 30 is prevented from falling out of the channel configuration 10 if the cab tilts. When the cab is complete, a mat is then placed over the holding device and the wing portions form a planar base, thereby levelling the surface close to the channel configuration 10.

30 The spikelike stop portions 23a, 23b cause redundancy. The spring function of the arm element whereby the arm portions 22a, 22b spring out against opposite wall sections 10b, 10c of the channel configuration 10 has of itself

enough retaining effect to allow, according to one variant, the holding device to be manufactured without stop portions.

5 The holding device I; II; III; IV is described above for application in channel configurations 10 in floor sections of vehicles. The holding device can be applied in any appropriate channel configuration in any desired orientation, including on walls and/or roofs. The invention therefore relates to the fitting of cabling in pre-pressed channel configurations in which the holding device according to the present invention is applied.

10

The above description of the preferred embodiments of the present invention is provided for illustrative and descriptive purposes. It is not intended to be exhaustive nor to limit the invention to the variants described. Many modifications and variations will obviously suggest themselves to one skilled in the art. The embodiments have been chosen and described in order best to explain the principles of the invention and its practical applications and hence to make it possible for one skilled in the art to understand the invention for various embodiments and with the various modifications appropriate to the intended use.

15

CLAIMS

1. A holding device (I; II; III; IV) for cabling (30), which cabling (30) is intended to run in a channel configuration (10), **characterised by** opposite
5 resilient means (22) forming part of a holder portion (20) and intended to be inserted into said channel configuration (10), bear against opposite sides (10b, 10c) of said channel configuration (10) and thereby retain the holder portion (20) in said channel configuration (10), which holder portion (20) comprises a spine portion (24) which is arranged to support said resilient
10 means (22), further comprising wing elements (26a, 26b) which project from said spine portion (24) and are intended to protrude on opposite sides of said channel configuration (10) and to support said holder portion (20).
2. A holding device according to claim 1, such that said holder portion (20)
15 comprises a plurality of pairs of opposite resilient means (22).
3. A holding device according to either of claims 1 and 2, such that said holder portion (20) is flexible and is thus bendable transversely to the longitudinal direction of the holding device (I; II; III; IV).
20
4. A holding device according to any one of claims 1-3, such that said holder portion (20) is flexible and is thus bendable transversely in the longitudinal direction of the holding device (I; II; III; IV).
- 25 5. A holding device according to any one of claims 1-4, such that said resilient means (22) comprise arm elements (22a, 22b).
6. A holding device according to any one of claims 1-5, such that the configuration of said spine portion (24) is substantially planar.

7. A holding device according to any one of claims 1-6, such that the holding device (I; II; III; IV) is arranged to support said cabling and keep it from away said channel configuration's bottom portion (10a).

5 8. A holding device according to any one of claims 1-7, further comprising at least one fastening element (40) intended to attach the cabling (30) to said holder portion (20).

9. A holding device according to claim 8, such that said fastening element
10 (40) is arranged to form a fastening loop (42) which surrounds said cabling (30).

10. A holding device according to claim 9, such that said fastening loop (42) is arranged to run through apertures in the holder portion (20).

15

11. A holding device according to any one of claims 1-10, such that said channel configuration (10) is situated in a floor section (2b) of a vehicle (1).

12. A holding device according to any one of claims 1-11, such that said
20 holder portion (20) is made of plastic material.

13. A vehicle (1) comprising a cable-holding device (I; II; III; IV) according to any one of claims 1-12.

1/5

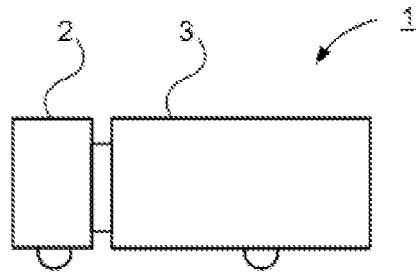


Fig. 1

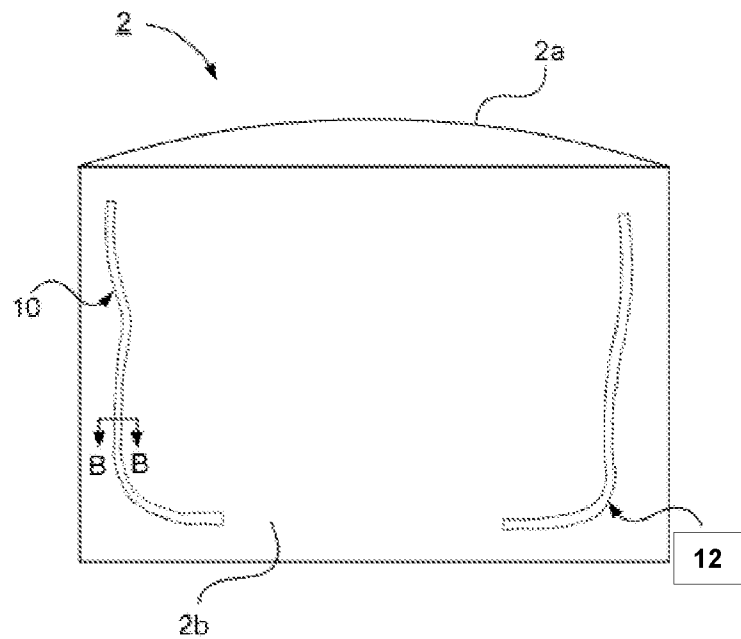


Fig. 2

2/5

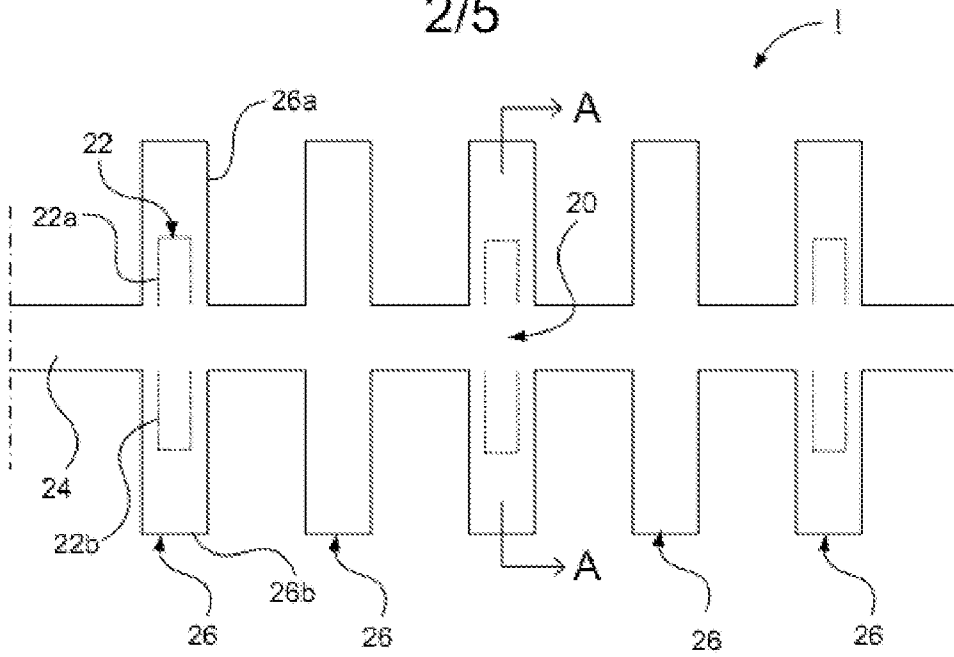


Fig. 3a

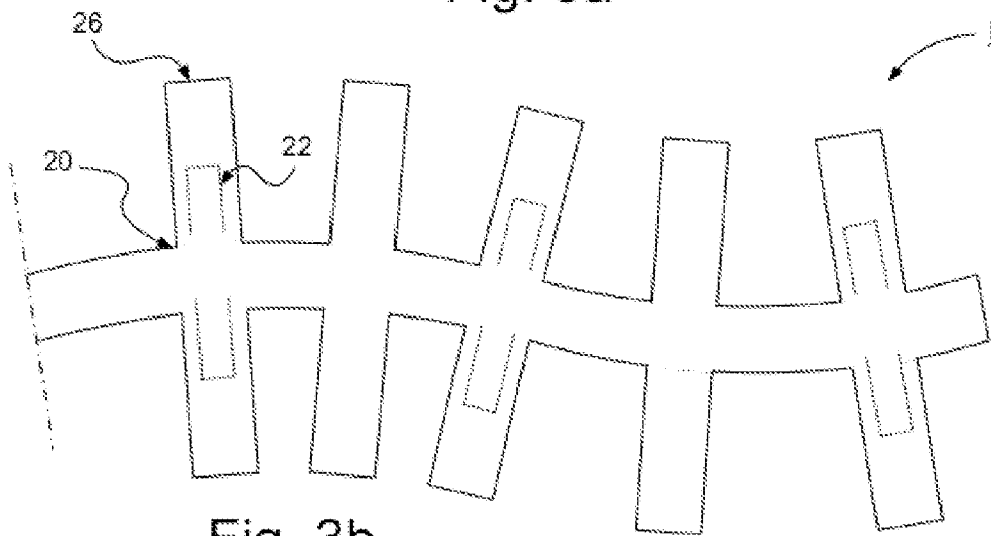


Fig. 3b

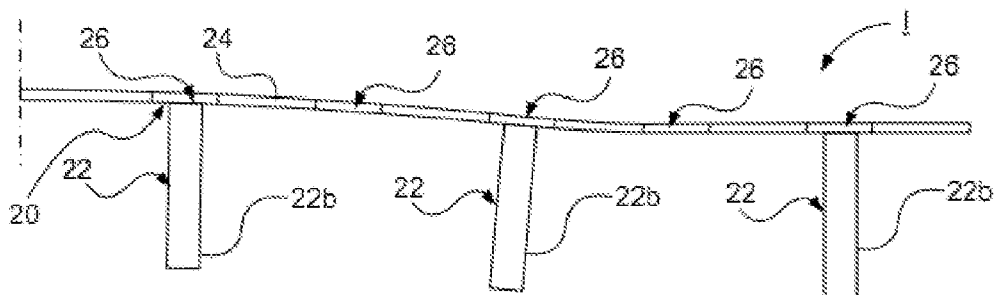


Fig. 3c

3/5

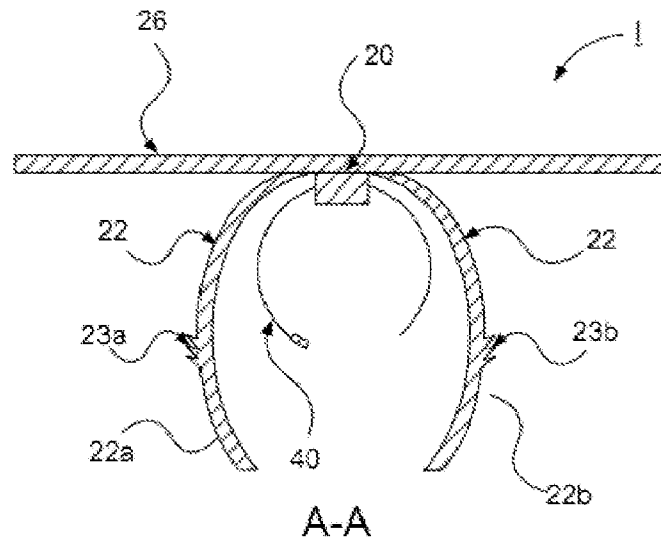


Fig. 4

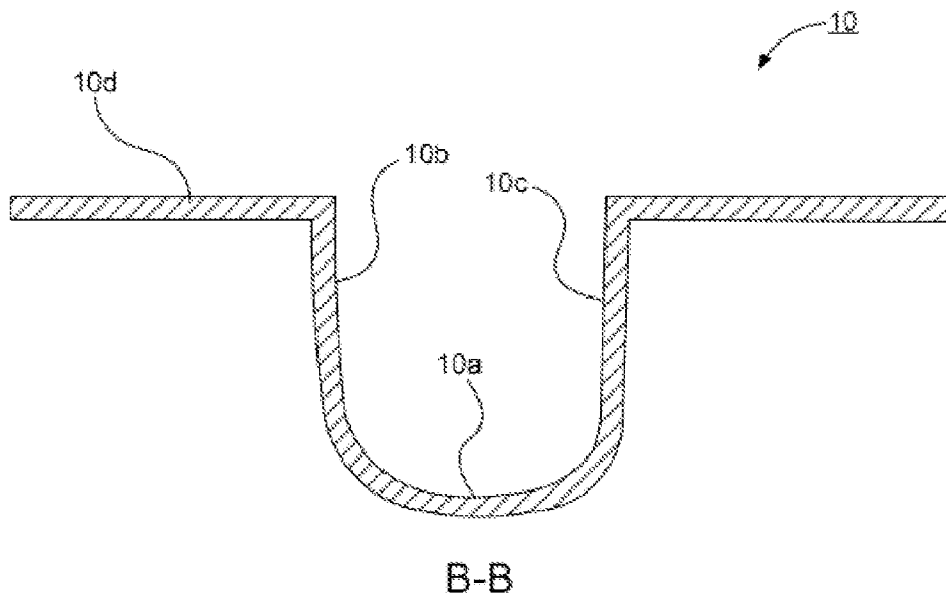


Fig. 5

4/5

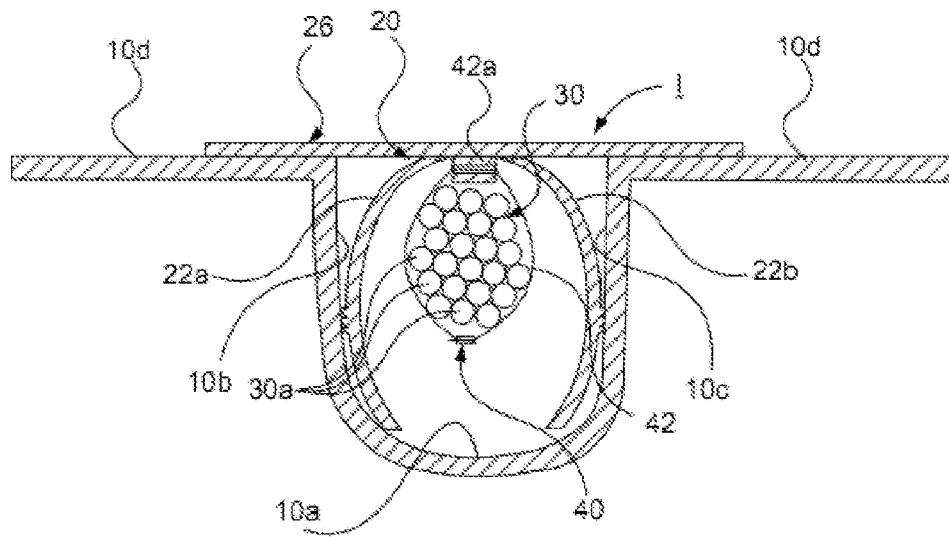


Fig. 6

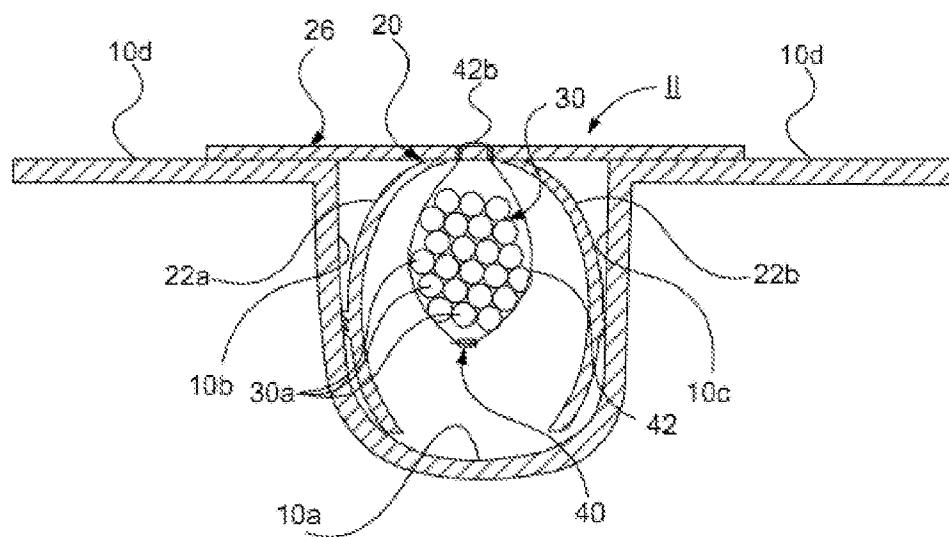


Fig. 7

5/5

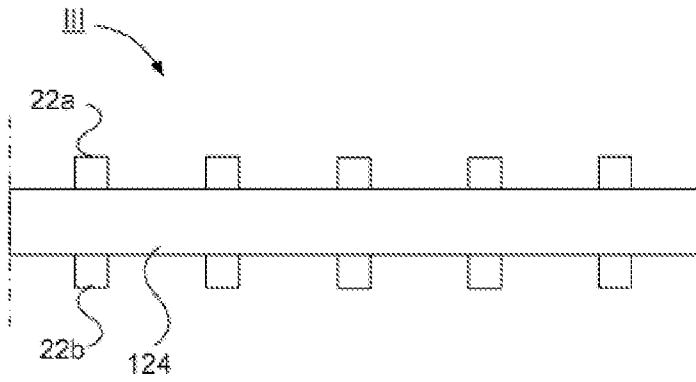


Fig. 8a

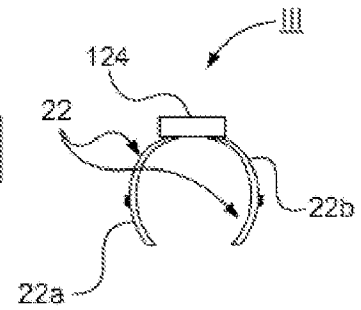


Fig. 8b

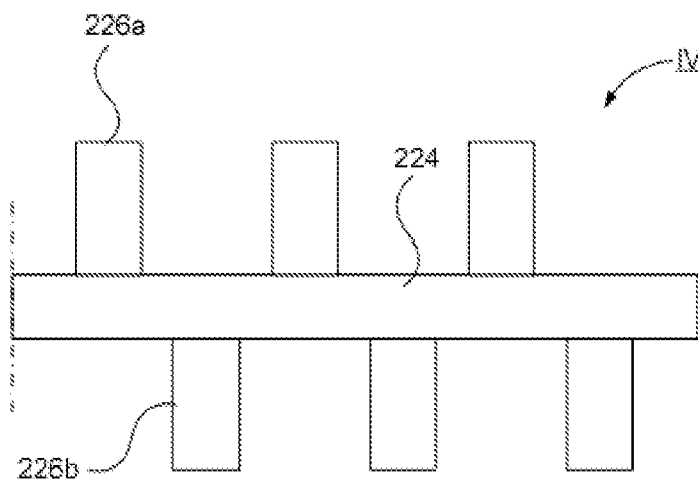


Fig. 9

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE2012/050395

A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet

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)

IPC: B62D, F16L, H02G

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

SE, DK, FI, NO classes as above

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

EPO-Internal, PAJ, 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	GB 825886 A (GEN ELECTRIC CO LTD), 23 December 1959 (1959-12-23); page 1, line 9 - line 16; page 1, line 41 - line 61; page 1, line 71 - page 2, line 24; figures	1, 2, 4-6
Y	--	7, 11-13
Y	DE 10145357 C1 (DRAEXLMAIER LISA GMBH), 22 May 2003 (2003-05-22); abstract; paragraphs [0001]-[0002], [0041]-[0047]; figures	7, 11-13
A	US 7408114 B2 (VANDERVELDE CHARLES F ET AL), 1 March 2007 (2007-03-01); abstract; column 2, line 26 - column 3, line 27; figures 2a,2b	1-13



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:	"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
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"E" earlier application or patent but published on or after the international filing date	"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
"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)	"&" document member of the same patent family
"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	

Date of the actual completion of the international search

25-05-2012

Date of mailing of the international search report

05-06-2012

Name and mailing address of the ISA/SE

Patent- och registreringsverket
Box 5055
S-102 42 STOCKHOLM
Facsimile No. + 46 8 666 02 86

Authorized officer

Ingemar Hedlund

Telephone No. + 46 8 782 25 00

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE2012/050395

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 20070235212 A1 (WALDORF HEATH A ET AL), 11 October 2007 (2007-10-11); abstract; paragraphs [0012]- [0013]; figures -- -----	1-13

Continuation of: second sheet

International Patent Classification (IPC)

B62D 21/17 (2006.01)

F16L 3/10 (2006.01)

H02G 3/04 (2006.01)

Download your patent documents at www.prv.se

The cited patent documents can be downloaded:

- From "Cited documents" found under our online services at www.prv.se
(English version)
- From "Anförda dokument" found under "e-tjänster" at www.prv.se
(Swedish version)

Use the application number as username. The password is **AHKVZLXVBI**.

Paper copies can be ordered at a cost of 50 SEK per copy from PRV InterPat (telephone number 08-782 28 85).

Cited literature, if any, will be enclosed in paper form.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/SE2012/050395

GB	825886 A	23/12/1959	NONE			
DE	10145357 C1	22/05/2003	NONE			
US	7408114 B2	01/03/2007	MX	PA06009537 A	22/02/2007	
			US	7586041 B2	08/09/2009	
			US	20070044987 A1	01/03/2007	
			US	20080289847 A1	27/11/2008	
US	20070235212 A1	11/10/2007	NONE			