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(72) Inventor: **Bastidas Salvado, Joaquín**
17820 Banyoles (ES)

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(74) Representative: **Ponti Sales, Adelaida**
Oficina Ponti
C. Consell de Cent 322
08007 Barcelona (ES)

(71) Applicant: **Bastidas Salvado, Joaquín**
17820 Banyoles (ES)

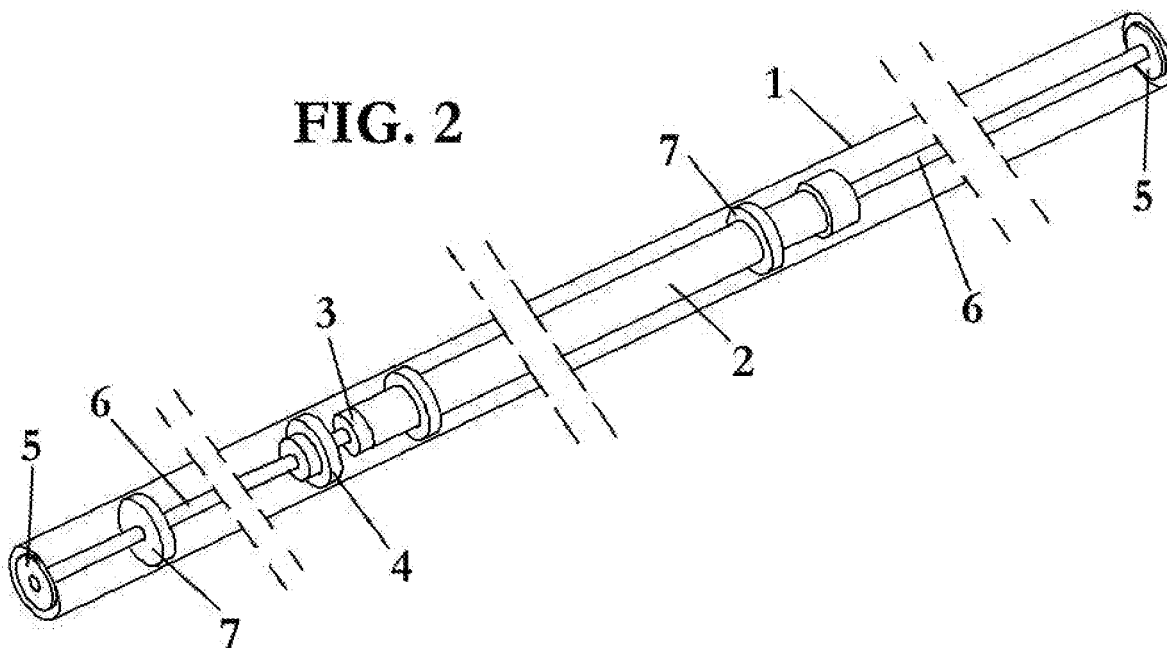
(54) **WINDING SHAFT WITH TUBULAR DRIVE**

(57) The system for rolling laminar elements, comprising a tube (1) rotatable about its longitudinal axis on which the laminar element is rolled; a driving element (2) housed inside said tube (1) and that drives the rotation of said tube (1) by means (3, 4) for transmitting the rotation movement; and at least a support (5), placed at one

or two sides of the tube (1) to fix the tube (1) to a surface; and it is **characterized in that** said means (3, 4) for transmitting the rotation movement and said at least one support (5) are completely housed inside the tube (1).

It permits to assemble two laminar elements one adjacent the other leaving no gap between them.

FIG. 2



Description

[0001] The present invention refers to a system for rolling up laminar elements, that comprises a tube inside which an element that drives the rolling up movement of the laminar element.

BACKGROUND OF THE INVENTION

[0002] It is currently known the use of systems for rolling up laminar elements that comprise a motor, so that the laminar element is rolled up and unrolled just driving a push-button.

[0003] To this end, the currently known systems comprise a cylindrical motor that is housed inside a tube, around which the laminar element is rolled up.

[0004] Examples of these systems are described in documents WO 2008/110334 and DE 20219780 U1.

[0005] The main drawback of these systems is that it is necessary to leave a space between the end of the tube and surface where it is fixed, e.g. a wall. Therefore, if two laminar elements are placed adjacent to each other it will be a gap between them. This space is because the movement transmission means between the motor and the tube is formed in a head placed external to the tube.

[0006] Furthermore, the presence of this head to transmit the movement makes necessary to place the motor close to one of the tube ends, which makes the balance of the tube-motor assembly difficult.

[0007] Therefore, it is apparent the need for a system to roll up laminar elements which permits all its elements to be housed inside the tube, leaving no space or gap when two laminar elements are placed adjacent to each other or when they are fixed to a surface such as a wall.

[0008] Furthermore, another object of the system of the present invention is to permit to place the motor in any position inside the tube, e.g. in a centered position, facilitating the balance of the tube-motor assembly.

SUMMARY OF THE INVENTION

[0009] With the rolling system of the invention said drawbacks can be solved, presenting other advantages that will be described.

[0010] The system for rolling up laminar elements of the present invention comprises:

- a tube rotatable about its longitudinal axis, on which the laminar element is rolled up;
- a driving element housed inside said tube and that drives the rotation of said tube by transmission means of the rotation movement; and
- at least a support, at one or two sides of the tube to fix the tube to a surface;

and it is **characterized in that** said transmission means of the rotation movement and said at least one support are completely housed inside the tube.

[0011] Thanks to this feature, two laminar elements can be mounted one besides the other leaving no space between them, or when they are fixed to a surface such as a wall, there is no evident space between the laminar element and the wall.

[0012] Advantageously, said transmission means of the rotation movement comprises at least an internal gear rotatably integral with the axis of the driving element that meshes with an external gear rotatably integral with said tube.

[0013] Furthermore, preferably said tube comprises inside it a number of longitudinal grooves, so that the teeth of said external gear are housed inside said grooves of the tube.

[0014] Advantageously, each or the support is formed by a plate that closes one of the ends of said tube.

[0015] To compensate the inclination, said tube can comprise inside it one or two rods, each extending from an end of the driving element to the nearer end of the tube, one or two rods and/or the driving element comprising at least a compensation disk.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] For a better understanding of what has been disclosed, some drawings are attached in which, diagrammatically and only as a non-limitative example, a practical embodiment is shown.

Fig. 1 is an exploded perspective view of the rolling system of the present invention; and

Fig. 2 is a perspective view of the rolling system of the present invention in its use position.

DESCRIPTION OF A PREFERRED EMBODIMENT

[0017] As it can be seen in the figures, the system for rolling laminar elements of the present invention comprises a tube 1 inside which a motor 2 is housed. Said motor 2 is a conventional motor currently known for its use for driving the rolling and unrolling of laminar elements. It must be pointed out that even though in the shown embodiment the driving is by a motor, this rotation movement could be driven by a non-motorized driving element.

[0018] On said tube 1 the laminar element (not shown) is rolled when said motor 2 is driven, when the laminar element is in the unfolded position.

[0019] In the present specification, "laminar element" means an element susceptible of being rolled on a tube, e.g. a curtain, a fabric, a non-woven fabric, a blind, etc.

[0020] The movement between the output axis of the motor 2 and the tube 1 is transmitted by an internal gear 3 rotatably integral with the output axis of the motor 2, which is also rotatably integral with an external gear 4.

[0021] On the other hand, this external gear 4 is rotatably integral with the tube 1. To this end, the tube 1 comprises inside it a plurality of longitudinal grooves, inside

which the teeth of said external gear 4 are housed.

[0022] In the shown embodiment, the tube 1 also comprises at its ends plate-shaped supports 5 that are also housed inside the tube 1. These supports 5 are fixed to a surface, such as a wall, by any suitable fixation means, e.g. screws. The feeding cable of the motor 2 passes through one of said supports 5.

[0023] However, it must be pointed out that two supports 5 in the tube 1 are not necessary, but it could be just one support 5, closing the other end by any suitable element.

[0024] To permit the balance of all the assembly, the system of the present invention also comprises one or two rods 6, two in the case of the shown embodiment, that extend from the ends of the motor 2 to the supports 5. The balancing of the assembly is obtained by a plurality of compensation disks 7, that can be placed on said rods 1 and/or on said motor 2.

[0025] When the laminar element is placed at the unfolded position, to roll it on the tube 1 it is just necessary to drive the motor 2 by a push-button or an external remote control (not shown), so that the rotation of the output axis of the motor 1 in one direction is driven.

[0026] The rotation of the output axis of the motor 2 is transmitted to the tube 1, as described previously, by the internal gear 3 and the external gear 4, so that the rotation of the tube 1 about its longitudinal axis in one direction makes the laminar element to be rolled.

[0027] To unroll the laminar element it is just necessary to drive the rotation of the output axis of the motor 2 in the opposed direction, which makes the tube 1 to rotate in the opposed direction by said internal 3 and external 4 gears.

[0028] As stated previously, as all the components of the system of the present invention are housed inside the tube 1, there is no gap between the tube 1 and any adjacent element, either the tube 1 of a laminar element or a wall.

[0029] Even though reference is made to a specific embodiment of the invention, it is apparent for a person skilled in the art that the described rolling system is susceptible of numerous variations and modifications, and that all the cited details can be substituted by other technically equivalent ones, without departing from the scope of protection defined by the attached claims.

of the tube (1) to fix the tube (1) to a surface;

characterized in that said means (3, 4) for transmitting the rotation movement and said at least one support (5) are completely housed inside the tube (1).

2. System according to claim 1, wherein said means for transmitting the rotation movement comprises at least an internal gear (3) rotatably integral with the output axis of the driving element (2) that meshes with an external gear (4) rotatably integral with said tube (1).
3. System according to claim 2, wherein said tube (1) comprises at its internal surface a plurality of longitudinal grooves, so that the teeth of said external gear (4) are housed inside said grooves of the tube (1).
4. System according to claim 1, wherein the, or each, support (5) is formed by a plate that closes one of the ends of said tube (1).
5. System according to claim 1, wherein said tube (1) comprises inside it one or two rods (6), each extending from an end of the driving element (2) to the closest end of the tube (1).
6. System according to claim 1 or 5, wherein at least one of the rod or said rods (6) and/or the driving element (2) comprises at least a compensation disk (7).

Claims

1. System for rolling laminar elements, comprising:
 - a tube (1) rotatable about its longitudinal axis on which the laminar element is rolled;
 - a driving element (2) housed inside said tube (1) and that drives the rotation of said tube (1) by means (3, 4) for transmitting the rotation movement; and
 - at least a support (5), placed at one or two sides

FIG. 1

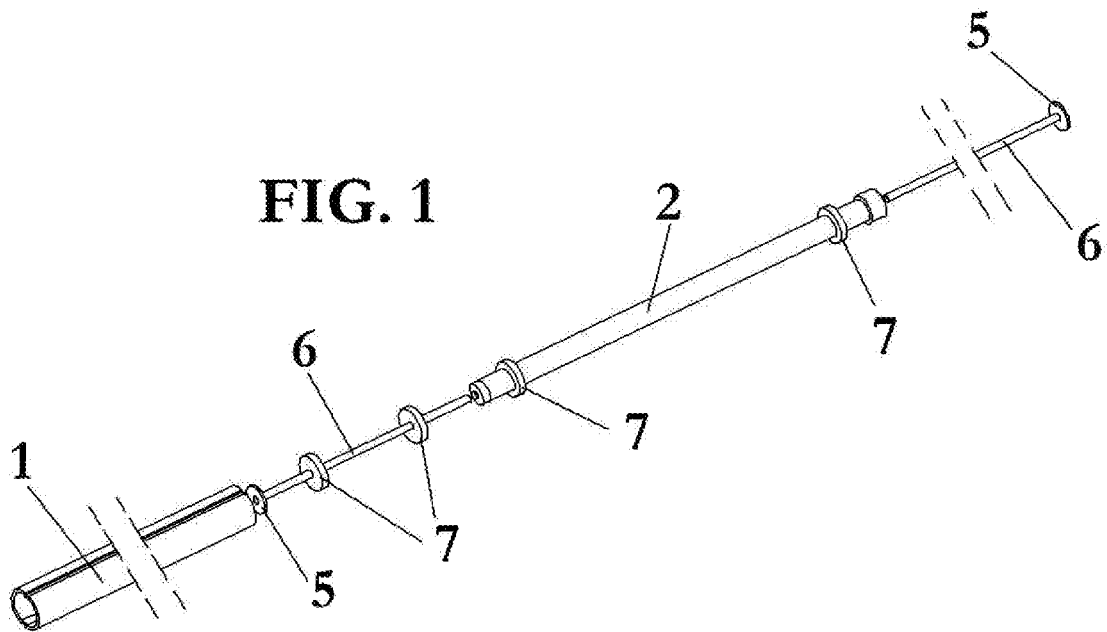
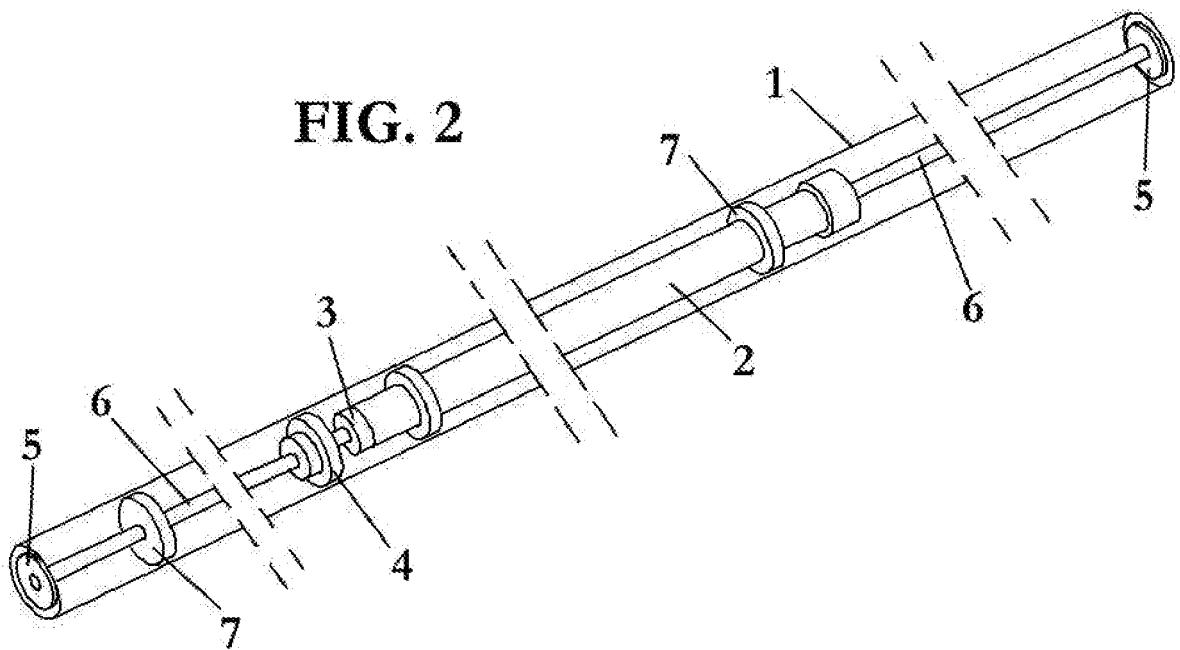


FIG. 2



INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2010/050554

A. CLASSIFICATION OF SUBJECT MATTER

INV. E06B9/72
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)
E06B

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 practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	figure 1	3
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A	EP 0 771 930 A1 (SOMFY [FR]) 7 May 1997 (1997-05-07) figure 1	1
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☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

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"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

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"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

4 May 2010

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17/05/2010

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

Schwertfeger, C

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2010/050554

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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Form PCT/ISA/210 (continuation of second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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REFERENCES CITED IN THE DESCRIPTION

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