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(54) A lateral retention system for roller screens, such as mosquito nets or blinds

(57) A lateral retention system for roller screens (1), constituted, for example, by mosquito nets or curtains or blinds, that can be rolled up on a purposely provided roller or tube (T), the system is equipped with fixed or hide-away perimetral guides (4) and comprises, in combination, a roller screen (1) that is provided, along its own free edges, with a plurality of rigid or semi-rigid leaves or laminas (3), which are characterized by being curved so as to project from the plane of lie of the sheet (1) that constitutes said screen and each of which is glued or appropriately fixed along the edge of the sheet (1), wherein each rigid or semi-rigid lamina (3) has a curvature such as to project from the plane of lie of the sheet (1) in the drawn-out configuration, and has a thickness comparable to that of the sheet (1).

According to the invention, said curved laminas have an elongated body with longitudinal development and are fixed to the sheet (1) in a single area of its own body.

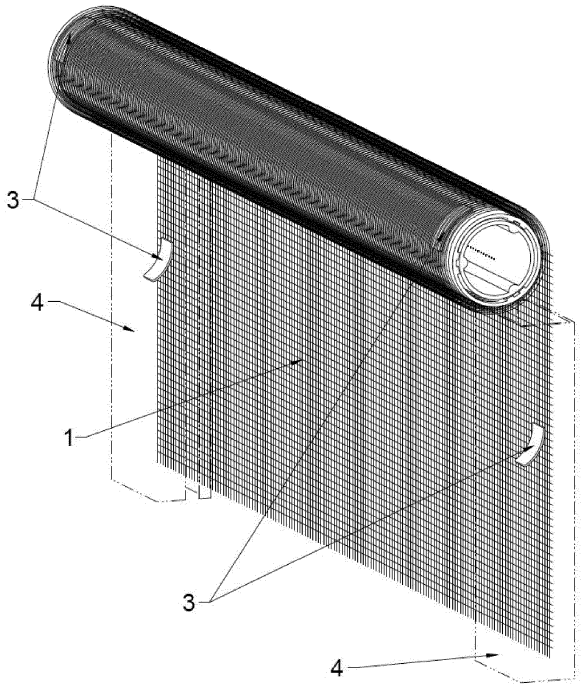

FIG. 4

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Description

[0001] The present invention relates to the sector of door and window frames, and in particular to the installation of screens of the roller type.

[0002] The main purpose of a screen is notoriously to prevent light (in the case of blinds) or insects (in the case of mosquito nets) from entering the internal environments of offices or dwellings from the openings in the walls.

[0003] Technical solutions are known where, for convenience, such screens may be temporarily removed from the corresponding opening by being rolled up in a purposely provided containing roller box.

[0004] The typical composition of this type of roller screens (to be used basically for openings having a quadrangular shape) hence envisages a sheet set between a first, roller-box, sectional element (which contains a roller around which the sheet is rolled up) and a second, mobile, sectional element (referred to herein as "handle") that enables unrolling/rolling of the sheet itself.

[0005] As regards the other two free sides, the sheet is contained by sectional elements referred to herein as "lateral guides".

[0006] The lateral guides, which may be of a fixed type or of a hide-away type, have the dual function of guiding sliding of the handle sectional element and of enclosing the free side edges of the sheet, guaranteeing complete closing of the opening, which is a characteristic necessary for proper operation of the screen.

[0007] In the case of wind, the sheet of the screen, which is held firmly fastened to the box on one side and to the handle on the other, may, however, come out of the guides set on the other two sides, and thus the condition of complete closing of the opening ceases to exist. In the case of roller mosquito nets, the sheet is notoriously constituted by a net with meshes sufficiently small as to prevent passage of mosquitoes.

[0008] In what follows, reference will be made to the figures described below, which illustrate some technical solutions currently known and a preferred embodiment of the invention.

[0009] In the drawings:

Figures 1 to 3 show an example of a roller mosquito net equipped with so-called "buttons" having the function of preventing the edges of the net from coming from the guides;

Figure 4 is a 3D view that represents schematically the main components of a roller mosquito net that can slide vertically, obtained according to the present invention, while it is in the partially open configuration, where also the lateral guides are represented with a dashed-and-dotted line;

Figure 5 shows a detail of the perimetral edge of the roller screen illustrated in Figure 4, which slides in a lateral guide, where an arched tab is shown within the latter;

Figure 6, which is similar to Figure 4, shows the present invention applied to a roller mosquito net that can slide laterally, with hide-away bottom guide;

Figure 7 is a horizontal cross section that shows a detail of the bottom perimetral edge of the roller screen of Figure 6, which slides in the hide-away guide with a tab within the latter;

Figure 8 is a 3D view of a detail of the bottom perimetral edge of the roller screen of Figure 6; and

Figure 9 is a vertical cross section of the roller screen of Figure 6, where both the hide-away bottom guide and the fixed top guide are shown.

[0010] With reference to Figures 1 to 3, there exist technical solutions that limit the possibility of the free sides of the sheet 1 coming out of the guides. Fixed along said edges of the sheet 1 - which are to be housed in the guides (not shown in the figures) - are small protrusions referred to as "buttons" 2 having dimensions such as to be able to slide conveniently within the guides and simultaneously such to prevent them from coming out of the internal space of the guide itself. In this way, the entire sheet portion 1 close to the button 2 cannot exit from the guide; with a number of buttons 2 appropriately distributed along the edges of the free sides of the sheet 1, we may be certain that the sheet 1 will not come out of the guide, for example, on account of wind.

[0011] Albeit accomplishing the function of keeping the sheet 1 within the guides, the buttons 2, however, entail a problem: their presence locally increases the diameter of rolling of the sheet owing to their thickness, which involves the need for more space in the box.

[0012] In some known solutions (Figures 1-3), recourse is had to a local reduction of the diameter of the tube T on which the sheet of the screen is wound, at the ends E of the latter. This means that at the ends there is left more space for rolling up of the sheet 1 but at the cost of a more complex manufacturing process with a larger number of components.

[0013] The document No. EP 1154119 describes a particular solution that can be applied to all roller-screen systems that envisage lateral guides at the sides of the screen. In this document, a system is described that envisages flexible elements, which, as is clearly illustrated in the figures and specified in the text of the patent, are welded on both ends. The flexible element must be welded or glued on the sheet when this is rolled up and the element itself is in a condition where it adheres properly to the screen, as described in the document itself. The reason for this is that the flexible element, with respect to the underlying layer of sheet, lies on an overlying layer, i.e., on a greater diameter (when the sheet is rolled up). The width of the screen glued to the flexible element is smaller than the width of the flexible element itself. When the sheet is unwound and assumes a plane condition said difference brings the flexible element, which is longer than the portion of sheet between the two attachment points, necessarily to project, thus creating a relief with respect to the sheet, i.e., an obstable that hinders exit of

the sheet from the guide.

[0014] In this connection, a problem should be noted: what is exploited, in the final analysis, is the difference in the winding diameter between one layer and the next of the sheet. Notoriously, screens have a contained thickness to enable winding of the sheet in a small space, and, as declared in EP 1154119, the flexible element has a thickness that is close to that of the sheet.

[0015] Evidently, also the difference in the winding diameter between one layer and the next can only be contained, and hence the projection of the flexible element with respect to the sheet - when this is splayed out - can in turn only be contained; i.e., it must be in the region of the thickness of the sheet itself.

[0016] To overcome said problem, it could be assumed that the flexible element of EP 1154119 is attached so as to form a projection sufficient to guarantee effectiveness thereof for the purposes of retention in the guide, but by so doing this projection would be preserved also in the condition where the sheet is rolled up, thus forming a 'local' encumbrance that would considerably increase the winding diameter, thus nullifying the result that it would be desired to obtain.

[0017] The document No. FR 2038584 describes a system of retention of the edges of a roller sheet with respect to lateral guides, obtained by applying, along the edges themselves, of a strip of material provided on which are tabs that project from the plane of the sheet. The material may be metal, synthetic material, or fabric and may be welded, glued, or sewn thereon.

[0018] Said tabs can slide in the guides but cannot come out of them, thus preventing exit of the sheet from the guides. At the moment when the sheet is rolled up, said tabs are flattened and remain within the thickness of the strip applied on the sides.

[0019] A first disadvantage of the above known solution regards the result obtained from said system with respect to the desired purpose, i.e., that of avoiding use of elements that, on account of their thickness, would increase the diameter of winding of the sheet at the edges. In no point of FR 2038584 are the thickness of the sheet and the thickness of the side strip specified, but it may be readily inferred that the thickness of the sheet is very contained, whereas that of the side strip is, in the best of cases, at least equal to that of the sheet itself.

[0020] This means that the winding diameter at the ends of the sheet becomes at least twice that due to the sheet alone. This result is in the direction opposite to that of not increasing the winding diameter of the sheet, as is instead obtained with the present invention.

[0021] A disadvantage of FR 2038584 regards the technology used for obtaining the tabs: each tab is obtained by making a C-shaped cut in the strip and then curving it. In FR 2038584 the tabs are not curved at their origin but are curved by mechanical action. When the tabs are rolled up together with the sheet, they are again subjected to a mechanical action that tends to flatten them or in any case to reduce their curvature (in the text of FR 2038584 it is clearly said that the tabs undergo deformation and remain within the thickness of the strip) so that it is questionable whether, once the sheet is again unrolled, they can assume again the curved shape.

[0022] It is to be emphasized that associated to the mechanical action that tends to flatten the tabs when the sheet is rolled up is also the effect of the high temperature that normally is set up in screen devices during the warm periods of the year so that, even if the tabs manage to preserve the curvature after some cycle of closing/opening, it seems unlikely that this will occur after a period of time sufficiently long as to include the warm period of the year.

[0023] The document No. US 1882982 represents a system designed to withhold a roller sheet in the lateral guides provided at the sides thereof, and the main advantage that it proposes is that of not increasing the winding diameter of the sheet.

[0024] In this case, however, the idea is that of setting along the side edges of the sheet strips welded to the sheet. These are welded not over their entire surface but rather only along the outermost edge, whereas the rest of the strip should remain curved with respect to the sheet so that the convex part faces the sheet. The guides according to US 1882982 have a particular design with a wall that is made to penetrate between the sheet and the strip in such a way as to prevent the sheet from coming out.

[0025] Different solutions for the side strip are presented: it may be continuous, i.e., applied along the entire edge of the sheet, or else it may be discontinuous, i.e., with stretches of strip applied to the sheet that are more or less long and more or less set at a distance apart.

[0026] US 1882982 explains that the strip is curved when the sheet is unrolled and that, when the sheet is rolled up, the strip is flattened on the sheet so as to not increase the winding diameter. This means that, evidently, the strip changes shape and from flat, when it is wound, returns to its curved condition. It is unlikely for a strip that is so thin and welded to the sheet along an edge to preserve over time the initial characteristics of elasticity: rather than continuing to change shape between one condition and the other, it ends up remaining in one of the two configurations. The strip will tend to remain attached to the sheet, or in any case its initial curvature will decrease until it no longer enters the part of guide designed to receive it but enters the opening provided for the sheet, thus nullifying the effectiveness in terms of retention of the sheet within the guide. This consideration arises from experience and from the knowledge of the materials used in the field of screens and of environmental conditions to which devices of this sort are subject. It should be noted that this problem does not arise if the strip is attached along the entire edge of the net, given that there will always be a first stretch of strip in the right seat that will appropriately guide the strip throughout the remaining length. But in this case the strip will increase considerably the winding diameter, nullifying the advan-

tage that is intended to achieve.

[0027] If, instead, the strip is applied only on some stretches, the problem of the winding diameter is reduced - even though not completely eliminated - but, if the various stretches of strip remain deformed and attached to the sheet, the condition in which the strip is guided throughout its length in the right seat within the guide ceases. Rather, there may be readily expected an anomalous operation at the moment when the stretches of strip come to impact against the element of the guide that defines the seat for the strip at the moment when the stretch itself enters the guide.

[0028] The main purpose of the present invention, is hence to overcome the aforesaid disadvantages and drawbacks that characterize currently known solutions by providing an innovative solution to the problem of exit of the sheet 1 from the guides 4, said solution advantageously not involving difficulties in rolling up the sheet 1 caused by the presence of the buttons 2.

[0029] This has been achieved, according to the invention illustrated schematically in Figures 4 to 9, with a roller screen provided, along the free edges of the sheet 1, with a plurality of rigid or semi-rigid laminas or leaves 3 characterized by being curved so as to project from the plane of lie of the sheet 1, each of which is glued or appropriately fixed along the edge of the sheet 1 in a similar way of the known buttons 2 and instead of them.

[0030] With this peculiar arrangement, when the mosquito net (or more in general the sheet) 1 is rolled up, each lamina 3 - thanks to its limited thickness, which is comparable to that of the sheet - sets itself between two adjacent layers of sheet, generating an increase in thickness that is advantageously barely perceptible.

[0031] In this connection, it should be noted that a further peculiar characteristic of the invention is constituted by the fact that the curvature of each of the lamina 3, in addition to being such as to project from the plane of lie of the sheet 1 in the configuration where the sheet is drawn, must have the concavity facing the roller or tube T for rolling up the sheet itself in such way that, when the lamina 3 is in a position corresponding to the roller T during rolling-up of the sheet 1, its concavity will facilitate this operation.

[0032] When the sheet 1 is unrolled and slides in the perimetral guide 4, this lamina or appendage 3, given that it is curved and projects from the plane of lie of the sheet itself, constitutes, in effect, a sort of hook that cannot exit from the guide 4, offering a lateral encumbrance determined by its geometrical shape and not by its thickness (Figures 5, 7, and 9).

[0033] According to the invention, the aforesaid lamina 3 is made of plastic or metal material or some other material, and is fixed to the net 1, by means of glue, thermal welding, ultrasound gluing, or some other suitable system, in a point of its own surface of contact with the sheet 1 that is located, preferably but not exclusively, at one end of the lamina itself.

[0034] The present invention has been described and illustrated according to a preferred embodiment, but it is evident that functionally and/or technically equivalent modifications and/or replacements may be made thereto by a person skilled in the branch, without thereby departing from the sphere of protection of the present industrial patent right.

Claims

1. A lateral retention system for roller screens (1), constituted, for example, by mosquito nets or curtains or blinds, that can be rolled up on a purposely provided roller or tube (T), said system being equipped with fixed or hide-away perimetral guides (4) and being **characterized in that** it comprises, in combination, a roller screen (1) that is provided, along its own free edges, with a plurality of rigid or semi-rigid laminas or leaves (3), which are **characterized by** being curved so as to project from the plane of lie of the sheet (1) that constitutes said screen, each of which is glued or appropriately fixed along the edge of the sheet (1); wherein each rigid or semi-rigid lamina (3) has a curvature such as to project from the plane of lie of the sheet (1) in the drawn-out configuration, and has a thickness comparable to that of the sheet (1); and wherein said curved laminas (3) have an elongated body with longitudinal development and are fixed to the sheet (1) in a single area of its own body.

2. The lateral retention system for roller screens (1) according to Claim 1, **characterized in that** said area of fixing of each curved lamina (3) to the sheet (1) is an end area, whereas the remaining area is free.

3. The lateral retention system for roller screens (1) according to Claim 1 or Claim 2, **characterized in that** the curvature of each of the laminas (3), in addition to being such as to project from the plane of lie of the sheet (1) in the drawn-out configuration, has a concavity facing the roller or tube (T) for rolling up the sheet itself; thus obtaining that, when the lamina or leaf (3) is in a position corresponding to the roller (T) during rolling-up of the sheet (1), its concavity will facilitate this operation.

4. The lateral retention system for roller screens (1) according to Claim 3, **characterized in that**, when the sheet (1) is unrolled sliding in the perimetral guide (4), since said appendage or lamina (3) is curved and projects from the plane of lie of the sheet itself, it constitutes, in effect, a sort of hook that cannot exit from the guide (4), offering a lateral encumbrance determined by its geometrical shape and not by its thickness.

5. The lateral retention system for roller screens (1) ac-

cording to any one of the preceding claims, **characterized in that** said laminas (3) are made of plastic or metal material or some other material.

6. The lateral retention system for roller screens (1) according to any one of the preceding claims, **characterized in that** each of said laminas (3) is fixed to the screen or sheet (1) by means of glue, thermal welding, ultrasound gluing, or some other suitable system, in one or more points of its own surface of contact with the sheet (1).

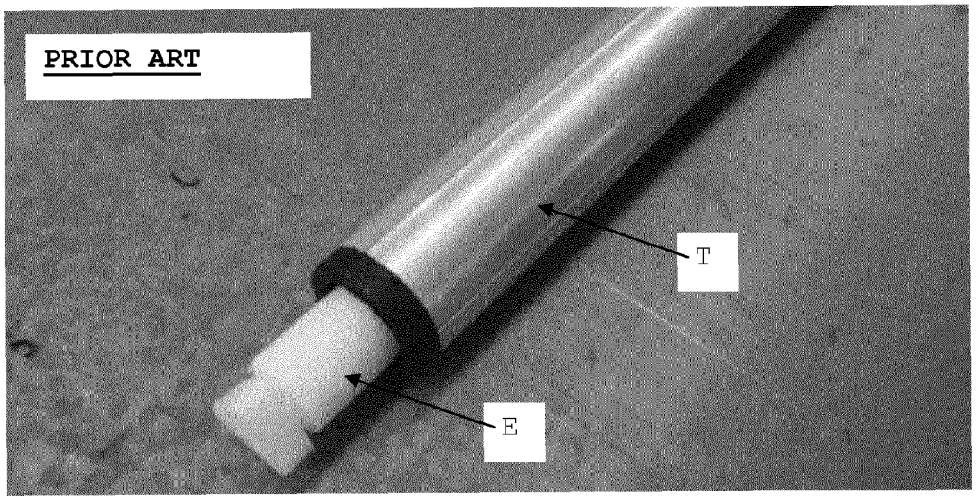

FIG. 1

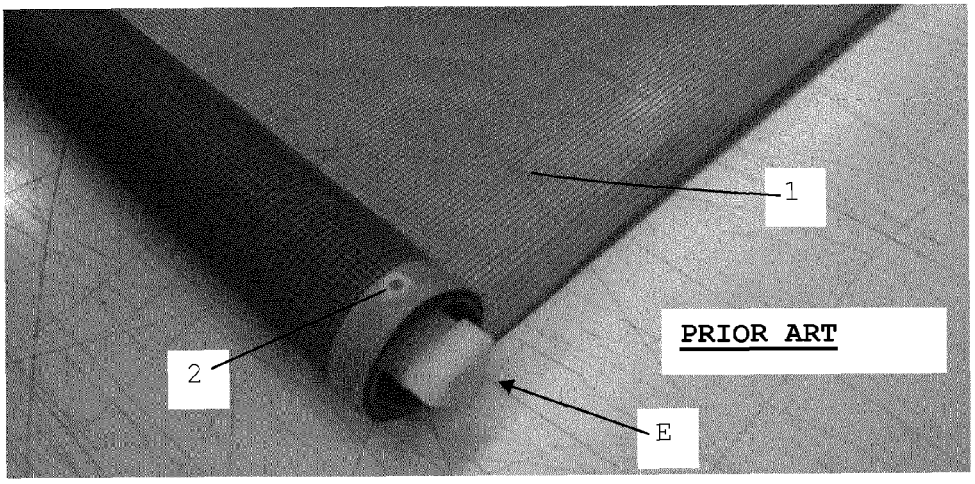

FIG. 2

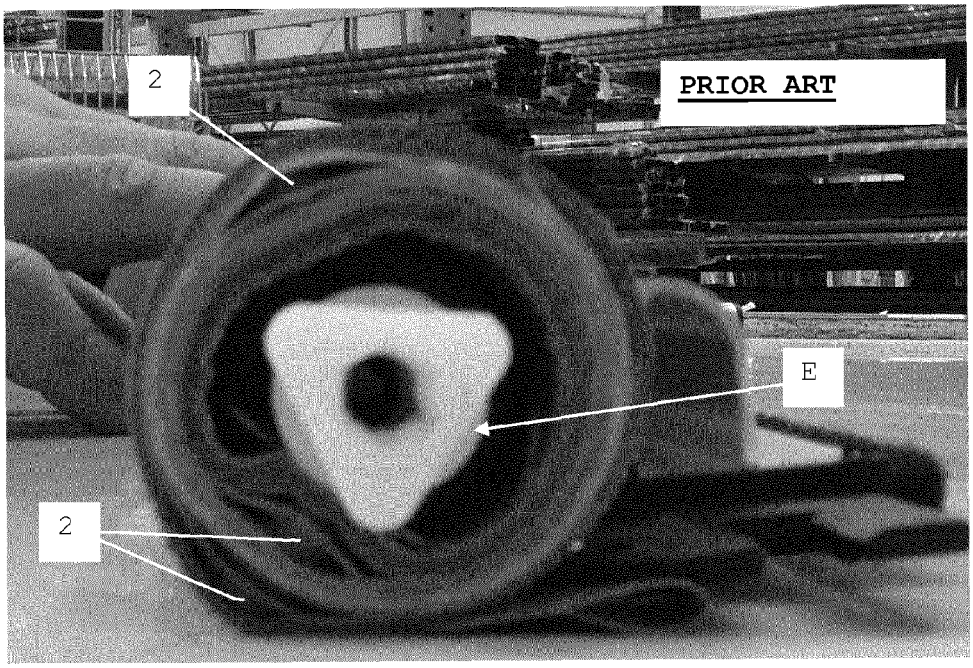

FIG. 3

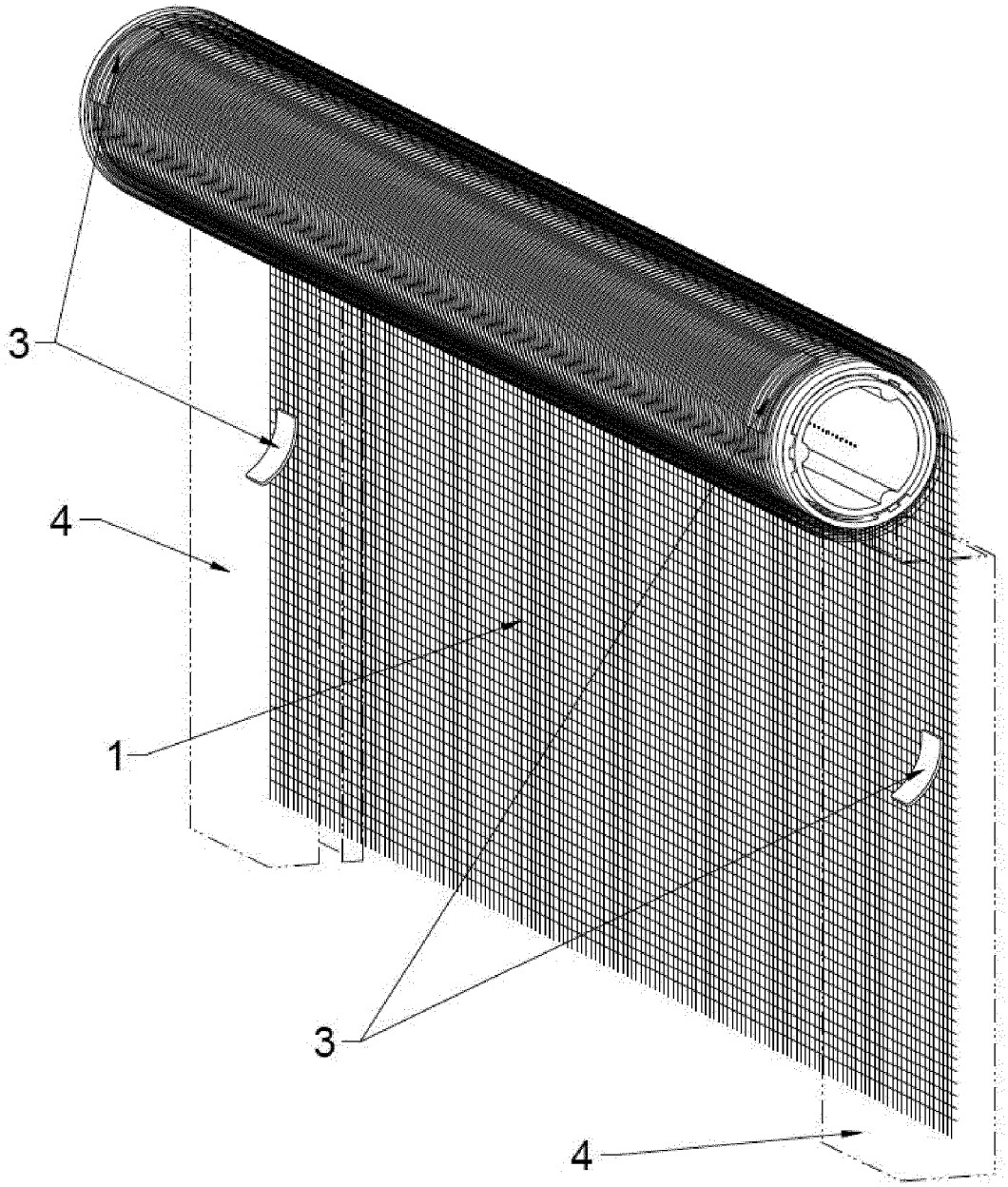

FIG. 4

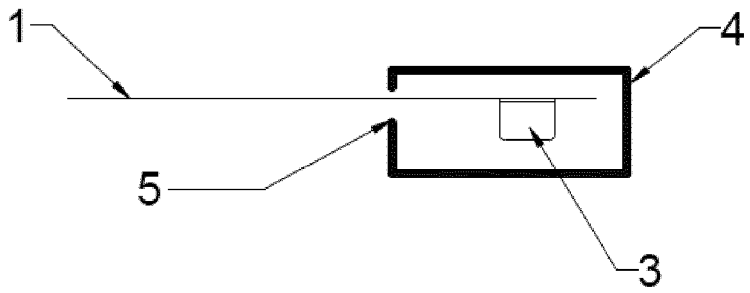

FIG. 5

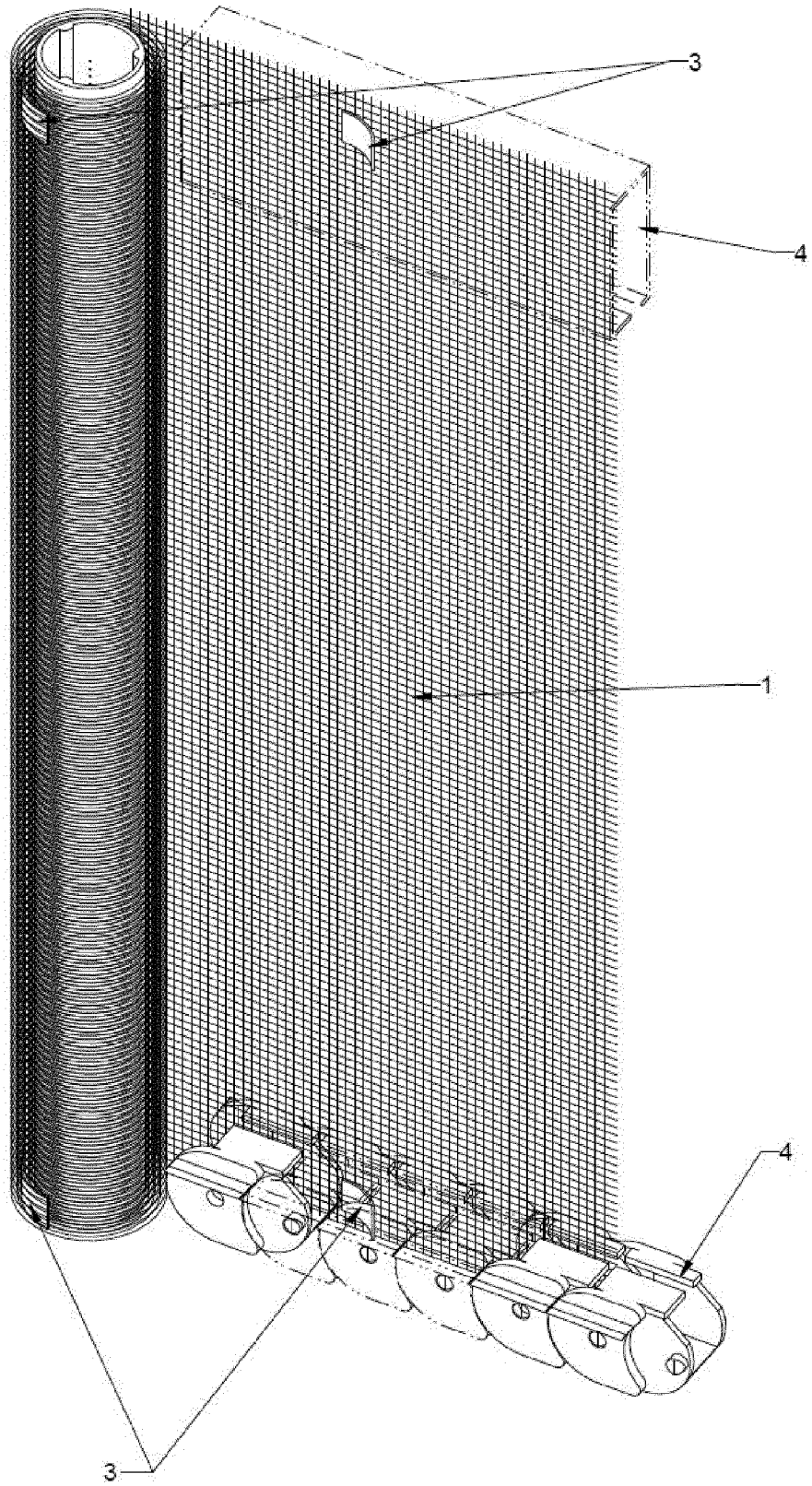

FIG. 6

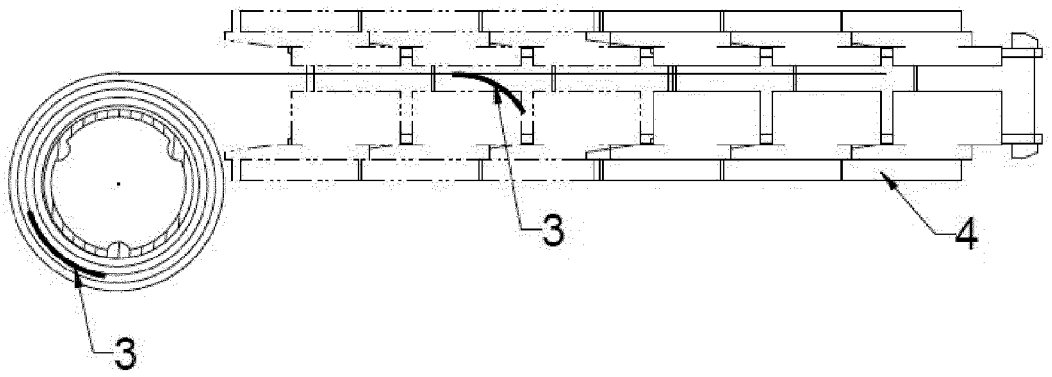

FIG. 7

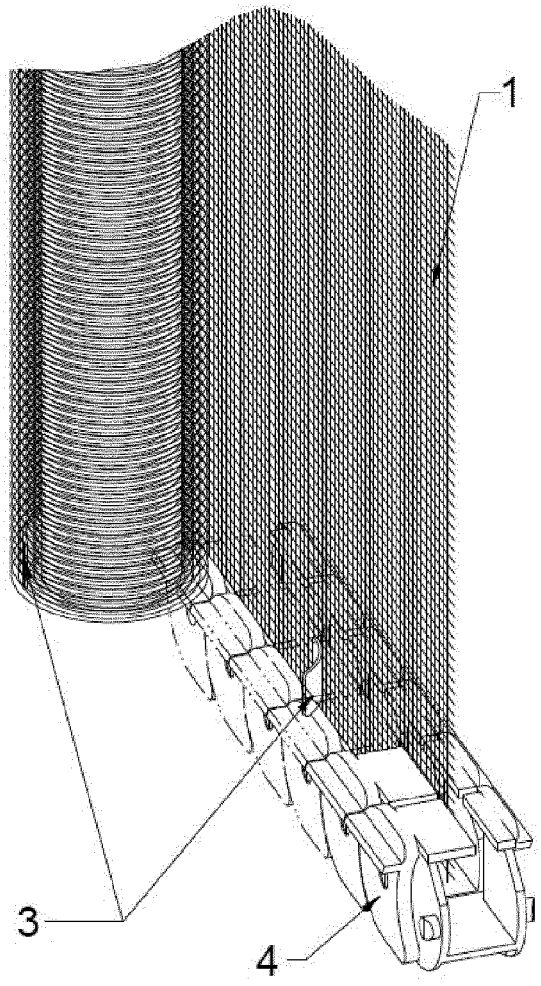

FIG. 8

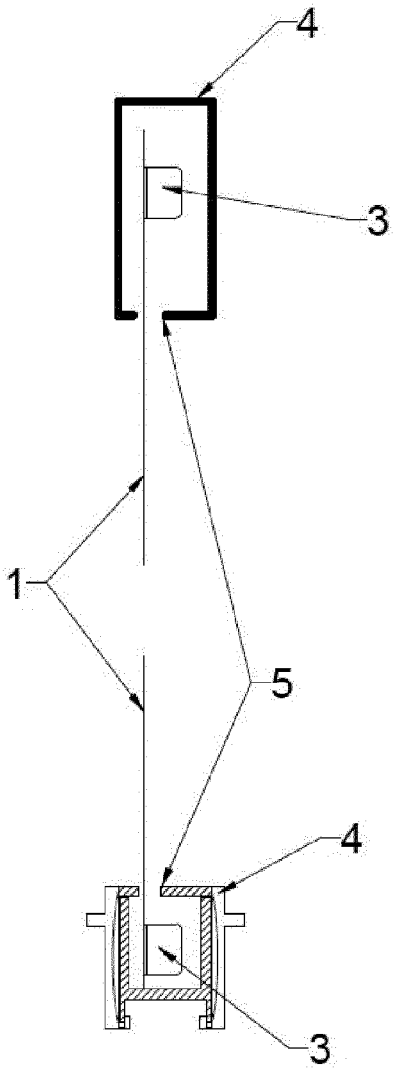

FIG. 9

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EUROPEAN SEARCH REPORT

Application Number
EP 14 15 8198

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A,D	EP 1 154 119 A2 (BAUTEX ADOLF STOEVER SOEHNE GM [DE]) 14 November 2001 (2001-11-14) * figures 1-3 * * paragraphs [0005], [0008], [0009], [0010], [0015] - [0017] *	1-6	INV. E06B9/58
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TECHNICAL FIELDS SEARCHED (IPC)
E06B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	11 June 2014	Tänzler, Ansgar

CATEGORY OF CITED DOCUMENTS

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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- FR 2038584 **[0017] [0019] [0021]**
- US 1882982 A **[0023] [0024] [0026]**