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(54) INTERCONNECTION AND INSTALLATION METHOD FOR LINEAR FIXTURE ILLUMINATION SYSTEM

(57) The Interconnection and Installation Method for Linear Fixture Illumination System foresees a method to reduce installation time, ensures perfect mechanical alignment and coupling between lamps and fast and simply lamp replacement. The linear lamp system is composed of linear lamps (3), equipped with specially designed side caps (2) and lamp holders (1). Lamp holder (1) is a mechanical junction and connection support device between multiple neighboring lamps (3) and is used to permit lamp installation in an on-ceiling, recessed and suspended installations and to ensure electric (power) and data signal transfer between neighboring lamps (3). Two side caps (2) on the same lamp (3) are connected using internal wire plant (2-W) that is an integral part of the lamp (3). Installation of the system is achieved by mounting the lamp holders (1) on an exact distance one from the other, and insertion of the lamps (3) between them.

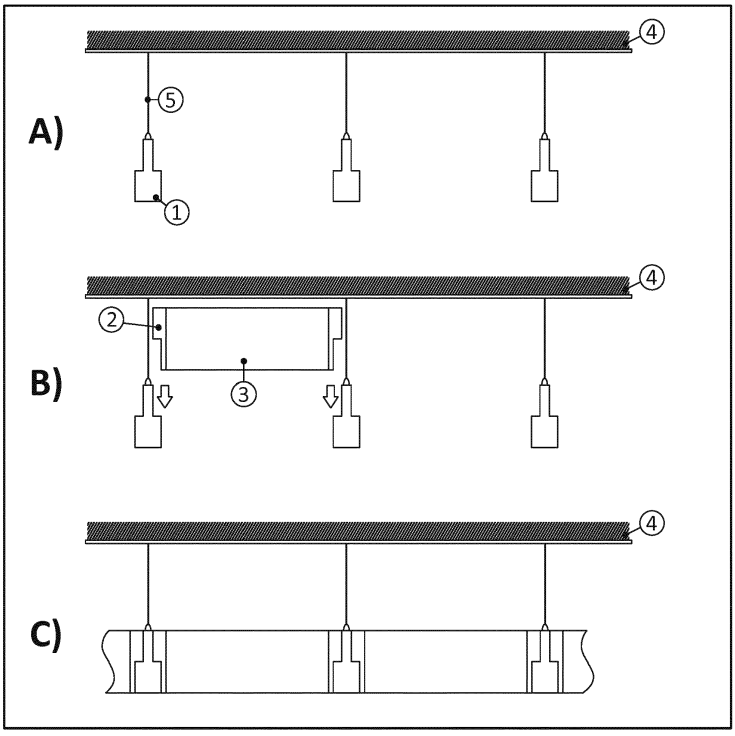

Fig. 5

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Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to method for interconnection and installation of linear fixture illumination system.

Description of Prior Art

[0002] Linear illumination systems are composed of linear fixtures - lamps, installed one behind the other, creating long, uninterrupted luminous lines. Lamps can be installed recessed, on-ceiling or suspended. In most cases lamps are connected mechanically directly one to the other and connected electrically one to the other one using connectors and cables, while in some cases the electrified track bar is used as a mechanical and electrical support where the lamps are mounted and connected to.

[0003] When lamps are connected one to the other using cables and connectors, installer must provide to connect one lamp to the other and fix the lamps to the ceiling. In most cases connection cable will be assembled by the installer. When the track bar is used, it must be mounted on the ceiling directly or suspended, and then lamps will be connected to it. This second solution is much more flexible than the first one, but with higher price because of the track bar structure.

SUMMARY OF THE INVENTION

[0004] The present invention was made in view of the prior art described above, and the object of the invention is to simplify installation procedure and reduce installation time and costs.

[0005] The invention is composed of three components: lamp holder, lamp side cap and internal lamp wiring plant.

[0006] Lamp holder has a purpose of mechanical connection of neighboring lamps into one solid structure, and to transfer electric power supply and data signals from one lamp to the other. Lamp holder is the only part that is mechanically fixed on the ceiling - directly or suspended. Lamp holder has a purpose to prevent lamp from detaching from the system, yet it permits easy extraction of the lamp out from the lamp system. When installed on the ceiling, extraction of the lamps will be done laterally from one side. When suspended, lamp will be extracted by pushing it towards ceiling. Lamp holder includes electrical contacts used to transfer power supply and data signals from one lamp to the other. The contacts are unreachable when lamp is not connected to the holder to avoid electrical shock. Lamp holder has mechanical guides that ensure correct insertion and coupling of the Lamp side cap.

[0007] Lamp side cap closes the lamp and contain electrical contacts for power supply and data. Those contacts are unreachable and well-hidden when lamp is not connected to the holder to avoid electrical shock. From internal side, Lamp side cap has electrical contacts that permit to connect internal lamp wiring plant used to transfer power supply and data from one side of the lamp to the other.

[0008] Wiring plant is used to connect two Lamp side caps internally and transfer accordingly power supply and data signals from one side of the lamp to the other. Depending on type of the installation, Wiring plant can be single or three phase, and can include emergency power supply line.

BRIEF DESCRIPTION OF DRAWING

[0009] The features of the invention believed to be novel are set forth with particularity in the appended claims. The invention itself, however, may be best understood by reference to the following detailed description of the invention, which describes an exemplary embodiment of the invention, taken in conjunction with the accompanying drawings, in which:

Fig. **1** represents detailed drawing of the invention applied to a suspended linear illumination system installation

Fig. **2** represents detailed drawing of the invention applied to a recessed linear illumination system installation

Fig. **3** represents detailed perspective view drawing of the invention applied to an on-ceiling linear illumination system installation

Fig. **4** is a detailed drawing of a method of coupling between lamp and lamp holder

Fig. **5** is a drawing of an installation procedure of the entire illumination system

DETAILED DESCRIPTION OF THE INVENTION

[0010] In cooperation with attached drawings, the technical contents and detailed description of the present invention are described thereinafter according to a preferable embodiment, being not used to limit its executing scope. Any equivalent variation and modification made according to appended claims is all covered by the claims claimed by the present invention.

[0011] Reference will now be made to the drawing figures to describe the present invention in detail.

[0012] The principle on the base of present innovation is the new approach to the interconnection and installation of the linear illumination system. Linear lamps are usually installed in-line, one behind the other, composing a long light line. The present innovation permits to reduce

installation time, ensure perfect mechanical alignment and coupling between lamps and fast and simply lamp replacement. The innovation is based on a special coupled pair "lamp holder-lamp side cap" that permits mechanical and electrical junction and coupling between lamps.

[0013] Fig. **1A)** represents detailed drawing of the invention applied to suspended linear illumination system installation. The system is composed of **(1) Lamp Holder**, used as mechanical and electrical junction interface for **(3) Lamp** interconnection. Lamp is connected to the Lamp Holder using **(2) Lamp Side cap**. The Lamp Holder is suspended on the **(4) Ceiling** using a **(5) Rope**. Fig. **1B)** is the same suspended linear system once the lamps are inserted into lamp holders.

[0014] Fig. **2A)** represents detailed drawing of the invention applied to recessed linear illumination system installation. The system is composed of **(1) Lamp Holder**, used as mechanical and electrical junction interface for **(3) Lamp** interconnection. Lamp is connected to the Lamp Holder using **(2) Lamp Side cap**. Fig. **2B)** is the same recessed linear system once the lamps are inserted into lamp holders.

[0015] Fig. **3A)** represents detailed perspective view drawing of the invention applied to an on-ceiling linear illumination system installation. The system is composed of **(1) Lamp Holder**, used as mechanical and electrical junction interface for **(3) Lamp** interconnection. Lamp is connected to the Lamp Holder using **(2) Lamp Side cap**. The Lamp Holder is directly mounted on the ceiling **(4)**. Fig. **3B)** is the same on-ceiling linear system once the lamps are inserted into lamp holders.

[0016] Fig. **4A)** is a 3D drawing of a **(1) Lamp Holder** and **(2) Lamp Side cap**. Fig. **4B)** is a detailed drawing of a principle of coupling between **(1) Lamp Holder** and **(2) Lamp Side cap**. The mechanical coupling is obtained by the mechanical design of Lamp Holder and Lamp Side cap. The electric coupling is obtained using elastic metal contacts **(1-C)** and **(2-C)**. On the lamp holder, electric contacts **(1-C)** transport electric energy from one side of the holder to the other side. Depending of a necessity of the application, electric contacts may assume different forms, such as sliding, male-female, elastic push-on. On the side of the Lamp side cap, electric contacts **(2-C)** are connected to the conductor **(2-F)** that is used to connect internal lamp wiring plant **(2-W)**.

[0017] Fig. **5** is a drawing of an installation procedure of the entire illumination system. Fig. **5A)**: First are installed Lamp Holders **(1)** at the exact distance one from the other. Fig. **5B)**: Lamps **(3)** are inserted and fixed to two Lamp Holders. Fig. **5C)**: represents illumination system installed.

Claims

1. The Interconnection and Installation Method for Linear Fixture Illumination System comprises:
   a) A Lamp Holder used as a mechanical and electrical junction coupling element between neighboring lamps
   b) A Lamp Side cap with electric contacts and mechanical components necessary to ensure solid and durable coupling
   c) Internal lamp wiring plant that connects two lamp side caps and allows energy and data connection from one side of the lamp to the other
2. The method of claim 1 wherein lamp holder is suspended from the ceiling
3. The method of claim 1 wherein lamp holder is fixed directly on the ceiling
4. The method of claim 1 wherein lamp holder is not fixed to the ceiling and is used as a mechanical and electrical interconnection junction element between neighboring lamps
5. The method of claim 1 wherein lamp holder is a node, used to connect two or more lamps in a "star" connection
6. The method of claim 1 wherein lamp holder is used to distribute electric power supply between neighboring lamps
7. The method of claim 1 wherein lamp holder is used to distribute single phase and multiphase electric power supply between neighboring lamps
8. The method of claim 1 wherein lamp holder is used to distribute emergency power supply between neighboring lamps
9. The method of claim 1 wherein lamp holder is used to distribute electric data signals between neighboring lamps

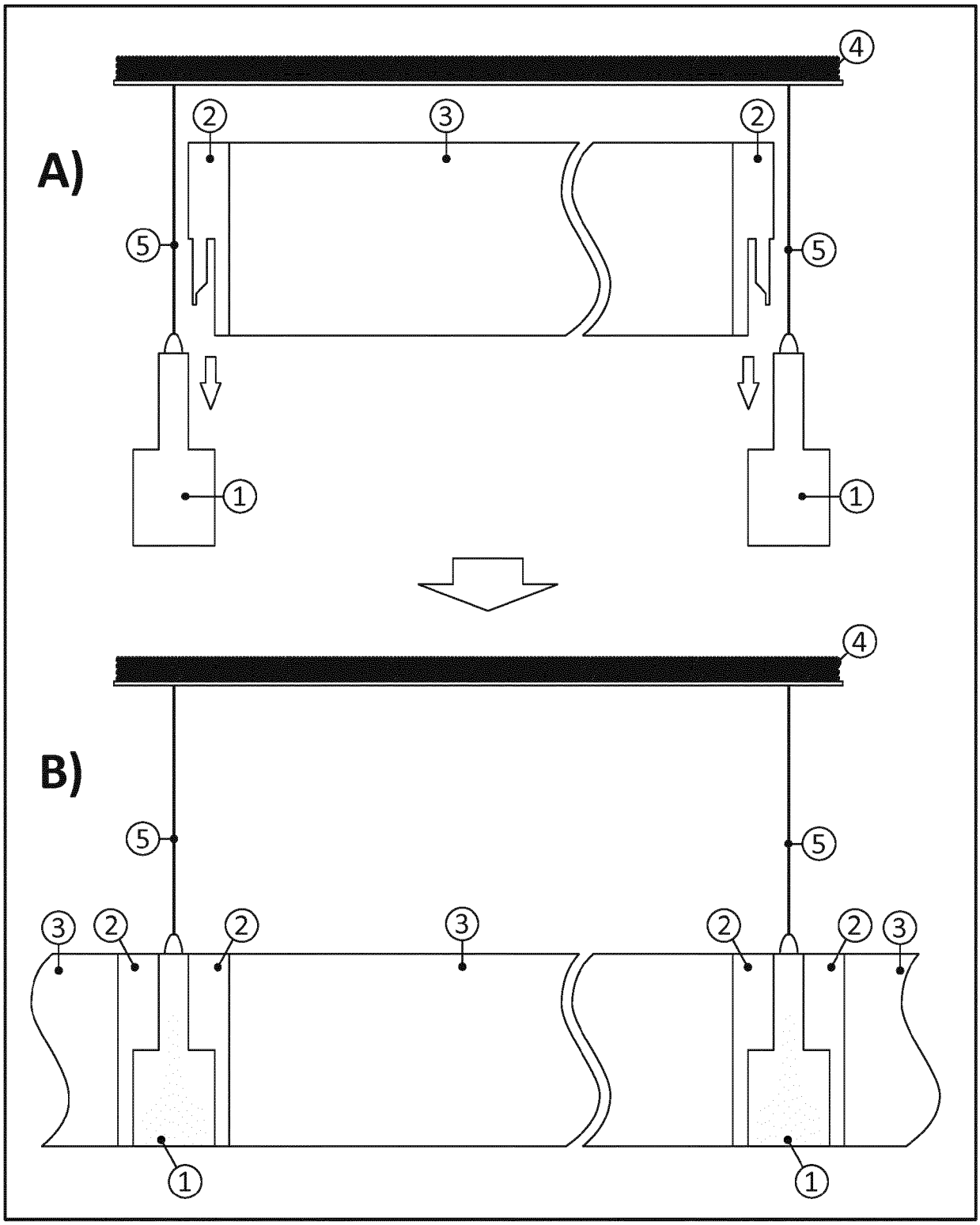

Fig. 1

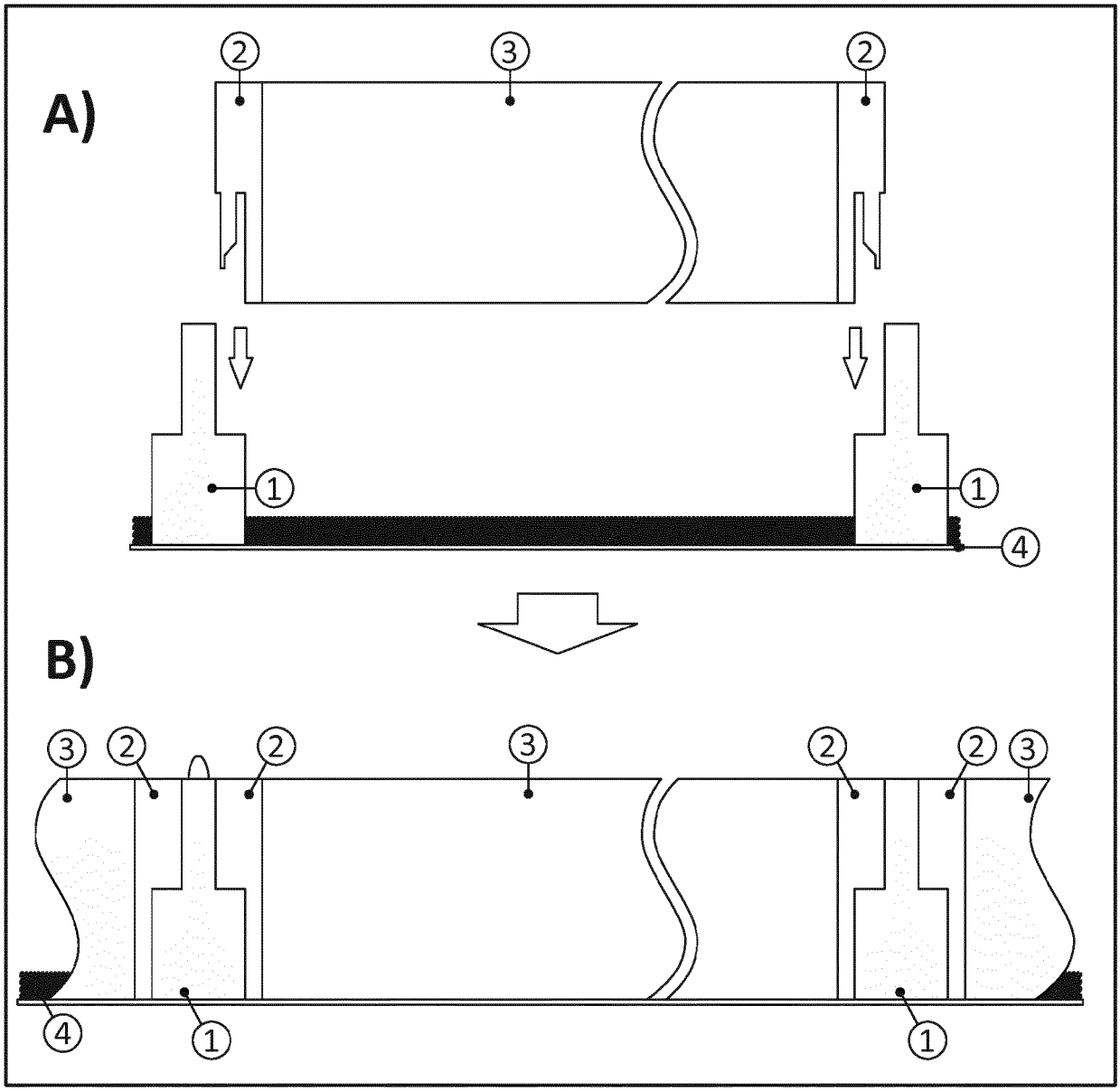

Fig. 2

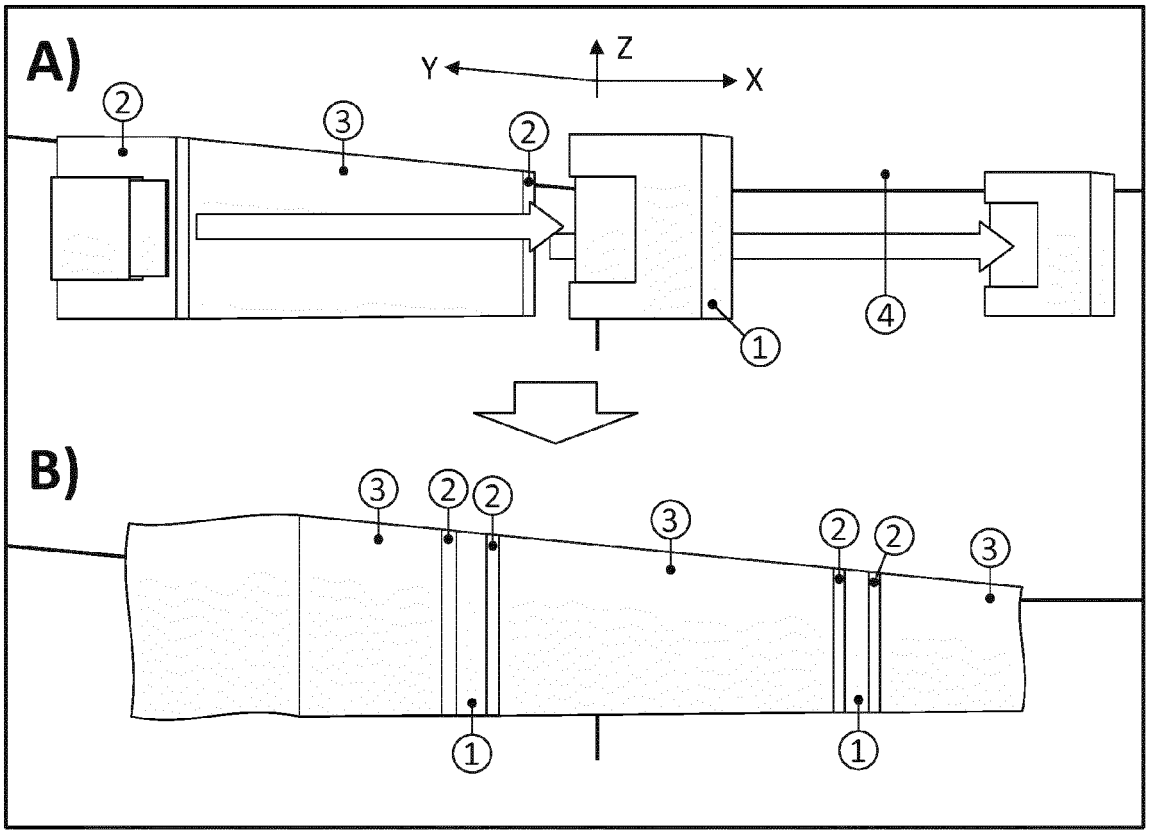

Fig. 3

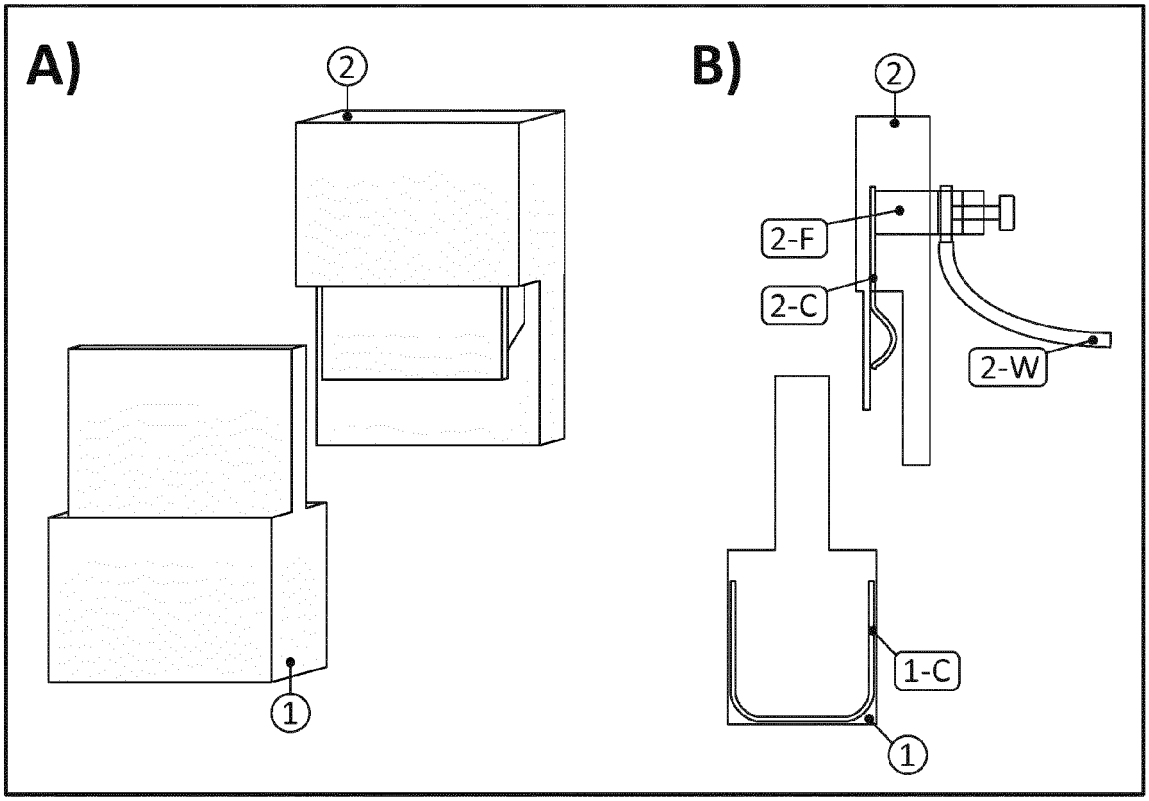

Fig. 4

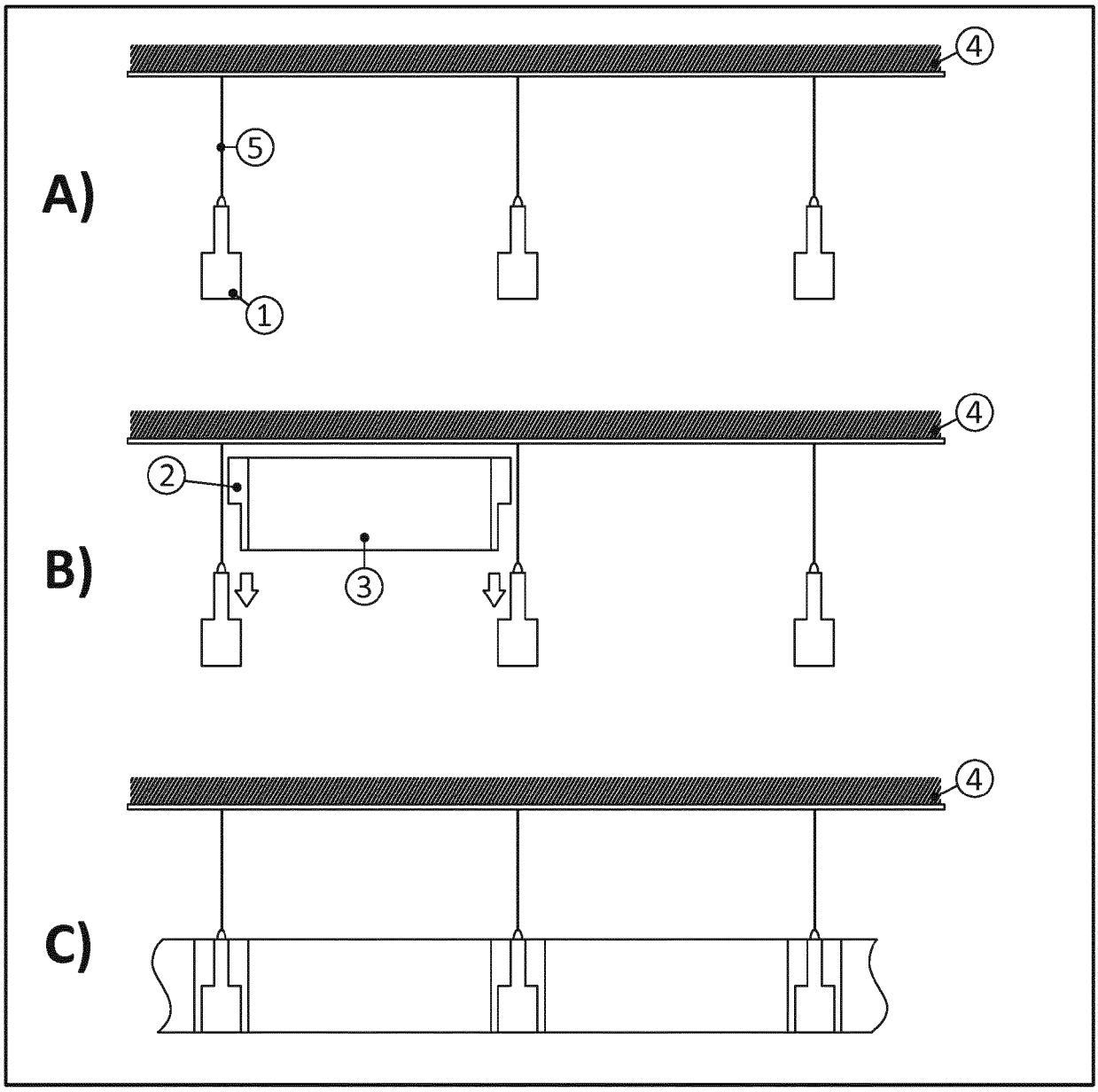

Fig. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 19 02 0356

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2015/159850 A1 (TODD ERIC [US]) 11 June 2015 (2015-06-11) * paragraphs [0038] - [0072]; figures 1-11 *	1-9	INV. F21V21/005 ADD. F21S8/02 F21S8/00 F21S8/06
X	DE 10 2005 027371 A1 (DENSCHLAG URSULA [DE]) 28 December 2006 (2006-12-28) * paragraphs [0037] - [0042]; figures 1-10 *	1-9	
A	US 2018/128467 A1 (SONNEMAN ROBERT A [US]) 10 May 2018 (2018-05-10) * paragraphs [0039] - [0043]; figures 5-6 *	1-9	

TECHNICAL FIELDS SEARCHED (IPC)
F21V
F21S

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	30 October 2019	Menn, Patrick

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 19 02 0356

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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30-10-2019

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